ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

POLICIES, REGULATORY REGIMES AND MANAGEMENT PRACTICES FOR INVESTMENT PROMOTION AND SUSTAINABLE DEVELOPMENT OF THE MINERAL RESOURCES SECTOR IN ECONOMIES IN TRANSITION AND DEVELOPING COUNTRIES OF EAST AND SOUTH-EAST ASIA

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PART ONE

EMERGING ISSUES OF POLICY AND MANAGEMENT PRACTICES IN SUSTAINABLE DEVELOPMENT OF LAND AND MINERAL RESOURCES IN EAST AND SOUTH-EAST ASIA

PART TWO

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Front cover photographs (Clockwise from left upper corner):

Left upper corner: Copper-molybdenum processing plant at Erdenet, Mongolia.

Right upper corner: Ore processing at the Chatree Gold Mine, Thailand.

Right bottom corner: The Dong Henk gypsum mine in the Lao People's Democratic Republic producing 100,000 tons of gypsum per year. Photograph courtesy of Alan Johnson.

Left bottom corner: Small scale mining by tribe people for road construction in the north of Viet Nam.

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PREFACE

The Asian and Pacific region during the past decade has experienced a decline in foreign direct investment flows in the mineral sector owing to varied reasons such as world recession, unstable prices for mineral commodities, unethical business practices and change in government policies. The issues related to decentralization of management of the mineral sector from central governments to provincial authorities and the question of conflicting land use policies have virtually demoralized mining companies in offshore investments in the region. This trend could be effectively reversed if all stakeholders, particularly the government, mining companies and host communities effectively realize the overarching cardinal factors of sustainable development, namely environmental, economic and social paradigms. To this end, it is envisaged that this publication will be useful in reorienting policies and regulatory regimes in a holistic manner with the main objective of enhancing foreign direct investment and promoting effective land use practices.

This publication is the eighth volume of the Mineral Resources Assessment, Development and Management Series. It includes a series of papers that were presented at the Training Workshop on Drafting of Implementing Rules and Regulations for Mining Laws of Transitional Economies, held at Bangkok from 18 to 20 December 2001. The publication contains two parts. The first part reviews the critical and emerging issues of policy and management practices in investment promotion and sustainable development of mineral resources sector. Based on an overview of international and regional mining practices, the papers provide valuable guidelines and policy options in the formulation of mining regulatory regime, inter-ministerial coordination and cooperation in the development of the mineral sector at a national level, policy issues related to decentralization and resource rent revenue sharing as well as policy options for land reclamation and mine closure. The second part of the publication contains a review of policies, regulatory regimes and management practices for investment promotion and sustainable development of the mineral resources sector as experienced by the countries with economies in transition and developing countries of East and South-East Asia.

The ESCAP secretariat wishes to record its appreciation to Dr. Jennifer Cook Clark, the ESCAP consultant, Dr. Allen L. Clark, Deputy Director, Programme on Energy and Mineral Resources of East-West Center as well as other resource persons for the preparation of excellent workshop material and background papers and their presentation during the Training Workshop. It is hoped that this publication will be useful to relevant government officials and senior executives of mining companies in understanding emerging policy options and regulatory regimes that effectively catalyse foreign direct investment in the mineral sector.

INTRODUCTION

The mineral sector in general experienced a downward trend in harnessing private investment, particularly foreign direct investment mainly attributed to various factors such as world recession, sluggish world mineral commodity prices and the strong lobby of environmentalists which saw this industry as dirty and polluting the environment. Foreign investors and lending agencies as well as commercial banks were reluctant to provide capital for exploration and mining activities owing to the negative publicity and those risks cited above. It was also realized that government policies, regulatory regimes and management practices related to the mineral sector underwent a dramatic change and some issues that were of concern to the industry were the trend in decentralization of management of mining activities from central governments to provincial authorities, and their inequitable sharing of revenue, inconsistent legal and fiscal regimes and the inadequacy of effective safeguards such as security of tenure and investment. The inability of provincial authorities to negotiate mineral investment agreements owing to the dearth of trained technical and managerial personnel was also a major drawback to convince mining companies that Governments should adopt the principle of a level playing field in promoting investment.

In order to reverse that trend, it is imperative that all stakeholders, namely Government, mining companies, host communities, NGOs and civil society, should be brought in as partners in the development of the mineral sector. This partnership should realize the cardinal factors in sustainable development: economic, environmental and social issues and its overarching effects.

The papers presented at the Training Workshop on Drafting Implementing Rules and Regulations for Mining Laws of Transitional Economies, held at Bangkok from 18 to 20 December 2001, effectively brought into focus the emerging trends in national mineral policy, economic, environmental, and conflicting land use issues as well as the legal framework on mine closure, with special emphasis on life cycle analyses. The papers presented by the representatives of the participating countries clearly indicated the present status related to those issues and were informative.

The World Summit on Sustainable Development that was convened in Johannesburg, South Africa, in August – September 2002 acknowledged the importance of promoting small-scale mining as opportunities to achieve sustainable livelihood for rural communities in developing countries. The Summit also accepted that mining, minerals and metals are important to the economic and social development of many countries and minerals are essential for modern living. It further identified actions *at all levels* to support efforts to address the environmental, economic, health and social impacts and benefits of mining, minerals and metals throughout their life cycle; enhance the participation of stakeholders and foster sustainable mining practices through the provision of financial, technical and capacity building in developing countries and countries with economies in transition.

Against that backdrop, the ESCAP secretariat has identified this publication as most opportune and a valuable guide in promoting mineral investment, including mining and downstream development, taking into consideration the evolving policy options, regulatory regimes and management practices elaborated in selected countries of East and South-East Asia.

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PART ONE

EMERGING ISSUES OF POLICY AND MANAGEMENT PRACTICES IN SUSTAINABLE DEVELOPMENT OF LAND AND MINERAL RESOURCES IN EAST AND SOUTH-EAST ASIA

I. COMPONENTS OF A NATIONAL MINERAL POLICY

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A. INTRODUCTION

Few countries in the world today actually have a comprehensive mineral policy that clearly provides the underlying basis for the development and utilization of a country's mineral resources. In the vast majority of countries, particularly those with a long mining history, such as France, the United Kingdom of Great Britain and Northern Ireland, and the United States of America do not have a comprehensive mineral's policy although the need for such a policy is widely recognized. Instead, what many of the developed countries have devised are national policies that are specific to an individual commodity e.g. uranium in France, coal in the United Kingdom, or commodities e.g. critical/strategic minerals such as in the United States. Indeed, in many of the developed countries that are major mineral producers, such as Canada and Mexico existing mineral policy has only been formulated and enacted within the last decade.

In developing countries the situation is similar to that in the more developed countries in that the vast majority, with the possible exception of some of the transitional economies, also do not have a comprehensive national mineral policy. The transitional countries are somewhat of an exception in that many do have a general mineral policy that is normally a reiteration of the State's role in the development of the country's mineral resources. Such national policies represent the first step in the development of a comprehensive mineral policy.

In the following, an outline of a comprehensive national mineral policy is presented. The proposed components of a national mineral policy should be viewed as a "best practices" guide rather than as an absolute model for national mineral policy development. As the reader will see not all of the individual issues may fit the existing perceptions of a national mineral policy and/or may not match existing legislation/decrees applicable to the mineral sector.

B. OUTLINE OF A COMPREHENSIVE NATIONAL MINERAL POLICY

Mineral resources are the national wealth of the people and will be developed in a manner that serves the national interest. The government is the steward of the people's interest and will seek to insure that mineral development is undertaken in such a way as to serve the interests of both present and future generations.

The government seeks to advance the economic development of the people of the country and desires to encourage the rational exploration and development of its mineral resources. The government expects to receive fair value for its mineral resources and, through private sector investment, to obtain the transfer of skills, know-how and technology to nationals. In the process of developing mineral resources, the government gives high priority to protection of the environment and avoidance of waste and misuse of its resources.

The government recognizes that people living in the immediate area of mineral development will bear significant environmental and social costs. Therefore, the government will seek to ensure that regional development, compensatory development, employment preferences, and small business opportunities offset these inevitable costs for the local residents and communities.

1. Process of Investing in the Minerals Sector

The government recognizes that finding and developing minerals is a long and risky process that spans many years and involves sizable outlays of exploration and pre-development funds. The government is prepared to recognize these risks and long-term commitments in its financial arrangements with mining investors. Further, government is prepared to recognize special circumstances of individual investors and the unique problems associated with development of particular projects.

To accommodate the character of mining development, the special needs of mining investors, and the unique character of particular projects the government anticipates that multi-stage negotiations will be required. These negotiations will occur at appropriate stages in the evolution of the project and will reflect the reduction in geological, environmental and development uncertainties. As a starting point in this process, entering investors will be expected to conclude a comprehensive agreement with the appropriate government agency which reflects both the mining law and the general policy framework for mining. Normally, these agreements involve representatives from major regulatory and fiscal agencies of the national government as well as local and community representatives from the exploration area.

Once the prospecting programme is established, the scale and success of exploration, environmental, and feasibility work will largely determine the timetable for subsequent discussions. Normally, discussions might be expected to occur at the conclusion of the pre-feasibility, feasibility, and development proposal stages. The issues to be discussed at each stage will be determined by mutual agreement and will normally focus on topics where fieldwork, design work, or financial analysis suggests that the assumptions of the entry agreement require modification or adjustment.

Over the course of the project's evolution, responsibility for investor liaison will be shared between the responsible government agencies. In general, the responsible government geological/mining department will handle all day-to-day investor contacts (including relations with local authorities and residents) and act as a project facilitator. A designated responsible government agency will oversee contractual and fiscal relationships with investors.

2. Fiscal and Monetary Policy

The fiscal and monetary policies of the government are set forth in the governing economic legislation of the country, usually developed by the Ministry of Finance in concert with all effected government agencies. The principal components of the government's fiscal and monetary policy, as it applies to mining, include the following:

- *Royalty* – Royalty rates in the Lao People's Democratic Republic are determined as a percentage of the FOB export value of mineral products. Royalty rates vary from mineral to mineral. Royalty rates for common minerals likely to be exploited by foreign investors are set out in the accompanying attachment.

- *Tax Rate* – Mining investors are subject to the general rate of income taxation of the nation. This rate is currently XX per cent of taxable profits. At the time of entering into a comprehensive agreement a tax rate for the project may be specified. Normally this tax rate will be the rate prevailing at the time of the Agreement.

- *Option for State or Local Equity Participation* – Government believes that a local minority equity ownership in mining ventures may sometimes be desirable. To this end, it reserves the option of having equity shares made locally available at specified intervals. Should increased local shareholding be desired mining investors will be expected to offer equity share for sale first to the government, and second {if the government does not accept this offer within 30 (thirty) days of the date of the offer} to nationals or national companies controlled by

nationals. The percentage of company shares to be offered (at specified intervals) following the commencement of operations shall be the difference between the total percentage of shares to be offered and the percentage of shares (if less than the following percentages) already owned by the government or nationals or companies at the date of offer.

The government is under no obligation to purchase shares in the company or to seek purchasers for such shares. Where a local equity ownership is sought, shares shall be purchased at a fair market value determined as the higher of: (i) the price at which shares would be accepted for listing on an internationally recognized stock exchange and offered for sale, (ii) the value of the shares, based upon a fair valuation of the company as a going concern.

- *Import Duties and Customs* – The company may import into the Lao People's Democratic Republic, free of import duties, capital good, equipment, machinery (including spare parts), vehicles other means of transport and raw materials needed in the exploration, feasibility study, construction, mining, production and supporting technical activities of mining projects.
- *Other taxes and charges* – Mineral investors, like all other private investors, shall be subject to the following taxes and charges:
  - (a) Land rent in respect of the concession area or the mining area.
  - (b) Personal income tax for its employees.
  - (c) Withholding taxes on interest, dividends, royalties and services.
  - (d) Stamp duty on legal documents.
  - (e) Any applicable land and building taxes in respect of the use of land area and space in which the company constructs facilities relating to its mining operations.
  - (f) Mining companies shall pay levies, taxes, changes and duties imposed by a regional government as approved by the national government.
- Currency Repatriation and Foreign Exchange Policy-All investment remittances into the Lao People's Democratic Republic (equity capital as well as loan) shall be deposited into a foreign investment account held at domestic foreign exchange bank(s). Conversion of the foreign exchange from such account into local currency shall be effected through the foreign exchange bourse at the prevailing rate of exchange.

Mining company will have the right to transfer abroad, in any currency, funds in respect of the following items, provided that such transfers are affected in accordance with the prevailing laws and regulations and at prevailing rates of exchange generally applicable to commercial transactions:

(a) Such funds as shall be required to meet the companies offshore operating expenses for a period not to exceed three months.

(b) Net operating profits in proportion to the share holding of the foreign investor(s).

(c) Repayment of loans and the interest thereon, as far as the loan is a part of investment, which has been approved by the government.

(d) Proceeds from sales of shared owned by the foreign investor(s) to the government or to nationals.

- Expenses for expatriate personnel and training of local personnel abroad.

Other foreign exchange requests will be subject to application to the Central Bank. Individual projects shall be entitled to receive treatment no less favorable than treatment that accorded to any other mining company carrying on operations in the nation.

3. Environmental Policies in the Mining Sector

Mining companies shall, in accordance with international best practices, the Mining Law, the Environment Law and any other environmental and natural preservation laws and regulations in force in the country, conduct its operations so as to (i) control waste or loss of natural resources, (ii) protect natural resources against unnecessary damage, (iii) protect sacred and historic sites from damage, (iv) prevent pollution and contamination of the environment, and (v) in general maintain the health and safety of its employees and the local community. Within this framework it should be understood that the primary focus of the Government's environmental concern is on ecological aspects that directly impact on the lifestyles, resources, and economic activities of residents of the region.

The company shall include in the feasibility study for an Environmental Impact Assessment (EIA) designed and conducted in accordance with generally recognized international standards. The EIA will identify and analyze the potential impact of mining operations on land, water, air, biological resources, human settlements, sacred and historic sites, and agriculture in the project region. *The content of the Environmental Impact Assessment will be set forth as an Annex to the basic development agreement.* The environmental assessment should also outline measures that the company intends to use to mitigate adverse environmental impacts of the operations and demonstrate how important environmental considerations have been reflected in mine planning and design decisions.

A preliminary *draft* of the EIA will be submitted as part of the feasibility study. Following discussions with a government, a work plan for finalization of the EIA will be agreed upon. Submission of the *final* EIA will be part of the company's development proposals.

Environmental Monitoring – All environmental monitoring will be funded by the project. As part of the development proposal approval process, the government will enter into discussions on who will undertake environmental field studies. The government would prefer creation of an independent monitoring agency but recognizes that in many cases the mining company has natural logistical advantages and expertise that would be difficult and expensive to duplicate in an independent agency. The government would not normally be directly involved in routine field monitoring activities.

Environmental Compensation and Bonding – Mining projects will be responsible for compensating residents and communities for the consequences of short term, long-term and catastrophic environmental degradation. While environmental liability will ultimately be underwritten through the assets of the company, a significant environmental bond will also be required. Procedure for assessing compensation and for establishing bonding requirements will be part of the initial entry agreement.

Mine Closure – It is the government's intention that as much rehabilitation of mine sites as is physically and economically feasible will be undertaken. However, it is difficult to generalize this concern without reference to specific projects. As part of its feasibility study the mining company will present a preliminary mine closure and financing plan for discussion with a government. This plan will be finalized and incorporated into the development proposal submissions. The company will be expected to begin to make financial provision for the closure plan not later than the end of the investment recovery period identified in the development proposals.

4. Infrastructure Policies in the Mining Sector

Except in unusual cases, the government does not normally provide dedicated infrastructure for new development projects. Wherever possible mining companies will be expected to integrate their facilities with existing infrastructure as a means of promoting regional development. Government will attempt to facilitate integration and may provide appropriate incentives or marginal "linkage" investments. Of particular importance to the government is the use of surplus hydroelectric power.

Other infrastructure policies of the government include (i) public access to all infrastructure services and (ii) project maintenance and operation of any company infrastructure investments. In addition, it is expected that infrastructure design and routing will be sensitive to the needs and concerns of area residents.

5. Labor Policies in the Mining Sector

Mining companies shall conduct a comprehensive training programme for national personnel both in country and, if necessary, in other countries. It shall carry out such programme for training and education in meeting the requirement for various classifications of full-time employment for its operations in the country within the shortest practical period of time. Mining companies, their contractors and subcontractors may bring into the country such expatriate individuals as are required to carry out the operations efficiently. At the company's request, the government will make arrangement for the acquisition of all necessary permits, (including entry and exit permits, work permits, visas and such other permits, as may be required). As part of their feasibility study submissions, mining investors will provide a manpower, training and localization plan. This plan will be jointly reviewed annually with the government and establish a framework for granting long-term expatriate work and residency permits. For all expatriate employees, mining companies shall conduct a programme to acquaint all expatriate employees' contractors and subcontractors with the history, laws and customs of the Lao People's Democratic Republic and the project area.

Wages and other Compensation – The wage sector for local workers is relatively small and subject to inflation. Since wage stabilization is a policy of the government, it is important that mining investors are sensitive to the impacts that their wage policies may have on the broader economy. To this end, mining investors will be expected to adhere to two general wage strategies. First, investors will insure that wage levels are in general conformance with comparable wage levels in the general economy. Second, the recruitment of mining labor from other employers in the nation through wage inducements is discouraged. Rather, mining companies should pursue training programmes that seek to upgrade the skills of their internal labor pool. Modest incentives may be provided for this purpose.

Employment Preference for Local Residents – As noted in the introduction, residents of the mining area will inevitably bear environmental and social disruption costs associated with mine development. To partially offset these costs, workers from the province- and especially residents from local communities in the immediate mining region – should be given preference in mine employment wherever possible. To discourage the influx of unemployed migrants to the project region, mining companies might consider hiring policies that minimize the hiring of non-residents at the project site. Rather an attempt might be made to only recruit workers in their home provinces or from urban areas.

Construction Labor – Experience suggests that the mobilization of construction manpower can create special problems and have long lasting effects on a mining area. Many of these problems are associated with the transient nature of construction workers. Government is concerned that the construction period for a new mine does not burden the local region with major social problems or entrenched squatter communities. Mining companies will be expected to insure that contractors remove all temporary facilities and repatriate all foreign construction workers as a condition of their construction contracts.

6. Social Policies and Local Government

Worker Health, Safety and Education – Given the comparative advantage which the mining company enjoys vis-à-vis its site and employees, it is expected that the company will assume responsibility for some health and education responsibilities for mine workers and their dependents. Typically, the mining company might provide treatment and health referrals through a health post or mobile clinic and a basic school might be provided. Rules, regulations and standards of general application for comparable health and education facilities in the Lao People's Democratic Republic shall be followed.

Relationship with Local Authorities – The relationship between the provincial/local governments and the national government is strong. In general, the national government is very sensitive to the needs and concerns of local authorities. It is anticipated that provincial officials will actively participate in all negotiations with investors and that the mining company will maintain direct liaison with local authorities. Wherever possible disputes and clarifications should be resolved directly at the local level rather than through referral to the national authorities. The field staff of the responsible geosciences agency will facilitate communication between the mining company and local authorities.

Land Issues and local relations – Land is always a sensitive issue in natural resource projects. All exploration activities will be coordinated through the responsible geosciences agency with local authorities. During the feasibility period and subsequent mine development investors will be expected to mount extensive public awareness programmes designed to involve local residents in important mine planning decisions. As guidelines and models, field-tested programmes have been developed for this purpose in the course of early hydroelectric projects. Local expertise for implementing these programmes is available both nationally and regionally. Likewise, land compensation and acquisition procedures are available.

Resettlement Policy – Resettlement is always a sensitive social issue. A comprehensive resettlement model has been developed and mining investors should use this model as a guide in undertaking resettlement schemes. Since mining often involves long-term land-use decisions, care should be taken to, wherever possible, maintain traditional land use and access to areas which are not immediately needed for mine or mine-related activities.

Relationship with resident communities – The mining company will be expected to maintain an active community relations programme during the exploration, construction and operations phases of a project. While this programme is most likely to be active in the immediate vicinity of project, where resident workers have been recruited, care should be taken to insure that all members of the community are kept abreast of company activities and intentions. Wherever possible minor community projects, which foster the mining company's image among the local people, might be considered.

Local Procurement and Small Business Development – Wherever possible preference will be given to procurement of locally made services, supplies, products, or foodstuffs. Through their procurement activities mining companies will be expected to foster small business development in the region and to support the formation of and operation of local enterprises such activities as local trucking services, trade stores, recreational facilities for workers etc. Mining projects will be expected to make maximum use of national contractors and sub-contractors where services are available from them at competitive prices and comparable standards. First preference in its assistance shall be given to landowners in, and other people originating from, the mining area.

As part of their feasibility study, mining companies will, in consultation with the government, prepare a Business Development Programme for the development of national businesses and enterprises associated with proposed projects. The Business Development Programme will be reviewed annually by the company and the government and may be altered by mutual consent.

C. CONCLUSIONS

As noted in the introduction, the preceding outline for a National Mineral Policy is intended primarily as a guide for countries wishing to develop and implement such a policy. The actual content of a National Mineral Policy will depend on both the above mentioned general characteristics of national policy but will also need to be modified to accommodate specific unique attributes of policy that a country may wish to impose. A general caution is that the above outline for a Draft Mineral Policy is developed from international best practices developed in other countries. Significant deviation from these practices may make a country more or less competitive internationally and impact on the levels of direct foreign investment into a country.

II. ELEMENTS OF MINING REGULATORY REGIMES: MINERAL POLICY, LEGISLATION AND CONTRACTS

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A. INTRODUCTION

Although having a coherent mining regulatory regime that is favorable to foreign investment has significant tangible benefits for Asian transitional economies, few of those countries have enacted laws that will seriously attract large amounts of foreign investment. Why? Most laws currently on the books for most Asian transitional economies lack even the most basic elements acceptable to the international mining community. This discussion will attempt to outline the basic tenets of security and certainty that the international mining community and their international lenders and sureties would require in a mining regulatory regime for the investment of large amounts of capital and equipment over a twenty to thirty year period of time that a large mining project would require in what is currently perceived as a less-than-stable transitional Asian economy.

B. MAJOR ELEMENTS OF MINING REGULATORY REGIME

1. Goals

There are a few primary goals that should be paramount when discussing mining regulatory regimes that are sometimes overlooked in favor of going straight to the details of specific provisions. These basics include:

(a) The rule of law must be paramount – it should not be varied by contract nor contradicted by edict nor regulations nor practice;

(b) There should be simple, efficient, minimal administration (minimal "red tape") and little overlap of responsibilities between agencies and divisions;

(c) There should be effective and fair oversight of company compliance and effective and fair enforcement of laws and regulations – no favoritism between state-owned, domestic and foreign companies ("level playing field");

(d) The laws and implementing rules and regulations should be as clear and simple as possible ("international norms");

(e) Company action should be the least circumscribed by law as possible;

(f) The mining regulatory regime should be as compatible as possible with other legislation, especially water law, land law, environmental law, industry law, taxation law, foreign investment law, labor law and others. These and other laws must be researched in advance to ensure compatibility rather than finding out after the mining law and other laws are enacted;

(g) Effective coordination and cooperation with other ministries and agencies should be provided within the regulatory regime, usually within the Mineral Policy and the Mining Law itself, so it is clearly spelled out where responsibility for certain governmental action, such as certain permitting responsibility lies;

(h) Prior effective planning for the evolution of the mining regulatory regime – designation of personnel to notate errors, problems and inconsistencies in the law, rules and regulations need revision or update;

(i) Prior planning for adequate funding for administration, oversight and enforcement activities contained in the proposed legislation ("sustainability of the institution").

The last item is almost universally ignored within Asian transitional economies. Even if a country were to draft the best of laws, it would never be successful if there is no money allocated to spend on implementing that law. Virtually all Asian transitional economies have extremely limited staff and budgets. Without additional staffing and funding, there would not be possible to handle the additional administrative, oversight and enforcement activities that a modern mining regime would impose. Government decision makers need to be educated that the responsible oversight agencies need to be supported in order to implement a law that could be very important in obtaining revenues for the country.

2. Benefits

The benefits of a modern mining regulatory regime go far beyond attracting foreign investment, although that is the primary motivation for most Asian transitional economies. Such additional benefits include jobs, education and skills training from basic to very high level of science and engineering. Economic benefits include the initial foreign investment, stable revenue streams over time, foreign exchange, and the economic multiplication factor from the revenue streams. In addition, the diversification, strengthening and overall development of the economy occurs over a relatively long-term period of twenty to twenty-five year life cycle of a large mine with the potential of billions of dollars.

From a development perspective, local and regional development can be especially dramatic, including infrastructure development, health care, and education. Often, there can be less dependence on commodity imports and there can also be downstream commodity possibilities that bring development possibilities locally and regionally.

3. Structure

Generally, a mining regulatory regime should follow the hierarchical structure shown in figure 2.1.

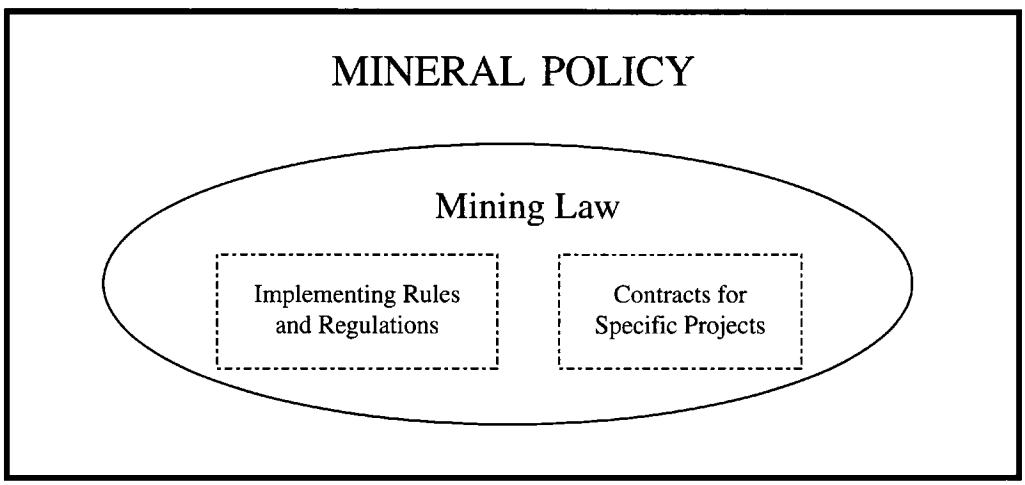

Figure 2.1. Schematic hierarchy of mineral policy, mining law, implementing rules and regulations and contracts for specific projects

The hierarchical structure outlined above pictorially shows that the government's mineral policy must address all aspects of what is regulated in the mining law, the implementing rules and regulations and contracts. Unfortunately, this process is exactly opposite of how most countries currently operate and may explain much of the difficulty now experienced. In practice, most countries first negotiate detailed contracts that often vary dramatically from the terms found in the mining law and the implementing rules and regulations. In fact, many countries have not yet even enacted implementing rules and regulations for their mining laws. Some countries use a standardized contract of work rather than legislation, for example, Indonesia uses Contracts of Work (COW) and has over seven versions and is currently in the process of redrafting its Mining Law.

Instead of starting with a mineral policy to determine the content and scope of the mineral law, the implementing rules and regulations and then the contracts for a specific project, a surprising number of countries do not even have a formal mineral policy. It is extremely difficult to conceive, create and implement a coherent mining regulatory regime consisting of a mining law, implementing rules and regulations, exploration and/or operation contracts (or standardized contracts of work) and the necessary interagency coordination and cooperation committees without a comprehensive mineral policy that is jointly formulated throughout government. Yet, despite all the evidence that a comprehensive Mineral Policy should be the logical starting point – *the evidence being the failure rate of countries attempting enact and implement a successful mineral regulatory regime without a mineral policy* – less than 15 per cent of all the countries in the world having a formal mineral policy!

C. CRITICAL COMPONENTS OF A MINERAL POLICY

Major components of a national mineral policy are adequately covered in a preceding paper by Dr. Allen L. Clark.

D. CRITICAL COMPONENTS OF A MINING LAW

As can be seen from above, many components of the mining law almost automatically extend from the Mineral Policy. However, there are some trends and some other provisions that are unique to the mining law that will be discussed herein. For example, the current trend in drafting mining laws is that it should be short and succinct. Some of the most important provisions in a mining law for attracting foreign investment from the international mining community include:

- Land access-abolish reserved, and restricted commodities;
- First in time-first in right for grant of applications;
- *Exclusive right to mine after exploration* – guaranteed security of mining title after exploration. Exclusive title to all minerals in the concession should be granted to the company. There should be an automatic right to proceed from exploration to exploitation subject only to limited, objective criteria for technical and financial suitability. Similarly, objective criteria only should be imposed for maintenance of rights throughout the mine cycle. Standard "international" time provisions should be applied for mining rights;
- Objective criteria for release, abandonment and closure;
- Transferability/pledge of exploration rights and mining titles. The right to transfer exploration rights and mining title should be subject to few, if any, objective criteria regarding financial and technical suitability. The ability for a company to transfer or pledge its exploration rights or mining title may be crucial for its financing (as loan collateral), insurance, subdivision and subleases and for contract mining for the project;

- International best practice requirements for environmental and social cultural issues;
- Protected and discreet protection of confidential business information;
- Protection from illegal mining;
- Agreement to dispute resolution through international arbitration;
- Protection against material changes in the law affecting substantive rights (stabilization clause);
- Protection against corruption of officials;
- Coordinated and cooperative interagency administration which includes "one-stop shop" permitting. While this sounds very good on paper, in practice, it is very difficult to achieve unless the country has a very good interagency cooperation and coordination mechanism;
- Local, regional and national cooperation. Decentralization is a growing problem as noted above. The mineral policy and mining law is a good place to sort this out so companies do not get caught running between officials and getting caught in the middle. The actual process and administration of local, regional and national cooperation should be detailed in Implementing Rules and Regulations;
- Convertibility of currency and foreign exchange;
- Repatriation of profits offshore;
- Minimal capital and currency requirements in the Central Bank. Account access should be restricted to company officials only. Government officials should not have wholesale access to company accounts.

The above represent only some provisions that should be found in a modern mining law. Some of the provisions, however, are lacking in mining law of Asian transitional economies. If they were included into newly enacted laws, they would most certainly increase interest by the international mining industry in exploration and investment.

E. RELATIONSHIP BETWEEN EXPLORATION AND OPERATIONS CONTRACTS AND MINING LEGISLATION

Many countries, especially in Asia, have developed two distinct methods to regulate and administrate their mining sector, first, variously styled "mineral exploration and operation agreements", Contracts of Work (CoW) and sometimes "Model Contract(s)". As a general statement, Model Contracts, or CoWs have been used as a guide for the majority of agreements with major transnational corporations. However, contracts with junior mining companies and local mining enterprises are generally "one of a kind" contracts with little resemblance to a standard contract. There is a general desire at the present of many countries in the region to develop and adopt a "Model Contract" that will dovetail with existing or proposed mining legislation. As a result, there is a need to review and create a model contract that could be used on a regional basis.

F. LEGISLATION TO GOVERN EXPLORATION/OPERATIONS VERSUS MODEL CONTRACTS

One major question that arises when countries negotiate specific contracts with individual companies to govern mining operations where there is already an existing mining law is: why are there often differences and/or contradictions between them? Do the provisions of the contracts, usually more

favorable to the company, vitiate the Mining Law? And, if so, what reason is there for a mining law if provisions and terms are contained in the contract? While this assessment may appear unduly harsh, different contracts with different companies (with vastly different provisions from each other) and the provisions of the mining law (some terms of which may directly conflict) may certainly have a diminishing effect on the credibility and applicability of the law. When faced with this question, governments should analyze what exactly they wish to accomplish with the mining laws, rules and regulations and what is to be accomplished with model contracts. The ideal is to draft them so that they are complimentary. That is, address the provisions of the law to those elements that should be common to all companies working in that country and address individual concerns, many of which are negotiable such as operating plans, technology and others concerns to the individual contracts. However, in practice, such an idea is obviously easier to articulate than to accomplish.

Table 2.1. Advantages and disadvantages for governments to enter into dominant contracts versus relying more on mining laws, rules and regulations

Advantages	Disadvantages
Contracts provide a government a way to deal with each company individually, without having to get all legislators to agree on the rules all companies must comply with.	The ability to reap rewards for the country is proportional with the knowledge of the resource, of the company, the international industry as well as the negotiating ability and skill of the government representatives in the contract negotiations.
Contracts provide a government a way to learn more about companies' goals and methods and interact specifically with company representatives (if the company's personnel is well-represented at the negotiating table).	The government tends to rely on the good faith of company representatives to undertake what is promised and the government must make sure that all such promises are contained in each contract.
The terms and conditions of draft model contracts are widely circulated and known to industry and, therefore, can set a base line for negotiations.	Provisions in the mining law can be negotiated out of a contract unless specifically noted.
The government can initially negotiate solely from the conditions of the mining law.	Provisions in the mining law can be specifically contracted away unless there is a statement about which has legal precedence.
A contract offers a flexibility in dispute resolution which is often required by financial institutions; a contract, especially in dispute resolution, often allows for negotiation history and the intention of the parties to be put forward to support or detract from certain provisions.	Contract provisions may be more difficult to enforce, as any disputes about terms may be considered a dispute between two parties rather than a violation of the law of the land, which might otherwise be dealt with as a regulatory compliance issue. A different venue for dispute resolution may result (regulatory commission versus arbitration/court).
Allows negotiation of virtually all terms and conditions.	Considerable transparency problems because of the often confidential terms of a mining contract.
The government may be able to negotiate additional concessions (e.g., social programmes, employment, infrastructure needs) beyond those in the mining law.	Corruption and bribery may be more likely to occur during a contract negotiation process rather than regulatory oversight (but is different in all countries).
	Companies enter into negotiations with the primary objective to reduce fiscal and tax burdens instead of wanting a balanced contract *vis-à-vis* reciprocal rights and obligations.

Table 2.2. Advantages and disadvantages for companies to enter into dominant contracts versus relying on more comprehensive mining laws, rules and regulations

Advantages	Disadvantages
Contracts allow many provisions to be negotiable that otherwise would not be with mining legislation.	Companies who are working in countries with transitional economies or countries with political instability may have serious problems with enforceability of specific contract terms.
The skill of a company representative to the negotiating table can significantly tip the scales in favour of the company especially with less experienced government representatives, especially where the government representatives are not knowledgeable about the resource and/or about the international mining industry.	The government individual who signs the contract may not always be in a position to enforce governments obligations under the contract.
Contracts provide a level of security concerning contract terms and also a level of specificity desired by the country to allow it to plan more effectively and more efficiently.	Notions of government sovereignty may interfere with the applicability and enforcement of a contract and may even result in loss of the resource and/or assets (although this may also happen with legislation, but most likely less so).
	Bribery and corruption is more likely with contracts as there is less transparency and more individual contact with specific individuals, absent sufficient good intentions and oversight.

In most cases, "dominant contracts" tend to be norm. However, there are significant pros and cons to the idea of having a dominant "contract" versus detailed legislation to govern mining operations. Tables 2.1 and 2.2 below, discuss some, though certainly not all, of the advantages and disadvantages from both the perspective of mining companies and the government.

In the author's view, the terms and conditions of most contracts should be largely non-negotiable and the negotiable elements reserved for those elements that deal with unique aspects of the mine and its development. Every mine is different and requires different proportions, scales of technology, access to resources, infrastructure/transportation, financing/taxation structures, downstream processing, transportation, and other factors that will require individual exploration, development, operating terms and plans.

However, there are many common provisions that should be applied equally to all companies, and especially to medium and large scale mining operations, such as permitting, environmental planning and reporting (although ultimately the specifics will differ from mine to mine) and mine safety and health, small scale mining being a possible exception with respect to certain issues.

G. CONCLUSIONS

The sections above dealing with the elements of a mining regulatory regime, especially mineral policy, mineral law and contracts are intended to show that all these pieces should be thought of in an integrated manner. The first step in building the whole is to determine a country's mineral policy. In the case of many transitional economies that will entail determining whether the centrally planned government is willing to give up absolute control over all aspects of the mining operation in order to effectively attract foreign investment. While this is a significant shift from past practice, it will be

a necessary step for those governments who sincerely wish to move ahead and develop the mineral sectors of their economies with the aid of foreign investment.

The second step in the process of building a mining regulatory regime is to draft a succinct mining law based upon the provisions of the mineral policy guided by best practice internationally and following the cautions concerning context and application in different legal systems and institutions. Third, the Implementing Rules and Regulations take the brunt of the drafting with most of the administrative and regulatory provisions detailing how investors apply for licences, how the government receives, reviews and approves exploration and mining licences, actions to register permits, titles and agreements, interagency cooperation procedure, interregional cooperation, environmental testing and monitoring, public consultation for mining, requirements for the ESIA, organization of the mining inspectorate and duties, mine safety and health rules and regulations, including such things as accident investigation procedure and reporting. The Implementing Rules and Regulations should be "the book" to tell the working level staff how to do their jobs and to tell the company representatives in a country what they need to do to comply with the law.

In all, each component of the regulatory regime, the mineral policy, the mining law, the implementing rules and regulations and the model contracts, the interministerial cooperation and coordination agreements should all compliment the purposes and methods of each other, not contradict each other. Such complimentary components are intended to reduce the administrative burden on the agencies, thereby reducing costs in labor and materials, to clarify their respective duties and responsibilities and to provide a clear, transparent regime in which companies may participate. Each of these components are meant to be reviewed, revised and used by a country to further their mining sector to benefit their respective national economic development.

III. MINING REGULATORY REGIMES IN ASIA'S TRANSITIONAL ECONOMIES

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A. INTRODUCTION

Mining as an extractive industry is a critical business for transitional and emerging economies around the world. Most transitional and emerging economies want to evolve from a centrally-planned economy or one-party system into a more open, western-style market economy at least to attract more foreign investment. In order to do this, governments seek to find sectors to develop. The exploitation of natural resources often becomes a primary focus, especially mining and oil and gas, as it is an effective way to increase foreign direct investment and build infrastructure early within the development of transitional and emerging economies. Along with basic geologic prospectively, development of a modern mining regulatory regime is a cornerstone to attracting quality companies that will develop a working relationship beneficial to the host transitional country and its people.

B. CRITICAL ELEMENTS OF MINING REGULATORY REGIME

1. Mining law versus "regulatory regime"

Throughout this paper the term mining law will be used interchangeably with mining regulatory regime, however, the latter is used to signify that in current practice it is not enough to simply draft and implement a mining law and implementing rules and regulations. There are too many issues that interface with mining law these days including water law, land law, industry law, labor law, customs law, tax law, just to name a few, that must at some point be touched upon when a country deals with a foreign investor in its mining sector. Also, since there are a variety of instruments that are now currently in use to regulate foreign companies, such as exploration and operations contracts, as well as simply companies being regulated by legislation, "regulatory regime" more accurately describes current international practice.

2. The transition to new mining regulatory regimes

One of the most significant hurdles to attracting foreign investment into the mining sector is modernizing a country's regulatory regime. Companies carefully scrutinize a country's regulatory regime in order to assess the risk of losing their investment in a mineral project due to one of many possible problems that can arise over the life of a mining project such as security of title, access to land, or the possibility of expropriation or nationalization. Mining legislation of centrally-planned economies usually emphasizes absolute state control over most aspects of the mining operation and also can reflect non-economic state development priorities. Also, it often establishes a preference for state-run mining enterprises over other domestic or foreign mining companies. It also often establishes that the government be given a mandatory equity share of the mining operation, that generally has been proven elsewhere in the world to be a very poor idea indeed. In cases where decentralization is occurring, the problems of the national government are often compounded many times the number of decentralized governmental units.

In general, international mining companies do not want to invest in countries with restrictive, preferential, command and control legislation because it does not offer sufficient protection from the power of the host government or where there is now decentralized government – the power of national, regional and local governments.

3. A difficult transition

Almost all Asian transitional economies who have attempted to make changes to their mining law to attract foreign investment have found the process extremely difficult. While some of the reasons for the transitional changes are in the details, much of the failure is in ideology. Many, if not most, centrally-planned governments are still unwilling to give up centralized governmental control and their rewritten mining laws still reflect this, for example, in Viet Nam, Cambodia and in the Lao People's Democratic Republic.

The common first step is to take draft mining laws which have been drafted by consultants, often funded by the United Nations agencies, Bretton Woods Group (World Bank and International Finance Corporation) where the country takes small parts of the consultants' draft legislation and parts of the country's old legislation and consolidates the outcome as a new "hybrid" law. Thereafter, much to the country's dismay, instead of wide acclaim and a rush of investors into the country to invest, the international community tends to negatively shrug, embassies complain and large mining companies back away, leaving at best, juniors doing exploration, and at worst, unscrupulous mining companies and illegal mining taking advantage of opportunities. All in all, at this writing, there are very few instances where a transitional economy in Asia has successfully adopted a modern mining regime sufficient to attract major foreign interest and investment into their mineral sector.

As a result, many fundamental changes are necessary for a transitional economy to move towards a mining regulatory regime that will successfully attract and keep reputed mining companies in a cycle of exploration and development. The changes that are required in a modern mining regulatory regime include the following:

(a) Stability and certainty as key issues;

(b) The institutional role of government must change. The institutional role of the government in transitional economies is currently one of state-owned mining company or equity stakeholder in the mining operation. It is critical that the government move away from active participation in the mining operation with preferential rules for itself and instead take an oversight role to ensure companies are fulfilling their obligations. Experience from many countries around the world, for example, Papua New Guinea, has shown that equity participation by the government does not significantly increase government revenue, but does significantly increase administrative problems, intergovernmental turmoil, conflicts of interest for decision-making, and social and cultural problems, among others. Also, it is important that legislation establishes equitable conditions for all companies, domestic and foreign, so that foreign companies will be assured of fair conditions if they invest.

(c) Legislation must be less "command and control" and deal more with investors rights and responsibilities and the responsibilities of government and provide access to remedies for the latter's misfeasance and/or malfeasance; and

(d) Administrative process and decision-making must become more transparent;

(e) Legislation must deal with more and more varied issues than ever before, such as:

- Decentralization and autonomous regions-fiscal/tax revenue sharing must be spelled out, cooperation methods for non-hierarchical decision making must be planned;
- Who is involved in the application and permitting process (who interprets, imposes and enforces the law) must be spelled out;

(f) Multiple land uses are becoming more common-both traditional (hunting, fishing) and modern (hydroelectric). Who has the authority to regulate and who has a priority is becoming extremely important.

4. Drafting/adopting mining legislation based on other codes or "model" codes

Compelling reasons exist why lawyers don't always start from a clean sheet of paper when drafting legislation-any kind of legislation-whether it is mining law or environmental law. However, most lawyers who do start with "borrowed" legislation or a "model code" from which to start do so with strong "pros" and "cons" in mind as they proceed – which often serve as serious pitfalls for the lay person.

Some of the "pros" that occur when started with a base of other legislation is that there is a long history of adoption of laws internationally from one country to another as a basis of change from one country to another. There are many examples of legislation being adopted when styles of government and kinds of economies have changed, such as the adoption of laws from Japan by the United States of America early in the nineteenth century. In addition, as mentioned above, where time is of the essence, as it is in the minerals industry, the economics of delaying the adoption of a liberalized mining regime can, under certain circumstances, be measured in millions of dollars of revenue to a country. A very persuasive economic case can be made that a good law based upon a model mining code that makes a country five million dollars in year one is better than a good law from scratch that makes a country five million dollars ten years later.

Another good case for adoption of another country's mining code is that for some codes there is a history of implementation and interpretation of that code. A record of implementation and interpretation is something that both the country and the company can look at and know more about the law – it reduces uncertainty. Similarly to the latter, is that a code that is based upon another country's code can be a significant incentive for foreign investors because it is a familiar good. Familiarity also reduces uncertainty, whereas newness does not. Also, another facet of this is that the model code is often adaptable to suit home country legislative and institutional contexts, without losing the substance that makes it attractive for foreign investors.

Moreover, given the now deplorable track record of transitional economy drafting and evolution of mining law and the considerable distrust that has grown in the international mining community, governments with transitional economies would do well to conspicuously borrow the best that other country's codes have to offer. This is even more evident as companies and non-governmental organizations put increasing pressure on governments with transitional economies to liberalize their mining regimes if the international community is to support investment. There are some decisive drawbacks, however, to wholesale adoption of other countries mining codes or model codes. Adoption does not allow the same pride of authorship, which has been an important factor in almost all cases.

Perhaps more obvious, but more difficult for the layperson is the different legislative context in which the adopted legislation has evolved. For example, did the legislation you are looking at evolve in a socialist system or an open market system, a civil code system or a common law system. Each of these systems has an intended interpretive usage, some more literal, some via used common law that uses an evolutionary case interpretation. Understanding how the legislation is used within each system is critical in knowing how it may or may not be adapted for use in another system.

Along similar lines is an understanding of the institution that is intended to use or interpret the legislation. Very often if the institution will not be the same or similar, or if the people have a different skills than that used by the original source legislation, the adopted legislation will very often fall short of its mark.

In short, it is not enough that the words of the legislation appear to fit the legislative purpose that it is trying to be filled. All aspects of the previous legislation, its overall purpose, its surrounding context (economic system, governmental system, institutional context, personnel skills, methods of dispute resolution and how it "uses" the legislation) will bear heavily on whether legislation used by a different country or a model code will be suitable for use in a country with economy in transition. Table 3.1 summarizes the above arguments.

Table 3.1. Advantages and disadvantages of adopting legislation of other countries or model legislation

Advantages	Disadvantages
Long history of adoption of laws from other countries when change is desired, e.g., Japan, Russian Federation, the United States of America.	No "pride of authorship" as uniquely own.
Time and resources are saved.	Economics of delay (lost opportunties) while unique laws are drafted.
History of implementation and interpretation exist.	Different legislative context for adopted legislation may exist that may not be fully understood or taken into account e.g., socialist vs. open market system, civil vs. common law.
Familiarity may be an incentive for investors.	Familiarity may be a crutch that hides differences in context and institutions for the unwary.
May be carefully adapted to suit new country's legislative and institutional context.	Little or mixed track record of dispute resolution under adopted law.
Increasing pressure on countries with economies in transition by non-governmental organizations and companies to adopt modern mining regimes.	History of mining laws in countries with economies in transition of no real implementation or evolution where regulation is merely evolution by government fiat.

5. Basics for drafting and/or amending a mining regulatory regime

There are some basic underpinnings that are required to formulate a mining regulatory regime or any regulatory regime for that matter.

(a) There must be respect for the rule of law:

  (i) the rule of law must be preeminent over the dictates of national and local government authorities;

  (ii) must be known in advance, printed and circulated;

  (iii) laws, rules and regulations must be in force – not only on paper and not only just in "draft";

  (iv) laws, rules and regulations must be enforceable – backed by the power of the government.

(b) There must be mechanisms in place within the legislation, rules and regulations to ensure proper and equitable application and administration of the law:

  (i) proper administrative authorities must be set up to allow expeditious handling of applications for exploration permits and reviews and decisions on feasibility studies, management plans and operational contracts;

  (ii) proper administrative authorities must be set up to allow the government to exercise its regulatory oversight activities and to ensure compliance with the law in areas such as mine safety and health and environmental protection;

(iii) proper authorities must be set up to deal with dispute resolution on an administrative level;

(iv) proper interagency cooperative mechanisms need to be in place to address and resolve issues that arise and require interagency resolution; and

(v) have known administrative functions and procedures to amend laws and regulations and renegotiate contracts when changes are necessary.

6. Factors for success in drafting/adopting a mining regulatory regime

The term "success breeds success" is also true in the mining industry. Look to those countries' mining laws that have successfully attracted foreign investment. What other than basic geologic prospectively made the country attractive to foreign investment? Was it the international "best practice" standards incorporated into the mining law in terms of stability of title for the investor, guarantees against expropriation, dispute resolution in an agreed upon forum in a neutral country, little or no "red tape" in terms of fees, taxes and interference by the government in the operation of the project? Analysis of other countries' legislation can provide valuable information on what provisions the international mining community generally views as favorable or unfavorable.

One caveat, however, beware of recommendations from anyone that a piece of legislation is or is not "good legislation". Careful review will often show that the legislation favors one interest over another (either the companies' view or a government's view). There are few examples of modern legislation that are balanced between "good" for international mining companies and also "good" for countries with economies in transition.

7. The process of drafting legislation, implementing rules and regulations and effective implementation

This author believes that a "pragmatic" step-by-step approach to drafting legislation in countries with transitional economies is likely to produce the most benefits in the long term, mostly because change in the form of adopting dramatically different laws overnight simply have not worked in Asian transitional economies. In this procedure, the following steps are recommended:

(a) Identify the most genuine and needed priorities for changes in the law and the desired effects of change;

(i) the priorities must be more specific than "investment promotion" or "to increase foreign investment" by answering the fundamental questions, for example, what have been the top five criticisms of the last version of our law, why have they been stumbling blocks, what are the real underlying reasons for that and what can be done to change them that would be acceptable to the government;

(ii) engage in a dialogue with those that have been critical on specific topics and look for specifically worded suggestions for change;

(b) Sort out the relationship between exploration and operational contracts and legislation in your country *prior* to drafting legislation. This topic is treated elsewhere in this volume in detail, however, it is important when it comes to the scope of drafting mining regulatory legislation as to what is going to be treated as negotiable in a contract and what will not be negotiable in legislation;

(c) Draw liberally from "best practice" legislation obtained from the international legal community with the pros and cons discussed above firmly in mind. In this regard, discuss the legislation to be adopted with as many people as possible and find out as much as you can about it;

(d) Alter this "best practice" legislation to suit the country's "local context", legal system, institutions and skill mix. For example, name the proper Ministries, Departments and administrative agencies;

(e) Let the lawyers add the "legal provisions" such as the "enabling clauses", "savings clauses" and other legal jargon. Technical people such as geologists should concern themselves with the substance of the law and the process by which foreign companies move through the "system" to obtain permits and approvals;

(f) Circulate the draft law widely to all affected "regulatees" such as mining companies, domestic companies, and other players to obtain feedback. Consider all feedback seriously and attempt to work out compromises where at all possible. Remember: compromises will likely result in a higher chance of investment and a lack of compromise will likely result in a less chance of investment;

(g) Train all officials, especially at the working level (those that will come into contact with foreign company staff) that will be directly affected by the new legislation or regulations. Officials, both at a national and regional level should be trained to respond in the same manner to the same questions and concerns and log books should be kept of all contacts and questions;

(h) Commission authorized translation of legislation and forms into relevant languages;

(i) Widely disseminate the legislation and forms. Publish these on the internet on government websites and submit them to local, regional and international mining publications; and,

(j) Publish, where possible, formal and informal guidelines on the legislation for companies on how to do business in the mining sector, what information is available and what the law requires.

8. Mining regulatory regimes – static or dynamic

One of the most confusing topics in mining legislation today is the topic of whether a mining law should be static or dynamic; that is, should it be drafted with the intention of changing over time or should it be drafted with the intention of staying the same without any change. The irony in this issue is that most non-governmental organizations and companies will state that virtually every with transitional economy country today needs to change its mining regulatory regime drastically *as fast as it can.* But then, assuming it meets those non-governmental and companies' expectations, they will say that those laws then need to be kept exactly the same for the next several decades so the companies know exactly what it will be required to do over the life cycle of an average mine. This author believes that this attitude only makes the current problem worse. Countries will hesitate even longer to enact "the perfect" mining law. In addition, it pushes countries and companies to deal more in the realm of contracts versus legislation that provide less transparency in the international mining communities dealings and intrudes far more into the legitimate realm of regulatory law. It would benefit both the governments and the companies, if mining laws in governments with economies in transition adopted simplier basic mining laws, (describing the "thick to thin" mining law trend that is happening elsewhere in the world). The mining law should leave project-specific terms to exploration and operations contracts, and more detailed administrative and regulatory provisions to implementing rules and regulations that do not materially affect rights and responsibilities but which may be updated as the country progresses administratively and in regulatory matters. An example of the latter, mine safety and health codes and environmental codes can be updated as a country's ability to test and monitor becomes more sophisticated. Any reasonable and responsible mine operator would similarly respond to updates in mine safety and health as a country with transitional economy updates its health and safety codes. This procedure would hardly impinge upon any material right or responsibility affecting whether a mine remains open or closes as presumably a responsible international operator would be operating in a "best practice" environment already.

C. CONCLUSION

Asian transitional economies have been largely unsuccessful up to now in modernizing their mining regulatory regimes. In large part, this is due to their attempt to adopt wholesale changes to their laws at one time following the assistance from international consultants supported by various organizations, which unfortunately has not worked. Instead, the law that is ultimately enacted is usually a "hybrid" law which retains many of the characteristics of the centrally-planned governments' will to retain power over all aspects of a mining operation, including the power to "take" the mining operation. The international mining community has found these provisions largely unacceptable and foreign investment in large mining projects in Asian countries with transitional economies has been very low. Because of this situation, this author recommends that persons assigned to redrafting their governments' mining laws prioritize the changes that must be made based on the most severe criticisms of the law from the international community and make a conscious decision to chart a course of small dynamic steps toward change that will be acceptable to both government and the international mining community.

IV. ROLES AND RELATIONSHIPS BETWEEN MINISTRIES AND AGENCIES FOR THE ADMINISTRATION, REGULATION, COMPLIANCE, MONITORING, ENFORCEMENT AND OTHER OVERSIGHT RESPONSIBILITIES IN THE MINING SECTOR

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A. INTRODUCTION

Various ministries and agencies within any country have oversight responsibilities over the mining sector pursuant to existing legislation, normally the Mining law, Foreign Investment Law, Environmental Law and other/and, forestry and water legislation. Under existing legislation, there is normally a designated lead agency, Ministry of Mines and Geology (MMG) or equivalent, a lead agency within the above line ministry, e.g. the Department of Mines and Geology (DGM), a Foreign Investment Management Committee (FIMC) usually within a Ministry of Trade and Economic Development, and the Ministry of Environment with a Department of Monitoring and Compliance. Additionally, the ministries of water, lands and forestry normally have oversight agencies on the mining sector with more or less impact, depending on the country and its legislation.

The Department of Geology and Mines (DGM) is the designated primary agency to which foreign and domestic individuals and companies look to for operational level administration, regulation, compliance oversight and enforcement of the Mining Law. However, complicating this is the fact that very often foreign companies must first go to the Foreign Investment Management Committee (FIMC). FIMC in consultation with DGM and other agencies will ultimately negotiate and contract with a foreign company, so, there is no "one-stop" shop for the foreign investor. In addition to the DGM, however, other ministries and agencies, some of which are listed above, within individual countries have other more limited administration, compliance oversight and enforcement responsibilities under existing legislation. Representative of this are the following typical provisions in most mining laws:

- Management of mineral resources
- Requirements for mineral development projects
- Minerals processing
- Minerals trading
- Rights of the Licencee in concession areas
- Obligations of mining licencees
- Relationship with local administrative authorities
- Standards for mining technique and technology
- Relinquishment and restoration of the mine area
- Compensation
- Authority and administration, including mine inspection
- Authority and duties of the provincial, municipal, and special zones
- Authority and duties of the district offices
- Authority and duties of village administration authorities
- Monitoring and inspection of mining activities
- Arbitration.

As can be seen from the above, numerous provisions in modern legislation anticipate/require some level of inter-ministerial cooperation if the mining sector is going to be effectively monitored, promoted and developed. In addition to the inter-ministerial cooperation provisions in the mining act, the Government of every country has promulgated other legislation that directly bears upon the mining sector. Typical examples include, but are not limited to:

- Foreign Investment
- Environmental Protection
- Industrial Waste and/or Discharge
- Industrial Facilities
- Forest(ry)
- Establishment of National Forest Reserves
- Management and Protection of Wild Animals, Fisheries and Hunting
- Water and Water Resources
- National Parks
- Land

In addition, many countries have acceded to several international treaties that will also bear upon mining operations, such as the Convention on Biological Diversity ("Biodiversity Convention"), the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (the "World Heritage Convention") and the Basel Convention on Toxic Wastes and most recently the Kyoto Protocal on Global Warming and Greenhouse Gases. While these individual pieces of legislation will not be discussed, they are exemplary of the ministries and agencies that will need to be involved in any inter-ministerial cooperation concerning the administration and regulation of the mining sector. As a group, these issues will be discussed in the context of modern concepts of how various operational agencies would most efficiently interact to achieve the country's legislative goals by inter-ministerial cooperation.

B. INTER-MINISTERIAL COOPERATION TO ACHIEVE LEGISLATIVE GOALS

Many developed countries are now conducting reviews of their internal inter-ministerial cooperation to determine how ministries can cooperate most efficiently to achieve legislative goals, especially those legislative goals that require significant inter-ministerial cooperation to succeed, e.g., Canada, the United States of America, the European Union, and Australia. These reviews have been the result of promulgation, over the last several decades, of broad inter-disciplinary legislation. Such legislation as clean air acts, water quality acts and environmental protection laws subsequently required oversight by several ministries.

Some of this inter-disciplinary legislation obviously concerns the regulation of mining, as mining affects not only the mining sector itself, but also the land, water, environment planning as well as the financial sectors and foreign affairs as is the case where foreign direct investment is involved. As a result, various countries had to develop different ways to handle the multi-disciplinary regulatory mandate. Some countries have divided the task strictly between the ministries, some have nominated a head ministry to coordinate activities and still others have an intermediary approach. The following recommendations to countries on a specific method on how to proceed with developing inter-ministerial cooperation, are based on a review of those countries who have evaluated their success and failures based on their different methods of inter-ministerial regulatory oversight. Provided herein are also the advantages and disadvantages of different methods and levels of effort and sophistication that are required to allow a country to make an independent judgment on what might also be appropriate alternative methods.

In order to delve into the concepts of successful inter-ministerial cooperation, discussion of the key concept in the field is appropriate. The most important concept of "coordination" is the need to ensure that the various relevant organizations work together and reduce redundant obligations on the domestic and international mining companies and to avoid gaps in the government's mining regime. Minimal acceptable coordination can be defined as that level of coordination where the various organizations are cognizant of each other's activities and make an honest effort to cooperate where required and not to duplicate or interfere. Usually, the various relevant organizations include ministries and agencies that are charged with creating public policy, undertaking administrative, regulatory, compliance and/or enforcement efforts and act to comply with their obligations under the legal regime governing the mining sector. This minimal definition of "coordination" also includes the sharing of information among the various relevant organizations. Levels of coordination, or the "policy coordination scale", as suggested by OECD, are shown in table 4.1.

Table 4.1. Coordination scale for mining sector regime

Step	Activity	Description
Step 1:	*Independent decision making by ministries*	Each ministry retains autonomy within its public policy domain
Step 2:	*Communication to other ministries (information exchange)*	Ministries keep each other up to date about what issues are arising and how they propose to act in their own areas. Reliable and accepted channels of regular communications must exist.
Step 3:	*Consultation with other ministries*	A two way process. As well as informing other ministries of what they are doing, individual ministries consult other ministries in the process of formulating their own policies, or position.
Step 4:	*Avoiding divergences among ministries*	Ensuring that ministries do not take divergent negotiating positions and that government speaks with voice.
Step 5:	*Inter-ministerial search for agreement*	Beyond negative coordination to hide differences, ministries work together, through, for example, joint committees and project teams, because they recognize their interdependence and their mutual interest in resolving policy differences.
Step 6:	*Arbitration of inter-organizational differences*	Where inter-organizational differences of view cannot be resolved by the "horizontal" coordination processes as defined in levels 2 to 5, a separate plan for decision-making is necessary, such as arbitration by the Prime Minister's office.
Step 7:	*Setting parameters for organization*	A central organization of inter-organizational decision making body may play a more active role by setting parameters on the discretion of individual organizations. These parameters define what organizations must not do, rather than prescribing what they should do.
Step 8:	*Establishing government priorities*	The center of government may play a more positive role by laying down main lines of policy and establishing priorities.
Step 9:	*Overall governmental strategy*	This case is added for the sake of completeness, but is likely to be attainable in practice.

Source: OECD, 1996.

Despite the presence of a legislative mandate for multi-ministerial oversight of the mining sector, within some countries there are increasing problems and frustrations that have arisen both within the government and with foreign investors about the effectiveness of coordination and communication between ministries and agencies. Two of the most critical complaints from foreign investors about governmental oversight are that they are subjected to different administrative, compliance and reporting activities from each agency or ministry and find such efforts to be frustrating, time-consuming and expensive.

The second major complaint is that the relevant ministries often have conflicting requirements on foreign investment, which leads to extreme confusion and frustration on the part of foreign investors and also often leaves them without a clear cut path to comply with the law. Such conflict, confusion and frustration are often a major consideration of companies when they review a country's regulatory regime prior to investment and will negotiate contracts with this problem in mind. As a result, many foreign investors earnestly attempt to define and streamline their obligations to various ministries, sometimes without success.

As noted previously, the mineral industry's frustration, delay and conflict between ministries and agencies have played a major role in many countries' legislative enactments of "one-stop" legislation for oversight of the mineral sector. However, the "one-stop" legislation often only applies to initial authorizations, contract negotiation, permitting or definitions of financial obligations. The "one-stop" shop rarely coordinates compliance over the life of the mine. As a result, such multi-disciplinary requirements usually surface just after the initial contracts and agreements are signed and when the company commences its activities.

Recognizing the extreme variations between countries with respect to the "ease" of doing business and the presence or absence of duplicative or conflicting legislation has led most major mining companies to adapt a comparative evaluation of such issues as a determinant of investment in a country. This concern echoed by the United Nations and funding agencies, including the Asian Development Bank and the World Bank. The lack of internal bureaucratic coherence and coordination places excessively confusing and expensive burdens on private investment. In turn, it increasingly discourages international financing for investors who seek to work in countries which have internal governmental coordination and communication problems.

However, whatever good is the idea of cooperation and communication within a government, most countries, developed and developing alike, have faced and still face serious problems concerning the lack of coordination and communication between various ministries and agencies and the mineral industry. While much has been written on internal ministerial cooperation and communication, most authors define the problem but few have been able to provide concrete steps for the government to reform the problem. One of the reasons for the problem and the failure of reform is often not the fault of the authors of intra-government coordination studies and their recommendations, but must be squarely placed on the country's political machinery, ministries and agencies.

C. BLOCKS TO EFFECTIVE COORDINATION AND COMMUNICATION

The lack of cooperation and coordination between ministries and agencies has been largely attributed to the fundamental policies and legal requirements of each ministry/agency as well as lack of line responsibilities of individuals at the level of active management and implementation. It is sometimes also a result of the traditional insularity of the entities, the indifference of management and implementation level employees, by political turf battles within the government. Often the problem is analyzed as the result of an agency waiting for other agencies to reform first. It is also not uncommon to find that one or more of these reasons combine together to prevent reform.

While fiscal stress is most likely the biggest motivation for reducing redundant and conflicting governmental responsibility, it can, however, also cause ministries and agencies who do not coordinate or communicate well to develop a "defensive" "core programme" mentality. As money becomes tighter, ministries and agencies tend to defend their programmes against all "outsiders" or "threats," that can often include "rival" ministries, especially other ministries and agencies that receive some portion of the revenues, taxes or fees from the industry.

Another block to effective coordination and communication is the traditional "government superiority" of being more powerful than the mineral industry for things other than purely regulatory (e.g., administration, periodic reporting) and putting the burden on the mineral industry to do all the work. There is now a growing trend by governments that wish to emphasize the role of government as that of providing "public service" and creating focused committees or organizations that are responsive to the mineral industry's long-term needs. Such actions have been effective in attracting mineral investment and reducing internal costs to the government.

D. ADVERSE RESULTS FROM A LACK OF COORDINATION AND COMMUNICATION

A lack of cooperation and coordination is also a serious matter for both the government and the mineral industry. Not only does the lack of cooperation and coordination increase the difficulty and cost for private investors, it increases the money that the government must spend in funding agency efforts (an especially important concern for poorer countries whose resources are already stretched thin), creates a lack of transparency for the mineral investor who is faced with complicated and disparate compliance burdens, and regrettably, also provides more opportunities for corruption within the government. Moreover, the lack of efficient coordination reduces public and international respect for the oversight capabilities of the government and thus negatively prejudices the government in the eyes of potential investors from the international mining community and dissuades companies from entering a given country's mining sector.

The entire problem of lack of coordination and communication results in a double loss of money to the government. It costs more to fund multiple agencies to carry out the duplicative or conflicting regulatory efforts for existing operations. It also causes the government to loose significant revenue from taxes, royalties and fees from potential investors who would have otherwise invested if the government appeared more organized and transparent. Therefore, a country that is interested in encouraging foreign investment, should review their regulatory regime from this inter-ministerial cooperation and coordination "perspective" and to emphasize this in their regulatory and administrative regimes in their mining sector.

E. METHODS TO INCREASE COORDINATION AND COMMUNICATION

Various experts in the field have argued that policies must be coordinated first in order to allow administration and implementation to be subsequently coordinated or to figure out what you want to coordinate and then design the coordination and implementation. While that may seem obvious, others believe that a *bottom up system* is better, focusing on service delivery issues. This involves coordination of administrative and regulatory details, such as issuing permits and establishing compliance methods, such as periodic reporting, inspection and testing. Therefore, one of the first decisions for a government will be either to first decide politically what are the main policies to be implemented *or* whether it makes more sense to deal first with service delivery issues to smooth out regulatory burdens on the mineral industry.

In the end, countries require both a policy and an implementation approach in order to design a truly effective system. In such a system, the government should establish the main policies first and, subsequently, the implementation level should be analyzed to determine the most effective methods and also which organizations should be responsible for implementation.

Another important issue for government to consider, when it attempts to increase coordination and communication, is to decide whether *imposing* policies and implementation methods from the top down is best or whether the organizations should bargain between themselves for their respective roles in regulating the mining regime. There is a large split between experts in whether upper, "political" government should set all policies and means of implementation or whether the management and implementation level should be allowed to develop implementation methods as they are the most experienced in doing so and will be the ones doing so in the future.

There are generally two major ways of increasing coordination and effectiveness between various ministries and agencies: hierarchically and horizontally. The hierarchical method is the one that centrally-planned governments tend to use. The higher individuals on the hierarchy make the policy determinations and determine the methods of implementation while lower individuals in the hierarchy carry out the day-to-day details of implementation.

In order to work, the hierarchy, faced with the necessity of increasing coordination and cooperation, must also include the highest levels of the hierarchy in order for it to work. This includes the heads of the central ministries and agencies, the cabinet at the least. However, there are many hierarchies where the top levels of government are only concerned with setting policy and the management and implementation level of the hierarchies must determine the methods of implementation. In order for the implementation level to succeed in their tasks, they must be able to coordinate and communicate with other management and implementation level personnel in other relevant ministries or agencies, or, in other words, to work *horizontally*. The *horizontal method* is where the different ministries and agencies, after having received the general policies from the ministerial level, work with one another to coordinate the methods of implementation and communication between themselves. This is also known as the "bargaining" method, where each involved ministry/agency involves itself in determining its role, as well as that of other involved agencies, to carry out the policy mandates of the ministries as well as the existing laws, rules and regulations. As a way to do this, inter-ministerial agreements, contracts, and memoranda of agreement, are becoming increasingly negotiated between ministries/agencies to define their respective and coordinated roles and responsibilities in the administration and regulation of the mineral industry.

F. METHODS OF ACHIEVING COORDINATION

The methods of increasing coordination in government range from older methods to newer ones designed to produce greater policy coherence in the government. The most recent methods in developed countries attempt to coordinate the expanded range of multiple ministries/agencies while expanding services to the mineral industry and attempting to control costs. Other methods still attempt to cope with the increasing dis-aggregation of government that is largely made up of traditional core ministries/agencies (e.g., environmental protection or foreign investment). The primary methods which have been applied in other counties and that appear to be successful are listed in table 4.2.

These above methods and levels of inter-ministerial cooperation should be reviewed by the decision makers within a Department of Geology and Mines in their capacity as the lead agency, and ultimately responsible to the government for effectively managing the mineral sector.

Table 4.2. Methods of communication and cooperation

Method	Individual, Group or Activity Responsible for Action	Description
Method 1:	*Coordination at the bottom*	This is the only method that is intentionally meant to work from the bottom-up instead of top-down (senior officials, central agencies). It is meant to utilize the skills of implementation level individuals. In the mining sector, this method might be useful (in addition to one or more of the others listed) as many of the contacts between industry and government organizations directly concern compliance issues, reporting, inspections and testing. While this may not deal with the larger issues of general policy coordination, from a practical standpoint, it would serve both the government and the mineral industry well.
Method 2:	*Coordinating organizations*	This method develops special organizations with the specific task of coordinating policy and to deal with specific sector or client needs. This method has not always been successful in the past because of a lack of power and resources dedicated by the organization, but it is one way to create ideas to reform policy.
Method 3:	*Inter-departmental committees*	These are ad-hoc groups made up of the relevant ministries and agencies involved. They are frequently used in developed countries to create policy-making, coordination and communication linkages between organizations responsible for sector activities. They are seldom useful, however, as they usually do not have the power to advance needed policies intended to help coordinate the organizations. However, they could also be formulated similar to the newer inter-ministerial organizations as described below.
Method 4:	*Task forces, working groups and others*	Often used when new policy initiatives are proposed with resulting confusion. There is a need for considerable cross-cutting between ministries and agencies. Usually, governments appoint a temporary task force, working group or blue ribbon panel or committee to undertake problem identification and clarification. If the task forces, etc., can solve the problems within a short period of time and they do not involve repeated visitation of the issues, then a task force is often the best method to coordinate policy and implementation. However, with the element of time over, for example, over the life of the mine in which different issues arise at each stage, they are less helpful. The form of task forces, etc., can also be formulated along the lines of the new inter-ministerial organizations defined below.
Method 5:	*Inter-ministerial organizations*	Most governments have some form of inter-ministerial coordination and thus they are not new untried methods. Whether they are successful or not is often related to the seniority of the representatives, the structure of the inter-ministerial organization, and the power the inter-ministerial organization can wield over policy and implementation coordination. A new form of inter-ministerial organization has been developing which is a "virtual organization" created by agreement between the various involved ministries and agencies, which has no permanent structure or existence. The organization is purposefully charged with creating solutions to coordination and implementation problems. The group will cease to exist when it fails to work effectively, so that individuals are motivated to find ongoing solutions to coordination and implementation problems.

Table 4.2. *(continued)*

Method	Individual, Group or Activity Responsible for Action	Description
Method 6:	*Boards*	An increasingly used method to coordinate and cooperate is by the use of independent/quasi-autonomous government organizations. The use of boards originally was used in Scandinavia. It has been one of the more successful methods to improve policy and implementation coordination and communication in government, especially when they contain senior officials from the various represented agencies who can advance their ideas and interests from their own organizations without formal intervention.
Method 7:	*Advisory committees*	Advisory committees present a way to represent the interests of the various relevant interests in administrating and regulating the mining sector. The advisory committee must consider significant policy initiatives by the agencies and requires consensual decision-making. This method allows the various organizations to remain up to date with coordination issues and allow settlement of differences earlier by raising conflicting issues. The downside is that the agendas of these committees is often set by existing organizations or dominated by specific organizations that use conventional notions of policy that stifle creativity and coordination.
Method 8:	*Super-ministerial organizations*	Creation of a "super ministry" that coordinates programmes and policies that would otherwise have to be made compatible across various "horizontal" ministries. The downside is that it requires additional resources to create a "new" ministry and it may, in practice, complicate the issues and present more coordination issues rather than clarifying them.
Method 9:	*Junior ministers*	A junior minister is assigned with the task of coordinating a sector issue within the lead ministry. The downside is that junior ministers are usually less powerful than others both above and below him, depending upon the sector and how much technical knowledge is required. Also, there is a risk that the junior minister is unwilling to confront senior ministers for fear of jeopardizing their political career and so do not effectively carry out their job.
Method 10:	*Ministers without portfolio*	Appointing ministers without portfolio who are charged with coordinating policy and implementation. Alternatively, one minister can be tapped to include policy coordination in his portfolio. The downsides include overburdening a busy minister with the task of coordinating receiving only the same or less time and consideration than the line responsibilities. Ministries without portfolios often lack the resources to carry out decisions.
Method 11:	*Inner Cabinet Committees*	Establishing inner cabinet committees consisting the relevant ministries for the mining sector or a central policy planning and implementation committee. The downside is that committees can proliferate and presents a need to coordinate the coordinators.
Method 12:	*Cabinet (especially with strong prime minister or minister of finance)*	In some ways, the most logical place for policy making and public service coordination efforts as all ministries are represented. The downside is that the Cabinet may be the place where individual "turf" is most precious in terms of budget, responsibility and revenue.

Table 4.2. *(continued)*

Method	Individual, Group or Activity Responsible for Action	Description
Method 13:	Central agencies	Budgetary, policy and personnel management organizations that report directly to central government or chief executive or that are assigned with principal responsibility for policy coordination and central management of issues. Significant downside is that such agencies can cause conflict between their agenda and methods and those of the line ministries and agencies.
Method 14:	Chief executive staff	The chief executive staff carries out efforts to more efficiently coordinate policy objectives because chief of government is too busy for formulation of policy and implementation.
Method 15:	Core executive	One chief executive or head of government (e.g., prime minister) who sets all policy and methods of implementation.

G. APPLICATION OF THE PRINCIPLES OF COORDINATION AND COMMUNICATION TO MINING REGULATORY REGIMES

In order to generate effective inter-ministerial cooperation for oversight of the mineral sector, there are two major steps that would appear to be most effective. First, the level of cooperation prescribed by the Mining Law should refer specifically to inter-agency and inter-ministerial cooperation. The second major step is to determine the appropriate division of responsibilities between the various ministries and agencies from the Mining Law and from other Ministries' subject legislation that bear directly on the mining sector. Finally, given that in most countries an inter-ministerial cooperation structure is already in place, or is being developed in the form of inter-ministerial agreements or Memoranda of Understanding (MOU) – (the name depending on the level of formality desired), this structure should be formalized under these basic agreements to clearly define the respective roles and responsibilities of the various agencies to those of the Department of Geology and Mines.

1. Legislation concerning coordination and cooperation

Aside from noting which ministry is the lead agency for mining projects, little is usually included formally as to how the government will cooperate and coordinate. Within the Implementing Rules and Regulations, committees could be set up and periodic meetings could be specified along with record-keeping requirements. Also, which ministry or department has the ultimate responsibility for decision making could cut the time spent in intergovernmental negotiation down dramatically.

A starting point to draft legislation in this area would be to collect all legislation that bears upon mineral resource development and to develop committee structures that could be included in Implementing Rules and Regulations. Also application, approval and permitting procedures for each respective agency, only as necessary, should also be added to Implementing Rules and Regulations, e.g., Environmental Protection, Water Resource Permits.

As the scope and depth of the inter-ministerial cooperation required could be complex, the individual roles and authority for each ministry/agency representative should be understood as they relate to the DGM in its capacity as lead agency. If the relationships between the subject ministries/agencies are worked out with the DGM in advance, a much clearer and stronger approach will emerge that (i) will reduce the time spent by the Committee of all ministries/agencies negotiating on all various authorities and

responsibilities; (ii) will speed the Committee's governance work and be more effective; (iii) will increase the transparency of how the Committee, and the government overall, works; and (iv) which ministry/ agency has the authority to deal with specific issues concerning the mineral sector.

A way to achieve this level of efficiency in the Committee and to provide each ministry/agency with a clearer definition of their respective authorities and responsibilities is to draft bilateral "Inter-Ministerial Agreements" between the lead agency in charge of the mineral sector, DGM, and the other individual cooperating ministries and agencies. Such bilateral agreements are far easier to develop, negotiate, amend and understand, than to come to agreement orally within a large multi-ministerial/agency committee. Going without such bilateral agreements in an Inter-Ministerial Committee situation will lead to dead ends, confusion, turf wars and endless discussion over who has authority over what topic, who shall undertake monitoring and compliance in a given area and who will have the final decision on what to do.

In most countries, the ministries/agencies that will be directly involved in any inter-agency cooperation with DGM may include, but would not necessarily be limited to, the following:

- The Prime Minister's/President's Office, which is responsible for overall policy and makes major decisions regarding any "variations" in a given mining operation;
- Ministry of Lands, who is responsible for land planning, cultural heritage sites and multiple use land planning and coordination;
- Ministry of Forestry, who is responsible for forestry reserves that will be affected by mining;
- Ministry of Water, who is responsible for water allocation and water use permits;
- Ministry of Environment that is responsible for environmental protection and compliance with the relative Environmental Protection Law;
- Foreign Investment Management Committee, that will often controls all incoming investment applications and who negotiates the terms of all foreign investment contracts, including those for mining activities; and
- Other ministries with other oversight mandates.

H. SUMMARY AND CONCLUSIONS

Initially, the issue of interministerial cooperation and coordination may not immediately come to mind when the subject of mining legislation is discussed. However, in practice, foreign investment in mining is such a multidisciplinary task in today's world that it is not uncommon for scores or more of permits from ten or more ministries/agencies at national and regional levels to be required for a single mining project. The speed, complexity, transparency and "hassle factor" in obtaining these permits/approvals are key factors in determining whether the international mining community will invest in a given country. While it is not the key factor, obviously, it is certainly one of several key factors that a government of a country with economy in transition wishing to maximize its opportunities for foreign investment in its mining sector can achieve the goal without significant capital if it has the political will.

V. MINERAL SECTOR POLICY TO ADDRESS THE DISTRIBUTIONAL EFFECTS OF DECENTRALIZATION AND RESOURCE RENT REVENUE SHARING

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A. INTRODUCTION

Historically, the development of mineral resources internationally was widely regarded, with just cause in many cases, as an "enclave" activity i.e. the activities and impacts of mining (hereinafter all individual mining, processing and/or smelting activities) were restricted to the immediate area of the mining activity and the benefits, primarily tax revenues of various types, accrued to the national government. Few if any benefits were derived by the populace living outside, and in some instances within, the "enclave" area.

Until the late 1980s and early 1900s, the mining industry in Asia, with few exceptions, was able to act, often with the full support of government, as an "enclave" activity primarily on the basis of economic arguments as being the best way to ensuring corporate profitability, foreign exchange earnings, tax revenues and for limiting "external" (environmental, social and cultural) costs. As a result, the majority of decisions relating to mining were almost always based on negotiations solely between industry and government and with a primary focus on economic "trade-offs" and/or concessions; very often to the detriment of the local areas most impacted by the mining activity. Within such a closed system of decision making decisions often did not take into account, or only incompletely accommodated, the needs and views of other stakeholders, in particular, those of local communities, indigenous people, concerned non-governmental organizations (NGOs), stockholders and a number of additional stakeholders with a diversity of vested interests. From the late 1980s, the number of concerned stakeholders, in particular the number who insisted on being involved with government and industry in mineral development negotiations, increased dramatically.

Especially important to the broadening of dialogue, joint actions and the inclusion of a number of concerned stakeholders during the late 1980s, and continuing through the 1990s, was the emergence of a number of entirely new issues that, to a greater or lesser degree depending on the country and the project, impacted on mining activities. Among the most important of these issues were/are global and/or regional environmental and commercial treaties; groups of inter-related factors, such as indigenous rights, sustainable development and inter-generational equity and, most directly impacting the industry, were the actions of individual governments in response to the needs (demands) of their citizens. All of these issues must now be addressed by modern mining countries and the mining industry within the context of a "New Reality of Mineral Development" (Clark and Clark, 1999) that more fully incorporates the diversity of concerns and stakeholders associated with a modern mineral development. Specifically, this has led to the development and implementation of new approaches to mining-related development and to changes in governance, responsibility and to addressing the distributional effects of mineral sector development, in particular, through government decentralization and resource rent revenue sharing. All of these issues in turn necessitated vastly changing roles for industry and government, at all levels, and the populace as a whole.

The present paper focuses specifically on one of the newest and most complex issues facing mineral development worldwide, i.e., the distributional effects of mineral sector development, specifically in the case of Asian mineral development. The present study begins with an overview of the nature of

mineral development in the Asian region, in which many of the present problems associated with mining are highlighted, and then focuses on two major issues that are central to the issue of the distributional effects of mineral sector development, i.e., decentralization and resource rent revenue sharing.

B. THE ASIAN MINING SCENE

The countries of Asia (including those in Central Asia, North-East Asia, Pacific Islands, South Asia, South-East Asia) are exceedingly diverse in terms of their mineral endowment, the nature and scope of their mineral sectors and in how they deal with the multiplicity of issues surrounding national and international mineral development. Within Asia, there are countries that are among the world's largest in terms of geographic extent, mineral endowment and mineral production (Australia, China, India, Russian Federation); those that are smaller in geographic extent and mineral endowment but are major metal producers (Japan, Republic of Korea, Singapore); developing economies that are major mineral producers (Indonesia, Papua New Guinea, Philippines); emerging economies that are both large (Kazakhstan, Uzbekistan) and small (Lao People's Democratic Republic, Mongolia, Myanmar, Viet Nam) mineral producers and many countries whose mineral development potential is largely unknown or untapped (Afghanistan, Cambodia, Fiji, Nepal). Given this highly diverse set of countries, each with its own unique mineral sector, it is difficult to define common elements of an "Asian" mining sector, nevertheless, there are some commonalities that are worth of note:

- Mineral sectors of the majority of the countries were developed, and continue to be developed (with a few notable exceptions), with few or no substentative inputs from local communities.
- The *direct* sharing of national resource rents (fiscal receipts) from mining activities with local government units (LGUs) has not been, and in most countries is still not, a common practice.
- In the majority of the transitional (from centrally planned to free market) economies, the state enterprises, and to a lesser extent the State, have been the major providers of all social services: a system that no longer functions with extensive mine closure, rehabilitation and privatization within the context of private sector development.
- In all countries, there are large environmental and social liabilities associated with existing and past mining operations that have to be addressed by government, industry and the local community. These issues have a major impact on fiscal resource allocation.
- In virtually all countries, there is a perception (in many cases real) that resource depletion and development has taken place without a commensurate improvement in the quality of life (sustainable development). This is particularly true at the provincial and local levels of government and within the populous as a whole.
- Overall, there is a broad-based dissatisfaction with the present nature of mining and the allocation and use of the fiscal receipts derived from mining activities.

To address the above deficiencies in mining development many of the countries of Asia have initiated, and many more are considering initiating, programmes of decentralization, resource rent revenue sharing and the initiation of multi-stakeholder developed sustainable development programmes associated with mining activities.

C. DECENTRALIZATION

In its simplest form, government decentralization is the transfer of both authority and responsibility for public functions from the central government to subordinate levels of government (provincial and local) or, in some special cases even to the private sector within four broad areas of government activity (World Bank, 1999a):

- *Political Decentralization* – Focuses on the transfer of the responsibility and authority for political self-determination from the central government to subordinate levels of government in particular for the formulation and implementation of policies.
- *Administrative Decentralization* – Seeks to redistribute authority, responsibility and financial resources for providing public services among different levels of government.
- *Market Decentralization* – Privatization and deregulation are the core elements of market decentralization that is directed toward the creation of a free-market in which government and industry cooperate to provide public services or infrastructure.
- *Fiscal Decentralization* – The core component of decentralization is fiscal decentralization by which the government transfers revenues, or allows the subordinate government levels to raise their own funds.

All four areas of decentralization have been ongoing, to a greater or lesser extent, in the majority of the countries of the Asia for several decades (table 5.1) and actual decentralization legislation has been passed, or decentralization powers are defined in the Constitutions, in 14 (approximately 40 per cent) of the countries in Asia.

It is arguable, and partially substantiated by table 5.1, that administrative decentralization has perhaps progressed further in most countries than any other area of government decentralization. In most instances of administrative decentralization, however, the national government (a) has provided funding to the Local Government Units (LGUs), for the specific purposes of carrying out overall national programmes, and (b) provided strong oversight of the LGUs activities in carrying out the programmes. As a result, such activities resulted in the transferring of significant responsibility, but rarely authority, and left the LGUs in the position of normally being implementers, rather than designers, of projects and consequently with little autonomy in local development. At best, such activities can be classified as "quasi" administrative decentralization.

Fiscal decentralization, of all the areas of decentralization, has probably proceeded more slowly than any other decentralization activity, with the possible exception of market decentralization (table 5.1), and in many nations has become a major source of discontent within the LGUs, with normal citizens and with many, if not most, non governmental organizations (NGOs). As a result, the issues surrounding fiscal decentralization of government functions, particularly with respect to increased revenue sharing, were emerging in many nations e.g. China, Fiji, India, Indonesia, Kazakhstan, the Lao People's Democratic Republic, Papua New Guinea, the Philippines and Thailand. With the recent Asian economic crises, there grew an even stronger and broader demand from LGUs at the provincial, district and community levels for a larger role in self-determination and with it revenue sharing. In no sector has this been more apparent than with respect to government revenues that are derived from the development of natural resources (resource rents).

The overthrow of the Marcos (Philippines) and Suharto (Indonesia) Governments, secessionist movements on Papua New Guinea's Bougainville Island, the aboriginal land claims (much of it mineral rich) in Australia and New Zealand and social unrest resulting from the privatization of State-run mining enterprises (in particular coal and base metals) in China and Kazakhstan (with the associated high levels of unemployment and failed social safety nets) all have thrust the issues of increased government decentralization and resource rent revenue sharing into the forefront of concerns for many (if not most) countries.

As a result, there is both a historical, and an increasing immediate need, to address decentralization and revenue sharing issues on the part of most governments in the Asian region. However, because the issues surrounding the actual processes of comprehensive and effective government decentralization and resource rent revenue sharing are relatively new, they are poorly legislated and understood at all levels of

Table 5.1. Status/level of decentralization in the Asian and Pacific countries

Countries	Status of Decentralization					
	Legislated	Political	Administrative	Fiscal	Market	Overall
Pacific						
Australia	Yes	High	High	High	High	High
Fiji	No	High	High	Limited	Limited	Medium
New Caledonia	No	Limited	Limited	No	No	Low
New Zealand	Yes	High	High	High	High	High
Papua New Guinea	Yes	High	High	High	Limited	High
Solomon Islands	No	Medium	Medium	Low	No	Medium
Vanuatu	No	Medium	Medium	Low	No	Medium
Central Asia						
Afghanistan	No	Low	Low	Low	No	Low
Azerbaijan	No	Low	Medium	Low	No	Low
Kazakhstan	No	Low	Medium	Low	No	Low
Kyrgyzstan	Yes	Medium	Medium	Medium	Limited	Medium
Mongolia	No	Medium	Medium	Medium	No	Medium
Russian Federation	Yes	Medium	Medium	Medium	Medium	Medium
Tajikistan	No	Low	Low	Low	No	Low
Turkmenistan	No	Low	Medium	Low	No	Low
Uzbekistan	No	Low	Medium	Medium	Limited	Medium
North-East Asia						
China	Yes	Medium	Medium	Medium	Medium	Medium
Democratic People's Republic of Korea	No	Low	Low	Low	No	Low
Japan	Pendin	High	Medium	Medium	High	Medium
Republic of Korea	No	High	Medium	Low	Limited	Medium
South Asia						
Bangladesh	Yes	Medium	Medium	Low	Limited	Medium
Bhutan	No	Low	Low	Low	No	Low
India	Yes	High	Medium	Low	Limited	Medium
Pakistan	No	Medium	Medium	Low	Limited	Medium
Sri Lanka	Yes	High	Medium	Medium	Limited	Medium
South-East Asia						
Cambodia	No	Low	Low	Low	No	Low
Indonesia	Yes	High	Medium	Medium	Limited	Medium
Lao People's Democratic Republic	No	Low	Medium	Medium	No	Low
Malaysia	Yes	High	High	High	High	High
Myanmar	No	Low	Low	Low	No	Low
Philippines	Yes	High	High	High	Limited	High
Thailand	Yes	Medium	Medium	Medium	Limited	Medium
Viet Nam	Yes	Low	Medium	Low	No	Medium

government. Consequently, government and civil society institutions are poorly equipped to design and implement such processes and as a result, in most cases, emerging problems remain largely unanticipated and/or unresolved. Nevertheless, the process is continuing and gaining in momentum in most countries.

In the following discussion, the inter-relations of the issues surrounding government decentralization, resource rent revenue sharing and sustainable development are addressed in context of (a) understanding resource rents, (b) resource rent sharing in Asia (c) resource rents and decentralization, (d) the impact of resource development projects, (e) the impacts of resource rent revenue sharing on national, provincial and local governments and (f) decentralization and sustainable development.

D. UNDERSTANDING RESOURCE RENTS

In the case of natural resources, governments often transfer selected property rights to industry, such as the right to mine an area or to exploit an area in exchange for some amount of economic rent. These economic rents collectively are known as "resource rents", since they are derived from the utilization of natural resources. Resource rents encompass all direct revenues derived by a nation. The most common forms of revenues are direct taxes (corporate income tax, royalty tax, withholding tax, import and export taxes, excess profits tax) and fees (registration, land, water, infrastructure use) for the use and development of the nations' resources (Garnaut and Ross, 1975, 1983).

Two additional types of resource rents that are associated with many mining projects are (a) landowner compensation and (b) national/local equity participation in resource development projects. In the former, the revenue derived may be quite high, accrue on a yearly basis (normally for the life of the development and in some cases beyond) and be shared by a very small number of people. In the latter case, the national government, and occasionally at the provincial level, becomes an actual partner in a project, thereby, acquiring a percentage of the profits in addition to taxes and fees. As the equity partner is normally the national government or its agent, the majority of revenues from profit sharing accrue to the national government. This latter activity may or may not make resource rent revenue sharing with LGUs more difficult.

As a general rule, albeit with some major exceptions, the majority of direct taxes accrue to the national treasury while the majority of the fees, and often a portion of royalties, accrue to the LGUs. This, however, results in a majority disparity in revenue distribution as taxes, which accrue to the national government, normally constitute 90+ per cent of all derived revenues from a mining project.

Historically, in most countries of Asia resource rents have been remitted to the national treasury and became part of a general fund that was then apportioned, according to a national development plan, through an Internal Resource Allocation (IRA) process to the individual provincial and local governments: a procedure that has been and continues to be criticized by the LGUs on the basis that it does not fairly or adequately compensate for (a) the use of the resource, (b) the accompanying social, economic and environmental impact of resource development and exploitation, (c) the longer-term social and environmental costs, particularly with respect to non-renewable resources, that are associated with rehabilitation, reclamation and readjustment and (d) provide for sustainable development of the local area once the resources are depleted.

E. KEY ISSUES IN DECENTRALIZATION AND RESOURCE RENT REVENUE SHARING

The major driving force behind the government decentralization movements within the countries of the Asian region is that of "people empowerment" which, although it varies somewhat in form and intensity between countries, has in common the desire for the "average" citizen, through the LGU, to have

a larger role in determining government policy and a more equitable participation in the fruits of economic development. The latter provides the primary linkage between the individual's desire for government decentralization and fiscal decentralization of resource rents. It should be noted that this discussion deals with fiscal decentralization in the context of mining related fiscal revenues and as such is a subset of the larger issue of fiscal decentralization of a nations total fiscal receipts. Three key issues, internal resource allocations, costs of establishing new projects, and management relate specifically to resource development activities and resource rent revenue sharing:

1. *Internal Resource Allocations versus Resource Rent Revenue Sharing* – Virtually every country has in place a well-established procedure for the transfer of funds, internal resource allocations (IRA) from the national treasury to the LGUs in support of activities under a National Development Programme (often a Five-Year Development Plan). This transfer of funds is usually "earmarked" for support of the LGUs, social services and for specific national development projects, which have been formulated at the national level. Such IRA funds, therefore, have three very important attributes, i.e., (i) they are directly or indirectly controlled by the central government, (ii) they are allocated on the basis of overall national development planning, and (iii) they are allocated without regard to the financial contribution that is made to the national treasury by a local area, e.g., resource rents paid to the State, by industry, for the development of the local areas natural resources.

2. *Resource Rent Sharing and the Costs of Establishing New Projects* – A fundamental difficulty with resource rent sharing in most countries is that the timing of the flow of funds to the LGUs is often exactly opposite to the timing of the actual need. This dichotomy arises because the timing of the receipt of LGU resource rent revenues from a resource development is directly linked to the timing of central government resource rent collections from a project. The norm is that the level of resource rent receipts increases over time as development proceeds and initial capital costs for the project are written off by industry. As a result, actual revenue receipts and significant resource rent revenue sharing may be delayed for several years. This problem is further exacerbated by the fact that many governments grant a "tax-free holiday" to investors that in most cases further delays actual receipts from a project.

3. *Decentralization and Management* – The decentralization process focuses on the transfer of a significant amount of authority and responsibility for operational and decision-making activities, over a broad spectrum of activities, from the national government to local government units. In the transfer of power, there are two key issues that must be recognized and addressed if decentralization is to be successful.

- First, it is essential to recognize that decentralization has two components i.e. a vertical distribution of decentralized factors (between levels of government) and a horizontal component (among the units at each level). All too often, the vertical component is fostered without the concurrent assurances for horizontal dissemination – particularly to ethnic minorities and disadvantaged populations.
- Secondly, for vertical and horizontal decentralization to be successful, it must be effectively transferred through the various levels of government and reach the lowest levels where it is normally intended to operate. In such a process, all too often, the intermediate levels of government are not included and decentralization becomes a national to local level process and management capacity is not developed commensurate with the levels of new responsibilities.

In summary, the most fundamental deficiency of the decentralization and resource rent sharing activities is that the LGUs are, with few exceptions, unable to immediately and effectively assume the new duties and responsibilities they have been given. As a result, there is a critical need to define and implement a more reasoned and sequential approach to the decentralization and resource rent sharing processes overall and as it pertains to mining related developments in particular.

F. SUMMARY AND CONCLUSIONS

The often closely related issues of decentralization and resource rent revenue sharing within resource-rich countries pose numerous problems as well as opportunities for the local government units and their constituents. The major problems that arise from decentralization and resource-rent revenue sharing associated with natural resources are comparatively new, poorly understood and are inadequately addressed by government and civil society institutions and are summarized in table 5.2.

Table 5.2. Major problems of decentralization and resources rent revenue sharing

Resource Rents	Decentralization
Resources, and associated rents, are unevenly distributed geographically.	Administrative capacity and personnel are unevenly distributed with in the LGUs.
Commodity prices are variable and as a result, associated rents fluctuate, making planning difficult.	Integration of national planning objectives with local objectives is difficult because of priorities and timing.
Resource rents accrue opposite the times of greatest need and real returns may be delayed for 3-7 years.	Fiscal receipts at the LGU level are inadequate for meeting the needs of large-scale resource development projects.
Resource rents are finite requiring efficient long-term planning for sustainable development.	Decreased national receipts require that the LGUs assume a larger burden for development.

As a result of the above, it is proposed that resource-rich countries undertaking programmes of decentralization and resource rent revenue sharing should, as a matter of national policy, adopt and undertake the following ten points national policy initiative:

1. Government should enter into a national planning programme, with inputs from the LGUs and NGOs, to define the nature and timing of decentralization and resource rent revenue sharing activities. Alternative models for action should be developed which meet the unique needs of the individual provinces/regions.

2. National and provincial agencies should assess actual and potential resource development options for individual provinces and establish, to the extent possible, the time frame for such developments and anticipated revenues.

3. National government, with inputs from LGUs, industry and NGOs should define the economic, social, cultural and environmental impacts of ongoing and planned resource development projects at the local to provincial level.

4. For those provinces anticipated to be impacted by resource developments, initial planning for the development of necessary infrastructure for the resource development should be phased with the needs for overall infrastructure development at a national and regional level.

5. National government should establish Memorandums of Understanding with the LGUs with respect to each group's responsibility and authority with respect to decentralization and activities undertaken under resource rent revenue sharing.

6. Government social programmes should continue at present levels for all provinces, however, impacted/to be impacted provinces should receive supplemental IRA funding to prepare the local communities for participation in the development.

7. The national government should develop and implement training programmes for the LGUs to ensure that they are able to undertake the additional management and planning activities that will arise as a result of decentralization and revenue sharing.

8. The national government should prepare an action programme for overall development that reduces, to the extent possible, the inequalities that will arise as a result of resource rent revenue sharing between resource-rich and resource-poor provinces.

9. Intra-provincial working groups should be established in order to share experiences and expertise in implementing decentralization and resource rent revenue sharing programmes.

10. Planning at all phases of government should emphasize sustainable and socially responsible resource development that has as a central theme the understanding that virtually no resources are truly renewable and virtually all will be depleted over time.

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VI. ENVIRONMENTAL AND ECONOMIC ISSUES OF MINERAL DEVELOPMENT IN SOUTH-EAST ASIA

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A. INTRODUCTION

Economic growth rates in the Aian and Pacific region during the 1980s and continuing into the 1990s, led by the "four tigers" (Hong Kong, China, Taiwan Province of China, Singapore, and the Republic of Korea) and the ASEAN countries have been substantially above those of the OECD countries and the remainder of the world. Similarly, population growth rates within the Asian and Pacific region in general, and the countries of South-East Asia specifically, have been significantly above the world average. Both the trends of increasing economic and population growth are projected to continue into the twenty-first century. Central to meeting the demands of this continued economic and population growth is an expanding supply of minerals.

The need for continued strong economic growth in the countries of South-East Asia is particularly important in that population, poverty and economic development are linked and only through continued and increasing economic development can an ever increasing population escape the burden of poverty. Within this broader linkage are the interrelationships of economic development, increased mineral use and consequently an increasing intensity of environmental degradation (the term environment in this paper refers only to the physical environment of air, land and water: although the impact of mineral development on social, cultural, biological and botanical impact systems is recognized but it is beyond the scope of the present paper to deal with).

As a result, the present paper confines itself to a brief analysis of the more obvious aspects of the mineral resources and the environment in the countries of South-East Asia. The purpose is to provide a framework which bounds the impacts and alternatives of mineral development and use. Subsequently, the present and projected rates of minerals demand and development are discussed as are the associated environmental impacts and economic costs. The paper concludes with an assessment of alternative policies and options that may mitigate the environmental impacts of increased economic growth and increased minerals demand and development.

B. ENERGY AND MINERALS SUPPLY FOR ECONOMIC DEVELOPMENT

The close coupling worldwide of economic growth with population growth and mineral demand, as shown by Drucker (1986), Tilton (1988), Labys and Waddell (1989), and Clark and Jeon (1990), has shown that the intensity of use of minerals (quantity consumed per unit of output) varies depending on the stage of development of the countries and for individual commodities. As a result, overall national development and the linkage between economic and population growth with increased demand for minerals, leads to the virtually inescapable conclusion that mineral use in the Asian and Pacific region will continue and most likely expand as economic development takes place. Similarly, one must conclude that this increased minerals use and development will bring with it an exacerbation of existing environmental problems and create new and perhaps larger ones in the future. In particular, because mineral-related activities by far result in the greatest contribution of metals to the global environment.

Additionally, it must be stressed that present levels of annual contributions of pollution will increase for most metals with the increase in economic development and as present sources of minerals are depleted. For the future, increasing rates of demand will require that (a) lower quality deposits will be developed and utilized resulting in (b) the movement of larger and larger quantities of material, (c) increasing processing and (d) longer distances of transport, all of which will substantially add to environmental impacts.

C. ENVIRONMENT AND MINERAL RESOURCE ATTRIBUTES OF SOUTH-EAST ASIA

When assessing the environmental impacts of mineral development and use in the countries of South-East Asia, there are a number of basic attributes of the countries which affect the scope and distribution of these environmental impacts.

First, most countries of South-East Asia are either archipelagoes or have extensive shorelines. As such, many, if not most, environmental impacts will have not only an on land component but also an offshore effect. Indeed, this very archipelagic nature also dictates that many activities (tin mining and mineral sand developments) will be undertaken offshore. In both cases, there may be a direct transfer of the environmental problem into the ocean environment where their effects may be broader.

Second, within most countries of South-East Asia, new mineral developments are taking place in two main areas, i.e., in remote onshore areas where the environment is virtually undisturbed and/or in and near densely populated urban centers where environmental problems are already large. In the former case, environmental impacts are highly visible, but initially, hopefully, less damaging because of reduced pollution from newer facilities and higher absorptive capacity of the environment overall. In the latter case, the environmental impacts may be less visible but are potentially more damaging as they are additive to an already stressed system.

Third, the archipelago attributes of many countries leads to difficulties in communication and management with respect to diverse and isolated mineral developments. In particular, their spatial distribution poses significant problems in monitoring and enforcing environmental policy and regulations, "de facto" necessitating a larger administrative and technical staff to cover the areas and activities. Such issues assume considerable importance in developing a national environmental policy.

The above factors have added significance when considered in the context that mineral resources have several attributes which dictate where, how and when they may be developed and utilized. Among the most significant are the following:

- Worldwide, regionally or nationally, mineral resources are not uniformly distributed in terms of either quantity or quality of the resources. Therefore, mineral development will be concentrated in some areas and absent within other areas, as will be the economic and environmental impacts of their development and exploitation.
- Mineral resources have distinct and highly variable modes of occurrence which dictates how they will be developed and exploited. As examples, large deposits of coal, copper and phosphate are economically recoverable only by large-scale open-pit mining. In essence, the environmental consequences of development are as large as the economic benefits.
- Mineral development and exploitation require large amounts of energy to produce the products of the industries. Therefore, to a substantial extent, the two industries are self-consuming, requiring that developments often be juxtaposed or that each has access to sources of supply of the other products. Clearly, this is more true of energy sources for the mining industry yet the great petrochemical complexes of the world are major consumers of metal and minerals.

- Past discoveries, subsequent use of domestic supplies, and changes in mineral policy have resulted in present, and by extrapolation, future exploration, development and exploitation of minerals shifting to less developed countries such as those in South-East Asia. Similarly, the easiest to find deposits, particularly in the developed countries, have already been discovered, mean that present and future exploration will be concentrated in "frontier areas". To a large extent, these "frontier areas" (a) are remote and inaccessible and represent areas of little environmental impact, (b) require massive infrastructure development, and (c) tend to result in large projects, the scope of which require large environmental expenditures to prevent or mitigate environmental impacts.

The above aspects of mineral resources all indicate that economic development, which is based on increased mineral development, carries with it both high economic and environmental costs. The nature of the resources, however, dictates that development must take place where the resources occur.

D. ASSESSING ENVIRONMENTAL COSTS

Perhaps not surprisingly, the field of environmental economics is rapidly expanding both in the scope of its coverage and with respect to the determination of real economic costs associated with resource development and usage. One of the most significant areas of research at present is with respect to defining direct (internalized) and indirect (externalized) environmental costs. Direct environmental costs are perhaps the easiest to define although in many instances. The costs are associated with new or future technologies for which costs are more difficult to determine. In general, however, direct environmental costs can be divided into five main areas.

1. Assessment Costs. Direct costs incurred in defining the anticipated environmental impacts of an individual project or activity. Normally, this would include base-line studies, environmental impact analyses and the preparation of an Environmental Impact Study (EIS).

2. Prevention Costs. Direct costs incurred with operations which prevent environmental impacts include such items as tailings dams from mining operations and safety valves on offshore drilling platforms.

3. Mitigation Costs. The largest direct costs are those for mitigation of environmental impacts. Unlike definition and prevention costs, which are primarily associated with new projects, mitigation costs are incurred by both new and existing facilities or activities. Common to both minerals are gaseous emission controls, and effluent/discharge controls.

4. Reclamation Costs. Direct costs incurred in returning the site of activity, and surrounding effected areas, to an agreed upon state approximating that existed prior to exploitation. Such direct costs may be incremental through the life of the project or occur as an assessed cost at the end of the project.

5. Compensation Costs. Direct costs assessed as compensation to affected parties or costs assessed for irrecoverable damage to the environment. Often, such costs are the results of civil or criminal litigation under existing protective legislation.

In dealing with direct environmental costs, a general rule is that the above direct costs from one through four are assumed primarily as part of new and/or ongoing projects. However, mitigation and reclamation costs are often costs assumed by the state/province/national levels for environmental protection or restoration for areas where past mineral activities have been carried out. The United States "Superfund" is perhaps the largest example of reclamation-compensation costs undertaken by the government subsequent to mineral operation. It is imperative to stress, particularly for the developing countries of South-East Asia, that direct environmental costs from 1 to 4 above should be included in all mineral developments now and in the future in order to avoid massive deferred reclamation compensation costs once mineral activities in specific areas have ceased operation.

Although considerable uncertainty exists with respect to which technologies, at what cost and within what time frames will be utilized to meet present and future environmental policies and standards, the direct costs can within bounds be defined and the impact of the economic costs on the industry and national economy evaluated. Such analysis is not the case with respect to indirect environmental costs which are (a) in many instances unknown, (b) difficult to measure, (c) difficult to value, and (d) difficult to integrate into overall economic evaluation and planning. As a result, indirect environmental costs are not represented in the standard measures of economic growth such as GNP/GDP or per capita consumption which fail to recognize:

- The depletion of national resources, in particular energy, minerals and the environmental components of water, air, soil and habitat.
- Environmental damage/degradation are not included in national accounts whereas direct environmental costs such as reclamation are included, further distorting the national economic profile.
- The indirect environmental costs associated with the lack of conservation and efficiency in resource utilization, requiring greater resource development and associated environmental degradation, is a large and hidden cost in the economy of most countries.

E. DIRECT ENVIRONMENTAL IMPACTS AND COSTS OF MINERAL DEVELOPMENT

In any assessment of environmental impacts and costs, the rapidly increasing rate, scale and complexity of interactions associated with development, population and mineral development and usage presents an almost limitless number of effects. It is not possible in this short overview to delimit environmental impacts and costs except in the most general terms: this is, however, sufficient to demonstrate that even at a summary level, both impacts and associated mitigation or prevention costs are high.

For minerals, environmental impacts and associated costs occur throughout the cycle of exploration, development, extraction, beneficiation, processing and transportation (table 6.1). In general, it can be said that the scale and complexity of the environmental impacts increases in the downstream industries of beneficiation and processing as do the associated costs of mitigation and prevention.

For minerals, including coal, the environmental impacts are principally on land, although specific activities such as tin mining/dredging are major offshore mining activities, and as a result, the impact of mining related activities is highly visible. This issue is also exacerbated by the fact that in the coal industry only 55-65 per cent of the extracted resource is utilized, and in the minerals industry less than 10 per cent of the extracted resource is utilized. As a result, large quantities of waste rock, low-grade ores, tailings and slag must be stored and or disposed of in an environmentally sound manner.

The anticipated expenditure for mineral development in the Asian and Pacific region was expected to be at US$ 20-22 billion during the 1990s. Based on estimates of direct environmental costs in other areas ranging from 5 to 23 per cent of total mining project costs, the environmental costs incurred in the Asian and Pacific region (assuming a conservative 10 per cent of project costs) were expected to be from US$ 2 to 2.2 billion for mineral developments alone during the 1990s. Clearly, direct environmental costs could be significantly higher within the region if existing environmental policies and regulations are made more stringent.

Table 6.1. Environmental impacts and relative costs of mineral development (includes coal)

Stages of resource development	Relative[a] Impact	Area[b] of Impact	Control Costs
Exploration			
Small-scale vegetation and surface disruption	M	VL	1
Minor erosion and sediment loading of streams and lakes	M	VL	1
Wildlife disturbance	S	L	2
Visual and aesthetic impacts	M	VL	1
Noise	M	L	1
Local release of drilling fluids	M	VL	1
Development			
Extensive vegetation and surface disruption (access, infrastructure and mine site)	S	P	2
Increased erosion and sediment loading of streams and lakes	M	L	2
Contamination of surface and ground water	M	L	2
Waste soil/rock storage and/or redistribution	M	VL	3
Wildlife disturbance	H	L	2
Significant visual and aesthetic impacts	S	L	2
Noise	S	L	2
Reduced air quality (dust)	M	L	2
Extraction			
Large-scale surface disruption and modification	H	L	3-4
Erosion and sediment loading of streams and lakes	S	P	3
Physical and chemical alteration of surface and groundwater quality and occurrence	S	L-P	3-4
Mobilization and storage of low-grade and waste rock	S	VL	3-5
Reduced air quality (dust, gases, equipment emissions)	S	L	2
Natural leaching of low-grade and waste rock piles	M	L	2
Visual and aesthetic impacts	H	L	3
Land subsidence (underground mines)	M-S	VL	4
Beneficiation			
Surface disruption and modifications	H	VL	3
Chemical alteration of surface and groundwater	S	L-P	4
Air quality (dust, chemical emissions)	S	P-R	5
Tailings disposal (associated seepage)	S	L	5
Hazardous waste (chemical effluents)	S	R	4
Visual and aesthetic impacts	H	L	3
Noise	H	L	3
Processing			
Surface disruption and modification	H	L	3
Tailings/slag disposal	H	L	4-5
Waste water disposal	S	P	3-4
Smelter emissions (SO_x, NO_x, particulates)	H	R	5
Hazardous waste	H	P	4-5
Chemical alteration of surface and groundwater	S	R	4
Visual and aesthetic effects	H	L	3
Noise	S	L	3

[a] = Qualitative estimate of the scope and permanency of the impact:
M = Minor
S = Significant
H = High

[b] = Qualitative estimate of the area extent of the impact:
VL = Very local, i.e., confined largely to site of occurrence
L = Local, i.e., confined largely to immediate area of site of occurrence
P = Provincial, confined to broad surrounding area bounded by primary dispersal controls
R = Regional, broad distribution resulting from primary and secondary dispersal

[c] = Associated costs of environment impact, mitigation or prevention for medium to large-scale mining activities (does not include annual upkeep costs):
1. US$ 0-250K; 2. US$ 250K-1M; 3. US$ 1-10M; 4. US$ 10-50M; 5. US$ 50 or more.

F. INDIRECT ENVIRONMENTAL COSTS: MINERALS

As mentioned previously, indirect environmental costs for mineral development and use are significant although the actual monetary cost may be difficult to ascertain. The principal reasons for this importance are the following:

- Mineral development and usage is an irreversible process in which for all intents and purposes the resources are utilized and lost to future generations.
- Although some countries have followed the "get dirty and clean up" development path, it is doubtful that such a course of development will succeed for most countries. The result is that mineral development, with a high environmental impact, may well exceed the ability of the environment to absorb such impacts without permanent disruption. The loss of these environmental attributes are similarly lost to future generations.
- Pollution transfer is the logical extension of exhausting national mineral resources thereby necessitating that such commodities be sought elsewhere. Indeed, a common allegation is that the developed world is transferring its pollution to the developing world, both literally and figuratively. In some cases, this may indeed be a deliberate policy but for most it is a matter of availability and economics which "de facto" results in the pollution transfer. Regardless of the reasons, the globalization of the mineral industries has further globalized pollution and environmental impacts. This is and will be the inheritance of future generations and a high indirect environmental cost now but a major direct cost for the future.
- Perhaps the highest environmental cost is yet to be extracted from the global climate changes. At present, it represents the ultimate indirect environmental cost. Estimates for reducing greenhouse emissions by achieving a global 35 per cent efficiency in converting coal to electric power as an example would require US$ 400 million per year until 2050 or US$ 25 trillion (Torrens, 1991). At present, such costs are indirect and largely unaccounted for in national accounts.

Overall, the world and the countries of South-East Asia are utilizing their mineral resources at an ever increasing rate of consumption at high levels of indirect environmental cost.

G. ENVIRONMENTAL – ECONOMIC EFFICIENCY TRANSITION

The environmental record of the mining industry remains one of the most difficult issues for the industry to address with respect to the general public: for every three steps forward, Red Dog in Alaska, INCO in Canada and Escondida in Chile, there are four steps back, OK Tedi and Bougainville in Papua New Guinea, Marcopper in the Philippines and Omai in Guyana. The latter four steps backwards received by far the most publicity but from which there are certainly some useful observations:

- The three steps forward were all taken with respect to relatively large and recent developments which have been initiated specifically with regard to environmental and social-cultural sensitivity.
- The four steps backwards were all taken with respect to older developments largely implemented via joint agreements between government and industry with far less activity vis-à-vis environmental and social-cultural issues.
- The four steps backwards are all characterized primarily by environmental and social-cultural impacts resulting from tailing disposal decisions by government and industry.

The above simplified assessment is intended only to make the point that although the modern day mining industry has made great strides in the responsible development of mining activities, the industry will continue to be plagued by the decisions, regulations and technical inadequacies under which older mining operations were implemented and continue to be conducted. These are issues which some present operators have failed to adequately address, although some strides have been made and must be addressed in the future because of (a) present and contingent liabilities and (b) that continued failures may jeopardize a companies ability to work internationally.

Although environmental problems with past mining activities will continue, they should not be allowed to mask the significant technological advances that the mining industry has made, and is making in pollution prevention throughout its operations. Among the most significant technologies have been the following:

Flash Smelting – The adoption of flash smelting technologies, such as the Kennecott/Outokumpu Oy Flash Smelter in Garfield, Utah, variously described as the "cleanest smelter in the world" or "the smelter that would never be built", which handles approximately 60 per cent of the total concentrate from the Bingham Copper Mine and the INCO Oxygen Flash Smelter, known as "the smelter that had to be built" which handles the concentrate from the Sudbury Mine, has significantly reduced pollution associated with older smelters at both mines. As examples, at the Kennecott facility annual SO_2 declined by 95 per cent (from 3,600 pounds per hour to approximately 200 pounds per hour) and at Sudbury facility by more than 10,000 tons per year.

Hydrometallurgy – The use of bio-leaching technologies have been applied solely or in conjunction with additional pre or post processing in the extraction of a range of metals (copper, gold, nickel and uranium), but in particular copper. As a proven technology, the applications of bio-leaching are rapidly expanding and diversifying. The primary reasons for this rapid evolution is that in addition to being lower cost (capital and operating), it has the added advantage of being adaptable to virtually any scale of operation. Environmentally, bio-leaching's primary benefits lie in the fact that it (a) replaces the more traditional and polluting smelting and refining activities, (b) normally produces by-products (arsenic) that are more easily handled and/or disposed of, (c) can be used to clean up effluents and (d) allows for the processing of low-grade material, in particular, tailings.

Tailings Reprocessing and Effluent Clean-Up – Not all technological innovations by the mining industry have been directed toward the reduction of associated environmental impacts in mining, smelting and refining efficiency. A considerable amount of successful effort has been directed toward the clean-up of past and present mining activities, particularly with respect to mine tailings and effluents associated with gold mining. Among the most successful of these activities has been Homestake Mining's use of gold-bearing, pyrite-rich tailings as autoclave feed at their McLauchlin mine and the activities of Cyprus, INCO and Homestake mining companies, as well as those by government agencies such as the United States Bureau of Mines, CANMET (Canada) and CSIRO (Australia) in the development of a new processes to destroy cyanide associated with gold mining activities.

The preceding examples demonstrate that the international mining industry is making great strides in the development of technologies and procedures which make mining a much more environmentally acceptable activity. To a great extent, these developments represent a win-win situation for the environment and for industry. The benefits to the environment have been discussed but what is less well understood and needs to be emphasized is that these innovations have been highly cost effective. Indeed, the cost of environmental stewardship in most of these cases has been increased profits.

In the above examples of Sudbury and Bingham, it is appropriate to note that had these two mining activities not adopted the new technologies of flash smelting, it is doubtful that they would be in existence today. In both cases, technological innovation led directly to lower environmental compliance costs, reduced contingent liability, increased efficiency, increased recoveries, additional business activities

(sulfuric acid) and higher profits while becoming among the worlds lowest cost producers. Similar economic benefits have been derived from the adoption of hydro-metallurgical processes and from the reclamation of tailings and effluents.

There is one additional economic aspect of the above discussion i.e. that most of the above processes have been patented and are now being commercially sold by industry to other mining enterprises. In essence, a new and expanding business sector within the mining industry is, and will be, the sale of patented environmentally sound technologies.

Regardless of the advances made by the mining industry with respect to the reduction of environmental impacts, it's past history will always be a difficult mantle to shed. Nevertheless, the industry can do much more to further reduce environmental impacts and to demonstrate to the world the success of its efforts. Among the most important activities will be the following:

- Continue to expend funding in research and development of environmentally sound technologies in the knowledge that "environmental efficiency equals economic efficiency".
- To reassess environmental problems associated with older mining activities and take immediate, and publicized, remedial action.
- To increase corporate transparency with respect to environmental problems and activities.

H. ECONOMIC DEVELOPMENT, MINERALS ENVIRONMENT AND THE FUTURE

The central themes of this discussion have been the linkage existing between economic development and population growth and increasing minerals demand as well as between increasing minerals development and usage and increasing environmental impacts and ultimately the interaction of economic development, population growth, minerals development and demand, environmental impacts and direct and indirect environmental costs. Overshadowing this and other discussions of these subjects is a priori "either/or" conflict which assumes large scale trade-offs of the environment for economic development or vice versa, and how these opposite extremes can be resolved within a context of sustainable economic development. The solution to this dilemma may lie in learning from the experience of the past and applying those lessons to the future, particularly for the countries of South-East Asia where the conflicts are and will be the greatest. The major lessons to be learned and applied are in the areas of policy and cooperation.

1. Policy

Effective economic development policy must first and foremost recognize that its formulation and implementation must account for developments impact on the environment and similarly environmental policy must recognize its impact on economic development. Unfortunately, this is rarely the case either internationally or within countries of South-East Asia. All too often, both policies are formulated with little or no input from the respective formulators or their constituents. As examples, economic policies which subsidize fertilizer and metal use effectively promote the environmental impacts resulting from increased usage and development. Similarly environmental policy which stipulates "unreasonably" high standards which "de facto" excludes certain industries or activities may unnecessarily retard economic development. As an example, emission control standards for coal-fired power stations, requiring costly or non-available technologies, may result in curtailed energy supply or conversion to alternate fuels with equally deleterious environmental effects.

Whatever policies are adopted for environmental protection, it is imperative that the policies provide for (a) effective and continued monitoring; (b) consistent enforcement; (c) institutionalization

within government; and (d) administrative flexibility (within prescribed bounds). It is also imperative to remember that all too often, particularly within developing countries, the capacity to make policy outstrips the ability to monitor and enforce the policy. Additionally, there are large added costs associated with monitoring and enforcement which are another form of both direct and indirect environmental costs to the country.

2. Cooperation

Clearly the globalization of pollution and global environmental problems such as a depleting ozone layer, acid rain and greenhouse effects have moved the world toward unprecedented levels of cooperation to resolve these issues or at least to understand them. Although global cooperation is increasing, the unresolved question is whether levels of cooperation between and within government and industry and between development proponents and environmental groups is increasing. Although the fortunate answer in general is yes, the specific answer is most likely "yes, *but* not at a rate sufficient to mitigate and/or prevent continuing environmental degradation."

A major opportunity exists within the countries of South-East Asia to open and maintain an effective dialogue which will result in the creation of environmentally sound economic development projects and policies. Such cooperation may presently occur on a project by project basis for many "greenfield" mineral developments, however, it is less common with respect to downstream activities involving existing facilities. The resolution of these issues will result from both cooperation, resulting in an understanding of the issues from all sides, and from environmentally sound economic policies which will provide both the incentive and the possibility to implement effective environmentally sound developments.

I. SUMMARY AND CONCLUSIONS

- Worldwide, the linkage of increasing economic development, population, minerals demand and environmental degradation has been demonstrated. Although the rate, scope and intensity of the interactions may vary with individual countries and stage of economic development, the ensuing problems are regrettably common and increasing particularly with respect to the environment.

- As the fastest growing economic region of the world, the Asia-Pacific region is faced also with a rapidly increasing demand for minerals requiring large scale mineral developments and/or expansion of mining, smelting and processing facilities.

- The rapid growth of minerals demand and production brings with it large environmental costs. Direct (internalized) environmental costs are at present the focus of attention by governments in terms of their impact on economic development. Indirect (externalized) costs, which for the most part do not appear in national economic accounts may perhaps be greater than direct costs requiring that they be included in future assessments of environmental costs. Overall direct environmental costs within the region during the 1990s have exceeded US$ 2-2.2 billion for mineral developments. Actual costs may be substantially higher depending upon national environmental policy and standards.

- For the countries of South-East Asia, the decade of the 1990s was one of challenge with respect to balancing economic growth with environmental preservation: the dual goals of sustainable development. The maintenance of economic growth is essential from the perspective of reducing poverty within the individual countries: only through continued economic growth can the economic and material resource needs of the ever increasing population be met.

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VII. MINING AND THE ENVIRONMENT: LAND RECLAMATION POLICIES AND OPTIONS FOR SOUTH-EAST ASIA

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ABSTRACT

A mechanism to achieve the goal of developing a country's mineral industry to the fullest extent, while taking into account environmental costs, should include the following basic principles:

- Minimize disincentives for investment in the mineral industry;
- Have highest possibility to achieving the goal of environmental protection;
- Provide incentives to the mining industry to optimize activities which protect the environment;
- Incur the lowest cost at each level of acceptable environmental protection;
- Be flexible with respect to changes in economics, technology and other sector-related factors; and
- Be practical, enforceable and applicable within a country's policy and capability.

Effective environmental protection requires four key components: legislation, monitoring, enforcement, and incentives. The benefits of using a reclamation bond policy are that (a) it would be an incentive for proper planning, (b) innovative mitigation and reclamation technologies will be developed and used, (c) mined-out areas will be reclaimed and thereby appropriate for other end uses, (d) mining will be conducted efficiently by taking into account "real" production costs including environmental and social costs, and (e) land-use conflicts between mining and other economic activities will be lowered. Most of all, it will be a major step forward in ensuring the sustainable development of the minerals industry. Although imposing any additional cost, such as having the reclamation bond, may act as a disincentive to invest in the mineral industry in certain limited cases, when considered in terms of societal welfare and the efficient uses of country's resources for sustainable development, such a performance guarantee scheme is necessary for the countries of the Asian and Pacific region.

A. INTRODUCTION

Since the inception of mining approximately 3,000 years ago, mining activities have left their mark on the landscape – normally as the ancient areas of excavation or sites of metal working. Although ancient scars remain, it is the activities associated with mining activities since the industrial revolution that have left the largest scars. Prior to the industrial revolution most mining was for high grade materials and therefore required comparatively modest excavation. The industrial revolution came with large scale, often open pit, mining for coal, iron, manganese, copper and to a lesser extent for lead, zinc, gold and nickel. Such mining not only removed enormous tonnage of ore but of waste rock and tailings as well – all of which requires reclamation if an area is to be used again. Regrettably, such reclamation was not the case and today, the developed countries, as well as the developing countries and NIEs, are faced with decades, if not centuries, of mining debris to clean up. As will be discussed later, the issue is not restricted to just the physical waste but to all the ancillary impacts derived from the waste and the mining activity overall. It is

these impacts from past and present mining activities, which must be mitigated and controlled through effective government action and sound environmental policies.

The last two decades represented a period of time during which the world's mining community has become dramatically more environmentally conscious, an awareness that has been translated into environmental efforts throughout the industry. Still, the record is clear that past mining activities have been environmentally degrading, often grossly so, and certainly not all of the present day mining activities are demonstrating the same level of environmental awareness. Overall during the last decade and a half, the mineral industries within the industrialized market economies have put in place environmental safeguards; either through their own concerns or because of increased governmental standards and enforcement. In the developing and newly industrialized countries, the record of the mining companies is less exemplary although many positive examples of environmentally sound mining can be cited. However, it is not the purpose of this paper to debate whether mining is more or less environmentally sensitive than in the past, although the record seems quite clear, but rather to deal with two basic problems of mining and the environment which persist today: those of environmental impact mitigation and the reclamation of mining areas.

A mechanism to achieve the goal of developing a country's mineral industry to the fullest extent, while taking into account environmental costs, should include the following basic principles:

- Minimize disincentives for investment in the mineral industry;
- Have the highest possibility of achieving the goal of environmental protection;
- Provide incentives to the mining industry to optimize activities which protect the environment;
- Incur the lowest cost at each level of acceptable environmental protection;
- Be flexible with respect to changes in economics, technology and sector-related factors; and
- Be practical, enforceable and applicable within a country's policy and capability.

Effective environmental protection requires four key components: legislation, monitoring, enforcement, and incentives. Many countries have implemented laws and regulations to achieve the goal of environmental protection, however, environmental problems are still serious and unreclaimed lands are prevalent. This is because the existing laws and regulations are undermined by inefficient and ineffective monitoring and enforcement: a situation not uncommon to many countries in the Asian and Pacific region and elsewhere and arising in most countries because of a lack of financial and technical resources. Recognizing that laws and regulations, though imposing certain obligations on miners, do not guarantee compliance an incentive and "guarantee" system to ensure compliance with the laws and regulations is necessary for the policy to work.

In the following such an incentive scheme, that of a performance guarantee system, will be discussed. However prior to a discussion of the actual mechanism to be implemented, it is necessary to briefly comment on the major environmental impacts of mining activities, to discuss the economic and social costs and benefits that must be considered before implementing such a programme, as well as a brief discussion of alternative methods of achieving the desired goals of mitigation and reclamation.

B. ENVIRONMENTAL IMPACTS FROM MINING ACTIVITIES

Environmental impacts occur throughout the mining activities beginning with grassroots exploration and continuing through development, exploitation, refining, processing, transportation and utilization. These impacts, however, are beyond the scope of the present paper to discuss in detail. In

summary, however, the environmental impacts from mining activities may be divided into five major groups: (i) impact on physical resources; (ii) impact on biological and ecological resources; (iii) impact on alternate use values; (iv) effects on quality of life; and (v) impacts on social and cultural values. The major concerns within each of these areas as they pertain to mitigation and reclamation can be summarized as follows:

Impact on Physical Resources. The major impacts within this group are those on the landscape (open pit, waste piles, tailing piles, physical infrastructure and deforestation) and require extensive treatment and reclamation to mitigate their environmental effects.

Impact on Biological and Ecological Resources. Biological and ecological impacts are perhaps the most difficult impacts to deal with in a mining venture, at least in the immediate area, in that the mining activity completely displaces or destroys these attributes (individual species of flora and fauna, unique habitats, unique ecosystems and linked associations of biodiversity populations). To a large extent, mitigation of these impacts is a long-term activity and requires the preservation of species, the reintroduction of habitats and the non-introduction of foreign species.

Impacts on Alternate Use Values. Initially, the use of land for mining precludes use for other economic activities as well as affecting the uses possible for surrounding areas. This impact is perpetuated when mining areas/activities are abandoned without appropriate reclamation as any alternative use value can only be achieved through reclamation of mined areas – normally with a specific alternate use in mind.

Impacts on the Quality of Life. Major impacts on human health and welfare may result from mining operations. Particular issues of health (silicosis, black lung, radiation exposure and metal poisoning) and general welfare (particulate emissions, gases, base metal water pollution, acid rain and noise) can be major impacts. These impacts are primarily mitigated by the implementation and enforcement of appropriate health, safety, and environmental standards, by the use of efficient mining and processing technology and ultimately by employing environmentally sound reclamation practices.

Impacts on Social and Cultural Values. Major impacts occur when mining activities take place in remote areas, normally areas without prior development activities. Major impacts include changes in the social structure of indigenous societies, the transfer from an agrarian/subsistence economy to a cash economy, changes to religions and beliefs, and impacts on the value and nature of indigenous lands. Central to overcoming such impacts is (a) the minimization of impacts from the start of the project, (b) appropriate complete restoration of the land, (c) community and local support in order to maintain traditional values and (d) reclamation practices which either allows a return to previous activities or provides alternative acceptable lifestyles.

As discussed, the environmental impacts of a mining activity may be diverse in number and complexity. The common factors in reducing these impacts are those of (a) prior planning, (b) mitigation, and (c) reclamation. Although the mining impacts will vary with the location, size of the mine and the mining method, it has been demonstrated that the vast majority of impacts can be avoided or mitigated through appropriate environmental controls and incentives which result in reclamation of the land during mining and following completion of the mining activity.

C. BENEFITS AND COSTS OF MITIGATION AND RECLAMATION

Theoretically, reclamation activities should proceed to the point that marginal reclamation costs are equal to the marginal benefits derived from the reclaimed land. Such benefits and costs must include all externalities and include both the natural and cultural environments. However, not all such costs and benefits can be easily or directly measured as the reclamation of mining areas on public lands involves defining not only the private costs but the broader spectrum of social benefits. As it is difficult to identify

the total social benefits from land reclamation, the standard that may have to be accepted is that the land will be reclaimed either close to its former use, as specified in the operation plans, or to an alternate condition agreed upon by both the industry and the responsible government agency.

Establishing benefits and costs is further compounded by the fact that environmental problems from mining activities can take place both "onsite" and "offsite" with respect to a mining area. "Onsite" environmental problems are those within the mining area (such as unreclaimed pits, unremoved spoil banks and unreclaimed tailing), which directly affect the owner of the land. The "offsite" environmental impacts, for example, dust, acid mine drainage, soil erosion and degraded scenic appeal, affect not only the owner of the land and the workers in the mine but also those who may live adjacent to the mining area and the public as a whole. The inclusion of both "onsite" and "offsite" environmental effects results in a fundamental difference between "private" cost/benefit analysis and "social" cost/benefit analysis.

In the case of mining which takes place on public lands, there is a complex interaction of private and social costs and benefits depending on how the individual participants view the issues. For the company, there are few economic benefits that accrue since the land reverts to the public domain. The mining companies will normally assume that there are only private costs which they must incur in order to protect the environment and reclaim the land during or following the mining activity. As a result, mining companies, from their perspective, may attempt to minimize and/or externalize these private costs in order to maximize profits (benefits) from the operation. Conversely, the government argues that both the onsite and offsite problems resulting from the mining activities must be compensated for to ensure that social benefits are at least equal the social costs of mitigation and reclamation on public lands. This dilemma has resulted in many governments attempting to develop a method to ensure that such "social costs" are compensated for by the mining activity in order to optimize the social benefits from past and future use of the land.

D. ENVIRONMENTAL PROTECTION APPROACHES

There are several measures which can be adopted to achieve the objective of environmental protection. The use of "command-and-control" approaches such as imposing laws and regulations is easy, but inadequate, ineffective and not the cheapest tool for environmental management. The "command and control" approaches are often criticized in that (a) they distort market mechanisms and are inflexible to changes in economic situations, (b) a land reclamation standard applied to all mines is economically inefficient in that it requires the miner to reclaim the land to the same level even though the costs of and benefits from the reclamation are different, and (c) they do not provide an incentive for the use of innovate technology. In addition, in the extreme cases where the miner is bankrupt and cannot afford to pay for reclamation, the government must bear the burden of reclamation.

Alternately, government may adopt several kinds of fiscal incentives to encourage environmental protection such as (a) subsidizing the reclamation project, (b) reducing import duties and (c) providing long-term low interest credits for the purchase of anti-pollution devices. These measures, however, normally result not only in inefficient resource allocation but ultimately result in society bearing the costs of reclamation.

Other incentives such as emission charges, pollution taxes, or deposit/refund systems are widely accepted as effective tools for environmental protection. These tools are based on the "polluter pays" principle which dictates that the polluters are responsible for correcting problems that occur as a result of their activities. Later in this paper, a detailed discussion of a proposed performance guarantee scheme, based on the "polluter pays" principle is presented. In the following sections, a brief overview is given of procedures utilized internationally for monitoring and ensuring environmental protection and reclamation activities.

E. ENVIRONMENTAL MANAGEMENT IN RELATION TO MINING ACTIVITIES: A GLOBAL PERSPECTIVE

In most countries, mining operations require the investor to obtain a mining licence. This single requirement is a fundamental building block of any country's environmental programme as it applies to mining activities. The general requirements for applying for a mining licence include submitting a Plan of Operations which addresses details of the manner and method of mining, and a Reclamation Plan which presents details on what the licence holder plans to do with the mining area during and/or after the operation is over. Some countries require the submission of only an informal reclamation plan for review but may demand a formal environmental report if the operation is judged to have the potential for significant environmental impacts. Other countries require by law that all miners prepare a formal Environmental Impact Assessment (EIA) or Environmental Impact Statement (EIS) report for approval before commencement of activities. The reclamation plan or EIA/EIS report provides the basis for governments' decisions of whether mining in a prospective area is environmentally acceptable. Such studies are also employed in setting specific environmental conditions and guidelines to which the miners must comply.

In the United States, most aspects of mining activities, from exploration through land reclamation, are under the control of either Federal or State Governments who are responsible for ensuring that public health and welfare will not be harmed by the mining activity. Several broad environmental acts have been legislated at the national level including the National Environmental Policy Act (1969), the Clean Air Act (1970), the Clean Water Act (1972), the Resource Conservation and Recovery Act (1976), and the Comprehensive Environmental Response, Compensation and Liability Act (1980) – better known as the Superfund. Regarding mining activities specifically, the Federal Government has enacted the Surface Mining Control and Reclamation Act (1977) to control environmental damages from and reclamation of coal mines. Additionally, the Federal Government oversees all mining activities on public lands (where mining activities are allowed). Therefore, mining in forest lands is controlled by the United States Forest Service (USFS); mining on other public lands is monitored and enforced by the Bureau of Land Management (BLM).

Other mining activities, besides the ones mentioned above, are the responsibility of the State Governments. However, not every State in the United States has mining and reclamation laws, and the laws, if they exist, vary from State to State. Therefore, environmental regulations, administration, organization and the implementation of environmental programmes can and do differ widely among different jurisdictions of the country. This situation is similar in Australia and Canada (with an exception of the Northwest Territories and the Yukon Territory) where each of the State (Provincial) governments has its own mining and reclamation laws to control mining activities and related environmental problems within its jurisdiction.

Mining laws and regulations exist in most developing countries, though in many cases, they are incomplete and do not encompass all aspects of mining activities. Environmental standards in developing countries are normally generic for all types of activities instead of specific for the minerals industry. Within Asia, excluding Australia, Malaysia has the most complete environmental laws and regulations for mining, imposing standards for air, water, and dust qualities to which mining must conform, and has established an environmental fund for mining activities.

Although conditions for land reclamation vary among countries, reclamation of mined-out areas is required in most countries. In some countries, the requirement is not mandated by a specific reclamation law but rather the law allows for case-by-case consideration. The reclamation standard, i.e., "To what extent should lands be reclaimed?" is, however, unclear and refers to such qualitative standards as returning land to a "usable condition", to a "stable condition", to the "greatest degree" or "equal to the level of highest previous use."

Deposit/refund systems to guarantee specific reclamation activities are currently standard practice in Australia, Canada, the United States, and Malaysia. Performance bonds may be required at several stages in the mining process. In addition to a reclamation bond at the production stage, several States in the United States also require posting of a reclamation bond during the exploration stage. Although the primary objective of requiring the bond during the exploration stage is to ensure reclamation of the land disrupted during the exploration process, the bond may also serve the purpose of discouraging both speculators and environmentally unsound exploration practices.

Existing reclamation schemes for mining activities are either in the form of a "reclamation fund" or a "reclamation bond". The difference between these two forms is that a "bond" is primarily used for land reclamation, not for other environmental problems, whereas a "fund" can be used for wider purposes, i.e., to solve other types of pollution problems (e.g., sediment control), mitigation activities, or for reclamation of former unreclaimed mine areas with no responsible owner. In cases where a forfeited bond is not enough to reclaim the area, the money from the fund may be used to subsidize additional reclamation costs. Unlike the reclamation bond, which is specific to a given mine or mining area, money for a reclamation fund may come from several sources, i.e., (a) fees to cover the costs for regulatory activities (filing, processing, and approval of licences); (b) fees for construction and operating permits; (c) reclamation surcharges; (d) other types of securities paid by miners; and (e) forfeiture of bonds.

In the United States, there are four types of "funds" and/or "bonds" for mining activities:

- Reclamation bonds for areas under the responsibility of the federal government, and the amount of the bond is dependent on the estimated reclamation costs.
- Reclamation funds and reclamation bonds for coal mines under public law 95-87 (Surface Mining Control and Reclamation Act (SMCRA) 1977). The SMCRA is applied to every coal mine within the United States and supercedes State law, where State law is less restrictive. The Act requires coal miners to post a *performance bond* and to pay a *reclamation fee.* The amount of bond is based upon the probable difficulty of reclamation and should be sufficient to ensure the completion of the reclamation plan if the work has to be done by the government in the event of forfeiture. In any permitted area, however, the amount will not be less than US$ 10,000. The reclamation fee is collected at rate of US$ 0.35 per ton for coal from surface mining and US$ 0.15 per ton for coal from underground mining. Monies are placed into the "Abandoned Mine Reclamation Fund" and utilized to reclaim abandoned coal mines when responsibility for the mine cannot be determined or enforced.
- Reclamation bonds and reclamation funds according to state laws. As the federal government does not require reclamation of any mine except a coal mine, the reclamation of other mines is dependent on the laws of the individual states. In addition to the above types of funding for mining activities, a mine closure bond is required in some States in the United States for environmental damages that might occur after mine closure. Additionally, in some States, there is a second bond, in addition to the reclamation bond, which covers hazardous wastes, chemical waste, or water purification.
- Superfund under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA 1980) is for use in the case of uncontrolled spills, accidental release, or disasters. For this fund, the United States Government levies a tax on chemical and petroleum feedstocks, a waste-end tax (tax paid on amount of hazards posed by hazardous waste), and general national tax revenues.

Other performance guarantee schemes similar to those of the United States have been adopted in Australia, Canada, Malaysia, and the Philippines, although, they are not as complicated as those in the United States. Mining in all states in Australia requires a performance guarantee by either cash payments or other financial guarantees. The requirements for bonding in Canada are not as strict as in Australia;

British Columbia and New Brunswick specify a definite bond requirement; Newfoundland, Nova Scotia, and Ontario require bonds upon a case-by-case basis; and Quebec and Saskatchewan do not require any bond. However, in Saskatchewan, the Provincial Government allocates a portion of annual revenues into the *Heritage* Fund to reclaim abandoned mines.

F. ESTABLISHING RECLAMATION COSTS

A difficulty in all performance guarantee schemes such as bonding is how to determine the appropriate amount for the bond. The higher the bond amount, the less likely a company is to walk away without reclamation. Contrarily, bonds should not be so high or prohibitive as to discourage the industry from developing economically viable resources. The major difficulty in setting bond amounts results from the fact that mitigation and the reclamation costs of each mine will vary widely with the following factors: (i) climatic parameters, (ii) geological factors, (iii) site specific conditions, (iv) mining methods, (v) size of the mine, (vi) end uses of land, and (vii) applicable reclamation standards. The reclamation costs for the same type of mineral with a similar mining method, but in a different area, may differ dramatically. It is estimated that the reclamation costs of a coal mine, to satisfy the PL 95-87 reclamation standard in the eastern states of the United States was US$ 10.33 per ton while mines in the mid-continent and the western states were US$ 3.87 per ton and US$ 0.81 per ton (at constant 1978 prices), respectively.

Bond charges may be determined in several ways including (a) at a fixed rate per area; (b) at a fixed rate per quantity of minerals extracted; (c) on estimated reclamation costs (on a case-by-case basis); or (d) may be a standard rate for each individual type of mining activity or commodity. Where the bond is charged per area, it usually refers to the total area covered by the permit, and not just to the operating area. For example, the amount charged varies among countries, and among States or Provinces of a country. The amounts of bond charged in the United States range between US$ 750 per acre (in Alaska) US$ 13,000 per acre (in North Dakota); and the amount of the bond for a coal mine is usually higher than for other minerals. As a comparison, in the New Brunswick Province of Canada, the amount of bond required for mining on public lands is approximately US$ 600 per acre and on private lands is around US$ 1,200 per acre whereas British Columbia determines the maximum amount of bond to be US$ 1,000 per acre, and the Philippines determines the amount of bond as little as US$ 16 per acre.

It should be emphasized that each methods of determining a bond amount has benefits and drawbacks. As an example, if the size of the bond depends on the quantities extracted, such as a fixed fee per ton of minerals extracted, the payments into the fund may have no relationship to the cost of rehabilitation. Conversely, the calculation of the size of the bond based on a rehabilitation plan may more closely reflect the estimated cost of rehabilitation.

As a basic rule, the optimal level of mine rehabilitation may be determined by considering reclamation costs and benefits. If the marginal cost of undertaking an additional degree of rehabilitation exceeds the benefits obtained from the expenditure then additional work on rehabilitation is not economically desirable. Therefore, in most cases, the government should set minimum standards for reclamation works, leaving specific details to be covered with rules, regulations, or guidelines. Such minimum standards should be used as a model and are specifically designed for continuous review and updating. Since reclamation requirement may be different at different mine sites, comprehensive laws attempting to outline all the specific details are inappropriate and do not provide the flexibility necessary to accomplish reclamation goals. However, one has to be aware of the disadvantages of not having specific laws and well-defined standards; the result becomes that reclamation requirements are almost entirely a matter of interpretation subject only to administrative decisions. Therefore, the objective is to find the balance between maintaining flexibility for a site-specific approach while guaranteeing a reasonable standard of impact mitigation and land reclamation.

G. ESTABLISHING THE BOND AMOUNT

The Office of Surface Mining Reclamation and Enforcement (OSMRE) of the United States estimates bond amounts, on an individual mine basis, for coal mining based on the estimation of actual reclamation costs by a four step procedure:

Step 1: Determine Maximum Reclamation Requirements.

Step 2: Estimate Direct Reclamation Costs, which include the following costs: (i) structure removal and demolition, (ii) earthmoving, (iii) revegetation, and (iv) other reclamation costs.

Step 3: Estimate Indirect Reclamation Costs, which include the following costs: (i) mobilization and demobilization, (ii) contingencies, (iii) engineering redesign, (iv) profit and overhead, and (v) contract management fee.

Step 4: Calculate Total Bond Amount.

The sum of the direct and indirect costs produces the required total bond amount: The bond estimate may be updated periodically to adjust direct costs in response to the price-level changes in the heavy construction earthmoving industry. Bonds are normally not posted for the entire estimated amount but rather are posted to cover an increment or a specific phase of a permit. The basic reclamation costs that should be taken into consideration are as follows: (i) backfilling; (ii) regarding; (iii) topsoiling; (iv) structure demolition; (v) drainage and toxic waste controls; (vi) sediment control; (vii) pond removal and (viii) revegetation. An alternative, but as discussed previously, less preferred method for most cases, is to estimate the level of a bond based on a fixed rate per area impacted, which provides a minimum rate of reclamation charges to be applied to all mines, but, to subsequently add an additional charge to the base rate which is proportional to the additional expected damage to the environment above and beyond the average.

A major issue which face most nations in the Asia-Pacific region with respect to implementing a bonding system is that of dealing with the small-scale mining and artisanal mining sectors. Most countries implement different measures regarding size of mines. Malaysia has different fund for large-scale and small-scale mines with different fund management. The former is called the "Mine Rehabilitation Fund" and the latter is called the "Common Rehabilitation Fund". Small miners in most countries usually receive some kinds of "privilege". For example, small miners are not required to post bond, or to prepare EIA/EIS reports, before commencing of operations. The definitions of *small mines* vary. Usually, the classification of a small miner is based on number of employees, mining method, gross profits, amounts of required reclamation costs, or number of claims held. However, exemption for small miners does not imply that they are exempted from reclamation of their mine sites. They are still bound to an agreement in writing to fulfill the reclamation requirement and be responsible for all pollution caused from their activities.

To deal with the assertion that requiring a bond will discourage mining investment and place a hardship upon small- to medium-scale mines, some states in the United States have adopted a system of "Bond Pooling" to solve the problems. Qualified miners are required to pay cash upfront into a pool at some predetermined percents of total estimated reclamation costs and then pay an annual fee. The qualifications of miners to join the pool is determined by the amount of estimated reclamation costs (i.e. not exceeding US$ 50,000).

H. BONDING AND RECLAMATION ALTERNATIVES FOR THE ASIA-PACIFIC REGION

In the establishment of a national policy with respect to the reclamation of mining areas, which is based upon a performance guarantee, or bonding procedure, there are a number of factors which must be considered; each factor normally having several options as to its form and mode of implementation. Among the most important factors are: (i) bonding system; (ii) bond posting; (iii) terms of payments; (iv) bond return; (v) responsible organization and (vi) auditing system, which are briefly described in the following sections. Throughout the discussion, several options are presented for bond establishment and management recognizing that the option with the strongest economic merit may not always be the one selected by the responsible governmental agency. Political and social factors will always play an important role in policy formulation. Therefore, in the following discussion, the various options and their pros and cons are presented and it is anticipated that individual countries would select that set of procedures which most closely meets its needs and policy.

1. Bonding System

Several options exist with respect to establishing the form of the bonding system which a country may adopt. Among the most common are the following:

- One bond system which is applicable to all mines but differs in amount depending on the type of mining operation (underground, open pit, quarry) and the anticipated environmental impacts, reclamation costs and anticipated land utilization after reclamation.
- A two-tiered system which consists of the single bond system, by type of mining operations (described above) and a second which is specific to mining in designated areas (forests, farm lands, urban areas, wildernesses). In most cases the second type of bond would be in addition to the single bond system and would be implemented to provide additional compensation for the degradation of aesthetic values, to protect and rehabilitate not only the mining area but adjacent areas as well and in special cases to compensate for the loss of use of the land and environs due to mining.

2. Bond Posting

The posting of a bond is central to insuring that the required monies are committed and available throughout the mining activity and during the post-mining phase to mitigate environmental impacts and insure reclamation. The modes of bond posting can, and do, vary greatly depending on the attributes of the mining activity and the level of assurance that a government requires that mitigation and rehabilitation will take place. Among the most common type of bond posting are the following:

- Actual cash deposit by the mining company which is refundable, with (or without) interest, at the end of the mining activity, when reclamation is complete or during the mine life if used for reclamation purposes.
- A financial guarantee in the form of certificates of deposit, government bonds, irrevocable letters of credit, or other liquid assets posted by the company which can be used to assure that the reclamation will take place.
- A bond guaranteed by an institution such as a bank, other financial institutions or insurance company which certifies that if the mining company fails to satisfy the rehabilitation requirements, the institution will take full responsibility for the damages. The amount of guaranteed money, and the associated fee, will be reduced proportional to the reclamation of the mine site.

- A composite system consisting of variable forms of bonds depending on a case-by-case consideration. The result may be one of the above three alternatives, a combination of two or more or a completely different type of bond if circumstances require another alternative.

A major disadvantage of having financial guarantees for reclamation is that either the financial institution or the mining company may go bankrupt, indeed the failure of one may lead to the failure of the other, in which case there is no recourse for rehabilitation funds. The result is that either the reclamation does not take place or the government has to assume the costs of the rehabilitation. Thus was the case in the United States when financial guarantees become a requirement of all coal mines.

The ability to provide flexibility in terms of selecting either a cash payment or a financial guarantee may be of critical importance to the mining company as both types have advantages and disadvantages. In particular, due to imperfections in the capital market some mining companies may have ready access to financial support whereas others do not, which would dictate the approach they could follow. As a result, the specification of the type of performance guarantee, in particular an up front cash payment, may pose a barrier to entry into mining for some companies.

3. Term of Payments

The terms of payment of a bond may vary considerably depending on the nature of the project and government's requirements for insuring that an adequate bond is posted. Among the most common methods are the following:

a) Fixed Percentage. In a fixed percentage procedure, a miner may pay some amount of bond (perhaps 50 per cent of the total bond) before receiving the mining licence and then pay the rest as a fixed percentage (perhaps 10 per cent of total bond) each year. Each payment should include interest on the unpaid portion of bond.

b) Stage Payments. Payments are arranged to be proportional to the total bond with each payment depending on the amount of environmental costs estimated to occur within a particular period of the mine's life. This alternative recognizes that environmental impacts vary throughout the life of the mine. For example, for the states of activity with respect to a 12-year project, the first stage (i.e., first 3 years) would involve minimal land disturbance because the activities during this period involve primarily facility construction, machine installation and mine development rather than actual mining activity. The impact on land disturbance will increase substantially during the second stage (i.e., 4-6 years of operation) when the operation involves extensive stripping, mineral extraction, and stockpiling. In the third stage (i.e., 7-9 years of operation), the operation may be expanded and correspondingly the impact on land would increase. However, the rate of marginal damage may be less, or in some cases, the total damages can be significantly lowered if portions of the land are reclaimed. After the ninth year, through to the end of the project, expansion of the mine will still occur, but in most cases more extensive land reclamation should be in process and total impacts overall should be smaller. The reasonable proportion of land damage for each phase and thus the corresponding proportion of bond payment required is 10:40:30:20 per cent, respectively, for every three-year period. This means that a miner has to pay 10 per cent of total bond before commencement of operation, 40 per cent of total bond in the third year of operation, and 30 per cent and 20 per cent of total bond in the sixth and ninth years of operation, respectively.

c) Incremental and Phase Payments. According to this procedure, bonds can be posted to cover either an increment or a phase of a permit. Under increment bonding, the reclamation steps will be applied to each *individual* activity specified in the permit as it takes place. Under phase bonding a *group* of activities must be completed for the release of the bond, e.g., phase I includes backfilling, regrading, structure demolition, drainage control, and may include topsoil replacement; phase II includes pond removal, topsoil replacement (unless in phase I), revegetation, and associated activities, and phase III

would be the reestablishment of vegetation and a stable reclamation environment in the event of failure in phase II.

A phase of a permit bond can be calculated according to two options, depending upon the choice of the government administration. The first option is to calculate the total bond for the area and set the amount of payment in phase I equal to 60 per cent of the total bond. The second option is to calculate the cost for each activity specified in each phase and payment is made accordingly. Indirect costs (which include mobilization and demobilization, contingencies, redesign costs, profit, overhead, and contract management fees) are added proportionately to each activity.

Phase bonding obviously requires a major portion of bond to be paid at the beginning of the operation period. This results in a small risk for the government because if the project ceases, the miner will have sufficient monies to reclaim the land, or in the event of forfeiture the government will have sufficient forfeited money to reclaim the land. This option, however, increases current costs to the miner during the start-up period.

The second option of a phase bonding, in which the amount of bond payments is prorated, benefits the miners because they are required to only pay a small portion of the bond during the start-up period and pay more during the later stages of operation. Such a prorated approach may benefit the government because the government can review the reclamation plan periodically and adjust the bond amount to be closer to actual reclamation costs, which can be significantly different from the reclamation cost estimated at the time of submitting the mining licence. However, the government incurs a higher risk in having to subsidize reclamation cost for the mine should the owners declare bankruptcy at some intermediate phase and cannot afford the required reclamation costs and the bond is also not adequate for the reclamation.

4. Bond Return

A miner does not have to wait to finish a mining venture before requesting and receiving back a portion of the initial bond. In most cases, a portion of the bond may be returned as reclamation requirements are fulfilled. However, some portion (which may be up to 25 per cent of the total bond) will normally be kept for some period of time after reclamation is completed and only returned once the area is in stable condition.

5. Responsible Organization

A major consideration in any bonding activity is to determine the organizational structure which best insures that the bonding activity meets it primary objectives of land rehabilitation. As the rehabilitation process involves a complex inter-play of government, private and special interest groups (national and international) there is a need to ensure both the credibility and the impartial nature of the process. To achieve these objectives a bonding activity should be handled as a semi-autonomous, private/public sector institution with representation from related government agencies, environmentalist and the NGOs.

The duties of the representatives would include (i) determining the size of bond; (ii) collecting the bond payments and investing the bond and to earn interest on behalf of the miners; (iii) site monitoring; (iv) compliance inspection; (v) providing technical assistance; (vi) review and certification of complete reclamation prior to the release of bonds; and (vii) responsibility for reclaiming the bonds contingent upon satisfactory reclamation.

An inherent difficulty in establishing a responsible authority for the bonding process is that the site monitoring and compliance activities are normally legislated to a governmental agency and its personnel. As a result special agreements between the Bonding Authority and these government agencies must be worked out and formally agreed to if the process is to function smoothly.

6. Auditing System

Mine rehabilitation should be an ongoing activity during and after the cessation of the mining activity. Thus, auditing is required in all steps of operation not just only after the mining licence is terminated. During the mining activity, a system of licence renewal can be of great benefit for insuring compliance and accurate auditing since the government can cancel the licence or postpone the renewal process if the mining activity does not follow the EIA/EIS or comply with the law.

Before releasing the bonds, it must be assured that satisfactory reclamation has been done, based on a comprehensive review and audit of completed reclamation, prior to the release of bonds. In many cases, the fund should engage the outside services of an environmental auditor's unit to determine whether land reclamation and forest protection mandates have been met according to the rules and regulations.

I. CONCLUSION

A deposit/refund system such as reclamation bonding is a useful tool to ensure mine reclamation by minimizing the disincentive to invest in the mineral industry while maximizing the incentive to protect the environment.

The benefits of using a reclamation bond policy are that (i) it would be an incentive for proper planning; (ii) innovative mitigation and reclamation technologies will be developed and used; (iii) mined-out areas will be reclaimed and thereby appropriate for other end uses; (iv) mining will be conducted efficiently by taking into account "real" production costs including environmental and social costs; and (v) land-use conflicts between mining and other economic activities will be lowered. Most of all, it will be a major step forward in ensuring the sustainable development of the minerals industry. Although imposing any additional cost, such as having the reclamation bond, may act as a disincentive to invest in the mineral industry in certain limited cases, when considered in terms of societal welfare and the efficient uses of country's resources for sustainable development, such a performance guarantee scheme is necessary for the countries of the Asian and Pacific region.

In the next decade, the environment will be the main problem facing the minerals industries within the countries of the Asian and Pacific region. To achieve the goal of sustainable development for a country, the minerals industry as part of the economy, must emphasize the concept of environmental protection. Unless the minerals industry is willing to change and accept the idea of environmental protection, the development of the minerals industry in the future will be more difficult. It is already time for governments to decide between having a domestic mining industry that operates with environmentally sound practices, or having no mining in the economy and depending totally on imports. Between these two choices is the decision as to which can contribute more to the economy in order to achieve the goal of sustainable development.

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VIII. AN INTERNATIONAL OVERVIEW OF LEGAL FRAMEWORKS FOR MINE CLOSURE

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A. INTRODUCTION

Since the inception of mining approximately 3,000 years ago, mining activities have left their mark on the landscape-normally as the ancient areas of excavation or sites of metal working. Although ancient scars remain, it is the activities associated with mining activities since the industrial revolution that have left the largest scars. Prior to the industrial revolution most mining was for high-grade materials and therefore required comparatively modest excavation. With the industrial revolution came large scale, often open pit, mining for coal, iron, manganese, copper and to a lesser extent for lead, zinc, gold and nickel. Such mining not only removed enormous tonnage of ore but of waste rock and tailing as well-all of which requires reclamation upon mine closure if an area is to be used again. Regrettably such reclamation on closure was not the case and today the developed nations, as well as the developing and emerging economies, are faced with decades, if not centuries, of mines and mining debris to clean up. As will be discussed later, the issue of mine closure is not restricted to just the physical waste but to all the ancillary impacts derived from the waste and the mining activity overall. It is these impacts, from past mining and present activities, which must be mitigated and controlled through effective government action and sound policies for mine closure.

The concepts, definitions and issues surrounding mine closure are rapidly and range from ".... the rehabilitation of disturbed lands to a safe, stable and productive post-mining landform, which is suitable and/or acceptable to the community..." (Allen and Briggs, 1999), as ".... site rehabilitation and restoration to ensure that the closure of a mine will not compromise environmental quality in the future and will limit the extent of any prospective liabilities for both the operator, the government and the community" (Sasson, 1996) and as ".... returning mine sites and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activity (Mining Association of Canada, 1994). The common theme in all of the above definition is that of the reclamation and rehabilitation of the area impacted by mining to a state that precludes further environmental damage and allows for alternative use. In essence, mine closure is largely regarded by industry and, until recently by most governments, as primarily an environmental issue.

From the perspective of governments, mine closure presents a complex mixture of environmental, social, economic and development issues that the government must have ensured that (a) industry has adequately recognized and prepared for over the life of the mining enterprise and (b) that the closure plan is carried out to the satisfaction of the communities involved, other major stakeholders and government at all levels. Governments are now coming to realize that they have the most direct responsibility for defining and ensuring comprehensive mine closure within the broader context of the issues of "social/economic equality" and "sustainable development". This recognition of a broader context of mine closure has greatly expanded the scope of government responsibilities and needed actions.

Mine closures have, are having, and will continue to have a major impact across the broad spectrum of concerns of all of the groups that are directly and indirectly impacted by the closure. The accommodation of all of these concerns, to the extent possible, results in what the authors term as

"comprehensive mine closure". It is the purpose of the reminder of this paper to address the key components, particularly of policy, legislation, and regulations, of government action that are required to ensure responsible mine closure and sustainable development following closure.

B. THE DIVERSE NATURE OF MINE CLOSURE ISSUES

The issue of the types of mine closure is itself diverse and it is necessary to recognize that mine closure takes many forms. The most obvious types of mine closures, and those most discussed, are abandonment and terminal closure; the latter occurring when an ore body is mined out and a company, following reclamation and rehabilitation, permanently ceases operations. In reality, however, it is common that many mines are "temporarily" closed because of political, economic, market, technical, environmental or social reasons with the intention (not usually realized) that they will be reopened at a later date. Many such temporary closures result ultimately in such properties becoming abandoned mines. Also common, particularly in the transitional economies (Clark and others, 1998), is that mine closure, resulting from rehabilitation, rationalization and/or privatization, often results in some form of partial closure, i.e. restricted to specific workings within or adjacent to a major mine, by which some level of mining continues in the rest of the mine or area. Each of these types of mine closure presents their own special problems for both government and industry.

Perhaps no area of government/industry responsibility in mine closure is expanding more rapidly than that of assuring the sustainable development of mining areas overall and in particular once mining ceases. Broadly viewed, the evolution of issues associated with mine closure have been characterized by a general lack of concern in most nations for comprehensive mine closure prior to the 1960s; followed by an increasing concern for environmental issues related to mine closure (acid mine drainage, reclamation and rehabilitation) in the 1970s and 1980s to the consideration of the broader spectrum of sustainable economic, environmental and social development issues related to comprehensive mine closure in the 1990s and that continues into the new millennium.

The most striking of these changes has been the need to meet, within the framework of "cradle to the grave" mineral development, the needs and concerns of a constantly increasing number of stakeholders (Clark and Clark, 1999) in the closure and post-closure process. The need to more fully address the social dimension of mine closure is a relatively new concern in the majority of nations and throughout the industry – albeit a few examples of successful mine rehabilitation, reclamation and closure have been accomplished in Canada and to a very limited extent in Australia, England, Wales and the United States. Central to the incorporation of the social dimension into mine closure is the need to integrate Social Impact Assessments into mine planning and to incorporate a Social Mining Plan as a part of the overall development (Clark, J., 1994).

C. GOVERNMENT'S ROLE IN MINE CLOSURE

In most countries, the role of government in comprehensive mine closure is expanding rather than contracting largely because government's role remains primarily that of enacting and implementing appropriate policy and legislation.

At the broadest levels government mine closure policy may be in part dictated by its own national constitution that mandates a healthy environment for its citizens or by requirements of international treaties and agreements (United Nations Convention on the Law of the Sea, Basel Convention). At the national level individual national sectoral policies and legislation (other than those for environment and mining), various Executive Decrees and specific Local Government Agreements (often with industry) all must be provided for as part of an overall national programme for acceptable mine closure. These are in addition to specific instruments under Environmental and Mining legislation that require putting in place policy and

legislation for Environmental Impact Assessments, Social Impact Assessments, Mining Plans, Standard Mining Agreements, bonding procedures and providing for Inter-Ministerial Agreements to achieve comprehensive mine closure and sustainable development.

The scope and complexity of the considerations that governments must accommodate in developing a comprehensive mine closure policy and process largely accounts for the fact that (a) that many countries do not have provisions for mine closure in their mining laws, (b) that mine closure in most countries is primarily with respect to reclamation and rehabilitation and (c) few governments have actual mine closure legislation. An international overview of the provisions for mine closure, and their scope, is presented in the following section.

D. GOVERNMENT MINE CLOSURE POLICY AND LEGISLATION: A GLOBAL PERSPECTIVE

Under the best of circumstances, comprehensive mine closure and all that it entails would simply be part of any mining enterprises, however, past history and present practices in many countries clearly demonstrates that this is not the case. Therefore, the majority of countries within which mining is a major (sometimes only a minor) activity have put in place policies and legislation that provide directly (within the national Mining Law) or indirectly (normally within the national Environmental Law but also within many Foreign Investment Laws) for comprehensive mine closure. Compliance with these provisions is often a pre-condition of acquiring a mining licence rather that a matter of "best practices" which would be a far better approach, e.g. as in Chile for recent developments by transnational corporations. In still fewer countries, their legislation contains only general statements with respect to "appropriate" or "reasonable" reclamation and rehabilitation with the specific issues related to mine closure normally being dealt with on an "ad hoc" basis.

Nevertheless, in most countries, comprehensive mine closure, as detailed in an overall *Feasibility Study, a Plan of Operations (Mining Plan), an Environmental Impact Assessment or an Environmental Mining Plan* are normally preconditions for acquiring a mining licence and de facto the most common means of ensuring comprehensive mine closure by the government. Regardless of the approach or the requirements, however, rehabilitation, reclamation and mine closure plans vary greatly among and within individual countries, as do the requirements for bonding or other surety instruments to ensure that the plans are carried out.

Overall, only a very few countries and/or their individual provinces/states, have enacted and implemented actual mine closure laws e.g. the United Kingdom, the Province of Ontario and the state of Nevada, United States of America. In most countries, mine closure requirements occur either within the mining law, and/or its associated Implementing Rules and Regulations (IRRs) for the mining laws, or within specific environmental legislation that is applicable to the mining sector. In the latter case, the requirement is that an EIA or EIS be prepared for development projects that are anticipated to have a large environmental impact.

In the following sections, a brief overview of the policies, legislation and requirements pertaining to mine closure in a number of countries are summarized. The discussion is divided on the basis of two groupings of countries, i.e. Australia, Canada, Europe, Japan and the United States (Group A – Table 8.1) and a second grouping (Group B – Table 8.2) of largely developing countries that have been geographically divided into countries of Africa, Asia, Latin and South America, Pacific Island countries and South-East Asia for purposes of the present discussion. In both cases, this arbitrary division is primarily for ease of discussion, because of commonalities of policy and legislation, although, there are significant differences within countries of each group. Selected overview of international legislation pertaining to mine rehabilitation, reclamation and mine closure is contained in Appendix 1.

1. Mine Closure Policy and Legislation of Group A

The mining history of the individual countries of Group A are quite similar, except with respect to the much longer history of mining in Europe compared to that in other countries, in that mining has been (a) extensive throughout each country, (b) diverse in terms of mineral commodities mined, (c) a mixture of small-to-large scale underground and surface mines and (d) that all countries have a large numbers of abandoned mines (factors that are also true for many of the countries of Group B to be discussed later). In general, however, in the countries of Group A, the scope and nature of resulting mine closure issues have been quite similar as have been their responses, at the national and subordinate (province, state, territory) levels of government. The most striking similarities include the following.

All countries have developed broad national policies and legislation that impact directly or indirectly on mine closure, e.g. in the United States, the national government has legislated the National Environmental Policy Act (1969), the Clean Air Act (1970), the Clean Water Act (1972) and the Resource Conservation and Recovery Act (1976), all of which generally apply to issues related to mine closure. Similarly, in the United Kingdom, the Department of the Environment has issued Mineral Policy Guidance Note 7 entitled "The Reclamation of Mineral Workings" as guidance to all local planning authorities for overall planning for mine closure (Department of the Environment, 1996).

Although mineral resources are considered the property of the State, the responsibility for the enactment, implementation, monitoring and for ensuring compliance of specific mine closure policy and legislation is largely, if not exclusively, the responsibility of the subordinate levels of government.

For all of the countries, the issues surrounding the closure of abandoned and operating coal mines is a paramount consideration, primarily because of the environmental impact of Acid Mine Drainage (AMD), and levies are placed (normally at the subordinate level of government) on present coal production to provide funding for the clean-up of abandoned coal mines. The issue of AMD is equally important for many base metal mines, however, no country, as yet, has specifically dealt with this issue.

Another common feature of policy and legislation relating to mine closure is that the Environmental Impact Assessment requirements require consideration of the social impacts of the mine as well as those on the environment. Further, existing policy and legislation and/or executive decrees require that these social impacts be considered during mining, closure and post-mining periods. In virtually all cases, policy and legislation requires that local and indigenous people be included in all development planning, in approval processes and throughout the life of the mine.

Although there are many similarities at the national and subordinate levels of government of the countries in Group A, there are also many differences in how they deal with the specific aspects of mine closure. The greatest differences are with respect to the level of specific policy and legislation that is in place for the abandonment and post-closure responsibilities of existing and planned mines (table 8.1). For these areas of concern, the subordinate levels of government in Australia and Europe have each evolved fairly consistent and comprehensive policies and legislation, whereas, in Canada and the United States, there is considerable variation among and between the subordinate levels of government.

The trend in all of the countries in Group A is most certainly toward developing a more comprehensive approach, at all levels of government, to ensure acceptable mine closure. Industry itself is also taking a more active role in defining acceptable guidelines for mine closure. The most recent and comprehensive example of this is the issuance of the "Mine Closure Strategic Framework" working paper prepared by the Australian and New Zealand Minerals and Energy Council.

Table 8.1. Legislative provisions for mine closure in the provinces/territories of Australia and Canada, Europe and individual States of the United States of America

Country, State or Province	Specific Provisions for Reclamation	EIA Required before Lease	Bonding Procedure	Provisions for Abandonment	Provision for Non-Compliance
Asia					
Japan	x	x	x	x	x
Australia					
New South Wales	x	x	x	–	x
Northern Territory	x	x	x	–	x
Queensland	x	x	x	x	x
South Australia	x	x	x	x	x
Victoria	x	x	x	x	x
Western Australia	x	x	x	x	x
Canada					
British Columbia	x	x	x	x	x
Manitoba	x	–	x	–	x
New Brunswick	x	x	x	–	–
Northwest Territories	x	x	x	–	x
Nova Scotia	x	x	x	x	x
Ontario	x	x	x	x	x
Quebec	x	x	–	–	–
Saskatchewan	x	x	–	–	–
Yukon Territory	x	x	x	–	x
Europe					
Germany	x	x	x	–	x
Ireland	x	x	x	x	x
United Kingdom	x	x	x	x	x
Wales	x	x	x	x	x
United States					
Alaska	x	x	x	–	x
Arizona	x	x	–	–	x
California	x	x	–	x	x
Montana	x	x	x	–	x
Nevada	x	x	x	–	–
New Mexico	x	x	–	–	x
Utah	x	x	–	x	x
Washington	x	x	–	–	x
Wyoming	x	x	–	x	x

Sources: Fortin, 1992; Gallaher, and Lynn, 1989 and Intarapravich and Clark, 1994.

Table 8.2. Mine closure provisions in the mining laws and associated implementing rules and regulations of Group B countries

Country	Closure Negotiated[1]	Require EIA[2]	Require SIA	Require Rec/Rehab	Require Bonding
Africa					
Burkina Faso	–	x	x	x	x
Botswana	x	x	–	x	–
Côte d'Ivoire	–	x	–	x	x
Ghana	–	x	–	x	–
Mali	–	x	–	x	x
Namibia	–	x	–	x	–
Tanzania	x	x	–	x	–
Zambia	–	x		x	x
Zimbabwe	–	–	–	–	–
Asia					
Bhutan	–	x	x	x	–
Brunei Darussalam	–	–	–	x	–
Cambodia	–	x	–	x	x
China	x	–	–	x	–
Democratic People's Republic of Korea			–	x	–
Indonesia	x	x	–	x	–
India	x	–	–	x	–
Kazakhstan	–	x	–	x	–
Kyrgyzstan	x	x	–	x	–
Lao People's Democratic Republic		x	x	x	x
Malaysia	x	x	–	x	–
Mongolia	–	x	–	x	x
Myanmar	–	–	–	–	–
Philippines	–	x	x	x	x
Republic of Korea	–	–	–	–	–
Sri Lanka	x	x		x	
Tajikistan	–	–	–	–	–
Thailand	x	x	–	–	–
Uzbekistan	x	–	–	x	–
Viet Nam	–	x	–	x	x
Latin/South America					
Chile	–	–	–	–	–
Costa Rica	x	x	–	x	–
Ecuador	–	x	–	–	–
Guyana	x	–	–	–	x
Mexico	x	x	–	x	–
Peru	–	x	x	x	–
Venezuela	x	x	–	–	–
Middle East					
Islamic Republic of Iran	x	x	–	x	–
Saudi Arabia	x	–	–	x	–
Pacific Islands					
Fiji	–	x	x	x	x
Papua New Guinea	x	x	–	–	–
Solomon Islands	–	–	–	x	x
Vanuatu	x	x	–	x	x

Notes: [1] Virtually all Mining Laws provide for a great deal of discretion on the part of the Minister would apply to issues of mine closure. Those noted (x) pertain to delegations of authority that are specific with respect to mine closure.

[2] Does not take into account provisions that may exist in other legislation (in particular environmental legislation) that may address mine closure issues either directly or indirectly.

2. Mine Closure Policy and Legislation of Group B

The level of provision for mine closure within the mining laws and regulations of the countries of Group B is largely dependent on three factors i.e. (i) the age of the country's mining law and regulations; (ii) the activities of past mining enterprises; and (iii) related policy and legislation, in particular environmental policy and legislation.

In general, it can be seen from table 8.2 that for those countries whose mining policies and laws have not been rewritten or revised since 1985, and in some instance even more recent legislation, have few if any specific provisions pertaining to the environment generally or for mine closure specifically. Particularly striking in this regard is the 1983 Mining Law of Chile, one of the world's largest mineral producing countries, that is perhaps the only Mining Law that does not contain the word environment nor has any provisions for reclamation, rehabilitation or mine closure. Chile has, however, recently moved to deal with these issues under its environmental policy and legislation. In the majority of the older mining laws, issues pertaining to mine closure are dealt with in only the most general terms. It is equally important to recognize that although the policy, mining laws and regulations in many of the countries of Group B have recently been rewritten or significantly updated, those in many countries, particularly in the Central Asian Republics and Latin and South America and to a lesser extent in Africa, are incomplete with respect to dealing with issues surrounding mine closure (table 8.2).

As a general rule, those countries with an extensive mining history, characterized by a large number of abandoned mines and resulting environmental problems and those which have recently rewritten their mining laws and regulations, e.g. Bolivia, China, Namibia, Viet Nam, and Zambia (table 8.2) tend to have developed more comprehensive and detailed policies and legislation for mine closure. In large part, this has been the result of (a) pressures exerted largely by local governments and communities acting in conjunction with components of both national and international civil society, (b) by transnational mining companies desiring a well-defined mining environment, and (c) the input of assistance organizations, (Asian Development Bank, World Bank, the United Nations Development Programme, bilateral assistance projects).

For many countries in Group B, the major determinant in ensuring more acceptable mine closure practices has been the rapidly increasing and diversifying role, and importance of governmental environmental agencies (normally the equivalent of a Department of Environment) and subordinate levels of government. In particular, the common requirement is that the approval for all development projects, and in particular those related to mining, be conditional on an approved Environmental Impact Assessment as a part of an overall Mine Development Plan has necessitated that similar conditions be included not only in mining policy and legislation but also in Foreign Investment Laws (Lao People's Democratic Republic, Viet Nam).

It should be noted that although the concern for comprehensive mine closure often derives from environmental agencies and their activities, their efforts are not, in many countries, the primary "driver" for comprehensive mine closure. Rather, it is a priority concern of the mining agencies as well. Again, in the case of Chile, the Environmental Unit of the Ministry of Mines has taken a leading role in carrying out studies to develop the above-mentioned new Chilean legislation for mine closure.

Finally, it should be noted that in many of the countries in Group B, mine closure issues may not be addressed within existing mineral policy and legislation, however, it may be covered within the various types of mining agreements. As an example, the Mining Law of Indonesia was passed in 1967 and, as can be seen from table 8.2, has only very few articles that pertain to the environment and mine closure. However, within the Indonesian Contract of Work (COW), under which mining is conducted, there are specific requirements for an Environmental Impact Assessment and plans for mitigation that include issues of reclamation, rehabilitation and mine closure. Conversely, in Papua New Guinea, the relatively recent Mining Law of 1992 does not have specific provisions for either an Environmental Impact Assessment or

for a Mine Closure Plan (table 8.2). Nevertheless, recent mining developments do fall under the Environmental Planning Act of 1978 and its subsequent amendments and, therefore, environmental impact assessments and an environmental work plan (containing provisions for mine closure) are required for new developments.

Ironically, two of the largest mines in the Papua New Guinea, the Bougainville Mine (now closed) and the OK Tedi Mine (presently planning for closure), that have had major environmental problems and for which provisions for mine closure remain problematic, remain excluded from compliance with the Environmental Planning Act (as they pre-date the Act). Instead, each mine operates under a separate contractual agreement within which environmental and mine closure provisions were/are largely negotiable. Such negotiable provisions for mine closure, on a case-by-case basis, is characteristic for many of the countries of Group B, e.g. Botswana, Guyana, India, Kyrgyzstan, Vanuatu and many others.

a) Varying Approaches to Mine Closure in Group B: As would be expected, the mine closure policies of the individual countries of Group B vary considerably in scope and detail, however, among the more common features are the following:

Many of the countries of South America (Brazil, Chile, Peru, Argentina), the former Union of Soviet Socialist Republics (in particular the Russian Federation, Kazakhstan, Kyrgyzstan, and Uzbekistan) and of Asia (Indonesia, China, Myanmar) that had (still have) large state-run mining operations, are characterized by (i) having only very general policy and legislation for mine closure, (ii) mine closure issues being normally negotiated and incorporated into individual mining agreements, (iii) the retention of a high degree of state responsibility for the closure of present and past state mining operations, (iv) limited contingent liability for foreign investors with respect to mine closure issues arising from past operations, and (v) few, if any, bonding procedures to ensure comprehensive mine closure (table 8.2).

Similarly, in the countries of Africa (Republic of South Africa, Tanzania), Latin and South America (Mexico, Ecuador), Asia (Papua New Guinea, Thailand), each with a long mining history of private sector mineral development, are characterized by (i) having only very general policy and legislation for mine closure, (ii) providing for mine closure on a negotiated "mine-by-mine" basis, (iii) a high degree of state responsibility for both abandoned and some operational mines, and (iv) few, if any, bonding procedures to ensure comprehensive mine closure.

Within the countries of Group B, only Bhutan, Bolivia, Burkina Faso, the Lao People's Democratic Republic, Mali, Mongolia, Namibia, Peru, the Philippines, Viet Nam and Zambia can be said to have comprehensive policy and legislation that provides for comprehensive mine closure and for post-mining sustainable development. With the exceptions of Bolivia, Namibia, the Philippines and Zambia, that would have to be considered major mineral-producing countries, all of the remaining countries have relatively small mining sectors. What is important in such an observation is that many of the world's largest mining countries, excluding those in Group A, have inadequate policies and legislation for comprehensive mine closure and still fewer provide for post-mining sustainable development. Yet, it is in these countries that post-closure sustainable development presents the greatest problems for government.

A key element in achieving comprehensive mine closure is that of requiring bonds to be posted to ensure that there will be adequate financial resources available to the mine, or the government, on closure to ensure that it can be carried out successfully. Bonding is particularly important in the countries of Group B where, quite often, other forms of ensuring compliance are weak or non-existent. Table 8.2 shows that approximately 30 per cent of the countries studied have provisions for bonding and of this group only the Philippines and Zambia can be considered as major metal producing countries. It is particularly noteworthy that none of the major mining countries of Central Asia or Latin and South America presently have bonding provisions.

Additionally, it can be said that in the vast majority of the countries in Group B, effective environmental reclamation and rehabilitation and mine closure, even where mandated, are still highly problematic. This is because many existing laws and regulations are too general to serve as a basis for enforcing compliance. In many countries, mine closure requirements are undermined by inefficient and ineffective monitoring and enforcement, to a large extent, arising because of a lack of financial and technical resources at the national and subordinate levels of government.

Overall, recent mining laws and their associated implementing rules and regulations are beginning to have the necessary requirements to ensure comprehensive mine closure and this trend appears to be accelerating. Therefore, as new policies and legislation are formulated, three major questions that must addressed are (i) what should government's policies be with respect to mine closure, (ii) what are the major components of an overall mine closure programme that provides for sustainable development and (iii) how might such a policy be implemented.

E. SUMMARY AND CONCLUSIONS

Prior the 1985, the issue of mine closure can be said to have been of a low priority for most countries, as evidenced by the large numbers of abandoned mines that exist in virtually every major mining country. As a result, very few countries had in place, and the majority still do not have, mineral policy and legislation that provide for comprehensive mine closure. The basic components of a comprehensive mine closure policy and associated legislation would (i) provide specific provisions for reclamation and rehabilitation, (ii) require both Environmental and Social Impact Assessments and associated work plans, (iii) have a comprehensive bonding and financial surety programme, (iv) provide provisions specifically for abandonment and post-closure activities and (v) have specific monitoring and enforcement procedures to ensure compliance.

All mining countries have a major problem with abandoned mines and to date none have devised an appropriate and cost-effective means of dealing with the issue. With respect to the above mentioned policies and legislation for comprehensive mine closure, many countries and states e.g. Australia, Bhutan, Bolivia, Burkina Faso, Canada, the Lao People's Democratic Republic, Mongolia, the Philippines, United Kingdom, the United States, Viet Nam and Wales can be said to have comprehensive policy and legislation that provides both for comprehensive mine closure and for post-mining sustainable development. With the exceptions of the above countries, whose policies and legislation have been implemented to varying degrees, the predominate majority of the world's largest mining countries have inadequate policies and legislation for comprehensive mine closure and still fewer provide for post-mining activities and sustainable development.

Comprehensive mine closure for abandoned mines, presently operating mines, and for future mines remains a major challenge for virtually every mining country in the world. To accommodate the need to close abandoned mines and to ensure that existing and future mines are appropriately closed, the cooperation will be required of a diverse stakeholder community, new an innovative methods of financing closure and major policy and legislative changes in most countries to ensure post-mining sustainable development.

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Appendix 1
Selected international legislation pertaining to mine rehabilitation, reclamation and closure

Africa	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Burkina Faso	ML Article 70: Environmental Impact Statement – Any holder of a mining title... must, prior to undertaking any work likely to impact the environment ... submit for approval and environmental impact study to which must be attached an environmental conservation and management programme. ML Article 71: Restoration Funds for Mining Sites: Any holder of a mining title ... must open an account ... an make deposits ... to cover the cost of implementation of the environmental conservation and management programme ... the amount is exempted from tax on commercial and industrial profits.
Botswana	ML Article 45 Obligations of Holder of Mining Licence: the holder of a mining licence shall ... develop and mine the minerals covered by his mining licence in accordance with the programme of mining operations, as adjusted from time to time, in accordance with good mining and environmental practice ... ML Article 58 Special Rights with regard to Industrial Minerals: (3) Any person exercising rights under this section shall ... minimize environmental damage and shall rehabilitate within a reasonable time ... ML Article 65 Environmental Obligations: The holder of a mining licence shall ... conduct his operations in such manner as to preserve in as far as it is possible the natural environment, ... minimize ... damage to natural and biological resources ... (2) In accordance with good international mining industry standards, the applicant ... shall prepare and submit a comprehensive Environmental Impact Assessment as part of the Project Feasibility Report. (3) The holder ... shall ensure that his concession is rehabilitated from time to time and ultimately reclaimed ... (4) ... and restore the land substantially to the condition ... prior to operations ... (6) In the event the holder of a mineral concession fails to fulfill his obligation ... the Minister may ... carry out the necessary restoration where upon the cost of the restoration shall be due to the Government by the holder ...
Côte d'Ivoire	ML Article 76: The activities governed by the Mining Law must ... ensure the protection of environmental quality, the rehabilitation of exploited sites ... ML Article 77: The holder of a mining title ... must prepare and submit ... a comprehensive environmental impact study and environmental management programme including a site rehabilitation schedule and a cost estimate ... ML Article 78: The holder of the mining title must ... implement the environmental management plan ... and bear the costs. ML Article 70: In addition to the provisions of the Mining Code, the holder of the mining title ... is equally subject to specific legal and regulatory provisions principally governing environmental preservation ... ML Article 85: As soon as exploitation starts, an environmental rehabilitation account is open(ed) ... to meet the costs relating to environmental rehabilitation ... at the end of exploitation. The amounts ... are exempted front business tax.
Ghana	ML Article 46 Mining Lease – ... (4) a mining lease shall not be granted ... unless (b) the proposed programme of mining operations submitted ... takes proper account of environmental factors.

Africa	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
	ML 72 Surface Rights – The holder of a mineral right shall ... take such steps as may be necessary to prevent pollution of the environment as a result of such mineral operations. IRR Mining and Mineral Processing Requirement for Environmental Impact Assessment (EIA) – Any company proposing to develop a mining project that will affect an area ... greater than 25 acres shall submit an EIA. IRR Requirement for Environmental Action Plan (EAP) – ... all existing mining operations shall submit an EAP ... IRR Rehabilitation – The company shall prepare a Rehabilitation Plan as part of the EIA or EAP ... IRR De-commissioning – The company shall prepare a conceptual De-commissioning Plan as art of the EIA or EAP.
Mali	ML Article 90: The holder of mining rights must make known before completion of research or at the end of mining operations the measures he intends to apply to maintain ... essential environmental characteristics, in accordance with current legislation ... ML Article 94: Upon termination of an authorization to extract ... the Minister of Mines will certify the proper execution of closure operations and the restoration of the mine ... ML Article 137: All holders of mining rights are obliged to respect the legislative and regulatory provisions currently in force relating to the environment. ML Article 139: The applicant is required to submit to the Ministry of Mines an environmental study. ML Article 140: The holder of an extraction permit is obliged to (a) carry out an Environmental Impact Assessment ... Guarantee the successful execution of the restoration work and securing the mine site by means of a security deposit.
Namibia	ML Article 33. (2) (c): Applications for registration claims ... shall contain – ... particulars of – (a) the condition of, and any existing damage to, the environment in the area to which the application relates; and (b) an estimate of the effect which the proposed ... operations may have on the environment and the proposed steps to be taken in order to minimize or prevent any such effect; ML Article 48. (c) (iii): Powers of Minister – ... (iii) an estimate of the effect which the proposed prospecting operations or mining operations, as the case may be, may have on the environment and the proposed steps to be taken in order to prevent or minimize such effect, in such manner ..." ML Article 50. (f): General terms and conditions of mineral licences – prepare ... for the approval of the Commissioner – an environmental impact assessment indicating the extent of any pollution of the environment ... and ... (f) (ii): if any pollution is likely to be so caused, an environmental management plan indicating the proposed steps to be taken in order to minimize or plan prevent ... pollution of the environment ... ML Article 54. (3). (1) (a) (b): Abandonment of reconnaissance areas, prospecting areas, retention areas and mining areas. The holder of the mineral licence to which such area relates shall – (a) demolish any accessory works ... remove ... from such land all debris ... (b) take all such steps as may be necessary to remedy ... damage caused ... to the surface and the environment on the land in the area in question.

Africa	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Tanzania	ML Article 38.4 (d): Application for special mining – Every application for a special mining licence shall include or be accompanied by – (d) the applicant's environmental management plan, including his proposals for the prevention of pollution, the treatment of wastes, the protection and reclamation of land and water resources, and for eliminating or minimizing the adverse effects on the environment of mining operations; ML Article 110.1: The Minister may make regulations for the better carrying into effect of this Act – "... such regulations as may provide for ... – the avoidance of pollution to the air, surface and ground waters and soils and the regulation of all matters relating to the protection of the environment and the minimization of all adverse impacts to the environment including the restoration of land on which mining operations have been conducted;
Zambia	ML Article 3: Environmental Project Brief: (1) A developer shall prepare ... an environmental project brief before undertaking any prospecting, exploration or mining operations ... (11) the Provisions of the Environmental Protection and Pollution Control Regulations of 1997 ... shall apply to any application under these regulations. Article 4. Environmental Impact Statement Procedure: (1) Where the Director determines that the exploration, prospecting or mining operation likely to have significant impact on the environment, the Director shall request the developer to prepare an Environmental Impact Statement ... ML Article 5: Contents of Environmental Impact Slatement: (1) The Environmental Impact Statement shall contain ... (2a) the operational cost of protecting the environment, covering the full life of the mine; (b) the cost of rehabilitating the mine, covering the full life of the mine; (c) the cost of decommissioning; and (d) the operational cost of protecting the mine after the closure of the mine ML Article 20: Closure of Dumping Site: ... (2) ... an application shall be accompanied by ... (d) a report on the progress on rehabilitating the dump ... and the amount of work still outstanding ... ML Article 65: The Environmental Protection Fund: ... (2) the contributions ... shall depend on the capacity of the developer to rehabilitate the mining operations ... Article 66: Fund Contributions: (1) The contribution to the fund ... shall be calculated depending on the performance of each developer ... (3) The contribution shall be deposited with the Fund over a period of five years beginning when ... mining operations arc commissioned or when the developer submits an approved Environmental Impact Statement.
Zimbabwe	ML Article 159: Application for Special Mining lease: ... (3) An applicant for a special mining lease shall furnish ... (vii) a report on the anticipated impact of mining operations on the environment and any measures to be taken to assess, prevent or minimize such impact, including proposals for ... (D) the reclamation and rehabilitation of land disturbed by mining operations ... (viii) ... details of any insurance to be taken out against liability arising from mining operations, including liability for damage to the environment ... ML Article 269: Open Workings to be Protected on abandonment ... (2) On or before the abandonment ... of a mining location, the holder of such location shall fill up all shafts, open surface workings and excavations ...

Asia	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Bhutan	ML Article 13 (ii): Powers of the Head of Division – Preservation, protection and setting standards of environment and conservation of natural resources consistent with the provisions of this Act, and other environmental legislation. ML Article 22: Final Mine Feasibility Study – Prior to granting of a mining lease, a final mine feasibility study is required to be prepared and submitted. Such a study shall contain an assessment of technical, financial, environmental and social parameters which demonstrate, in a reasonable manner, the socio-economic viability of the proposed mine. ML Article 23: Final Mine Feasibility Study – The Final Mine Feasibility Study shall include, *inter alia*, a Mine Plan, Environment Management Plan and a Mine Restoration Plan, and other data as prescribed. ML Article 50: Regulations – The Ministry may ... (v) Prescribe measures for the restoration, reclamation and rehabilitation of mining areas before mining commences, during mining and after mining is discontinued.
Brunei Darussalam	ML Article 9: Prospecting Licences: (Covenants) – (i) That he will … work and carry on the operations … with as little damage as possible to the surface of the lands over which the licence extends ... (vii) That he will upon the expiration or sooner determination of his science or the abandonment of the undertaking licensed ... remove all buildings, structures, engines, machinery and other property and ... (vii) That he will within 6 months ... securely plug all bores and fill up or fence all holes and excavations that he may have made in the lands ... and will to the like extent restore, so far as may be, to their natural or original condition the surface of the said lands …
Cambodia	ML Article 23.2: Proper Conduct of Exploration and Mining Operations – protection of the environment as detailed in an approved environmental impact assessment and study, an environmental management plan, a mine site restoration and rehabilitation plan and financial guarantees; ... The Holder of a mining licence is allowed to surrender the mining licence ... provided: ... (c) the licence area has been in compliance with the environmental management plan and mine restoration and rehabilitation plan and all other applicable laws in that respect. IRR 18.2: (Industrial Mining Licence) – Environmental Management Plan: (a) "... required to file as a supporting document to the final mine feasibility study shall be ... approved jointly by the Minister and the Minister of Environment ..." IRR 18.4 (Industrial Mining Licence) – Mine Closure: "... (c) when a mine or part of a mine is to be closed, the licence holder shall be personally responsible for the carrying out of provisions as specified in the restoration and rehabilitation plan until ..." (d) closed mine workings and tailings retention works shall be made safe as specified in the restoration and rehabilitation plan. IRR 18.5 (Industrial Mining Licence) – Restoration and Rehabilitation Plan: "... (c) the holder of an industrial mining licence shall be obligated to implement and meet all requirements of the approved restoration and rehabilitation plan or such amended plans." IRR 18.6 (Industrial Mining Licence) – Restoration Fund: Further ... the holder of an industrial mining licence shall pay into a restoration fund dedicated to the site specific restoration and rehabilitation of the mined land to the full discharge of the mining licence obligations in that regard.

Asia	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
China	ML Article 32: Mining Mineral Resources: In mining mineral resources, it is essential to observe legal provisions on environmental protection to prevent pollution of the environment. In case cultivated land, grassland or forest land is damage owning to mining, the relevant mining enterprise shall take measures to utilize the lands affected, such as by reclaimation ..." IRR Article 34 Mineral Exploitation: After the reports of closing down ... are approved, the mining enterprise shall complete the following works. (2) ... labor safety, water and soil conservation, land reclamation and environmental protection or completing the payment in full the charges for the land reclamation and environmental protection in accordance with the report on the closing down of mines.
India	ML Article 18. (1): Mineral Development – It shall be the duty of the Central Government ... to provide for all or any of the following matters, namely: ... (2) ... the manner in which ... owners of any mine ... do or refrain from doing certain things in the interest of conservation ... or for the protection of the environment ... IRR 14: Prospecting and mining operations: The prospecting and mining operations shall be carried out in such a manner so as to ensure systematic development of mineral deposits, conservation of minerals and protection of the environment. IRR 23. (1): Abandonment of mines: The owner, ... or manager of every mine shall not abandon a mine ... except with prior permission in writing of the Controller General ... (3): ... Such a notice shall be accompanied by ... the measures envisaged for the protection of the abandoned mine ... and the environment ... IRR 34: Reclamation and rehabilitation of lands: Every holder of prospecting licence or mining lease shall undertake the phase restoration, reclamation and rehabilitation of lands affected by ... operations and shall complete this work before the conclusion of such operations and the abandonment of prospect or mine.
Indonesia	ML Article 25. (1): Relation between Mining Authorization and Land Rights – The holder of the Mining Authorization is obligated to pay for the damage inflicted upon anything that is found on the surface, to the holder of the title to the land, both within and without the relevant mining area of the land caused by it as a consequence of his operations, ... ML Article 30: Mining Supervision – After completion of the mining for minerals in a certain mine, the holder of the relevant Mining Authorization obliged to restore the land in such condition so as not to evoke any danger of disease or any other danger to the people living in the environment of the mine. COW Article 8. 4. Feasibility Studies Period – The Feasibility Study Report ... shall include physical impact studies into the effects of the operation of the Enterprise on the Environment ... COW Article 26. 2. Environmental Management and Protection – The Company shall include in the feasibility study for each mining operation and Environmental Impact Study ... The environmental study will also outline measures, which the Company intends to use to mitigate adverse impacts.
Japan	ML Article 22.2: (Explanatory statement of mineral deposit) – The explanatory statement of a mineral deposit ... shall contain, ... a statement on the extent and nature of mining damages which may presumably be caused.

Asia	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
	ML Article 109. (Obligation of Compensation) – When damages have been sustained by other parties by digging of the ground, discharging of mine water or used water, accumulation of abandoned stones and mineral tailing, or discharging of mining smoke, the mining right owner of the mining area concerned at the time of occurrence of the damages ... shall be responsible for the compensation for the damages. ML Article 117: (Deposit) – The mining right owner or the mining lease holder of coal or lignite ... shall deposit every year a fixed sum of money in proportion to the quantity of coal or lignite mined.
Kazakhstan	ML Article 28.2: Applications to Obtain the Licence (Competitive Bid) – A competitive bid for the right to receive the Exploration Licence must contain the following: ... (3) intentions of the applicant in respect of the protection of the natural environment, including recultivation and restoration of land of the Contract Territory. ML Article 48.1: General Ecological Requirements – At any stage of subsurface utilization including prediction, planning, designing, the ecological requirements must be complied with in a priority procedure, as stipulated in legislation concerning the protection of the natural environment. ML Article 50.2: Ecological Basis for Performance of Subsurface Utilization Operations – A Subsurface User shall be obliged to ensure the submission for ... evaluation ... assessment of the impact of intended activities upon the natural environment and of the (Protection of the Natural Environment) Section including the efforts for the periods of Exploration and Production, of cessation of Subsurface Utilization .... ML Article 63.16: The Obligations of Subsurface Users – to reclaim terrains and other natural assets damaged by as a result of performing Subsurface Utilization Operations into condition which is suitable for further use, in accordance with legislation.
Republic of Korea	ML Article 91.1: (Kinds of and Obligations to Compensation for Mining Damages) – When significant damages are inflicted on other persons … the mining concession right holder … shall be liable to compensate for said damage …
Democratic People's Republic of Korea	LL Article 42: Land Conservation – The Institutions, enterprises and organizations engaged in the development of mineral resources should first set up waste dumps and ore residue settling basins … should take care to prevent cave-ins … LL Article 43: Land Conservation – At coal and ore mines, the areas where waste and removed earth have been dumped and where mine excavation has been undertaken should be leveled out quickly so that crops and trees can be planted there.
Kyrgyzstan	ML Article 14: Contents of Licence agreement – "… Licence agreement shall contain the following information: … measures for rehabilitation of environment disturbed by the use of entrails of the earth." ML Article 19: Rights and obligations of the users of entrails of the earth – "… The user of entrails of earth shall be required to ensure: ... 6) the return of land parcels and other natural objects disturbed while the use of entrails of the earth to a state suitable for their further use in conformity with regulatory requirement". ML Article 30: Abandonment and shutdown of mineral mining enterprises and other objects non-connected with extraction of mineral resources – "... In the event of complete or partial shutdown or abandonment of mineral mining enterprises, or objects ... shall be brought, ... to the state providing safety for the public, environment protection, conservation of buildings and construction, and, while abandonment, …"

Asia	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Lao People's Democratic Republic	ML Article 5: Environmental Protection – any person licenced to develop mineral resources shall utilize procedures to limit adverse environmental impacts and to limit the destruction of natural resources. ML Article 23: Requirements for Mineral Development Projects – ... If a person or entity seeks to obtain a mining licence the following must be submitted ... an environmental assessment concerning the impacts of the mine on the environment, the ecology and society. ML Article 30: Feasibility study – Feasibility studies shall contain ... an elaboration on ... the social impact of the mine ... ML Article 31: Along with the feasibility study the investor shall submit an environmental impact assessment ... ML Article 42: Obligations of the Mining Licensees – ... (4) to preserve and restore the land utilized during mining and to rehabilitate the land after mine closure and to guarantee that the project shall have no serious impact on the environment ... ML Article 46: Relinquishment and Restoration of the Mine Area – In the case where the surface of the land has been changed by mining activity, the land shall be restored and rehabilitated before relinquishment, where necessary, cleaning, chemical decontamination and revegetalion. ML Article 47: Compensation – The licensee shall set up and maintain a fund appropriate for ... (4) environmental protection; and (5) restoration and rehabilitation of the mining area.
Malaysia	ML Article 20.1: (Mine abandonment) – Before any mining operation is abandoned or discontinued, a written notice shall be given three months before such intended abandonment ... (20.3): ... – Where a mine or part of a mine is to be abandoned, the holder of a proprietary mining licence ... shall securely fence or cover every mine shaft or adit and ... (20.4) ... – Abandoned mines and waste retention areas shall be made safe in such manner as may be prescribed. ML Article 63.1: (Regulations) – The Minister may make regulations in respect of any matter which may be prescribed under this Act. ... 63.2.c ... (2) In particular and ... such regulations may – ... prescribe environmental protection measures, effluent standards, noise standards and means to protect the environment: ...
Mongolia	ML Article 28.2: (Environmental protection) – A licence holder may not commence exploration or mining operations without first obtaining written approvals from relevant environmental protection authorities ... ML Article 30.1: (Environmental protection obligations of mining licence holders) – An environment impact assessment and an environmental protection plan shall be prepared as quickly as possible by a licence holder ... either before or after receiving a mining licence ... (5) ... – The environment protection plan shall also provide for post-mining rehabilitation measures ... to allow future utilization of the disturbed land for public purposes ... (11) ... – To pledge the discharge of its responsibilities with respect to environmental protection, a mining licence holder shall deposit an amount equal to 50% of the environmental protection budget for a particular year in a special bank account ... ML Article 36.1: (Requirements for closure of a mine) – Before a closure of a mine, mining licence holders shall ... inform the OGMI ... one year prior to any such closure, and ... (1.1): ... – to take all necessary measures to ensure safe use of the mining area and mining claim for other purposes and to protect the environment.

Asia	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Myanmar	ML Article 3. (f): Objectives ... (f) to protect the environmental conservation works that may have detrimental effects due to mining operation.
Philippines	ML Section 70: Environmental Impact Assessment (EIA) – Except during the exploration period ... (an) environmental clearance certificate shall be required ... a completed ecological profile of the proposed mining area shall also constitute part of the environmental impact assessment. ML Section 71: Rehabilitation – Contractors ... shall technically and biologically rehabilitate the excavated, mined-out, tailings covered and disturbed areas to the condition of environmental safety, ... A mine rehabilitation fund shall be created, ... and shall be deposited as a trust fund ... IRR Section 35: Mandatory Requirements for Mineral Agreement Application – The applicant shall submit ... 35.3 ... a satisfactory Environmental Management Record and Community Relations Record ... (35.4)... Mandatory Requirements for Mineral Agreement Application – Environmental Work Programme ... (35.6) ... Proof of financial capability to undertake ... Environmental Protection and Enhancement Programme ... IRR Section 136. (a): Development of Host and Neighboring Communities – The Contractor/Permit Holder/Lessee shall perform the following: (a) Coordinate with proper authorities in providing development plans for the host and neighboring communities. IRR Section 181(a) (b): Mine Rehabilitation Fund – A Mine Rehabilitation Fund (MRF) shall be established and maintained by each operating Contractor/Permit Holder as a reasonable environmental deposit to ensure availability of funds for the satisfactory compliance ... The MRF shall be in two forms, namely: a) Monitoring Trust Fund (MTF) ... (b) Rehabilitation Cash Fund ....
Sri Lanka	ML Article 52.2: Ownership of Minerals and Issue of Licences – The holder of a licence issued under this Act shall on the completion of the activities authorized by his licence or on the date of expiration of this licence, whichever occurs earlier, rehabilitate the land to the satisfaction of the Bureau ... (3) – Where the Bureau determines that the land has not been rehabilitated to a satisfactory condition, the holder shall be liable to the payment of compensation to the owner of the land in such amount as may be determined by the Bureau in the prescribed manner. ML Article 61.1: Health, Safety and Welfare of Workers in Mines – The holder of a licence issued under this Act, shall carry out the activities authorized by... the National Environment Act, No. 47 of 1980 and ... shall restore and rehabilitate the land on which such exploration or mining had been carried.
Thailand	ML Article 67: Mining – A holder of a Prathanabat shall not discharge outside his mining area any slime or tailings resulting from his mining operation unless such water dots not contain solid matter in excess of the amount prescribed in a Ministerial Regulation. ML Article 69: Mining – In undertaking mining or ore dressing operation, the holder of a Prathanabat shall not perform any act ... that ... is likely to render poisonous minerals or other poisonous matters harmful to persons, animals, vegetations, or properties. ML Article 72: Mining – Any pit, winze or shaft which is no longer used in the mining operation shall be filled up or the land restored to its original condition by the holder of a Prathanabat ...
Tajikistan	No Mining Law – All mine closure issues covered under mining agreement and/or in response to Ministerial directives.

Asia	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Uzbekistan	ML Article 18: General Rights and Obligations of the Users of Subsoil – "... The user of subsoil shall be required to ensure: ... – protection of the environment, buildings and constructions from harmful effects of works related to the use of subsoil; ... – improving the allotments of land damaged during the use of subsoil to conditions suitable for their further use; ..." ML Article 29: The basic requirements to designing of enterprises connected with the use of subsoil – The projects ... shall provide for: ... rational use of the strip rock ... taking into consideration the ... requirements for re-cultivation of the land; ...
Viet Nam	ML Article 7.1: (Interests of the people in a locality where minerals are mined or processed) – On the basis of the income earned from mineral mining and processing activities, the State shall appropriate an amount from the budget for the purpose of socio-economic development in the locality where minerals are mined or processed ... ML Article 16.1: (Protection of the environment in mineral activities) – Organizations and individuals ... must use technology, equipment and materials and comply with other provisions of the Law on the Protection of the Environment in order to minimize any adverse impacts on environmental elements; rehabilitate the environment, ecology and the land after the termination of each phase of or the whole mineral activity. (16.2) – Organizations and individuals permitted to conduct mineral activities must bear all expenses related to the protection and rehabilitation of the environment, ecology and land ... Organizations and individuals ... deposit a fund ... to operate in Viet Nam as security for the rehabilitation of the environment, ecology and land. ML Article 33: (Obligations of organizations and individuals permitted to mine minirals) – Organizations and individuals permitted to mine minerals shall have the following obligations ... (33.5) apply measures to protect the environment in accordance with the approved environmental impact assessment report; ... (33.9) "... close the mine, rehabilitate the environment, ecology and land upon the expiry of the Mineral Mining Licence ..."
Latin/South America	**Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure**
Bolivia	ML Article 84: Mining activities will be carried out in adherence to the principle of sustainable development, subject to the Environmental Law, it's regulations and provisions of this code. ML Article 85: The State will establish financial or tax mechanisms to facilitate the control of contaminating flows ... originating in mining activities carried out prior to the effectiveness of the Environmental Law ... Article 86: The mining concessionaires or operators are obliged to mitigate the environmental damages originating in their mining concession ... The mining concessionaires are not obliged to mitigate tile environmental damage caused prior to the effectiveness of the Environmental Law. The extent of such damages will be determined through an environmental audit ...: The responsibilities ... arising from environmental damage subsist even after reversion to the ... State ...
Chile	ML: No Articles pertaining to environment, reclamation, rehabililation or mine closure – Existing provisions in Environmental Law for EIA only, no actions required for mining.

Latin/South America	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Costa Rica	ML Article 34: Exploitation concession – The beneficiary of an exploitation concession is obligated to … – Prepare a complete study on the environmental impact of the operating process ... and fulfill the provisions regulating environmental pollution and the recovery of renewable natural resources.
Ecuador	ML Article 79: Environmental Impact Studies: The holder of mining concessions and plants for processing, smelting and refining must make environmental impact studies and environmental management plans to prevent, mitigate, control and rehabilitate and compensate environmental and social impacts derived from their activities. ML Article 80: Environmental Management Plan: Every environmental management plan should contain (1) ... the environmental means to be applied to ... (d) rehabilitation, reforestation, control of erosion and restoration of areas affected. ML Article 146: Control of Activities: The Regional Directorates of Mining shall see that the work of subsistence mining and artesianal mining are conducted ... ensuring that harmful effects to the environment are avoided.
Guyana	ML Article 22: The Commission may require an applicant … to execute a bond … for the performance and the observance of … the conditions of the licence. ML Article 64: The holder of a mining permit or claim licence shall – ... carry out promptly and direction relating to mining ... for the purpose of ensuring safety or good mining practices. ML Article 84: ... (4) Where in the course of prospecting or mining … any damage is done to the surface of the parcel of the land ... the licensee shall be liable to pay fair and reasonabl compensation ...
Mexico	ML Article 27: Obligations imposed by Mining Concessions and Allotments and the Beneficiation of Minerals – Holders of exploration and exploitation concessions, regardless their date of issuance, are obligated ... to the general provisions and to the specific technical rules applicable to the mineral-metallurgical industry in the area of safety of mines and ecological balance and environmental protection. ML Article 39: Obligations imposed by Mining Concessions and Allotments and the Beneficiation of Minerals – In the exploration and beneficiation activities of minerals or substances, mining concessionaires must endeavour to take care of the environment and of the ecological protection in accordance with the legislation and the normativity on the subject.
Peru	ML Article 219: In order to guarantee an adequate stable climate for mining investment ... it is required that such activities conform with the Provisions of the Environmental Code. ML Article 221: Individuals that carry out or wish to carry out processing and exploitation activities must obtain approval ... subject to specific guidelines and obligations inherent in the protection of the environment ... New claims for processing concessions shall include an Environmental Impact Assessment … IRR Article 6: ... it is the obligation of the title holder to implement and maintain the programmes … in the Environmental Impact Assessment and/or the Environmental Adjustment and Management programmes ... IRR Article 16: The title holder of a mining activity shall submit a closure plan … which shall include the methods that must be adopted to prevent adverse effects ... in the short, medium and long term.

Latin/South America	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
Venezuela	ML Article 71: Developing of the mining industry and environmental preservation – ... mining activities ... will require the corresponding Declaration of Environmental Impact issued in accordance with the norms and procedures governing this matter. ML Article 90: The Obligations of Those Who Carry Out Mining Activities – ... the holders of concessions ... must comply with the following obligations: ... (2) ... respect and comply with the applicable environmental norms, ... ML Article 96: Nullification of the Mining Rights – The nullification of the mining rights will not free the parties in question from the mining as well as environmental obligations existing at the moment of the nullification.
Middle East	**Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure**
Islamic Republic of Iran	ML Article 24: In order to expedite the exploration and exploitation of mines, the executive bodies are bound to respond to the Ministry of Mines and Metals about the lawful scope of operations ... of paragraph (a) of Article 3 of the Environmental Protection and Rehabilitation Law. ML Article 25: In case the scope of mining operations falls within the scope of national and natural resources steps will be taken according to Note 4 of Article 3 of the State Forests and Rangeland and Rehabilitation Law ....
Saudi Arabia	ML Article 25: Voluntary Relinquishment of a Lease: The lessee may relinquish his lease ... In such event he will pay all sums due to the Government and leave ... the surface occupied by him in a safe and orderly condition satisfying the Minister's standards.
Pacific Islands	**Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure**
Fiji	ML Article 43. (1): Restoration of Land – During the currency of any mining tenement, the Director may order the holder thereof to restore the surface of the land ... disturbed by prospecting or mining operations. Such requirements of restoration shall be embodied in an appendix to such tenement ... (2) ... – When any mining tenement is terminated or abandoned ... the person ... shall, ... fill up all shafts, pits, holes and other excavations ... ML Article 68. (1): Regulations – the Minister may make regulations ... and in particular for ... (17) ... the regulation and use of the surface of the land ... (18) ... Regulation – the use of water ... (27) ... – the preservation of public health and the prevention of nuisances of all kinds arising from mining operaitons or the smelting or other treatment of any mineral product.
Papua New Guinea	ML Article 43: Approved Proposals for a Mining Lease – In assessing an application ... the board shall consider whether – ... (a) the proposal ... (ii) provide adequately for the protection of the environment, in which case evidence that the applicant has complied with the requirements of the Department responsible for environmental matters will be conclusive of protection ... ML Article 152: Removal of Mining Plant, Ore Tailings etc., on expiry of Tenement – (5) Where at the time a tenement expires ... the holder ... (b) does not, within the prescribed period, either remove or complete treatment of the tailings, other materials or mined ore, such tailings, other materials and mined ore shall, ... become the property of the State.

Pacific Islands	Mining Law (ML) or Implementing Rules and Regulations (IRR) Articles Pertaining to Mine Closure
	ML Article 154: Principles of Compensation ... (6) Where any land or improvements, adjoining or in the vicinity of the land the subject of the tenement, for the purposes of mining, is ... depreciated in value by the exploration or mining of the tenement, the landholders of that land are entitled to compensation for all loss or damage sustained ... EL Article 4: Submission of Environmental Plan; Where, ... the project ... may have significant environmental implications ... the proponent (is required) requiring him to submit an environmental plan .... EL Article 5: Guidelines: ... (5) Guidelines ... shall recognize that environmental planning involves the consideration of ... (j) any permanent change in the physical, biological, social or cultural characteristics of the affected environment ...
Solomon Islands	No legislation: all mine closure activities specified in Mining Agreement
Vanuatu	No legislation: all mine closure activities specified in Mining Agreement

ML = Mining Law or Mining Code
IRR = Implementing Rules and Regulations for Mining Law or Mining Code
EL = Environmental Law
LL = Land Law

REFERENCES FOR APPENDIX 1

ARGENTINA – Mining Law 22259 of 1980 (Signed 29 July 1980). Amends Mining Law 1919 of 1886; Government Memorandum dated 24 July 1980 Re Amendment of the Mining Code (Law 1919 of 1886). In 1980 by Law 22259; **BHUTAN** – Mines and Minerals Management Act of 1995; **BOLIVIA** – Mining Code (Law No. 1777) dated 17 March 1997; **BOTSWANA** – Mines and Minerals Bill (Bill 5 of 1999) dated 21 May 1999; **BRAZIL** – Constitutional Provisions Governing Exploitation of Minerals & Petroleum. At 1 January 1983; Mining Code Decree Law 227 of 28 February 1967. As Amended by Decree Law 318 of 14 March 1967; **BRUNEI DARUSSALAM** – Mining Act of 4/3/1984; **BURKINA FASO** – Bearing the Mining Code – Law No. 023/II/AN (22/10/97); **CAMBODIA** – Mines and Minerals Law of 1998; **CHILE** – 1983 Mining Code (Entered into Force 13 December 1983); Mining Law 18.097 of 1982 (Organic Constitutional Law of Mining Concessions); **CHINA** – The Mineral Resources Law of the People's Republic of China, Amended 29 August 1996 and in Force 1 January 1997 (Order No. 74 of the President of China). – Rules for Implementation of the Mineral Resources Law of the People's Republic of China – No. 152 (3/26/94); **COLOMBIA** – Decree 1275 of 29/7/70 as amended by 2181 of 1972 (Contains therein the Mining Code for Colombia); **COSTA RICA** – Mining Code – Law No. 6797 (22/10/82); **CÔTE D'IVOIRE**: – Cote d'Ivoire Mining code of 1998; **ECUADOR** – Ecuadorian Mining Law and Regulation (Law No. 126), dated 28 May 1991; **DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA** – The Land Law of the Democratic People's Republic of Korea of 29 April 1977; **FIJI** – Mining Act; **GHANA** – Minerals and Mining Law, 1986 (Enacted 4 July 1986); Guidelines for Draft Regulations in Ghana 12/91; **GUYANA** – Mining Act 1989 (Act No. 20 of 1989). The Mining Act 1989 (Amendment) Act 1992; **INDIA** – Mines and Minerals (Development and Regulation) Act, 1957 (as amended upto 20 December 1999); **INDONESIA** – Indonesian Mining Law of 1967 (Law 11 of 1967); Indonesian Contract of Work (7th Generation) 1996; **JAPAN** – the Mining Law 3/91; **ISLAMIC REPUBLIC OF IRAN** – Mining Law, dated 16 May 1998; **KAZAKHSTAN** – Decree dated 27 January 1996 on Underground Resources and Underground Resources Use; **LAO PEOPLE'S DEMOCRATIC REPUBLIC** – Mining Law of the Lao People's Democratic Republic No. 04/97/NA of 12/04/97; **KAZAKHSTAN** – Law of the Republic of Kazakhstan Concerning the Subsurface and its Utilization – Edict No. 2828 of 27/1/96; **KYRGYZSTAN** – Law of the Kyrgyz Republic on Entrails of the Earth dated 24 June 1997; **MALAWI** – Mines & Minerals Act, 1981; **MALAYSIA** – Mineral Development Act of 1994; **MALI** – Mali Mining Code Including Decree 112/p6 of 3 September 1970 and Regulations; **MEXICO** – Mining Federal Mining Law of 1992, Regulations to the Mining Law of 1992; **MONGOLIA** – Minerals Law 1997 (Effective 1 July 1997); **MYANMAR** – The Myanmar Mines Law (6/9/94); **NAMIBIA** – Minerals (Prospecting and Mining) Act, 1992 (16/12/1992); **PAPUA NEW GUINEA** – Mining Act 1992, Environmental Planning Act (1978); **PERU** – Single Revised Text of the General Mining Law (Supreme Decree No. 014-92-EM), dated 2 June 1992; Implementing Rules and Regulations for Environmental Protection (Supreme Decree No. 016-93-EM) dated 28 April 1993; **PHILIPPINES** – Philippine Mining Act 1995 (Republic Act 7942 of 25 July 1994) DENR Administrative Order No. 96 – Revised Implementing Rules and Regulations of Republic Act No. 7942, otherwise known as the Philippine Mining Act of 1995; **REPUBLIC OF KOREA** – Mining Act 1981 (Law 3357 promulgated on 29 January 1981, amended by Law 3640 dated 31 December 1982); **SAUDI ARABIA** – Mining Code of the Kingdom of Saudi Arabia; **SRI LANKA** – Mines and Minerals Act, No. 33 of 1992; **TANZANIA** – The Mining Act, 1998; **THAILAND** – Minerals Act B.E. 2510 of December 1967; **UNITED KINGDOM** – Mines & Quarries Act, 1954; **UZBEKISTAN** – Subsoil Code of Uzbekistan dated 23 September 1994; **VENEZUELA** – Resolution 148 of 21 March 1978 Governing Granting of Mining Concessions; **VIET NAM** – Order No. 47-L/CTN of 3 April 1996 promulgating the Law on Minerals; **ZAIRE** – Ordinance No. 67-416 of September 1967 Establishing the Mining Regulations (Regulations to Mining Law 231/67 of 11 May 1967); Ordinance-Law 67231 of 11 May 1967 Establishing General Legislation on Mines & Hydrocarbons; **ZAMBIA** – 1995 Mines and Minerals Act (Statutory Instrument No. 29 of 1997) dated 7 March 1997; **ZIMBABWE** – Mines and Minerals Act dated 7 December 1979.

PART TWO

REVIEW OF POLICIES, REGULATORY REGIMES AND MANAGEMENT PRACTICES FOR INVESTMENT PROMOTION AND SUSTAINABLE DEVELOPMENT OF THE MINERAL RESOURCES SECTOR IN TRANSITIONAL AND DEVELOPING ECONOMIES OF EAST AND SOUTH-EAST ASIA

IX. MINING REGULATORY REGIMES IN CAMBODIA

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ABSTRACT

Cambodia is a country abundant in natural resources. The discovery of minerals serves as catalyst to accelerate the industrial and economic development of the nation. The result of geological studies and mineral investigations, carried out since the latter half of the nineteenth century by French and Chinese geologists, have indicated significant mineral potential in Cambodia, including sapphires, rubies, gold, cassiterite, silica sands, bauxite, manganese, kaolin, coal, peat, pagodite, limestone, phosphate, construction materials and other minerals. The development of mineral resources in Cambodia is still slow and below its geologic potential, because of lack of finance, qualified specialists and technology. It is clearly seen that the development of mineral resources needs the participation of foreign investment, but the investment in mineral exploration and production is a risky business and usually needs quite a large capital.

In conformity with the Law on Mineral Management and Mining of Cambodia, the procedures for awarding exploration/mining rights to mining firms have been set up to promote private sector in mineral resources development in Cambodia. Foreign and local mining companies that wish to obtain the rights to explore and exploit mineral resources in Cambodia shall fulfill the requirements, as prescribed in regulations or Prakas (declarations) of the Ministry of Industry, Mines and Energy.

A. THE LAW ON MINERAL MANAGEMENT AND MINING OF CAMBODIA

The Law on Mineral Management and Mining of Cambodia was promulgated on 13 July 2001 to effectively manage and regulate mineral exploration and mining operations in Cambodia. The Law is considered as a new achievement made by the effort of the Government of Cambodia in order to attract local and foreign mining companies to invest in mineral exploration and mining in Cambodia. Forty-two articles spread over 10 chapters govern the mineral exploration and mining operations in Cambodia. The followings are analysis of the main provisions of the Law on Mineral Management and Mining of Cambodia.

1. General provisions

Three articles define the mineral management and mining, utilization of mines sites and all activities related to mineral operations in Cambodia. Except oil and natural gas operations shall be governed by a separate law. All minerals found on land or in the subsurface land, mountains, upland areas, internal waters, territorial sea, islands, seabed and under the seabed within the sovereignty of Cambodia, belong to the State.

2. Mineral licence

Seven articles define the eligibility of applicants, selection of mining companies and concessionaires' rights to conduct mineral operations. No natural person or legal entity may conduct

mineral exploration or mining without a mineral licence issued by the Ministry of Industry, Mines and Industry. Land property owners or legal land occupiers may privately use conglomerate, sand, clay and rocks with no requirement of a mineral licence but are not permitted to transport the products out of the boundaries of such property for commercial purposes. To acquire a mineral licence, natural persons or legal entities shall submit the application for mineral licence to the Minister of Industry, Mines and Energy. The application for a mineral licence shall include:

- Mining company's information and intention by providing evidence for the legal status of company, and identifying company interest in mineral exploration and mining in a specific area located in any province where the mineral licence areas are located;
- Evidence – showing company's financial capability, technical experience, availability of labour, equipment and machinery to conduct mineral operations in a proposed specific area located in any province;
- Method and time schedule for mineral operations during the mineral exploration and mining periods;
- Minimum work programmes and financial guarantee – for mineral exploration period. (Applicant who applies for a gem cutting and polishing licence is not required to submit work programmes and financial guarantee);
- A copy of business registration: (All local and foreign companies, mining firms or merchants or commercial companies, which are domiciled or having a branch office, are required to register with the Commerce Registor by submitting to the Ministry of Commerce a declaration in duplicate with the signature or thumbprint of the interested party, except those merchants excmpt from taxation on profits);
- Statement of Joint Venture – In the event that the company is to be a joint venture of two or more legal enterprises, details pertaining to their relationship, responsibility, equity split, and designation of an operator have to be provided.

Natural persons or legal entities may acquire a mineral licence, based on the full consideration and evaluation of their technical and financial capability and business registration. Before entering any private property land to explore and mine for minerals, a concessionaire shall enter into written agreement with a property owner with respect to non-interference and non-access to the property owner and compensation for any damage to the land surface caused by the activities of mineral operations. If an area of State property, designated to be protected, reserved or restricted, a concessionaire shall have written permission issued by the competent institutions or inter-ministerial institutions governing those areas before entering the area to conduct mineral operations. The prospecting for, exploration and mining of minerals in State property land, designated as national cultural and artistic heritage sites, shall be prohibited.

3. Categories of mineral licence

Three Articles define the categories of mineral licence. To effectively facilitate the management of mineral exploration and mining operations within Cambodia, natural persons or legal entities may apply for the following mineral licences:

- **Artisanal Mining Licence** shall be issued only to Cambodians to conduct the exploration and mining of minerals by using locally available hand tools and by their own labour or the number of family labour not exceeding 7.
- **Pits and Quarries Mining Licence** shall be issued to qualified natural persons or legal entities to conduct the exploration and mining of any construction material and industrial mineral, mined from pits and quarries, to be used for construction, chemical and processing industries.

- **Gemstone Mining Licence** shall be issued to qualified natural persons or legal entities to conduct the exploration and mining of precious, semi-precious and ornamental stones;
- **Mineral Cutting Licence** shall be issued to qualified natural persons or legal entities to cut precious, semi-precious and ornamental stones.
- **Mineral Exploration Licence** shall be issued to qualified natural persons or legal entities to conduct the exploration and study of mineral potentiality.
- **Industrial mining licence** shall be issued only to concessionaires holding mineral exploration licence to conduct the exploration and mining of minerals found in commercially viable mineral deposits located within the boundaries of the mineral exploration licence area.

Concessionaires who hold mineral exploration licences shall submit the technical, financial, environmental, social and economic analysis to determine the socio-economic feasibility of mining operations to the Minister of Industry, Mines and Energy for review and approval. The procedures, contents of reports, final feasibility study and references, and conditions to issue industrial mining licence shall be stipulated in sub-decree.

If the Minister of Industry, Mines and Energy determines that the application for a mineral licence indicates a large-scale project and is of special benefit to the nation, the Minister of Industry, Mines and Energy will negotiate with the applicant a mineral investment agreement to be appended to the mineral licence.

4. Mineral licence procedures

Seven articles are devoted to the procedures to issue a mineral licence. Cambodians may apply in person for an artisanal mining licence at the provincial departments of the Ministry of Industry, Mines and Energy, in provinces and municipalities, where the artisanal mining licence area is located, while natural persons or legal entities shall apply to the Minister of Industry, Mines and Energy for other mineral licences under the provisions of the Law.

The Minister of Industry, Mines and Energy shall respond in writing, the approval or disapproval of the application for a mineral licence within a maximum period of forty five (45) days following the date of submission of the technically completed application for the mineral licence.

Except for a artisanal mining licence, the concessionaire who acquired other mineral licences under the Law may renew, amend, surrender, mortgage, assign or inherit his/her mineral licence with the written approval from the Minister of Industry, Mines and Energy. If any concessionaire violates the provisions of the Law, the mineral licence of such concessionaire shall be suspended or revoked. The suspension and revocation of mineral licence shall be determined by sub-decree.

5. Mineral exploration and mining operations

Four articles define the rights and obligations of concessionaires to conduct mineral operations. Each concessionaire or sub-contractor shall be responsible for conducting mineral operations and shall comply with the operational requirement as follows:

- Conduct mineral operations by following technical and financial plans as detailed in an approved exploration work programmes or an approved mines feasibility study;
- Protect the environment as detailed in the Law on Environmental Protection and Natural Resources Management, including the study of environmental impact assessment, environmental management plan and mines site restoration and financial guarantee;

- Ensure the occupational health and safety of workers to be detailed in the programmes of mine plan, occupational health and safety in mines sites, including the protection of accidents and procedures for reporting such accidents;
- Protect the public safety in and around mine sites as detailed in an approved mine plan;
- Educate, train, and employ Cambodians to be detailed in the employment, education and training programmes;
- Commit the procurement of goods and services obtainable within Cambodia, where and when it is appropriate.

The guidelines on mineral licence, contents of reports, work programmes, and financial guarantee shall be stipulated in Prakas (Regulations) of the Ministry of Industry, Mines and Energy. To control the implementation of the Law, the Minister of Industry, Mines and Energy shall appoint its competent officers, whose duties are as follows:

- Be responsible to the Minister of Industry, Mines and Energy for the management regime under the provisions of the Law;
- Make annual reports on regular activities of mineral exploration and mining operations for successive years and submit such reports to the Minister of Industry, Mines and Energy;
- Collect the information and keep the records related to exploration operations, mining, transport, processing, marketing and export of minerals and mineral products;
- Keep track and control the implementation of all provisions of the Law;
- Control the implementation of regulations relating to the occupational health and safety of workers and people and environmental protection;
- Perform other duties as appointed by the Minister of Industry, Mines and Energy.

The powers and duties of officers appointed to control, inspect and report activities on mineral exploration and mining operations, research and analysis related to the management regime under the Law, shall be stipulated in sub-decree.

6. Concessionaire and land property owner

Two articles are devoted to the compensation for damage caused by mineral operations. A concessionaire who acquired a mineral licence shall compensate a land owner for both within and outside mineral licence areas for damage caused by his/her mineral operations, regardless of whether or not such damage is caused accidentally or could be anticipated. The compensation shall be made as follows:

- If an area of mineral operations, designated in the mineral licence, affected property land, a land owner shall permit a concessionaire holding a mineral licence to conduct mineral operations in the said land with mutual agreement in advance, in which the land owner shall receive reasonable and fair compensation;
- The compensation shall be made periodically or totally by mutual agreement between the land owner and concessionaire;
- In case that the land owner and concessionaire holding mineral licence failed to reach an agreement on compensation, the Minister of Industry, Mines and Energy shall resolve this case. If those concerned are not willing to accept the resolution on compensation, the Minister of Industry, Mines and Energy shall submit a proposal to the Government to establish a joint committee to settle this case. If all parties concerned are still not willing to

accept a resolution made by the joint committee, such matter shall be referred to the court of Cambodia.

7. Financial provisions

Six articles define the financial obligations to be fulfilled by concessionaires. Applicants or concessionaires, holding mineral licences, shall pay the State a fee of registration, renewal and transfer, and other fees and annual land rentals. During mining operations all concessionaires, holding mineral licences, shall pay the State a royalty on the value of mineral exploited, except concessionaires holding mineral exploration licence or gem cutting licence. Besides paying the fee of registration, renewal, transfer, and other fees, annual land rentals, and royalties, concessionaires holding mineral licence shall pay tax, custom duties, shareholding tax, and dividend tax, according to the prevailing laws. The royalty rates for minerals and royalty payment procedures shall be determined by Inter-ministerial Prakas (Regulations).

8. Penalties

Eight articles define the penalties for violating the provisions of the Law. Any person, who conducts mineral operations without a mineral licence, shall be liable to a fine from 500,000 (five hundred thousand) to 1,000,000 (one million) riels. In the event of a subsequent offense, such person shall be liable to a fine from 1,000,000 (one million) to 2,000,000 (two million) riels and/or to imprisonment from 1 (one) month to 1 (one) year or to the both penalties.

Any person, who conducts mineral operations in private a property without the consent of the land owner or in State owned land designated as national culture and artistic heritage sites, shall be liable to a fine from 5,000,000 (five million) to 10,000,000 (ten million) riels and/or imprisonment from 6 (six) months to 2 (two) years or to both penalties.

Any person, who conducts mining operations without a mineral licence or in private land without the consent from the land owner or in State owned land designated as national culture and artistic heritage sites, or hold an expired mineral licence, shall be liable to a fine of three times the estimated prices based on the mining period, capacity of mining equipment and machinery, and mineral quantities mined from such area, and shall be liable to a fine from 1,000,000 (one million) to 10,000,000 (ten million) riels per day by counting from the day on which such person commits a violation until the day on which such activities of mining operations are suspended, and shall be liable to imprisonment from 1 (one) year to 5 (five) years without prejudice to the compensation for other damages. All the said mining equipment and other producing machinery shall be confiscated and will become State property.

Any concessionaire, who did not pay royalties and transported minerals from his/her mineral licence area, shall be liable to a fine which is the double prices of minerals transported and/or shall be liable to the revocation of the mineral licence or to the both penalties.

Any concessionaire, who does not allow an appointed officer to control mines sites, shall be liable to a fine from 5,000,000 (five million) to 10,000,000 (ten million) riels and/or shall be liable to the suspension of the mineral licence for a period not exceeding 6 (six) months. In the event of a subsequent offense, the mineral licence shall be revoked.

Any person, who is not a legal land owner and forbids mineral operations of concessionaire legally holding a mineral licence, shall be liable to imprisonment from 6 (six) days to 1 (one) month.

The officers, appointed by the Ministry of Industry, Mines and Energy, conspires with a violator or commits a violation of the provisions of the Law, shall be subject to administrative sanctions without prejudice to other criminal violations.

9. Transitional provisions

One article defines the transitional provisions. All natural persons or legal entities, who have started conducting mineral exploration or mining operations and are holding the official valid permission prior to the Law coming into effect, are able to continue their works, but they shall be required to apply for a new mineral licence under the previsions of the Law within a maximum period of 90 (ninety) days.

10. Final provisions

The last article of the Law states that all provisions contrary to the Law shall be abrogated.

B. DRAFT OF IMPLEMENTING RULES AND PRAKAS (REGULATIONS) FOR THE LAW ON MINERAL MANAGEMENT AND MINING

According to the provisions of the Law on Mineral Management and Mining, the following draft Sub-Decree and Prakas (Regulations) have been made to be submitted to the Minister of Industry, Mines and Energy and the Council of Ministers for review and approval, respectively, in order to fully and effectively implement the Law:

- Sub-Decree on the Conditions to Issue Industrial Mining Licence, Power and Duties of Appointed Officers, and Suspension and Revocation of Mineral Licence;
- Prakas (Regulations) on The Guidelines on Mineral Licence, Contents of Reports, Work Programmes, and Financial Guarantee;
- Inter-Ministerial Prakas (Regulations) on Royalty and Royalty Payment Procedures.

1. Draft sub-decree on the conditions to issue industrial mining licence, power and duties of appointed officers, and suspension and revocation of mineral licence

The Draft Sub-Decree has 14 articles spreading over 3 chapters defines the conditions to issue industrial mining licence, power and duties of appointed officers, and suspension and revocation of mineral licence.

a) Conditions to issue industrial mining licence

An industrial mining licence may be issued to concessionaire holding mineral exploration licence for the purpose of conducting the exploration and mining of a commercially viable mineral deposit established within the boundaries of the mineral exploration licence area. Concessionaire holding a mineral exploration licence shall submit the application for an industrial mining licence to the Ministry of Industry, Mines and Energy for review and approval within ninety (90) days before the expiry date of the mineral exploration licence.

b) Application for industrial mining licence

The application for industrial mining licence shall be accompanied by the reports and final feasibility studies and other required references, containing accurate information dealing with some or all of the following major components, to be addressed as determined by the Minister of Industry, Mines and Energy, and in such detail as the magnitude of the proposed industrial mining licence:

- Mines Plan
- Processing Plan
- Plant Site and Facilities Analysis

- Environmental Impact Assessment Study and Management Plan
- Restoration and Rehabilitation Plan
- Marketing and Sales Plan
- Financial Analysis
- Capital and Operating Cost Analysis
- Programmes for employment, education and training of Cambodian citizens
- Proposal for procurement of goods and services obtainable within Cambodia.

c) Requirement of Reports

Concessionaire holding an industrial mining licence shall submit the following reports to the Ministry of Industry, Mines and Energy during the first week of each month of the calendar year. The reports shall include:

- Monthly, quarterly and annual reports on mineral production;
- Sales reports;
- Statements of mineral costs and other statements as may be required according to the principles of accounting in Cambodia;
- Procurement plans for goods and services, and copies of all contracts with sub-contractors;
- Reports on education and training programmes;
- Safety programmes and reports of accidents; and
- Any other reports as may be required by the Ministry of Industry, Mines and Energy.

d) Period of industrial mining licence and conditions for renewal

The period of an industrial mining licence is valid for five (5) years. If commercial production from mineral operations remains possible at the expiration of such a licence period, the Ministry of Industry, Mines and Energy may renew the industrial mining licence to two successive period of five (5) year each, provided that:

- Concessionaire holding the industrial mining licence has applied for an extension at least ninety (90) days prior to the expiration of such industrial mining licence. The application for renewal of industrial mining licence shall be attached with the following reports:
  - Detailed reports on mineral production and productivity for the previous term and next term;
  - Mineral production plans for the next term and marketing;
  - Reports on the restoration and rehabilitation carried out; and
  - Mining and restoration and rehabilitation plans for next term
- Concessionaire holding industrial mining licence shall provide evidence showing the complete payment of royalty, land rental, income tax and other taxes and duties, and other fees and charges, as stated in the Law on Mineral Management and Mining and Inter-Ministerial Prakas (Regulations); and
- The requirements of the Law on Mineral Management and Mining have been satisfied.

e) Mine site closure

If any mine site is to be closed, the concessionaire holding the industrial mining licence, at the time of closure, shall accurate plans to the satisfaction of the Minister of Industry and such plan shall be forwarded to prepare the Minister of Industry, Mines and Energy within one (01) month thereafter.

f) Restoration fund

Within thirty (30) days from the date of issue of an industrial mining licence, the restoration fund shall be established in Cambodia with a financial institution authorized to do business in Cambodia in the name of concessionaire, and a bank account for this fund shall be jointly administered by the Ministry of Industry, Mines and Energy and concessionaire. The restoration fund shall be formed according to the following principles:

- An initial deposit for an amount equivalent to twenty (20) per cent of the approved estimated total cost of mines restoration before mining commences; and
- The remainder of the approved estimated cost of restoration in annual equal and consecutive amounts based on the number of years of validity of the licence. The said amount shall be deposited within thirty (30) days in the first month of each calendar year.

g) Powers and duties of appointed officer

h) Powers of appointed officer

The Minister of Industry, Mines and Energy shall appoint a number of competent officers to control the implementation of the Law on Mineral Management and Mining. The duties of the appointed officer are determined as follow:

- To be responsible to the Minister of Industry, Mines and Energy for the management regime under the provisions of the Law;
- To make annual reports on regular activities of mineral exploration and mining operations for successive years and submit such reports to the Minister of Industry, Mines and Energy;
- To collect information and keep records related to exploration operations, mining, transport, processing, marketing and export of minerals and mineral products;
- To keep track and control the implementation of all provisions of the Law;
- To control the implementation of regulations relating to occupational health and safety of workers and people and environmental protection; and
- To perform other duties as appointed by the Minister of Industry, Mines and Energy.

(i) Duties of the appointed officer

The appointed officer may visit any mineral licence area at any time to inspect mineral operations or to investigate alleged violations of the Law on Mineral Management and Mining.

If and when the appointed officer find that any concessionaire holding a mineral licence has failed to conduct work in accordance with the Law on Mineral Management and Mining, the appointed officer may ask for clarification, and such concessionaire shall give a written explanation within the time prescribed by the appointed officer.

The appointed officer shall submit the report of inspections and investigations to the Minister of Industry, Mines and Energy within the time limit prescribed. After receiving reports, the Minister of

Industry, Mines and Energy may issue necessary directives to the concessionaire holding the mineral licence, and it shall be the concessionaire's duty to comply with such directives within thirty (30) days.

(ii) Suspension and revocation of mineral licence

(i) Suspension of mineral licence

The Minister of Industry, Mines and Energy may suspend a mineral licence in any of the following situations, if, after having given to the concessionaire holding a mineral licence a written notice specifying the reasons for default and a ninety (90) days delay to remedy the default, the concessionaire holding mineral licence has not done so:

- Non-payment of fees, royalties and taxes;
- Not allowing an appointed officer to control the mineral operations site;
- Failure to commence or unapproved interruption of commercial production;
- Substantial unauthorized deviation from the final mines feasibility study or an amended study and supporting plans;
- Mining on land adjacent to the licence area without holding a mineral licence for that land;
- Failure to keep required records or to file periodic operation reports or knowingly filing false or inaccurate information;
- Failure to restore the mineral licence area to a safe condition according to environmental standards as documented in restoration and rehabilitation plans and as may be established in other applicable laws.
- No work has been done on the mineral licence area over any continuous twelve (12) month period from the time of issue of the mineral licence.

(ii) Revocation of the mineral licence

The mineral licence shall be revoked in case that any concessionaire holding mineral licence commits on three occations the offense of the provisions of the Law on Mineral Management and Mining, and failed to respect the Ministry's orders after receiving each time a written warrant to remedy the default from the Ministry of Industry, Mines and Energy.

The revocation of the mineral licence shall not relieve the concessionaire from any terms, conditions or financial obligations contained in the provisions of the Law on Mineral Management and Mining that existed at the time of revocation.

2. Draft prakas (regulations) on the guidelines on mineral licence, contents of reports, work programmes, and financial guarantee

The Draft Prakas (Regulations) has 20 articles defining the guidelines on mineral licence, contents of reports, work programmes, and financial guarantee.

a) Guidelines on mineral licence

(i) Mineral licence areas

The initial area covered by artisanal mining licence shall not exceed one (01) hectare with a depth of five (05) metres. The initial area covered by other mineral licence, except artisanal mining licence, shall be less than four (04) square kilometres and shall not be exceed two hundred (200) square kilometres.

(ii) Period of mineral licence

An artisanal mining licence shall be valid for one (01) year and may be renewed an unlimited number of times for further periods of one year maximum on each occasion.

A pit and quarries mining licence, gemstone mining licence and gemstone cutting and polishing licence shall be valid for two (02) years and may be renewed an unlimited number of times for further periods of two (02) years maximum on each occasion.

A mineral exploration licence shall be issued for a term of two (02) years. The mineral exploration licence shall be renewed up to a maximum of three times for a term of two years each time, upon the receipt of a properly completed renewal application, at least sixty (60) days before the expiry date of the mineral exploration licence, provided that all requirements of the Law on Mineral Management and Mining have been satisfied.

At the end of the eighth and final year of a mineral exploration licence, the Minister of Industry, Mines and Energy may approve an extension of such licence for an additional limited period where the concessionaire can justify such extension by written documentation of special economic constraints on proceeding at that time with an application for an industrial mining licence for an established mineral deposit within the licence area.

b) Conditions of renewal of mineral licence

The conditions of renewal of mineral licence, except industrial mining licence, are as follows:

- Concessionaire has applied for an extension at least ninety (90) days prior to the expiration of such mineral licence. The application for renewal of mineral licence shall be attached with the following reports:
  - Detailed reports on mineral production for the previous term
  - Mineral production plans for next term
  - Reports on the restoration of mining areas carried out; and
  - Mining, restoration and rehabilitation plans for next term.
- Concessionaire shall give evidence showing the complete payment of royalty, land rental, income tax and other taxes and duties, and other fees and charges, as stated in the Law on Mineral Management and Mining and Inter-Ministerial Prakas (Regulations).
- The requirements of the Law on Mineral Management and Mining have been satisfied.

c) Concessionaire's rights

Concessionaire holding mineral licence shall have the exclusive rights to:

- Carry out exploration and mining within the mineral licence area;
- Store, transport, process, market and export minerals extracted from the licence area and dispose of any waste;
- Use water, sand and gravel within the mineral licence area, as permitted by the applicable laws;
- Use such portions of the mineral licence area to establish, construct and maintain all houses, buildings and facilities as may be required for mining and permitted by applicable laws;

- Use such portion of the mineral licence area as may be required for the purpose of growing such plants, fruits and vegetables, or keeping such animals and fish as may be reasonable for use of the employees and permitted by applicable laws;
- Do all acts and things to properly carry out mining.

d) Concessionaire's obligations

Concessionaire holding mineral licence shall be obligated to:

- Commence and continue exploration and mining;
- Comply with the final mines feasibility study, and its supporting plans or amended such study and plans;
- Pay fees, royalties and taxes, according to the prevailing laws and Inter-Ministerial Prakas (Regulations);
- Compensate legitimate land users for any disturbance or damages;
- Keep accurate records of his sales, and shall submit such records to authorized officers as required;
- Keep records and books of account of the mining and other business carried on upon the mineral licence area and of the disposal of the minerals obtained and submit information and periodic activity reports;
- Allow the Government sponsored scientific surveys and engineering studies with no interference with mining operations occurs;
- Allow the appointed officers to control mineral operations site;
- Allow access over or through the mineral licence area to any adjoining land where no interference with mining operations occurs;
- Allow the construction and use on the land of such water-courses, pipelines, transmission lines, public roads and public utilities where no interference with mining operations occurs;
- Practice defined procedures to ensure efficient extraction of the minerals authorized to be mined;
- Practice defined procedures to ensure compliance with all mines, environment and restoration plans.

e) Surrender of mineral licence areas

Concessionaire holding mineral licence may voluntarily surrender all or a specified part of the mineral exploration licence area by notice in writing to the Minister of Industry, Mines and Energy. The surrender of part or all of mineral licence does not relieve the concessionaire from any terms, conditions or financial obligations contained in the provisions of the Law on Mineral Management and Mining that existed at the time of such surrender.

f) Restricted areas

Concessionaires holding mineral licence shall be absolutely prohibited from conducting mineral operations in the perimetre of archeological, patrimonial and historical properties, burial places, railway, public roads, ponds, and land reserved for other special public purposes, even those areas are located in the licence area.

3. Work programmes

All concessionaires holding mineral licence, except concessionaires holding mineral cutting licence, shall submit work programmes within ninety (90) days after the effective date of mineral licence, to the Ministry of Industry, Mines and Energy for review and approval.

Work programmes shall include an assessment of potential impacts on the environment and natural resources from mineral operations being proposed. The assessment will also include measures, which will be taken to protect against air pollution, land and water, potential damage to agriculture lands and other natural resources of Cambodia.

At least sixty (60) days prior to the beginning of each subsequent calendar year, concessionaires holding mineral licence, except concessionaires holding cutting mineral licence, shall submit the proposed work programmes to be carried out during the ensuing calendar year to the Ministry of Industry, Mines and Energy for review and approval.

4. Contents of work programmes

The proposed works programmes shall include:

- Detailed work programmes,
- Budgets and, if any, authorizations for expenditures from all participants,
- Time schedule,
- Map of the area showing proposed location of work
- Mining methods, mineral extraction, concentration, storage, transport and sales, employment data, and any other relevant information as may be periodically requested,
- Environmental Protection Plan,
- Restoration and Rehabilitation Plans and Restoration Fund,
- If the work is to be carried out by sub-contractors, their names and address,
- Name and position of the person in charge of the work for concessionaire

5. Financial guarantee

The financial guarantee shall be made according to following procedures:

- Concessionaires holding mineral licence, except concessionaires holding mineral cutting licence, shall provide to the Ministry of Industry, Mines and Energy within thirty (30) days from the date of issue of the mineral licence, a financial guarantee from a financial institution and in a form acceptable to the Ministry of Industry, Mines and Energy, in an amount which shall correspond to the total amount in United States dollars indicated for the exploration work programmes for each exploration period during that year. Each identifiable item of work committed shall be assigned a portion of the financial guarantee.
- The amount of such financial guarantee shall be reduced from time to time upon completion of identifiable portions of the work obligations by the amount assigned to such portion of the work in the financial guarantee.
- If, at the end of the each exploration period, and any extension thereof, or upon the expired date of mineral licence, concessionaire has failed to perform all or part of any of its work obligations during that year, then concessionaire shall immediately pay the entire amount corresponding to the uncompleted items of work for that year and if concessionaire fails to pay such amount, then the guarantor shall pay such amount under the current financial guarantee to the Ministry of Industry, Mines and Energy.

6. Amendment of Work Programmes and financial guarantee

If necessary changes are to be made in the work programmes and financial guarantee submitted, the concessionaire shall submit the details of the proposed changes within fifteen (15) days prior to commencing work. After the work programmes and financial guarantee are submitted, the Ministry of Industry, Mines and Energy may ask for additional details from the concessionaire, and it shall be the duty of concessionaire to furnish the information prior to commencing such work.

7. Restoration fund

Within thirty (30) days from the date to issue of mineral licence, the restoration fund shall be established in Cambodia with a financial institution authorized to do business in Cambodia in the name of concessionaire, and the Ministry of Industry, Mines and Energy and concessionaire shall jointly administer a bank account for this fund. The restoration fund shall be formed according to the following principles:

- An initial deposit for an amount equivalent to twenty (20) per cent of the approved estimated total cost of mine restoration before mineral operations commences; and
- The remainder of the approved estimated cost of restoration in annual equal and consecutive amounts based on the number of years of validity of the licence. The said amount shall be deposited within thirty (30) day in the first month of each calendar year.

8. Draft inter-ministerial Prakas (regulations) on royalty and royalty payment procedures

a) Royalty

All concessionaires holding mineral licence shall pay the State a royalty on the gross value of the quantity of mineral exploited and sold or disposed of under the mineral licence, except concessionaires holding mineral exploration licence or mineral cutting licence.

b) Royalty rates for minerals

The royalty rates for minerals are determined as follows:

- For precious stone – 12.50%
- For semi-precious stone – 10%
- For precious metals (gold, silver and platinum) and other minerals (metallic, non-metallic, industrial and fuel minerals) – 3-5%
- For construction materials:
  - $\$0.6/m^3$ for crushed stone with the size grater than 1 cm x 2 cm
  - $\$0.4/m^3$ for gravel
  - $\$0.2/m^3$ for crushed stone with the size smaller than 1 cm x 2 cm, and for construction sand and laterites
  - $\$0.1/m^3$ for final clay products, including bricks and tiles, and for the other clay products except ceramic products
  - $\$0.1/m^3$ for soil excavated for commercial purpose.

c) Royalty payment procedures

(i) Deadline of royalty payment

Concessionaires holding mineral licence shall pay the State a royalty at a municipal-provincial bank, where mineral production and exploitation sites are located, based on a revenue order issued by municipal-provincial departments of industry, mines and energy, on the 20th day of January, April, July and October of each year.

(ii) Royalty payment reports

A quarterly report and attached evidence of royalty payment shall be submitted to the Minister of Industry, Mines and Energy on the 30th day of January, April, July and October of each year. If no disposal or sale occurred, a NIL quarterly statement is required. All concessionaires holding mineral licence must maintain specific books of account documenting the quantity and market value of every minerals and mineral products extracted and removed from mineral licence areas, and sold or otherwise disposed of.

(iii) Inspection

Based on the income plan recorded in the budget book of municipal-provincial departments of industry, mines and energy, a joint committee consisting of a representative of the Ministry of Industry, Mines and Energy – chairman, and other representatives of the Ministry of Economic and Finance and of municipal-provincial authorities – members, shall control activities of mineral production and mining at each sites in order to calculate a real amount to be paid by the concessionaire.

C. SOME KEY TERMS OF MINERAL INVESTMENT AGREEMENT

Some key terms and conditions of mineral investment agreement are as follows:

- Contract area shall not be less than 4 square kilometres and shall not exceed 200 square kilometres;
- The period and renewal of mineral licence are defined according to the provisions of Sub-Decree on the Conditions to Issue Industrial Mining Licence, Power and Duties of Appointed Officers, and Suspension and Revocation of Mineral Licence, and Prakas (Regulations) on the Guidelines on Mineral Licence, Contents of Reports, Work Programmes, and Financial Guarantee;
- Contractor shall relinquish at least 30 per cent of an initial exploration area less any area that falls within a mining licence area by the end of each exploration period;
- Contractor shall pay an annual land rental, royalty and other taxes, duties and fees according to the Law on Mineral Management and Mining and the Law on Taxation;
- Contractor shall keep its book and accounts relating to the agreement. The Ministry of Industry, Mines and Energy shall have the right to inspect and audit contractor's books and accounts for any calendar year for the purpose of verifying royalty payment and other taxes concerned;
- The Ministry of Industry, Mines and Energy may employ a firm of independent accountants to inspect and audit contractor's book and accounts. The fees and expenses of the said firm shall be borne by contractor;
- Contractor shall employ as much as possible, appropriately qualified Cambodian nationals and undertake education and training programmes for Cambodian employees;

- Contractor shall apply the standard procedures of mineral exploration and mining published by a recognized professional institution or by the Ministry of Industry, Mines and Energy;
- Contractor shall establish security areas around all machinery, equipment and tools, protect the natural environment, maintain records of workers and undertake responsibility for occupational health and safety of workers;
- The Ministry of Industry, Mines and Energy may terminate the agreement by issuing a written notice to the contractor in the following cases:
  (a) If contractor fails to commence mineral operations within twelve (12) months after the effective date of mineral licence without appropriate reason.
  (b) If contractor has deliberately failed to comply with any provision of the agreement within its control or any order or inspection issued by the Ministry of Industry, Mines and Energy and failed to comply with any obligation within sixty (60) days after being ordered to do so.
  (c) If contractor fails to make a discovery capable of production in commercial quantities within two (02) years after the effective date of mineral licence.
  (d) If contractor becomes insolvent, bankrupt or in liquidation.
- Termination of agreement shall not relieve contractor from the performance of any terms, conditions and financial obligations, outstanding prior to termination.
- Settlement of disputes shall be made under the Laws of Cambodia.

D. FOREIGN INVESTMENT IN CAMBODIA'S MINING ACTIVITIES

The foreign investment in Cambodia's mineral sector include five companies awarded for gold exploration, four companies for limestone mining for cement production, two companies for silica sand and one company for phosphate fertilizer (figure 9.1). Gold exploration licences have been issued to the following companies:

- Sun Trading Co., Ltd. was awarded the area of Memot and Memong in the northeast of Cambodia;
- Delcom Company was awarded the area of Phnom Dek in the north of Cambodia;
- Brewer Natural Resources Co. was awarded the area of Oyadao Leu and Krom (in the northeast of Cambodia;
- Wang Fa Cambodia Investment Group was awarded the area of Pu Chu Leu in the northeast of Cambodia;
- Jupiter International Resources Cambodia was awarded the area of Banlung in the northeast of Cambodia.

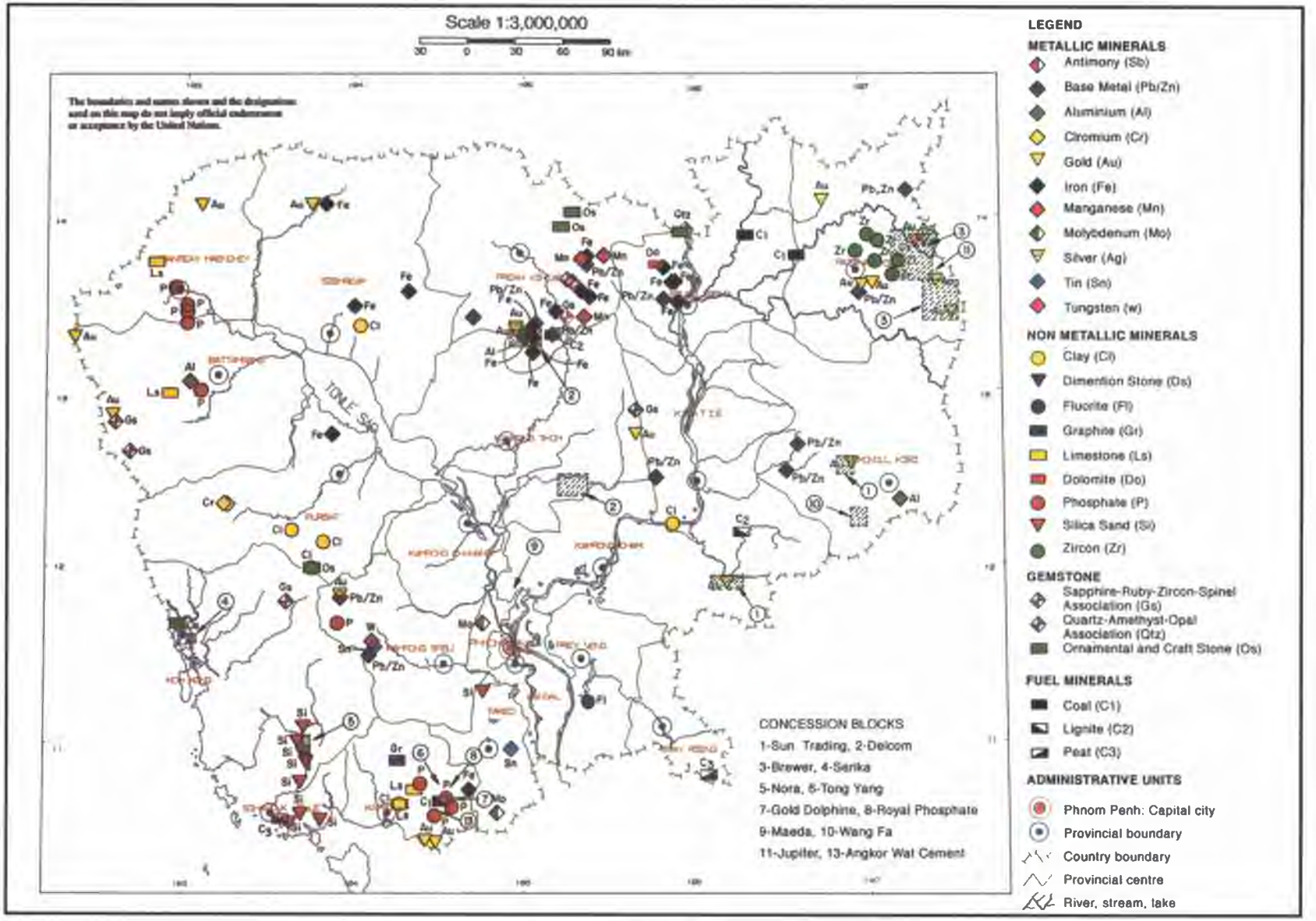
In 1997, four cement product licences have been issued to the following companies:

- Tong Yang Cement Corporation was awarded the area of Tuk Meas West in south of Cambodia;
- Golden Daulphine Co. was awarded the area of Tuk Meas East in south of Cambodia;
- Angkor Wat Cement Co., Ltd. was awarded the area of Kampong Trach in south of Cambodia;
- Cambodia Cement Factory was awarded the area of Kampong Trach in south of Cambodia;

Silica sand licences have been issued to:

- Selica Co., Ltd. was awarded the area of Taman in southwest of Cambodia;
- Nora Trading was awarded the area of Keo Phos in southwest of Cambodia;

In 1997, a permit of exploitation of phosphorite has been issued to Royal Phosphate Company of Malaysia. So far, the above companies are conducting the exploration activities in their contract areas, but Nora Trading and Royal Phosphate Company of Malaysia have just started mining.



Source: Department of Geology and Mines, Ministry of Industry, Mines and Energy of Cambodia, 1977. (Mapping Unit Projection: UTM).

Figure 9.1. Mineral resources and concession blocks map of Cambodia

X. NEW CENTURY, NEW OPPORTUNITIES FOR THE NEW MINERAL INDUSTRIES IN CHINA – AN OVERVIEW OF THE MINERAL INDUSTRIES AND NATIONAL MINERAL POLICY

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A. INTRODUCTION

China is one of the world's most important mining countries both as a producer as well as a consumer. A considerable share of production, and import and export of a number of mineral commodities in the world were and will be occupied by China. On one hand, the Chinese mineral industries, as one of pillars to national economy, have made and will continue to make a powerful contribution to China's economic development and the welfare of the people. On another hand, the Chinese demand for copper and other metals and export of tungsten, tin, antimony, rare earths, fluorite, barite, etc. can have major influences in movements of international prices of these commodities. China's mineral industries have been and are going to be a major force on world mineral industries and international markets.

A lot of changes have occurred in the mineral industries of China with both domestic economic restructuring and the trend of economic globalization during the past two decades. Those changes have spread a wide range from exploration to development, production, linkage between domestic market and international market, and government policy. The market force plays a more and more important role in the mineral industries as the Chinese economy transits from traditionally centrally-controlled mechanism toward market oriented one. There is a more and more close linkage between the nation and the outside in mineral commodities, capital investment, technology transfer, etc. The Chinese mining legislation, national mineral policy and government management framework become more and more internationally comparable and competitive.

Obviously, it is very important that the world mining community who are doing and are going to do business with their Chinese partners have a good understanding of the performance of the Chinese mineral industries and of changes that are taking place. The paper is to provide a key to an understanding of China's mineral industries and national mineral policy.

B. NATIONAL ECONOMIC BACKGROUND AND PLANS

As a consequence of the economic reforms initiated in 1978, the Chinese economy became one of the most dynamic globally. During the past five years, GDP grew at an average rate of over 8.3 per cent, amounting to over 8,900 billion RMB Yuan (over US$ 1,000 billion). China had achieved the goal of quadrupling the 1980 GDP in 1999. General macro-economic indicators are listed in Appendix 1 to this paper.

In March 2001, the National People's Congress formulated the nation's tenth five-year plan (2001-2005) to guide the national economy through the first five years of the new century. The plan contains the principal features as follows:

- A target for doubling the 2000 GDP by the year 2010, average annual economic growth of 7 per cent, amounting to 12,500 billion RMB Yuan in which agriculture accounts for 13 per cent, industry 51 per cent and services 36 per cent, by the year 2005, average per capita GDP

9,400 RMB Yuan, unemployment rate less than 5 per cent, relevant stable pricing, and balanced international revenues and payment;

- A high priority on readjustment of economic structure, aimed at raising economic efficiency and effectiveness, improving integral quality and international competitiveness of China's national economy, and achieving the goal of sustainable development;
- A continuation of the open-door policies and attempt to empower market forces in national economy;
- An attention on basing economic growth and readjustment of economic structure on both economic mechanism innovations and scientific and technological innovations;
- A commitment to improve the level of people's physical and cultural lives;
- A higher priority to achieve sustainable development: controlling population natural growth rate under 0.9 per cent, mitigating ecological deterioration and upgrading environmental quality, decreasing 10 per cent of the amount of major pollutants discharged by the year 2005 as compared with that in the year 2000, meeting requirements for supply of energy and raw materials, promoting resources saving and conservation;
- A new programme to initiate the Western Development Initiative (WDI) aimed at narrowing the gap between the western region and the eastern region.

Under the framework of the nation's tenth five-year plan (2001-2005), ten special programmes respectively on urbanization, science and technology and education, employment and social security, ecological construction and environmental protection, water conservancy, energy, transportation and communications, western development (WDI), information technology (IT) and joining the World Trade Organization have been initiated, under which key projects will enjoy priority of capital investment funded by the Central Government's budget. It is no doubt that sufficient and sustainable supply of energy and raw materials based on the petroleum, mining and mining-related industries are necessary to achieve the economic and social objectives set by the plan. However, it is not an easy task to achieve these objectives.

C. RESOURCES ENDOWMENT AND EXPLORATION

1. Geological Setting

China has a land area of over 9.6 million square kilometres and a marine space of more than 3.0 million square kilometres. Topographically, it is high in the west and low in the east, having plateaus and high mountains in its western part and mostly hills and plains in its western part. In southwestern China, there exists the Qinghai-Tibet Plateau referred to as the "roof of the world", with Mount Qomolungma – the highest peak on the globe – at an elevation of 8,848 metres above sea level. In northwestern China, there is the Taklimakan Desert, the second largest desert in the world and the Turpan Basin with an altitude of 155 metres below sea level which is the lowest depression in China and one of the well-known depressions in the world. In southern China, there occur beautiful and peculiar karst landforms, and in northern China, there is a vast expanse of loess plateau. The country shows a complicated and varied geomorphology, with a crisscross pattern of magnificent mountains and rivers.

Geotectonically, China is located in the southeastern part of the Eurasian plate, adjoining the Pacific plate in the east and the Indian plate in the south, and spanning three tectonic domains: the Palaeo-Asiatic tectonic domain, the Marginal-Pacific tectonic domain and the Tethys-Himalaya tectonic domain. The various regions of the country differ greatly in tectonic setting and evolution history, and therefore show different characteristic features in regional geology. China as a whole is characterized by the presence of completely developed stratigraphic sequences of all geological ages, varied types of

sedimentation, complicated geological structures, frequent events of magmatism, various types of metamorphism, complex and diversified geological settings and superior geological conditions for mineralization, all of which have led to the occurrence of abundant mineral resources on this piece of land.

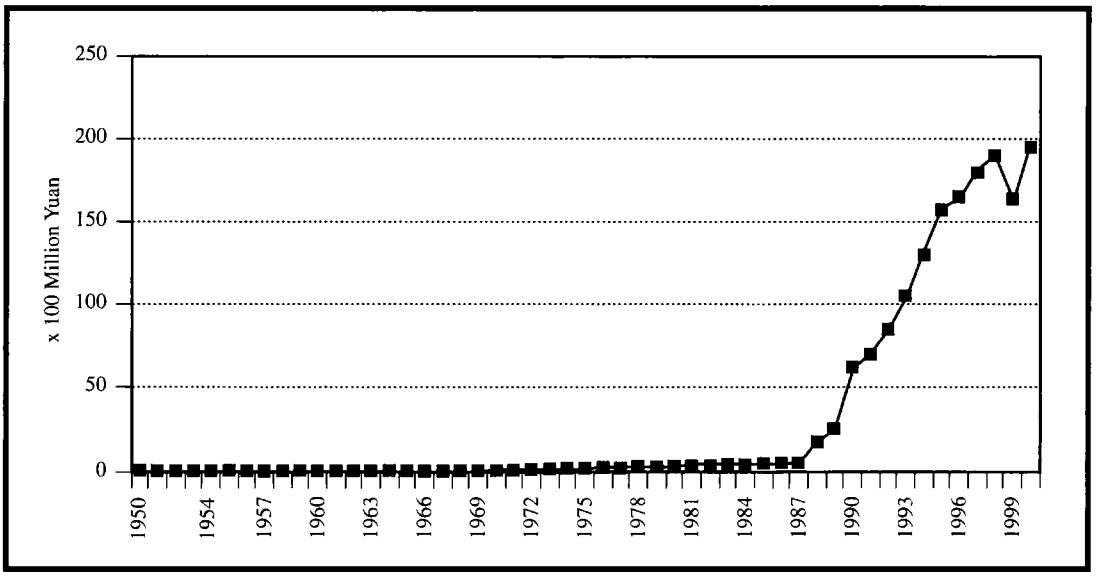


Figure 10.1. The annual state-funded mineral exploration expenditures in China, 1950-2000

With its complex geology and huge land area, China is well-endowed in most major mineral fuel, metallic and non-metallic resources.

2. Mineral Exploration Expenditures

During the past five decades, especially before 1990, most of mineral expenditures were funded by the central Government's budget. Figure 10.1 shows the increasingly growing amount of exploration funds. A special policy on funding exploration only for oil and gas attributed to the sharply increase of exploration expenditures since 1988. The central Government allowed the State-owned Petroleum Corporations – the CNPC, CNOOC and SINOPEC – to retain a part of sales revenues at a rate of firstly 0.8 Yuan per ton of crude oil and current rate of 1.2 Yuan per ton specifically for exploration for oil and gas. This policy is very similar to the depletion allowance in the United States, Canada and Australia. The percentage of the central Government-funded exploration expenditures in the total national financial budget steeply rose during 1950s, fluctuated for a long period from the early 1960s to the late 1980s, and declined sharply since the early 1990s as demonstrated in figure 10.2. Since early 1980s, non-state-owned investors, both international and domestic, are encouraged to make investment on exploration for and development of mineral resources in China. As a result, other sources of exploration expenditures other than the State-funded have been access to the mineral industries. Figure 10.3 shows the composition of exploration expenditures in China's mineral industries in 2000.

3. Mineral Reserves

As a result of great efforts in mineral exploration, 171 types of mineral and energy resources distributed in more than 20,000 mineral occurrences have been discovered and reserves of 156 types of resources have been verified. The distribution of mineral deposits is fairly uneven throughout the country due to the complicated and varied geological conditions. There are also different degrees of intensity of geological survey and exploration in China, generally high in eastern regions and low in western regions.

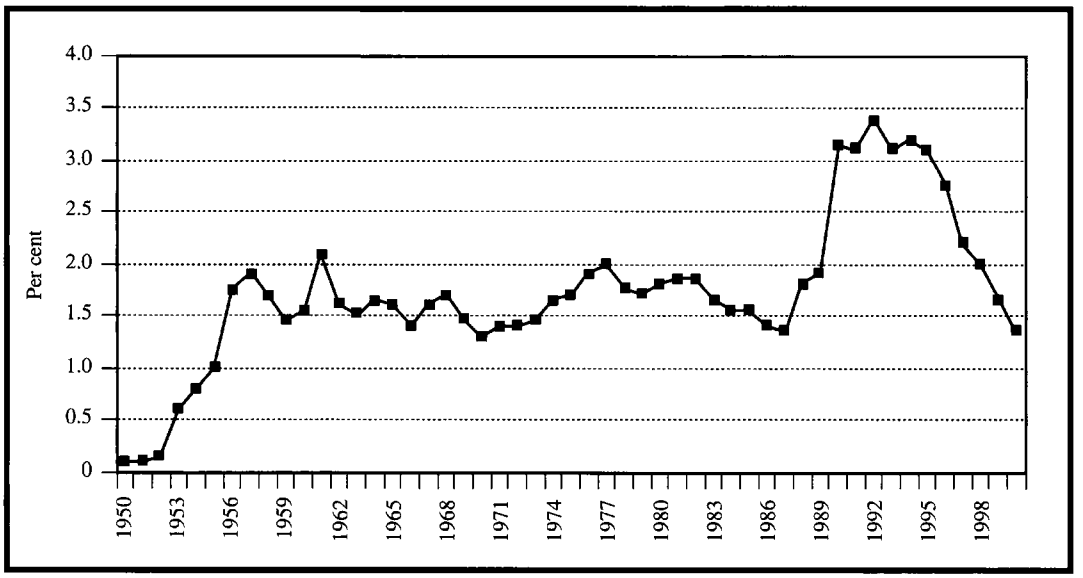


Figure 10.2. The annual percentage of the state-funded exploration expenditures in the total Central Government Budget of China, 1950-2000

The reserves, base reserves and resources of the selected mineral resources are listed in table 10.1. The terms of reserves, base reserves and resources are based on a new national standard for classification of mineral resources and are comparable internationally. The data listed at table 10.1 are based on the recalculation and re-evaluation of mineral resources nation-wide undertaken by the Ministry of Land and Resources in 2000.

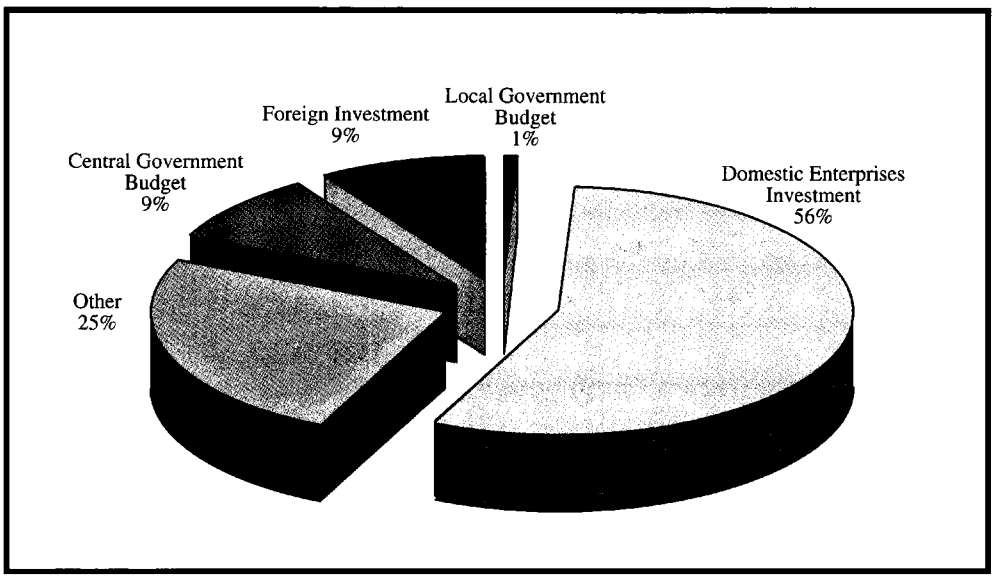


Figure 10.3. Composition of exploration expenditures in China in 2000

Table 10.1. Reserves of major mineral resources in China, 2000

Mineral	Unit	Reserve	Base Reserve	Resource
Coal	Billion tons	158	283	725
Oil	Billion tons	2.5	n.a.	n.a.
Natural gas	Billion m	1 178	n.a.	n.a.
Iron ores	Billion ton	12.6	22.4	23.5
Manganese ores	Million tons	120	200	340
Chromium ores	Million tons	3.72	4.79	5.48
Bauxite ores	Million tons	360	500	1 800
Copper	Million tons	16.71	27.46	35.46
Lead	Million tons	6.88	11.35	23.53
Zinc	Million tons	20.95	32.50	59.37
Nickel	Million tons	2.75	3.13	4.58
Cobalt	Million tons	0.47	n.a.	n.a.
Tungsten, $W0_3$	Million tons	1.24	2.68	2.63
Tin	Million tons	0.94	1.80	1.85
Molybdenum	Million tons	1.72	3.43	4.93
Antimony	Million tons	0.63	1.03	1.67
Gold	Tons	814	1 166	2 944
Silver	Tons	15 839	23 433	90 262
Platinum group metals	Tons	5	16	290
Pyrite ores	Million tons	820	1 600	2 900
Phosphate rocks	Billion tons	2.1	3.9	9.4
Potash, KCL	Million tons	79.71	175.27	280.84
Barite	Million tons	46.08	66.01	302.83
Limestone	Billion tons	22.4	29.0	22.2
Fluorite, Ca_2	Million tons	9.43	16.94	78.88

Source: The Ministry of Land and Resources, November 2000.
Note: n.a.: not available.

D. MINERAL DEVELOPMENT

1. Structure of Mining Industries

In 2000, 153,063 mining enterprises and individual mines at different scales were engaged in mining activities in China, including 513 mines at large scale, and 1,424 mines at medium scale. The number of mines reached a peak of more than 280,000 in the early 1990s as the local government supported collectively-owned small scale mines and individual miners flooded in, and got down gradually during the past years as a result of the readjustment of mining structure and the implementation of new mining legislation. Figure 10.4 demonstrates the trend of decrease in number of mines, especially the small-scale mines.

Out of all mines in China, about 5 per cent are the State-owned mines. There are 164 mining enterprises with foreign investment and 225 mining enterprises with Hong Kong, China, Macao, China and Taiwan Province of China investment.

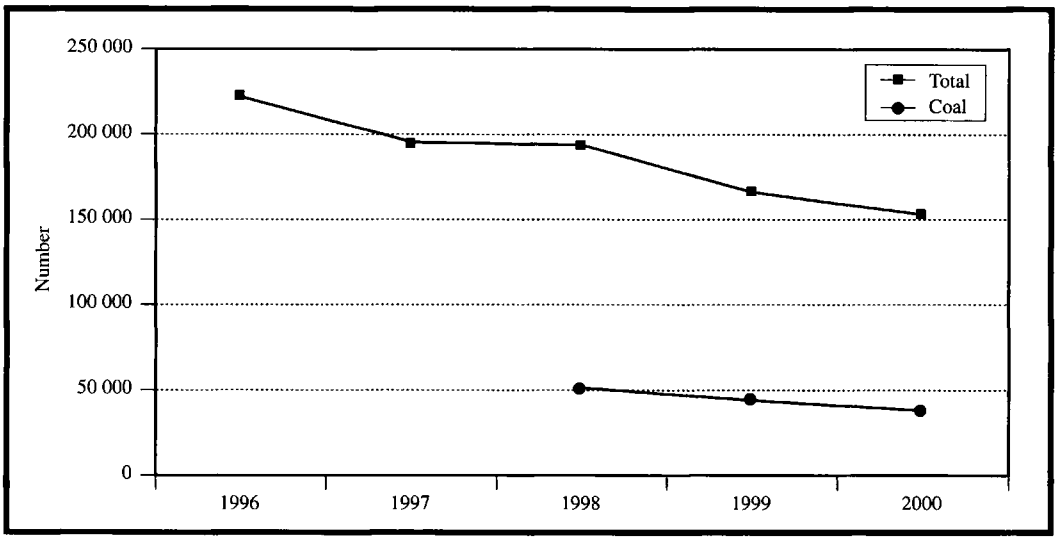


Figure 10.4. Changes in number of mines in China from 1996 to 2000

2. Production of Minerals and Oil and Gas

The mineral industries of China produced 5 billion tons of all kinds of solid minerals, 163 million tons of crude oil and 27.7 billion cubic metres of natural gas in 2000. The total output value was 447.78 billion RMB Yuan, accounting for 5 per cent of GDP. The output value of the petroleum sector was 249 billion RMB Yuan, the coal mining sector 98.46 billion RMB Yuan, the ferrous metal sector 18.2 billion RMB Yuan and the non-ferrous metal sector 17.8 billion RMB Yuan. Figure 10.5 shows the output values of the mineral industries of China during the past twelve years. Table 10.2 shows the production of major mineral commodities nationwide in 2000. Figure 10.6 indicates the historic trend of changes in production and consumption of crude oil in China. The year 1993 was a turning point in China's petroleum sector. China had been found in the list of the net importers of crude oil since that year. Figure 10.7 shows the historic natural gas production in China from 1955 to 1999.

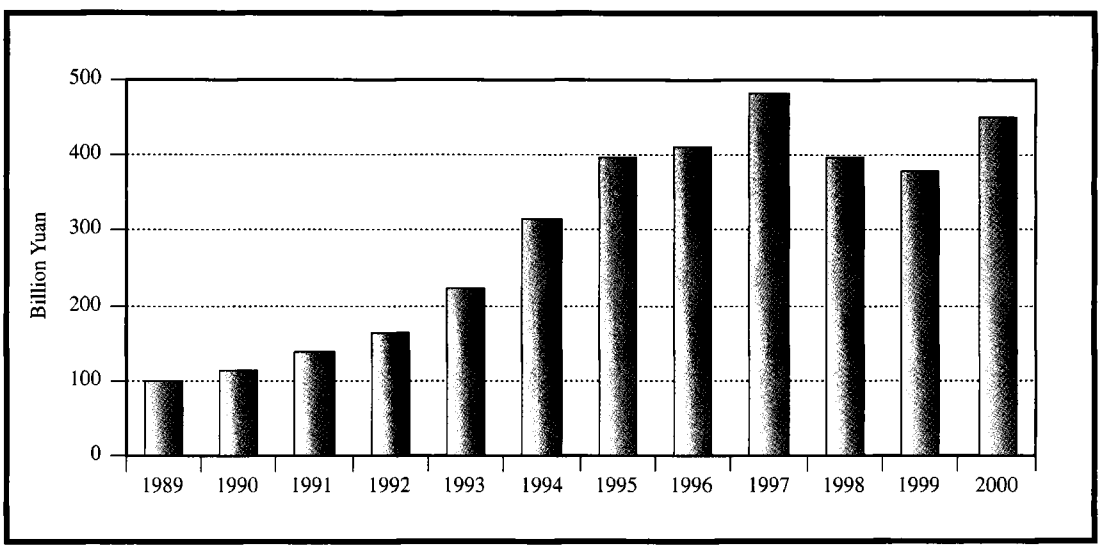


Figure 10.5. National output value of mineral industries in China from 1989 to 2000

Table 10.2. National production of selected minerals in China, 2000

Mineral	Unit	1999	2000
Coal	Million tons	1 045	950
Crude oil	Million tons	160	163
Iron Ore	Million tons	237	228
Steel	Million tons	124	129
Non-ferrous metals	Million tons	6.95	7.75
Phosphate	Million tons	29.11	20.75
Cement	Million tons	561	597

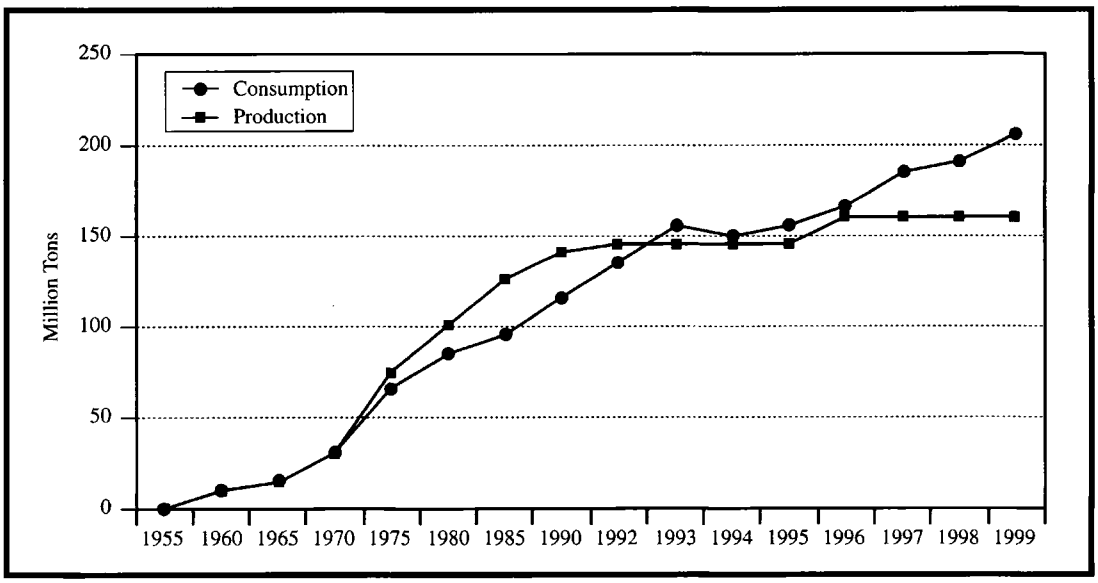


Figure 10.6. National Historic Production and Consumption of Crude Oil in China, 1955-1999

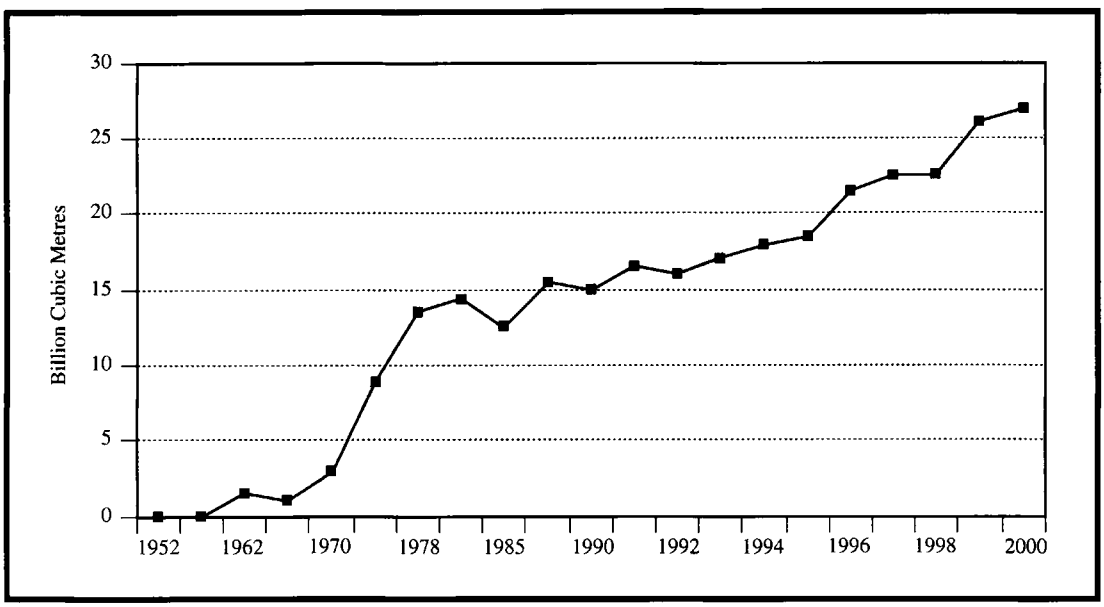


Figure 10.7. National production of natural gas in China, 1952-2000

3. The Coal Mining Sector of China

Coal, so called "industrial grain" or "black gold", is not only an important fuel for power industry but also a significant raw material for metallurgical and chemical industries. China is rich in coal resources, ranking the second in the world. Coal is relatively concentrated in distribution with pattern of "rich in the north and poor in the south" and "abundant in the west but deficient in the east". Ninety five per cent of the country's coal reserves are located in Shanxi, Inner Mongolia, Shannxi, Xinjiang, Guizhou, Ningxia, Anhui, Yunnan, Henan, Heilongjiang, Shandong and Hebei provinces.

China has a complete set of coal ranks. Bituminous coal is dominant, representing over 70 per cent of the national total reserves. Anthracite and lignite account for about 12 per cent each. In the bituminous coal rank, coking coal occupies 37 per cent, and others 63 per cent. The coking coal rank is dominated by gas-associated coal accounting for half of the total, while coking, lean and fat coal ranks make up 20 per cent, 15 per cent and 13 per cent, respectively.

China is one of the biggest producer, consumer and exporter of coal. Figure 10.8 indicates the historic trend of changes in production and consumption of coal in China. China's coal production peaked in 1996, reaching over 1.4 billion tons. Recently, its production has kept around 1 billion tons annually. Figure 10.9 shows the historic trend of changes in export of coal in China.

In China, coal occupied a major share in the composition of primary energy production and consumption structure in China. The situation will remain even though the share of coal in the energy composition will lower in the future. Table 10.3 shows the share of coal in China's primary energy structure. Table 10.4 provides the scales of key coal mining shafts in China in 1996 and table 10.5 lists the production of China's major coal mining districts.

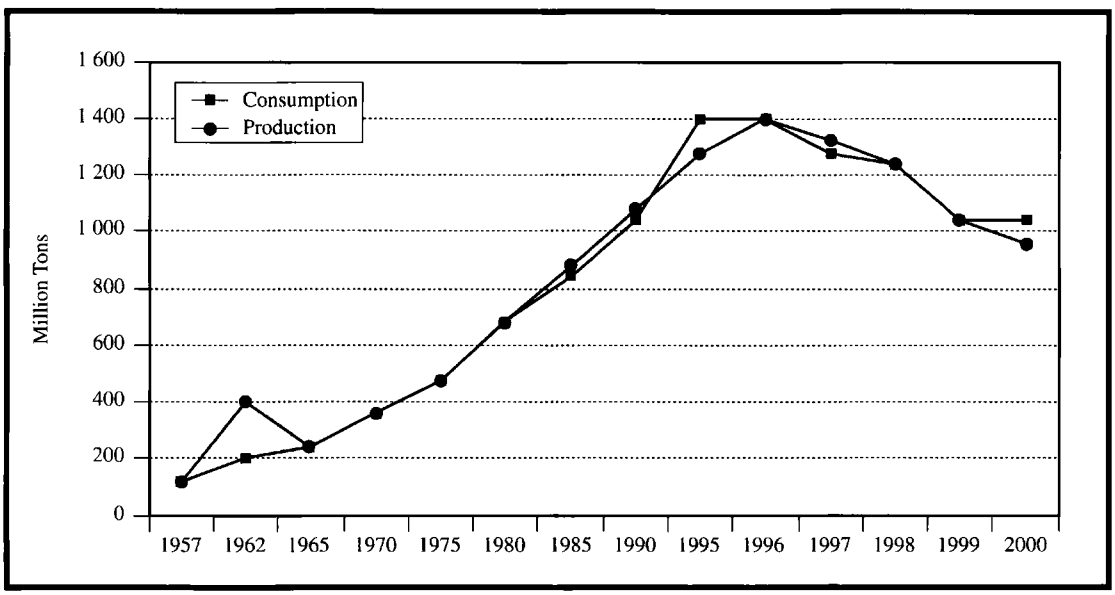
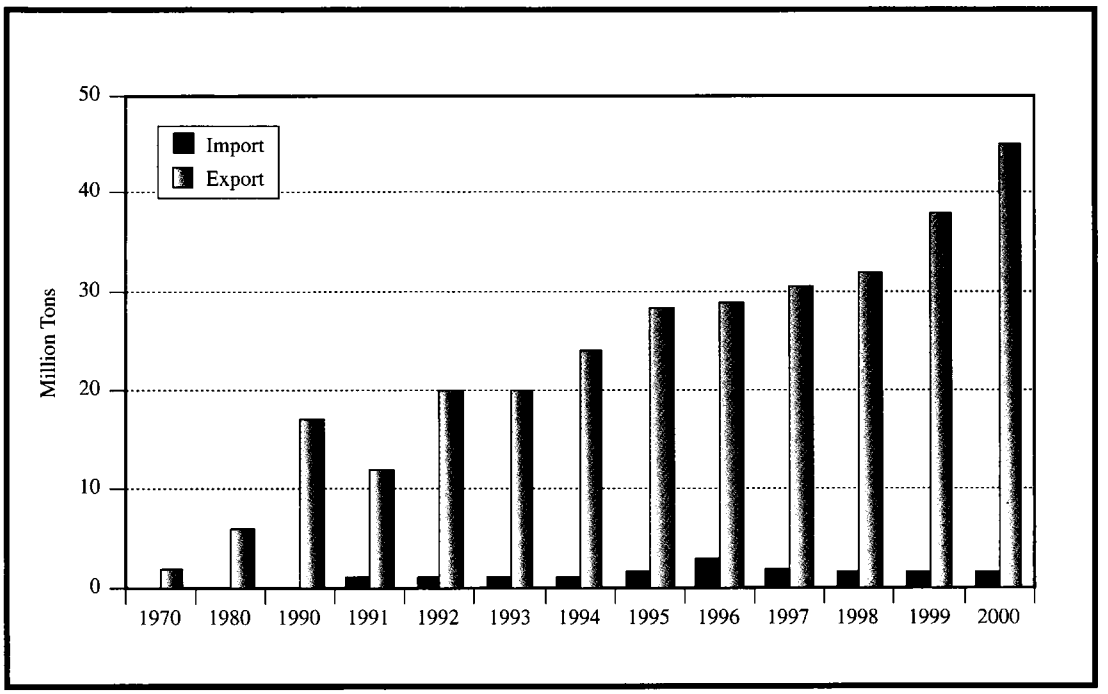


Figure 10.8. National historic production and consumption of coal in China, 1957-2000



Source: The Ministry of Land and Resources, 2000.

Figure 10.9. Import and export of coal in China, 1970-2000

Table 10.3. Structure of primary energy production in China, 1999, 2005, 2010
(Unit: per cent)

Type of energy	1999	2005	2010
Coal	67.1	65.2	61.6
Oil	23.4	22	21
Natural gas	2.8	4	6
Hydropower	6.7	8	10
New energy and renewable energy		0.8	1.4

Source: The Ministry of Land and Resources of China, 2000.

Table 10.4. Capacity of key coal mining shafts in China in 1996

Scale of Shaft (Mt)	Number of Coal Shafts	Production (Mt)	Productive Capacity (Mt/a)
Over 0.9	213	333.53	379.06
0.3-0.9	158	88.14	88.01
Less than 0.3	225	47.13	45.99
Total	596	468.80	513.06

Source: The World Coal Industry Development Report, edited by Li Xilin and others, China Coal Industry Publishing House, 1998.

Table 10.5. Production of large coal mining districts in China, 1996

Mining District and Province	Production (Mt)	Production of Washed Coal (Mt)	Ash (%)	Employment (Person)
Daton in Shanxi	37.06		9.72	123 574
Pingdingshun in Henan	20.71	3.56	22.96	83 841
Yanzhou in Shandong	18.65	6.48	16.28	65 250
Kailuan in Hebei	18.64	4.50	26.54	122 032
Xishan in Shanxi	17.73	6.93	15.47	73 850
Huaibei in Anhui	16.85	4.47	23.20	106 224
Yangquan in Shanxi	16.16		17.94	64 295
Tiefa in Liaoning	14.65		32.84	53 615
Hegang in Helongjiang	13.60	2.55	17.39	106 507
Huainan in Anhui	13.57	0.98	25.77	123 814
Xuzhou in Jiangsu	13.11	2.10	21.62	99 215
Pingshuo in Shanxi	12.63		19.33	6 683
Jixi in Helongjiang	12.09	1.57	26.17	94 225
Jingcheng in Shanxi	11.52		18.30	25 276
Fuxin in Liaoning	11.02		22.50	74 586
Fengfeng in Hebei	10.77	4.06	18.09	73 452
Shuangyashan in Helongjiang	10.46	1.28	19.02	78 371
Luan in Shanxi	10.15	1.26	15.94	29 201

Source: The World Coal Industry Development Report, edited by Li Xilin and others, China Coal Industry, Publishing House, 1998.

4. Import and Export of Mineral Commodities

The import and export of mineral commodities have occupied a significant share in the international trade nationwide during the past two decades. In the year 2000, the international trade of mineral commodities in value accounted for about 15 per cent of the total of all commodities imported and exported. The trend of international trade in mineral commodities during the past decade is shown in figure 10.10.

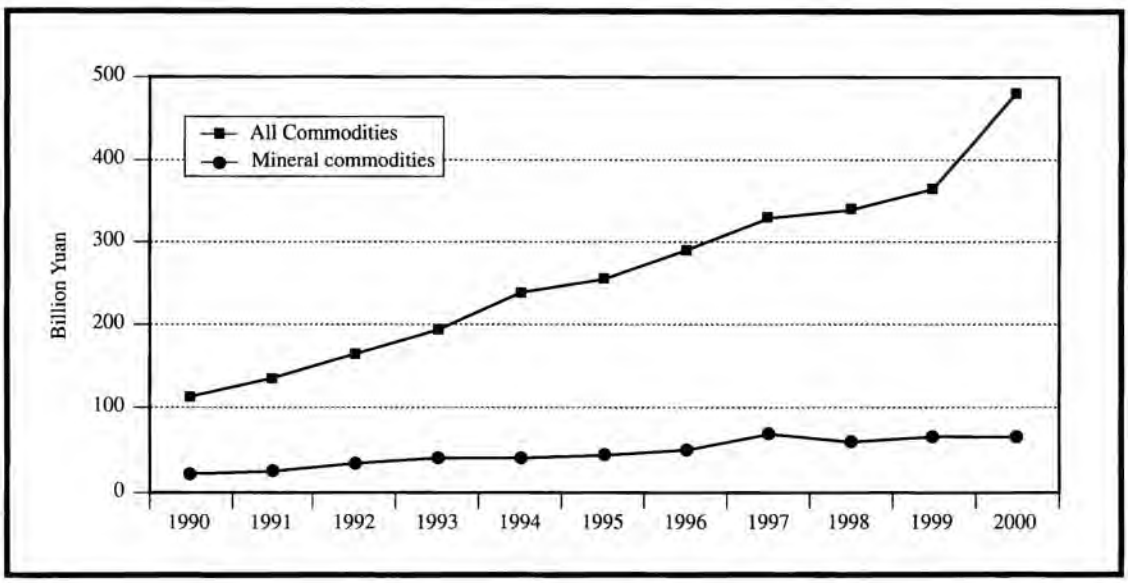


Figure 10.10. Historic trend of international trade in mineral commodities in China during 1990s

China has kept a close linkage with more than 50 countries or regions globally through international trade of mineral commodities. Table 10.6 shows the sources of the mineral commodities imported in 2000. Figure 10.11 shows the historic trend of import and export of crude oil in China during the last two decades.

Table 10.6. The sources of the mineral commodities imported by China in 2000

Mineral	Amount (million tons)	Sources and percentage of import in the total import
Crude oil	70.27	32 countries, including Oman 22%, Angola 12%, Islamic Republic of Iran 10%, Saudi Arabia 8%, Indonesia 7%, Yemen 5%, Sudan 5%, Iraq 5%, Viet Nam 4%, Qatar 2%.
Iron ores	69.97	18 countries, including Australia 47%, Brazil 21%, India 16%, South Africa 11%, Peru 2%.
Manganese ores	1.20	11 countries, including Australia 28%, Japan 20%, Ghana 18%, Myanmar 10%, Brazil 9%, India 9%.
Chromium ores	1.11	13 countries, including India 64%, Islamic Republic of Iran 14%, Pakistan 9%, Australia 8%, Viet Nam 5%.
Copper ores	1.81	30 countries, including Chile 34%, Mongolia 23%, Australia 13%, Canada 7%, Islamic Republic of Iran 6%, Peru 4%, Indonesia 2%.
Potash fertilizer	5.39	8 countries, including Russian Federation 58%, Canada 29%, Jordan 5%, Israel 3%, Latvia 1%.

Source: China Customs Administration, 2000.

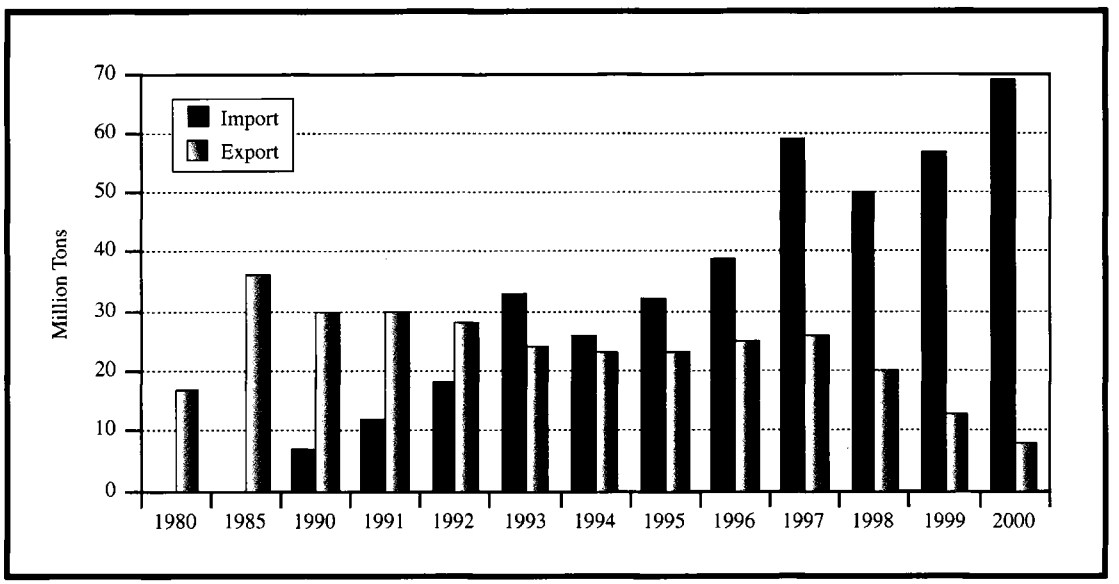


Figure 10.11. Import and export of crude oil in China, 1980-2000

The Chinese Government has done great efforts in reducing import tariffs to meet requirements for joining the World Trade Organization. The average rate of import duty was 3 per cent. Figure 10.12 shows the yearly rates of the import duty during the past six years.

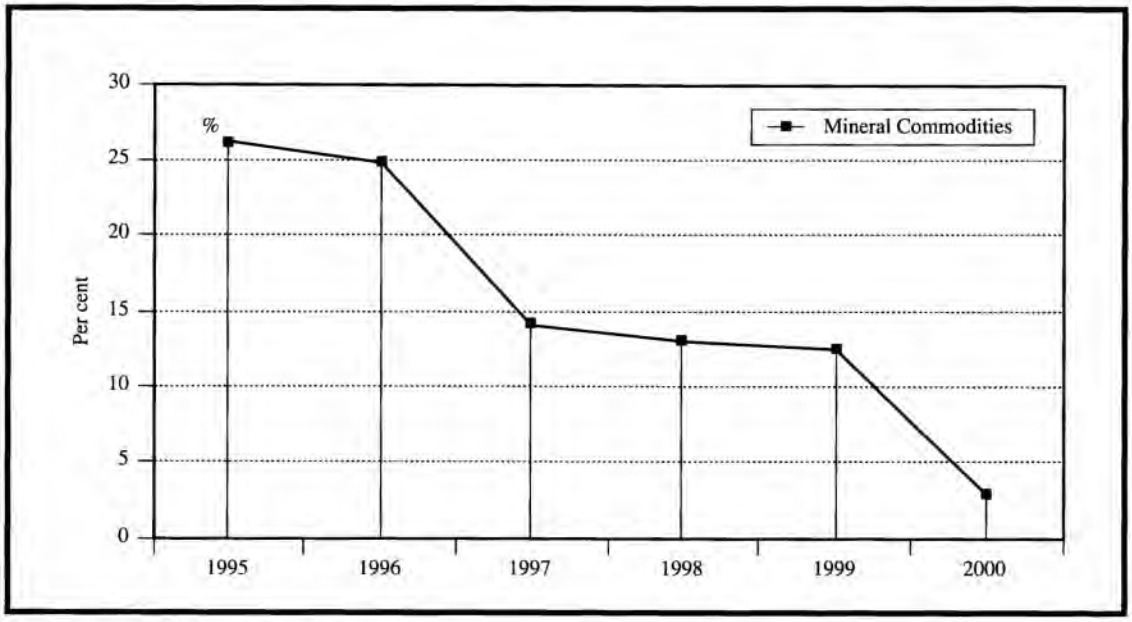


Figure 10.12. The annual rates of import duty for mineral commodities in China, 1995-2000

Table 10.7. Forecast of demand and production of selected mineral products in China, 1999-2005

Mineral	Unit	1999	2005	
		Production	Production	Demand
Coal	Million tons	1 045	1 000-1 100	1 000-1 100
Crude oil	Million tons	160	162	242-262
Natural gas	Billion m'	24.1	50-60	60-65
Iron ore	Million tons	237	250	400
Manganese ore	Million tons	3.19	4.40	7.25
Chromium ore	Million tons	0.22	0.22	1.30
Copper	Million tons	0.52	0.85	1.70
Aluminum	Million tons	2.81	3.50	3.20
Lead	Million tons	0.55	0.90	0.60
Zinc	Million tons	1.48	1.70	1.26
Tungsten, WO_3 65%	Tons	39 200	22 000-24 000	10 000-12 000
Tin	Tons	80 100	50 000-55 000	30 000
Molybdenum	Tons	29 700	18 000	13 000
Antimony	Tons	90 700	40 000-50 000	14 000-20 000
Nickel	Tons	49 500	55 000-60 000	50 000
Gold	Tons	169	200	300
Silver	Tons	1 299	1 500	1 600
Pyrite ores	Million tons	14.85	15.00	20.00
Phosphate rocks	Million tons	20.90	24.00	24.00
Potash	Million tons	0.50	2.00	11.00
Limestone	Million tons	690	700-800	700-800

Source: Ministry of Land and Resources of China, 2000.

5. Forecast of Demand and Production of Mineral Commodities in China

China will have a strong demand for mineral commodities due to sustained high rates of economic growth. Table 10.7 shows a forecasted demand and production of the selected mineral commodities in China.

E. NEW MINING LEGISLATION

The first mining law of China, which was titled "The Mineral Resources Law of the People's Republic of China", was passed by the National People's Congress on March 19, 1986, and came into effect as of 1 October of the same year. It is well known that the past decade has experienced great changes in almost all the economic and social fields in China. The Mineral Resources Law of 1986 became more and more out-of-date. In this regard, as authorized by the State Council of China, the former Ministry of Geology and Mineral Resources started to draft the Proposed Amendments to the Mineral Resources Law since 1994. Those Amendments were passed at the twenty-first Session of the Standing Committee of the eighth National People's Congress on 29 August, 1996 and went into force as of 1 January 1997.

For the detailed implementation of the revised Mineral Resources Law of 1996, the State Council of China issued three items of regulations on mineral rights management on 12 February 1998. They are the Regulations on Registration for Mineral Exploration, the Regulations on Registration for Exploitation of Mineral Resources and the Regulations on Transfer of Exploration Rights and Mining Rights.

1. Equal Legal Status of Different Types of Mining Enterprises

In the Mineral Resources Law of 1986, different types of mining enterprises – the state-owned mining enterprises, collective-owned mining enterprises and individual miners had different types of legal status. The mining enterprises with foreign investment, private mining enterprises and other types of mining enterprises had no status. This discriminatory legal status was an important obstacle to the inflow of foreign capital investment and up-to-date technology. The amended Mineral Resources Law makes a great change in the legal status of different types of mining enterprises. Same treatment is accorded to the domestic enterprises and the enterprises with foreign investment according to the amended Mineral Resources Law and the three items of Regulations on exploration rights, mining rights and transfer of exploration rights and mining rights respectively.

2. Security of Mineral Titles

The right to mine is a critical precondition to investment in exploration. To guarantee a holder of exploration right to apply for and obtain a mining right, the new Mineral Resources Law stipulates that an exploration licencee has the privileged priority to obtain the mining right in respect of the mineral resources within the area under the exploration right. It means that, in the event of discovery, the right of the holder of an exploration right to obtain a mining right to conduct mining operations in respect of a deposit in the exploration area is guaranteed if he meets the conditions and requirements regarding, for example, funding and technical qualifications, mining plans, environmental impact statements, etc. prescribed by the Mineral Resources Law and the regulations on mineral rights. No person except the exploration licencee is permitted to apply for mining right in respect of the exploration area. No government agency responsible for mineral rights management may issue a mining right to a person other than the exploration licencee.

New mining legislation has considered necessary time requirements for preparing feasibility studies, environmental impact statements, financial arrangements, etc. through the stipulations on the initial period and renewal of an exploration right, etc. Especially, a retention period between the exploration

stage and the mining stage is prescribed in the Regulations on Registration for Mineral Exploration. After ascertaining an economic deposit within the term of an exploration licence, the exploration licencee may apply for the retention of an exploration right in respect of the economic deposit within 30 days prior to the expiration of the exploration licence. The maximum period of retention is 2 years. If there is a need to extend the term of retention, the exploration licencee may apply for an extension twice; each extension does not exceed 2 years. The area for retention of the exploration right should be the area covering economic deposits.

3. Maximum Exploration Area

The exploration area is determined in a grid pattern in which the basic block is longitude 1' x latitude 1'. The maximum area under an exploration licence is as follows: (a) 10 basic blocks for mineral waters; (b) 40 basic blocks for metal, non-metal, and radio-active minerals; (c) 200 basic blocks for geo-thermal resources, coal, and water and gaseous minerals; (d) 2,500 basic blocks for oil and gas.

4. Maximum Period of Mineral Rights and Renewal

The maximum period of an exploration licence for any of mineral resources other than oil and gas is 3 years. The maximum period of an exploration licence for oil and/or gas is 7 years. If there is a need to extend the period of an exploration licence, the exploration licencee shall, within 30 days prior to the expiration of the exploration licence, apply for the extension of the exploration licence with the licencing authorities. Extension of exploration licence shall not exceed 2 years each time.

The term of a mining licence shall be decided in accordance with the magnitude of the mining project. If the scale of the project is large or plus, the maximum term of the mining licence is 30 years; for a project medium in scale, 20 years; for a project small in scale, 10 years. If there is a need to extend the term of a mining licence, the mining licencee shall, within 30 days prior to the expiration of the mining licence, carry out the procedures for the extension of the mining licence with the licencing authority. The maximum period of a mining licence for on-going exploration and development of oil and/or gas is 15 years.

5. Minimum Exploration Expenditures and Diligent Work

The exploration licencee shall, from the date of issue of the exploration licence, meet minimum exploration expenditures according to the following schedule: (1) 2,000 RMB Yuan per square kilometre for the first year of exploration; (2) 5,000 RMB Yuan per square kilometre for the second year of exploration; and (3) 10,000 RMB Yuan per square kilometre each year thereafter, starting with the third year of exploration. If the exploration licencee's expenditure for any given year exceeds the minimum stipulated for that year, the surplus may be applied to the expenditure for the following year.

The exploration licencee shall begin work within 6 months from the date of issue of the exploration licence. When starting his exploration work, the exploration licencee shall report to the department responsible for geology and mineral resources management under the people's government at the county level where the exploration project is located. He shall also notify the licencing authorities as to the details of the commencement of his work.

6. Payment for Mineral Rights

The payment for acquiring an exploration right or a mining right is equivalent to the rentals for mineral rights under the mining acts in the states of Australia and the dead-rent in Indonesia and India. The rates of the fee for the use of exploration right are as follows: (1) 100 RMB Yuan per square kilometre per year for the first three years; (2) 100 RMB Yuan per square kilometre shall be added per year starting from

the fourth year. However, the highest rate shall not exceed 500 RMB Yuan per square kilometre per year. The rate of the fee for the use of mining right is 1000 RMB Yuan per square kilometre per year.

7. Reimbursement Fees for Exploration Rights and Reimbursement Fees for Mining Rights

If anyone applies for an exploration right or mining right to any blocks containing mineral deposits discovered at the State's expenses, the applicant shall pay the reimbursement fees for exploration right, in addition to the fee for the use of exploration right as prescribed, or as the case may be, pay the reimbursement fees for mining right, in addition to the fee for the use of mining right as prescribed.

The reimbursement fees shall be paid in full or in installments. The reimbursement fees shall be evaluated by the qualified organizations designated by the Ministry of Land and Resources. The results of the evaluation of the reimbursement fees shall be confirmed by the Ministry of Land and Resources.

8. Mineral Rights Management Agencies

One of the most important changes introduced in the amended Mineral Resources Law and the three items of regulations is about the provisions on the authorities to approve the applications for the mining of mineral resources and grant of mining rights.

a) Grant of Exploration Rights

The Ministry of Land and Resources is responsible for reviewing and approving the applications for exploring for (i) those mineral resources that straddle two or more provinces, autonomous regions or municipalities directly under the central government, (ii) those mineral resources located in the territorial sea or other sea areas under China's jurisdiction, (iii) those mineral resources to be explored for by foreign investment, and (iv) any mineral resources listed in the appendix attached to the Regulations on Registration for Mineral Exploration and for which the exploration expenditure is over 5 million RMB Yuan.

The departments under the people's governments of provinces, autonomous regions and municipalities directly under the central government shall be responsible for reviewing and approving the applications for exploring for the mineral resources other than those for which the Ministry of Land and Resources is responsible.

b) Grant of Mining Rights

The Ministry of Land and Resources is responsible for reviewing and approving the applications for the exploitation of (i) those mineral resources within the state planned mining areas and within the mining areas of great value to the national economy; (ii) those mineral resources located in the territorial seas or other sea areas under China's jurisdiction; (iii) those mineral resources to be exploited by foreign investment and (iv) coal, petroleum, natural gas, carbon dioxide, coal-bed methane, radioactive minerals, gold, silver, platinum, copper, lead, zinc, bauxite, nickel, tungsten, tin, antimony, molybdenum, rare earth, phosphate, potash, strontium, diamond, niobium, tantalum, as listed in the appendix attached to the Regulations on Registration for Exploitation of Mineral Resources, whose reserves are evaluated as large in scale and plus.

The departments in charge of geology and mineral resources management in provinces, autonomous regions and municipalities directly under the central government are responsible for reviewing and approving the applications for exploiting oil shale, geothermal resources, manganese, chromium, cobalt, iron, sulfur, asbestos and mineral water, as authorized by the Ministry of Land and Resources, and those mineral resources beyond the approving authority of the Ministry of Land and Resources and whose reserves are evaluated as medium in scale.

The departments in charge of geology and mineral resources management at prefecture or/and county levels are responsible for reviewing and approving the applications for the exploitation of mineral resources beyond the approving authorities of the Ministry of Land and Resources and the departments in charge of geology and mineral resources management in provinces, autonomous regions and municipalities directly under the central government, as prescribed by the standing commissions of people's congresses of provinces, autonomous regions and municipalities directly under the central government. Those mineral resources are mainly minor or small-scale.

9. Acquisition of Mineral Rights through Public Bidding

In addition to issuing mineral rights through the routine of application and approval, the licencing authorities may select bidding blocks, make public invitations for bids, establish and announce the bidding requirements and establish deadlines for the bids, in accordance with the limits of authorities stipulated in the regulations on exploration rights and the regulations on mining rights respectively. However, the bidding blocks available for foreign investment shall be determined by the Ministry of Land and Resources.

The licensing authorities shall organize the evaluation of bids and select the best offer. Upon acceptance of a bid, the successful bidder shall pay the fees for the use of exploration right and the reimbursement fees for exploration right, or as the case may be, the fees for the use of mining right and the reimbursement fees for mining right, as prescribed, complete the registration procedures, and obtain the exploration licence or mining licence, where upon they shall fulfill the obligations stipulated in the bid documents.

10. Report and Inspection

If the licencing authorities need to investigate the progress of the input of exploration expenditures and exploration work, the exploration licencee shall report swiftly and accurately with relevant materials. Concealing relevant information or making false declarations shall constitute a violation of the obligations of the exploration licencee. The investigation shall not be refused.

At the request of the exploration licencees, the licencing authorities shall keep confidential any materials or information deemed sensitive by the exploration licencee, including material submitted for the applications for the exploration licences as well as the materials concerning exploration results and the financial reports.

The licencing authorities shall conduct the supervision and inspection of issues regarding rational development and utilization of mineral resources, environmental protection and other obligations that shall be fulfilled by the mining licencees in their administrative areas. The mining licencees shall report any relevant circumstances truthfully and submit an annual report to the licencing authorities.

11. Transferability of Mineral Titles

A very important change in the new mining legislation is that exploration rights and mining rights are transferable. The holder of an exploration right may, after completing specified minimum exploration expenditures and on approval in accordance with law, transfer his exploration right. A mining enterprise holding a mining right may, on approval in accordance with law, transfer its mining right due to merging or splitting ownership, or entering an equity or cooperative joint venture, selling its assets, or in other forms of altering the ownership of its assets.

a) Approving Authorities

The Ministry of Land and Resources is responsible for reviewing and approving the applications for the transfer of exploration rights and mining rights that were reviewed, approved and licenced by the Ministry itself. The applications for the transfer of exploration rights and mining rights beyond the approving authority of the Ministry of Land and Resources shall be reviewed and approved by the departments in charge of geology and mineral resources under the people's governments of provinces, autonomous regions and municipalities directly under the central government.

b) Preconditions for Transfer of Exploration Right

Any exploration licencee who wishes to transfer his exploration right shall meet the following requirements: (i) two years or more have passed since the date of issue of an exploration licence, or the mineral resources already discovered in the exploration area are worthy of further exploration or mining; (ii) the minimum exploration expenditures requirements have been met; (iii) the licencee has undisputed ownership of the exploration rights; (iv) the fees for the use of exploration right and the reimbursement fees for exploration right have been paid in accordance with the relevant provisions of the State; and (v) other requirements otherwise specified by the Ministry of Land and Resources.

c) Preconditions for transfer of Mining Right

Any mining licencee who wishes to transfer his mining right shall meet the following requirements: (i) one year or more has passed since the mining enterprise began mining; (ii) the mining licencee has undisputed ownership of the mining right; (iii) the fees for the use of mining right and the reimbursement fees for mining right, royalty and the resources tax have been paid in accordance with relevant provisions of the State; and (iv) other requirements otherwise specified by the Ministry of Land and Resources.

12. Stricter Legal Liabilities for Violation

In accordance with the new mining legislation, stricter legal liabilities, including administrative penalties and criminal responsibilities, are imposed on the holders of mineral rights or any units or individuals who are in violation of the provisions under the amended Mineral Resources Law and the three items of Regulations. Legal liabilities are also imposed on the staff of the governmental agencies in charge of supervising and administering the mineral exploration and mining operations that illegally exercise their power. The department in charge of geology and mineral resources under the people's governments at higher levels are entitled to revoke the exploration rights or mining rights granted illegally.

F. NATIONAL PROGRAM FOR EXPLORATION AND DEVELOPMENT OF MINERAL RESOURCES

The mineral resources planning system consists of the national integral planning for mineral resources and mineral resources planning at provincial, prefecture and mineral-rich county levels. Special planning, including national planning for geological exploration, planning for developing and protecting mineral resources and planning for protecting mine environment, will be worked out under the national integral planning for mineral resources.

In April 2001, the State Council approved the National Program for Exploration and Development of Mineral Resources of 1999-2010. Under the guide of the strategy on sustainable development, the Program targets four major objectives as follows:

- To raise domestic mineral availability by means of both strengthening national geological survey funded by the central government and local governments and promoting commercial geological exploration for mineral resources through appropriate mineral policy;
- To guarantee the supply of energy and minerals needed by national economic and social development based on "two sources of resources and two markets", both domestic and international;
- To change the mode of the development and utilization of mineral resources from the extensive to the intensive, so as to achieve effective conservation and rational development and utilization of mineral resources;
- To upgrade mine environment.

The following projects have been included in the National Program for Exploration and Development of Mineral Resources of 1999-2010:

- National geological survey and appraisal of mineral resources;
- Commercial exploration for mineral resources, onshore and offshore;
- Mineral development;
- Introduction of foreign investment in the mineral industries in China;
- Import and export of mineral commodities;
- Exploration and development of mineral resources overseas;
- Conservation and rational development of mineral resources; and protection of mine environment.

G. GREAT SURVEY OF NATURAL RESOURCES PROGRAM

The MOLAR has implementing the Great Survey of Natural Resources Program to conduct a comprehensive survey and assessment of land resources, mineral resources, marine resources and geological environment in the Chinese territory and the sea areas under the jurisdiction of China for a period from 1999 to 2010.

The Great Survey of Natural Resources Program aims at providing scientific basis for planning and management of natural resources, offering services in natural resources information for the decision-making by the governmental agencies and for uses by the public. The major tasks under the Great Survey of Natural Resources Program are as follows:

- To further conduct comprehensive survey and assessment of land resources, mineral resources, underground water and marine resources and basic mapping and surveying on the basis of works in the previous years;
- To conduct survey and assessment of land resources targeting provision of scientific basis for reinforcing land management to reach running balance of the total area of the cultivated land;
- To conduct survey and evaluation of the potentials for discovering mineral resources and ascertain the potentials for discovering the minerals of which China is urgently short;
- To conduct survey of geological and ecological environment, aiming at ascertaining geological and ecological background in the major economic zones and big river basin areas in order to work out the measures for prevention and treatment of geological disasters;

- To conduct the survey and assessment of the high risk areas of geological disasters and work out the programme on prevention and control of geological disasters;
- To fully understand the general characteristics of marine territory and to conduct the survey and assessment of marine mineral resources.

The Great Survey of Natural Resources Program consists of one plan and four projects in addition to the land use survey and monitoring project:

1. Basic Survey Plan

It is planned to conduct comprehensive survey and assessment using the techniques like regional geology, regional hydro-geology, regional engineering geology, regional environmental geology, regional geophysical prospecting, regional chemical prospecting and remote sensing to produce, on the basis of previous working results, and according to the new tasks and the new technical requirements, the base map series on which will reflect the fruits from the survey and assessment of land resources, mineral resources and marine resources, and ecological and geological environment, and to update the existing base maps through supplementing and revising the existing information materials, in order to meet the demands by land management, geological exploration, engineering construction, environmental management and geo-scientific research.

2. Mineral Resources Survey and Assessment Project

This project will concentrate the assessment of geological potential for discovering mineral resources in important mineralized zones, discover and assess a set of new mineral occurrences and underground water sources in short-of-water regions.

3. Pre-warning of Geological Disasters Project

This project will focus on working out the planning for survey and prevention and control of the geological disasters in the frequently-occurring zones so as to minimize the effects of geological disasters; conducting the assessment and pre-warning of geological disasters such as landslide, mud-and-rock flows in important economic zones and along main transportation lines in order to put forward the measures for prevention and control and provide basis for drafting the planning for prevention and control of geological disasters; establishing demonstrative monitoring stations and data base for typical geological disasters in key regions; and conducting research on the formative mechanism of geological disasters, location of geological disasters in time and space and current crustal deformation. The following sub-projects will be included under this project:

- The special survey of geological disasters in the Three Gorges reservoir area;
- The survey, forecasting and pre-warning of the slowly-deforming geological disasters in Shanghai economic zones;
- The special survey and assessment of geological disasters in the frequently-occurring zones; and
- The construction of a network of station for demonstratively-monitoring geological disasters and a system for pre-warning of geological disasters.

4. Digitation of Territory Project

Under this project, it is planned to conduct the analysis, screening and digitation of the existing natural resources information in order to provide information services for the decision-making by the

government agencies and open to the public; to establish natural resources data base and map base with functions of information management, comprehensive analysis and assessment; to achieve digitation and networking of the implementation process and fruits from the Program; and to establish the rules and regulations on submission and sharing of information.

5. Technological Development of Natural Resources Survey and Utilization Project

It is planned to conduct research and development of and introduce part of advanced technology and instruments so as to solve the problems on techniques in survey, exploration, development and management, enhance the level of technology in survey, assessment, development and utilization of natural resources and the level of monitoring and control of ecological and geological environment.

H. FOREIGN INVESTMENT PROMOTION PROGRAM

One of general policies of the Chinese Government on open door to the outside is to introduce foreign capital and advanced and applicable technology into the mineral industries. In general, the current situation of foreign investment in the mineral industries is unsatisfactory. In this regard, great efforts have been and will be made to improve foreign investment conditions. The Chinese Government decides to further widen open door to outside, and raise the level of the utilization of foreign investment.

1. Forms of Foreign Investment in China

Five forms for foreign investment are available to foreign investors who wish to make investment on mineral projects in China:

- *Equity Joint Venture (EJV):* regulated by the Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures of 1979 and its Implementation Rules of 1983.
- *Contractual Joint Venture (CJV):* regulated by the Law of the People's Republic of China on Chinese-Foreign Contractual Joint Ventures of 1988 and its Implementation Rules of 1995.
- *Foreign Capital Enterprise (FCE):* regulated by the Law of the People's Republic of China on Foreign-Capital Enterprises of 1986 and its Implementation Rules of 1990.
- *Company Limited by Shares with Foreign Investment:* regulated by the Provisional Regulations of the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) on Certain Issues Concerning the Establishment of Companies Limited by Shares with Foreign Investment of 1995.
- *Investment Company by Foreign Investor:* regulated by Provisional Regulations of the MOFTEC on the Establishment of Investment Companies by Foreign Investors of 1995.

2. Minerals Accessible to Foreign Investment

Foreign investors are encouraged to undertake the exploration and exploitation of mineral resources. According to Interim Provisions for Guiding Foreign Investment of 1995 and the updated Catalogue of Industries for Foreign Investment of 1997, issued by the Chinese Government, the minerals accessible to foreign investors are divided into the following categories:

Group A: The mineral projects on which foreign investors are encouraged to make investment include: mining and washing separation of coal, mining and beneficiation of iron ores and manganese ores, mining of high alumna and hard paste, production of grog. Mining of copper, lead and zinc, aluminum, however, wholly owned foreign capital enterprises for those projects are not permitted.

Group B: Foreign investment projects pertaining to the exploration and mining of rare and precious mineral resources are listed as the restricted. The restricted mineral projects in which the wholly owned foreign capital enterprises are not permitted include: processing of copper and aluminum, mining, beneficiation, smelting and processing of precious metals (gold, silver and platinum group metals), mining of tungsten, tin and antimony, exploration, mining, smelting and separation of rare earth, exploration, mining, processing of precious minerals such as diamond and other natural gemstones (wholly owned foreign capital enterprises for those projects are not permitted), mining and processing of Ludwig ores.

Group C: The prohibited mineral projects include: mining, beneficiation, smelting and processing of radioactive minerals, mining and processing of boromagnesites and mining of celestites.

Group D: The minerals on which foreign investors are permitted to make investment include the minerals not included in group A, B and C.

3. Procedure for Foreign Investment in the Mineral Industries

The procedure includes the following sequential steps:

Step 1: Inquire of the Ministry of Land and Resources about whether the area to be applied by the proposed enterprise with foreign investment is available to foreign investor.

Step 2: Reserve the name of the proposed enterprise with foreign investment to the competent agency responsible for industrial and commercial administration in accordance with the Provisions on Administration of Registration for Names of Enterprises.

Step 3: Apply to the Ministry of Land and Resources for the designation of the exploration area under an exploration right or as the case may be, the mining area under a mining right, to be applied by the proposed enterprise with foreign investment. If approved, an approval document will be issued.

Step 4: Apply to the Ministry of Foreign Trade and Economic Cooperation or its provincial agency for the establishment of the proposed enterprise with foreign investment. If approved, an approval document will be issued.

Step 5: Register to the competent agency on industrial and commercial administration for the enterprise with foreign investment, and obtain business licence. Make registration on taxation, custom and foreign exchange.

Step 6: Apply to the Ministry of Land and Resources for grant of exploration right or mining right, or as the case may be, for transfer of an exploration right or mining right. If agreed, an exploration licence or a mining licence will be issued.

Step 7: Apply to the competent agency under the Ministry of Land and Resources for land use right.

4. New Programme for Promoting Foreign Investment

In the past few years, the Chinese Government has adopted a series of new actions to further improve foreign investment environment and expand opening up of the country to the outside world. In August 1999, the State Council issued the Regulations on Further Encouraging Foreign Investment, which declares that:

- The enterprises with foreign investment are encouraged to carry out research and development, and expand the purchasing of domestic goods and services;

- Foreign investors are encouraged to make investment in the central and western regions of China;
- A great financial support shall be offered for the enterprises with foreign investment, and
- The government management and services related to foreign investment shall be further improved.

To this end, a set of policies and measures, including preferential taxes and tariff treatment, financial policy and other incentives shall be applied to foreign investment.

In December 1999, the Ministry of Finance enacted the Provisions on Accounting Treatment of Exploration Rights and Mining Rights Held by Mining Enterprises and the Provisions on Exploration Rights and Mining Rights Held by Geological Exploration Units, which clarifies that the exploration expenditures paid by mining enterprises or exploration units shall be accounted as production costs for deduction from the base for taxable income.

In June 2000, the Chinese Government issued the Catalogue of Advantageous Industries for Foreign Investment in Middle and Western Regions. Foreign investment projects listed in the Catalogue can enjoy the preferential policy same as that apply to the Encouraged Category in the Catalogue of Industries for Foreign Investment. They shall be exempted from tariff and VAT for imports when the enterprises with foreign investment import equipment and related components and spare parts for self-use, which cannot be produced domestically or the local products are unable to meet their quality requirements.

In August 2000, the State Development and Planning Commission, together with other relevant ministries, further delegated the authorization of approving project proposal for some foreign investment projects to provincial governments or departments. For foreign invested mineral projects listed in the Encouraged Category in the Catalogue of Industries for Foreign Investment, the approval authorization has been delegated to the provincial level, except for the exploration for and development of gold and the development and utilization of rare earth.

Recently, the Chinese Government is revising the Catalogue of Industries for Foreign Investment of 1997 in accordance with the rules of the WTO and the commitments made by the Chinese Government, so as to increase transparency, clarify approval procedures and authority, and expand and widen the fields for foreign investment.

In October 2000, the State Council approved the Regulations on Further Encouraging Foreign Investment on Exploration and Development of Mineral Resources Other Than Oil and Gas, which declares that:

- Exploration rights and mining rights shall be further opened to foreign investors;
- A series of taxes and royalty policies shall be applied to support foreign mineral investment;
- Foreign investors are encouraged to make investment in exploration and development of mineral resources in the western region of China;
- The government management and services related to foreign investment on exploration and development of mineral resources shall be further regulated and improved.

The basic geological information for public purpose collected with State fund will be available to the public. From 1 June 2000, the regional geological survey information on scales less than 1:50,000 and the geological information of regional geological prospecting for minerals, regional geochemical survey, geophysical survey, airborne physical survey, remote sensing survey and other data will be available to the public free of charge. Domestic and foreign investors share same treatment.

I. WESTERN DEVELOPMENT INITIATIVE

In 2000, the Chinese Government launched the Western Development Initiative (WDI) mainly aimed at accelerating development of western region and narrowing the gap between the less developed western region and the well-developed eastern coastal region, as one of the most important step to achieve the third strategic target for realizing modernization. It is very significant for expanding domestic demand and keep sustained, rapid and sound economic growth. It is requirements of optimizing the economic structure and promoting reasonable layout of production. It will help improve national unity, reduce poverty, and achieve coordinated economic and social development at border areas. It is also inevitable for narrowing regional differences and realizing common wealth.

The WDI covers 12 provincial administrative regions, including Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Inner Mongolia, and Guangxi provinces with an area of 6.85 million square kilometres, occupying 71.4 per cent of the country. The population of these areas was 355 million by the end of 2000 representing 28.1 per cent of the population of the country. GDP of western region is 1,660 billion RMB Yuan accounting for 17.2 per cent of the GDP of the country.

1. Conditions for Western Development

The WDI region has a number of advantages for development, especially as follows: (i) abundant in energy and mineral resources; (ii) rich agriculture and husbandry resources; (iii) outstanding tourism resources; (iv) lower cost of labor force; (v) basis for industry development; and (vi) connecting "Eurasia continental bridge" and passage.

However, the economic and social development in the WDI region has big differences with eastern region. In 2000, the per capita GDP of the WDI region was 4,685 RMB Yuan, 61 per cent of the national average (7,683 RMB Yuan) and 41.5 per cent of the eastern region average (11,294 RMB Yuan). The WDI region is characterized by weak infrastructure, insufficient water conservancy facilities and railway network, low access of road and electricity of some villages, low coverage of telephone, bad ecological environment, unreasonable industry structure, bad agricultural conditions, low technology level, slow development of services sector, and backwardness of social development. The comprehensive knowledge development index (composed of technology, education, culture, etc.) is 60 per cent that of the national level. The region is less opening to the outside world. In 2000, the value of import and export in the region is only 3.9 per cent that of the country. Foreign capital investment in the region is only 4.6 per cent that of the nation.

2. Objectives of the WDI

The Chinese Government plans to achieve its objectives by means of the WDI as follows:

- The infrastructure and environmentally-sound construction should make breakthrough progress in 5-10 years, with great development in science and technology, education, agriculture and industry;
- People's life will be greatly improved;
- Reforms and opening up of the region will be accelerated;
- Through efforts of several generations, by mid-21 century, China will basically realize modernization, and building a prosperous, progressive, stable, united and beautiful western region of the country.

3. Priorities of the WDI

The WDI will be based on accelerating infrastructure construction with due regards to environmental protection, focusing on industrial restructuring, and guaranteeing on technology and education. The four tasks will be given highest priority for a period from 2001 to 2005.

Infrastructure Construction: Fund from various channels will be mobilized to construct infrastructure. Road, railway, airport, natural gas pipeline, and inland river transportation will be improved. Promoting the diversion of gas and electricity from west to east, building oil and natural gas processing, storage facilities and pipelines. It is planned to use a high quality coal and develop renewable energy, strengthen information infrastructure, and promote urban infrastructure construction.

Environmental Protection: Comprehensive environmental protection will be strengthened through natural forest protection, forestation and grassland restoration from cultivated land, sandstorm sources treatment, natural pasture protection and construction, soil conservation, and key area ecological construction, thus to form a green belt in the west. Water pollution at the upper reaches of Yangtze River, upper and middle reaches of Yellow River will be treated and mitigated. Air pollution in some key cities will be controlled.

Industrial Restructuring: Agriculture, tourism and mineral industries will be the pillar industries in the WDI region. Mineral resources with market potential will be developed. New high-tech will be applied to renovate the traditional industry of machinery, metallurgy, non-ferrous industry, chemical industry, light industry, food and textile industries. It is encouraged to develop bio-medicine, electronic-industry, aviation and aerospace, new energy, new materials, and other modern industries.

Technology and Education Development: A series of high-tech will be developed and technology application ability will be constructed and improved. It will be strengthened to introduce, use and train personnel and promote personnel exchange between the east and west, speed up the generalization of nine-year compulsory education, actively develop higher education and vocational education, and create more employment opportunities. More support will be given to poverty alleviation.

4. Key Development Areas under the WDI

Some areas with more population and transportation will be selected as the key areas for development. The WDI will rely on transportation trunk lines such as the Eurasia Continental Bridge, the Yangtze River waterway, and the southwest sea-access channels, with lines linking selected points and selected points connecting entire areas, carrying out priority development of key cities, creating an economic belt along the new Xi-Long-Hai-Lan line, the economic belt at the upper reach of the Yangtze River, and the Nanning-Guiyang-Kunming economic zone. Urban construction and rural development will be integrated to combine economic growth and poverty alleviation, promoting economic and social coordinated development of the urban and rural areas.

5. Policies and Measures for the WDI

As stipulated by the 10th Five-year National Plan for Economic and Social Development, the Chinese Government will apply key policies and measures to implement the WDI. The State Council released the Notification on Policies and Measures for Western Development, according to which the following policies and measures will be applied to support the WDI:

- Increasing construction capital investment;
- Increasing fiscal transfer disbursement;
- Increasing financial credit input;
- Applying tax preference policy;

- Applying land use preferential policy;
- Applying preferential mineral policy;
- Improving the investment climate;
- Expanding fields for foreign investment;
- Extending foreign investment channels;
- Releasing conditions for foreign fund use;
- Encouraging rational movement of personnel; and
- Supporting the development of science, technology and education.

J. NEW OPPORTUNITIES FOR MINERAL INVESTMENT IN WESTERN REGION

As mentioned above, the mineral industries have been given a high priority in implementing the WDI. New opportunities are facing the mineral industries of China, both domestic and international investors.

1. Resources Endowment and Geological Potential in WDI Region

Mineral resources in the WDI region have strong comparative advantages, which can serve as a resources base for developing unique and pillar industries. 123 kinds of mineral resources have been identified with proven reserve in the region. Out of 45 types of major mineral resources, the proven reserve of more than 20 minerals in the WDI region accounts for over 50 per cent of the national total reserve. Natural gas reserve of the WDI region is over 70 per cent of the total, coal reserve is about 60 per cent of the total, petroleum is 23 per cent, chromium and potassium is 99 per cent, iron ore is 52 per cent, copper is over 60 per cent, lead and zinc is 66 per cent, nickel is 89 per cent and phosphate rocks reserve is 70 per cent of the national reserves.

Ten key mineral resources target areas have been discovered and identified as a result of geological survey and exploration efforts during the past decades. They include:

- The Tarim Basin (oil and natural gas) in Xinjiang province;
- The middle reaches of the Yellow River (oil and natural gas) in Shannxi, Gansu and Ningxia provinces;
- The Chaidamu Basin (oil and natural gas, and potash) in Qinghai province;
- The East Tianshan Mountain – North Qilian (non-ferrous metals and precious metals) metallogenic belts in Xinjiang and Gansu provinces;
- The middle and west segments of the Qingling Mountain (non-ferrous metals and precious metals);
- The middle and south reaches of the "Three Rivers" in southwest China (non-ferrous metals) in Yunnan province;
- The west part of Panzhihua – middle part of Guizhou areas (phosphate, metals and energy resources) in Sichuan and Guizhou provinces;
- The Sichuan Basin (natural gas);
- Red Water River – Right River (non-ferrous metals, precious metals) in Guangxi province; and
- The Tibetan "One River and Two Rivers" area (non-ferrous metals, precious metals).

The WDI region has favorable conditions for mineralization including three metallogenic belts and the four large oil and gas bearing basins. Due to a limited scale of geological investigations in the region, there remains great potential for further discoveries of large and extra-large mineral deposits in this region.

2. Role of Mineral Industries in WDI

In 2000, 1.22 billion tons of solid mineral products, over 30 million tons of crude oil and over 15 billion cubic metres of natural gas were exploited in the WDI region, accounting for 24 per cent, 19 per cent and 54 per cent of the national total production respectively. The output value of the mineral industries of the WDI region amounted to 103.59 billion RMB Yuan, accounting for only 24 per cent of the national output value of the mineral industries, but accounting for 6.69 per cent of GDP and 11.48 per cent of industrial output value of this region, higher than these of national levels (respectively 5.01 per cent and 5.30 per cent). The output value of the mineral industries and the follow up processing industries accounted for over 40 per cent of the industrial output value in the WDI region. It is believed that the mineral industries will play a more important role in implementing the WDI in the future.

3. Preferential Mineral Policy for Supporting WDI

Domestic and international investors are encouraged to make investment in exploration and development of mineral resources in the ten key mineral resources target areas specified above.

The central government budgeted and the Ministry of Land and Resources implemented new circle of national geological survey programme initiated from 1999 which will give a high priority to the WDI region. In 1999-2000, over 60 per cent of the expenditures of the national geological survey was spent for works in the WDI region, and the proportion will increase in the following years. The emphasis of geological survey and mineral resources investigation in the WDI region is put on the Key Mineral Resources Centralized Areas, the investigation and evaluation of minerals in shortage domestically and underground water, as well as basic geological survey in the areas with a low geological work coverage and geological disaster which frequently occurred in the areas.

The reimbursement fees for exploration right or mining right to a mineral deposit discovered or/and identified at the State's expenses can be converted into the State's capital of the State-owned mining enterprise or exploration unit that holds the exploration right or mining right if one of the following conditions is met:

- Exploration for or exploitation of oil, natural gas, coal-bed methane, high-grade iron ores, high quality manganese, chromium, copper, nickel, gold, silver, potash, platinum group metals, and underground water;
- Exploration for and exploitation of mineral resources in the poverty areas or the Key Mineral Resources Centralized Areas.
- Exploration for the succeeding resources for prolonging the life of a large- or medium-scale mine that is close to the stage of existing resources depletion;
- A state owned capital held unit takes its exploration rights or mining rights as stocks to joint venture when it has been authorized to achieve joint stock restructuring or establish a joint venture with a foreign investor; or
- A state owned mining enterprise is hard to pay the reimbursement fees for exploration right or mining right to a mineral deposit discovered or/and identified at the State's expenses because of force majeure.

The fees for the use of exploration right or fees for the use of mining right may be reduced or exempted if one of the following requirements is met:

- Exploration for or exploitation of oil, natural gas, uranium, coal-bed methane, high-grade iron ores, high quality manganese, chromium, copper, nickel, gold, silver, potash, platinum group metals, and underground water;
- Exploration for the succeeding resources for prolonging the life of a large- or medium-scale mine that is close to the stage of existing resources depletion;
- New techniques and methods are applied to improve the rates of recovery of the valuable minerals, including the recovery of low grade mineral products and mineral ores difficult to be separated or/and smelt, and the tailings or and residuals at the old mines; or
- Other requirements as prescribed by the Ministry of Land and Resources of China.

The fees for the use of exploration right may be exempted in the first year. Half of the rates are charged during the second and the third year. 75 per cent of the rates are charged during the forth to the seventh years.

The fees for the use of mining right may be exempted during the period of mine construction and in the first year in which the mine is put into operation. Half of the rates apply in the second and third years of the mine production stage.

Foreign investors are encouraged to invest in exploration for and development of mineral resources in the WDI region. Beside the national preferable policies, the foreign investors are not charged for the first year and half charged for the following two years with the fees for the use of exploration right and the fees for use of mining right. There is no royalty for the exploitation of mineral resources for the first five years of mine production if the mining project with foreign investment is listed in the encouraged category of the Catalogue of Industries for Foreign Investment.

K. REORGANIZATION OF GOVERNMENT AGENCIES AND RESTRUCTURING OF THE MINERAL INDUSTRIES

During the past two decades, great changes have taken place in the role of the Chinese Government in the mining activities in the process of transition from the centrally planned economy to the market-oriented economic system. Under the traditional economic system, the former State Planning Commission (SPC) had a very important role in setting priorities for and approving minerals and energy exploration and development in conjunction with the various mineral-related ministries or/and provincial governments. Almost all mineral projects on exploration and exploitation, have been carried out and funded by the State for a long period from 1950 to 1982. The various mineral-related ministries were responsible for the control of production of the specific minerals and energy development e.g., the Ministry of Metallurgical Industry (MMI) for ferrous metals, the CNNC for non-ferrous metals, the China National Petroleum Corporation (CNPC) for petroleum exploration and development on land, the Ministry of Geology, which was renamed into the Ministry of Geology and Mineral Resources (MGMR) in 1982, which organized mineral exploration nation-wide. More than ten ministries and national corporations were engaged in minerals and energy development activities.

Since the early 1998, all functions in relation to mineral resources management have been given to one ministry, i.e. the Ministry of Land and Resources (MOLAR). The MOLAR was established in this March 1998 in accordance with the Reorganization of the State Council's Agencies Programme as approved by the 1st Session of the 9th National People's Congress and the Notification of the State Council on the Establishment of the Organizational Structure. The MOLAR, as one of the member departments

constituting the State Council, is in charge of the planning, management, protection and rational utilization of land resources, mineral resources, marine resources, and other natural resources.

The functions that have been assigned the MOLAR include (a) the functions under the former State Bureau of Land Management; (b) the functions under the former Ministry of Geology and Mineral Resources; (c) the functions on marine resources management under the former State Oceanographic Bureau; (d) the functions under the former National Commission of Mineral Resources and its sub-agencies; (e) the functions on formulating the land planning, integral planning for land use under the former State Planning Commission; (f) the functions in relation to the mineral resources management under the former Ministry of Metallurgical Industry, the former Ministry of Coal Industry, the former Ministry of Chemical Industry, the former China Nuclear Industry Corporation, the former China National Non-ferrous Corporation, as well as other departments and organizations.

The reorganization the government agencies related to the mineral industries has been associated with the silnoulteneous restructuring of the mineral industries. Almost all the state-owned exploration units and mining enterprises, except three national petroleum corporations and the national aluminum industrial corporation, have been attached to provincial governments for management. The Central Government is funding a national geological survey programme being carried out by the China Geological Survey under the MOLAR and adopts mineral policy to promote and enforce mining legislation to regulate the commercial exploration and development of mineral resources based on market principles.

L. CONCLUSIONS

At the turning point of a new century and a new millennium, the Chinese Government has initiated a series of programme and measures, including the WDI, foreign investment promotion programme, reorganization of government agencies, restructuring of the mineral industries, new mining legislation and great survey of natural resources programme aimed, to promote China's speedy economic and social development. The mineral investment climate of China has been improved, and will be further improved to be more internationally competitive even though great challenges such as depressed international mineral market and other problems face the mineral industries. It is believed that the huge geologic potential and substantially upgraded investment conditions will become more and more attractive to the investors, domestic and international, for investment in exploration and exploitation of mineral resources.

Appendix

BACKGROUND INFORMATION ON ECONOMIC INDICATORS, MINING LEGISLATION AND FISCAL REGIME IN CHINA

1. Geography

1)	land area:	9,600,000 sq. km
2)	population with growth rate:	1.266 billion (2000), 0.88% (2000)

2. Macro-economic Indicators

1)	GDP – purchasing power parity:	8,940.4 billion RMB Yuan (2000)
2)	GDP – average annual growth rate:	8.3% (1996-2000)
3)	GDP – per capita:	7,078 RMB Yuan (2000)
4)	Inflation rate – consumer price index:	0.4% (1999)
5)	Unemployment rate:	officially 3.1 % in urban areas (2000)
6)	Exchange rate – per US$ 1:	yuan (¥) per US$ 1-8.2784 (2000); 8.2789 (1998); 8.2796 (1997), 8.2898 (middle rate in 1997), 8.3142 (1996), 8.3514 (1995), 8.6187 (1994), 5.7620 (1993) note: beginning 1 January 1994, the People's Bank of China quotes the midpoint rate against the United States dollar based on the previous day's prevailing rate in the interbank foreign exchange market
7)	Exports – total values:	$249.21 billion (f.o.b., 2000)
8)	Imports – total values:	$225.10 billion (c.i.f., 2000)
9)	Number of newly approved enterprise with foreign investment:	22,347 (2000)
10)	Amount of actually introduced foreign capital investment:	$62.38 billion (2000)
11)	Total number of enterprises with foreign investment:	350,000 (up to the end of 2000)
12)	Total amount of actually introduced foreign direct investment:	$280.00 billion (1996-2000)
13)	National reserve of foreign currency:	$165.6 billion (December, 2000)

3. Mining Legislation

1)	Mining Law:	Mineral Resources Law, No. 36 (19 March 1986) and No. 74 (amended on 29 August 1996)
2)	Implementation Rules:	Regulations for Registering to Explore for Mineral Resources, No. 240 (12 February 1998); Regulations for Registering of Mine Mineral Resources, No. 241 (12 February 1998); Regulations on Transfer of Exploration Rights and Mining Rights, No. 242 (12 February 1998); Implementation Rules for the Mineral Resources Law, No. 152 (26 March 1994); Regulations on the Management of the Collection of the Mineral Resources Compensation (Royalty), No. 150 (27 February 1994)
3)	Relevant Laws and Regulations:	Constitution of the People's Republic of China; Criminal Law; Law on Foreign-Capital Enterprises (12 April 1986); Law on Chinese-Foreign Contractual Joint Ventures (13 April 1988); Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures (20 September 1983); their implementation rules; Environmental Protection Law; Relevant Tax Regulations, etc.

4)	Government Contract and Agreement:	None
5)	Government Authority:	State (MRL[1], Art. 3)
	Ownership of Minerals	
	Regulatory Government Authority	Ministry of Land and Resources
	Granter of Titles	Ministry of Land and Resources and Department in charge of geology and mineral resources under the people's government of provinces, autonomous regions, municipalities[2] (MRL, Art. 12, 16; EMR[3], Art. 4 ; MMR, Art. 3).
	International Arbitration	Regulated by Art. 110 of the Regulations for the Implementation of the Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures (20 September 1983)
6)	Restriction of Mineral Activity on:	Same treatment as domestic investment (EMR, Art. 37, 38; MMR, Art. 28, 29)[4]
	Foreign Direct Investment	
	Commodities	None
	Application Area	State planned mining area, mining area of great value to the national economy, and the specified minerals for which protective mining policy is prescribed by the State (MRL, Art. 17); harbors, airports, national defense zone, important industrial district, large scale conservancy works, municipal engineering installations of cities and town, railways, highways, important rivers and embankments, natural reserves, important scenic spots, historical relics, or scenic beauty (MRL, Art. 20)
7)	Coverage of the Mining Law	Geological survey, exploration, mining, selling minerals[5]
8)	Exploration Stage:	
	Title Acquirement	Apply to the licencing authorities[6] (EMR, Art. 4;) or public bidding (EMR, Art. 16)[7]
	Permitting Termination	40 days (EMR, Art. 8)
	Necessary Conditions for Permitting	National plan for geological exploration or exploration contract, implementation proposal for exploration, certificate for the qualification of exploration unit, documents of proof showing the source of the funds (EMR, Art. 6)
	Title(s) Exclusivity	Yes (EMR, Art. 9)
	Initial Term for Exploration	EL[8]: 3 years (EMR, Art. 10) RER[9]: 2 years[10] (EMR, Art. 21)
	Renewal(s)	2 years each time (EMR, Art. 10) RER: 2 years x 2 (EMR, Art. 21)
	Extent of Concession	40 basic unit blocks[11] for metal, none-metal, and radioactive minerals[12] (EMR, Art. 3)
	Shape of Concession	Polygon (EMR, Art. 3)
	Reporting Obligation	Yes (EMR, Art. 18, 24, 25)
	Relinquishment Obligation	none
	Transfer of Concession	Yes, but need to be examined and approved within 40 days from application by the licencing authorities[13] (MRL, Art. 6.2; EMR, Art. 22.3; TR[14] , Art. 3, 4, 5, 7, 8, 9, 10)
	Concession Holding Fee	1-3 year – 100 RMB yuan per sq. km annually; 4- year – 100 RMB yuan per sq. km added per year; and the highest amount shall not exceed 500 RMB yuan per sq. km per year as annual Exploration Fee[15] (EMR, Art. 12).
	Minimum Expenditure Obligation	1 year – 2,000 RMB yuan per sq. km; 2 year – 5,000 RMB yuan per sq. km; and 3 year – 10,000 RMB yuan per sq. km each year thereafter (EMR, Art. 17).

9)	Security of Tenure:	
	Exclusive Rights from Exploration to Mining	Yes[16] (MRL, Art. 6.1)
	Accompanied Documents to the Application	Environmental Impact Assessment (EIA) report[17] (MM[18], Art. 5.4), exploration report[19] (MRL, Art. 13), mine design and development plan[20] (MRL, Art. 29, 30; MMR, Art. 5.3)
	Approval termination	40 days (MMR, Art. 6)
10)	Mining Stage:	
	Maximum Extent of Concession	not specified[21]
	Initial Term for Mining	Large scale project – 30 years; medium scale project – 20 years; and small scale project – 10 years (MMR, Art. 7)
	Renewal(s)	possible (MMR, Art. 7)
	Concession Holding Fee	1,000 RMB yuan per sq. km per year as mining rights use fee (MMR. Art. 6, 9)
	Minimum Production Requirement	not specified
	Mining Rights Transfer	Yes[22] (MRL, Art. 6.2; TR, Art. 3, 4, 6, 7, 8, 9, 10)
	Mortgability	it is permitted.
	Compensation Requirement	Yes[23] (MRL, Art. 32)
	EIA Requirement	Yes (MMR, Art. 5)

4. Fiscal Regimes

1)	Corporate income tax:	33%
2)	Royalty:	gold, 4%[24], copper, 2%; and zinc, 2% on sales revenue
3)	Import duty:	none for enterprises with foreign investment under specific conditions (Regulations for the Implementation of the Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures, Art. 71)
4)	Dividend withholding tax:	none
5)	Tax holiday:	5 years tax will apply if a mine will operate for more than 10 years (1, 2 year – 100%; 3-5 year – 50%), tax holidays does not apply to mines producing gold, other precious metals or rare earth metals
6)	Foreign external account:	allowed
7)	Government equity requirement:	none
8)	Export duties on minerals:	None for enterprises with foreign investment; gold cannot be exported
9)	Exchange control:	free from major restrictions
10)	Value added tax:	Actual tax rate is about 6-8% as a percentage in sales revenues for domestic mining enterprises, gold is exempted; zero rate is applied to the enterprises with foreign investment
11)	Tax stabilization:	none

5. Environmental Regulations

1)	Environmental law:	Environmental Protection Law, Law on the Prevention and Mitigation of Water Pollution, Law on the Prevention and Mitigation of Air Pollution, Regulations on the Control of Noise Pollution, Regulations on Land Reclamation, Interim Measures on the Collection of Fee for Excessive Release of Pollutants, Measures on Environmental Protection Management on Capital Construction Projects

2)	Adopted international law:	Antarctic-Environmental Protocol, Antarctic Treaty, Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands: signed, but not ratified: none of the selected agreements.
3)	Environmental administration for mining:	Ministry of Environment, Ministry of Land and Resources
4)	Inspection and monitoring agency:	Ministry of Land and Resources (MMR, Art. 14)
5)	Emission/effluent standard:	as specified by relevant provisions and rules
6)	Community consultation obligation:	Not specified
7)	Pollution taxes:	levies for excessive release of pollutants
8)	Mine close/reclamation bond:	None[25] (MRL, Art. 21)

[1] Mineral Resources Law.

[2] The Ministry of Land and Resources shall examine, approve, register, and licence to an exploration project which straddle two or more administrative areas, or is the sea area, or is from an enterprises with foreign investment applicant, or project for which those minerals listed in the Appendix attached to the regulations on exploration (EMR, Art. 4).

[3] Regulations for registering to Explore for Mineral Resources Using the Block System.

[4] Regulations for Registering to Explore for Mineral Resources prescribes that "These Regulations shall be applied to any foreign investment in exploring for mineral resources" in Article 37. Regulations for Registering to Mine Mineral Resources prescribes that "These Regulations shall be applied to any foreign investment in mining mineral resources" in Article 28.

[5] Minerals products to be purchased exclusively by designated units may not be purchased by any other units or individuals (MRL, Art. 34).

[6] Applicants shall pay Reimbursement Fee for Exploration Right or Mining Right of mineral deposits discovered by the State in any blocks, and the Reimbursement Fee will be based on costs incurred by the State (EMR, Art. 13; MMR, Art. 6, 9). The Exploration or Mining Fee and Reimbursement Fee may be reduced or exempt (EMR, Art. 15; MMR, Art. 12).

[7] The licencing authority shall give priority to any exploration project listed in the first category of the National Geological Exploration Plan (EMR, Art. 8).

[8] Exploration Licence.

[9] Retention of Exploration Right, which can be applied by the exploration licencee within the term of a valid exploration licence from the need to defer the present development of the deposit or from the present technical support (EMR, Art. 21).

[10] The licencee shall continue to pay the Exploration Fee (EMR, Art. 21).

[11] Basic Unit Block is longitude 1' x latitude 1' (EMR, Art. 3).

[12] The State shall adopt a Unified Block Registration System (MRL, Art. 12).

[13] Exploration licence may be transferred to others after completion of the stipulated minimum exploration expenditure and subject to approval in accordance with law (MRL, Art. 6.1).

[14] Regulations for Transferring Exploration Rights and Mining Rights.

[15] The Exploration Fee may be reduced or exempt if the minerals or areas are encouraged for exploration by the State (EMR, Art. 15).

[16] Exploration licencees have the privileged priority to obtain mining right to the mineral resources in the exploration area (MRL, Art. 6.1). However, the authority shall examine its application of the mining area, mining design or plan, production technique, and safety and environmental protection measures before the approval (MRL, Art. 15).

[17] Environmental Impact Statement (EIS) report shall be presented to the licencing authorities prior to submitting the application for the mining rights (MMR, Art. 4).

[18] Regulations for Registering to Mine Mineral Resources.

[19] The mineral resources approving agency shall be responsible for examining and approving the prospecting reports to be used for the purpose of mine construction designing (MRL, Art. 13).

[20] The recovery rate and impoverishment rate in mining and recovery rate in ore dressing shall meet the design requirements (MRL, Art. 29), and minerals of commercial value shall be comprehensively mined and utilized in accordance with a unified plan to avoid waste (MRL, Art. 30).

[21] Three dimensional spaces for mining (MMR, Art. 32).

[22] Mining companies may transfer its mining right to others, subject to approval in accordance with law (MRL, Art. 6.2).

[23] Damages caused from mining mineral deposits to the production and livelihood of other persons shall be liable to making compensation and adopt necessary remedial measures (MRL, Art. 32).

[24] Gold must be sold to the Peoples Bank at a price which is equal to or higher than the international market rate, published by the central government.

[25] Need approval of the submitting report about mining operation, hidden dangers, land reclamation and utilization, and environmental protection (MRL, Art. 21).

XI. CURRENT STATUS OF REGULATORY REGIME FOR THE MINERAL SECTOR IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

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A. MINERAL DEVELOPMENT POLICY

In 1985, the Government introduced the "New Economic Mechanism (NEM)" which is aimed at changing the basis of the national economy from centalized planning to free-market principles and a new constitution was promulgated in 1991.

The NEM encompasses a wide-ranging and evolving series of trade and fiscal reforms; the restructuring or privatization of some state enterprises, liberalization of foreign investment policy and regulations and other measures designed to promote private sector activity. Many of these reforms are specifically directed towards the mining sector, which is recognized as a potential engine of economic growth.

Most relevant to the minerals industry are the establishment of a Foreign Investment Management Committee (FIMC), the promulgation of a new Foreign Investment Law (March 1994) and the promulgation of a Mining Law (31 May 1997).

Notwithstanding the increasing importance of mining industries' contribution to the national economy of the Lao People's Democratic Republic in recent years, geological details and the extent of the country's mineral resources remain relatively unknown, but indications are, however, that of high prospectivity. The country is known to have a mineral resource endowment that includes precious and base metals, iron ore, copper, galena with sphalerite and in some cases with high silver content, lead, zinc, gemstones, and possibly petroleum. The exploration for tin, gypsum, coal, barite, limestone and sapphire are currently underway.

Foreign investment in the mining sector is still at the very early stage of evolution, and an accurate analysis of overseas private sector involvement in the Laotian mineral industry is considerably a difficult task.

The mineral sector, which is now considered to be an engine of economic recovery in the country, has the potential for activating investment and promoting the Lao People's Democratic Republic as a land of investment opportunities. The exploitation of the mineral potential will depend on specific investment projects which, in line with the government's new policy, should increasingly come from the private investor especially for commercial exploration and new mine development.

Currently, the role of the Government in the mining sector is to create a favorable legal and investment policy framework, which is conductive to attracting foreign mining interest. In line with this role, the Government's strategy for the mining sector is as follows:

- Promote the ecologically sustainable use of the country's mineral resources;
- Promote systematic exploration of the country by modern and integrated techniques;
- Promote the immediate development of small scale and artisanal mining ventures;
- Promote the medium-term development of large scale mining operations.

To implement this strategy, the Government has initiated a number of measures, which include the following:

- Establishment of appropriate national mining, environmental protection and investment laws so as to provide a well defined investment climate for both mineral exploration and subsequent development projects.
- Encouraging the existing parallel market operators (usually small scale) to transfer to the formal market.
- Providing administrative and support services to investors in mineral exploration and development.
- Undertaking geological survey programmes to help identify those areas with high prospectively. Identified areas can be promoted as exploration targets to private sector companies.
- Developing government organizations and services necessary to support the mining sector and efficiently manage new mining projects.

To achieve its goals, the Government plans to embark on a mineral resources investment promotion programme both within the region and internationally. The primary targets of the investment promotion programme will be foreign mining companies with an established reputation for environmental sensitivity and good environmental management. This programme will highlight the favorable investment climate (legal, financial, institutional) and the mineral prospectivity and development potential in the country. To support this programme, the Government will continue to expand geological information, laboratory and title management services within the DGM. These service will provide investors with current information on which to base their exploration and investment decisions (Vilaihong, M., 1999).

B. CURRENT STATUS OF MINING LEGISLATION AND REGULATIONS IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

After the independence of the Lao People's Democratic Republic in 1975, the Government encouraged the development of the mining sector through mineral exploration. At the present time, the Department of Geology and Mines has a database of relevant exploration and development information. From 1989, the Government of the Lao People's Democratic Republic under the New Economic Mechanism (NEM) has authorized the issuance of a limited number of mineral concessions to foreign corporations for exploration of coal, construction material, base metals and gold (figures 11.1 and 11.2). In 1990, there were some transnational companies intended to invest in the mining sector. The Department of Geology and Mines (DGM) has experienced some difficulties to draft mining agreements and negotiate with mining investors due to a lack of experience and a weak legal system in the mining sector. In 1991, the first ADB legal consultant came to the Lao People's Democratic Republic to assist the Department of Geology and Mines (DGM) to draft a Mining Decree. One year later, the Lao Government had an opportunity to send the Lao officer abroad to be trained in drafting Mineral Exploration and Production Agreement (MEPA).

The DGM has first line authority for regulation and administration of the minerals development sector, which includes oversight of foreign and domestic corporations and also individuals undertaking exploration, development and production of minerals.

In 1996-1997, UNDP sponsored a project on drafting of a proposed Mining Law and Implementing Rules and Regulations. A Mining Law was enacted in May 1997. The Mining Law, however, as enacted was in some parts different from the draft Mining Law that had been proposed by the UNDP legal consultant. The UNDP office in the Lao People's Democratic Republic subsequently sponsored the

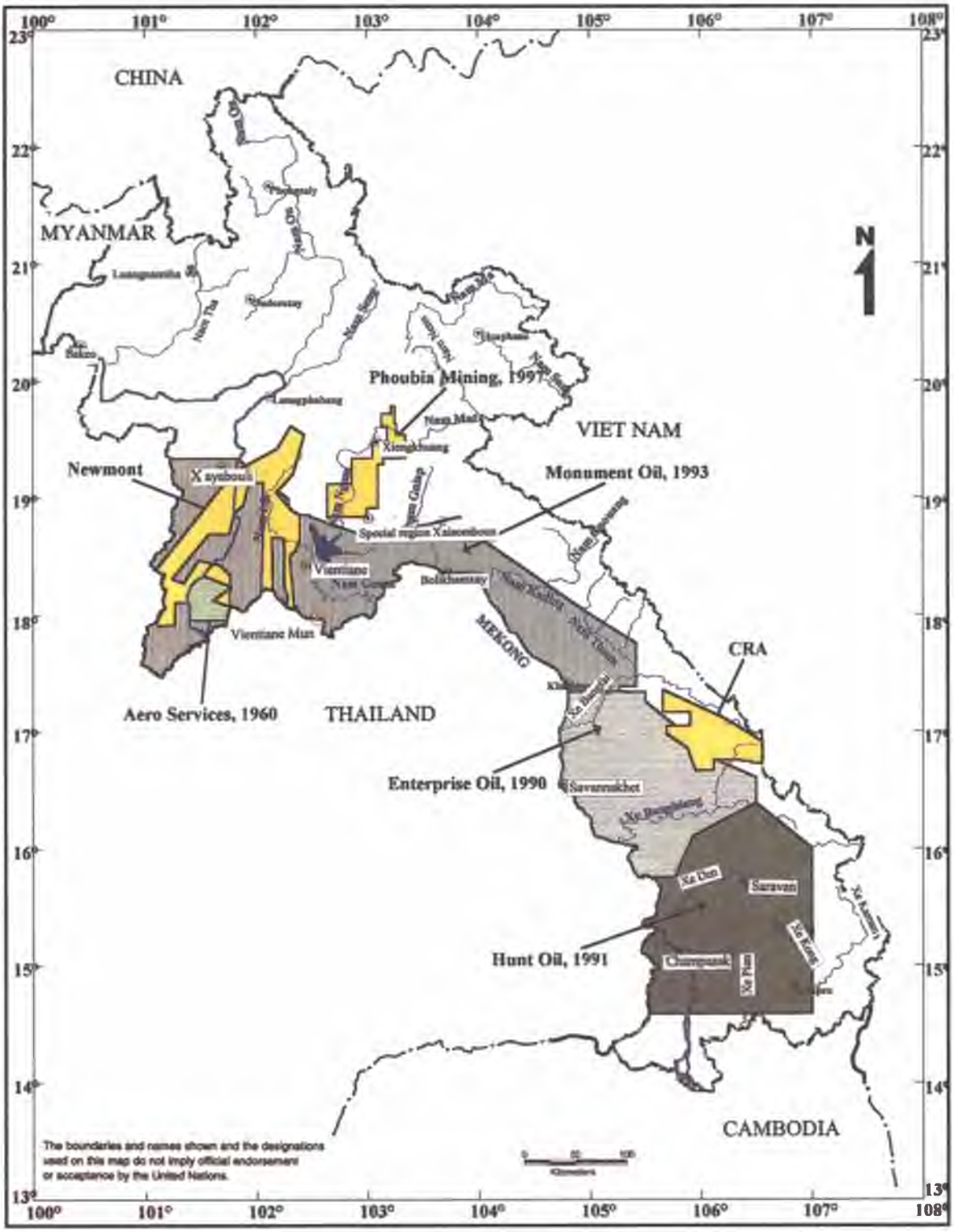

Figure 11.1. Location of principal mineral concessions in the Lao People's Democratic Republic, 1997

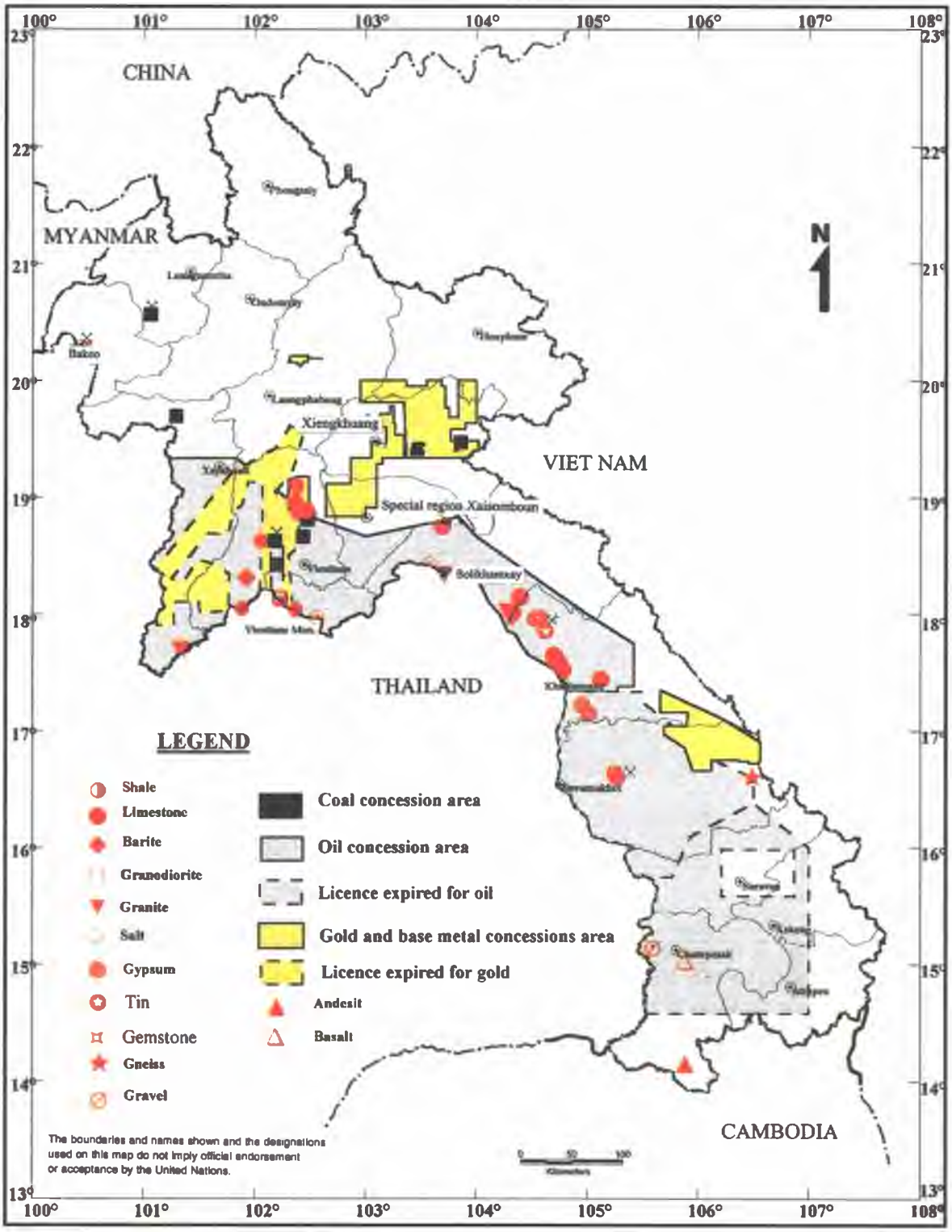

Figure 11.2. Location of principal mineral concessions in the Lao People's Democratic Republic, 1998

drafting of additional Implementing Rules and Regulations for the Mining Law, for regulation of environmental impacts of mining and regulation of mine safety and health. All three areas of Implementing Rules and Regulations such as mining, environment, mine safety and health, are currently still in a draft stage and have not been officially promulgated.

Even though the Mining Law is in place, there is so far no working regulatory or administrative scheme currently in place. Formulation of Implementing Rules and Regulations will provide the Department of Geology and Mines with necessary guidance and procedures to implement the provision of the 1997 Mining Law on a daily basis. Many problems have been experienced within DGM concerning routine of regulation and administration of mineral exploration and mining activities.

The overall reaction to the 1997 Mining Law by the international mining community was negative due to broad provisions in the Mining Law, which are considered extremely regressive by many in the international mining companies. The situation has been exacerbated by the fact that no official English translation of the Mining Law exist, although, a rough unofficial translation was prepared in 1997.

In addition, significant legal issues have arisen with each of the current mining companies undertaking mineral activities in the Lao People's Democratic Republic. These include such issues as valuation of minerals, first right of exploration by an existing concessionaire, authorization of multiple processing plant within exploration areas and the extent of the legal obligations of the prime concessionaire for sub-contractors.

Resolution of most of these issues should be made in accordance with the Mining Law. All of the existing mining companies have been informed by DGM that their respective contracts of work with the Government of the Lao People's Democratic Republic must be renegotiated in the near future to bring their authorities under regulation of the Mining Law. The renegotiation of these contracts should, however, take place only after the Implementing Rules and Regulations are in place in order to ensure a cohesive and responsible legal regime and rational renegotiation of contract that will adequately protect the interest of the Lao People's Democratic Republic. These issues of concern received prior attention by the Government. Based on these concerns, the ESCAP secretariat was requested in 1999 to provide training and legal technical assistance to DGM on regulation and administration of mining activities, which was aimed to establish a more stable and more investors friendly regulatory and administrative regime. Such assistance has been provided by ESCAP during 1999-2000 through two projects and included the drafting of three important components of the Lao People's Democratic Republic's regulatory regime over its mineral sector: (a) Implementing Rules and Regulations under the 1997 Mining Law (IRRs); (b) Inter-Ministerial Agreements (IMAs) that proposed an allocation of regulatory responsibilities and cooperative methods between DGM and four other respective ministries, including the Foreign Investment Management Committee (FIMC), the Science, Technology and Environment Agency (STEA), Ministry of Finance (MOF) and the Ministry of Forestry and Agriculture (MAF); (c) Model Operations Contracts for three levels of mining operations (small, medium and large) and subsequent follow up Training on Implementing Rules and Regulations for the 1997 Mining Law, Inter-Ministerial Agreements and contract negotiations. The training project was organized by ESCAP in cooperation with PACRIM Resource Development, Inc. (PACRIM) and was conducted in the Department of Geology and Mines (DGM) of the Ministry of Industry and Handicrafts (MIH) and various other ministries that have regulatory oversight responsibilities over the mineral sector. The in-country portion of the project took place between 31 October to 26 November 2000 (Clark, J., 2000).

The project has found that the Department of Geology and Mines has and continues to face difficult issues that are not specifically addressed by the Mining Law and that were considered in drafting the current IRRs. The most problematic issues arise from existing mining operations in the Lao People's Democratic Republic and include such things, but are not limited to, the rights and responsibilities of foreign investors' to develop mining operations after exploration; the right and/or bidding priority for

contractors who have previously relinquished concessions; and, the allowable extent of a foreign investor to bring in third parties, contractors or subcontractors to develop separate areas in mineral contract areas including multiple processing plants. In addition, at the time the 1997 Mining Law was promulgated and effective per the laws of the Lao People's Democratic Republic, there was several foreign investors who held mining contracts. The 1997 Mining Law specified that parties to the pre-existing contracts would be contacted by the Government and those contracts would be subsequently re-negotiated to fall under the 1997 Mining Law. None of the above issues have been satisfactorily dealt with, in large part because of the absence of IRRs, which would address such issues in further detail.

At the conclusion of this component of the project, DGM reiterated its desire to continue with this project until the regulatory regime within the Lao People's Democratic Republic for its mining sector is completed and active. As part of its reform of the regulatory regime for foreign investment, the Government has expressed its desire to amend the Mining Law to remove those provisions that have been blocking more foreign investment in the country's mineral sector (Clark, J., 2000).

The Government wishes to have a complete overall regulatory regime within the Lao People's Democratic Republic that will increase foreign investor confidence and subsequently increase foreign investment into the country's mining sector. While a "complete" regulatory regime is an ideal that probably is only obtainable over a substantial period of time, if indeed at all, the most important consideration for the Lao People's Democratic Republic at this time is to increase foreign investment into the mining sector to fuel economic growth and development.

A critical step in the reform efforts needed to increase foreign investor confidence will be to amend or revise the 1997 Mining Law. The Lao People's Democratic Republic Government is well aware that some provisions of the 1997 Mining Law have had an adverse impact on investor confidence. The 1997 Mining Law has also drawn severe criticism from the international mining industry, foreign governments with active international mining companies, non-governmental organizations, and various international mining consultants. The project concluded that DGM is willing to consider amendments to the Mining Law to attempt to remove or revise those provisions that have been seen to discourage foreign investment in the country's mineral sector. Where the provisions of the 1997 Mining Law may be amended or changed, the IRRs will need to be amended and/or changed respectively. The most important recommendation made by the consultant hereto is the continued work on the amendment to the Mining Law and the harmonization of the IRRs (Clark, J., 2000).

Therefore, one of the project recommendations made for ESCAP was to continue support for legal and training assistance to the Lao People's Democratic Republic on the amendment of its Mining Law and subsequent harmonization of its IRRs, to the extent it is necessary. In addition, DGM also formally requested the consultant to provide them with proposed legislation for the Lao People's Democratic Republic coal sector and the Lao People's Democratic Republic oil and gas sector, as both areas are within the regulatory mission of DGM. Also, the consultant discussed with DGM the desirability of having separate sections of the Mining Law and IRRs for gemstones, industrial minerals and coal mining. DGM expressed interest in formulating these separate provisions and requested that these issues be considered for future cooperative work (Clark J., 2000).

Based on the above documents, the DGM has just finished drafting Implementing Decree on Mining Law, draft rules on environmental protection and mine health and safety. These documents were modified in December 2001 and sent to the concern authorities for consideration.

C. CURRENT STATUS AND PERSPECTIVES OF MINERAL RESOURCES DEVELOPMENT IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. The Non-Fuel Mineral Potential of the Lao People's Democratic Republic

The Lao People's Democratic Republic has a high potential for metallic and bulk minerals but this potential has not yet been realized in development of a economically viable mining industry. Compared to other countries in the Greater Mekong Subregion, the Lao People's Democratic Republic has a higher potential for the discovery of new ore deposits and their successful development.

It is difficult to make a complete assessment of current mineral potential on the basis of the present uneven distribution and incomplete state of mineral exploration data for the Lao People's Democratic Republic. Approximately 84 per cent of the country's area remains to be geologically surveyed at the reconnaissance scale of 1:200,000. The geology of the Lao People's Democratic Republic is not well known in detail and much modern coverage is the result of satellite image interpretation with limited ground follow up.

2. Major targets for mineral exploration and mining projects

The development of a significant minerals industry in the Lao People's Democratic Republic will be realized only if major international mining companies can be persuaded to invest time, manpower and money in large scale exploration programmes spread over several years. Mining, by its very nature, is a long-term business and mining companies will need to be convinced that by spending periods of up to five years carrying out exploration work they can be reasonably confident of finding world-class ore deposits which they will be permitted to manage and mine profitably.

At the present time, a number of factors – both physical and legal – are acting to hold back the development of such programmes. The Government of the Lao People's Democratic Republic will need to do everything within its power to eliminate, or at least minimize, the adverse impacts of these constraints on the future development of the minerals industry.

The Lao People's Democratic Republic has potential for development of gold, copper and zinc deposits. The geological evidence is favorable as at least more than 500 mineral occurrences have been reported. Nevertheless, much data undoubtedly remains to be assembled and, accordingly, the true potential cannot be fully assessed at this time (Vilaihong, M., 1999).

The UNDP Project Lao/88/023 has identified 16 mineral districts (not including areas allocated to State Mining Enterprises) with a potential for economic mineral development (table 11.1 and location map on figure 11.3).

The mining activities in the country have been on a relatively small scale, and prior to 1990 there was almost no systematic exploration for commercial scale mineral deposits. However, there has been a continuing interest by large foreign exploration companies to acquire mineral concessions in the more prospective regions. Most of the interest is focused on exploration for base metals, gold, and coal. This is reflected in the concessions granted and recent exploration activities summarized above. Of particular interest has been the surface exploration and drilling activities of companies namely CRA-RTZ, Normandy – Anglo Asian MMC and BHP. These activities have focused on gold and copper. CRA's programme is currently centered on the Sepon mineral field. Metallurgical characterization of more advanced gold prospects is in progress. At Phonesavan, Normandy Anglo-Asian's exploration programme has identified significant low grade copper-gold mineralization at the Khamthonglai and Bo Thane prospects. Extensive drilling is underway at Phu He. MMC & BHP's exploration programme is underway in the area next to the area of Normandy Anglo-Asian.

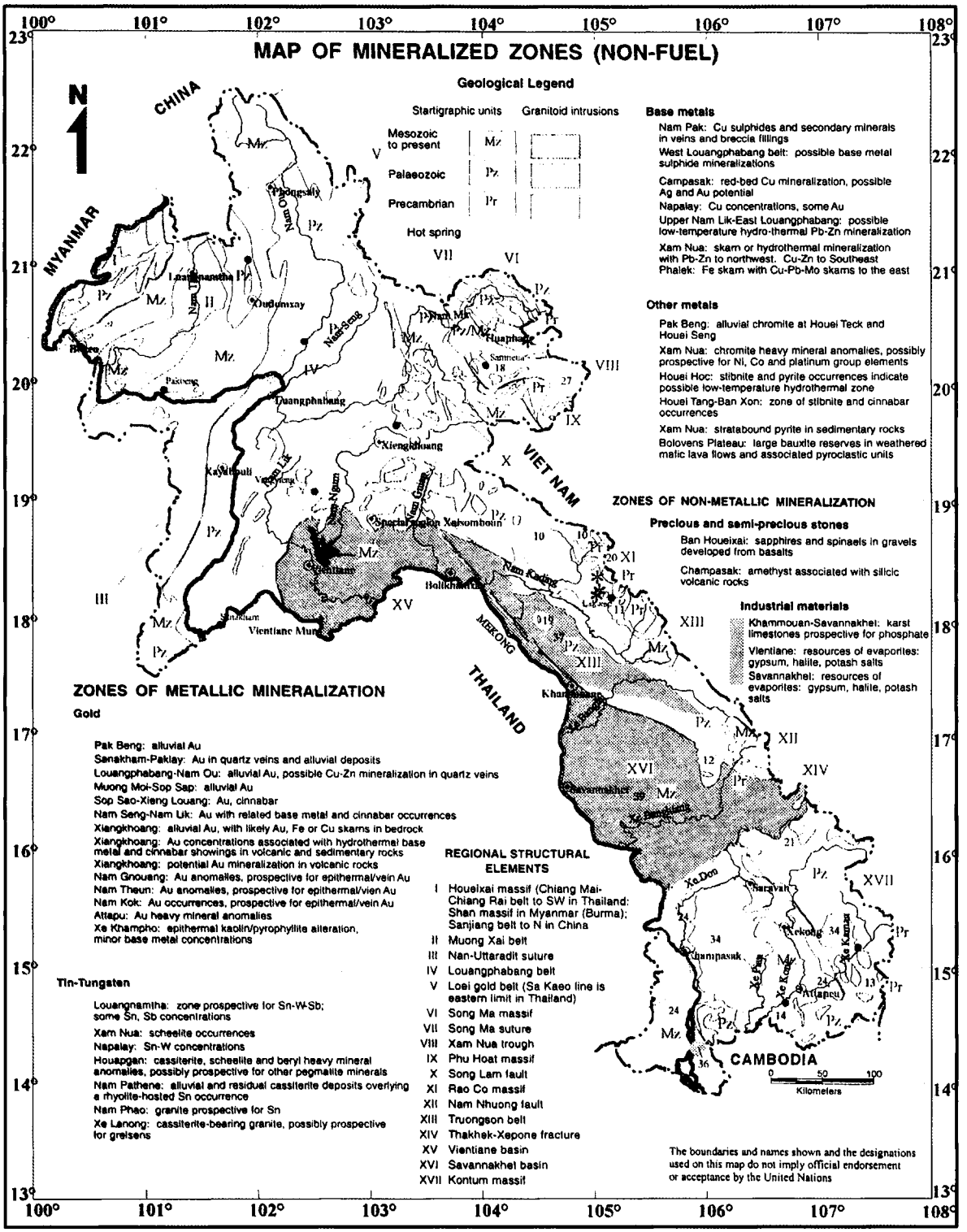

Figure 11.3. Map of mineralized zones (non-fuel) in the Lao People's Democratic Republic

Table 11.1. Potential districts for economic mineral development in the Lao People's Democratic Republic

	Mineral districts	Minerals and genetic types
1.	Muang Fouang-Nam La	Gold and base metals Replacement in limestone
2.	Sanakham	Gold and Base metals Granitoid-associated
3.	Nam Met	Gold Eluvial and Alluvial
4.	Vang Vieng-Kasi	Base metals, polymetallics Replacement in limestone
5.	Louang Prabang	Gold – volcanogenic environment Placers
6.	Nam Ou	Gold – volcanogenic environment Placer
7.	Pak Beng	Gold – volcanogenic environment Placer
8.	Oudomxai	Base metals – copper occurrences
9.	Xiengkhouang	Gold and Base metals
10.	Sam Neua – Ban Done	Gems/Beryllium
11.	Sam Neua	Chromite/platinum Ultramafites
12.	Pha Lek	Iron – Cu/Au Skarns
13.	Lak Xao	Gold Placers
14.	Upper Xekong basin	Gold/Silver Placers
15.	Upper Xe Kaman	Gold Placers
16.	Champasak	Base metals

In 1995, a mineral concession was issued to Pa Daeng Company, a Thai Company, to explore for zinc at Vang Vieng, Vientiane province. Reserves discovered up to now are small, and the company will continue exploration in other areas.

Prospects remain good for the discovery and development of a medium to large gold or base metals deposits within 2-5 years. It is also critical that further institutional, legal and investment promotion mechanisms be developed to stimulate private sector initiatives and to facilitate the rapid and smooth development of commercial mineral discoveries. Of particular importance is the creation of an environmental management framework and analytical capacity within DGM. This capacity is essential for both the regulation of existing exploration/development programmes and, through the removal of policy uncertainties, to the attraction of new prospecting interest.

3. Mining Development and Trends

Since 1975, most detailed exploration in the Lao People's Democratic Republic has been focused on gold, tin, sapphires and evaporates, some attention also being paid to iron, glass sand, limestone and clay. As of today, important deposits of many valuable minerals have been found, but whether or not these

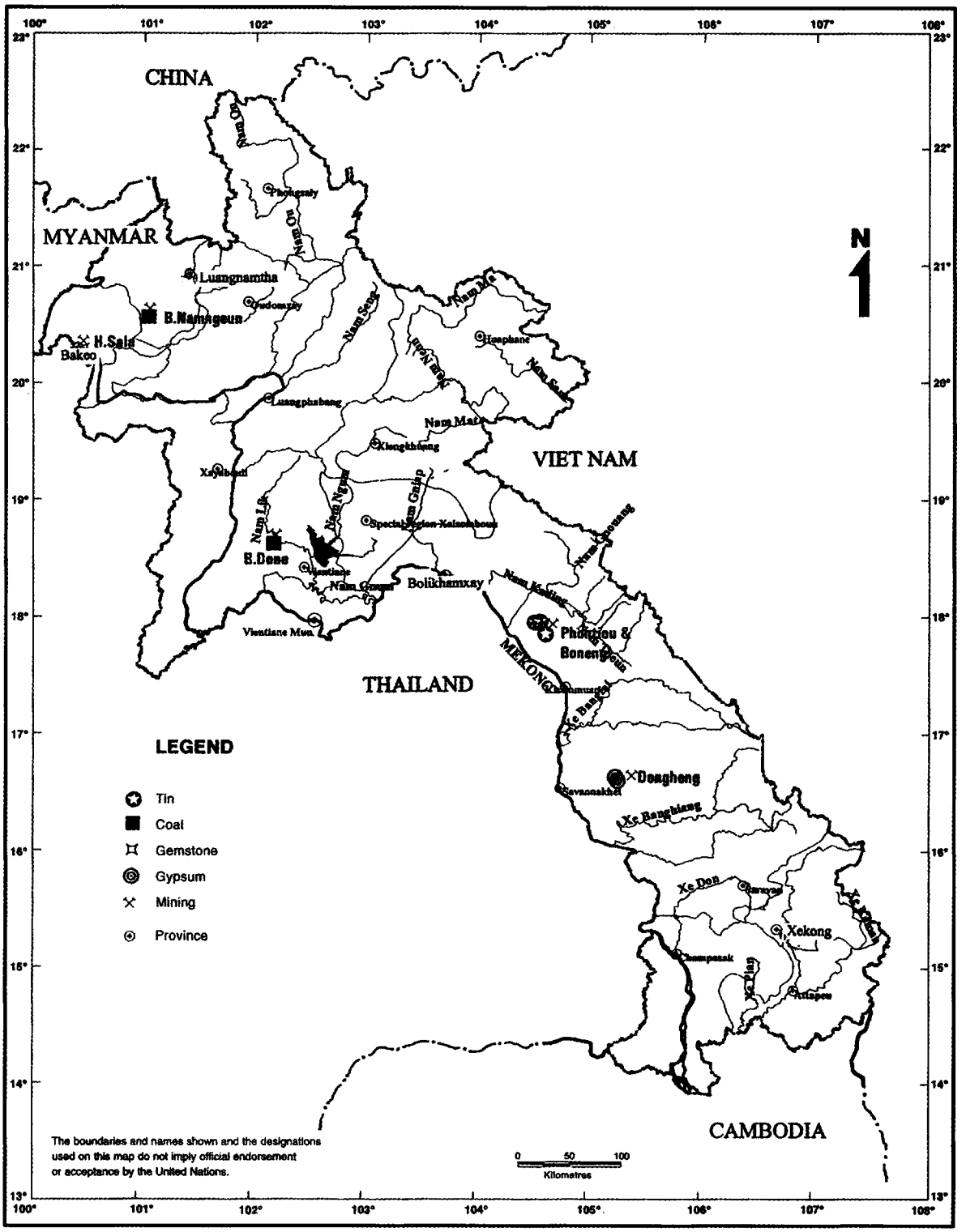

Figure 11.4. Location of current mining activities in the Lao People's Democratic Republic

exist in quantities or concentrations which would justify commercial exploitation on large scale remains to be ascertained. Minerals, which have so far been identified, include gold, copper, gypsum, coal, iron ore, leas, zinc, limestone, manganese, tin and bauxite.

Alluvial gold is panned from streams over much of the Lao People's Democratic Republic. In many areas, especially along the Mekong River in the northern half of the country, gold is being eroded out of sediments that have been intruded by igneous bodies. Gold is panned casually year after year by the villagers. It appears to be a renewable resource in such locations, replenished by the annual floods.

Large-scale mineral production in the Lao People's Democratic Republic has been limited to gypsum, tin, salt, coal, and gemstones with production and silver continuing on a smaller-scale (figure 11.4). At present, commercial mining activities are focused on gypsum and tin with minor coal and barite workings. Other, even smaller-scale mine activity is limited to sapphires and gold from alluvium, extraction of salt and guano, quarrying of limestone, road construction materials, construction sand and gravel, and kaolin and brick-clay. Mineral production in the Lao People's Democratic Republic for the period from October 1999 to September 2000 is given in table 11.2.

Table 11.2. Mineral production in the Lao People's Democratic Republic, October 1999 – September 2000

Mineral commodity	Unit	Quantity
Coal for export	Tons	167 878.23
Coal for domestic use	Tons	17 785.96
Tin (70%)	Tons	578.25
Sapphires	Carats	802 656.00
Limestone for cement	Tons	122 265.47
Limestone for construction	Cubic metres	15 856.00
Shale fro cement plant	Cubic metres	17 031.08
Baryte	Tons	1 400.00
Gypsum	Tons	137 500.00

Source: Phengthavongse, 2001.

A gold project which located in Sepone, Savannaket Province was scheduled to be exploited at the end of the year 2001. From early 2001, a potash exploration and development project was planned to be carried out under the Lao-China cooperation. Sapphires are undertaking the exploration by two companies, one is a local company and another one is a foreign company.

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XII. MINERAL POLICY, LEGISLATION AND REGULATIONS IN MONGOLIA

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A. INTRODUCTION

Mongolia is one of the countries worldwide where mining is expected to play an important role in the economy in the long term. At present, it accounts along with limited other industrial outputs for about one third of GDP.

The country has already a developed mineral industry with large-scale copper and coal mining and considerable production of fluorite and gold from placer operations. There are strong indications that the country has the potential to develop a larger mining industry. Indications are for good gold and silver potential, base metals and REE along with proven large deposits of coal.

The government encourages the development of the mining industry and has put in place the necessary legal departmental arrangements to support private investment in mining. The 1997 Minerals Law of Mongolia is one of the most favorable in the developing word. It is simple and straightforward and provides investors with adequate time frames for exploration and mining licences against a low cost and assured transferability of titles. The Law has clear title provisions, provided for stability agreement and guaranteed transferability of mineral titles. The 1997 Minerals Law made the regulatory framework clear and transparent. The simple procedure and the possibility for investors to obtain stability agreements made the Law attractive to investors.

There are, however, several problems in Mongolian mining industry. The old operations are still characterized by aspects of the central planning environment under which they were initiated. Economic problems in the copper and fluorite industry include the continued output of relatively low-grade products and transportation of these products over very large distances to the final destinations. The environmental problems of the industries are largely due to the lower level of attention given to environmental management under centrally planed economic policies. This is also valid for the coal mining industry. Mongolia's gold industry is mainly producing gold from placer deposits, although the potential for hard rock gold mining definitely exists. Placer mining can be very destructive for large and extensive parts of the river systems where they operate.

The international mining industry has been very positive towards Mongolia since the country turned towards market oriented policy. This positive attitude relied on the perceived good mineral potential of the country, and the political stability. Most of the company's attention has been for gold. Recently, there has been severe downturn in exploration activity. Generally, this has been caused by the prevailing difficult conditions in mineral exploration and the mining industry worldwide, and Mongolia is not the only country where exploration is low. The problem for Mongolia has been aggrevated by "gold tax", a sales tax on the value of all exported gold.

Increasingly worldwide, there are growing concerns for the interests of local people and areas where mining takes place. These concerns focus amongst others, on the occupation of traditional lands, the disturbance of a traditional way of life, the destruction of the local environment and the sharing of the local community in the revenues obtained from the mining. In Mongolia, however, it seems unlikely that active intervention of the local population will seriously disturb mining operations.

B. CURRENT STATUS OF THE MONGOLIAN MINING INDUSTRY

The mining and mineral-based industries play a most important role in the economic development of Mongolia. The production and export of mineral commodities accounted for approximate 40 and up to 60 per cent of gross industrial output and export respectively in the last five years.

Mongolia is one of the major producers and exporters of copper and molybdenum in Asia and one of leading world producer of acid and metallurgical grade fluorspar. Currently, about 500 deposits of non-ferrous metals, coal, rare earth, precious metals and uranium have been discovered. The Mongolian mining industry is dominated by the development of copper/molybdenum, fluorspar, gold and coal. Around 200 mineral deposits, including 35 of construction materials, are under exploitation, and 90 deposits of construction materials are planned to be developed. Except the biggest open-cut coal mines as Baganuur, which supplying the coal to power stations of the central energy system, the Mongolian-Russian joint ventures like ERDENET copper mine and MONGOLROSTSVETMET mostly produces fluorspar are dominants of the Mongolian mining industry.

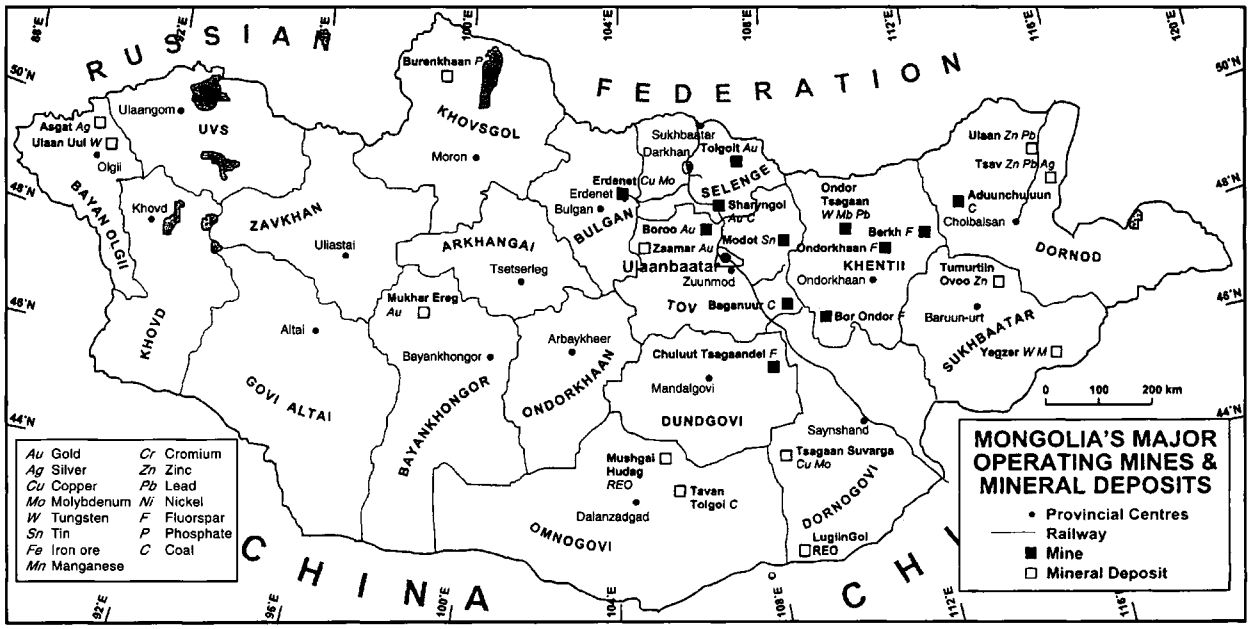
Mongolia accounts for nearly 14 per cent of the world's fluorspar output, with underground mines in Berkh and Borundur, and the open pit mines at Khar-airag, Khajuu-ulaan and Urgen. The biggest mining and processing complex at Borundur has produced 75,400 tons of 92 per cent fluorspar concentrate and 67,100 tons of 75 per cent metallurgical grade fluorspar by October 2000. Almost all production was exported to the C.I.S. countries.

Other mining operations include tungsten mines at Tsagaan-davaa and Ulaan-uul, tin mines at Modot are shut down because of market, gold mines in Tolgoit, Zaamar, Bayankhongor and Sharyngol gold fields are in operation. There are several deposits with surveyed and assessed reserves which Mongolia opens for investment by foreign mining companies. There are the country's largest known cooking hard-coal deposit at Tavan tolgoi in the south Gobi with 5 billion tons of reserves, base metal deposits at Ulaan, Tsav and Mukhar in eastern Mongolia, deposit of skarn magnetite's at Tumurtyn Ovoo in Sukhbaatar province and the Asgat silver deposit in western Mongolia, (figure 12.1). Mineral production and the share of the mining industry in the national economy are provided in tables 12.1 and 12.2 respectively. Major deposits for mineral development are presented in table 12.3.

C. LEGAL AND FISCAL FRAMEWORK FOR DEVELOPMENT OF THE MINERAL SECTOR

With the adoption of a new Minerals Law in 1997, the mineral sector has seen a significant increase in mineral exploration. Over 20 per cent of the country's territory has been licenced for exploration and mining. The Minerals Law provides equal rights to investors, irrelevant of their nationality. Complete foreign ownership is allowed and there are no restrictions on the repatriation of dividends and profits. Although the country has a well educated workforce, Mongolian law allows freedom of staffing from both domestic and foreign sources. The new Minerals Law has the following notable features:

- First come-first served is the criterion for the granting of a mineral licence.
- An application for a mineral licence can only be rejected if the requested area wholly or partially overlaps with: (i) special needs for land; (ii) a reserved area; (iii) an area subject to a valid licence; or (iv) a disputed area (subject to a court ruling).
- Mineral licence holders have an exclusive right to explore for and mine all minerals within their licence area (except water, petroleum and natural gas).



Source: Galsandorj, D., 1996.

The boundaries and names shown and the designations used on this map do not imply official endorsement or aceptance by the United Nations.

Figure 12.1. Major operating mines and mineral deposits of Mongolia

Table 12.1. Mineral production of Mongolia, 1990-2001

Mineral commodity	Unit	1990	1995	1996	1997	1998	1999	2000	2001
Fluorspar concentrate	Thousand tons	118.9	120.3	127.6	130.1	125.0	110.4	110.9	130.0
Metallurgical Fluorspar	Thousand tons	118.9	120.3	127.6	130.1	45.9	53.7	87.8	71.0
Cu – Mo ore	Million tons	18.6	20.8	20.99	17.5	22.1	22.23	23.06	24.01
Cu in Concentrate	Thousand tons	123.9	121.9	132.0	124.4	125.4	126.7	125.2	130.2
Mo in Concentrate	Tons	1 978.0	1 822.6	1 822.6	2 202.4	1 993.0	1 953.7	1 336	1 440
Gold	Kilograms	810.8	4 080.0	5 997.8	8 771.4	10 040.4	10 038.4	11 432	12 400
Coal	Thousand tons	7 157.0	4 796.0	5 112.0	4 922.0	5 019.0	4 964.0	5 185.0	5 200
Tin Concentrate (50%)	Thousand tons	362.9	68.4	36.8	19.6				
Tungsten Concentrate (68%)	Thousand tons		62.3	32.0	48.0	69.0	40.0		

Table 12.2. The share of mining sector in national economy of Mongolia, 1997-2001

Share of mining sector in, %	Years				
	1997	1998	1999	2000	2001
GDP	14.3	8.4	8.6	8.5	N.A.
Industry	42.6	41.5	45.1	49.8	56.0
Export	55.7	45.2	41.0	40.5	45.9

- The Government may only participate in exploration and mining through business entities. Such entities have the same legal rights, and are subject to the same legal obligations, as any other person or entity. There is no distinction made in this regard between State enterprises and private entities.
- The procedures for obtaining mineral licences are clear and simple. Ten business days are allowed for processing an application for an exploration licence and 20 business days for a mining licence.
- Mineral licences can be freely transferred or pledged, in whole or in part. To be effective, a transfer or pledge of a mineral licence must be registered with the Cadaster office.
- Licence holders have full management and marketing freedom. There is no requirement for approval of a business plan or operation plan by any government agency. Licence holders are, however, required to submit their operation plans and work reports solely for information and reporting purposes.
- In order to provide a stable tax structure for long-term operations, a mining licence holder who proposes to invest more than US$ 2 million in a project may apply to enter into a Stability Agreement with the Minister of Finance. The term of such agreements ranges from 10 to 15 years, depending on the amount that is proposed to be invested.
- There are no work or expenditure requirements for exploration licence holders or other conditions to be met to a avoid forfeiture. The only requirement is the payment of an annual licence fee.
- There is no limit to the number of licences that may be held by a person or legal entity.
- The Mineral Resources Authority of Mongolia (MRAM) is the Government implementing agency regulating mineral exploration and mining activities.
- Exploration and mining licences are granted by the MRAM. An exploration licence has an initial term of three years, which can be extended two times for periods of two years for each extension.
- The maximum size of the area covered by an exploration licence is 400,000 hectares.
- An exploration licence may be held by any Mongolian or foreign citizen or legal person.
- Mining licences are issued for a term of 60 years, extendable for a further period of 40 years.
- Only a legal person formed and operating under the laws of Mongolia may hold a mining licence.

The Minerals Law has come into effect from 1 July 1997 and consists of 10 Chapters and 65 articles.

Chapter One
General provisions

Articles:

1. Purpose of this Law
2. Minerals related legislation
3. Scope of this Law
4. Law Definitions
5. Ownership of minerals

The Law covers all the activity of mineral development such as exploration (EXP), development (DVP) and mining (MNG). The purpose of the Law is to regulate relations concerning exploration and mining for minerals and protection of the environment of the exploration areas and mining claim within the territory of Mongolia. The main principles of the Law are as follows:

Ownership of minerals

- The mineral resources naturally occurring on and under the earth's surface and in natural water courses in Mongolia are the property of the State.
- The State, as owner of all mineral resources in Mongolia, has the right to grant exploration and mining licences to other persons in accordance with the terms and conditions of this Law.

Rights of Exploration Licence Holders

Exploration Licence holders have the following rights:

- The exclusive right to conduct exploration for minerals within the boundaries of the exploration licence area in a period for 3 years.
- The exclusive right to obtain a miming licence for any part of the exploration area.
- The right to transfer or use as collateral all or part of the exploration licence area.
- The right to renew an exploration licence twice for 2 years with each renewal.
- The right to have access to, entry on, and transit through the exploration licence area.
- The right of entry to and transit through lands adjacent to the exploration licence area for the purpose of gaining access and entry to the exploration licences area.
- The right to construct temporary structures on the exploration licence area as needed for conducting exploration activities.

Rights of Mining Licence Holders

Mining Licence holders have the following rights:

- The exclusive right to engage in mining of minerals within the mining licence area (with the exception of oil, natural gas, and water) in a period of 60 years.
- The exclusive right to manage mining operations and market mineral products extracted from the mining licence area.
- The right to sell mineral products from the mining licence area at market prices on either domestic or foreign markets.
- The exclusive right to conduct exploration for all minerals within the mining claim.
- The exclusive right to transfer or use as collateral all or part of the mining licence area.
- The right to renew the mining licence one time for a period of 40 years.
- The right of having access to, entry on, and transit through mining licences area.
- The right of entry to and transit through lands adjacent to the mining licences area for the purpose of gaining and entry to the mining licences area.
- The right to construct temporary structures as needed on the mining licence area for the purpose of conducting activities related to mining and mineral exploration.

Stability agreements

- If a mining licence holder undertakes to invest in its mining project in Mongolia no less than US$ 2 million for the first five (5) years of the project, and if the mining licence holder submits an application to enter into a stability agreement, then the Government, acting through the Minister of Finance, shall enter into such a stability agreement providing guarantees for a long term stable environment for such mining licence holder.
- The licence holder interested in concluding a stability agreement shall submit its application and draft agreement to the Ministry of Finance. An investment programme, specifying the amounts to be invested within the first five (5) years, and the proposed term of the project, shall be attached to the application. If further clarification or amendment is required, the applicant shall be informed within seven (7) business days.

Taxes

The principal taxes applicable to mining operations are:

- A corporate income tax of 15 to 40 per cent, depending on the total amount of a given firm's taxable income (note: tax preferences can be negotiated by firms making large investments in a licence)
- A royalty equal to 2.5 per cent of the sales value of all minerals produced.
- A 10 per cent value added tax (VAT) on the value of gold exports.
- A VAT on imports of mining equipment and supplies, much of which can be waived by negotiation prior to import.

Exploration Licence Fees

Exploration licence fees are as follows:

- US$ 0.05 per hectare for the first year and US$ 0.10 per hectare for each of the second and third years.
- US$ 1.00 per hectare for each of the 4th and 5th years during the first exploration licence renewal.
- US$ 1.50 per hectare for each of the 6th and 7th years during the second exploration licence renewal.

Mining Licence fees

Mining licence fees are as follows:

- US$ 5 per hectare per year for the first 3 years.
- US$ 7.5 per hectare per year for the next 2 years.
- US$ 10 per hectare per year from the 6th year.

Environmental issues

Environmental protection obligations of exploration licence holders are as follows:

- After consultation with the environmental inspection agency and local governmental authorities, exploration licence holders shall prepare an environmental protection plan within thirty (30) days following the receipt of an exploration licence.
- The environmental protection plan shall be submitted to and approved by the Governor of the relevant soum or duureg where the exploration claim is located. The Governor shall make a decision with respect to the plan within ten (10) business days following receipt of the plan, and notify the licence holder of the decision by an official letter.
- Upon approval of the environmental protection plan, the licence holder shall provide a copy of the plan to the local environmental inspection organization.
- The licence holder shall record all instances of adverse environmental impact resulting from the exploration activity and submit annual reports with respect to the environmental protection plan to the Governor of the relevant aimag or capital city and soum or duureg.
- A licence holder shall provide officials in charge of monitoring implementation of the laws on environmental protection and local government representatives with an opportunity to enter the exploration area to conduct monitoring activities on the site.
- To ensure the discharge of its responsibilities with respect to environmental protection, an exploration licence holder shall deposit an amount equal to 50 per cent of its environmental protection budget in a special bank account established by the Governor of the relevant soum or duureg. This deposit shall be refunded to the licence holder upon full, implementation of its environmental protection plan.

Environmental protection obligations of mining licence holders

- An environmental impact assessment and an environmental protection plan shall be prepared by a mining licence holder in accordance with applicable laws and regulations as soon as possible before or after receiving a mining licence.
- The environmental impact assessment shall identify the possible adverse environmental impact from the proposed mining operations on land, water, air, plant, animal, and human life and shall include preventive measures to avoid and minimize such adverse impact.
- The environmental protection plan shall contain measures to ensure that mining operations are conducted in a least damaging way to the environment. The plan shall also identify preventive measures to protect air and water quality, and human, animal and plant life from the adverse effects of mining operations in accordance with the regulations adopted by the central governmental organization in charge of the environment.
- The environmental protection plan shall also provide for post-mining rehabilitation measures through backfilling, plugging, and cultivation to allow future utilization of the disturbed land for public purposes.
- The environmental impact assessment and environmental protection plan shall be submitted to the central government organization in charge of environment and to the Governor of the relevant soum or duureg. The central government organization in charge of environment shall review these documents and notify the licence holder of its decision within thirty (30) days after receiving such documents.

- Upon approval of the environmental impact assessment and the environmental protection plan, the licence holder shall deliver the documents to the local environmental monitoring organization where the mineral deposit is located.
- Mining licence holders shall record all instances of adverse environmental impact resulting from mining activity, prepare and send a copy of annual reports on the implementation of the environment protection plan to the central government organization in charge of environment, the Governor of any relevant aimag or capital city and soum or duureg.
- Amendments to the environmental protection plan may be made only after the central government organization in charge of environment approves the amendments.
- A mining licence holder shall provide local and central government officials in charge of monitoring implementation of laws and regulations on environmental protection, an opportunity to enter the mining claim area and to conduct monitoring activities on the site.
- To ensure the discharge of its responsibilities with respect to environmental protection, a mining licence holder shall deposit an amount equal to 50 per cent of its environmental protection budget for a particular year in a special bank account established by the Governor of the relevant soum or duureg. This deposit shall be refunded to the licence holder upon full implementation of the environmental protection plan.

Review of environmental protection plan in connection with extension of licences

- Exploration, mining licence holders applying for a licence extension shall submit for approval to the Governor of the relevant soum or duureg, prior to the expiration of the exploration licence, either their revised environmental protection plan or a new environmental protection plan.
- The central governmental organization in charge of environment may require the licence holder to amend the environmental impact assessment and environmental protection plan to reflect impacts from the use of new machinery or technology or environmental impact not foreseen in the approved environmental impact assessment or environmental protection plan.

Accounting Regulations for Mining Licence Holders

The principle accounting regulations applicable to mining licence holders are as follows:

- Equipment shall be depreciated on a straight-line basis over 5 years.
- Buildings shall be depreciated on a straight-line basis over 10 years.
- Exploration and site preparation costs shall be amortized on a straight-line basis over 5 years, beginning with the tax year in which production commences.
- Acquisition costs shall be amortized on a straight-line basis over the term of the licence.
- A loss incurred in any tax year may be carried forward for the following 3 years.

Tax Incentives for Mining Licence Holders

Foreign Investment Law of Mongolia states that mining licence holders may be entitled to the following tax incentives:

- An income tax holiday for the first 5 production years, depending on the mineral produced.
- Following the tax holiday, income taxes may be discounted up to 50% for period of 5 years.

D. POLICY ON INTENSIFYING GEOLOOGIC AND MINERAL RESOURCE EXPLORATION AND PROMOTING MINING SECTOR EXPORTS

1. Geologic and mineral exploration

- Increase the national budget allocation for geologic investigation by 2.5 times, in order to make annual increases in the amount of geologic exploration work to be carried out.
- Create 1:200,000 scale geologic maps for the entire territory of Mongolia.
- Create 1:50,000 scale geologic maps and carry out initial prospecting for areas of high mineral resource potential covering an area not less than 50,000 square kilometres.
- Support mineral resource prospecting by private investors through creation of a favorable investment environment and tax policies.
- Create a geologic information database using Geographic Information System (GIS) technologies.

2. Promotion of minerals trade and investment

- Increase income from export of mining products.
- Support measures to increase the efficiency of the Erdenet copper processing plant by renovating the plant and upgrading its technology.
- Increase cathode copper producing capacity from 10,000 to 15,000 metric tons per annum.
- Increase gold mining capacity by 1.5 times.
- Create a favorable investment environment for developing the Tummurtey zinc deposit, the Boroo hard rock gold deposit, and the Toson and Bayangol placer gold deposits.
- Prepare relevant legal documents necessary for developing the Tavern Tolgoi cooking coal deposit and promote the deposit for development to foreign investors.
- Create a favorable investment environment for developing the Tavt gold deposit, Tsagaan Suvarga copper and Asgat silver deposits.
- Create a favorable legislative environment, which will defend investors' rights, and review the current taxation system to bring it in line with international standards in order to accommodate increased foreign and domestic investment in the geologic and mining sectors.

XIII. STATUS AND CURRENT ISSUES OF MINING REGULATORY REGIME IN MYANMAR

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A. INTRODUCTION

The law permitting and regulating various mining activities have been in existence in Myanmar since the 1880s. Prior to the promulgation of the Myanmar Mines Law 1994, the Mines Act 1923 was in force, which basically was to regulate the safety and health of the mine workers. Mineral concession was granted according to the Mineral Concession Rules 1957.

The Mines and Minerals Act was enacted in 1961 to suit the changing situation of the country. It was the first mines act to be enacted after Myanmar's independence from British colonial rule. This act was an attempt to deal with granting of mineral rights for prospecting, exploration, developing and extraction of minerals. But the implementing regulations to this act were not promulgated, as there was a change in government in Myanmar in 1962, which adopted a socialist economic system. Under this system no mining right was granted to any private citizens and all the mines were nationalized. No state mining enterprises need to apply for mining rights and thus the 1961 Mines Act became irrelevant.

B. MYANMAR MINES LAW 1994

In 1989, Myanmar embarked on a policy of encouraging foreign investment and invited foreign companies to invest in the mineral sector in Myanmar. The 1965 Law for establishment of a Socialist Economic System was repealed and the market oriented economic policy was introduced. The Union of Myanmar Foreign Investment Law was also promulgated in 1989.

The Myanmar Mines Law was promulgated on 6 September 1994 and the Myanmar Mines Rules on 30 December 1996. The Myanmar Gemstones Law was later promulgated on 29 September 1995 and gemstone mining in Myanmar is governed by this law.

1. Main Provisions of the Myanmar Mines Law

Definition – According to the Myanmar Mines Law, minerals are divided into (a) metallic mineral; (b) industrial mineral; and (c) stone.

Objectives – The objectives of the Law are as follows:-

(a) To implement the Mineral Resources Policy of the Government;

(b) To fulfill the domestic requirements and to increase export by producing more mineral products;

(c) To promote development of local and foreign investment in respect of mineral resources;

(d) To supervise, scrutinize and approve applications submitted by person or organization desirous of conducting mineral prospecting, exploration or production;

(e) To carry out for the development of, conservation, utilization and research works of mineral resources; and

(f) To protect the environmental conservation works that may have detrimental effects due to mining operation.

Application and Granting of Permit – Application for prospecting, exploration and production of metallic minerals, large-scale production of industrial minerals and stones are to be made to the Minister, Ministry of Mines. For small scale prospecting, exploration and production of industrial mineral or stones application should be made to the Director General of the Department of Mines of the Ministry. Mineral prospecting, exploration or production could be done only with permit issued under the law. Application for subsistence production of minerals permitted may be made to the Department of Mines or to the officer authorized by the Ministry.

Royalty – Royalty, under the Myanmar Mines Law is a sale based royalty. Royalty is to be paid as determined by the Ministry on the value of mineral sold when sale is affected.

(a) Gold, silver, platinum and other precious metallic minerals: 4 to 5 per cent.

(b) Iron, zinc, copper, lead, tin, tungsten, nickel, antimony, manganese and other metallic minerals: 3 to 4 per cent.

(c) Industrial mineral or stone: 1 to 2 per cent.

The Ministry may exempt in whole or in part any royalty payable by the holder of a permit for such period as may be determined and also defer payment of royalty due.

Ownership of Mineral – Ownership of all naturally occurring minerals lies with the state.

Administrative Ministry – Ministry of Mines is the administrative Ministry for the Myanmar Mines Law and the Director General of the Department of Mines is the Chief Inspector of Mines and the Department of Mines is the regulatory body of the Ministry.

C. MYANMAR MINES RULES 1996

Main provisions of the Myanmar Mines Rules are as follows:

Mineral Prospecting Permit

- Application shall be made to the Ministry of Mines for metallic minerals.
- Application shall be made to the Department of Mines for industrial minerals and stones.
- Approval of the Government is required for all minerals if foreign investment is involved.
- Term of permit (1) year + (1) year extension.
- Land area permitted shall not exceed 4,200 square kilometres.

Mineral Exploration Permit

- Application shall be made to the Ministry of Mines for metallic minerals.
- Application shall be made to the Department of Mines for industrial minerals and stones.
- Approval of the Government is required for all minerals if foreign investment is involved.
- Exclusive right given for exploration.
- Term of permit (3) years + (2) years + further extension if it is required.
- Extension of area in contiguous areas permitted.
- Land area permitted is maximum 3,150 square kilometres.

Large Scale Mineral Production Permit

- Application shall be made to the Ministry of Mines for all minerals.
- Environmental protection plan to be submitted.
- Approval of the government required for all minerals if foreign investment is involved and if investment by a local investor in local kyat exceeds kyat 10 million. Minimum investment for all foreign investment US$ 500,000 (United States Dollars Five Hundred Thousand).
- Conjunctive right to mine is given if application is made by a holder of mineral exploration permit who has already made a discovery of mineral to which his permit relates.
- Term of permit not exceeding 25 years + extension of 5 years at a time.
- Exclusive right given.
- Expansion of area contiguously permitted.

Small Scale Mineral Production Permit

- Application shall be made to the Ministry of Mines for metallic minerals.
- Application shall be made to the Department of Mines for industrial minerals and stones.
- Investment shall be less than kyat 10 million and area permitted shall not exceed 50 acres in case of metallic minerals and 247 acres or 1 square kilometre for industrial minerals and stones.
- Term of permit 5 years + up to 4 years extension.

Subsistence-Mining Permit

- The Director General of the Department of Mines is empowered to issue subsistence-mining permit.
- Some Divisions, and States have also been given the authority to issue subsistence-mining permit after consultation with the Ministry.
- Term of permit (1) year at a time.
- If a mineral exploration permit or a large scale or small scale mineral production permit is issued in respect of an area for subsistence-mining, rights for that area shall cease on expiry of the permit.

Integrated Permit for more than one operation out of the three operations of Mineral Prospecting, Mineral Exploration and Mineral Production:

- Application may be made to the Ministry.
- Term of each activity is the same as mentioned above.

Duties and Rights of Holder of Mineral Prospecting Permit:

- Exclusive right will be given only when permitted with specific stipulation by the Ministry.
- Minimum expenditure commitment required.
- Relinquishment of area required after end of prospecting.

Duties and Rights of Holder of Mineral Exploration Permit:

- Shall have exclusive right in accordance with the exploration permit.
- Minimum expenditure commitment required.
- Relinquishment of area required after each year unless permission obtained from Ministry.

Duties and Rights of Holder of Large Scale Mineral Production Permit:

- Carry out mining according to approved programme.
- Backfill arrange, revegetation or reclaim the land in the areas already mined out to the satisfaction of the Ministry.
- Shall have exclusive right in accordance with the mining production permit.

Duties arid Rights of Holder of Small Scale Mineral Production Permit:

- Carry out mining according to conditions of permit.
- Carry out rehabilitation and reclamation of mined out area.
- Shall have exclusive right in accordance with the mineral production permit.

Duties and Rights of the Holder of Subsistence Mineral Production Permit:

- Carry out production operation according to the permit.
- Use of explosives not permitted.

Duties and Rights of the Holder of Integrated Permit:

- Shall have the same rights as the mineral prospecting, mineral exploration and mineral production permit holder.

Transfer, Surrender, Suspension and Cancellation:

- Has the right to transfer a permit with approval of the Ministry.
- May surrender part or whole of the permit area.
- Ministry may suspend or cancel permit for infringement of specified condition of permit after due notice has been given.

Entering into Agreements:

- Any person or organization may enter into joint venture agreement with any State Owned Enterprise under the Ministry.
- Agreements may be on production sharing basis or profit sharing, based on equity contribution by both parties or other form of benefit sharing.

D. MINERAL POLICY

At the national level, the main focus of Myanmar's economic policy is to give priority to the agriculture sector which is the mainstay of the economy and concurrently all round development of different sectors. Myanmar is a developing country and one of the four economic objectives of Myanmar is the development of the economy inviting participation in terms of technical know-how and investments

from sources inside the country and abroad. Also one of the basic principals of the Foreign Investment Law is exploitation of natural resources which require heavy investment.

Myanmar is well endowed with a variety of mineral resources, both metallic and industrial minerals, a lot of which remain unexplored and untapped. As mineral resources in Myanmar are very much underutilized and as there exists a large mineral potential, it is the policy objective of the Ministry to boost up the present production of various minerals by promoting local and foreign investment in respect of mineral resources thus fulfilling the growing domestic needs of mineral products and at the same time increase the foreign exchange earnings of the country. Mineral-wise, the Government's emphasis is more on production of copper, gold, lead, zinc, iron and steel and coal.

Myanmar has therefore invited foreign mining companies to invest in Myanmar and there are a few foreign companies working in Myanmar. The most successful joint venture is the Myanmar Ivanhoe Copper Company Ltd., which is producing cathode copper from the Kyesintaung and Sebetaung deposit. The company is now planning to develop the world class Letpadaung copper deposit. Ivanhoe Company has proved that Myanmar has a workable mining regulatory regime.

E. ENVIRONMENTAL MANAGEMENT AND ENFORCEMENT

People of Myanmar have lived in harmony with their environment since time immemorial and the country is still endowed with rich natural forests covering half of the total land area of the country and a lot of minerals in the country still remain untapped. There exist very negligible air and water pollution in Myanmar. Environmental issues of Myanmar is not those associated with industrialization and urbanization but those with deforestation and loss of biodiversity. There are still very little problem associated with mining sector in the country except that of environmental problems related to artisanal miners and illegal miners for gold.

Artisanal gold mining could be found all over Myanmar and some 20,000 people or more are involved in artisanal gold mining. It is an alternative or complementary way of securing a livelihood of people in the rural area. Mercury is extensively used by these workers for separation of fine gold particles through amalgamation.

Similarly small-scale miners are using cyanide for better recovery of gold and during the cyanidation process some of the cyanides is lost to the nearby creeks, rivers and soil as there are no proper tailing ponds or degradation of cyanide. The Ministry of Mines has therefore issued directives prohibiting use of cyanide by artisanal and small-scale miners with effect from 1 January 2000. However, small scale miner's main aim is to get rich quickly and it is rather difficult to impose environmental rules on them unless action is taken according to law.

Environmental provisions have been included in the mining contracts signed with foreign companies and there are also environmental provisions in the Myanmar Mines Law. However, there is still no framework legislation on environmental protection in Myanmar and no environmental standards.

Although the Environmental Law has not been enacted, it is a requirement for all large scale mining projects to undertake Environmental Impact Assessment (EIA) as part of their feasibility study and the foreign companies either follow the World Bank standards or standards not lower than those existing in their countries. Initial Environmental Examination (IEE) is being carried out by the Department of Mines for all mining applications. Periodical inspection of mines is also being undertaken by the Environmental Division of the Department of Mines. If it is in the opinion of the Department of Mines that any matter incidental to a mine or the operations carried out in any mine or any part thereof are likely to affect the environment or the life or physical parts of any person, the Department may give notice in writing thereof to the holder of a mineral production permit or manager of the mine. Such notice shall state in which part

of the mine or the operations which are dangerous or defective and shall require the same to be remedied within such time as may be specified in the notice.

F. REGULATORY REGIME FOR MINERAL EXPLORATION AND MINING WITH FOREIGN INVESTMENT

A foreign company intending to invest in Myanmar for mineral exploration shall apply to the Ministry of Mines in accordance with the Union of Myanmar Mines Law and the Myanmar Mines Rules. The company can discuss the terms and conditions of the mineral exploration agreement with the Department of Geological Survey and Mineral Exploration which has to be approved by the Ministry of Mines and the Myanmar Investment Commission.

A permit will be issued to an investor under the Myanmar Mines Law concurrent with the execution of a joint venture agreement and this permit will incorporate the conditions of the investment permit, issued by the Myanmar Investment Commission which has the approval of the Cabinet.

According to agreements for mineral prospecting, mineral exploration and for feasibility study of developing copper and gold resources for notified blocks in Myanmar between the Department of Geological Survey and Mineral Exploration and foreign companies, the agreement area for each block is 1,400 (one thousand four hundreds) square kilometres. The land area permitted for exploration shall in no case exceed 3,150 square kilometres for each permit under the Myanmar Mines Rules.

The company shall on or before the end of the mineral prospecting period relinquish not less than 700 square kilometres of the agreement area and on or before the end of the one year mineral exploration period relinquish not less than 1,050 square kilometres of the agreement area on a cumulative basis should the company elect to conduct feasibility study for development and production of the deposit.

The tenure of permit for each activity is as follows:

Mineral Prospecting	–	1 year
Mineral Exploration	–	3 years
Feasibility study	–	1 year

The above periods are extendable with the approval of the Ministry. According to the Myanmar Mines Rules, an application for the extension of the tenure of a mineral exploration permit may normally be made on two occasions only. The Ministry shall on receipt of such application extend the permit for one year at a time. The Ministry may further extend the permit with the approval of the government.

Conjunctive right to mine will be granted to a holder of mineral exploration permit who has already made a discovery of a mineral to which his permit relates.

The principal terms and conditions to be included in definitive joint venture agreement is usually attached to the Exploration Agreement. If a company decides to proceed to production stage, detail terms and conditions are to be negotiated. After agreement has been reached, the Draft Contract together with proposal for investment will have to be submitted to the Myanmar Investment Commission for approval.

The Union of Myanmar Foreign Investment Law (FIL) was promulgated in November 1988 and its Procedures prescribed in December 1988. In order to oversee and administer the FIL, the Myanmar Investment Commission (MIC) was formed. The duties and powers of MIC are:

(a) To scrutinize the proposal to see that it conforms with all the rules and regulations as set out in the FIL;

(b) To check to ensure that the proposal is financially credible, economically justifiable and that the proposed technology to be used is appropriate;

(c) To ensure that the proposed project is environmentally friendly;

(d) To grant approval by the issuance of a Permit with stated terms and conditions;

(e) To monitor and evaluate foreign investment after approval has been given;

(f) To relax and amend the terms and conditions previously defined if necessary;

(g) To give suggestions and recommendations, where necessary;

(h) To facilitate and promote foreign investments;

(i) To take necessary and prompt action in respect of issues regarding promotion of foreign investments.

The FIL allows that foreign investment activities can be undertaken either in the form of a wholly foreign-owned or a joint-venture with any Myanmar partner, either an individual, a private company, a cooperative society or a State-owned enterprise. Foreign investment can also be undertaken as a sole proprietorship or as a partnership between foreigners as well as between foreigner(s) and Myanmar citizen(s). In all joint ventures and partnerships between foreigner(s) and Myanmar citizen(s), at least 35 per cent of the total equity capital shall be foreign capital.

Minimum foreign capital to be brought into Myanmar has been notified by MIC. It is US$ 500,000 for manufacturing (includes mining) and US$ 300,000 for services. Duration of investment is, at present, permitted by MIC according to the amount of investment made by the foreign investor as follows:

Sr. No.	Amount of Foreign Investment (US$ in Million)	Permissible Duration	Permissible Period of Extension
1	2	3	4
1.	Less than 1.00	10 years	5 years
2.	1.00 to 3.00	15 years	5 years
3.	3.00 to 5.00	20 years	Two 5-year terms
4.	5.00 to 10.00	25 years	Two 5-year terms
5.	More than 10.00	30 years	Three 5-year terms

The potential investor shall submit a proposal to MIC in a prescribed form. The proposal has to be supported by the following documents:

(a) Business profile and document supporting financial credibility such as the latest audited accounts of the person(s) or the firm intending to make the investment;

(b) Bank reference and recommendation regarding the potential foreign investor's business standing;

(c) Detailed calculation relating to the economic justification of the proposed project;

(d) A draft contract to be executed with a State organization that is responsible for the smooth operation of enterprise in the respective field if the project is a wholly foreign-owned venture;

(e) A draft contract between the partners if the project is a joint venture;

(f) A draft land lease agreement (if required);

(g) Draft Memorandum and Articles of Association if the proposed joint venture is in the form of a limited company;

(h) An application for exemptions and reliefs defined under Sector 21 of the FIL.

The MIC office makes a preliminary appraisal of the proposal. The proposal is then forwarded together with the views and comments to the MIC. Then, MIC will scrutinize the proposal from the technical, financial, commercial, economic, social and environmental aspects within the framework of the policy objectives of the FIL. As it is already mentioned above, if the proposal meets the requirements set out in the FIL, MIC will issue the Permit with specified terms and conditions as required according to the type of business.

As the FIL is aimed at bringing in more foreign capital into the country, it offers investment incentives and guarantees to foreign investors. An enterprise permitted by the FIL shall enjoy a tax holiday period of three years inclusive of the year the enterprise commences its commercial operation and also to a reasonable period upon application, provided the MIC, in the interest of the State, considers appropriate. In addition, MIC may grant one or all of the following exemptions and reliefs:

(a) Exemption or relief from income-tax on reinvested profits within one year (corporate income tax is 30 per cent on profit);

(b) Accelerated depreciation rates approved by the Commission;

(c) Fifty per cent relief from income-tax on profits accrued from exports;

(d) Right to pay income-tax on behalf of foreign experts and technicians employed in the business and the right to deduct such payment from the assessable income;

(e) Right to pay income tax on the income of foreign employees at the rates applicable to Myanmar nationals;

(f) Right to deduct R&D expenditures from the assessable income;

(g) Right to carry forward and set off losses up to three consecutive years from the year the loss is sustained;

(h) Exemption or relief from customs duty or other internal taxes or both on import of machinery, equipment, instruments, machinery components, spare parts and materials used in the business during the period of construction;

(i) Exemption or relief on customs duty or other internal taxes or both on imported raw materials for the first three years of commercial operation after completion of construction.

In the case of export-oriented commodities, commercial tax levied on such commodities may be exempted upon application. Relief of commercial tax on locally distributed commodities are also considered on case-by-case basis.

The FIL provides an irrevocable State guarantee that an enterprise permitted by MIC under the FIL shall not be nationalized during the permitted period or the extended period (if any). It also provides repatriation of profit (after all deduction of all taxes and the prescribed funds) as well as legitimate balance of salary and lawful income of foreign personnel (after payment of living expenses and taxes). In the case of termination or dissolution of the business, repatriation of foreign capital which an investor is entitled to withdraw a prescribed by the Commission is also allowed.

G. CURRENT ISSUES

There are no important current issues regarding the Myanmar Mines Law and Mines Rules, although there are policy and other related issues.

1. Sectoral policy issues regarding agreements

Myanmar Mines Rules provides that possible investments can be through production sharing or profit sharing agreement. Because of foreign exchange constraints, the government does not intend to make new investment by itself and is encouraging foreign investors to make investment. The Government is inviting participation for exploration in new areas or new deposits and for existing facilities where participation would be in the form of providing raw materials or the existing facilities as contribution in the joint ventures. These participation would be valued on fair and equitable basis so that a foreign investor may receive reasonable return and may enjoy mutual benefit.

The main issue in most of these form of joint ventures is the Government's policy of either having majority equity ownership or equal share ownership and the Government's condition of a minimum of 15 per cent free equity from an investor in new equity joint ventures as part of the contribution for the Government's share of 50 per cent. There have been cases where the Government gave the investor the option to purchase the working interest of the state enterprise at an agreed price after positive feasibility study before the production stage. The state enterprise shall at a later stage have the option to purchase back its share interest purchased by the company at fair market value.

Another issue is the production sharing type of investment derived from petroleum contracts, which could either be straight split on total production or with consideration of recovering production cost. In the cost recovery type of production sharing, it is usually done in such a way that a certain percentage of total revenue is reserved before consideration of recovering the production cost. Straight production split type is preferred in large volume, low price-low cost of production types of minerals such as dimension stones, coal and other minerals. In the case of more valuable metallic minerals such as gold and copper, production sharing with cost recovery type of cooperation may be negotiated. The ratio of production split may be negotiated with the Government.

All of the local joint ventures are production sharing joint ventures without the Government investing any money but as those are very few or no production sharing agreement for large scale mining project by foreign investors, this policy matter is being reviewed to attract more foreign investment.

2. Dispute Settlement

A permit will be issued under the Mines Law concurrent with the execution of a Joint Venture Agreement after approval by the Myanmar Investment Commission. In most of the agreements, arbitration proceeding shall be in accordance with the provisions of the Arbitration Act (Myanmar Act no: IV of 1944) and the venue of arbitration shall be in Yangon. The arbitration shall be conducted by three arbitrators one of whom shall be appointed by the state enterprise or department, the second of whom shall be appointed by the company and the third of whom shall be appointed by mutual agreement of the two appointees. The award of the arbitrators shall be final and binding upon the parties.

Myanmar's Arbitration Act 1944 is similar to the English Arbitration Act of 1950 and arbitration legislation in other common law countries at that time. The Act provides for the appointment of arbitrators, supervision by the court, enforcement of the award and appeal from an award.

Some of the major mining companies insist upon inclusion of settlement under UNCITRAL Arbitration Rules and venue of arbitration outside of Myanmar. Myanmar is not a signatory to the New York Convention on UNCITRAL Arbitration Rules.

3. Stability Issue

The Union of Myanmar Foreign Investment Law guarantees that an economic enterprise formed under a permit issued by the Investment Commission shall not be nationalized during the term of the contract or during an extended term if extended. But, there is no guarantee regarding change of law. Major mining companies therefore insist upon inclusion of stability provision in the mining agreement. There has been cases where the Government has agreed to inclusion of such a provision.

4. Ownership of Land

Foreign companies are not permitted to own lands or immoveable property under the Immoveable Property Restriction Act. However, land may be acquired on long renewable lease up to 30 years and extendable on individual case basis generally every 10 years: land cannot be pledged for purposes of securing funding. Grant of lease is given to investors and the investor has the right to use the land for the purpose granted by paying rent to the Government. In mining projects, any outside financing for development of a deposit or deposits in order to bring them into commercial production should be secured only by the applicable portion of the concession and the assets of the joint venture company and the proceeds of sale of any production on a non-recourse basis to the parties to the joint venture. The borrower may grant, transfer, assign, sub-lease, mortgage or pledge to the security agent, leasehold interest in the land and mining right of the company.

5. Financial Issues

- Exemptions and reliefs for foreign investors are provided under Section 21 of the Foreign Investment Law.
- However, the Union of Myanmar Commercial Tax Law (1991) was enacted only after the Foreign Investment Law and Procedures Relating to the Foreign Investment Law, and is therefore not included under Section 21 (Exemptions and Reliefs) of the Law. An investor, therefore, has to apply for exemption when submitting proposal to the Commission.
- There is also withholding tax of 15 per cent on interest payment which is also not included under Section 21 of the above Law.

6. Monetary Issue

Myanmar currency is not freely convertible internationally. Because of disparity of the official US$ to kyat exchange rate, Foreign Exchange Certificates (FEC) have been issued by the government. Foreign companies can convert their dollar to FEC which can be converted to kyat which is equal or close to the US$ to kyat market rate. Foreign companies are also permitted to open offshore account on a case-by-case basis.

H. CONCLUSION

Myanmar's Mining Law is a simple mining law and may need certain amendments and refinements. But the current issues facing the mining industry are more of a policy nature than regulatory. Issues regarding ownership ratio in equity joint ventures, share of production in production sharing contracts, cost recovery matters, land ownership, dispute settlement rules, are all being reviewed to attract more foreign and local investment in the mining sector in Myanmar.

XIV. CHALLENGES AND CURRENT STATUS OF MINING INDUSTRY AND REGULATORY REGIME OF THAILAND

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A. INTRODUCTION

For more than a century the mining industry has put a solid footage in the Thai economy and played a significant role in the economic and social development of Thailand and contributed to the nation's overall economy. Since the early phase of development, the mining industry in Thailand had been in the shadow of tin; it was known as tin-dominated era. At that point in time, more than 90 per cent of the total production was from tin. Moreover, 90 per cent of this production was exported. It made Thailand one of the largest tin producing and exporting country in the world. Unbelievably, the collapse of tin price in the world market in 1985 that knocked down the price by half within an overnight swept out more than 90 per cent of tin mines from business. Since then, Thailand has become a tin importing country. It is worthy to note that economic growth at the same time drew an increase in domestic mineral demand most of them are industrial minerals for use as raw materials in industries. In 1986, for the first time, the production of industrial minerals surpassed that of metallic minerals and the structural changes have remained the same until now. As for mineral production, a growing trend had been observed until 1997 when Thailand was hardly hit by economic crisis. Industrial production dropped sharply, resulting a slow down in demand for minerals. As a result, industrial mineral production for use as raw materials in the industries declined by more than 20 per cent. Most of them are industrial minerals, especially industrial rocks, which are mainly used for the construction industry. With a sharp and sudden decline in demand, many mines could not survive. The number of operating mines in 1999 was only 691 mines, reduced by more than 20 per cent.

However, in 1999, overall macroeconomic indicators revealed signs of economic recovery in the country and throughout the region. Gross national product climbed from negative growth rate in 1998 to an impressive 4 per cent growth rate. The production capacity utilization rate was reported to be over 60 per cent, reviving from 50 per cent during the 1997-1998 period. In this respect, it was not quite surprising to observe a burgeoning demand for indigenous minerals in 1999 and early 2000. Currently, Thailand is commercially producing more than 40 different minerals, of which more than 80 per cent of its total production, in monetary term, are industrial minerals. They are for example limestone, lignite, gypsum and feldspar, etc. The total production, after the crisis in 1997, has been steadily increasing with an average growth rate over 3 per cent a year. It increased from 20,776 million baht in 1997 to 23,323 million baht in 1999. The cement industrial minerals contributed the largest share in total production, accounting for 32 per cent of the overall increase. However, the largest increase was observed in industrial rock sector, when its production soared from 210 million baht to 3,100 million baht. Surprisingly, the value of metallic minerals has been increasing over the period, in which more than 70 per cent of its production is zinc. The production of metallic minerals is mainly extracted to serve as raw materials for domestic smelters. The tin smelting plant is located in Phuket, whereas the zinc and lead smelter plants are located in Tak and Kanchanaburi provinces, respectively.

As mentioned above, among an increasing importance of other minerals, lignite could be considered to be the most important mineral in term of its quantity and how it was utilized. In 1999, 22 million tons of lignite was exploited, increasing around 5 per cent from that of the previous year, mainly due to an increase in demand for energy. The Electricity Generating Authority of Thailand (EGAT) the

largest producer and consumer at the same time, produced 15 tons at the Mae Moh mine in the province of Lampang where the lignite mine at Krabi province was closed down few years ago. As for lignite produced by private companies, an average of 4 million tons a year was consumed in cement plants and tobacco curing houses. Even though a large amount of lignite was exploited every year, there still exist a supply shortage for domestic demand, especially of high quality lignite and anthracite. It is estimated that there is an import of anthracite from Indonesia of approximately 5-8 million tons a year.

As for export, gypsum has been a major export-oriented mineral during the last decade, as more than 75 per cent of its production were exported. Moreover, its export value accounted for nearly 50 per cent of an overall export value in the last few years. After the export restriction policy was imposed in 1996 in order to jpromote the conservation of resources and to increase an export price to a fair level, the exports were still high, totaling nearly 6 million tons in 1996. In 1997, nearly 9 million tons of gypsum was exploited, declining by 20 per cent from that of 1996, as a result of a sluggish demand for gypsum in cement and gypsum board industries, out of which nearly 5.7 million tons were exported. However, in 1998, only 3.6 million tons of gypsum were exported; a decrease of 35 per cent. This was due to an economic slow down in the ASEAN region including in the Far East, such as in Japan, the Republic of Korea and Taiwan Province of China, which are the major markets of Thai gypsum. However, the trend of gypsum exports is expected to increase as the economy recovers in the region.

At the same time, even though the domestic mineral utilization seems to capture all attention of policy makers, it could not however, be denied that the structural changes in mining industry is partly a result of declining metallic mineral reserves. These minerals were once in the top export list of the country. Hence, the present policy on mineral development has also emphasized on accelerated development of export-oriented mineral resources in order to attain more foreign earnings. The minerals concerned are gold, potash, lead, copper and zinc. To achieve this end, large-scale exploration projects for new potential areas are mandatory. With domestic constraints on capital availability and expertise, it is necessary to stimulate and attract the interest of foreign investors with sufficient capital and technical expertise, so that production can be made with efficiency and, generate benefit to all concerned parties. In order to conduct extensive investment promotion in mining sector, a series of measures have been launched to encourage the private sector to increase its participation in mining development, especially foreign investors. Tax incentives, which have been given through the Board of Investment, are major tools for the Government to stimulate investment in the country and aboard. Examples of tax Instruments normally used are tax holiday, tax allowances and tax regime in favor to the investor but fair to other resource stakeholders. Besides fiscal policy, the government agencies also provide necessary information such as geological survey results and geological maps for facilitating and for supporting the investment decision making process in the private sector. With this regard, in 1999, the Cabinet has approved the Accelerated Mineral Exploration Project, which will be conducted by the Department of Mineral Resources over the next 7 years. The completion of this project would give us the knowledge of the mineral potential in the whole country, in which it will help the country to be able to manage minerals in an efficient way and in a sustainable manner. On the other hand, encouragement and support will be handed out to the private sector in order to ensure the most efficient utilization of mineral resources in the short run, as well as to ensure its sustained availability in the long run.

B. NEW CHALLENGES IN MINING

After the economic crisis, the mining industry might have an opportunity to get back on track again, but this time, after considering the circumstances, it won't be the same as it used to be. Entering into the new millennium, there are many things that the mining industry must adopt and take it as a part of its development process, if it wants to survive. What are expected in the mining industry in Thailand in the year 2002 and onwards could be categorized as follows:

1. Increase in demand for minerals with better quality

The economic recovery will no doubt increase the demand for minerals as raw materials for production processes. However, new and more advanced technologies in the production would generate substitute materials for natural minerals but with much better quality, or at least much more convenient in use. Although, most of natural minerals are still non-substitute materials, the nature of investment and business will also be the same as it was. The bargaining power is still in the hand of consumers. Quality will be a main concern to customers and become a strategic factor to producers together with the security of supply.

2. Price competition

The industrial minerals will still dominate the mining industry for the years to come. Even though, these minerals are main raw materials to industries and could be used to generate high value-added, the low cost of production and vast reserves will keep their price very competitive. Moreover, quality and specification of minerals from each reserve show no difference. They are perfectly substituted by each. Hence, fierce competition among producers will be expected and price is a main strategic tool.

3. An increase of community participation

Mining industry cannot deny the participation of community in the mineral development process. The rights over their resources in the areas have been recognized by the new Constitution. Community where the mining project located will become a major partner and will set the direction of resources development in the area. Mutual benefit and understanding between firm and community are needed. On the process of development, environment impacts and social disturbances of mining activity on the community will be great concerns. Also from the government stand point, many measures on environmental protection and conservation will be launched out. It is, therefore expected that mining project will have a great pressure on the implementation on environment protection, and of course cost of this part will become more visible in the company's budget.

4. A greater role of private sector

The Government in the near future will play a role of facilitator rather than investor and leave role in mineral development to the private sector. To facilitate an investment in mining industry, the Government might carry out large-scale exploration projects covering large areas, and tender the results out to interested investors. Moreover, special incentives will be offered to private sector to invest in exploration or mining operation in some areas or for some minerals, especially those minerals or projects that require large capital and advanced technology.

5. Efficiency utilization

As all natural resources become scarcer, the conflicts between different resources become more visible. Land use conflict will remain a major hurdle for mineral development. Like in the past, the priority of resource utilization in any designated area will be given to those obviously seen on the ground rather than minerals, in which they are usually located in the ground. The objectives of different agencies over the resources in the areas still show a conflict. Hence, the purpose of development in area must be jointly set by all agencies involved. The priority should be placed and identified to all resources, and a clear policy in avoiding the conflicts of co-existing resource utilization in the area must be established.

6. Recognition and acceptance from public

The image of mining in the eyes of public will never be changed, as it is the one who creates enormous effects on environment and society. Mining firms have never voluntarily incurred cost to

prevent these effects, unless the tough policy is implemented. Moreover, people and society in the area will receive only a small part of benefit where the chunk will go to the investor. In order to gain recognition of its importance and to improve its image to society, the mining industry cannot avoid providing a fair benefit to society and showing their intention and full responsibility in protecting and conserving the environment. On the government part, the concern agencies are urged to impose stricter measures to restore and to conserve mineral resources and environment due to an increasing degradation of the global environment. As fully recognized by society, the implementation of environmental management system – ISO 14000 in the mineral industry has already been embodied in the Eighth National Economic and Social Development Plan (1977-2001). This might well be a major key factor for the solution of sustainable development for this industry in Thailand.

Part of the challenges facing the mining industry in Thailand in the new millennium are problems that have been carried over from the past, but only the level of complexity was greater. This is due to the fact that many of them had never been seriously and appropriately handled. Lack of sincerity from all concerned parties also contributed to the problems. However, with an intention to compromise and well aware of all diftculties and challenges as well as new approach in a way to look at mining industry from all parties, one should be confident that the mining industry in Thailand would enter into the new millennium with a great prospect.

C. POLICY GUIDELINES IN THE NEW MILLENNIUM

From the year 2000 onward, there will undeniably be an increasing environmental concern in the country and in the world at large to play a major role in development processes of all areas. There is therefore a need for the mineral industry to adapt itself with an increasing involvement of the communities in all stages of development. The new and current constitution has stated clearly that the public community has rights in managing their resources. Without any exception, the Thai Government has taken this concern into account for formulating its policy in managing and developing the mineral resources. Together with the objectives of the readiness of raw materials for domestic industries and the assurance of harmonization and sustainability of development in environment and minerals, the policy guidelines and measures shall be as follows:

1. Enhancing mineral utilization to increase value-added, as well as to form a basis for domestic industrial development as well as promoting the forward and backward linkage in mineral-based industries.
2. Designating mineral resources development zone in line with mineral resources production structure to minimize conflicts emerging from mineral resource utilization on other coexisting natural resources in order to promote balance in the ecosystem and to upgrade quality of life for people in surrounding areas.
3. Encouraging the participation and investment from the private sector and also providing incentives of application of modern and appropriate technologies for exploration and exploitation of mineral resources to ensure the growth and the competitiveness of mining industry. The government will provide necessary facilities to speed up the investment of the private sector in large mining projects to improve productivity and efficiency in mineral extraction.
4. Promoting and providing facilities to increase the participation of local people and communities in management of mineral resources and environment in such a way that all concern parties would gain from the benefits of mineral development.
5. Promoting the best practice in mining development and utilization in order to increase productivity in production process and reduce environmental impacts from mining activities. Ensure the resources will be utilized in an efficient manner.

6. Enhancing the effectiveness of the mineral resources management system in all levels. A revision and improvement of current legislation system should take place in order to provide for better facilities to mining administrative processes and to support the operation of the mining sector in a changing and highly competitive business environment. The new information technology system will be fully utilized to facilitate the decision making of the management.

7. Promoting the exploration and production of metallic minerals in the country especially one that has existing smelting and refining facilities, and in case that there are not enough resources in the country, Government should provide support to the private sector to invest and seek for reserves in neighboring countries.

8. Establishing the cooperation among private investors in order to promote efficient production, management as well as the bargaining powers in the market. Currently, the Mining Industry Council, with the acknowledgement of the Department of Mineral Resources, has been a cooperation centre of gypsum exporters and producers, in order to ensure that export policy on gypsum be complied.

In summary, the primary principle and objective of the government policy in the new millennium focus on the promotion of the sustainability of mineral development. Under this light, the policy must assured mineral development harmonizes with other coexisting resources, together with an efficient utilization. The efficiency and best practice in mineral development and utilization processes will be commonly required for reducing environmental impacts. In other word, the policy must generate a balance between the continuous growth in mining industry and an improvement of environmental quality. An increase in the participation of communities in mining development will be anticipated. Private sector will play an important role in mining sector and Government will confine itself to monitoring and supporting functions. Incentives are given to attract foreign investors for large mineral exploration and exploration projects that require vast capital and advanced technology.

D. MINING LEGISLATION AND REGULATIONS

The principal government agency responsible for the regulatory aspects of the mining sector is the Ministry of Industry (MOI). The other relevant-agencies are the Ministry of Science, Technology and Environment (MOSTE) and the Ministry of Agriculture and Cooperatives (MOAC).

According to the Minerals Act of 1967, the Department of Mineral Resources (DMR) under the MOI is responsible for supervising exploration and production activities, in accordance with geosciences in geology, minerals, petroleum and groundwater with taking into account of the environmental protection. In offshore areas, the DMR is also involved in coastal zone management programme, petroleum management, mineral resources exploration and environmental protection.

The principle concepts on minerals are minerals are regarded as crown property, exploiting is subject to permission from the King and development of mineral industry is through private sector. The principle law is the Minerals Act B.E. 2510 (1967). The Act governs onshore and offshore exploration, mining, ore dressing, metallurgy, transport, trading and export of minerals. The Department of Mineral Resources is empowered to enforce provisions of the Act and the Minister of Industry Ministry is having charge and control of the execution of the Act.

1. Mining legislation relating to environmental protection

The Mineral Act was issued in 1967 and has been amended three times: in 1973, 1979 and 1983. The Act is administered by the MOI through the DMR. Under the Act, a mining concession or lease is required before mining can take place.

Although the main objective of the management of mineral resources was the acceleration of mineral exploration and optimum exploitation of the country's identified mineral reserves, awareness of the need to protect other natural resources and assure the safety of people led to the issuing of a number of decrees. Under the Mineral Act, the developers are required to provide a mining plan showing the method of storing tailings and turbid water, control or treatment of dust, noise and vibration, and treatment of poisonous materials. If no poisonous materials are employed, this must also be stated. The drainage system for the mine and mineral processing facilities must also be shown. Any pit, winch or shaft which is no longer used in the mining operation must be filled up and the mined area must be reclaimed for future use. The miners must operate their mines in conformity with approved mining plans.

In mining operations, the miners shall not obstruct, destroy or undertake any work which may be detrimental to the use of highways or public waterways. Neglect of infraction of any of the conditions imposed in the mining plan can lead to suspension of the lease, fines, and as a last resort, jail sentences for company directors.

A significant section in the Act relating to pollution control is Section 55. It allows a surface rental fee to be charged in addition to the normal fee for the mining lease. This fee does not exceed 10 per cent of the royalty and is paid to the DMR, who is required to use these funds to reclaim mined areas, enforce the Act, and develop the local area where the mine is located. Collection and allocation must follow ministerial regulations.

In accordance with Section 18 of the Mineral Act, a Committee responsible for giving advice and recommendations to the Minister of Industry on the enforcement of the Act has been established. The chairman of the Committee is the Under-Secretary of State of MOI. Other members are the Director-General of DMR, the Director-General of the Royal Irrigation Department, the Director-General of the Land Development Department, the Director-General of the Royal Forestry Department, the Secretary-General of the Office of Environmental Policies and Planning (OEPP) and two other persons appointed by the Minister. All mining permits are considered by this committee before being granted by the Minister of Industry.

2. Environmental legislation relating to mining

In addition to the Mineral Act, two other acts concern environmental protection and management of the mining industry: the Environmental Act and Forestry Act.

The most important environmental law for the mining industry is the Enhancement and Conservation of National Environmental Quality Act of 1992, which is administered by the OEPP. The Act covers four issues relating to mining:

- Mining projects of any size must submit an environmental impact assessment (EIA) report to the OEPP for approval before commencement of the activity.
- Environmental standards, for example, the standards for surface water quality and ambient air quality, are predetermined and all economic activities, including mining, must comply with them.
- The OEPP has authority to designate any natural area as an environmentally protected area in order to control its use.
- The Act establishes an environmental fund for the Thai economy. This fund can be another source of money from which miners can borrow for environmental mitigation and reclamation activities.

The forestry law regarding mining operations involves designation of forest areas as either open to or prohibited for mining. The prohibited areas include national parks, wildlife sanctuaries, class 1A

watersheds and areas considered as national heritage sites. Mining in general forest areas is controlled by the Forestry Act of 1941. Mining in reserved areas of natural forest must conform with the National Reserved Forest Act of 1964. The operators must get permission to use the land from the Royal Forestry Department, prior to getting a mining concession from the DMR.

3. Exploration

Prospecting can be undertaken only after a prospector has obtained a prospecting licence. There are three kinds of licences, namely, the General Prospecting Licence, the Exclusive Prospecting Licence and the Special Prospecting Licence.

The General Prospecting Licence (GPL) permits the holder to conduct mineral prospecting in a specified area. It is valid for one year and non-renewable.

The Exclusive Prospecting Licence (EPL) gives an investor an exclusive right to explore for specified minerals within a specified area. Each licence covers an area of not exceeding 2 square kilometres. It is valid for one year. A work plan and a description of exploration methods are to be submitted to the Department of Mineral Resources. Exploration commencement is within 60 days. After receiving the exclusive prospecting licence, an exploration report should be filed within 180 days and final report must be sent before 30 days of its expiration date.

The Special Prospecting Licence (SPL) has a life span of three years and is renewable for another two years. It covers an area not over 16 square kilometres. An application for an SPL must include a work plan and an estimate of expenses for each year for the whole project as well as an offer of special benefits to the Government. Moreover, the prospector must commence exploration within 90 days and file a progress report every 120 days.

4. Mining

The investor must apply and obtain the mining licence before having a right to exploit the specific minerals. Each licence covers an area of not exceeding 300 rai or 0.48 squares kilometre for the onshore and 50,000 rai or 80 square kilometres for the offshore areas. It is valid for not over 25 years. However, if it was granted not to exceed 25 years, it can be renewed, but the total life span shall not exceed 25 years. The requirements included for the application are documents showing an area to be mined, evidence of financial capital, evidence showing acquisition of surface land rights, evidence of technological ability, a work plan and an environmental impact assessment. The holder has the right to transfer his to others, allow others to takeover in mining operation or relinquish his mining licence.

5. Royalty rate

At the production stage in mining investment, the Government collects fees through the royalty system according to the Royalty Law that assigns the royalty rate in the percentage of the mineral price announced by the Department of Mineral Resources. Royalty on mineral production are payable to the Government on a variable formula basis, depending on the commodity.

E. LICENCING PROCEDURE

Mineral exploration activity in any areas of land, both claim and non-claim areas, must be prior vested a prospecting licence. There are three types of prospecting licences, namely, General Prospecting Licence (GPL), Exclusive Prospecting Licence (EPL) and Special Prospecting Licence (SPL) as shown in figure 14.1.

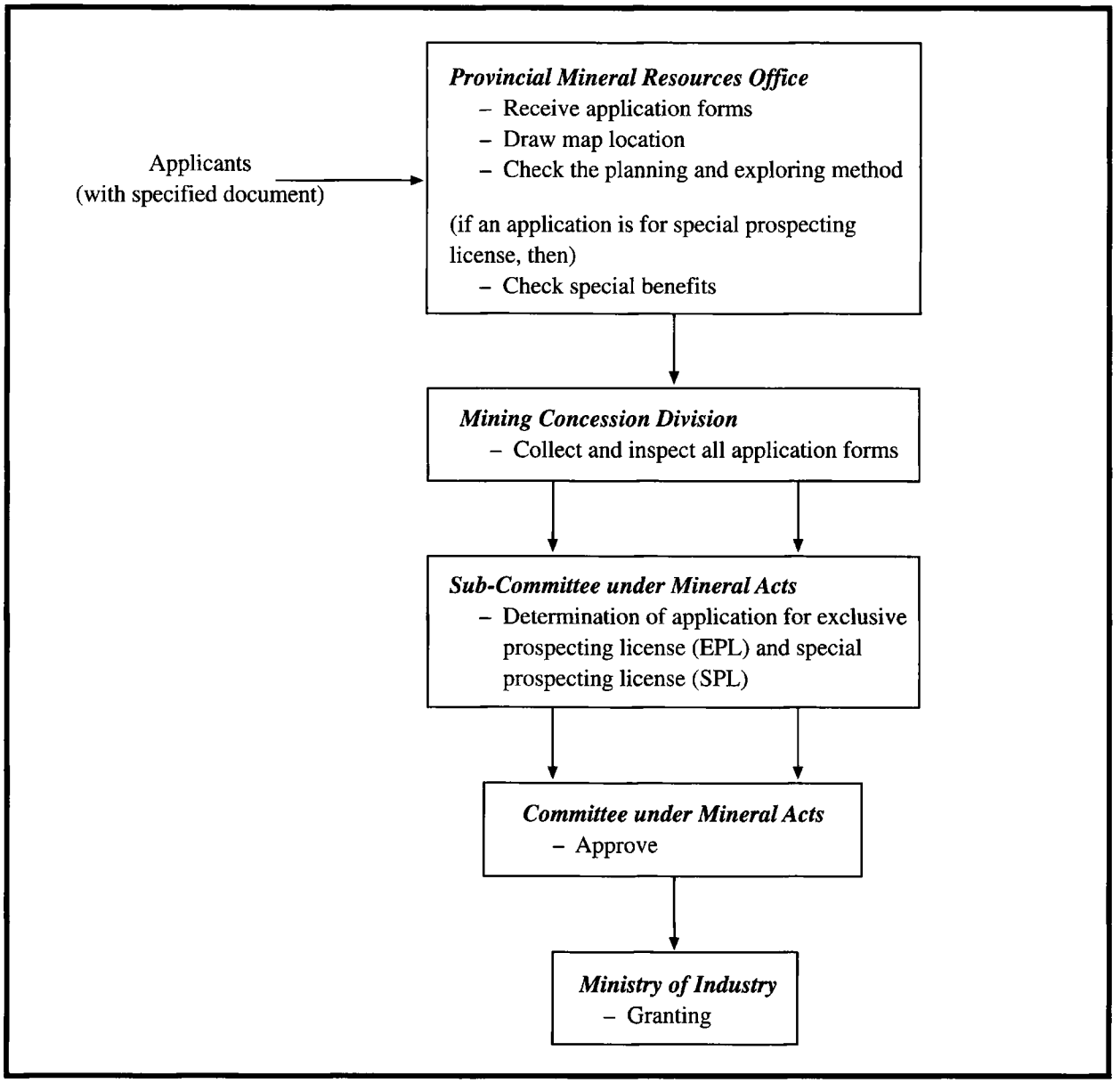

Figure 14.1. Licensing Procedure Chart for General Prospecting Licence (GPL), Exclusive Prospecting Licence (EPL) and Special Prospecting Licence (SPL) in Thailand

1. General Prospecting Licence (GPL)

The Provincial Mineral Resources Office, where a designated area is located, issues this non-exclusive licence. It permits the holder a right to undertake mineral exploration over the area. It is valid only for one year and non-renewable.

2. Exclusive Prospecting Licence (EPL)

An exclusive prospecting licence (EPL) is issued by the Minister of the Ministry of Industry or the person entrusted by him. The holder of EPL have exclusive right to undertake prospecting in area designated in the licence. There are two types of EPL, namely offshore EPL and on-shore EPL. Each on-shore EPL could not exceed the area of 2,500 rai, in which only at most 1,250 rai would be granted, except in the case where:

- The applicant has been granted an investment privilege for exploration or mining activity in designated mineral area from the Board of Investment.
- The applicant who holds the permission certificate of metallic smelting activity in which the designated mineral would be used as raw materials.
- The applicant holds the manufacture permission certificate in which it will use the designated mineral as raw materials.

The individual, who applies for more than one prospecting area, and designated areas of land are over 2,500 rai, must submit a Special Prospecting Licence (SPL) application. As for offshore exclusive licence, no applicant is allowed to apply for prospecting areas exceeding 500,000 rai in which only 20,000 rai will be granted. No one will be allowed to hold more than 20,000 rai of the offshore prospecting areas. The onshore prospecting licence is valid for one year while the offshore-prospecting licence is valid for two years after the issued date specified in the licence.

The holder of prospecting licences, both onshore and offshore, has to commence prospecting activity within 60 days from the date of receiving prospecting licence, and also to report the results of operations and prospecting works undertaken within 180 days from the date of receiving the EPL to the Department of Mineral Resources. As for the results of operations and prospecting works undertaken thereafter, the EPL holder has to report to DMR within 30 days before the expiration of the EPL.

3. Special Prospecting Licence (SPL)

The Special Prospecting Licence is a licence issued by the Minister of the Ministry of Industry for exclusive right in prospecting in the designated mineral and in special case. Each application covers an area not exceeding 10,000 rai. An applicant for a SPL must specify the prospecting obligations by stating the amount of money to be expended in the prospecting area each year throughout the validity of the SPL and offer the special benefits in the interest of the state in the line approved by the Minister, in the case where the SPL is granted.

The SPL shall be valid for 3 years and could be renewed for a period not more than 2 years. In applying for a renewal of the SPL, the holder of the SPL must submit the application before the expiration of the SPL not less than 90 days.

At the end of each obligations year, if the SPL holder has not yet fully complied with the prospecting obligations, he must pay a sum of money equal to the amount of prospecting expenses not yet incurred in each obligations years to the DMR. In case where the SPL holder has made prospecting expense in any obligations year in excess of the amount proposed for such obligations year, he shall be entitled to have the excess deducted from the prospecting obligations of the subsequent obligations year.

The SPL holder must commence prospecting within 90 days from the date receiving the SPL and must report the results of operations and prospecting works to the DMR every 120 days from the date receiving the SPL.

4. Mining Licence (ML)

Mining means the operations undertaken on land or underwater to obtain minerals. Mining in any areas regardless of any person's right over areas to be mined must prior obtain a Mining licence (ML). Mining Licence and Temporary Mining Licence are issued by the Minister of Industry and the obtaining procedure is shown in figure 14.2. There are two types of mining licences, namely onshore and offshore mining licences. Each application for onshore licence shall be for an area not exceeding 300 rai, whereas an application for offshore licence shall be for an area not exceeding 50,000 rai. However, the Minister is empowered, with an approval of the Cabinet, to grant an offshore mining licence for an area exceeding

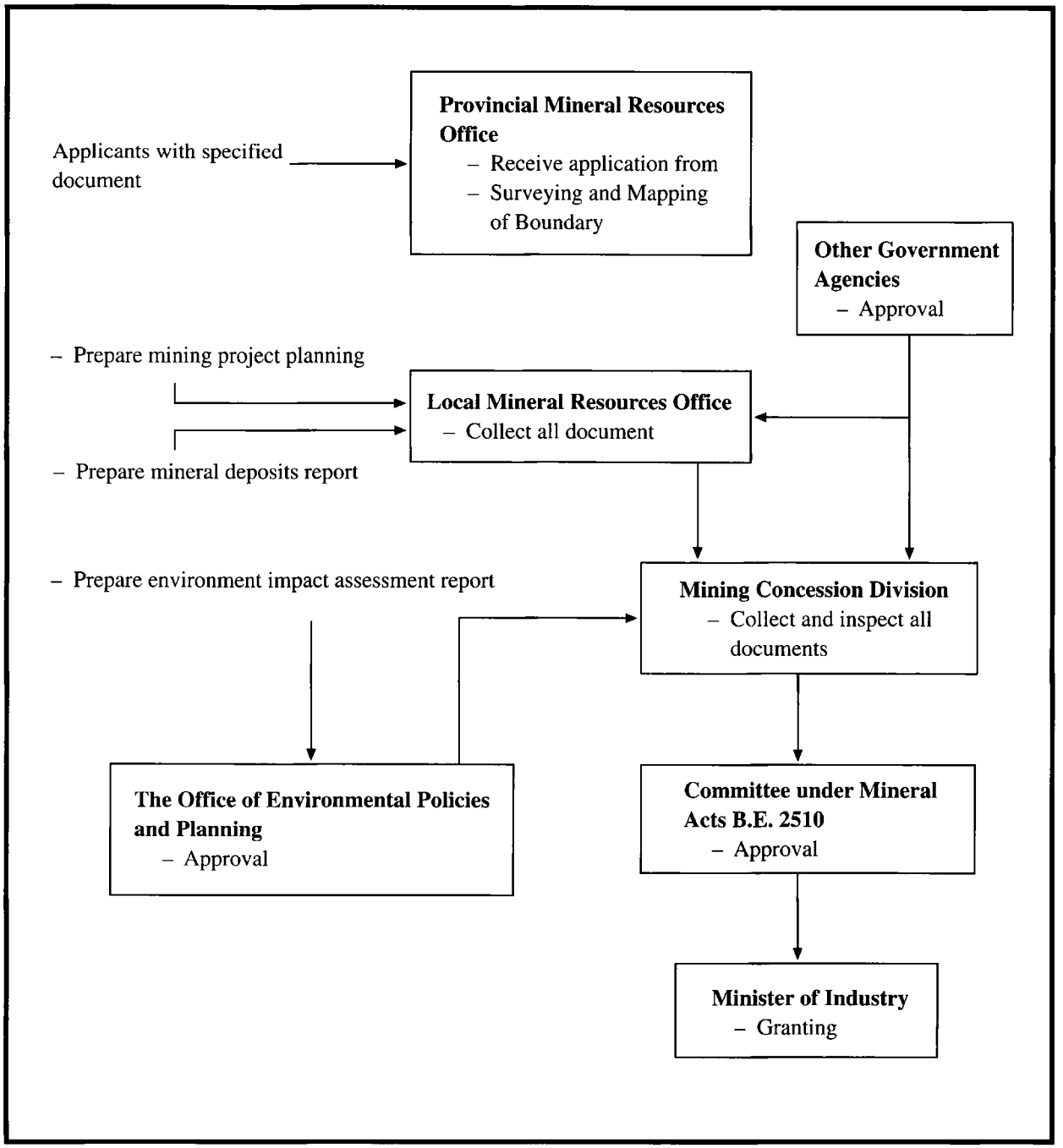

Figure 14.2. Licensing Procedure Chart for the Mining Licence in Thailand

50,000 rai. In the process of application, the application has to offer benefit in the interest of the state following the principle approved by the Minister in case the mining licence is granted. The mining licence shall not be valid for more than 25 years. If the mining licence provides for a validity period of less than 25 years, the mining licence holder may apply for validity period, but the total life span must not exceed 25 years. All of the qualifications, documents and fees requirements for GPL, EPL, SPL and ML are shown in table 14.1.

Table 14.1. Qualifications, documents and fees requirements for GPL, EPL, SPL and ML in Thailand

	GPL	EPL	SPL	ML
Qualifications				
1. Must be at least 20 years of age.	–	*	*	*
2. Must have domicile or residence in Thailand.	–	*	*	*
3. Must hold membership of the Mining Industry Council.	–	*	*	*
4. Must not be unsound mind nor have physical and mental infirmity, and must not be incompetent or quasi-incompetent.	–	*	*	*
5. Must not be bankrupt.	–	*	*	*
6. Must never have been revoked any application of EPL, SPL and mining licence.	–	–	*	*
7. Must never have been adjusted as guilty of act contrary to the provision of section 25 and section 43 of Minerals Law (1967).	–	–	*	*
In the application for gold prospecting in the areas designated by the Ministry of Industry, the application must have qualification specified in as follows:				
• Must be company.	–	–	*	*
• Must have at least 50 million baht of registered capital or sum of registered capital and assets own by the company be at least 50 million baht.	–	–	*	*
• Must have reasonable amounts of machines, tools, instruments and experts to operate gold prospecting and mining.	–	–	*	*
Documents				
• Copy of identification card of the applicant.	–	*	*	*
• Copy of a housing registration certificate of the applicant.	–	*	*	*
• Copy of company memorandum and regulations and letter of guarantee to certify commercial registration.	–	*	*	*
• Letter of guarantee to certify the names of partners, the Board of Directors and agent of authority.	–	*	*	*
• List of company shareholders certified by the registration official.	–	*	*	*
• If someone applies on behalf of an applicant, copy of an authorization letter in the form prescribed by the General Director of DMR should also be submitted.	–	*	*	*
• Guarantee letter to certify the membership of the Mining Industry Council.	–	*	*	*
• The details and lists of applications of EPL, SPL and Mining licence submitted by the applicant, including the valid EPL, SPL and Mining licences held by the applicant at the time of submitting this SPL application.	–	*	*	*

Table 14.1. *(continued)*

	GPL	EPL	SPL	ML
• The applicant must have a map indicating the prospecting areas applied (Before submitting EPL, the applicant has to apply for copying the map from the DMR in which the survey officer would make a map designating the prospecting areas, and will submit directly to the concern agency).	–	*	*	*
• The applicant must submit prospecting plan and method which are prescribed in the Ministerial legislation.	–	*	*	*
• To submit documents to specify the prospecting obligations by stating the amount of money to be expensed in the prospecting area each year throughout the validity of the SPL.	–	–	*	*
• To offer the special benefits in the interest of the state, 83 baht per rai for coal and 28 baht per rai for others (SPL), 0.1 per cent of the value of the mineral deposits exceeding 50 million baht (ML).	–	–	*	*
• The reliable evidence that specified minerals for which the applicant wishes to mine are discovered or existed in the applied for.	–	–	–	*
• The documents that the applicant must submit after submitting the application for mining licence are mining plan and all details that can be used to calculate the validity period of the mining licence, the report of mineral geological study in the area applied for and the report of the environmental impact assessment.	–	–	–	*
Fees				
• Application fee 20 baht.	*	*	*	*
• Exclusive prospecting licence fee	100 baht	500 baht	500 baht	500 baht
• Land use fee (.....baht per rai per year).	–	5	5	5 for tin and 20 for others
• Survey fee	–	–	–	10 baht/line
• Investigation fee	–	–	–	100 baht
• Boundary post	–	–	–	100 baht/post

Remarks: * means "required"
– means "not required"

F. ENVIRONMENTAL ADMINISTRATIVE SYSTEM AND ENFORCEMENT FOR MINING INDUSTRY

Most countries have environmental regulations for the mineral industry. Their effectiveness depends on the awareness of the people and on law enforcement. Developed countries seem to have clearer and more systematic laws and guidelines for environmental protection. The environmental effects of mining in developed countries are subject to a wide array of law and regulations. In Thailand, the environmental administrative system or process for the mining industry (figure 14.3) is not of much difference from those of the developed countries. The system consists of six steps:

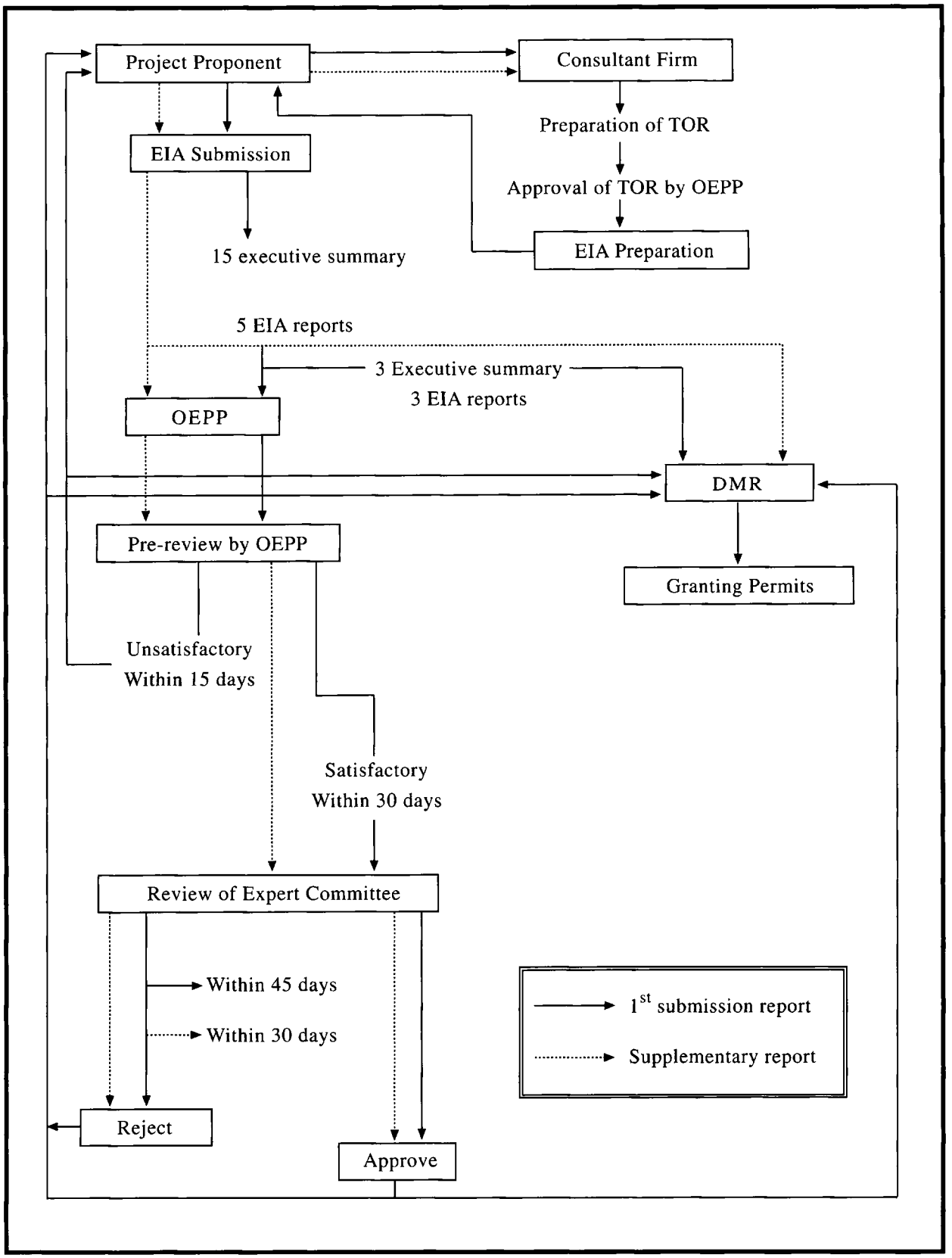

Figure 14.3. EIA Approval Process in Thailand

Protection of conservation and protected areas from mining, including:

- Conservation areas consisting of national parks and wildlife sanctuaries.
- Protected areas consisting of class-1 watershed areas, marine parks (coral reef reserves), mangrove forests, archaeological and historical areas and recreational areas.
- Approval of the project by the local authority and the land owner (including the Royal Forestry Department in the case of using forest land for mining).
- Requirement for EIA approval of mineral development projects in applicable areas under the environment law.
- Approval of mining plans and imposition of environmental protection condition by DMR.
- Overall approval of mining proposals by the advisory committee under the Minerals Act and granting of mining lease.
- Inspection of mining operations and enforcement (in addition to ensure the environmental protection and mitigation measures, DMR has introduced performance guarantee for new mining leases since 1995).

In addition, many areas in Thailand have certain restrictions to mining development. They are areas preserved by laws such as national parks, wildlife areas, the Ministry of Defense's restricted areas along the country border, military strategic areas and areas designed for the purpose of prospecting, testing, studying or researching in connection with minerals under the Minerals Law. Moreover, other preservation areas according to the government's policy are watershed areas (class 1), conservative seashore forest, militarily areas and natural or cultural preservation areas.

The Department of Mineral Resources supervises and controls the operation of the licence holder to be corresponded with the project proposal. The licence holders shall strictly comply with the environment prevention and preservation measures. In case of failing to do so, the Bank guarantee deposit for the use in environment rehabilitation will be forfeited by the Department of Mineral Resources. In addition, the licence holder should engage an engineer from the Board of Control of Engineering Profession in Thailand to look after the mining operations.

G. MINERAL EXPLORATION AND MINING WITH FOREIGN INVESTMENT

The Minerals Act B.E. 2510 (1967) has no restrictions against foreign investment in mineral exploration and mining in Thailand. The applicants shall possess a domicile or residence in the Kingdom.

From time to time, the DMR on behalf of the Ministry of Industry would invite private investors to participate in a project initiated by the Government by means of international bidding. The party who offers the best benefits, apart from fulfilling basic requirements, would usually be awarded the bidding. Furthermore, terms and conditions of the contact for a particularly project will have to be discussed and agree upon between the Government and the party concerned. This type of project usually materializes through negotiation on the basis of special case agreement.

The Foreign Business Act of 1999, which became effective on 4 March 2000, repeals and replaces the 1972 National Exclusive Council Announcement 281, better known as the Alien Business Law. The Act serves to define an "alien", and identifies the scope of foreign participation in business in Thailand.

An "alien" is defined as:

- A natural person who is not of Thai nationality;
- A juristic entity that is not registered in Thailand;

- A juristic entity incorporated in Thailand with foreign shareholding accounting for one half or more of the total number or value of shares;
- A limited partnership or ordinary registered partnership whose managing partner or manager is a foreign.

Businesses that initiate activities that fall under Lists of the Foreign Business Act are subjected to the limitations imposed by the Act.

Businesses that are covered by List 2 in which mining is included are prohibited to aliens unless specific permission is granted by the Commerce Ministry, by and with an appropriate Cabinet resolution. Alien juristic entities allowed to engage in List 2 activities must meet the following two conditions:

- At least 40 per cent of all shares are held by Thai persons or non-alien juristic entities (This may be reduced to 25 per cent on a case-by-case basis).
- Two fifths of the members of the Board of Directors are Thai.

According to the investment promotion act B.E. 2520 (1977), ore prospecting and mining are listed as the activities eligible for promotion. The promotion companies are given certain guarantees, privileges and benefits.

- Exemption of import duty on machinery
- Corporate income tax exemption for 8 years provided that a project with capital investment of 10 million baht or more (excluding cost of land and working capital) obtains ISO 9000 or similar international standard certification within 2 years from its start-update, otherwise the corporate income tax exemption will be reduced by 1 year.
- Exemption of import duty exemption on raw or essential materials used in the manufacturing of export products for 5 years.

H. TRENDS IN MINING POLICY

The principal policy on mineral development of Thailand has never been changed since the early days in that "the State is committed to the development of its mineral resources through the private sector". In the former national economic and social development plan, mineral policy was emphasized on mineral goods for export in order to earn the country's foreign revenue. However, from 1992 onward, the seventh plan, the mineral policy has been improved the concept of the natural resource administration system, in order to conserve natural resource through environmentally sound and sustainable development concept. At present, mineral policy is placed on promoting large-scale project for prospecting and mining, in order to enhance environmental conservation capability and promoting the production of the local consumed minerals.

In order to promote large-scale underground mining project, the DMR is preparing for the next amendment of the Minerals Act which is now in the approval process of the Parliament. The main improvement will be focused on the waiver of surface land right above the mining area. However, the project has to be proved of safe and environmental considerate working condition, otherwise compensation will be paid to the damages occurred from the operation.

I. CONCLUSIONS

Thailand has always prepared to encourage and promote mining industry for the purpose of mutually economic benefits among parties involved. Investment promotion in several fields within mineral industry will be more and more dynamically pursued. The Government has established the clear policy to welcome foreign investors to participate in the development of large-scale projects. The economic mineral zones which mining has priority to commence its activities have been declared in many designated areas to reduce land-use conflict problems. Legislation have been revised and improved to cope with the changing global environment. Mineral resources management policy has been formulated to facilitate the long-term development of mining industry. In order to promote the mining activities and the sustainable development of the resources, the Department of Mineral Resources has also prepared all the necessary basic information needed, such as geological maps of various scale and a variety of airborne geophysical maps covering the whole country. The government agencies involved in such industry, including the local authority, have worked very closely together in such a way that the land-use conflict on mining development is kept to the minimum, in order to maintain peace and bring-up fruitful productivity out of the areas and for the country as a whole.

XV. CURRENT STATUS OF THE MINING INDUSTRY AND LEGAL AND REGULATORY REGIME ON MINERALS IN VIET NAM

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Department of Geology and Minerals of Viet Nam

A. OVERVIEW OF MINERAL RESOURCES IN VIET NAM

The mining industry in Viet Nam commenced during feudal times and was more developed at the beginning of the nineteenth century under the Nguyen dynasty (1802-1859). During this period, nearly 150 mines were in operation with 15 different kinds of minerals such as copper, lead, zinc, tin, iron, sulfur and other minerals. During the French colonial period, the number of mines put into operation were over 300, producing more than 20 different kinds of minerals. During the period from 1955 to 1985, more than 40 kinds of minerals have been extracted from 700 operating mines. Since 1986, when the Government of Viet Nam adopted the policy of market economy, mining activities have rapidly developed both in the number of mines and the kinds of minerals extracted.

Viet Nam has abundant and diversified mineral resources, consisting of crude oil/gas, coal, non-metallic and metallic minerals. Coal consists of mainly anthracite and lignite. Anthracite is mainly located in the Quang Ninh, Thai Nguyen and Nong Son coal basins. Lignite with enormous reserves is located at shallow depths in the Red river basin. Non-metallic minerals are composed of apatite, kaolin, pyrophyllite, silica sand, cement raw materials and construction materials. Among these, apatite, pyrophyllite, and silica sand have large reserves and construction materials and cement raw materials are of enormous potential. Metallic minerals are composed of iron, chromium, manganese, bauxite, lead, zinc, tin, tungsten, copper, nickel, titanium, zirconium, stibnite, rare earths and gold. The distribution of major mineral resources of Viet Nam is shown in figure 15.1.

In order to develop the mineral resources of Viet Nam, the Government recognizes that it is essential to focus on intensifying geological investigations, mineral prospecting and exploration. This development should coincide with upgrading the mining industry to meet the requirements of the national economy and the Viet Nam's export targets. Foreign and domestic investment in exploration and mining of mineral resources must be encouraged.

Viet Nam is a country with abundant mineral resources of which the non-metallic resources (oil/gas and coal excluded) are perhaps the most important. Most of the metallic occurrences have never been evaluated beyond the geological exploration stage. Exploitation of mineral resources has been carried out from historical times but systematic geological studies and mineral exploration have only been done since the beginning of the twentieth century, especially during the last 40 years. Achievements of geological and mineral exploration have greatly contributed to mineral development of the country and region. Further geological studies have resulted in establishing a series of geological and mineral distribution maps and specific maps at small and medium scales. At present, large scale maps are being prepared. About 5,000 ore occurrences and deposits have been identified by mineral prospecting and out of these about 500 ore occurrences and deposits have been subjected to preliminary or detailed exploration. The data collected from such exploration programmes form the basis for long-term development and numerous explored deposits are now being mined.

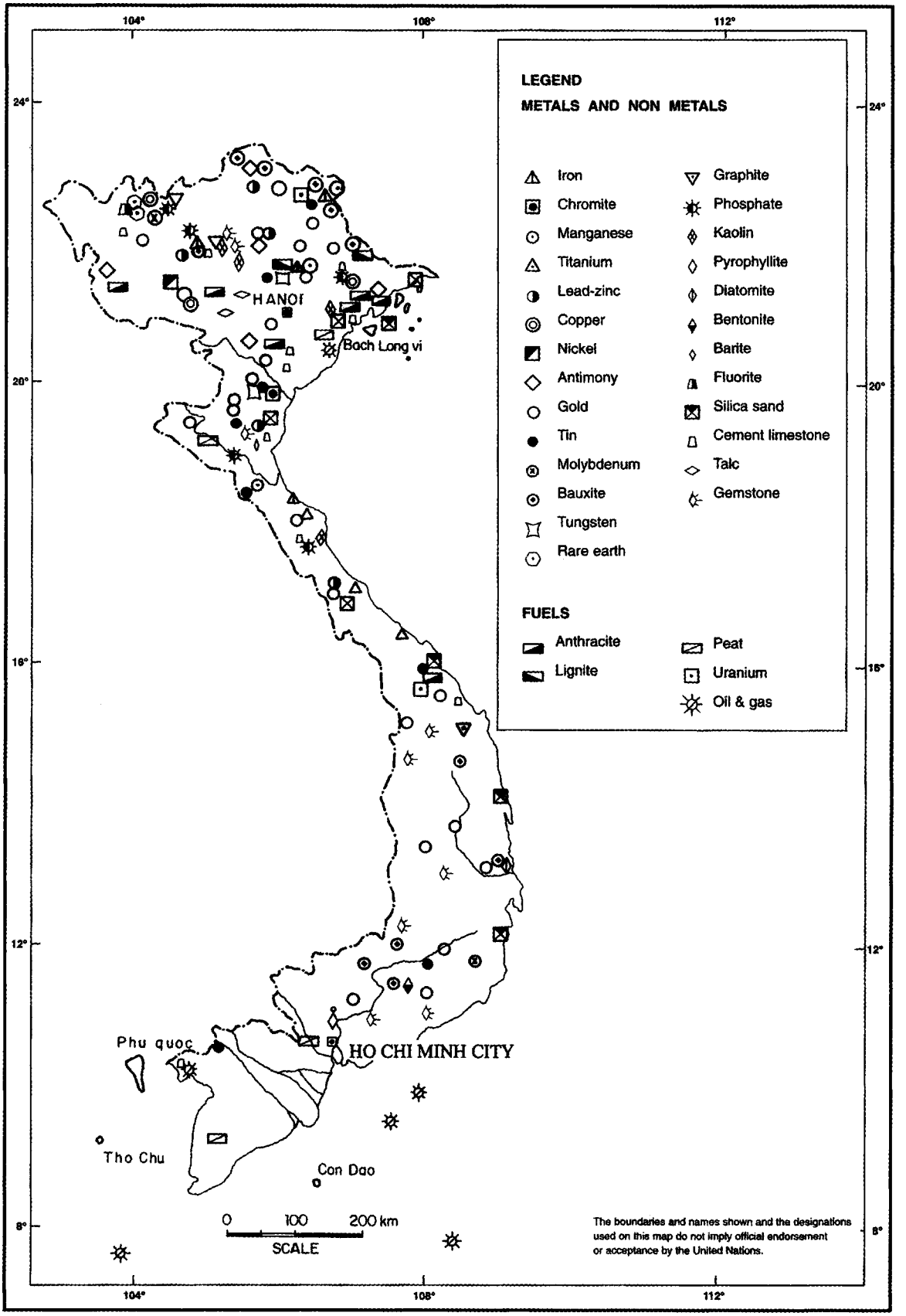

Figure 15.1. Distribution of major mineral resources in Viet Nam

Mineral resources of Viet Nam may be divided into three groups:

- High potential exists for development of deposits of bauxite, rare earth, anthracite, lignite, apatite, construction materials, kaolin, silica sand and mineral water;
- Medium potential is associated with the development of tin, tungsten, gold, titanium, chromium, iron, stibnite, lead, zinc, copper, nickel, uranium, bentonite, pyrophyllite and graphite deposits;
- Limited potential refers to pyrite, manganese and fat coal deposits.

Summary of mineal resources of Viet Nam is provided in table 15.1 and resources/reserves of mineral deposits in Viet Nam are given in table 15.2.

Table 15.1. Summary of mineral resources in Viet Nam

Minerals and Rocks	Estimated Reserve (tons)	Annual output (tons)	Location and Remarks
Coal	3,500 Mt	6.9 Mt in 1988, 11 Mt in 1998	3,600 Mt in Quang Ninh, 80 Mt in Thai Nguyen Total design capacity 14.5 Mt tons/year.
Oil	Nearly 10,000 bft	11 Mt in 1999	In northern lowlands, southern deltas and continental shelves.
Uranium	N.D.	None	In Cao Bang, Lai Chau, Quang Nam.
Ferrous metals			
Bauxite	Proven 3,000 Mt	Limited	Good quality (ore content 40-43%)
Chrome	12 Mt	Limited	Only in Thanh Hoa, cobalt and nickel exist in ore.
Iron	1,000 Mt	0.5 Mt	In Bac Thai, Ha Tuyen, Cao Bang, 700 Mt at Thach Khe mine. Also-in Quang Ngai.
Manganese	3.5 Mt	1,000 tons	In Cao Bank, Ha Giang, Nghe An, Khanh Hoa.
Titanium	7.2 Mt	N.D.	In coastal regions.
Base and Precious Metals			
Antimony	Not significant	Limited	In Tuyen Quang, Quang Ninh, Hoa Binh, Thanh Hoa, Nghe An.
Bauxite, laterite	1,000 Mt	Limited	In the south.
Bauxite, sediment	95 Mt	Limited	In Ha Giang, Cao Bang, Lang Son.
Copper	637,000 tons	Low	In Lao Cai, Son La, Cao Bang; 550,000 tons of good quality exist at a single mine.
Chromite	12 Mt	Potential 20,000 tons	Relatively low quality, only in Thanh Hoa.
Gold	170,000 tons	Limited	In 53 areas: Cao Bang, Bac Thai, Lang Son, Quang Ninh, Bong Mieu, Thanh Hoa, Nghe An, Binh.
Molybdenum	N.D.	None	Thuan, Lam Don-, Don- Nai.
Mercury	N.D.	None	In Lai Chau, Lao Cai, An Giant.
Nickel	158,000 tons	None	In Bac Thai, Ha Giang, Ha Ninh Binh.
Silver	N.D.	Limited	In Bong Mieu.
Tin and wolfram	225,000 tons	Low, 1995 target: 1,000 tons	In Tinh Tuc, Pia Oac, Tam Dao, Quy Hop, Lam Don-, Kontum, Nghe An, Bao Loc.
Zinc and lead	2 Mt	Limited, by individuals	Bac Thai, Tuyen Quang, Cao Bang, Ha Giang, Yen Bai, Lai Chau, Nghe An.

Table 15.1. *(continued)*

Minerals and Rocks	Estimated Reserve (tons)	Annual output (tons)	Location and Remarks
Fertilizer minerals			
Apatite	2,000-3,000 Mt	600,000 tons	408 Mt in Lao Cai.
Barite	3 Mt	Limited	15 sites in Ha Bac, Bac Thai, Lai Chau, Nghe An.
Limestone	41 Mt	N.D.	In many regions.
Phosphorite	Low	17,800 tons	Small scattered reserves.
Pyrite	8.7 Mt	None	Small scattered reserves in Vinh Phu, Ha Tay, Tuyen Quang, Thua Thien.
Serpentinite	40 Mt	None	31 Mt in Lao Cai, 8 Mt in Thanh Hoa.
Building Materials			
Cement clay	290 Mt	N.D.	In Hoang Thach, Co Dam, Ha Tien.
Granite	Very large	Limited	In Bac Thai, Ha Tay, Thanh Hoa, Binh Dinh, An Giang ... rich in varieties.
Materials for pottery and chinaware			
Dolomite	13 Mt	N.D.	In La Giang (8 Mt), Ngoc Long (5 Mt)
Feldspar	9.5 Mt	N.D.	In Vinh Phu, Lao Cai.
Fluorite	6.2 Mt	N.D.	In Cao Bang, Lai Chau, Phu Yen.
Kaolinite	196 Mt	N.D.	In Red River, Bac Thai, Quang Ninh, Da Lat, Dona Nai.
Sand, quartz	90 Mt	N.D.	In Khanh Hoa, Quang Niah, Quang Nam-Da Nang.
Sand, silicate	Large	N.D.	In coastal areas, high quality.
Precious and semi-precious stones, ruby, sapphire	N.D.	Limited	In Luc Yen, Quy Chau, Di Linh, Phan Thiet, Yuan Loc. Ruby has high quality.
Topaz, beryls, nephrytes, zircon, jadeite, garnet, Spinel, amethyst, tourmaline	N.D.	Limited	In Thanh Hoa, Nghe An, Vinh Phu, Quang Ninh, Cao Bang, Di Linh, Phu Yen.

Source: Asian Development Bank, Viet Nam Environment Sector Study, December 1992.

Note: N.D.: No Data, Mt = million tons.

Table 15.2. Estimated reserves and possible resources of main mineral deposits in Viet Nam ('000 tons)

Mineral commodity	Estimated reserves	Possible resources	Grade and major locations
Coal	3 524 000		
Lignite	910 000		
Apatite	885 300	2 100 000	Lao Cai
Iron ore	758 700	1 000 000	
Chromite	20 800	20 000	
Zinc and lead	748		Cho Dien, Lang Hit, Tu Le
Tin	138		
Bauxite	4 175 000	5 500 000	Al_2O_3 (39.5-65.4%) 200 Mt Al_2O_3 (47-50%) 4,000 Mt
Gold	0.4		
Silica sand	39 406		
Graphite	506		C (18-20%), Tyen An
Manganese ore	4 700	3 000	Mn (15-35%)
Ilmenite	11 000		
Copper	771		Singh Quyen, Ban Phuk
Nickel	119		–
Rare earth	9 292	9 000	
Titanium		15 500	
Wolfram	43		
Pyrite	12 100		5 (10%), Ba Tran
Serpentinite	8 000		Te Loi
Kaolin	3 000	8 000	
Bentonite	542	3 300	Tam Bo
Barite	601		$BaSO_4$ (80-85%) Lang Kao

Source: State Committee for Cooperation and Investment; General Statistical Office, Statistical Yearbook 1992; press reports.

B. CURRENT STATUS OF THE MINING INDUSTRY IN VIET NAM

The mining industry in Viet Nam, although still undeveloped, has made an important contribution to the socio-economic development, the industrialization and modernization of the country. Mineral deposits and mining areas, especially small and medium size deposits and small-scale mining areas, are distributed unevenly throughout the country. The dense concentration of coal mines are noted in Ouang Ninh and Thai Nguyen districts while aggregate stone quarrying is ongoing in the Thai Nguyen, Lao Cai, Yen Bai, Son La, Ha Tay, Hoa Binh, Hai Duong, Ninh Binh, Thanh Hoa, Ha Nam, Nghe An, Ha Tinh, Quang Binh, Rhanh Hoa, Dong Nai, Ba Ria – Vung Tau districts and areas.

In the period of the centrally planned economy, only state-owned enterprises were involved in mining and mineral resources processing industries. Nowadays, under the market economy conditions, the entities involved in the mining industry have been diversified and comprise state-owned enterprises, private enterprises, limited liability companies, joint stock companies, enterprises with foreign investment capital, cooperatives and others. State-owned corporations, however, such as PetroViet Nam,

VINACOAL, VMC, VIGEGO, VINASTEEL, VINACHEM, VINACEMENT continue to play an important role in the economic devleopment of the country.

The number of employees in the mining industry at the end of 1998 was 212,100 people, accounting for 5.75 per cent of the total number of industrial workforce and 0.55 per cent of the total number of employees in the whole country. According to the statistics, out of 826 organizations and individuals having mining licences, 456 state-owned enterprises account for 55.2 per cent, 120 non-state-owned enterprises such as limited liability companies, joint stock companies and private enterprises account for 14.5 per cent, 114 cooperatives account for 13.8 per cent and 118 individuals account for 12.4 per cent. Enterprises with foreign investment capital account only for 2.2 per cent with 18 enterprises operating mainly in the field of quarrying construction materials.

At present, there are 1,183 mining sites pertaining to 980 deposits being in legal mining operations. The mining industry is dominated by quarrying of common construction materials at 433 mines accounting for 44.18 per cent, followed by brick clay mining at 88 mines (8.98 per cent), building sand and gravel at 81 mining sites mainly of river bed sand (8.27 per cent), anthracite and fat coal at 53 mines (5.41 per cent), mineral water for bottling and medical treatment at 50 mineral and hot springs (5.10 per cent) and cement raw material at 37 mines (3.78 per cent). Some other minerals such as ilmenite, facing stones, cement clay, placer tin, peat and kaolin are being mined at 10-20 sites each.

Most of mineral deposits and ore occurrences (excluding oil and gas, coal, thermal water) under development are the deposits of small and medium size. The mines being operated with a large capacity are coal mines (with capacity over 1,000,000 tons per year, mineral water (over 10,000,000 litres per year), cement limestone (over 1,000,000 tons per year), sand and gravel (over 1,000,000 m^3 per year) and apatite (over 500,000 tons of ore per year).

The mines with a medium capacity are focused on some common construction material deposits operated by state-owned enterprises with a production capacity of over 500,000 m^3/year and exposed coal deposits with a capacity of over 400,000 tons per year account for a small portion of a total mineral production. The rest of common construction materials and brick clay mines and small scale metallic ore mines is being operated by cooperatives and individuals. The location of major mining sites is shown in figure 15.2 and main mineral production is provided in table 15.3.

C. REVIEW OF MINING LEGISLATION AND REGULATIONS IN VIET NAM

The 1992 Constitution of the Socialist Republic of Viet Nam, in Article 17, stipulates that "All land, forests, rivers, lakes, water resources, mineral resources. stipulated by the law as State properties, are of all people's ownership". After the promulgation of the 1992 Constitution, our State promulgated: (i) the Petroleum Law on 6 July 1993; (ii) the Mineral Law on 20 March 1996; and (iii) the Law on Water Resources on 20 May 1998.

1. Some basic contents of the Mineral Law

The objects of governing by the Mineral Law are all minerals in solid, gaseous form, natural mineral water and thermal water within the mainland, island, internal water, territorial waters, exclusive economic zones and the continental shelf of Viet Nam. The scope of application of the Law include the management, protection, basic geological survey of mineral resources and mineral activities (prospecting, exploration, mining and mineral processing).

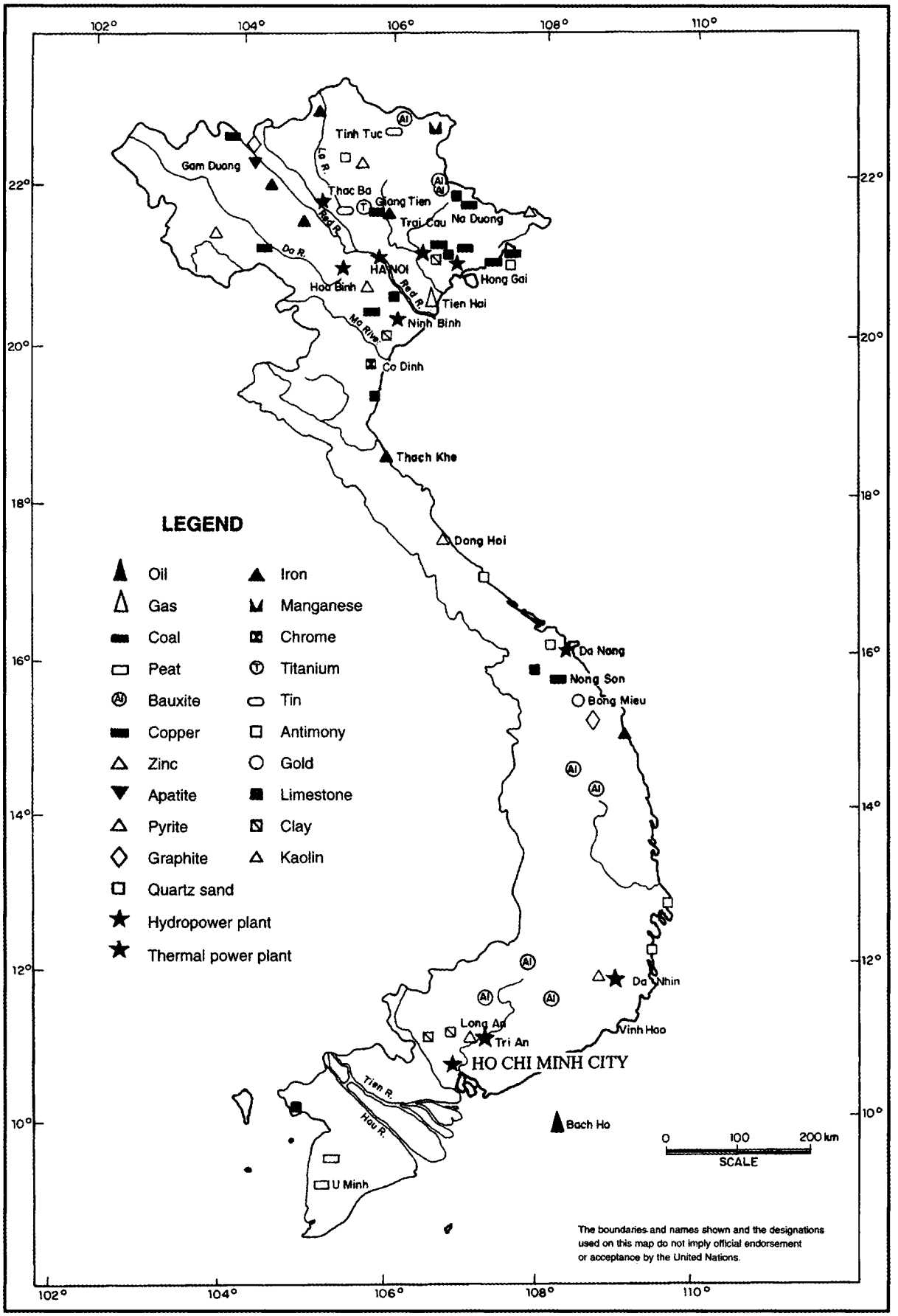

Figure 15.2. Location of major mining areas in Viet Nam

Table 15.3. Main mining production in Viet Nam, 1996-1998

Mineral commodity	Unit	1996	1997	1998
Clean coal	Million tons	9.86	11.39	11.2
Crude oil	Million tons	8.80	10.10	12.6
Iron ore	Million tons	0.193	0.330	0.374
Chromium ore, dry	Tons	40 000	51 000	68 400
Manganese	Tons	6 700	6 700	6 540
Lead-zinc	Tons	54 000	52 000	55 100
Copper	18% Cu, tons		53 000	2 830
Tin ingot	Thousand tons	3 008	2 830	2 430
Bauxite	Thousand tons		29 000	46 360
Ilmenite	Thousand tons	80	97	130
Gold	Tons	2.0	1.8	1.8
Phosphate	Thousand tons	613	590	580
Kaolin	Thousand tons	212	350	200
Silica sand	Thousand tons	408	450	300
Cement limestone	Million tons	7.6	12.6	14
Mineral water	Million litres		108	110

Sources: Statistical year book: 1996-1997, 1998, Socialist Republic of Viet Nam, Hanoi; Annual reports of the Ministry of Industry, 1996, 1997, 1998, Hanoi; Goldfield Mineral Services Ltd. May, 1998. SWIP, London.

The Mineral Law dated 20 March 1996 contains the following provisions:

- It confirms the all-people's ownership right over the mineral resources.
- Ensures the overall right of the State to manage the mineral resources and mineral activities.
- Determines clearly the rights and obligations of state agencies at the central and local level toward mineral resources.
- It stipulates the responsibility to protect, rationally and economically use the mineral resources of the country.
- It encourages investment in the development of mining industry.
- It stipulates clearly activities allowed or not allowed to be carried out, identifies clearly the rights and obligations of organizations and individuals engaged in mineral activities.

2. Mining regulations

The main regulations amended and supplemented of the Degree No. 76/2000-ND-CP are as follows:

a) The maximum area covered by an exploration licence for

- Precious metals (gold, silver, platinum), gemstones (diamond, ruby, sapphire, emerald) is increased from 50 to 100 km^2;
- Coal, metallic minerals (except precious metals), non-metallic minerals (except common construction materials) in the mainland regions, with or without water surface is increased from 100 to 200 km^2.

- Minerals in the continental shelf are increased from 200 to 500 km^2.
- Minerals to be used as common construction materials in the mainland regions, with or without water surface is increased from 2 to 10 km^2.
- Mineral waters, thermal water are increased from 0, 1 to 20 km^2.

b) *Vietnamese currency* is to be used for setting the fee for exclusive right to carry out exploration and minimum exploration expenditure is equal for both Vietnamese and foreign organizations and individuals.

c) *The duration for examining application for mineral activity licence* is decreased from 60 days to 45 days for Vietnamese organizations and individuals and from 90 days to 60 days for foreign organizations and individuals.

d) *The mineral exploration-practicing licence* is removed and replaced by a statement on conditions for practicing mineral exploration.

3. Mineral activity licences

Mineral activity licences in Viet Nam include:

- Mineral prospecting licence
- Mineral exploration licence
- Mining licence
- Mineral processing licence
- Individual mining licence

a) *Mineral prospecting licence*

- Validity term is not more than 12 months. If the prospecting area is more than 100 km^2, the licence shall be extended one time with extension period not more than 12 months. The licence shall not be assigned to another organization or individual. The mineral prospecting licence is not an exclusive licence.
- The right to apply for extension of mineral prospecting licence is only accorded to organization or individual licenced to carry out prospecting in an area of 100 km^2 or more, with one extension for a period not more than 12 months.

b) *Mineral exploration licence*

- Validity term is not more than 24 months, the total extension time shall not exceed 24 months.
- Organizations and individuals have the special right to apply for mining licence when the exploration is successful and the right to process the mineral exploited without applying for mineral processing licence.

c) *Mineral processing licence*

- Validity term of the mineral processing licence is based on the feasibility study report on mineral processing. Organizations and individuals have the right to assign and bequeath the right of mineral processing according to the licence issued.

d) Provisions on surrender of mineral activity licences and partial surrender of mining areas

- The Mineral Law allows enterprises to surrender the mineral activity licences or partially surrender their mining areas.

e) Provisions on assignment and bequeathing

The organization and individual licenced to carry out the mining activities has the right:

- To assign the mineral exploration, mining and mineral processing rights.
- Assign information on mineral prospecting and exploration results wholly invested by the organization or individual.
- To bequeath the mineral exploration, mining and mineral processing right.
- If the licencee fails to satisfy all the conditions according to the provisions of Viet Nam's Law, to continue the mining activities the licencee shall have the right to assign these rights to another organization or individual.

f) Provisions on environmental protection in mineral activities

- The approval of the environmental impact assessment by the competent state authorities shall be one of important bases to consider for decision on issuing mining and mineral processing licences.
- The organization or individual licenced to carry out mining activities must deposit at a Vietnamese bank or a foreign bank allowed to operate in Viet Nam an amount of money to ensure the environment and land rehabilitation after terminating the operation in some part of the mining area and when closing the mine.

g) Financial provisions

- The fee for issuance of exploration licence shall be: ....., the fee for issuance of mining licence shall be ..... USD/licence, the fee for extension of licence shall be calculated by dividing the amount of issuance fee by the time allowed for prospecting or exploration and multiplying by the time allowed for extension.
- The fee for exclusive right to carry out exploration is calculated based on the exploration area and validity term of the exploration licence at the following levels:

  First year: 300,000 VND/km^2/year

  Second year: 400,000 VND/km^2/year

  Third year: 550,000 VND/km^2/year

  From forth year onward: 700,000 VND/km^2/year

- The fee for exclusive right shall not apply to the exploration licence where the validity term including the extension term is less than twelve (12) months and shall not apply to the exploration activities in the areas licenced for mining.
- The amount of money deposited shall be 25 per cent of the estimated exploration cost of the first year of exploration approved by the licence-issuing agency.
- If after 6 months from the effective date of the mineral exploration licence the exploration is not carried out and the licence expires, the money deposited shall be lodged to the State budget.

- If after 6 months from the effective date of the mineral exploration licence the exploration has been carried out according to the plan, the organizations and individuals licenced to carry out the exploration shall have the right to receive back the money deposited.
- For exploration licence with a validity term of less than six (6) months, the deposit shall not have to be paid.
- Organizations and individuals licenced to carry out exploration may register an escrow account at a Vietnamese bank or a foreign bank allowed to operate in Viet Nam instead of paying deposit.

h) Royalty

- Besides the obligations to pay fees, the holder of mineral activities licences also have the obligation to pay other taxes, including royalty tax.
- According to the provisions of amended Ordinance on Royalty tax dated 28 April 1998, the frame of royalty tax rate is stipulated as follows:
  - Metallic minerals, except gold and rare earth: 1-5 per cent
  - Gold: 2-6 per cent
  - Rare earth: 3-8 per cent
  - Non-metallic minerals: 1-5 per cent
  - Gemstones: 3-8 per cent
  - Coal: 1-3 per cent
  - Petroleum: 6-25 per cent
  - Gas: 0-10 per cent
  - Natural mineral water, purified bottled and canned natural water: 2-10 per cent

The royalty tax price shall be the selling price of mineral products at the place of mining.

i) Provisions on rights and obligations of enterprises with foreign investment capital in mineral activities in Viet Nam

- Basically, the enterprises with foreign investment capital shall have rights and obligations as those of domestic organizations and individuals carrying out mineral activities.
- The difference is that to carry out the mining and mineral processing activities, the enterprises with foreign investment capital must be granted with the investment licence by the Ministry of Planning and Investment of Viet Nam.
- The mineral exploitation or processing licence shall be issued to the enterprises with foreign investment capital at the same time with the investment licence or after the investment licence is issued.
- An investment licence issued to the enterprises with foreign investment capital to carry out the mineral exploitation may include the mineral exploration, exploitation and processing activities.
- Foreign organizations and individuals shall not be granted with individual mining licence.

D. MAIN MEASURES TO PROMOTE INVESTMENT IN THE MINING INDUSTRY OF VIET NAM IN THE COMING PERIOD

- Perfect the system of legal documents on minerals currently in force, with the aim to enhance the attractiveness of the investment encouragement policies, simplify the administrative procedures, create more favorable conditions to promote investment from foreign countries and various domestic economic sector to take part in the mining and mineral processing activities.
- Speed up the equalization of mining and mineral processing enterprises to attract investment sources and enhance the efficiency of management and business in mining and mineral processing activities.
- Renovate and modernize the mining and mineral processing technologies with the aim to increase the labor productivity, to make full exploitation and save the mineral resources, intensify fine processing to increase the value of the mineral product together with environment protection and labor safety in mining and mineral resources processing activities.

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