

## APPENDICES

With the advice for pre-terms of reference for the  
Post Conflict Impact Assessment for the  
Reconstruction of the Mining Sector in Katanga,  
Democratic Republic of Congo

(appendices 1 to 14)

## APPENDIX 1

### Letter from UNEP of 16 July 2009 in which the Commission has been asked to submit pre-terms of reference.



UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement Programa de las Naciones Unidas para el Medio Ambiente  
Программа Организации Объединенных Наций по окружающей среде برنامج الأمم المتحدة للبيئة

联合国环境规划署



Netherlands Commission for Environmental Assessment (NCEA)  
BP 2345  
3500 GH Utrecht  
The Netherlands

Geneva, 16 July 2009

Dear colleagues,

We would like to thank the Netherlands Commission for Environmental Assessment (NCEA) for its interest to collaborate with the United Nations Environment Programme (UNEP) and to contribute to its project for the Post Conflict Environmental Assessment of the Democratic Republic of Congo.

It is our pleasure to invite the below nominated NCEA staff for the environmental assessment mission led by UNEP in Katanga, DR Congo on 10-30 August 2009:

Mr. Adrianus van der Velden  
Mr. Reinoud A.M. Post  
Mr. Piet Hein Van der Kleijn  
Mr. Serge Cogels.

We are confident that the above-referred joint mission will add value to the overall environmental assessment of DR Congo.

Looking forward to our close continued cooperation.

Yours sincerely,

  
for Henrik Slotte  
Chief

Post-Conflict and Disaster Management Branch

UNITED NATIONS  
ENVIRONMENT  
PROGRAMME

Post-Conflict Branch  
(PCoB)

Geneva, Switzerland



## APPENDIX 2

### Project information

**Proposed activity:** Post Conflict Impact Assessment for Reconstruction of the Mining Sector in Katanga, Democratic Republic of Congo.

The United Nation Environmental Programme, more specifically its Post-conflict and Disaster Management Branch has decided to assist the DRC in its post conflict reconstruction planning and sustainable development by providing a Post Conflict (environmental and social) Impact Assessment (PCIA). UNEP has decided that this assessment will address four aspects related to post conflict reconstruction:

- rebels in the national parks
- resettlement of refugees
- the environmental problems of Kinshasa and its surroundings
- reconstruction of the mining sector (base elements) in Katanga.

The present advisory report relates to the fourth component of the PCIA: the Assessment of the Katanga mining sector.

The specific objective of this component is to define the conditions and modalities in which the development of the mining sector in Katanga can contribute to poverty reduction and to political and civil stability. An important additional objective is to identify approaches that can be useful for the development of the mining sector in RDC as a whole. Primary focus of the assessment is on industrial mines of the base metals: copper, cobalt, zinc, while small scale mining will also get attention. The study will be mainly geared towards assessing the development perspectives for the sector, the conditions for management of the sector so that it contributes to sustainable development, to improvement of environmental governance, to poverty reduction and to peace.

**Categories:** OECD-DAC/CRS codes 2010: 15110 Public sector policy and administration management, 15230 Post-conflict peace-building (UN), 32264-Mineral Resources and Mining of Nonferrous Metals, 32169 Basic Metal industries.

**Project numbers:** I086

**Progress:** Pre-Terms of Reference.

#### **Composition of the working group of the Commission for EIA:**

Mr. Aad van der Velden (Chairman)

Mr. Serge Cogels

Mr. Piet Hein van de Kleijn

**Resource person:** Mr. Fernando Fahl

**Technical secretary:** R.A.M. Post

## APPENDIX 3

### The Tax Gap

The tax gap is partly explained by the fact that some mining companies transport their ore or concentrate for further treatment out of Katanga by road into Zambia or in transit from Zambia to South Africa.

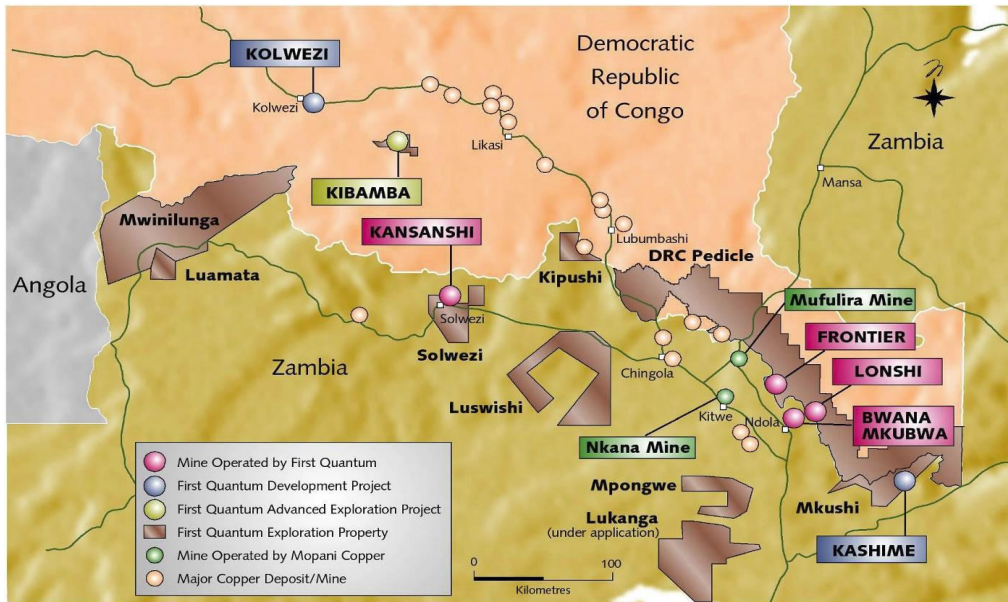
The Zambian Internal Revenue Service considers income derived from refined or smelted copper or from traded concentrate as taxable income independent from the mineral deposit's origin. According to Global Witness, there are no export duties charged or border crossings registered. Global Witness mentions, based on interviews, that a significant proportion of DR Congo's ore is processed at various smelters along the Zambian copper belt, however without quantification or providing specific evidence. It is uncertain if the finished product after processing in Zambia is re-exported back to DR Congo. [Global Witness, juillet 2006. Rapport : « Une corruption profonde : Fraude, abus et exploitation dans les mines de cuivre et de cobalt du Katanga », Washington; p 1-55, section X p 46]

It must be said that the DR Congo Mining Code, article 85 : "Sale of mining products", states that export of unprocessed ores for treatment outside the National Territory is permitted, subject to the Minister's authorisation. Authorisation is granted based on cost considerations and indication of advantages for DR Congo. There is mention of an agreement signed in 2005 between Zambia and DR Congo aiming at toll arrangements. It seems unlikely, however, that carrying the ore back into DR Congo is more favourable above export to South Africa, unless the recent levied Zambian windfall tax is a driving force. [LOI N° 0072002 DU 11 JUILLET 2002 PORTANT Source : Journal Officiel n°spécial du 15 juillet 2002 Fait à Lubumbashi, le 11 juillet 2002. Joseph KABILA; p 1-137, p 64]<sup>1</sup>

Within this context First Quantum Minerals Ltd should be mentioned with their Frontier mining property, located within 2 kilometres of the Zambian border (see map). First Quantum's Frontier is advantageously located, relatively close to the Mopani smelter facilities at Mufulira in Zambia. Frontier commenced production late 2007 and has an estimated mine life of 25 years. Installed concentrate mill capacity is 75 kilotons copper per annum from a sulphide copper resource at an average grade above cut off of 1.16 % copper. The total resources are defined to contain 2.1 m tons of copper. First Quantum holds a strategic interest of 16.9 % in Mopani smelter. In 2008 the minister granted shipments of concentrate to Zambia. For the first six months in 2009, First Quantum reports for their Frontier mine a production of 43.3 kilo tons of contained copper, concentrated from a feed grade of 1.3 % copper.

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<sup>1</sup> <http://www.riddac.org/document/pdf/cd-codeminier.pdf>



*First Quantum Minerals Ltd projects in South Katanga and Zambia (2009)*

## APPENDIX 4

### Tenke Fungurume Mine EIA Components

In addition to the ESIA Socioeconomics study: (Socio economic impact assessment: 24 p. ; Macro economic assessment: 14 p.; cultural heritage: 11p.), socio economic studies were conducted by an international consultant (anthropologist) and five university graduates from Lubumbashi.

A. The baseline study comprises:

- Inform the population about the project and its impact in terms of:
  - land needs and compensation of the population;
  - opportunities and limits of access to available jobs;
  - participation of the mining project in the development of the region.
- Gather opinions, expectations and fears of the population about the project.
- Establish the priorities of the local population on development.
- Describe and understand the local economy.
- Conduct an extensive census and map the population.
- Conduct a baseline study to use the results to evaluate the socioeconomic impact of the project.

The baseline study relies on:

- demographic data collected in 40 villages in the project area, as well as in Tenke and in Fungurume: 704 households interviewed (403 in the villages and 301 in Tenke and Fungurume);
  - data collected during 45 consultation meetings held in villages and hamlets with PAP: 1100 persons participated (of which 40% women).
- B. A Resettlement Action Plan was submitted for three villages situated in the immediate direct production zone. In these villages a resettlement committee was set up (composed of men and women, locals and recent migrants).  
The consultation committees visited seven resettlement sites proposed in the RAP, and ten sites proposed by the villages. Four sites have been retained for resettlement.
- C. Market studies have been conducted: prices of goods and services have been (and are still being) monitored each month, i.e. agricultural crops, meat and fish, housing rent, building materials.
- D. An employment policy was set out (local employment was put forward as one of the main issues during consultations) by drawing up a list of job seekers in neighbouring villages: 12.000 registered in April 2007. Unqualified jobs have been chosen from these lists using a lottery system; qualified jobs were attributed following individual competences: in case of equal qualification, locals were preferred to outsiders.
- E. Implementation of a grievances tracking system (compensation issues, eligibility for resettlement; damages to agriculture land).
- F. Monitoring of use made with compensation money ( sample of 10% of farmers).

## APPENDIX 5

### Historic overview of development of the mineral industry

- 1960 - 1965
- On 30 June 1960, the country became independent and was named the Republic of Congo. The independence was followed by, what is known as, the “Congo Crisis”. During this crisis, the rich province Katanga, under leadership of Moise Thombe, created the secession of the province. Under influence of international communities the secession was overruled and the previous situation was restored not long after.
- 1965 - 1996
- Mr Mobutu seized power and ruled the country till 1996. Established the Republic of Zaire. Relative peace and stability prevailed until 1977.
- 1977 – 1978
- Katangan rebels based in Angola, launched a series of invasions into the Shaba (Katanga) region. The rebels were driven out with the aid of Belgian paratroopers.
- 1990-ties
- After the end of the “Cold War” in Europe Mr Mobutu’s position became weaker by lack of support from Western Governments. As a counter action he declared the Third Republic agreeing to a constitution and to elections. This period is marked by strong economic decline demonstrated by an annual hyper-inflation rate of 1,200 % in 1993, social unrest, corruption rebellion and looting by militia. Belgian and French troops were flown in to evacuate a large number of endangered foreign nationals.
- 1996 - 2003
- Late 1996, a first conflict started as a result of the Rwanda and Burundi Hutu-Tutsi genocide and large numbers of refugees crossed the border into Zaire. The Tutsi militia in Zaire formed a coalition joined by various opposition groups and was led by Laurent-Desire Kabila. The militia, became known as the Alliance des Forces Démocratiques pour la Libération du Congo-Zaire (AFDL). AFDL made significant military progress against Mobutu in early 1997. In May 1997 Mobutu left the country, and subsequently, after an unopposed march to Kinshasa, Kabila named himself president and consolidated power around himself and the AFDL. He renamed the country to Democratic Republic of Congo.
- 2001
- In January 2001 Laurent Kabila was assassinated and succeeded by his son Joseph.
- Inter Congolese discussions were coordinated to indicate the route for transition to democracy with financial backing from the World Bank.

2003 A transitional constitution was approved and a government of national unity was formed.

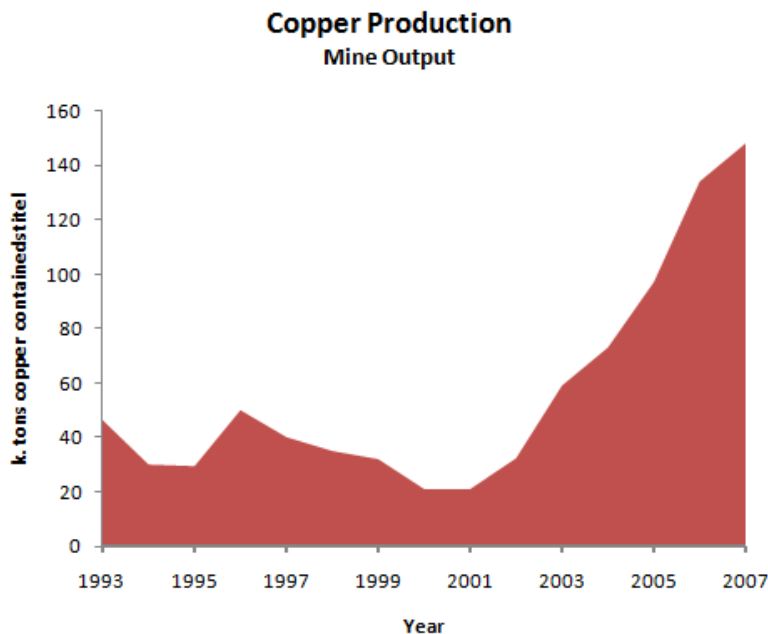
2007 After a new constitution was adopted by referendum, elections followed, held mid-2006. Joseph Kabila was elected as president. Early 2007, a new Government was formed.

## Mineral Industry

1966 Mobuto took over the Belgian mining trust 'Union Minière de Haut Katanga', established in Congo since 1906, and founded the government owned Générale des Carrières et des Mines, (**Gécamines**).

In the following years the output of Gécamines declined, as did the country's economy. Installations and equipment of the company could not properly be maintained and/or re-

placed and became obsolete. From 1978 onward, the output of the mineral industry in Shaba (Katanga) declined dramatically and the contribution from mining to the national income diminished by more than 80%. At the same time, unfortunately, international mineral commodity and oil prices were subject to market movements. In 1989 the company started to decline and mine output fell from 500,000 tons of contained copper to 21,000 tons in 2001.



In terms of assets, however, Gécamines is remote from being bankrupt, holding rights of world class low cost, high metal grade mineral resources. Considering the cost curve for world

copper mining, the copper belt deposits in Africa are found in the lower part of this curve, with estimated average cash cost less than 45 ct/Lb copper, including credits from by-products and corrected for realisation cost, treatment and refining charges. Compared to over 100 ct/Lb at the upper end of the curve. Treatment and refining charges are subject to supply and decreased considerably since 1997. Simultaneously, a depreciating exchange rate (29% CDF per USD in 2008) balanced an increasing domestic rate of inflation (26 % in 2008).

1996-1997 In order to revitalise the mining industry, it was decided to attract foreign investors. During 1996 and 1997, the Government, at first Zaire and later DR Congo, was successful in attracting a number of foreign investors, particularly Australian and Canadian junior mining and exploration



companies. Joint venture agreements were made (with the Gécamines) for new grassroots exploration and to rehabilitate various known metal mining properties. Government owned operations (through the Gécamines) aiming at venture redevelopments included more than 20 copper cobalt and zinc mines and processing facilities. In compliance with the mining code of 1980, over one hundred exclusive exploration licenses were granted to foreign investors in high potential areas.

Shortly after, however, in 1998 the Government started to question the validity of the joint venture agreements and cancelled a number of these agreements, referring to lack of transparency on the company level, uncertainty on the legal authority of witnessing signatories at both sides or a lack of clear development strategy at the level of the Government.

Under the new agreements, foreign investors would retain up to 49% equity interest in the joint venture; most equity interests ranged from 20% to 45%. By the beginning of 1998, Gécamines had established 23 cooperative projects, which included development of the Tenke-Fungurume deposits, hoping it would restore annual production levels of copper to 400,000 t and cobalt to 25,000 t. Between 2000 and 2002, however, most of these projects were either on force majeure hold or proceeding cautiously with feasibility work.

## APPENDIX 6

### Overview<sup>1</sup> of mining resources and economic value

Mineral resources<sup>2</sup> are very abundant and very diversified in the Democratic Republic of Congo (DRC) of which copper, cobalt and diamond deposits are considered as world class deposits. The various resources are located in the following regions :

Katanga province : hosting important deposits of copper and cobalt. And separate -or associated smaller deposits inter alia of zinc, silver, germanium, gold uranium. Large area's covered by disposed tailings of copper and cobalt mining are waiting for cleaning and extraction of remaining metals.

Eastern regions : in the provinces North-Kivu, South-Kivu, Maniema, along the borders with Uganda, Rwanda and Burundi occur important deposits of gold, tin, columbite/tantalite, tungsten.

Kasaï provinces rich in diamond deposits.

Coastal area's Off shore oil and gas reservoirs, as well as on shore reservoirs in a zone parallel to the coastline.

In 2008, the mining, minerals processing and quarrying sector of the DRC accounted for 14.1 per cent of the GDP, representing 1,768 m US\$, compared to 8.5 per cent in 2006.



Exports of mineral commodities, including oil and gas, contribute to over 70 per cent of the total official exports. Of the total registered minerals export, diamonds account for 38 per cent of the GDP, crude for 25 per cent, cobalt for 16 per cent and copper for 11 per cent. Other minerals exported include zinc, manganese, gold, niobium (columbium), tantalum, tin, tourmaline, and tungsten. The figures, however, are only a fraction of the total mineral exports because of uncontrolled trading and border crossing of non registered ship-

<sup>1</sup> for a concise history of Katanga and its mining industry, see Appendix 5

<sup>2</sup>[http://www.kfw-entwicklungsbank.de/DE\\_Home/Service\\_und\\_Dokumentation/Online\\_Bibliothek/PDF-Dokumente\\_Diskussionsbeitraege/AMD\\_50\\_Rohstoffe\\_Kongo25236.pdf](http://www.kfw-entwicklungsbank.de/DE_Home/Service_und_Dokumentation/Online_Bibliothek/PDF-Dokumente_Diskussionsbeitraege/AMD_50_Rohstoffe_Kongo25236.pdf)

ping's through Dar es Salaam, Durban and Angola sea ports, apart from the minerals produced by the large army of uncontrolled artisanal miners.

[OECD, African Economic Outlook, Congo, Democratic Republic, 2009, Chapter Democratic republic of Congo p 179-193]

The most important trade partner countries (2008) are Peoples Republic of China (47.3% ), Belgium (15.4%), Finland (9.6%), US (8.1%), Zambia (4.4%). Trade between DRC and China e.g. jumped in 2008 with 45 per cent. The increased global demand for metals since 2006 led to a considerable price rise, which has benefited Congolese mining production. Katanga copper production increased by 2.5 per cent, cobalt production by 3.5 per cent and zinc production by 8.1 per cent.

Coal deposits are likely to represent a considerable source of energy in DRC.

Hydrocarbon reserves in DRC are small compared to the neighbouring countries as represented in the following table.

**Table 1 DR Congo Oil and Gas reserves compared to neighbour countries, 2008.**

<b>Oil and Gaz</b>	<b>Nigeria</b>	<b>Congo (Brazaville)</b>	<b>DR Congo</b>	<b>Angola</b>
Oil Proven Reserves b.bbl	36,2	1,6	<b>0,2</b>	904,0
Oil production k.bbl/d	2.169,0	239,9	<b>20,0</b>	2.015,0
Gaz Proven Reserves b cum.	5.215,0	90,6	<b>1,0</b>	269,8
Gaz production m cum/d	32.820	180	-	680

[Source : USA Central Intelligence Agency. CIA - The World Factbook<sup>3</sup>]

Expected life of remaining oil reserves may be confined at current level to an odd 30 years and this calls for prudent revenue distribution.

## **Ore Deposits**

### **Introduction**

The Katanga Province is part of the Central African Copperbelt, arc shaped and extending for over 600 km and 50 km wide from Zambia through Katanga into Angola. The Copperbelt is one of the world's richest base metal mining area's containing high class resources of copper and cobalt as well as hosting important deposits of zinc, uranium and less abundant deposits of tin and minor occurrences of nickel, gold, silver, germanium, gallium, cadmium, and vanadium.

<sup>3</sup> <https://www.cia.gov/library/publications/the-world-factbook/>

Copper and cobalt are the most important metalliferous commodities produced in Katanga. Up to date identified copper resources existing in Katanga are estimated at 51 million tonnes, and, currently, cobalt resources are estimated at 3.4 million tonnes, representing 9 percent and 48 percent respectively of total estimated world resources. Average metal grades of 3.5 per cent copper and 0.35 per cent cobalt exceed 2 to 8 times grades reported from the American continent.

Table 2 DR Congo overall Mineral Resources and 2007 Mine Production

<b>(metal contained)</b>		<b>Resources</b>		<b>Mine output</b>
		<b>(k.metric tons)</b>		<b>(k.metric tons)</b>
<b>Cobalt</b>				
DR Congo		3.400	48%	25,3
	<i>World total</i>	7.100		65,5
<b>Copper</b>				
DR Congo		51.000	9%	148
	<i>World total</i>	550.000		15.400
<b>Zinc</b>				
DR Congo		2.843	2%	18,5
	<i>World total</i>	180.000		10.900
<b>Silver</b>				
DR Congo		1,9	1%	0,08
	<i>World total</i>	270		20,80
<b>Manganese</b>				
DR Congo		270	0,1%	-
	<i>World total</i>	460.000		11.600
<b>Uranium</b>				
DR Congo		3,5	0,1%	-
	<i>World total</i>	5.470		-

[Sources: USGS (United States Geological Survey) Mineral Commodity Summaries 2009<sup>4</sup> a and b; Zinco Ltd (2003); MBendi information Services 2009<sup>5</sup>]

Systematic strategic exploration programmes initiated by the state do not exist and successful private initiatives employing modern techniques so far have lagged behind. Recently however new interesting Canadian and Australian projects, for gold in the eastern provinces and for copper in Katanga, have been announced in the press. Political risks, doubts with respect to licence tenure, the opaque deal with the Chinese government (high value infrastructure support in exchange for access to mineral resources), and licences uncertainty, however discourage potential investors.

<sup>4</sup> <http://minerals.usgs.gov/minerals/pubs/mcs/2009/mcs2009.pdf>

<sup>5</sup> <http://www.mbendi.com/indy/ming/cpr/af/zr/p0005.htm#5>

## **Copper and cobalt deposits in the Copperbelt**

The belt in which the mineral deposits occur has a folded and thrust structure and is composed of predominantly sedimentary rocks, less abundant metamorphic crystalline formations and locally intruded by magmatic and volcanic rocks. Age determinations indicate a geologic evolution that took place between 880 million and 550 million years ago. The copper-cobalt occurrences are classified as sedimentary stratiform Cu(-Co) deposits, laterally extensive for several hundreds of meters, and vein type deposits. The nature of the mineralisation is rather complex as a result of multiple mineralisation and remobilisation phases and producing ores with different metallurgical qualities.

The first, and likely main phase of mineralisation occurred after sedimentation during setting (diagenesis) of the sediment. In a following phase of mineralisation, a mineral assemblage of various sulphidic iron-copper and cobalt minerals were formed in various shapes and also finely disseminated sulphides in nodules and lenses.

The sedimentary basin at greater depth underwent tectonic deformation and, simultaneously, an elevated heat flow and increased lithostatic- and compressive pressures. Locally magmatic intrusions occurred into the sedimentary host rock.

Under these conditions a second mineralisation took place by remobilisation of copper- and cobalt sulphides, precipitating in different forms of rock like dolomite and quartz veins. At some locations copper-silver mineralisation originated.

Weathering of the primary sulphide deposits at surface created a secondary enrichment zone with different mineral assemblages of copper –and cobalt hydroxides,-oxides,-silicates or –carbonates that occasionally reach up to 300 m of depth from present surface. The secondary enrichment of this so called oxidised zone, in general resulted in higher copper and cobalt metal grades.

[For more detailed information, see: GECO Project, Belgium joint GSB & RMCA, [http://www.gecoproject.org/tab/Katanga Geology and Dewaele, s. et al, 2008. Multiphase origin of the base metal deposits in the Lufilian fold-and-thrust belt, Katanga \(Democratic Republic of Congo\).](http://www.gecoproject.org/tab/Katanga%20Geology%20and%20Dewaele,%20s.%20et%20al,%202008.%20Multiphase%20origin%20of%20the%20base%20metal%20deposits%20in%20the%20Lufilian%20fold-and-thrust%20belt,%20Katanga%20(Democratic%20Republic%20of%20Congo).)<sup>6</sup>

## **Copper and cobalt mining**

Copper cobalt deposits are generally mined from large surface mines. The operations are characterised by removal, transport and dumping of waste (which is not processed), and by extraction of the metal containing ores. The blasted ores from the mine are loaded into trucks and hauled to the primary crusher. The copper ore is crushed and ground to a size, such, that an acceptably high degree of liberation has occurred between the copper sulphide ore minerals and the gangue minerals. The gangue minerals are disposed to the tailing area.

As mentioned before, basically two distinct ores occur: the sulphide ores and the oxide ores. The sulphide ores, after crushing-grinding and classifying, are beneficiated in froth flotation cells requiring special kerosene based chemicals. The gangue material which has not floated off in the flotation cell is discarded as tailings. An upgraded concentrate is produced with between 20 per cent and 30 per cent copper.

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<sup>6</sup> [http://www.gecoproject.org/pdf/Report\\_GECO\\_multiphase\\_origin.pdf](http://www.gecoproject.org/pdf/Report_GECO_multiphase_origin.pdf)

Copper concentrates can be sold to smelters and refiners who treat the ore and refine the copper and charge for this service via treatment charges (TC's) and refining charges (RC's). The customer in this case can be a smelter, who resells blister copper ingots to a refiner, or a smelter-refiner which is vertically integrated. Concentrates produced in the DRC are exported to Zambia or South Africa for further treatment with special approval from the Congolese authorities. The realisation cost, TC's plus RC's, are transferred abroad and thus are the returns from sale of the final product on the world market.

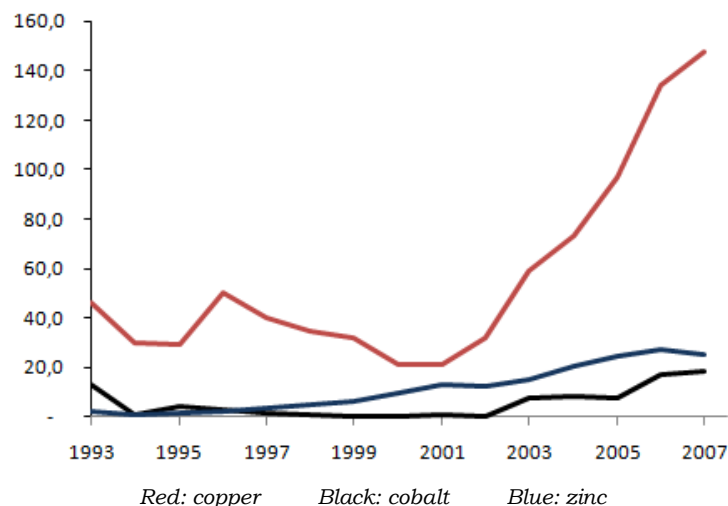
Realisation cost, TC's plus RC's, may amount up to 20 percent of the total cash cost, excluding penalties (arsenic, bismuth, lead) or credits (cobalt, silver, gold). Smelter contracts in general include deductions to cover smelter risks and, pricing of the concentrate is often based on future, hedging conditions. Optimised profits can be achieved by considering concentrate efficiency (grade selective mining, dilution control, improving recovery and ratio of concentration), but also by looking at alternative integration of concentration with treatment and refining. Efficient electric power supply herewith is a pre-requisite.

The oxide ores are, as described above, treated with hydrometallurgical processes: leaching by sulphuric acid to liberate the copper minerals into a solution of sulphuric acid, laden with copper sulphate in solution. The copper sulphate solution is then stripped of copper via a solvent extraction and electro winning (SX-EW).

The coarser ore goes to the heap-leach, where the copper is subjected to a diluted sulphuric acid solution to dissolve the copper. Subsequently, the leach solution containing the dissolved copper is subjected to a process called solvent extraction (SX). The SX process concentrates and purifies the copper leach solution, so the copper can be recovered at a high electrical current efficiency by the electro-winning cells.

There are around 45 open pit mines in the Katanga Province (active and inactive sites) and 2 underground mine operations: Kipushi Mine, mining zinc and copper and Kamoto Mine, mining copper and cobalt.

**Graph 1 Katanga mine output in k.metric tons between 1993 and 2007**



Yearly mine output in the early seventies of the previous century amounted to over 600 kilotons of metal.

## **Zinc deposits**

The Kipushi Mine is a copper-zinc mine located adjacent to the border with Zambia, about 30 kilometres southwest of Lubumbashi within the Democratic Republic of Congo. The mineralisation was discovered in 1894. Underground mining started in 1925. The mine became 100 per cent property of Gécamines in 1967 and - after 68 years of continuous production - was put on care and maintenance in 1993 because of lack of financial resources.

Mining arrived at a depth of 1,195 m. The ore zone stretches out over the Zambian border to a reported depth of 1,800 m. Over the duration of production, Kipushi raised 60 million tons of ore at an average grade of 6.8 per cent copper and 11 per cent zinc. Currently United Resources AG from Switzerland and First Quantum Minerals Ltd of Canada hold options to participate in the project with Gécamines subject to the outcome of reserve definitions and technical - economic assessments.

For the year 2007, USGS (2008) reports a production of 18,000 m tons zinc oxide dust by La Société pour traitement du Terril de Lubumbashi (STL). Gécamines owns a leach plant, refinery and smelter at Kolwezi but no productions are reported.

[USGS (United States Geological Survey) Mineral Commodity Summaries 2008]<sup>7</sup>

## **Uranium deposits**

Uranium deposits in the Katanga Copperbelt occur at approximately 25 different localities (see Meneghel,1981). The deposits are found at the same stratigraphic level as the main copper-cobalt mineralisations. Uranium minerals are disseminated within the sedimentary sequences adjacent or below to the copper mineralisations or, appear as fracture fillings in these sediments. The latter type carry the highest concentration. The most common uranium minerals are thorium-free pitchblende and secondary uranium minerals. There is no consensus in literature about the origin of the uranium deposits. Most likely they are the result of remobilisation, however without understanding the source of supply of the metal. No correlation between the presence of copper/cobalt and uranium could be proven.

The Shinkolobwe deposit was discovered in 1915 at 35 km south west of Likasi. It is the main existing uranium deposit in the Katanga Province. Mining started in 1925. In 1940, approx. one thousand metric tons were shipped to the United States as raw material for the production of nuclear explosives. Since then, several thousands of tons have been extracted and utilised as energy fuel. Operations were ceased and abandoned in 1960, when Congo became independent. However, in the fall of 1990 and early 2000, mining resumed for copper and cobalt, this time by artisanal activities.

In 2004, the mine was permanently closed after fatal caving accidents and because of unstable wall conditions. At that time, Shinkolobwe's population reached approximately 15,000 people, including 6,000 artisanal miners [PNUE/DAH (Programme des Nations Unies pour l'Environnement et Département des Affaires Humanitaires de l'ONU), novembre 2004 : « Mine Uranifère de Shinkolobwe (RDC) : Mission d'évaluation de la situation humanitaire » ; p 1-17]

So far, no figures of reserves and grades, normally expressed in ppm, have been sighted. The majority of occurrences must be considered as having no economic potential and the potential of uranium in the Katanga Province is uncertain. The few available refer-

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<sup>7</sup> <http://minerals.usgs.gov/minerals/pubs/mcs/2008/mcs2008.pdf>

ences that describe the uranium metallogenesis in the area, indicate a potential resource between 3,500 [International Atomic Energy Agency, 2001]<sup>8</sup> and 30,000 tonnes of uranium. [Task Force "MIRECA" – Mineral Resources in Central Africa, Ministère belge des Affaires Étrangères; Bonne Gouvernance & Transparence dans le secteur minier, Traçabilité des flux de matières et des flux financiers dans le commerce des minerais de Cu et de Co en RDC Description synthétique du projet Avril 2008 ; p 1-111, p 3 – Milesi et al]

### **Manganese**

The Kisenge mine, located in the south west of the Katanga Province adjacent to the Angola border, produced manganese until 1993, when the Minière de Kisenge Manganèse, the company that used to exploit the DRC's only manganese deposit, closed its operations due to financial problems. The company still has a stockpile of 540,000-t of manganese carbonate ore at a grade of 47% to 50% manganese (M Bendi - Information Services, 2009b).<sup>9</sup>

### **Silver**

The Dikulushi mine, located in the eastern part of the Katanga Province, is the only copper - silver mine in the Province. This mine is not a typical stratiform disseminated deposit as found in the Katanga Copperbelt; instead, the ore is concentrated in veins of massive to semi-massive sulphides, hosted in faults that cut sedimentary lithologies [Anvil Mining Limited, 2006]<sup>10</sup>. Additional Cu-Ag occurrences are described in the region, showing a potential for the development of new mines of copper and associated hydrothermal minerals (Ag, Zn and Pb) outside of the Katanga Copperbelt.

### **Tailing Resources**

In addition, there are many large tailing areas containing still commercial interesting metal grades and toxic residues, sealed by tailing dams in various states of maintenance (in particular downstream the mining operations of Kolwezi, Kipushi and Likasi). At least 3 tailing deposits in the Kolwezi area were subject of feasibility studies for Cu-Co extraction and show considerable potential for further development.

### **Coal deposits**

Coal deposits seem to represent a considerable source of energy in DRC. Coal occurs in Katanga near Lukunga in the north east and in Luena near Kolwezi. Reserves of 88 million tons are reported (BGR, 2006), without going into details. USGS reports a production of 800,000 metric tons per annum of a bituminous tar coal by Gécamines from a surface mine at Luena. The coal properties indicate steam coal which is not suitable for coking. The mine is in production since 1920.

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<sup>8</sup> <http://www.iaea.org/>

<sup>9</sup> <http://www.mbendi.com/indy/ming/cppr/af/zr/p0005.htm#5>

<sup>10</sup> <http://www.anvilmining.com/>



## **APPENDIX 7**

### **Mining Code of July 2002, an Introduction**

On 11 July 2002, the new Mining Code was adopted by the transitional Parliament of Mr Joseph Kabila. This was in line with global developments in the mining sector since 1989, to reduce State participation and open up roads to private investors prepared and equipped to participate in uncertain risk bearing ventures. This shift needed new legislation providing a legal framework to a broad spectrum of interest as trade, environment, local communities, labour, health and safety, education, training etc. Modern States who want to create a favourable investment regime have to offer a stable tax regime with incentives and fair windfall measures, banking infrastructure, currency exchange, financial services like insurances, lease, outsourced services to contractors including the transfer of operational responsibility, and a competent mining authority to guarantee stability.

A sound investment climate also requires loan financing based on asset security of which mining titles are part, transferable ownership under democratic control and local incorporated operating companies with articles making clearly distinction between A- and B share interest, controlled free carried interests and government share participations. The operating companies need freedom to operate efficiently, having control over their own operation. They also need the right to market the minerals or metals produced both by long term contracts and spot market, the freedom to controlled transfer into accounts abroad, the right to control access and security at the granted surface area's, in compliance and with respect for valid civil legislation, contributing to the country by creating employment and improving social welfare.

Environmental issues related to mining are to be regulated by both mining and environmental laws, the executive and controlling authority not necessarily residing in one and the same ministry, as long as competences and organisational structures are well defined. The environmental base-line needs to make clear distinction between residual "inherited" disposals and new disposals and needs to be accepted by all stakeholders, prior to commencement of operations. Secured water rights and authorised pollution control of disposals, emanations of gases, noise, dust and visual disturbance, reclamation already during the operation phase, the development of a strategy for abandonment and mine closure need also to be regulated and post operational financial resources need to be assured.

The mining and metals sector is inherently risky. External project finance requires sound risk analysis and risk mitigation. Projects in the mining sector carry their own exclusive uncertainty and risks, like mineral resource/reserve and metallurgical risk, completion an technological risk, economic and market and certain environmental and social risks along with country risk and threats from war or terrorism. The new mining code is certainly up to date for these challenges

With assistance of the World Bank, the new mining code was drafted and passed by Parliament on July 11, 2002. A manual that implements the modality and conditional applications was released by decree on 26 March, 2003. The new code and regulations are intended to promote mineral development by the private sector with the principal role of the state to promote and regulate the development of the mining industry by the private sector. The law governs the prospecting, exploration, exploitation, processing, transportation, and sale of mineral substances, which include the artisanal exploitation and sale of these mineral substances. Mining rights are vested with the State.

### ***Business structure***

Companies that carry out mining activities need to be locally incorporated. Incorporation may be in the form of :

- Private limited company (SPRI), with a minimum of two shareholders. No tax deductions for interest on shareholder loans.
- Company limited by shares (SARL), with a minimum of seven shareholders and corporation only after approval by the President.

The major sources of finance are equity, shareholder loans and loans from local and foreign banks. A domestic stock exchange is non-existent.

There are no import restrictions. There are restrictions on employment of the number of foreign employees. Maximum 5 per cent for management staff and a maximum of 10 per cent for other positions. Work permits are valid for two years and renewable.

There are no restrictions or limitations on marketing and exportation mining products from company's own mining licensed area. To export non processed ore however, exemption is needed from the Minister of Mines provided processing within DRC is economic not attractive and export carries economic advantages for DRC. There is an incentive tax rate on the revenue tax rate if ores are locally treated within the joint venture structure.

The holder of an Exploitation License may transfer to a third party the right to exploit artificial surface deposits, such as tailings or slag, that are located within his mining perimeter while retaining his underground rights.

Provisions for taxation and customs duties, included selected exemptions, are spelled out in the Code. Corporate tax on profits is set at 30 per cent. The mining royalties on sales, less sales -and transport cost, are set at 4 per cent for precious stones, 2.5 per cent for precious metals, 2 per cent for non-ferrous metals, 1 per cent for industrial minerals, 0.5 per cent for iron or ferrous metals, and 0 per cent for standard construction materials. Royalty payments are to be distributed to the central government (60 %), to the provincial government (25 %) and to the township (15 %) where mining takes place.

Currency is fully convertible and transferable, and foreign currency accounts are allowed. The mine or quarry installations cannot be compulsorily expropriated by the State except in exceptional circumstances set by law, in exchange for fair compensation paid to the holder concerned at least six months prior to the compulsory execution of the decision to expropriate. The law also spells out terms for compensation to those landowners affected by mining and penalties for noncompliance with License requirements and for illegal sales of minerals. Provisions for dispute settlement by domestic and international arbitration are included.

DR Congo is a member of the World Trade Organization (WTO), the World Bank Multilateral Investment Guarantee Agency (MIGA) and the Convention for the Creation of the International Centre for Settlement of Investment Disputes (ICSID). All conditional to attract foreign loans, equity, bank guarantee and insurances. DRC is accepted in 2008 as an candidate country for the Extractive Industries Transparency Initiative (EITI). However there are currently no yet international tax treaties in place.

## APPENDIX 8

### Attribution of powers<sup>1</sup>

The Code attributes the powers as follows:

*The President of the Republic* has jurisdiction over enactment of the Code and Mining Regulations.

*The Minister of Mines* is responsible for day-to-day implementation of the law.

*The Governor of the province and the Head of the Provincial Mining authority of mines* have jurisdiction over the issuing of artisanal miners' cards and the granting of exploration and exploitation rights for quarry products for standard construction materials.

He also has jurisdiction over the granting of surface rights. According to the Land Law of July 1973, the state has the exclusive property of the land. The state can grant surface rights to private or public parties: this has to be distinguished from mining rights since surface rights do not entail the right to exploit the mineral substances of the soil or subsoil and, inversely, a mining right does not entail any surface occupation right over the surface. However, subject to any rights of third parties over the surface concerned, the holder of an exploitation mining right has, with the authorisation of the Governor of the province concerned, and on the advice of the Administration of Mines, the right to occupy within his mining perimeter the land necessary for his activities and associated industrial activities, including the construction of industrial plants and dwellings, to use the water, dig canals and channels, and establish means of communication and transport of any type. Nevertheless, any occupation of land depriving the rightful surface right holders from using the surface, or any modification rendering the land unfit for cultivation, will entail the obligation for the holder of the mining rights to pay fair compensation.

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<sup>1</sup> The following main sources of public information and services are available :

- Mining Registry (CAMI) [www.cami.cd](http://www.cami.cd)
- Network of information on geology and prospecting in the DRC [www.drcmining.com](http://www.drcmining.com)
- Technical Cell of Co-ordination and Mine Planning (CTCPM) [www.miningcongo.cd](http://www.miningcongo.cd)
- Service d'Assistance et d'Encadrement de Small Scale Mining (SAESSCAM) [www.miningcongo.cd](http://www.miningcongo.cd)
- Centre of Evaluation of Expertise and Certification of precious-and semi precious stones (CEEC) [ceecgroup.com/](http://ceecgroup.com/)
- Centre of Geological and Mining Research (CRGM) [gis.mapsofworld.com/.../centre-de-recherches-geologiques-et-minieres-democratic-republic-of-congo.ht...](http://gis.mapsofworld.com/.../centre-de-recherches-geologiques-et-minieres-democratic-republic-of-congo.ht...)
- University of Lubumbashi [www.unilu.ac.cd](http://www.unilu.ac.cd)
- Ministry of Mines [www.miningcongo.cd](http://www.miningcongo.cd)

The mining right holder is also liable for damage caused to the occupants of the land in connection with his mining activities, even if they are authorised. The Mining Code provides for judicial and arbitral recourses in case of disputes.

*The Mining Registry (Cadastre Minier, CAMI)* is a public entity with legal status and financial autonomy under the supervision of the Mines and Finance Ministers. The articles, organisation and operation are determined by Presidential Decree. In order to cover operating cost, CAMI is authorised to charge filing applicants and to collect the annual surface duties. CAMI is in charge of processing applications for mining and/or quarry rights, coordinating the technical and environmental evaluation of applications for mining or quarry rights, and certifying the minimum financial capacity of the applicants who apply for the mineral and quarry exploration rights.

CAMI issues official certificates and titles to applicants in accordance with the provisions of the Mining Code for exploration, mining including tailings and small scale mining activities. Prospecting Certificates are available for a 2-year maximum but convey no mineral rights. Mining and quarrying exploration and exploitation rights can only be granted through an authorised mining and quarrying agent domiciled in the country. The granting is based on “first-come, first-served” principle and in exceptional cases the Minister of Mines may submit a tender open or by invitation to a specific deposit. Granting is based on judgment of submitted technical data, development schedule, exploitation plans and environmental protection plans. Moreover, CAMI judges and is responsible for certification of applicants’ financial capacity, authentication of loans, lease deeds and deeds of transfer of rights to third parties.

Proof of minimal financial capacity to perform exploration is required. Mining Exploitation Licenses are valid for 30 years, and are renewable several times for a duration of 15 years each. Exploitation Licenses are approved after submittal of proof of an economic mineral deposit, a feasibility study, construction plan, and source of financing. Prior to approval, the EIS and EMP must be approved, and 5% of free carried interest company capital shares, transferred to the Government.

*The Geology Directorate* is responsible for the promotion of the mining sector through basic geological research and the dissemination of public information. The Directorate conducts research and studies also with the sole purpose of improving geological knowledge of the National Territory or for scientific purposes which do not require obtaining any mining- or quarry rights. The mining regulations set forth the organisation and operation of the Directorate.

The Department is part of the Ministry of Mines. It is not clear on what grounds the private parties that wish to engage in mining activities is given access or not to relevant data held by this department.

*The Mining Directorate* of the Ministry of Mines is responsible for inspection and supervision of mining activities and quarry works with regard to safety, health, work procedures, production, transport, sale, and social matters and to compile and publish statistics and information about the production and sale of products from mines and quarries.

*The Department in charge of the Protection of the Mining Environment, located within the Ministry of Mines.*

The Department defines and implements the environmental regulations protection according to the mine regulations:

- that govern exploration,
- that govern artisanal mining,
- the guidelines for mining and quarrying,
- the conditions to supervise the obligations with regard to environment.

The department is charged with the technical evaluation of environmental impact statements (EIS) and environmental management plan (EMPP) submitted by applicants for mining -or quarry rights. Exploration operations are subject to the approval of a Mitigation and Rehabilitation Plan for mines and quarries (MRP) subsequent to the delivery of the research permit. Prospecting and small-scale exploitation permits are only subject to codes of conduct. The Department is charged with the technical evaluation of the MRP.

The Code gives a maximum of 47 calendar days to obtain a research permit, max 24 calendar days for the approval of the (MRP) and an exploitation permits takes max 252 calendar days from the date the request is filled.

## APPENDIX 9

### Diggers experiences<sup>1</sup>

“Officiellement, tout creuseur est supposé se faire connaître auprès de l’inspecteur des mines : ce dernier lui délivre le ‘jeton’, qui l’autorise à exercer ce métier sur les sites artisanaux officiels (anciennes concessions abandonnées de la Gécamines, mises provisoirement à la disposition de l’EMAK<sup>2</sup>). Pour s’approvisionner dans ces mêmes sites, les ‘négociants’ doivent obtenir une ‘fiche de négociant’ auprès de l’inspection des Mines, également.

Toutefois, une écrasante majorité d’entre eux ne s’y plie pas, mais préfère passer un arrangement individuel avec un creuseur plus ancien de la carrière, qui y possède une ‘grotte personnelle’, soit un accès aménagé à un filon d’une teneur jugée profitable. Ce dernier est supposé s’acquitter, auprès de la Direction de Mines, d’un ‘Certificat d’exploitation’. Souvent, les négociants sont aussi exploitants : ils paient même d’avance les creuseurs pour qu’ils leur fournissent une quantité convenue de minerais. Enfin, les négociants doivent en principe s’acquitter du « Bon de sortie » des minerais de la carrière, établi par l’inspection des mines (au niveau des carrières) et contresigné par la police des mines ainsi que de la « Quittance » (même tarif), délivrée par l’inspecteur du territoire de Kipushi). En pratique, ils ne le font pas, invoquant le fait que les quantités qu’ils sortent équivalent à 10 tonnes ; en outre, selon leurs dires, le fait de posséder ces documents ne les exonéreraient pas des ‘tracasseries’ (de la part de la police des mines) qui les attendent à l’entrée de Lubumbashi, donc où est l’utilité de s’en acquitter ? Aussi les stratégies habituelles sont-elles de bénéficier de l’intercession d’un gradé de la police ou de l’armée pour faire passer les produits en paix ou, alors, d’évacuer les minerais très tôt matin à bord d’un taxi bus.

Outre les creuseurs que nous venons de décrire, il faut aussi mentionner ceux qu’on nomme les ‘clandestins’ : il s’agit surtout d’enfants (âgés de 9 à 20 ans) qui, de nuit, vont dérober les minerais extraits par Forrest (dans sa carrière située sur le mont Lukuni), avec ou sans la complicité des gardiens (police des mines et gardes privés de Forrest). L’arrangement passé avec ces derniers est le suivant : ils payent 15.000 CDF pour qu’on les laisse remplir 25 sacs de 50 kg (d’une valeur à la revente de 62.500 CDF). Les clandestins entreposent ces minerais dans leurs maisons, puis les revendent à des négociants de Lubumbashi.

Tous sont la proie des éléments du service de renseignements militaires : ces derniers sont envoyés par leurs chefs pour patrouiller autour des carrières artisanales ou des concessions privées afin d’arrêter les clandestins ou les voleurs des produits : tout voleur appréhendé devra payer une amende de 8000Fc ; s’il est en règle, il paiera quand même 5.000 Fc pour être libéré.

Pareillement, nombreux sont les ‘négociants’ hors la loi, qui bénéficient de faveurs, par le biais d’employés de Forrest (accès libre aux minerais), ou de passe-droits parce qu’ils sont sous la protection d’une autorité militaire, de la police, de l’inspecteur des mines

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<sup>1</sup> Data collected in 2004-2005 in the village of Kawama, 15 km from Lubumbashi)

<sup>2</sup> Carrières Karajipopo, Shamitumba et Kampina de Kambove ; Karoano et Karukuruku de Kipushi ; Tombolo de Mutshatsha

ou encore du chef coutumier. En bout de chaîne, les négociants revendent le minerais en ville aux 'preneurs' (comptoirs) » (Trefon & Cogels, 2005).

<b>Documents officiels autorisant l'exploitation des ressources minières (prix en 2005)</b>		
<i>Documents</i>	<i>Service ou agent délivreur</i>	<i>Bénéficiaire/objet</i>
Permis d'exploitation (200\$/an)	Ministère des mines	Gros exploitant minier
Certificat d'exploitation (50\$/an)	Division des mines	Moyen et petit exploitant minier
Fiche de négociant (10\$/an)	Inspection des mines au niveau des carrières	Négociant (qui est souvent aussi petit exploitant)
Jeton (1500Fc/an)	Inspection des mines au niveau des carrières	Creuseur
Bon de sortie des minerais de la carrière : 5.000 Fc pour charges = ou > à 20 tonnes	Etabli par l'inspection des mines au niveau des carrières ; Contresigné par la police des mines	
Reçu	Inspection des mines au niveau des carrières	
Carte de membre (20\$)	EMAK	Pour faciliter l'accès aux ressources minières aux membres de l'EMAK
Quittance (sortie des carrières) : 6000 FC pour charges = ou > à 20 tonnes	Inspecteur du territoire (administration du territoire à Kipushi)	
<b>Ponctions non officielles</b>		
<i>Documents</i>	<i>Service ou agent délivreur</i>	<i>Bénéficiaire/objet</i>
« Droit d'entrée » : 2.500-3.500 Fc	Inspection des Mines	Dessous de table exonérant les plus creuseurs les plus pauvres de leur dû officiel ; concédé 'pour les aider'
Tribut coutumier : 2.000 Fc par chargement	Au représentant du chef coutumier	Chef coutumier

Achat de la bienveillance : 15.000 Fc pour 25 sacs*25 kg	Gardes privés et/ou police des mines	Vol de minerais dans concessions privées sans être inquiété par gardes
Motivation : 15.000 Fc/chargement	Police des mines	Passer sans encombres le contrôle d'entrée de la ville
Bon de sortie : motivation de 1000 Fc	Réclamés par l'inspecteur des mines en sus des 5.000 Fc réglementaires	Pouvoir sortir avec un chargement de la concession
Quittance : 1000 Fc	Payés à la police des mines	Echapper au paiement de 6.000 Fc du à l'inspecteur du territoire
Amende pour vol avéré : 8.000 Fc ou suspecté : 5.000 Fc	Sécurité présidentielle/service des renseignements militaires	



## APPENDIX 10

### Recommended obligations for mine closure

#### Introduction

Sustainable development in mining, as defined by the International Council on Mining and Metals (ICMM), means that the projects should be technical appropriate, environmentally sound, financially profitable and socially responsible.

Long term integrated care for the natural environment and social habitat however, continues beyond the extraction phase and requires a timely and comprehensive mitigation of disturbances, looking forward, and planning for recovery and reclamation or replacement, and a social and economic transition from sometimes a dominant extractive industrial society into a society based on different livelihood and scope for developments.

“The real challenge comes when the mine closes and the local community is faced with potentially large environmental liabilities and possible socio-economic collapse. Until recently, mine decommissioning and closure activities were not obligatory in most countries. Many decades and even centuries of inadequate and non-existent mine closure practice, have left a huge legacy of derelict mine sites and often impoverished communities”<sup>1</sup>

Reclamation, where possible as a concurrent integrated part of the extraction, subsequent mine closure, site abandonment and decommissioning are nowadays recognized as responsibility of the mining industry and host government.

Guidelines for sustainable development in mining are widely accepted and defined in international context.

World Bank, IFC (International Finance Corporation), EITI (Extractive Industries Transparency Information), OECD, the Equator Principles as leading voluntary standard for managing environmental risk in project financing by financial institutions, Euromines (the European Association of Mining Industries), ICMM (International Council on Mining and Metals), bringing together nineteen of the world's leading mining and metals companies as well as thirty national and regional mining associations. 2

The Democratic Republic of Congo is in the process to join EITI and, within this context, the mission is of the opinion that there is strong need to develop a strategic framework in which Mine Closure and Decommissioning is an essential component to Katanga's extractive industry.

#### Strategic Framework for Mine Closure and Decommission (MC&D)

A large number of mining countries have developed strategies, guidelines and amended legislation-regulations for MC&D. Amongst these countries are South Africa, Ghana, Australia, Sweden, Romania, Peru, Chili, Canada, US etc., and the above mentioned councils and international organisations.

The NCEA proposes to prepare a strategic framework for MC&D in two steps :

- Step 1. Reconnaissance
- Step 2. Guidelines and Instruments

#### Step 1. Reconnaissance.

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<sup>1</sup> Quote from website of Postmining Alliance (Cornwall, UK) <http://www.postmining.org/index.php>

<sup>2</sup> <http://www.icmm.com/members/member-companies>

Objective is to analyse and define a detailed vision for integrated rehabilitation, mine closure, decommission and post decommissioning maintenance viable in the Katanga situation.

“Integrated” also means sound environmental and socio-economic care during exploration, project planning and feasibility assessment, during project implementation and planning for post MC job creation and continuation of existing health and social aspects.

The NCEA suggests to assemble a Reconnaissance International Working Group made up of reputed experts from DRC government, industry, NGO’s, mining consultant firms and academia to :

- Review and analyse relevant available literature and reports regarding mine closure. Make use of experiences derived from other mining countries.
- Map in detail existing mining projects in operation and projects in the permitting phase. Analyse annual reports and legal frameworks. Classify according to size, ownership distribution, etc.
- Define a vision for mine closure and decommission plans to be viable in Katanga. Make distinction between large mining ventures, small scale mining and indicate if measures can be developed to have artisanal mining participating in such a scheme.
- Identify and indicate area’s for which guidelines and toolkits are required for all phases of the implementation of a mine closing and decommissioning project, including relinquishment of a mining title.
- Consult local stakeholders representatives.
- Plan Step 2 in detail, including timing and cost estimation.

## Step 2. Guidelines and Instruments

Objectives are to develop guidelines and instruments to create new opportunities in Katanga for financial resources to invest profitable and, to attract qualified investors to participate in -and develop sustainable exploitation of mineral resource projects; to contribute to long term socio-economic growth and to foster stability in the region.

Step 2 is within this context intended to integrate MC&D.

Each decommissioning programme is unique because no two mining operations are equal. Moreover because of size and method of mining, complexity of operation, surface installations, beneficiation plant, refining/smelting plant, disposal areas and heritage of previous industrial disturbances it is not always desired to rehabilitate baseline situation.

Decommissioning is complex and is subject to “mine life planning” and even beyond when maintenance is going to be involved. There is a shared involvement between many stake holders where mine owners, operating companies, local-, federal- and state governments care responsibilities.

The NCEA suggests inter alia the following items for guidelines to be prepared:

- Planning for mine life. MC&D should be taken into account during the full life of mine and beyond. Develop guidelines for *Exploration*, drilling and limited earthmoving; *Mine design and planning*, considering when possible rehabilitation of worked out and depleted area’s as part of mining operation and requires optimising of the ore reserve block model; *MC&D planning* as part of feasibility study and to fulfil permission and licence application requirements; *Socio-economic developments*, stakeholder platforms, unions and collective agreements, social benefits like health services and insurances-pension funds-redundancy deposits-workers provident savings-recruiting and redundancy schemes-contractors, farmed out general services-, local supply companies-vocational training- primary schools etc...require planning of timely measures because of mine closure.
- Construction and Operation. To improve overall project efficiency reclamation should be carried out, where technical possible, integrated with the production scheme with the objective to reduce costs for mine closure in the future. The increase of operating cost, being direct tax deductible, will be compensated by

smaller contributions to a mine closure sinking fund. Such a planning requires year to year adjustments and revisions.

- For Environmental Management System (EMS) services it's absolute essential that larger mining operations run an Environment-Health and Safety department (EHS) in house. Smaller operations should rely on external services for this matter. Guidelines need to be developed for disclosure of an environmental audited Annual Environment Report including adjusted MC&D plans and updated cost estimates. In this context the NCEA advises to consider commitment to ISO 14000 standards.
- Detailed MC&D plan. Guidelines have to be developed for a wide range of issues in MC&D plans. The guidelines need retroactive authorisation by the Mine Regulations, and have to be prepared in a flexible way allowing adjustments for distinct projects. Separate sets of guidelines however for surface mines, underground mines, strip mines and tailing re-working operations are recommended. Separate guidelines for long and short lives operations too need to be prepared. In compliance to legislation part of the cost are also due to post closure monitoring and maintenance for a number of years to be defined in advance for each situation.
- Financial assurance and guarantees. The DRC Mining Code and Appendix II of the in forced Mining Regulations sets out in generic terms the obligation of a "mining company" to lodge an assurance deposit in an account with a multilateral or bilateral financial institution, conditional to recognition and approval by the DR Congo National Central Bank.

The legislation is not specific in amounts, criteria, management of the deposited funds and future balance required to cover all liabilities related to decommissioning and post abandon liabilities. The NCEA mission is uncertain if the legislator also takes special tax incentives and allowances into consideration.

Total MC&D expenditures can reach 5-10 % of total capital expenditures for larger complex operations. At times the mineral deposit almost becomes depleted, cash flows from operations will decrease and likely the operations are ceased once cash cost are exceeding net operating income. Income expected from salvage is probably to be neglected compared to cost for dismantling, rehabilitation and social and additional liabilities. Bankruptcy and subsequent winding up of a local registered company without having free disposition to funds allocated for MC&D has to be prevented.

Therefore the NCEA recommends inter alia the following actions during Step 2 :

- Mining Code, Regulations and Company Code need to be investigated and tested for relevance to such a situation and if required proposals for supplementary amendments suggested for submission to parliament.
- Legal and financial instruments have to be designed and developed to foster accruing funds adequate and accountable for MC&D expenses.
- A regulatory setting and organisational structure needs to be put in place to manage these funds.
- Develop guidelines for financial guarantee agreements like there are Trust Funds, Surety Bonds, Letter of Credit or Irrevocable Letter of Credit, Bank Guarantee, Insurance Policy, Corporate Guarantee and Share Holder Loan, etc...These saving instruments are certainly not free of risk and need a prudent and profitable financial management over the entire period of deposit. When payments are deposited outside the host country, instruments are to be developed to mitigate currency exchange rate risk. Consider instruments to relate annual assurance fund contributions to height of annual operating margins (EBITDA) and e.g. incentives like depreciation allowances in accordance with market value.
- Fund ownership and fund management, transparency and annual financial reporting standards, implications for internal revenue, transfer of shares and majority ownership should be considered as well.
- Relinquishment of mining title and legal aspects.

Mine closure and subsequent decommission, rehabilitation of the environment and incorporation of social plans are complex and are of concern to all stake holders. Mineral resources are property of the State. Licences and permits for exploration and exploitation are granted by the government for a by jurisdiction restricted duration. The Government within the context of protection and sustainable development. has the most direct responsibility for defining and ensuring all aspects for mine closure.

The NCEA is of the opinion that relinquishment of a mining licence needs a clear definition and criteria to be met before mandated authorities can give a formal sign off.

Part of the criteria may be post-closure or post-relinquishment commitments or a transfer of responsibilities like there are :

- control of public access;
- long term maintenance of abandoned mine sites;
- control of ground and slope stability;
- control of acid and polluted mine water;
- maintenance of waste and tailing disposal areas;
- tailing dam, sanitation of watercourses draining from old mine sites, etc...

Complementary legislation and regulation is required for mine closure and relinquishment. This includes non-compliance enactment, premature mine closure, interim transfer of shares, bankruptcy and winding up, closure planning conditional to granting of titles, tax incentives, etc...

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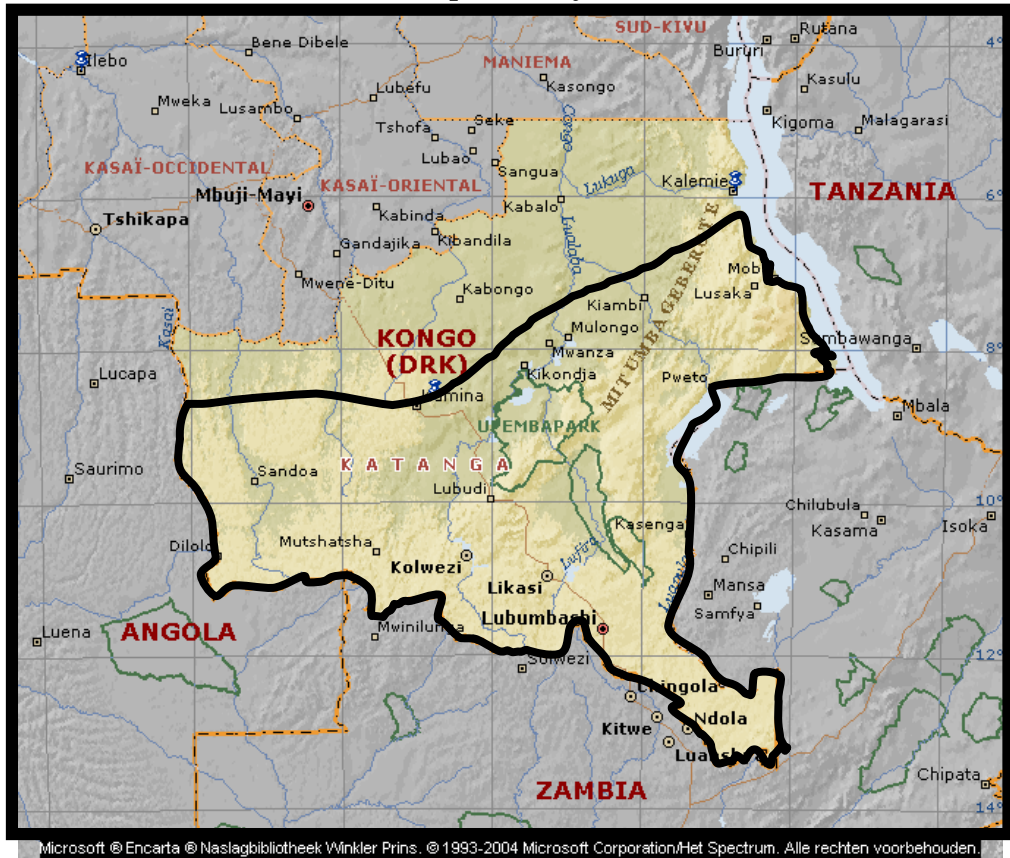
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## APPENDIX 11

Map of study zone



## **APPENDIX 12**

### **List of Interviews**

#### **In chronological Order**

- 19 August 2009 Interview granted by CMSK (Compagnie Minière du Sud Katanga)
- Interview granted by ONG Kanyundau
- Interview (1st) granted by MONUC
- 20 August 2009 Interview granted by Gécamines
- Interview granted by ASADHO (Association Africaine pour la Défense des Droits de l'Homme)
- Interview granted by Congo Equipment / Caterpillar
- 21 August 2009 Interview granted by NGO PACT-Congo (Private Agencies Collaborating Together)
- Interview granted by Anvil Mining
- Interview granted by UNILU
- Interview granted by Gécamines
- Interview granted by KML (Katanga Mining Ltd.)
- Interview (2nd) granted by CMSK
- 22 August 2009 Interview granted by UNILU, representative Ba in Political Sciences, collaborator within Cedemol
- FEC (Federation des Entreprenneurs de Congo)
- Interview (2nd) granted by MONUC
- Interview granted by STL (Société pour le Traitement du terril de Lubumbashi)
- 25 September 2009 Interview granted by VUB (Vrije Universiteit Brussel), manager of the project: TF MIRECA: « Bonne Gouvernance et Transparence dans le secteur minier»; initiator of CEDEMOL (UNILU)

## APPENDIX 12

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## APPENDIX 14

### Acronyms and Abbreviations

ACIDH	Action Contre l'Impunité pour les Droits Humains
Asadho	Association Africaine de Défense des Droits de l'Homme
ASM	Artisanal and Small Scale Mining
BIC /ED	Bank Information Centre / Executive Director
BIT ACT MINES	... Amélioration des Conditions des Travailleurs dans les Mines au Katanga
BIT	Basic Information Technology
CAMI	Cadastre Minier (Mining Cadastre)
CHEMA	Chemaf SPRL is a subsidiary of Shalina Resources Ltd, a privately owned company that has been operating in the Democratic Republic of Congo (DRC) for nearly thirty years ( <a href="http://www.shalinareources.com">www.shalinareources.com</a> ).
CMKK	Coopérative Minière Madini Kwa Kilimo
CNCC	Société Nationale des Chemins de Fer du Congo
CPI	Corruption Perception Index
CTB-BTC	Belgian Technical Cooperation
DFI	Direct Foreign Investments
EIE	Évaluation d'Impact sur l'Environnement [Environmental Impact Statement]
EITI (initiative)	Extractive Industry Transparency Initiative
EMAK	Exploitants Miniers Artisanaux du Katanga
EMP	Environmental Management Plan
FEC	Fédération des Entreprises du Congo
Gécamines	Générale des Carrières et des Mines)
GPS	Global Positioning System
HDI	Human Development Index
HRW	Human Right Watch
ILO (guidelines)	The International Labour Organisation (ILO) is the tripartite UN agency that brings together governments, employers and workers of its member states in common action to promote decent work throughout the world
IMF	International Monetary Fund
IPIS	International Peace Information Service
MCK	Mining Company Katanga
TF MIRECA	Task Force Mineral Resources in Central Africa (task force)
MONUC	United Nations Organization Mission in the Democratic Republic of the Congo
MSF	Médécins Sans Frontières
NCEA	Netherlands Commission on Environmental Assessment

OCHA	(United Nations) Office for the Coordination of Humanitarian Affairs
OECD	Organisation for Economic Cooperation and Development
ONG /NGO	Non Governmental Organisation
PAP	Person Affected by the Project
PAR (fr)	Mitigation and Rehabilitation Plan
PCIA	Post Conflict Impact Assessment
PGEP (fr)	Environmental Management Plan
PRODEPAAK	Développement de la Pêche Artisanale et de l'Aquaculture au Katanga
RAID	Rights and Accountability in Development
RDC	Republic of Congo
RMCA	Royal Museum for Central Africa
RRC	Resource Rich Countries
SAESSCAM	Service d'Assistance et d'Encadrement du Small Scale Mining
SAESSCAM	Service d'Assistance et d'Encadrement du Small Scale Mining
SEA	Strategic Environmental Assessment
SNC	Société en Nom Collectif
STL	STL (Société pour le Traitement du terril de Lubumbashi)
TFM (project)	Tenke Fungurume Mining (Project)
ToR	Terms of Reference
UMHK	Union Minière de Haute Katanga
UNDP	United Nations Development Program
UNEP /PNUE	United Nations Environmental Program
USAID	United States Agency for International Development
VUB	Vrije Universiteit Brussel
WB	Worldbank
WRM	World Rain Forest Movement