ANGLOGOLD ASHANTI
ASHANTI GOLDFIELDS KILO SARL

Mongbwalu Project Environmental Impact Study and Management Plan of the Project for Public Disclosure, Executive Summary

September 2011

SRK Consulting
Engineers and Scientists

SRK Consulting (South Africa) Pty Ltd. in association with SRK Consulting Congo S.P.R.L

TABLE OF CONTENTS

1	Introduction	4
2	Project location	5
3	Project overview	7
4	The environmental assessment process	12
5	Public consultation and disclosure	16
6	The physical environment	19
7	The biological environment	25
8	The social environment	30
9	Environmental management plan of the project	37
10	Closure plan and financial provisioning	38
11	Sustainable development plan	39
12	Conclusions and recommendations	40
13	EIS and EMPP report for public disclosure	41
14	Summary table of impacts identified for the project	42
15	Contact details	48

Above: (left) Baglafecht Weaver (Groundtruth 2011) and (right) Surroundings of Kanga village (SRK Consulting)

ACRONYMS AND ABBREVIATIONS

AGA	AngloGold Ashanti Limited
AGK	Ashanti Goldfields Kilo S.A.R.L.
ARD	Acid Rock Drainage
ASM	Artisanal and Small-Scale mining
BID	Background Information Document
CBO	Community Based Organisation
CDC	*Le Cadre de Concertation*
CITES	Conservation on International Trade in Endangered Species
CO_2	Carbon Dioxide
CSI	Corporate Social Investment
DPEM	Directorate Responsible for the Protection of the Mining Environment
DRC	Democratic Republic of Congo
EBA	Endemic Bird Areas
EIS	Environmental Impact Study
EMPP	Environmental Management Plan of the Project
LOM	Life-of-mine
NGO	Non-Governmental Organisation
NO_2	Nitrogen Dioxide
PM_{10}	Particulate Matter
RAP	Resettlement Action Plan
RWD	Return Water Dam
SDP	Sustainable Development Plan
SOKIMO	Société des Mines d'Or de Kilo-Moto
SO_2	Sulfur Dioxide
SRK	SRK Consulting
TOR	Terms of Reference
TSF	Tailings Storage Facility
WRD	Waste Rock Dump

Above: (left) *Mussaenda arcuata* (GroundTruth 2011) (right) Children in one of the villages near the project site (SRK Consulting)

Chapter 1

INTRODUCTION

Ashanti Goldfields Kilo (AGK) is undertaking gold exploration activities in north eastern Democratic Republic of Congo (DRC), focussing mainly on the Mongbwalu area. The proposed Mongbwalu project will involve the development of an underground mine and associated processing and surface infrastructure that will be used to produce gold. AGK is a joint venture between AngloGold Ashanti (AGA) and the DRC state mining company *Société des Mines d'Or de Kilo-Moto (SOKIMO).*

SRK Consulting South Africa in collaboration with SRK Congo (SRK) was appointed by AGK to conduct an independent Environmental Impact Study (EIS) and compile an Environmental Management Plan of the Project (EMPP) for the Mongbwalu Project. The EIS and EMPP involved the assessment of environmental, social and health impacts as well as the development of management plans for the project. This aims to ensure that all possible impacts are identified, understood and managed.

An EIS and EMPP are required for mining permit approvals in terms of DRC law (*Code de Minier*). The EIS and EMPP carried out by SRK is compliant with DRC requirements, AGA Standards and aligns with international good practice.

Purpose of this document:

- Provide background information on the proposed project;
- Recap the EIS process that was undertaken, including the rounds of consultation with stakeholders;
- Present the main findings of the EIS and EMPP report. This includes:
  - Brief descriptions on the present environmental and social environment;
  - A summary of the major impacts identified; and
  - A summary of the proposed management measures.

Above: Views of the general project area (SRK Consulting)

Chapter 2

PROJECT LOCATION AND SETTING

AGK holds mining permits for a 5,487 km^2 area (the Kilo Regional Exploration area) within the former Concession 40. The project is located in the Ituri District of the Orientale Province, north eastern DRC. The site is close to the town of Mongbwalu, ~ 48 km north west of Bunia, ~ 500 km north east of Kisangani (the provincial capital) and ~ 320 km north west of Kampala in neighbouring Uganda.

The closest town is Mongbwalu, but 15 villages and settlements surround the project area (the area of the proposed for mining operations and associated infrastructure).

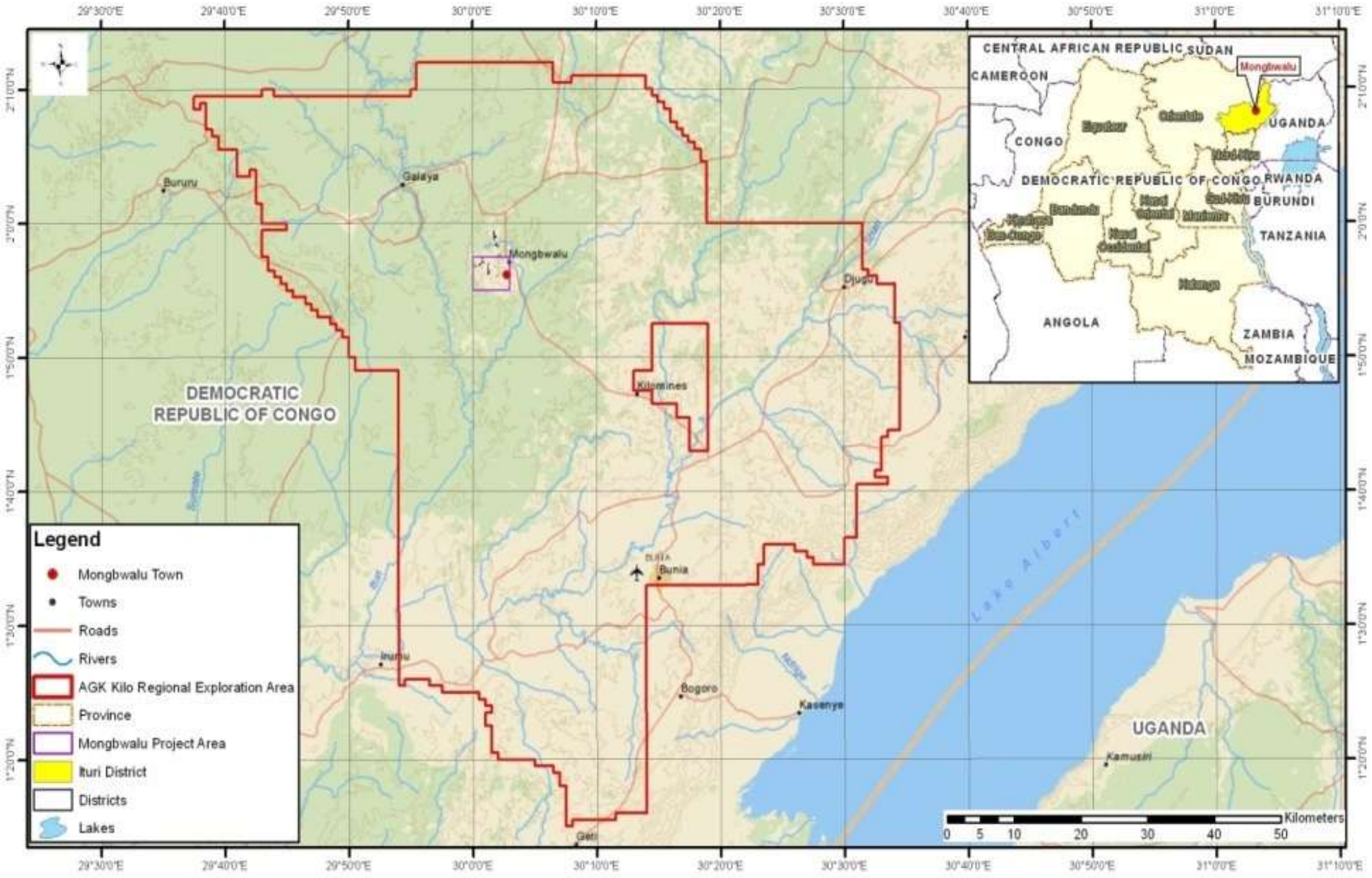
The area has experienced a long history of gold exploration and mining, which has been both formal and traditional in the form of artisanal and small scale mining. Formalised mining established between 1935 and 1940 resulted in the development of local infrastructure. Much of this infrastructure was destroyed during civil war or has been lost through no maintenance or upkeep over the last twenty years.

The area's complex social, political and economic history is characterised by conflict, violence, political and economic instability associated with the second Congo War, local conflict and competition for local resources. The area is currently experiencing a fragile level of peace and co-existence.

Communities around the project area range from the densely populated urban centre of Mongbwalu, and similar surrounding settlements to several traditional villages. Communities have poor water, infrastructure and sanitation services with a weak health care system and under resourced education system.

The project area falls within the Equatorial/Tropical Rainforest biome, and is located approximately 30 km to the east of the Ituri-Epulu-Aru Conservation Landscape, a priority landscape area of the Congo Basin Forest Partnership. Despite this, the immediate project environment is substantially deforested and degraded due to past and current mining activities, notably existing artisanal mining, as well as land clearance for agriculture. Water quality in local water courses is poor, and they contain high levels of sediments.

Above: Makala Mine Dam (GroundTruth 2011)



Above: Location of the Mongbwalu project

Chapter 3

PROJECT OVERVIEW

3.1. Introduction

AGK will mine gold bearing ore from the Adidi-Kanga area of the Mongbwalu resource. The gold will be mined using underground mining methods for a period of five years. While AGK does not intend to stop mining after five years, the life of production is based on AGK's current planning. Preliminary information indicates that it will be possible to extend the life of the project but further studies will be required to confirm this.

An overview of the proposed mine layout is shown in the figure below.

3.2. Mining Method

The underground mine will be accessed using an excavated portal and decline shaft. During the Phase One about 500,000 tons of ore per year will be processed with an additional 500,000 tons per year processed during Phase Two.

Ore from underground will be transported by underground vehicles to the run of mine pad for processing or to the waste rock dump.

The waste rock dump (WRD) will be located near the portal and will be approximately 11 hectares in size. As the WRD will be located in a watercourse, a pipeline will be installed under the WRD to preserve the original flow of the water course and measures will be implemented to prevent water contamination.

The mine will operate 24 hours a day, 7 days a week, with the exception of the crushing plant which will only operate for 16 hours a day.

3.3. Mineral Processing

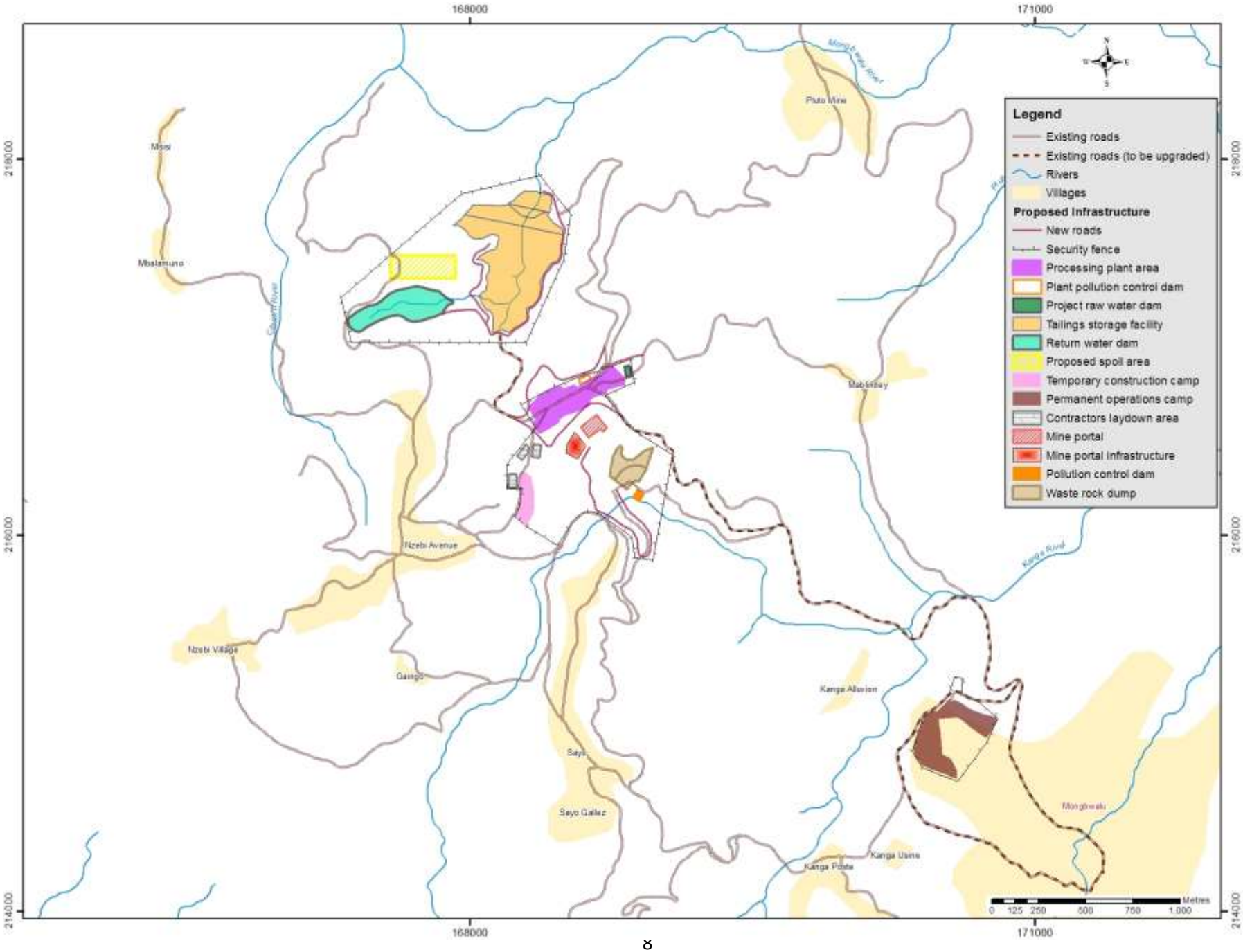
A metallurgical gold plant will process mined ore into unrefined gold at a rate of 40,000 tonnes per month for Phase One, with an increase to 80,000 tons per month in Phase Two.

The following processes will be used: crushing, screening and grinding / classification (milling), followed by gravity concentration. After this, the concentrate will undergo cyanide leaching, elution, electrowinning and smelting to produce the final product, which will be unrefined gold bullion. The product will be transport off site by helicopter for final processing. The main reagent to be used is cyanide.

3.4. Waste Management

Tailings Storage Facility

Waste from the plant will undergo cyanide detoxification before being pumped to a tailings storage facility (TSF). The TSF will be a valley filled facility and will be approximately 16 hectares in size and 44 metres high. Previous mining started in 1935 disposed tailings in the valley and more recently artisanal mining has occurred there.



Above: Layout of the proposed mine

Drainage systems will be built around the TSF to allow removal of water from the tailings and also around the base of the TSF walls to collect any seepage. A watercourse diversion will be required to separate clean and dirty water.

A return water dam (RWD) will be constructed and any decanted water from the TSF will be pumped to the RWD from where it will be pumped back to the processing plant and re-used.

Waste Disposal

Domestic waste will be disposed of in a dedicated domestic waste landfill. If possible, the domestic waste will be recycled. The location of this facility is not yet known.

Recyclable waste will be decontaminated and once declared safe, distributed to local communities.

Industrial waste will be decontaminated and recycled if possible; otherwise it will be disposed of in a designated industrial landfill site. The location of this facility is not yet known.

Hazardous waste will be stored in appropriate containers which in turn will be stored in a designated hazardous waste area/container. Disposal options will be investigated with suppliers and local government.

Medical waste will be incinerated.

Domestic effluent including sewage and grey water will be treated in a sewage treatment plant.

Pollution Control Dams

A desilting pond will be constructed downstream of the WRD. This dam will desilt any runoff from the WRD. A pollution control dam will be constructed at the portal area. This pond is designed as a balancing pond for the underground water pumped from the mine. The portal area will also have sumps that will collect dirty water. This water will be pumped back to the plant.

There will also be a pollution control dam in the plant area for the plant workings. Water from the pollution control dam will be reused in the process (milling and thickening).

Above: Earth moving activities (GroundTruth 2011)

3.5. Other Mine Infrastructure

Temporary Facilities

During the construction phase the following will be required:

- Contractors' camp;
- Offices;
- Equipment and furnishings;
- Ablutions and sewerage;
- Power;
- Water and water treatment;

- Voice and data communications; and
- Laydown area for construction equipment and materials.

After construction these will be removed and the area rehabilitated.

Processing Plant

This will be located 200 metres north of the portal and will include:

- A gold processing plant;
- Administration block (including a basic laboratory);
- Meeting rooms and training facility;
- Workshop;
- Stores;
- Bulk fuel storage and refuelling, messing facility;
- Change house;
- Electricity generation;
- Pollution control; and
- A helipad.

Expansion to Existing Exploration Camp

The exploration camp will be expanded to provide accommodation for the operational phase for approximately 150 employees. This will include accommodation units, kitchen, messing facilities, power, ablutions, laundry, potable water, water treatment, sewerage and waste disposal. The mine camp will also have a clinic.

Access Roads and Haul Roads

Main access to the Mongbwalu project site is mainly via an 86 kilometre gravel road from Bunia. This road is currently being upgraded and will need to be maintained during the Life-of-Mine (LOM).

Internal access roads will comprise of service roads in the mine portal and plant area (to be constructed).

Power Supply

Power will be a combination of hydropower from the existing (and soon to be rehabilitated) Budana hydropower station and thermal generated (diesel) power supply generated on site.

Transport of People and Materials

Transport of people will be via helicopter and road. Busses will be provided from the operations camp to the construction site.

Transport of materials, cyanide and explosives will be via road. Unrefined bullion will be transported from the gold plant to Bunia via helicopter. Fuel will be transported to site in tankers. All reagents, parts and spares, where possible, will be transported in containers for sea and road transport.

Borrow Pits

Borrow pits will be required for hard rock, gravel and sand. The majority of this material will be used in the construction of the plant and infrastructure. Existing borrow pits will be used wherever possible.

Water Supply

Raw water supply will be from mine dewatering and possible extraction from a groundwater supply.

Abstraction boreholes will be used to actively dewater the mine. This water will feed the plant raw water supply and excess water will be channelled back into the river catchment system from which it was dewatered. There is also the opportunity to re-use passive dewatered and treated fissure water from the underground workings to the plant area.

The underground mine will have small sumps to collect groundwater or water used from mining activities. The water will be pumped to a centralized pumping position where it will be pumped directly to the surface. Water will be treated and recycled for use in the plant or for discharge to the catchment from which it was removed. There will be no underground water storage.

Water from the TSF will be pumped to the RWD, from where it will be pumped back to the plant and re-used.

3.6. Employment

It is envisaged that the mine will employ a total of 1,352 people during construction of which approximately 886 will be sourced from the local area, 192 will be national from the DRC and a further 273 will be Third Country Nationals. At full production, it is envisaged that a total of 618 people will be employed of which 486 will be sourced locally, 78 nationally from the DRC and 54 from Third Country Nationals.

Above: Community members in Masisi village (SRK Consulting)

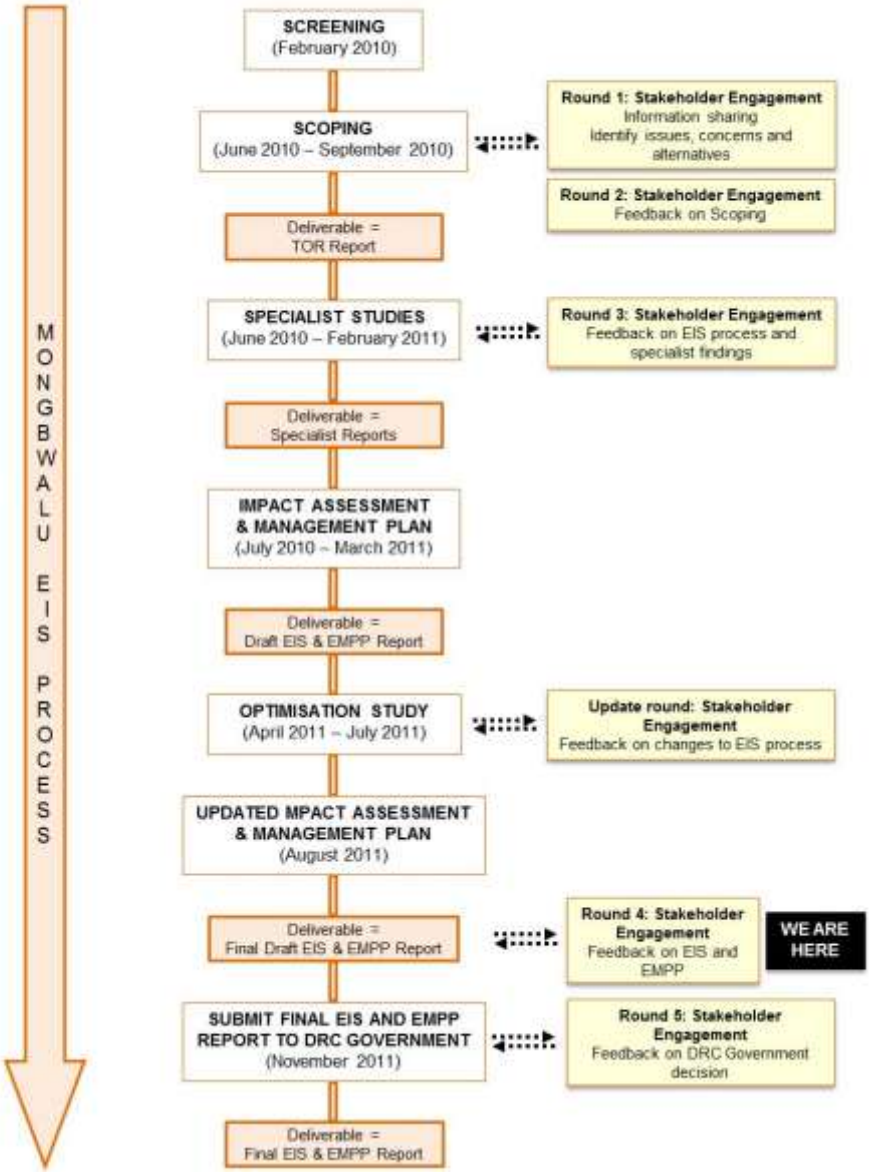
Chapter 4

THE ASSESSMENT PROCESS

4.1. Process followed

The EIS and EMPP processes were geared to ensure compliance with the DRC's environmental process requirements (specified in the *Code Miniere* and its regulations, specifically the Directive on the Compilation of EIS and EMPP's contained in Schedule IX of the Regulations), AGA standards and to align with international standards.

The assessment and public consultation processes followed during the EIS and EMPP compilation are as follows:



4.2. Screening

SRK conducted an environmental and social screening of the project as part of the tender process. This involved a site visit to identify potentially important issues and to understand the extent of social and environmental assessment required. The results of the screening exercise were incorporated into the Scoping and Terms of Reference (TOR) report referred to below.

4.3. Scoping and Terms of Reference

The formal EIS process began with a scoping exercise to determine the nature and extent of the environmental and social assessment necessary for the project. Information was gathered from a number of sources, including site visits, project meetings, stakeholder meetings, spatial data and an Environmental and Social Adjustment Plan compiled in 2008 for the Mongbwalu Tailings Retreatment Project.

4.4. Overview of specialist studies

A number of specialist studies were undertaken as part of the EIS and EMPP process, in order to address the issues identified during screening and scoping. These included a range of physical, biological and social studies. Local DRC specialists and fieldworkers were involved wherever possible.

In addition to the EIS and EMPP specialist studies, additional studies were undertaken to determine ways to manage complex issues over the entire exploration area. These studies included: indigenous peoples; land and resettlement; conflict, human rights, regional economics and artisanal and small scale mining. The studies were led by Synergy Global Consulting. The relevant results from these studies have been incorporated into the EIS and EMPP report.

4.5. Assessing impacts and management measures

Informed by issues identified during scoping, specialists identified, defined and evaluated project impacts as part of their studies. The core environmental assessment team then reviewed and integrated the specialist findings into the main EIS and EMPP report.Impacts were rated using a significance rating system (see table below) which involves four parts:

- **Part A:** Define the impact consequence using it's magnitude, spatial scale/ population and duration;
- **Part B**: Using a matrix, determine the consequence rating;
- **Part C**: Use the matrix to determine the significance of each described impact; and
- **Part D**: Define the confidence interval.

Using the matrix, the significance of each impact was described before management measures were applied. The rating assumed the management measures forming part of the project design were in place. Practicable management measures were then recommended to enhance positive impacts and avoid negative ones (if avoidance is not possible, then reduce, restore and off-set negative impacts). The significance of the impact 'after management' was then rated.

Method for rating the significance of impacts:

PART A: DEFINING CONSEQUENCE IN TERMS OF MAGNITUDE, DURATION AND SPATIAL SCALE *Use these definitions to define the consequence in Part B*		
Impact characteristics	**Definition**	**Criteria**
MAGNITUDE	Major	Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded
	Moderate	Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded
	Minor	Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded
	Minor+	Minor improvement; change not measurable; or threshold never exceeded
	Moderate+	Moderate improvement; within or better than the threshold; or no observed reaction
	Major+	Substantial improvement; within or better than the threshold; or favourable publicity
SPATIAL SCALE OR POPULATION	Site or local	Site specific or confined to the immediate project area
	Regional	May be defined in various ways, e.g. cadastral, catchment, topographic
	National/ International	Nationally or beyond
DURATION	Short term	Less than 18 months
	Medium term	18 months to 5 years
	Long term	>5 years

PART B: DETERMINING CONSEQUENCE RATING *Rate consequence based on definition of magnitude, spatial extent and duration*					
			SPATIAL SCALE/ POPULATION		
			Site or Local	**Regional**	**National/ international**
MAGNITUDE					
Minor	**DURATION**	**Long term**	Medium	Medium	High
		Medium term	Low	Low	Medium
		Short term	Low	Low	Medium
Moderate	**DURATION**	**Long term**	Medium	High	High
		Medium term	Medium	Medium	High
		Short term	Low	Medium	Medium
Major	**DURATION**	**Long term**	High	High	High
		Medium term	Medium	Medium	High
		Short term	Medium	Medium	High

PART C: DETERMINING SIGNIFICANCE RATING *Rate significance based on consequence and probability*				
		CONSEQUENCE		
		Low	**Medium**	**High**
PROBABILITY (of exposure to impacts)	**Definite**	Medium	Medium	High
	Possible	Low	Medium	High
	Unlikely	Low	Low	Medium

PART D: CONFIDENCE LEVEL		
High	Medium	Low

4.6. Optimisation study

An optimisation study was undertaken by AGK from April to August 2011 to reduce costs and increase ore throughput. This resulted in a:

- Phased approach to the project with an increased ore throughput; and
- Refined layout with a smaller land take.

SRK reassessed impacts and identified management measures based on the results of the optimisation and these are presented in this report.

4.7. Independent review

The Scoping and Terms of Reference report has undergone an external independent review process to ensure quality and independence, as well as to advise on the environmental process. The draft EIS and EMPP report will be reviewed before the fourth round of public disclosure (now). The independent reviewer/advisor for the project is Bryony Walmsley, Director of the Southern African Institute for Environmental Assessment (SAIEA).

Key aims and objectives of the EIS and EMPP:

- Present the project;
- Analyse the physical, biological and social environments affected by the project;
- Identify and assess potential impacts that the proposed mining project will have on the environment;
- Identify ways to avoid the negative impacts and optimise positive impacts; and
- Present an EMPP to ensure that management measures are in place from the first day of construction.

4.8. Future steps

The following tasks need to be undertaken before the social and environmental assessment can be completed:

- Present the final draft EIS and EMPP report to stakeholders for review (round 4). Feedback will be in the form of public meetings held in October 2011;
- Finalise the report based on comments from stakeholders;
- Submit the finalised EIS and EMPP documentation to the DRC government (Directorate Responsible for the Protection of the Mining Environment (DPEM)) for decision making; and
- Notify stakeholders about the DPEM's decision.

Above: Aerial view showing the degraded nature of streams in the area (GroundTruth 2011)

A summary table of identified impacts is included in chapter 12. This table lists each impact during each phase of the project as well and includes an impact rating.

Chapter 5

PUBLIC CONSULTATION AND DISCLOSURE

5.1. Stakeholder engagement

An Integral part of the EIS and EMPP is the process of stakeholder engagement. Public consultation and disclosure provides all stakeholders with the opportunity to raise concerns, questions and issues about the proposed project and the EIS and EMPP process, giving them the opportunity to influence project planning and design. These meetings are also important as potential impacts and mitigation measures are discussed with stakeholders. They also explain to stakeholders how their issues and concerns have been incorporated and addressed in the EIS and EMPP.

5.1. Mongbwalu stakeholder engagement

Stakeholder engagement for the Mongbwalu EIS and EMPP has been undertaken to meet DRC requirements, those of international good practice and AGA's policies and standards. Five rounds of public consultation meetings with stakeholders and community members will accompany the EIS and EMPP, with three rounds and an update round completed to date.

Above: Community meeting (including the Mbuti) in Nzebi Avenue (SRK Consulting)

Above: Children in Pluto Mine (SRK Consulting)

Stakeholders identified:

- Impacted communities
- Indigenous peoples
- Artisanal miners
- International watchdog organisations
- Biodiversity organisations
- Local civic organisations
- Government institutions
- Traditional authorities
- Trade unions
- AGK employees
- Commerce and business
- Multilateral organisations and donor agencies
- Security agencies
- Media
- Shareholders
- Service parastatals

A summary of the stakeholder engagement activities is provided in the table below:

ROUND	METHOD	STAKEHOLDERS	DATE
<u>Round 1</u>: Information sharing and issues identification	• 12 meetings were held. • Advertisements were placed, invitation letters and Background Information Documents (BIDs) distributed to identified stakeholders. • French posters and presentations were used during the meetings.	Mongbwalu Mayor, security team, tax officer, Mongbwalu stakeholder forum, village leaders in directly affected area, village leaders in indirectly affected area, local non-government and community based organisations, Nzebi community, Mongbwalu community, AGK employees, *Cadre de Concertation* (CdC), OKIMO, Regional government, MONUC	May – June 2010
<u>Round 2</u>: Feedback on scoping and further issues identification	• 17 meetings were held. • Advertisements were placed, invitation letters and BIDs distributed to identified stakeholders. • Radio adverts were also used to notify stakeholders of upcoming meetings. • French posters and presentations were used during the meetings.	OKIMO, CdC, civil society, government officials, Mongbwalu stakeholder forum, Mbuti community, Mabalindey community, Pluto Mine community, Msisi community, Nzebi Village, Nzebi Mine and Gaingo communities, Sayo community, Kanga Usine and Kanga Alluvion communities, AGK employees, Non-Governmental Organisations (NGO's), Ministry of Mines, *Institut Congolaise de la Conservation de la Nature* (ICCN), Department Responsible for the Protection of the Mining Environment (DPEM), Ministry of Environment, Nature Conservation and Tourism	October 2010
<u>Round 3</u>: Interim EIS and EMPP meetings	• 6 meetings were held. • Invitation letters and BIDs were distributed to identified stakeholders. • French posters and presentations will be used during the meetings.	*Chef de Cité*, civil society, NGO's and Community Based Organisations (CBO's), Government officials, OKIMO, community leaders, CdC	February 2011
<u>Update round</u>: Feedback to stakeholders on changes to the EIS and EMPP process	• 10 meetings were held. • Invitation letters and BIDs were distributed to identified stakeholders. • French posters and presentations were used during the meetings.	*Chef de Cité*, Kanga Poste and Kanga Alluvion leaders, Nzebi leaders, Mbalamuno and Masisi leaders, Pluto leaders, Mbuti community, NGO's and *Cadre de Concertation*	April 2011
<u>Round 4</u>: Final EIS and EMPP feedback meetings	-	-	To be undertaken in October 2011
<u>Round 5:</u> Feedback meetings on the Governments Record of Decision **(undertaken by AGK)**	-	-	To be undertaken in the first quarter of 2012

Key issues raised by stakeholders during stakeholder engagement are addressed in the EIS and EMPP. The key concerns included the following:

Key issues raised by stakeholders:

- Air and water pollution
- Payment of pensions for Ex-KIMIN employees
- Employment
- Community engagement
- Current impacts and compensation
- Compensation for lost and damaged land
- Economic and physical displacement
- Infrastructure and social development needs
- Relocation and economic displacement of artisanal miners

Meetings with the local communities in Mabalindey (above) and Nzebi Avenue (below) (SRK Consulting)

The EMPP includes a detailed stakeholder engagement plan to guide future engagement.

Above: Children in Nzebi Avenue (SRK Consulting)

Chapter 6

THE PHYSICAL ENVIRONMENT

6.1 Topography and landscape

The project area is characterised by hilly terrain covered with degraded and transformed lands, grasslands, remnants of forest, small subsistence farms, AGK exploration activities and artisanal mining. Slopes are gentle to moderately steep, with numerous steep cuts made by artisanal workings. The area is incised by several watercourses, the most notable of which are the Ituri and Abombi Rivers. The main river in the project area is the Mongbwalu River which flows from the north of Mongbwalu southwards to join the Abombi River.

6.2 Geology

The project area lies within an Archaean granite-greenstone belt that extends approximately west-northwest of Lake Albert. There are 12 main rock types and three major dykes found within the project area. There is potential risk of tremors and earthquakes in the area from the African Rift Belt, but the seismic study showed this to be a low probability. Mylonites are a type of parent rock that hosts the gold mineralisation.

Impacts: Failure of the tailings dam and return water dam would impact on lives and livelihoods including artisanal miners. The Village of Pluto Mine and Pluto Yalala, and the upper parts of the Sharpa River environment and forest areas and farmland would be affected.

Key management measures: Ensure that the TSF and RWD are built, managed and monitored to meet international standards. Emergency preparedness and response plans must be put in place and the risks of an incident must be communicated to those that can be affected.

6.3 Geochemistry

Geochemical tests of the material that will be mined or deposited on the waste rock dump show that there are high background levels of trace metals. However, these have low potential to mobilise.

Although there are sulfides present in the waste rock and tailings material, there is generally an excess of buffering potential which will likely neutralise the acidity produced by the oxidation of the sulfides. Test-work conducted on tailings is limited, but has indicated that there does not appear to be a significant potential to generate acidity. The risk of future acid rock drainage (ARD) arising from the waste rock dump or TSF thus appears to be relatively low.

Minor concentrations of trace metals were detected under acidic conditions, with the concentration of iron in the waste rock exceeding the DRC low risk standard in some instances. Although iron is mobilised, based on available information, it is not believed to be a significant environmental risk and does not necessarily warrant the lining of the waste facilities.

Further testwork on the proposed tailings material is required.

6.4 Soil, land capability and land cover

Nitisols are the only type of soil found in the project area. These soils are naturally

Above: Topography of the general Mongbwalu area

productive and are able to support a variety of crops. Uncultivated, nitisols are also productive as they tend to be erosion resistant, particularly when covered by natural vegetation.

Above and below: Soils in the project area and surrounds (SRK Consulting)

However, soil fertility in the project area is low as a result of leaching from high rainfall and agricultural practices. Another factor limiting agricultural activity in the project area is the steepness of the slopes: as slopes get steeper, deeper soils are required to sustain agricultural activity. Slopes steeper than 6% are potentially susceptible to erosion.

As soil depth across the site is greater than 2 m, soil depth does not influence land capability. Instead, land capability in the region is determined by slope.

There is widespread soil degradation in the project area, mainly through artisanal mining and removal of organic content for cultivation. The project area is dominated by secondary scrub (~58%) followed by forest (~15%) and cultivation (~8%).

Impacts: Mine infrastructure will marginally reduce land available for cultivation and food production and also result in a loss of livelihood for a small number of farmers. The TSF and WRD will remain after mine closure and the soils underneath them (26.3 ha) will be lost permanently. Pollution from runoff, spills and accidents could contaminate soils, making them unsuitable for agriculture. Mining activities could also increase erosion if surface water flow and storm water is not properly managed.

Key management measures: As planned in the feasibility study, minimise the infrastructure area and avoid cultivated areas wherever possible throughout the project life. Alternatively, compensate for economic displacement (loss of land) in accordance with international standards.

Separate clean and dirty stormwater and design the TSF and infrastructure to avoid pollution of the environment from leachates, oil and diesel spills. Incident procedures for oil and diesel spills should be actioned within 12 hours of the spill and an emergency preparedness and response plan that covers soil contamination issues should be developed.

Prepare and implement a closure and rehabilitation plan. Preserve topsoil for rehabilitation, and implement erosion control measures during all project phases.

6.5 Climate and air quality

Climate

The climate is usually warm throughout the year, with humid and wet conditions prevailing. There is also very little difference between the seasons.

Although temperatures do not vary much (range from 19^0C to 22^0C), maximum temperatures occur in January and February whilst minimum temperatures occur in August. Rainfall is received throughout the year, most of which falls between August and November, with no single day experiencing heavy rain, but rather short periods of gentle rain. The area has a positive water balance with more rainfall per year than evaporation.

Above: Environments in the project area

Winds are relatively consistent throughout the year, but patterns do differ during the day and night. Prevailing winds originate from the east and southwest with lower occurrences from the west to southwest and east to northeast.

Air quality

Dust fallout, particulate matter (PM_{10}) levels and levels of sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) gases in the ambient air are all low in the project area. This is a good indication that inhalable dust in the area does not pose a risk to sensitive human receptors close to the project area. Existing sources of air emissions include dust from the road network, limited levels from domestic wood and charcoal burning, seasonal biomass burning and vehicle emissions.

Above: Dust generated by motorcycles and vehicles

Impacts: Increased dust levels during mine construction and operation (mainly from the TSF) can have an impact on human health (from being inhaled) and will also be a nuisance.

Highest PM_{10} concentrations will be located south of the TSF, but no villages are located within the pollution plume hotspots. The hilly topography and low wind speeds contribute to the low concentrations of dust in the project area. When the incinerator is operating, chemical concentrations in the air will increase, but this will be a low impact. The incinerator is therefore not expected to be a significant source of pollution in the mine concession area.

Key management measures: Reduce vehicle speeds, sweep up dust and use water sprayers and suppressants to control dust. Cover bare ground with vegetation. Use high burning temperatures to ensure total destruction of waste and install suitable air cleaning mechanisms on the incinerator.

Greenhouse gas emissions

In 2009, the DRC released 2.64 million metric tons of carbon dioxide (CO_2). This compares with the 1,155 million metric tons of CO_2 released by Africa and the 30,400 million metric tons released globally. The DRC has a low CO_2 intensity and its annual CO_2 footprint is among the lowest in the world. The project will emit about 257,590 tons of CO_2e over its life, which deemed insignificant relative to DRC and global emissions. Opportunities do exist to manage emissions and it is recommended that AGK implement a carbon and energy management strategy.

6.6 Surface water

The main river in the project area is the Mongbwalu River which flows from the north of Mongbwalu, southwards to join the Abombi River. The Abombi lies 9 km south east of the site and flows in a south westerly direction to join the larger Ituri River which lies 8 km to the west of Mongbwalu. The Mongbwalu River is fed by a number of tributaries and springs. Major tributaries (from upstream) include the Creek, Kanga and Killi and Sharpa. The Mongbwalu concession area is divided into five main catchments.

Above: A source of water for Mbalumuno and Masisi communities (SRK Consulting)

Local communities use surface water for livestock watering, domestic uses such as washing and for artisanal mining. The latter activity has impacted severely on the water flow and quality of the streams, which through erosion and soil loss have resulted in high levels of sedimentation. Surface water is rarely drinkable and so most water comes from springs.

Impacts: The river ecosystem and downstream users may be impacted by pollution (including cyanide) from the tailings facility and the return water dam. There may be reduced water quantities in the rivers downstream of the RWD and TSF. This will affect aquatic ecology and downstream users. The consequence of this flow reduction will, however, be low as there are few water users directly downstream of the TSF.

Key management measures: Watercourses will be diverted around the RWD and TSF to avoid reducing their normal flows and minimising pollution. Cyanide in the tailings material will be detoxified. Monitoring will be in place to ensure pollution treatment and discharges of water meet DRC effluent quality standards. Water will be recycled as far as possible. The TSF and RWD will be designed to withstand 1:50 year flood events and the partial or complete lining of the TSF may prevent further water pollution (however, more studies regarding the lining of the TSF are needed). Excess groundwater that cannot be used in the process will be discharged into rivers, making up for any reductions in river flow.

6.7 Groundwater

Water table levels in the project area vary and the groundwater flow directions follow the local topography. There is a rapid response to rainfall and the majority of the springs are recharged by rainwater. Two types of rock (saprolite and saprock) have high storage capacities and permeabilities, and are therefore an important source of recharge to the structural flow zones.

Drinking water supply for the communities in the project area comes from 13 natural springs. Mine dewatering may impact on the quantity of the water in some springs and should this occur, AGK will need to ensure that that alternative springs or water sources are available to meet community supply.

Impacts: Depletion of groundwater will occur during the operational phase as a result of mine dewatering. Water availability from springs used by local communities may also be affected as the mine dewaters. Groundwater quality may also be reduced due to contaminated seepage and aquifer degradation.

Key management measures: Groundwater must be monitored before, during and after the completion of mining. An alternative water supply will need to be provided for affected users. Revegetate and shape the land to minimise pollution of groundwater. Cyanide in the tailings material will be detoxified. Seepage through the TSF base or wall will be limited by compaction of the base and lining if necessary. Seepage from the TSF wall will be captured in seepage ponds and pumped back to the TSF.

6.8 Water quality

High levels of suspended solids and elevated metals (iron and manganese), resulting from erosion and artisanal mining activities, downgrade the surface water quality for domestic use. It is probably for this reason that most communities in the area rely on the water from springs for drinking water. These springs are generally fed from sources that are not subject to contamination from the underlying geology or the mining activities in the area.

The WRD, TSF and WRD are likely to result in seepage to groundwater. Seepage will flow to the south east from the WRD, and to the north east from the RWD and TSF. This will discharge at a point downstream of the TSF before it joins the Creek River. The dissolved solid levels in the river will be less than international and national guideline levels. Excess groundwater to be discharged will also likely be within guideline levels but will need to be tested prior to discharge.

Creek Stream (above) and a relatively undisturbed and well vegetated site in the project area (GroundTruth 2011) (below)

6.9 Noise, blasting and vibrations

The population in the project area is concentrated in large towns such as Mongbwalu as well as several smaller villages. Noise caused by community activities is therefore limited to small areas of influence. Apart from the present exploration operation, the noise levels are dominated by community activities, local traffic and natural sounds. The hilly topography of the general area prevents the propagation of noise over long distances.

The general baseline ambient noise levels in the project area are 44 dBA for the daytime and 39 dBA for the night time. Therefore, general baseline ambient noise levels in the project area fall within the DRC and international guidelines.

Impacts: There will be increased noise levels particularly in Nzebi Avenue and other settlements as a result of mining and processing activities. There may be impacts on community safety and damage to structures (including Sayo Dam) from fly rock and vibrations that result from blasting activities.

Most of the noise impacts have been avoided through careful location of infrastructure, such as the crusher.

Key management measures: Use noise reduction measures for machinery and equipment. Select equipment with low noise emission levels and avoid traffic through community areas wherever possible. Limit the operation of specific equipment and blasting to the daytime. Make sure that no community members are within 1 km of the blasting impact zone during blasting. Monitor blasting amplitudes.

Left and below: Houses and communities may be affected by blasting, vibrations and noise (SRK Consulting)

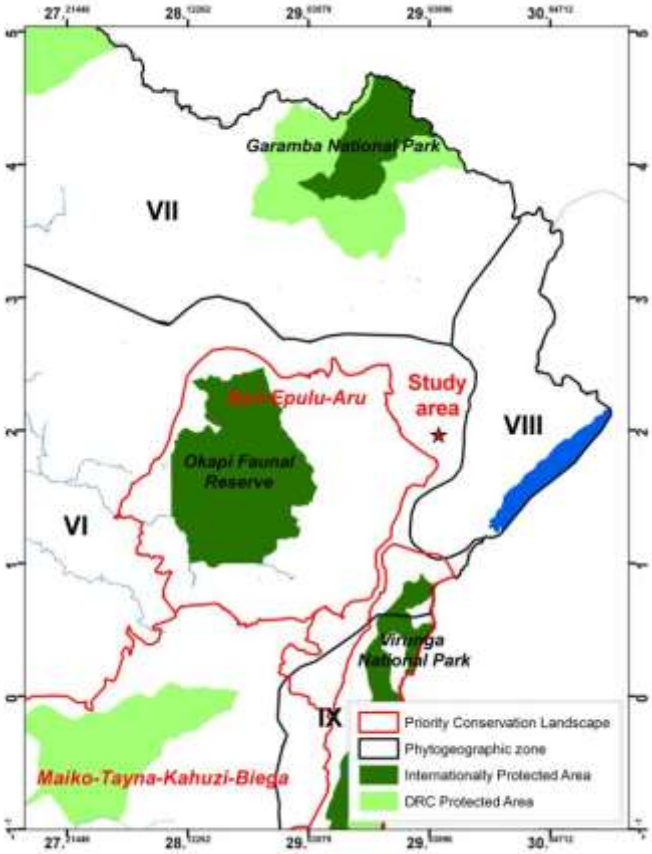
Chapter 7

THE BIOLOGICAL ENVIRONMENT

7.1. Regional ecology and sensitive environments

Several protected areas are located in the north eastern DRC; however, none are within close proximity of the study area. The Ituri-Epulu-Aru Conservation Landscape is the closest priority landscape to the project area (about 30 km west). This landscape contains the Okapi Faunal Reserve (about 100 km west), a World Heritage Site that is home to the Okapi, and also supports a number of endangered, vulnerable, near threatened and data deficient bird species. The eastern part of the DRC is particularly important for birds, supporting 11 of the 19 Important Bird Areas (IBAs) identified for the DRC, one of these areas being the Okapi Faunal Reserve, approximately 100 km west of the project site. Other protected areas in the region include two internationally protected areas, Virunga National Park and Garamba National Park, as well as a DRC protected area, Maiko-Tayna-Kahuzi-Biega.

Above: Biodiversity in the general area (SRK Consulting)



Above: Position of the study area relative to protected areas and conservation landscapes in the north eastern DRC (GroundTruth 2011)

The project area falls within an ecoregion that contains the largest tract of lowland rainforest in Africa. This ecoregion is particularly important in terms of water supply within the Congo Basin. The Aruwimi-Ituri-Uélé area, within which the project area occurs, has been highlighted as one of thirty wetland priority areas of the DRC. Furthermore, the project area is located at the transition between two recognised Endemic Bird Areas (EBAs), indicating the potential for supporting restricted-range species.

7.2. The project area's ecology

Despite the regional importance, the immediate project area has been heavily converted and used for decades, with only small patches of remnant forest in some

areas and more natural forest represented to the north and west of the site. Land transformation in and around the mine's proposed area is taking place at a rapid rate and the project area is dominated by degraded and transformed land cover such as cultivated lands, degraded forests and artisanal mines. The historic disposal of tailings into local catchments, notably in the proposed tailings has affected the ecology of rivers and catchments.

Above: Remnant rainforest on the slopes near the proposed TSF location (GroundTruth 2011)

7.3. Terrestrial ecology

A total of 954 floral taxa were recorded during the wet and dry season surveys. A number of vulnerable and near threatened plant species were recorded in the project area, such the tree species *Milicia exels*, *Turraeanthus africanus*, *Khaya anthotheca*, *Entandrophragma candollei* and *E. cylindricum,* as well as three endangered tree species, namely: *Diospyros crassiflora*, *Dialium excelsum* and *Brazzeeia longipedicellata* (an extremely rare tree).

No amphibian or reptile species of international concern were recorded in the project area during the wet (October 2010) and dry (January 2011) season surveys; however, one notable species of snake, Christy's Banded Snake (*Chamaelycus christyi*) was recorded. There have not been any reported records of this snake over the past several decades.

Christy's Tree Frog (above) and Christy's Banded Snake (below) (GroundTruth 2011)

A total of 162 bird species were recorded in the project area, with only two Red Listed species of bird, the Grey Parrot *Psittacus erithacus* (near threatened) and Bedford's Paradise Flycatcher *Terpsiphone bedfordi* (near threatened) being recorded as well as a number that are listed under the Convention on International trade in Endangered Species (CITES) and protected in the DRC.

Right: Bedford's Paradise Flycatcher (*Terpsiphone bedfordi*) (GroundTruth 2011)

No Red Listed mammal species were recorded in the project area; however, a number that are listed under CITES were recorded in surrounding forests such as the Blue Monkey *Cercopithecus ascani,* which is also partially protected in the DRC.

a 

b 

c 

d 

e 

Impacts: Temporary loss and fragmentation of remnant forest habitat will result through clearing for mine infrastructure. The loss in some areas such as the tailings facility, waste rock dump and return water dam will be permanent.

However, the extent to which patches of forest will become further fragmented is not considered to be significant because of the existing degraded nature of the area.

On top of in-migration, job seekers moving into the area will increase the pressure on forests by clearing for agriculture, hunting, housing material and exploitation of resources. The area will also be more accessible as a result of the upgrading and maintaining roads by AGK and could result in cumulative impacts on ecology. This could impact on species diversity and local communities reliant on surrounding forest resources for their livelihood. The functions that the surrounding forests play as a buffer for the Ituri-Epulu-Aru Conservation Landscape is also important and could therefore be impacted.

Key management measures: Keep the development area as small as possible throughout the project life, Avoid using vulnerable or rare timber and put in place effective reforestation procedures during rehabilitation. Ban plant collecting, clearing and hunting outside of the area designated for infrastructure for AGK workers and contractors. Conduct regular biomonitoring surveys. Develop a regional Biodiversity Action Plan to address indirect and cumulative impacts of the project.

Above: a) Black-crowned Waxbill; b) Brown-throated Wattle-eye; c) Grant's Bluebill; d) Jameson's Wattle-eye and e) Cutting of degraded forest to make way for fields for cultivation (GroundTruth 2011)

7.4. Aquatic ecology

Artisanal mining, historical deposition of tailings and clearing for cultivation have resulted in a poor condition of aquatic habitats and rivers. High levels of sedimentation and siltation were found in the project area, with suspended solid loads in all surface water sites sampled being well above aquatic macroinvertebrate and fish tolerance levels. As a result, aquatic macroinvertebrates and fish counts at sampled sites were low and no Red Listed fish species were recorded.

Barbus spp. cyprinids (above) and a typical rheophillic, clear-water, current-loving fish species (below) (GroundTruth 2011)

Analyses at the disturbed sites showed that no diatoms (a type of algae used to monitor environmental conditions) were present. These results are indicative of extremely poor river health conditions at all sampled sites within and around the proposed mine site. Results from the fish tissue metal analyses indicate “strong” mercury signal within the river systems, originating from the previous use of mercury in gold processing by artisanal miners. This is cause for concern for both the environment and communities depend on these systems for fresh water protein resources. Mercury is extremely toxic to aquatic organisms and has the potential to bio-accumulate in the food chain.

Impacts: Pollution from mining activities poses a cumulative threat (in addition to artisanal mining and poor aquatic conditions) to aquatic biodiversity as well as to communities that depend on the rivers.

Key management measures: Monitor the local and regional aquatic habitats, work with and educate artisanal miners to improve their impact. Ban hunting, vegetation harvesting, clearing and plant collection outside of the area designated for infrastructure. Undertake environmental awareness programmes with AGK employees, contractors and suppliers.

Typical conditions of an aquatic environment in the project area (above) and the Ituri river main channel showing the effects of elevated turbidity (GroundTruth) (below)

7.5. Ecosystem goods and services

Even though the Mongbwalu economy is centred around gold, livelihood strategies are still influenced by what the environment can provide. Ecosystem services are the benefits that humans derive from nature. The surrounding forests in particular, support the livelihoods of numerous local communities, including the Mbuti Pygmies.

Mongbwalu town is classified as predominantly commercial. The only place where local ecological goods, imported from beyond the project area, are traded is at the Mongbwalu Town market. Conversely, Msisi and Mbalamuno villages were classed as being mostly agricultural. The Mbuti group were classified as a subsistence group, using food from the natural forest, hunting for meat and collecting medicines from the environment.

The two natural habitats surrounding the project, rainforest and swamp forest, of which little remain in the direct impact area, are the most important in terms of delivering goods and services, with the rainforest being of particular importance. Even though the swamp forest is relatively less important, it must be seen as functioning together with the rainforest.

a

b

c

d

Right: Examples of ecosystem goods and services. a) locally grown fresh produce available at the Mongbwalu market; b) typical design and construction of Mbuti dwellings; c) leaf known as ‘mangungu’ obtained from the forest and used to wrap a cassava product known as ‘kpanga’; d) livestock and a variety of crops in a village (GroundTruth 2011)

Chapter 8

THE SOCIAL ENVIRONMENT

8.1. Regional context

Over the last decade, the project area and the Ituri District have been characterised by conflict, violence and instability associated with the Second Congo War, civil conflict and battles over natural resources. Severe human rights abuses, conflict persistent violence, marginalisation and exploitation have all contributed to the fragility of the socio-economic environment. Whilst peace currently prevails in the area, the underlying causes of tension have not been eliminated. Managing the project and its impacts in this complex environment is the most substantial challenge to successfully developing the project.

Above: Villages within the project area (SRK Consulting)

8.2. Administrative divisions, local and traditional authorities

The DRC is subdivided into Provinces, which are further divided into Districts and *Territories*. Territories are subdivided according to two parallel administrative systems, namely *Cités*, *Quartiers* and *Avenues* on the one hand, and *Collectivités*, *Groupments* and villages on the other. Each of the traditional structures is administered by a chief.

The project is situated in the *Cité* of Mongbwalu, *Territoire* of Djuga, Ituri District in the Orientale Province. The project area extends beyond the *Cité* and includes areas in the *Groupment* Mablindey.

Benefits: Improved capacity of organisations and local governance is expected as a result of the mine development as well as AGKs presence and interactions in the area.

Key enhancement measures: Foster communication with local government and traditional structures prior to and during development. Communicate and partner with NGOs and CBOs and develop a sustainable development plan (SDP) in conjunction with them.

8.3. Demography and population structure

Fifteen settlements are located in close proximity to the project area and supporting infrastructure, with about 50 000 people estimated to be living in the vicinity of the proposed mine.

Settlements include:

- Gaingo;
- Kanga Alluvion (including Kanga Usine and Kanga Poste);
- Mablindey;
- Msisi;
- Mbalamuno;
- Mongbwalu;
- Pluto Mine;
- Pluto Yalala;
- Nzebi Avenue;
- Nzebi Village;
- Sayo;
- Sayo Gallez; and
- Ndiri

There are as many as 18 ethnic groups in the area, with the most dominant being Landu, Nyali and Alur. Mongbwalu is the largest of the settlements and is the most ethnically diverse of the settlements in the area. The Mbuti people are the most distinctive but not the only indigenous people in the project area and warrant attention because of their relative marginalisation and their traditional connection and dependence to the natural resources and surrounding areas.

Overall in-migration exceeds out-migration. In-migration consists of displaced people who left the area during the recent civil conflict and are now returning to re-establish themselves. There is on-going in-migration (mostly men) from other areas in the DRC (particularly Bunia, Kisangani and North Kivu) who temporarily and occasionally permanently, settle in Mongbwalu or the surrounding villages, to engage in gold mining, commerce and/or farming activities. Out-migration also occurs in the District with migrants (typically young men) being involved in artisanal mining and agriculture.

a

b

c

Above: Villages around the project site a) Mablindey, b) Nzebi Avenue and c) Mbuti village (SRK Consulting)

Impacts: Social problems and ethnic tension could arise from influx into the area, with added competition over land and access to limited resources. Sexual exploitation of women may also increase.

Key management measures: Planning must ensure that benefits are experienced by all ethnic groups as far as possible, and an influx management plan should be developed with key stakeholders. There must be a 'zero-tolerance' policy on sexual harassment and violence for AGK and its employees and contractors.

8.4. Access to land and settlement patterns

Land is important as people rely on it for artisanal mining, farming, charcoal, medicinal plants, sacred sites and other natural resources. Land ownership in the project area is clan based, with each village having one or more clans controlling access to village land. However, the legal status of land ownership appears contradictory around traditional ownership. The key land issue in the project area is therefore the control of and access to resources, primarily land and gold.

A number of factors influenced the settlement of people in different villages. The close proximity to artisanal mining was an important consideration in villages such as Kanga, Sayo and Nzebi North, whilst for other settlements, access to land was more important.

Impacts: Project land take may cause loss of artisanal and small scale mining (ASM) livelihoods. The project may also increase competition for resources, project benefits and services, and could also generate tension in communities. There could also be an influx of job-seekers into the area, placing pressure on services.

Key management measures: AGK should understand and manage human rights risks and ensure a rights-based approach for the project. AGK should develop and implement an ASM management strategy aiming to ensure that ASM can co-exist with commercial mining despite the illegal status of ASM in the permit area. An employment policy and influx management plan should be developed, as well as a Resettlement Action Plan (RAP) for the relocation of affected artisanal miners.

8.5. Local economy and livelihood strategies

The historical struggles over the access and control of natural resources have played a key role in shaping the DRC's economic development path. Therefore, the access and control of natural resources is not only a source of revenue but also a sign of power and legitimacy.

Most households in the project area practice a mixed economy including, crop cultivation, artisanal mining, commerce, trade and to a smaller extent, animal husbandry.

Artisanal mining forms the basis of the local economy and is an important livelihood for people to fight against poverty. About 80-100% of people in the study villages are involved, either directly or indirectly in ASM. Many of the artisanal gold miners in the project area are demobilised soldiers and it has contributed to stabilising this post conflict area by nurturing economic growth, improving food security and providing a productive livelihood option for former combatants.

Above: Artisanal mining in the project area (SRK Consulting)

Traditional subsistence farming is the main farming method in the project area. Most farmers have small fields and do not produce enough food for their own families. If harvest is in excess of

household consumption, crops are sold opportunistically to earn money.

Natural resources use is an integral part of rural people's livelihoods. Hunting is a common practise in the area and a number of households produce their own charcoal and collect timber in the forests.

Above: Agriculture in the project area (SRK Consulting)

Impacts: While the feasibility study has avoided cultivated areas and forested areas as far as possible, the project may result in the loss of forest, water and other natural resources. Communities will also lose access to small areas of productive and potentially productive land (fallow land). This could increase pressure on remaining common property resources and also increase conflict from competition for land and resources. Loss of natural resources could have impacts on indigenous peoples.

Project facilities and fencing may interrupt or eliminate access routes between communities. This will affect travel times, travel distance, social networks, social services, farmland and markets. Following decommissioning, there will be loss of employment.

Key management measures: Minimise the area of the mine and infrastructure throughout the project life, thus reducing land acquisition; compensate for displaced productive land and implement livelihood restoration programmes where necessary. Explore opportunities to ensure access routes are not affected. A detailed closure plan must be developed that addresses social issues such as training and job losses.

8.6. Infrastructure and services

Due to the remoteness and high levels of poverty, many settlements in the project area lack adequate services and infrastructure. Most settlements in the project area do not have healthcare and education facilities and access to these facilities is expensive or entails travelling great distances on foot.

Water and sanitation in the project area is also poor. Water sources are often unclean and only 66% of households have access to pit latrines. There are no sewage and refuse collection systems. Community knowledge and practices relating to sanitation are poor. Water-borne diseases such as diarrhoea are common and linked to contaminated drinking water and poor sanitation. All villages in the area have access to at least one spring; however it is often difficult to access.

Above: Spring (SRK Consulting)

Energy used for cooking consists predominantly of wood and charcoal. Energy for light comes from burning candles, petrol lamps and torches.

Benefits: There may be benefits associated with improved access to social services and infrastructure through employment and a number of social development programmes implemented by AGK. These will be enhanced through involvement and partnerships with local government, NGOs and CBOs. Improved employment and enterprise opportunities through capacity building will result from construction and operation.

However, following decommissioning and closure, there could be loss of access to social services and infrastructure that was supported by the mine.

Key enhancement measures: Implement the sustainable development plan (SDP) (Chapter 13) that identified opportunities through local government NGOs and CBOs as well as focuses on enterprise development.

8.7. Health

The most prevalent diseases in the area are as follows:

- Malaria;
- Diarrhoea and typhoid (from unclean water);
- Sexually transmitted diseases (STDs);
- HIV/AIDS;
- Tuberculosis;
- Meningitis;
- High blood pressure; and
- Influenza.

Malaria is the biggest public health threat in the area. Tuberculosis, fuelled by HIV, is also a major health challenge in the area and acute respiratory infections are among the top three most common causes for childhood mortality. Malnutrition in babies and children is prevalent.

Mongbwalu has been identified as a high risk area for HIV transmission, with prevalence rates significantly above the district and national averages.

Alcohol and drug abuse is widespread in the project area, particularly amongst the youth and at artisanal mining sites. Sexual violence is common and there is little support for victims.

Mongbwalu Hospital (above) and Mongbwalu primary School (below) (SRK Consulting)

Impacts: Increased pressure on limited healthcare infrastructure as a result of people moving into the area for the project. This could also lead to overcrowding in communities which in turn will increase communicable diseases such as tuberculosis, HIV/AIDS and other sexually transmitted diseases (STDs). The in-migration of job seekers, access to disposable income and improved mobility will contribute to facilitating the spread of STDs.

The workforce will be exposed to vector related diseases such as malaria. Job seekers building makeshift houses may contribute to the increasing mosquito breeding sites.

Following decommissioning and closure, there could be loss of access to healthcare.

Key management measures: seek assistance from NGO's to support the Mongbwalu hospital whilst also supporting their health programmes. Support improvement for local diagnostics and treatment, as well as community based peer educators and health care systems with Voluntary Counselling and Testing (VCT) centres. Implement measures for reducing malaria and support malaria control programmes. Set objectives to extend beyond the life of the project and clarify that OKIMO are responsible for the Mongbwalu General Reference Hospital.

8.8. Traffic and transportation

The Bunia-Mongbwalu road is the main transport route into the project area. Links between settlements consist largely of narrow unpaved roads and paths which are difficult to negotiate during the dry season and almost impossible during the wet season. Transport services between settlements and Mongbwalu are provided by motorcycles. People walk long distances to access services and markets in neighbouring settlements.

Above: Traffic in the surrounding areas (Aurecon)

Impacts and benefits: Traffic will increase from mining activities but roads utilised will be better maintained. However there will be a significant impact on road safety especially for cyclists and pedestrians.

Management and enhancement measures: Rehabilitate and maintain roads, and use appropriate signage. Develop and implement policy for road safety.

8.9. Cultural heritage

The project area is endowed with cultural resources from the past and present. A total of 37 cultural sites were found in the project area including graves/cemeteries, sacred trees, and archaeological artefacts.

Sacred trees have an important role in the Nyali society as they represent the foundation of a village and resting place of important ancestors. They are used for rituals, ceremonies and medicinal purposes. They therefore constitute part of the population‘s living cultural heritage. Burials and cemeteries are also considered sacred by the Nyali. Individual burials and cemeteries were often found in association with sacred trees.

The archaeological material collected indicates that this region may have been occupied since the Late Stone Age onwards. Identification of archaeological material was limited to individual find spots as no “structures” such as pits, hearths and furnaces were identified.

No sacred trees or cemeteries occur within the direct project footprint.

Impacts: Several archaeological finds are located in the plant area, but the likelihood of these being affected is low. There may be damage to new resources during construction but these are not currently known to exist.

Key management measures: Identified sites should be marked and protected, and chance find procedures implemented to address new finds that might occur.

Above: Graves in the surrounding areas (SRK Consulting)

8.10. Development needs

There are broad social development needs in the area relating to the provision of social services and infrastructure, affordability of services, lack of community development and limited economic diversification. NGOs and CBOs are present in the area and in some cases; AGK has already partnered on community development projects. The EMPP includes a sustainable development plan that addresses social development needs (Refer to Chapter 11 for further details on the sustainable development plan).

Impacts: Benefits to local service and infrastructure provision through implementation of the Sustainable Development Plan.

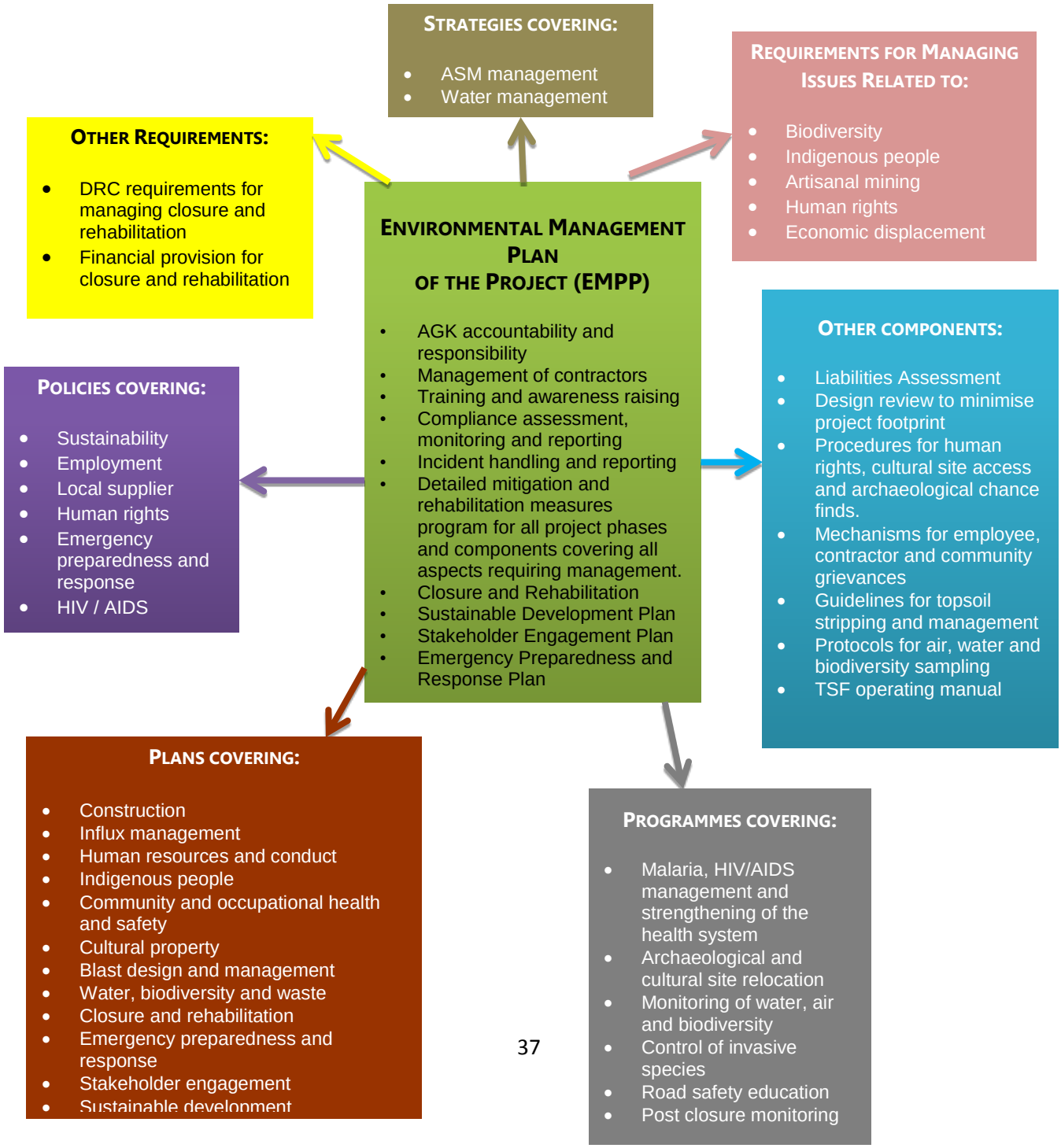
Key management measures: Implement the Sustainable Development Plan in collaboration with local stakeholders.

Chapter 9

ENVIRONMENTAL MANAGEMENT PLAN OF THE PROJECT (EMPP)

In order to manage the physical, biological and social impacts identified in the EIS, AGK has committed to implementing an environmental management plan of the project (EMPP). The EMPP meets the requirements of the DRC and includes additional elements required by international good practice.

The green box in the diagram below indicates what can be found in the EMPP. The other boxes provide information on a number of policies, strategies, plans and programmes that will be developed to support and implement the EMPP.



Chapter 10

CLOSURE PLAN AND FINANCIAL PROVISIONING

Whilst it is not AGK's intent to cease mining after five years of operation, AGK will still make the necessary closure planning arrangements in accordance with the requirements of legislation and good practice. The closure of the Mongbwalu mine will ensure adherence to the local, provincial and national legislation of the DRC.

A conceptual closure plan, including estimates of the financial provisioning, has been developed for the Mongbwalu project.

Planning towards closure is a dynamic iterative process, and AGK intends on operating on the understanding that current activities will impact on closure. It may therefore be possible to limit impacts during operations and reducing closure requirements. The closure plan is not based on any community and stakeholder engagement.

The biophysical liability estimate planned for the project is given in the text box. It must be noted that various limitations and assumptions pertain to the cost estimate, such as no social closure costs being included due to the lack of available social closure information.

Decommissioning phase:

Demolition costs = $1,879,011
Rehabilitation costs = $4,252,765
Maintenance costs = $99,511

Restoration phase:

Rehabilitation costs = $3,386,933
Maintenance costs = $131,977

TOTAL estimate = $9,750,196

Above: View from Nzebi Avenue (SRK Consulting)

Chapter 11

SUSTAINABLE DEVELOPMENT PLAN

The EMPP includes a sustainable development plan as required by DRC legislation. It aims to improve the economic, cultural and social well-being of communities affected by the project and builds on AGK's existing projects and relationships with local government and non-government organisations.

It includes the following elements:

- The DRC and international policy and legal requirements;
- A summary of AGK's social management standards regarding Stakeholder Engagement, Artisanal Mining and Indigenous Peoples;
- The project description and a summary of the socio-economic baseline informing the SDP;
- Summary of AGK's existing development activities;
- Community socio-economic mitigation and development opportunities, project identification and participatory approaches to community development;
- A description of potential development partners;
- Key elements of the SDP structure including the Community Development Committee, roles and responsibilities, schedule and budget; and
- A description of the monitoring requirements, including indicators, targets and reporting.

SDP Goals

- Establish a locally appropriate and cooperative framework for social development of affected local communities;
- Enhance community participation in deciding on and implementing social development priorities;
- Ensure and sustain a social licence to operate; and
- Implement AGK's community development policies and responsibilities.

The SDP identifies and describes six projects for implementation in the following areas:

- Improved literacy
- Malaria prevention
- Rehabilitation and construction of water points
- Sanitation awareness
- Support to local enterprises
- Engaging with indigenous people.

The key success factor for the SDP will be the participation, commitment and cooperation of stakeholders involved in implementation of projects.

Chapter 12
CONCLUSIONS AND RECOMMENDATIONS

This project is located in an area of social sensitivity and complexity due to its history and particularly around artisanal mining. These together are the main challenge to successfully developing the project. A key recommendation is the implementation of a stakeholder engagement process to build trust with stakeholders through a cooperative and partnership-based approach as well as an artisanal mining management plan.

Without a definite long-term investment strategy, the proposed short five year life of mine creates risk for the environment and the community. Although direct negative impacts will occur in an already degraded area, overall benefits of the project for stakeholders are limited over the 5 year project life.

Most of the impact predictions (over 5 years) are negative, including:

- Risk of destabilising the social environment and causing increased conflict in communities;
- Risk of livelihood impacts on artisanal miners and local communities; and
- Risk of pollution and waste affecting soil, water, air and ecosystems.

The positive impacts include:

- Slight improvement in services through the sustainable development plan;
- Contribution to taxes;
- Improved road infrastructure; and
- Increased local employment and skills.

However, AGK intends extending the project life beyond five years and will be conducting studies for this longer term strategy. This will allow AGK to better plan for an overall positive impact from the project, which will depend on AGK's relationships with stakeholders and its approach to project governance and implementation.

A comprehensive Environmental Management Plan of the Project has been compiled which sets the basis for AGK to develop a certifiable integrated management system to manage the identified risks and impacts. This includes numerous plans required by DRC legislation, including a mitigation and rehabilitation plan, a sustainable development plan, a stakeholder engagement plan, an emergency preparedness and response plan, and a closure and rehabilitation plan.

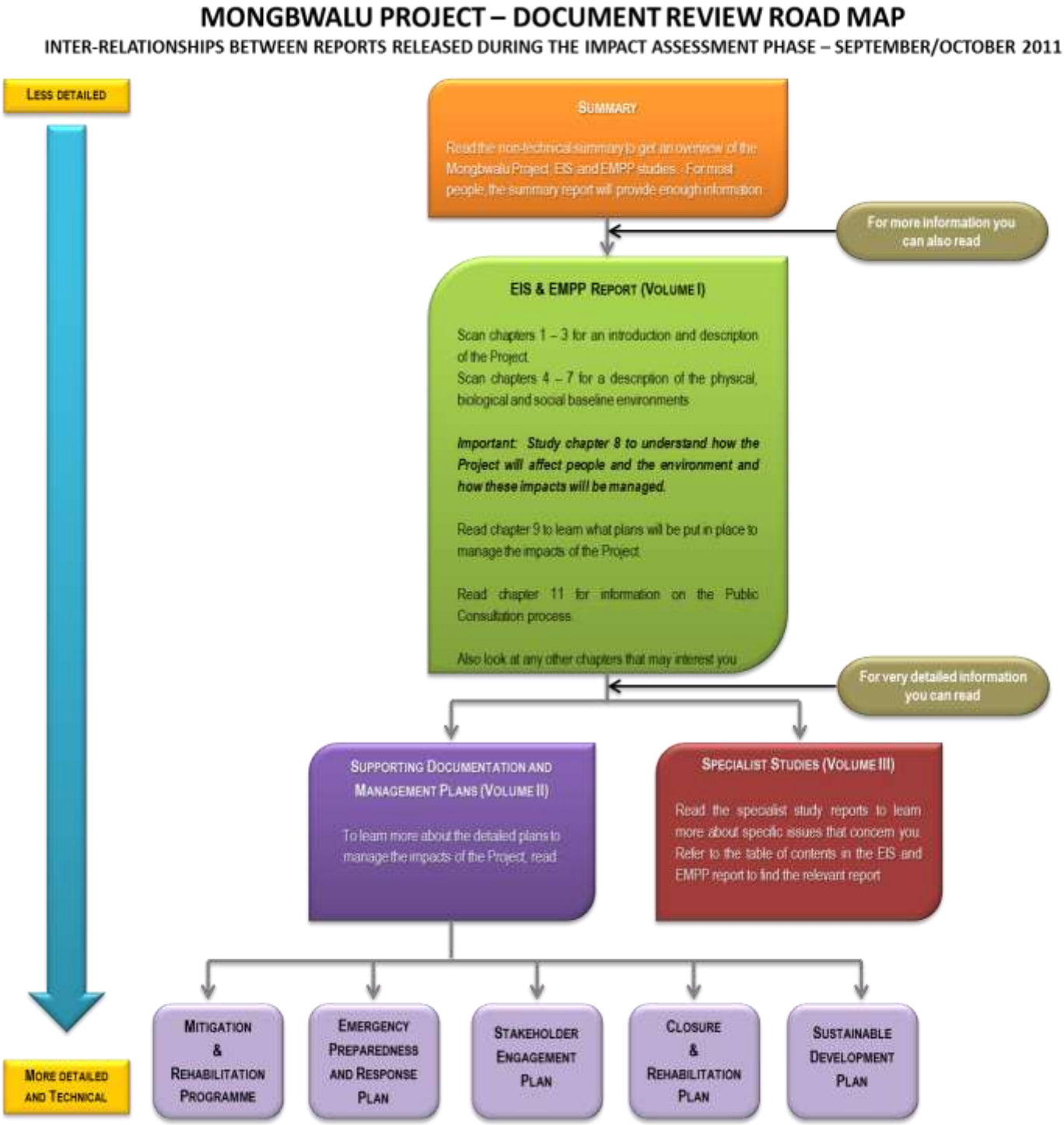
Further work is needed before construction to ensure the engineering design accommodates the recommended environmental and social management measures (as outlined in the EMPP) needs and to close gaps in project knowledge.

Above: remnant swamp forest in the project area (GroundTruth 2011)

Chapter 13

EIS AND EMPP REPORT FOR PUBLIC DISCLOSURE

- This road map is intended to help readers review the EIS and EMPP documents.
- Summary documents provide the least amount of detail but provide a good overview.
- It is important to understand how the project will affect people and the environment and how the impacts of the project will be managed. The diagram below shows you how to find this information.



Chapter 14

SUMMARY TABLE OF POTENTIAL IMPACTS IDENTIFIED FOR THE MONGBWALU PROJECT

Summary of the potential PHYSICAL impacts for the project per project phase:

Impact description	Timing	Significance before management	Significance after management
Geology			
Surface developments resulting in sterilization of exploitable mineral resources	Pre Construction	-	-
	Construction	-	-
	Operation	-	-
	Decommissioning/Post Closure	-	-
Failure of structures as a result of subsistence, faulting or seismic activity, leading to destruction and/ or loss of life and livelihoods and pollution of the environment	Operation	*High* -	*Medium* -
	Decommissioning/Post Closure	*High* -	*Medium* -
Soils, land capability and land use			
Loss of soil resource for small scale cultivation through sterilization by surface infrastructure	Pre Construction	*Medium* -	*Low* -
	Construction	*Medium* -	*Low* -
	Operation	*Medium* -	*Low* -
	Decommissioning/Post Closure (temporary infrastructure)	*Medium* -	*Medium* -
	Decommissioning/Post Closure (permanent infrastructure)	*Medium* -	*Medium* -
Soil contamination through runoff, spills, accidents and incidents	Construction	*Medium* -	*Low* -
	Operation	*Medium* -	*Low* -
	Decommissioning/Post Closure	*Low* -	*Low* -
Increased erosion from mining activity and changed hydrological conditions	Pre Construction	*Medium* -	*Low* -
	Construction	*Medium* -	*Low* -

	Operation	*Low -*	*Low -*
	Decommissioning/Post Closure	*Low -*	*Low -*
Climate and air quality			
Increased ambient respirable dust concentrations generated by construction and operations activities	Construction	*Low -*	*Low -*
	Operation	*Low -*	*Low -*
Increased levels of nuisance dust	Operation	*Low -*	*Low -*
Increased ambient chemical concentrations generated by the incinerator during operational conditions	Operation	*Low -*	*Low -*
Surface water			
The river ecosystem and downstream users may be impacted by the quality of runoff and spillage discharging to rivers from mine infrastructure including plant, ore stockpiles, waste rock, RWD, TSF, workshops, storage areas, excess water made underground and sewage works	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Medium -*
	Decommissioning/Post Closure	*Medium -*	*Low -*
The river ecosystem and downstream users may be impacted by a reduction in flow downstream of the RWD and TSF resulting in reduced availability for downstream users. There could also be an increase in flow due to disposal of excess underground water.	Construction	*Low -*	*Low -*
	Operation	*Medium -*	*Low -*
	Decommissioning/ Post Closure	*Medium -*	*Low -*
Ground water			
Depletion of groundwater impacting users as a result of the ongoing dewatering of the proposed underground mine workings	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Low -*
	Decommissioning/ Post Closure	*Medium -*	*Low -*
Impact on groundwater users due to degradation of the aquifer water quality due to contaminated seepage from the Plant complex, waste rock dumps, RWD and TSF	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
	Decommissioning/ Post Closure	*Medium -*	*Low -*
Noise			
Increased ambient noise levels in Nzebi Avenue and other settlements as a result of mining and processing activities	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
	Decommissioning/ Post Closure	*Low -*	*Low -*
Blasting and vibrations			
Community safety impacts associated with fly rock from surface blasting	Construction	*Medium -*	*Low -*
Damage to structures and nuisance related to vibrations caused by surface and underground blasting	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*

Summary of the potential BIOLOGICAL impacts for the project per project phase:

Impact description	Timing	Significance before management	Significance after management
Change in Land-cover through land transformation resulting in loss and fragmentation of forest habitat	Pre Construction	*High -*	*Medium -*
	Construction	*High -*	*Medium -*
	Operation	*Medium -*	*Low -*
	Decommissioning/ Post Closure	*Low +*	*Medium +*
Indirect loss of forest habitat and associated species through population pressure and increased access	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium -*
	Decommissioning/ Post Closure	*Low +*	*Low +*
Degradation of aquatic habitat through pollution	Pre Construction	*Medium -*	*Low -*
	Construction	*Medium -*	*Low -*
	Operation	*High -*	*Low -*
	Decommissioning/ Post Closure	*High -*	*Medium -*

Summary of the potential SOCIAL impacts for the projects per project phase:

Impact description	Timing	Significance before management	Significance after management
Human rights			
Perpetuation of loss of human rights related to increasing vulnerability and triggering of competition and conflict over resources as a result of impacts associated with project land take	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium -*
Population and demographic movements			
Influx and spontaneous settlement due to mine activities and infrastructure development placing pressure on social services, water and sanitation infrastructure	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Low -*
Community organisation and human rights			
Improved local governance through increased cooperation and engagement	Construction	*Low +*	*Low +*
	Operation	*Medium +*	*Medium +*
Increased activity and capacity of local NGOs and CBOs through engagement and cooperation	Construction	*Low +*	*Low +*
	Operation	*Medium +*	*Medium +*
Land and natural resources			
Loss of communal property through land acquisition and infrastructure development	Construction	*Medium -*	*Low -*
Increased pressure on natural resources resulting from project related influx	-	-	-
Conflict arising from increased competition for productive land and common property resources	Construction	*Low -*	*Low -*
Health			
Increased pressure on limited healthcare infrastructure due to project related influx	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium -*
Increased communicable diseases linked to project related influx	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium*
Increased exposure of workforce to vector related diseases	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium -*
Increased sexually transmitted diseases including HIV/AIDS due to influx and improved mobility	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium -*

Impact description	Timing	Significance before management	Significance after management
Loss of access to mine supported health services at closure as a result of health system issues	Decommissioning/Post Closure	*High -*	*Medium -*
Social services and infrastructure			
Improved access to social services and infrastructure through employment and SDP programmes	Construction	*Low +*	*Low +*
	Operation	*Medium +*	*Medium +*
Loss of access to mine supported social services and infrastructure at decommissioning	Decommissioning/Post Closure	*Medium +*	*Low +*
Economy, work and livelihoods			
Loss of access to productive land and livelihoods activities (economic displacement) through the Project's acquisition of land	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium -*
Economic displacement of artisanal miners due to land acquisition and infrastructure development	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium*
Interrupted access to livelihood activities (i.e. fields and ASM sites) through project restricted-access roads	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium -*
Loss of livelihoods and ecosystem services for indigenous peoples through the project's acquisition of forest land	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
Economic displacement of indigenous communities through the Projects acquisition and transformation of land	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium -*
Loss of subsistence food sources and further shift towards market economy through displacement from productive land	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
Reduced Mbuti access to ASM opportunities due to economic displacement of artisanal miners	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
Improved employment and enterprise development opportunities through skills development and capacity building initiatives	Construction	*Low +*	*Low +*
	Operation	*Low +*	*Low +*
Loss of access to employment opportunities and enterprise development at decommissioning	Decommissioning/Post Closure	*Medium +*	*Low +*
Potential of the project to significantly shrink the local economy	Construction	*High -*	*Low -*
	Operation	*High -*	*Low -*
Social conflict and vulnerable groups			
Conflict arising from increased competition for productive land and communal property resources	Construction	*Low -*	*Low -*
	Operation	*Low -*	*Low -*

Impact description	Timing	Significance before management	Significance after management
Competition over compensation claims, including non-residents displaced by conflict, 'squatters' and recent arrivals	Pre Construction	*Medium -*	*Medium -*
	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium -*
Outstanding compensation and housing grievances interfere with Project's new compensation program and related consultation	Pre construction	*Medium -*	*Low -*
	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
Ethnic tension from increased competition for access to natural resources, social services and employment opportunities	Construction	*High -*	*Low -*
	Operation	*High -*	*Low -*
Increased social pathologies arising from influx and presence of construction workers	Construction	*Medium -*	*Medium -*
	Operation	*High -*	*Medium -*
Increased sexual exploitation of women	Construction	*High -*	*Medium -*
	Operation	*High -*	*Medium -*
Increased anxiety and confusion regarding the scope of AGK projects resulting from a lack of disclosure and stakeholder engagement	Pre Construction	*Medium -*	*Medium -*
	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium -*
Cultural heritage			
Damage to cultural heritage and archaeological resources through land transformation activities	Pre-Construction	*Medium -*	*Low -*
	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
Loss of community access to cultural heritage and archaeological resources through fencing off parts of project site	Construction	*Medium -*	*Low -*
	Operation	*Medium -*	*Low -*
Traffic			
Change in traffic conditions on the surrounding road network due to additional traffic generated by mining	Construction	*Low -*	*Low -*
	Operation	*Low -*	*Low -*
	Decommissioning/Post Closure	*Low -*	*Low -*
Reduced road safety conditions along the sections of road where there is a high concentration of pedestrians and cyclists	Construction	*Medium -*	*Medium -*
	Operation	*Medium -*	*Medium -*
	Decommissioning/Post Closure	*Medium -*	*Medium -*
Deteriorating condition of the affected road network	Construction	*Medium -*	*Low +*
	Operation	*Medium -*	*Low +*

Chapter 15

CONTACT DETAILS

SRK Consulting

(Johannesburg, South Africa)

Vuyo Matshikiza

Stakeholder Engagement Coordinator

Tel: +27 11 441 1021

Email address: vmatshikiza@srk.co.za

SRK Consulting

(Lubumbashi, DRC)

Susa Maleba

Logistics and Coordination

Tel: +243 81870 1753

Email address: smaleba@srk.co.za

Ashanti Goldfields Kilo

Alain Mulumba Musangu

Community and Development Mananger

Tel: +243 990 900416

Email address: AMMulumba@AngloGoldAshanti.com

Or

Contact us through comment boxes provided in:

- Mongbwalu Forum
- The Mayor's Office
- EP3 Primary School
- Nzebi village