Crew Gold
Lefa Gold Mine

1 DISCLOSURE OF MINERAL RESOURCES AND RESERVES, LEFA GOLD MINE, NORTHEAST GUINEA TECHNICAL REPORT UPDATE

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Prepared for

Crew Gold Corporation
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GLOSSARY OF TERMS

3D	3 dimensions/dimensional
ABA	Acid Base Accounting
AC	Air Core (drilling)
ARD	Acid Rock Drainage
AARL	Anglo American Research Laboratories
BCM	Bank Cubic Metres
BRGM	Bureau de Récherches Géologiques et Minières
cfm	Cubic feet per metre
CIL	Carbon-In-Leach
Coeff Var	Coefficient of Variation (Statistic)
Crew	Crew Gold Corporation Ltd
DFS	Detailed Feasibility Study
EBIT	Earnings Before Interest, and Tax
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
g	Grams
g/t	Grams per Tonne
G&A	General and Administration
GS3	Mineral Grade Estimating software developed by Hellman&Schofield
Guinor	Guinor Gold Corporation Ltd
ha	Hectare
HARD	Half Absolute Relative Deviation
HFO	Heavy Fuel Oil
H&S	Hellman and Schofield Pty Ltd
ITS	Inchcape Testing Services
kg	Kilogram

kg/m	Kilograms per metre
km^2	Square Kilometres
koz	Thousand Troy Ounces
kt	Thousand Tonne
ktpm	Thousand Tonne per Month
kW	Kilo-Watts
LEFA	Lero-Fayalala
LEP	Large Exploration Program
LFO	Light Fuel Oil
LoM	Life of Mine
Lycopodium	Lycopodium Engineering Pty Ltd
mm	One thousandth of a metre (millimetre)
Mt	Million Tonne (dry)
Mtpa	Million (dry) Tonnes per Annum
M USD	Millions of United States Dollars
MW	Mega-Watts
Maxwells	Maxwell Geoservices
METS	Mineral Engineering Technical Services Pty. Ltd
MIK	Multiple Indicator Kriging
NATA	National Association of Testing Authorities
NPV	Net Present Value
oz	Troy Ounces (1oz = 31.1035 grams)
OMC	Orway Mineral Consultants
OSD	Oresearch Drilling Guinea Sarl
ppm	Parts per million
psi	Pound per square inch
PAL	Pulverise and Leach

QAQC	Quality Assurance Quality Control
RAB	Rotary Air Blast (drilling)
RC	Reverse Circulation (drilling)
RL	Relative Level (Elevation)
ROM	Run Of Mine
RQD	Rock Quality Designation
SAG	Semi-Autogenous Grinding
SMD	Société Minières de Dinguiraye
Std. Dev.	Standard Deviation (Statistic)
Surpac	Geological Modelling and Mining software developed by Gemcom
SW	Scott Wilson Ltd
S.R.	Strip Ratio
t/m^3	Tonnes per Cubic Metre
tpd	Tonnes per Day
tph	Tonnes per Hour
TSF	Tailings Storage Facility
Transworld	Transworld Laboratory Services
t:t	Tonne per tonne
UTM	Universal Transverse Mercator
USD	United States Dollars
USD/oz	USD per Troy Ounce
Wardell	Wardell Armstrong International Ltd
WADS	West African Drilling Services
Whittle	Pit Limit Optimising software developed by Gemcom

3 SUMMARY

Crew Gold Corporation Limited (Crew) is an international gold mining and exploration company, focused primarily on mining, mine development and exploration in Guinea, West Africa, through its subsidiaries Delta Gold Mining (DGM) and Société Minières de Dinguiraye (SMD).

The main mineral deposits of interest occur on the Dinguiraye Concession, a 1,600 km² Concession held by SMD, under the operating licence, to explore and exploit gold resources with the Government of Guinea, in accordance with the agreement titled the "Convention de Base". Another six contiguous Prospecting licences are also held and explored by SMD, which totals approximately 950 km². These prospecting licences host some of the minor regional resource areas.

SMD owns and operates the LEFA Gold Mine, which is located 700 km northeast of Conakry, the capital of Guinea, in a sparsely populated rural area, where subsistence agriculture and open range cattle grazing are the dominant activities. The principal area of operations is situated within the Préfecture of Siguiri. A portion of the mine site also falls within the Préfecture of Dinguiraye. Access is achieved via road, or a bi-weekly charter flight from Conakry or Bamako (Mali).

The mine is currently configured as a gold, open pit, carbon-in-leach (CIL) operation. It has built a modern camp for some 270 people. The mine site has satellite, telephone, fax, television, radio and internet service. Two public mobile telephone networks operate, with calling cards also available.

The climate is consistent with a tropical continental regime, with an average annual rainfall of 1,200 mm, largely restricted to the monsoonal season between July and September. The climate is warm to hot, with average daily temperatures ranging from a minimum of 10º C in the early dry season, to a maximum of 40º C, immediately prior to the onset of the monsoonal season.

The basement geology of the LEFA Gold Mine incorporates a Palaeo-Proterozoic sedimentary sequence. This sedimentary sequence is referred to as the Siguiri Basin, representing part of the Birimian volcano sedimentary series, which dominates the geology of the West African Shield. Compressional deformation during the Eburnean Orogeny resulted in the Birimian Series over-thrusting the under plating Man Shield.

Gold within the LEFA Gold Mine is mainly associated with mesothermal fractured and vein style mineralisation. The mineralisation is preferentially developed in the more permeable, altered, coarser grained sediments, within and/or adjacent to east-northeast oriented structures, and more consistently north to north-northwest trending vein/fracture zones. The dip and strike of mineralised zones, and the style of mineralisation, varies considerably between deposits. Gold mineralisation is dominantly associated with silicification, stockwork and sheeted quartz–carbonate–sulphide veining, stockworks of albite-carbonate-sulphide veinlets, sulphidic haematitic fracture zones or retrograde skarn magnetite-epidote-pyrite mineralisation.

Pyrite is the dominant sulphide species, ranging from a fraction to a few millimetres in size, largely confined to vein margins, or disseminated within alteration selvedges. Gold is largely developed within fractures in pyrite grains and is non-refractory. The base of oxidation commonly extends to over 100 m depth, commonly more locally depressed within zones of fracturing and brecciation.

Exploration techniques employed on the Concession and permits involves airborne magnetic and radiometric surveys, reconnaissance investigation and sampling, along with geochemical sampling and auger drilling. On receiving of the results of these programmes, the prospect is either deemed prospective or none economical. The prospective areas then have more advanced exploration techniques. Exploration techniques, as well as the different types of drilling, logging and sampling, and database management, have been completed to accepted international standards, with supervision and management by experienced expatriate personnel. The data is generally considered to be of high quality.

At the time of the preparation of this report, mine ore production was approximately 10,000 – 15,000 tonnes per day, at varying gold grades. Depending on operational requirements, different pits are actively mined, namely Fayalala and Lero-Karta (including Lero, Lero South, Karta and Camp de Base). The Kankarta West, Kankarta East, and Banko pits were dormant at the time. Other undeveloped mineral resources may be mined in the future.

In the course of normal end of year reporting, LEFA Gold Mine constructed mineral resource estimates for the Lero-Karta, Fayalala, Kankarta, Banko, Firifirini and Toume Toume areas. Those mineral deposits not updated in 2009, were completed by RSG Global as part of a feasibility study in 2004 and 2005.

Only those mineral resources added, or re-ran completely, by SMD were updated in 2009, except for Folokadi and Sanou Kono. The remaining mineral resources are consistent with those reported by Guinor as at 31 March 2005, and as previously filed in the RSG Technical Report in March 2005, since when there has been no material change in the information.

The estimated LEFA Gold Mine mineral resources, as at 31 August 2009, by resource classification are presented in Table 3.1. These resources are inclusive of those mineral resources modified to produce the mineral reserves. The in-situ Measured and Indicated mineral resources are some 109.9 Mt, at average gold grade of 1.2 g/t, for contained gold of 4.4 million ounces, excluding 9.1 Mt at 0.7 g/t of stockpiled rock. 97% of these resources are within the LEFA Corridor.

Total estimated Measured and Indicated mineral resources are 119.0 Mt, at average gold grade of 1.2 g/t, for contained gold of 4.6 million ounces.

Furthermore, the estimated Inferred mineral resources are 14.1 Mt, at average gold grade of 1.3 g/t, for contained gold of 0.6 million ounces, of which 66% are within the LEFA Corridor.

Crew considers the estimation of the mineral resources at the LEFA Gold Mine to be robust, and believes a significant economic gold deposit exists. Furthermore, Crew considers data of a scientific nature to be robust enough to continue to explore for, and extract and process, the gold mineralisation at the LEFA Gold Mine. Sovereign risk factors associated with working in Guinea certainly do exist and are well managed. The political landscape in Guinea is subject to change, and while the basic rights of the Convention de Base remains inviolate, there will be some issues that may receive different interpretation by respective government agencies. Strong relationships have been built and are maintained with the relevant government authorities of the Government of Guinea.

Table 3.1 Mineral Resources by Classification

Deposit	Measured			Indicated			Inferred			Cutoff[1]
	kt	g/t	k oz	kt	g/t	k oz	kt	g/t	k oz	g/t
LEFA Corridor										
Lero-Karta	26,819	1.4	1,227	13,065	1.5	639	2,784	1.3	117	0.5
Fayalala	46,390	1.0	1,465	5,042	1.0	155	3,877	1.1	132	0.5
Kankarta	2,844	1.4	129	1,171	1.3	48	99	1.3	4	0.5
Firifirini	3,779	1.6	188	1,951	1.4	85	1,084	1.6	54	0.5
Banko	975	1.9	58	446	1.3	18	223	0.9	6	0.4
Folokadi	545	1.5	27	1,746	1.7	93	689	2.0	45	0.4
Toume Toume	218	1.4	10	497	1.3	21	512	1.3	22	0.5
Sanou Kono				1,629	1.2	60				0.7
Stockpiles	6,801	0.9	197							
Heap Leach				2,313	0.8	57				
Sub-total	**88,371**	**1.2**	**3,300**	**27,860**	**1.3**	**1,177**	**9,268**	**1.3**	**380**	
Regional										
Banora	2,196	1.7	119	598	1.5	29	330	1.6	17	0.7
Diguili Bougoufe							273	2.1	18	0.8
Dar Salaam							522	1.1	18	0.8
Diguili North							1,782	1.4	78	0.8
Banora West							432	1.5	21	0.8
Hansaghere							511	1.1	18	0.8
Sikasso							584	1.4	26	0.8
Solabe							371	1.5	18	0.8
Sub-Total	**2,196**	**1.7**	**119**	**598**	**1.5**	**29**	**4,805**	**1.4**	**214**	
TOTAL	**90,567**	**1.2**	**3,419**	**28,458**	**1.3**	**1,206**	**14,073**	**1.3**	**594**	

1. Marginal gold cutoff grades are approximate, based on material type weighted average.

By mineral deposit, the Lero-Karta pits are the most important. The excavated material in these pits is the largest, at some 52% of the total for all pits. These pits contain 45% of the excavated ore tonnes, for approximately 51% of the in-situ gold ounces. The average waste to ore stripping ratio is approximately 4.2:1, tonne per tonne. Most of the identified ore tonnes in this area are in the transition and fresh rocks.

The Fayalala group of pits is the second largest, representing some 28% of the total excavated material. The pits in this area contain 39% of the excavated ore tonnes, for 31% of the in-situ gold ounces. The average waste to ore stripping ratio is the lowest at 2.3:1. The identified ore tonnes in this area are almost evenly split between oxide and transition/fresh rocks.

The third group, consisting of Kankarta, Folokadi, and Banko, represents 10% of the total excavated material. These pits contain 8% of the excavated ore tonnes, for 10% of the in-situ gold ounces. This group of pits contains the highest estimated average gold grades. The average waste to ore stripping ratio varies between 3.3:1 at Banko, and 7.1:1 at Kankarta.

Lastly, Firifirini and Toume Toume form the group of pits mining the skarn mineral resources. This group represents 9% of the total excavated material, and contain 8% of the excavated ore tonnes, for 8% of the in-situ gold ounces. The average waste to ore stripping ratio are some of the highest, at 4.4:1 at Firifirini, and 5.8:1 at Toume Toume.

The estimated mineral reserves, as at 31 August 2009, by category are presented in Table 3.2.

Table 3.2 Mineral Reserves by Classification

Deposit	**Proven**			**Probable**			**Proven+Probable**			**Fresh**
	kt	**g/t**	**k oz**	**kt**	**g/t**	**k oz**	**kt**	**g/t**	**k oz**	**%**
Lero-Karta	17,697	1.7	941	8,092	1.7	453	25,789	1.7	1,394	76%
Fayalala	21,822	1.2	844	566	1.2	21	22,388	1.2	865	53%
Kankarta	1,911	1.7	106	544	1.6	28	2,455	1.7	134	94%
Firifirini				4,041	1.7	219	4,041	1.7	219	33%
Banko	334	3.2	34	34	2.7	3	368	3.2	37	39%
Folokadi	395	1.8	23	1,072	2.1	72	1,467	2.0	95	45%
Toume Toume				258	1.5	12	258	1.5	12	19%
Stockpiles	6,784	0.9	187	2,307	0.7	54	9,091	0.8	241	7%
TOTAL	48,943	1.4	2,136	16,914	1.6	862	**65,858**	**1.4**	**2,998**	56%

At a gold price of USD 800/oz, the LEFA Gold Mine estimated mineral reserves are 65.9 Mt, at average gold grade of 1.4 g/t, for contained gold of 3.0 million ounces. The average waste to ore stripping ratio varies between 2.3:1 at Fayalala, and 7.1:1 at Kankarta. The overall waste to ore stripping ratio is 3.6:1. The overall average fresh to laterite/saprolite ratio is 1.3:1. That is, including the stockpiles, 56% of the estimated mineral reserves is fresh material.

Environmental issues do exist at the LEFA Gold Mine such as environmental degradation, ground disturbances of active mining areas, waste dump areas, stockpile areas, the CIL plant, existing and planned infrastructure, tailings dam location and surface and underground water course contamination. All of these factors are monitored by the Environmental department at the mine to minimise the impact of the mining operations on the surrounding environment. There are no factors considered so detrimental that would cause the operation to be closed down.

All units of measure (distance, area, volume, mass, etc) reported herein are in the metric system, unless otherwise stated. Gold grades are in grams per tonne, and contained and recovered gold is reported in troy ounces. Units of density are in tonnes per cubic metre. All monetary units reported herein are US dollars (USD), unless otherwise specified.

3.1 Interpretation and Conclusions

Modern, systematic exploration techniques applied to the LEFA Gold property has seen the delineation of a substantial gold resource. This was the justification for the purchase and construction of a 6 million tonne per annum CIL treatment plant, and appropriate earthmoving equipment to mine and process the gold resource.

The palaeo-Proterozoic sediments of the Siguiri basin, in the Birimian Supergroup of West Africa in which the LEFA Gold Mine forms a part of, is host to several multi-million ounce gold deposits. Mesothermal shear hosted and retrograde - skarn style mineralisation has been observed on the property, and the regional terrain is considered very prospective to host further mineralisation. SMD considers that ongoing exploration will continue to delineate incremental increases in the gold resource.

- The geology of the LEFA Gold Mine mineral deposits is well known and understood, and there are sufficient adequate descriptions of the geology in previous reports. The geological model, including the interpretation adjustments done by H&S, is acceptable and represents adequately the laterite, saprolite, transition, and fresh zones;

- The mineral deposits are very well defined in all directions, so the exploration potential in the deposits' immediate vicinity is limited. However, SMD holds 2,552 km^2 of mining concessions, with exploration potential;

- The geostatistical mineral resource models, mineral resource classification, and mineral reserves estimation developed by SMD are reasonable, as per accepted current industry standards;

- The LEFA Gold Mine mineral deposits present favourable conditions for open pit mining, due to geometry, grade distribution, and geotechnical characteristics;

- The metallurgical testwork is considered sufficient for the definition of the processing flowsheet;

- Additional testwork and geotechnical analysis at Banora and Sanou Kono will be required to evaluate the economics of mining theses mineral deposits;

- Due to the isolated location of the project, the logistics of transporting supplies to the mine, and shipping products to their final destination is financially and technically challenging;

- The operating and capital costs were estimated based on reasonable assumptions and historical data, and reflect the current mining and processing methods;

- Average mine site direct operating costs for the project are estimated at USD 21.9 per tonne of ore processed, which is equivalent to an average of approximately USD 541 per ounce of gold produced;

- According to the governing document of the LEFA Gold Mine, the Convention de Base, new Environmental Impact Assessment is not required. Per the Convention de Base, SMD is required to protect the environment and reforest the lands used at the end of the operation;

- In general, the economic evaluation is considered to be conservative, at a gold price of USD 800/oz;

- The project economics are most sensitive to revenue (grade, recovery, gold price). The most relevant parameter being gold price, as gold grade and metallurgical recovery may not change much;

- The labour, power and cyanide acid costs are relevant. However, the impact on project economics is moderate.

3.2 Recommendations

Due to budgetary constraints the exploration programme was stopped during 2009. However, SMD estimates that an exploration budget of USD 2 million will be spent during 2010, for gold exploration with both near mine and regional targets being explored.

The rationale for exploration is to continue to delineate mineable resources near mine, using advanced drilling techniques, and to have a pipeline of regional targets becoming drill ready. This involves:

- Desktop compilation, analysis and interpretation of existing data including geophysical datasets and remote sensing techniques;

- Reconnaissance field investigations and geological mapping;

- Trenching, pitting and rock chip sampling;

- Stream sediment and geochemical grid sampling to low detection limits;

- Ground geophysical magnetics surveys;

- Auger interface drilling testing in situ anomalies below the transported horizon;

- Air Core and Rotary Air Blast drilling;

- Reverse Circulation and diamond exploration and resource definition drilling; and,

- Ongoing collection of geological, reconciliation, grade control, metallurgical and geotechnical data for resource block model construction and feasibility studies.

SMD considers that a continuation of these modern exploration techniques in a systematic and methodical manner will continue to provide gold mineral resources for mining and milling at the LEFA Gold Mine.

The Pebble crusher installation, which is expected to improve the plant throughput for the higher fresh to saprolite ore blends, must be investigated. Once the plant is operating at sustainable high levels, SMD believes the commissioning of the gravity circuit will be completed.

Further metallurgical test work is recommended for the Firifirini and Toume Toume mineral deposits, to investigate the effect of cyanide strength, solid concentration, and grind size, with respect to head grade, and test work to establish the metallurgical response of samples taken from various sections of the Firifirini and Toume Toume mineral deposits.

Recommendations for geotechnical analysis (extracted from the SW report, titled "LEFA Corridor Project – Geotechnical Pit Design Reviews", November 2009):

- Structural Geology - as pits will be developed in stages opportunities will occur for pit wall mapping and drilling geotechnical holes into the wall rocks. In each push-back, the wall rocks should be structurally mapped and orientated, with diamond drill holes to obtain geotechnical test samples in suspect weak areas. The ongoing geological mapping of benches should be expanded to include key discontinuity characteristics of joint roughness, joint alteration and persistence;

- Hydrogeology – routine records of pit water levels, pumping times and pumping equipment rates should be commenced together with the design of a water level monitoring array of ponds, rivers and boreholes. Piezometers should be installed in appropriate exploration boreholes or dedicated drilled boreholes;

- Pit slope monitoring – survey records shall be used in routine internal and external audits to ensure the compliance of constructed pit slopes with geotechnical designs and non-compliances reported before proceeding to the subsequent levels; and,

- Slope performance data – instances of geotechnical hazards arising from boudins or crest, bench, rock mass and structural failures should be recorded together with mitigation activities.

It is imperative that a programme of geotechnical observations, as outlined above, is implemented to verify through geotechnical analysis the parameters and slope geometry adopted for detailed design of the open pits.

4 INTRODUCTION

4.1 Preparation

This Technical Report Update has been prepared at the request of Crew. This report has been prepared in conformance with Canada's National Instrument 43-101 ("NI 43-101"). It provides a summary in NI 43-101 format of the material information contained in the various technical reports, particularly updating the mineral resources estimates, and completing the mineral reserves estimates for the LEFA Gold Mine in Guinea.

The Qualified Persons responsible for the preparation of this report are Mr Neil Hepworth, Vice President of Operations for Crew Gold Corporation, Mr Edgar Urbaez, Consultant Mining Engineer trading as In Silico Mining, Mr Kevan Walton, Geotechnical Engineer for Kevan Walton Associates, and Mr Nicolas Johnson, Principal Geologist and Geostatistician for Hellman and Schofield. Mr Hepworth and Mr Urbaez are the main authors and responsible for the overall preparation of this report.

This report is prepared on behalf of Crew for submission to Canadian Provincial Securities agencies. This report is intended as an update of the Independent Technical Report completed by RSG Global, in March 2005.

4.2 Purpose

The most recent technical report for the LEFA Gold Mine was filed by Guinor on 31 March 2005. Since Crew took over the operation in mid-2006, the company has mainly focused on the following activities:

- Developing the CIL plant infrastructure to the specifications in the 2005 RSG Technical Report;
- Changing mining activities over from contractor operated to owner operated and serviced;
- Intensive technical training of the local work force to reduce the number of on site ex-patriate personnel, while maintaining operational performance;
- Proving up and expanding the mineral resources identified in the 2005 RSG Technical Report; and,
- More recently, updating the pit designs based on the recently developed 2009 mineral resource models.

Since the 2005 RSG Technical Report, and other supporting technical reports, contain more technical information than the investing public requires, this Technical Report provides a summary and update, in NI 43-101 format, of the material information contained in these reports, and particularly addresses the LEFA Gold Mine mineral resources and mineral reserves updates as at 31 August 2009. This Technical Report relies extensively on data collected for, and findings resulting from, the Independent Technical Report completed by RSG Global, in March 2005.

4.3 Sources of Information

In summary, the following organisations and individuals have provided expert opinion or conducted testwork for, or in support of, the relevant sections of this Technical Report.

- Geological modelling and Mineral Resource estimates: Hellman and Schofield Ltd / RSG Global Ltd / SMD;
- Geotechnical modelling and slope recommendations: Scott Wilson Ltd;
- Metallurgical testwork: Orway Mineral Consultants, AMMTEC Limited, Wardell Armstrong International Ltd;
- Metallurgical analysis and recommendations: Lycopodium Engineering Pty Ltd;
- Hydrological and hydrogeological studies: Knight Piésold Consulting Pty Ltd;
- Environmental and socio-economic baseline Study on the LEFA Gold Mine concessions: Knight Piésold Consulting Pty Ltd;
- Pit optimisations, pit designs and Mineral Reserve estimates: Mr Edgar Urbaez (Private Consultant).

4.4 Personal Inspection

SMD had carried out extensive exploration on the LEFA property over the past 3 years, including trenching, pitting, auger, air core, reverse circulation and diamond drilling. SMD has carried out a due diligence of the results from this work, and in 2008, initiated a follow up program of drilling and sampling in order to infill the areas where the drilling was sparse, and to extend the known Mineral Resources both, along strike and down dip. The drilling and sampling program was under the supervision of Mr. Rohan Williams, SMD's Chief Geologist, who has been based on the LEFA property since 2003.

Hellman and Schofield Ltd (H&S) visited the exploration offices of SMD on the LEFA property, in Guinea, for 1 week in April 2009. This visit allowed H&S to review at first hand the geological modelling procedures, and to suggest any necessary adjustments to the geological database prior to the Mineral Resource evaluation exercise. H&S carried out site visits to the LEFA property previously in 2003, November 2006 and April 2008. At that time, H&S reviewed the grade control methodology, reconciliation data and updated the block models as requested by SMD. The Mineral Resource validation and estimation work forming the basis of this Technical Report was initiated with H&S in April 2009 and completed during June 2009.

Scott Wilson Ltd (SW) was appointed by Crew in 2009 to validate all the LEFA Corridor open pit designs, for the purpose of mineral reserve estimation. SW visited the LEFA property, in Guinea, for 1 week in September 2009, for a field inspection. Additionally, SW reviewed all previous geotechnical report/work, which enabled SW to satisfy itself of the suitability of previous recommendations. Pit sections were considered in relation to a pit slope Factor of Safety design criteria of 1.2, and field observations of structural controls and groundwater.

Lycopodium Engineering Pty Ltd (Lycopodium) was appointed by Guinor Gold Corporation, the previous owner and operator of the LEFA Gold Mine, to complete a comprehensive metallurgical testwork program on samples of LEFA Corridor ore. Laboratory testwork for the main mineral deposits was conducted by AMMTEC Ltd, Australia. Lycopodium provided estimates of process recovery and processing costs. 61 variability test samples were submitted which were used for both, physical testwork and cyanide leach testwork.

Further to the work completed by Lycopodium, Crew appointed Wardell Armstrong International Ltd (Wardell) in 2008, to conduct a metallurgical testwork program on samples from the skarn mineral deposits at the LEFA Gold mine. Laboratory testwork was conducted by Wardell, Australia. The objective of the testwork program was to establish the metallurgical response of the weathered and fresh ores to both, cyanide leaching and gravity-and-cyanide leaching (gravity tailings). During the cyanide leach testwork programme, the effect of solids concentrate and cyanide strength were investigated. In total, 124 variability test samples were submitted which were used for both, physical testwork and cyanide leach testwork.

The mineral resource block models were optimised using appropriate cost, metallurgical recovery, and pit slope angles, as estimated for each mineral deposit, to define an optimum pit shell per deposit. This selected optimised pit shell was then engineered to determine practical mining pit designs, applying appropriate detailed slope designs, access and infrastructure. This work was completed by, or under the supervision of, Mr Edgar Urbaez (Private Consultant). Mr Urbaez visited the LEFA property in August 2009, for 1 week. During this visit, Mr Urbaez reviewed at first hand the main technical-economic parameters to be used for the 2009 LEFA Corridor mineral reserves estimate, checked the mineral resource block models for the pit optimisation analysis, inspected the existing operating pits, stockpiles, heap leach pads, tailings impoundment, landing strip, mine camps, and general site infrastructure and equipment, among others. Also, Mr Urbaez has previously visited the LEFA property in June 2007, in May and August 2008, and in July 2009, for preliminary assessment of the LEFA Corridor mineral reserves. The Mineral Reserve estimation work forming the basis of this Technical Report was initiated in August 2009 and completed in early November 2009.

Numerous other site visits by Crew personnel, including Mr Neil Hepworth, have been conducted to the property during the course of the preparation of this Technical Report. Mr Hepworth assumed group operational responsibility for the LEFA property in May 2008 and spent approximately 6 months on-site in 2009. During this time, Mr Hepworth has been intimately involved with the main departments of the LEFA property, such as geology, mining, mineral processing, equipment maintenance, administration, environment and closure plan, among others.

5 RELIANCE ON OTHER EXPERTS

In the preparation of this Technical Report Update, Messrs. Hepworth and Urbaez have relied on the opinion and content of several Technical Reports prepared by Qualified Persons from Hellman and Schofield, Scott Wilson, Orway Mineral Consultants, AMMTEC, Wardell Armstrong International, Lycopodium Engineering, Knight Piésold Consulting, and most notably, the Technical Report prepared by RSG Global, and previously filed on SEDAR by Guinor Gold Corporation (Guinor), titled "LERO GOLD PROJECT, Guinea, West Africa - Independent Technical Report", March 2005, referred to from hereon as 'RSG Technical Report'. It is Messrs. Hepworth and Urbaez's opinion that the results stated in these previous Technical Reports are representative, accurate, and consistent with industry standards for, at least, preliminary feasibility analysis, and accept them as such. The document summarises the professional opinion of Messrs. Hepworth and Urbaez and contributing Qualified Persons and third party professionals.

This report includes conclusions and estimates that have been based on professional judgment and reasonable care. Said conclusions and estimates are consistent with the level of detail of the studies carried out and based on the information available at the time this report was completed. All conclusions and estimates presented are based on the assumptions and conditions outlined in this report. This report is to be issued and read in its entirety. Written or verbal excerpts from this report may not be used without the express written consent of the authors, or officers of Crew.

6 PROJECT DESCRIPTION AND LOCATION

The LEFA Gold Mine is located 700 km northeast of Conakry, the capital of Guinea, West Africa, at a latitude of 11º 40' N and longitude of 10º 10' W, as illustrated in Figure 1.1. The principal area of operations for the LEFA Gold Mine is situated within the Préfecture of Siguiri. However, a portion of the site also falls within the Préfecture of Dinguiraye. The majority of exploration, mining and processing activities, occurs within the Sous-Préfectures of Siguirini and Banora, representing the local subdivisions of the Siguiri and Dinguiraye Préfectures, respectively.

Figure 6.1 LEFA Gold Mine Location Map

The mine site is located in a sparsely populated rural area, where subsistence agriculture and open range cattle grazing are the dominant activities. The towns of Dinguiraye and Siguiri, which are respectively located 120 km to the southwest and 100 km to the east of the mine site, represent the largest commercial centres within the region.

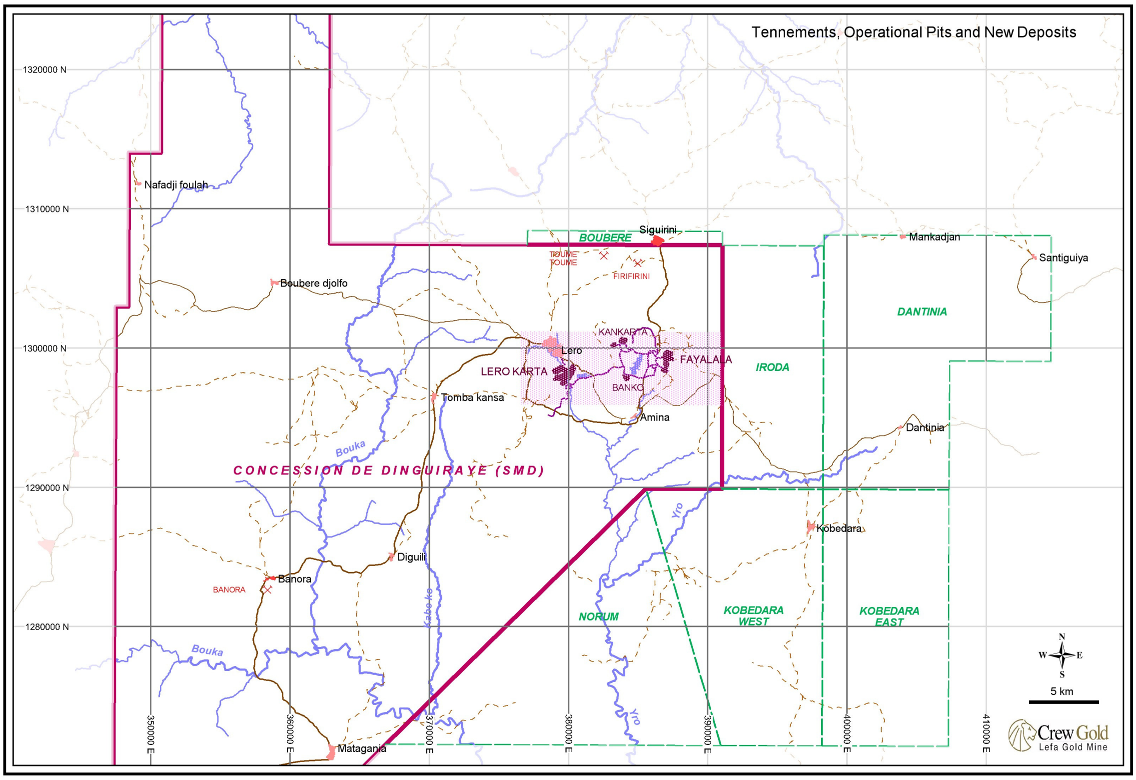
Along with the original Dinguiraye concession, the LEFA Gold Project comprises a further six contiguous granted Prospecting Permits, covering an aggregate area of 2,552 km^2, as presented in Table 6.1 and illustrated in Figure 6.1. The concession boundaries have not been legally surveyed, but are described by latitude and longitude via decree.

Table 6.1 Tenement Schedule

Concession	Licence	Area	Date Granted	Term
Dinguiraye	Basic Agreement	1,599 km^2	21 March 1994	Initial: 25 years Renewal: 5 years
Kobedara (East)	Prospecting Permit 2003/032	169 km^2	15 September 2003	Initial: 2 years Renewal: 2 years[1]
Kobedara (West)	Prospecting Permit 2003/030	186 km^2	15 September 2003	Initial: 2 years Renewal: 2 years[1]
Iroda	Prospecting Permit NoA2002/42	129 km^2	8 November 2002	Initial: 2 years Renewal: 2 years[1]
Boubere	Prospecting Permit 2003/031	14 km^2	15 September 2003	Initial: 2 years Renewal: 2 years[1]
Dantinia	Prospecting Permit	230 km^2	2 June 2007	Initial: 2 years Renewal: 2 years[1]
Norum	Prospecting Permit NoA2003/7	224 km^2	17 March 2003	Initial: 2 years Renewal: 2 years[1]
Total		**2,552 km^2**		

1. Every 2 years with 50% retrocession.

Figure 6.1 Tenement Location



The six granted Prospecting Permits adjoining the Dinguiraye concession are not subject to the Dinguiraye concession's Basic Agreement, but fall under the general mining code of Guinea. These additional Prospecting Permits comprise the granted Kobedara East, Kobedara West, Iroda, Boubere, Dantinia and Norum permits, which require a retrocession of 50% after 2 years. An initial extension was granted for one year, due to the favourable relationships which existed between SMD and the Mining Ministry of Mines, and has been extended further, while negotiations continue with the Government of Guinea. These negotiations also include extending the life of the Mining Concession by 10 years and adding other Prospecting areas.

The Kobedara East and West concessions comprise two contiguous Licences (2003/032 and 2003/030), both of which were originally granted on 15 May 2001, and have respective areas of 169 and 186 km^2. The Kobedara concessions lie immediately adjacent to the southeast corner of the Dinguiraye concession within the Préfecture of Siguiri. Renewals have been granted for 2-year periods for the Kobedara East and West concessions since 15 September 2005.

The Dantinia concession was successfully granted on 2 June 2005 for an initial period of 2 years, with renewals granted for 2-year periods since then. This permit lies to the east of Iroda, and forms a contiguous block extending from the LEFA mine area to the East.

The Iroda permit covering some 129 km^2 in area, was originally granted on 8 November 2002. The tenement is also located within the Préfecture of Siguiri, to the immediate east of the Fayalala deposit, adjoining the eastern boundary of the Dinguiraye concession.

The Boubere concession covers some 14 km^2 in area, and was originally granted on 26 January 2000. The tenement comprises a narrow east-west strip lying along the northern boundary of the Dinguiraye concession, immediately north of the LEFA mine area, within the Préfecture of Siguiri. An extension application for a further 2 years was granted for the Boubere concession on 15 September 2005, and the one year extension was granted before 50% retrocession was required.

The Norum permit, located south of the LEFA mine area and adjoining the southern boundary of the Dinguiraye concession, was granted on 17 March 2005. This tenement forms a contiguous block between the Dinguiraye concession and the Kobedara West permit, covering an area of 224 km2 within the Préfecture of Siguiri.

At the time of the preparation of the 2009 LEFA Gold Mine Mineral Resources and Reserves statements, negotiations with the Ministry of Mines, over the retrocession of 50% of the exploration licences, had been ongoing whereby there was a possibility Crew would not have to reduce its tenement size by 50%. All Measured and Indicated mineral resources are contained within the Mining Concession area, with only Inferred mineral resources in the exploration permits areas that may be subject to retrocession.

7 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE & PHYSIOGRAPHY

Access to the LEFA Gold Mine is achieved via road, or a bi-weekly charter flight from Conakry or Bamako (Mali). The road has an all weather bitumen surface for 400 km from Conakry to Bissikrima, then a 300 km gravel road of variable quality. Access to the LEFA Gold Mine can be restricted during the monsoonal season, due to flooding within drainages and inundation of broader, low-lying areas.

In January 2009, work began in converting the diesel power generators to work with heavy fuel oil (HFO), with a total capacity of eight 4,500 MW units, equivalent to 36,000 MW. HFO is provided under contract by Total, which owns and manages the onsite storage capacity of 9 million litres, as well as a light fuel oil (LFO) storage facility of 2 million litres.

Since November 2008, all samples have been prepared and analysed at the SGS Lero onsite laboratory, constructed and commissioned in 2008.

Lero is the largest village in the immediate proximity of the mining operation, housing the vast majority of the mine's national workforce. Numerous small businesses have been attracted to the centre as a result of the Lero operation and the mine has provided a school, mosque (with solar power for lighting), and a new medical centre, following the removal of the Camp de Base hospital and pharmaceutical facility.

A bypass road has been constructed to accommodate supply vehicles travelling to and from the site. The mine has also assisted with building a church on the outskirts of the village, to accommodate the 10% of Christian families in Lero. Due to the mining operations impacting on the senior local workforce housed at Camp de Base, the mine successfully negotiated the transfer of all residents from Camp de Base to the Fayalala construction camp. A new army barracks was also constructed to relocate the military contingent based in Camp de Base.

The immediate area around the mining operation includes the four main settlements of Lero, Tambico, Amina and Carrefour. Amina is a traditional alluvial gold mining village, with continuing activities having a minimal impact on SMD's operations. Services and social development programs, similar to Lero, have been implemented in the smaller villages of Amina and Fontou.

Expatriate staff, itinerant consultants and contractors, and senior national staff, presently reside in the main, well appointed Base Vie mine camp, located approximately 8 km from the mining and processing operation. Base Vie can accommodate up to 150 people. A separate camp, the Fayalala Camp, able to accommodate another 120 people, has been established for middle management national personnel and other expatriates, while the majority of the non-professional workforce live in Lero village, and are transported to and from work via the SMD bus service.

The site has satellite, telephone, fax, television, radio and internet service. Two public mobile telephone networks operate, with calling cards also available.

The climate is consistent with a tropical continental regime, with an average annual rainfall of 1,200 mm, largely restricted to the monsoonal season between July and September. The climate is warm to hot, with average daily temperatures ranging from a minimum of 10º C in the early dry season, to a maximum of 40º C immediately prior to the onset of the monsoonal season.

The terrain is gently undulating within southern portions of the concession block, progressively becoming interspersed with hills and bluffs associated with exposures of Jurassic diorite and Cambrian clastic sediments, rising to 500 m above sea level in northern portions of the mine site. The vegetation is dominated by broad expanses of grassland, interspersed with savannah woodland of moderate density, becoming more prolific along drainages.

8 HISTORY

In January 1984, the Guinean Minister of Mines issued a Ministerial Arrete (No. 1166/SGG/MMG) to create an association for exploring and exploiting gold, diamonds and other minerals. The association was between the Government of Guinea (50%), with FAMA Precious Metals Limited and Norwegian shipping companies, Klaverness Chartering AS and Preco AS (50%). This association was subsequently confirmed by a Protocol d'Accord, providing the partners with a mineral concession of up to 15,000 km^2, and the original Dinguiraye concession of 13,791 km^2 was subsequently granted.

Following the registration of a joint venture company as Dinguiraye Gold Mines (DGM), the interests of Klaverness Chartering and Preco in DGM were transferred to the Norwegian company Kenor ASA. Limited exploration commenced through until 1985, when the concession area was reduced to 7,300 km^2 in the first required retrocession.

In 1986, Société d'Etudes de Recherches et d'Emploitations Minières (SEREM), an affiliate of Le Bureau de Récherches Géologiques et Minières (BRGM), entered into the joint venture by acquiring a 33% interest in DGM, and BRGM was appointed as operator.

In April 1989, a Convention de Base (Basic Agreement) was issued, establishing the operating company, Société Minières de Dinguiraye (SMD), as a company owned 50% by DGM and 50% by the Government of Guinea.

In 1989, a further retrocession reduced the concession to 3,554 km^2. Notwithstanding this, however, the eastern boundary was subsequently adjusted to include the Fayalala area.

SMD entered into a technical assistance contract with DGM, resulting in an equity adjustment in the latter company, with Kenor and LaSource (BRGM) each retaining a 50% interest. Kenor listed on the Oslo stock exchange in 1994, prior to purchasing a 100% interest in DGM from LaSource in June 1998, and the final equities in SMD (DGM 85% and the Government of Guinea 15%) were therefore confirmed.

BRGM completed an extensive program of regional soil sampling over virtually the whole of the original Dinguiraye Concession. A number of anomalous areas were detected, with that associated with the Lero deposit representing one of the more significant targets identified, generating a peak gold soil response of 3,000 ppb (3 g/t) gold.

Extensive field investigation of artisanal workings throughout the Dinguiraye Concession was also completed by BRGM. However, the vast majority of workings were found to be alluvial in origin. Regional geological mapping at 1:200,000 scale, completed under a German Government grant in the 1990's, was used as the basis for geological interpretations, together with remote sensing data, such as Landsat and Radarsat. On the basis of this work, seven regional prospects were Reverse Circulation drilled during the late 1990's. Assessment of two of these prospects resulted in small resources being defined. However, none demonstrated sufficient size potential to justify further exploration until the discovery of the Lero anomaly and peripheral targets.

Following definition of extensive oxide mineralisation at the Lero deposit, feasibility studies were progressed through 1993 and 1994, resulting in a positive outcome. The Lero operation was commissioned in April 1995, at a processing throughput rate of 360,000 tonnes per annum, to exploit a 3.5 year open pit reserve at an average gold grade of 3.7 g/t.

In 1998, having acquired the balance of the project, Kenor met with immediate exploration success at the Karta deposit, located immediately adjacent to Lero, and the more distant Fayalala anomaly, with the former having no geochemical expression, and the latter representing one of the subordinate anomalies previously identified by BRGM.

Infill geochemistry, within what is now referred to as the Lero-Fayalala (LEFA) Corridor, lead to the identification of the majority of other known deposits and prospects. The Lero pit was exhausted of readily accessible oxide ore by the end of 1998, and the Karta open pit was commenced in January 1999.

During 1999 the Fayalala deposit, lying 9 km east of the Lero facilities, was brought into production with the mining of principally pisolitic laterite ore, that could be dumped directly onto leach pads without the requirement for crushing and agglomeration. In mid 1999, SMD introduced Moolman Mining, a mining contractor from South Africa, with a larger fleet, including 50t trucks.

During 2000, oxide ore production from the Karta and Fayalala deposits continued. In mid-2000, a trial pit was developed on a near surface, high-grade section of the Tambico resource, and mining continued until October the same year.

In early 2001, Kenor completed, with assistance from independent consultants, a detailed review of the Lero Project, to determine the ultimate exploration and development potential of the concessions. The findings of these studies concluded that the project has the potential to significantly expand and support the development of a large tonnage CIL processing operation, with production from both oxide and primary ore types.

During 2001, the contract mining fleet was expanded to 10 trucks, to enable increased laterite production from the Fayalala deposit, following depletion of the oxide resources at Karta in mid-2001. During the last quarter of 2001, the relatively small saprolite reserve at Kankarta was brought into production.

In 2002, the majority of all production was derived from the Fayalala pit, supplemented by remnant production from Kankarta in the early part of the year. The Fayalala production predominantly comprised pisolitic laterite ore for dump leach processing. However, the first high-fines laterite and saprolite material types were exposed and mined later in the year. The Banko mineral resource was brought into production in mid-2002, with a shallow pit developed on the pisolitic laterite ore. Subsequent optimisation of the remaining laterite and saprolite ore types resulted in a more substantial reserve.

In September 2002, Kenor commenced an exploration strategy, termed the Large Exploration Program (LEP), complimented by a USD 9 million budget, designed to define sufficient mineral resources to support a large tonnage CIL operation. Mineral resource estimates were progressively updated by RSG Global during the course of the LEP strategy, and subsequent feasibility program.

In 2003, mine production was predominantly comprised of saprolite ore derived, from the Fayalala and Banko deposits, for agglomeration and heap leach processing.

In July 2003, an economic study was undertaken to re-evaluate the viability of establishing an 8 Mpta CIL processing operation. The study was based on modelled mineral resources to May 2003, and likely mineralisation projected to through until completion of the LEP strategy in December 2003. The study indicated that the project could generate a healthy return if the assumptions made were realised.

In September 2003, predominantly on the basis of the preliminary economic study, the Kenor board curtailed the LEP strategy in favour of commissioning a Detailed Feasibility Study (DFS) to assess the viability of establishing a large open pit mining and CIL processing operation.

In early 2004, the mining of economic oxide ore associated with the Banko deposit was completed, compensated by the recommencement of mining at the Tambico deposit. Mine production for 2004 was predominately sourced from the Fayalala and Lero-Karta deposits.

On 27 February 2004, Guinor Gold Corporation (Guinor) made an Exchange Offer to acquire all of the issued and outstanding Kenor shares. The offer period expired on 26 March 2004.

On 29 March 2004, Guinor announced all conditions had been fulfilled or waived. By the beginning of April 2004, Guinor became the owner of 133.5 million Kenor shares, representing approximately 93.7% of the total 142,544,729 issued and outstanding Kenor shares at that time.

In May 2004, the remainder of the outstanding Kenor shares were compulsorily acquired by Guinor.

In March 2005 RSG submitted a technical report on the LEFA Gold Mine on behalf of Guinor, titled Independent Technical Report filed on www.sedar.com.

In October 2005, Crew Gold Corporation announced it had offered to purchase 100% of the Guinor Gold Corporation shares in a fully financed all cash transaction.

In December 2005, Crew Gold Corporation announced the conditions offered to acquire all of the issued and outstanding common shares of Guinor Gold Corporation have been complied with or waived.

In June 2006, Crew Gold Corporation purchased the outstanding 15% of the DGM shares owned by the Guinean Government.

Mining in 2005 and 2006 continued to expand, with substantial cutbacks around several of the existing open pits, after approval was given for the development of the LEFA Gold Mine expansion. The majority of material excavated was in the form of waste rock as pre-stripping. However, a small amount of ore from the Lero pit was sent to the heap leach pads, prior to de-commissioning in 2006.

Stockpiles for the new CIL plant began accumulating adjacent to the Fayalala pit, where the pre-owned Kelian Gold Mine plant, from Indonesia, was being reassembled. This plant began commissioning in January 2007. The state of the plant and the need for rebuilds for much of the installed equipment, however, meant that despite being partially operational in February 2008, it would only reach full capacity by November 2009.

During 2007, the mining fleet became fully commissioned by earthmoving contractors PMC (Guinea), and full production of the earthmoving equipment of 8 m^3 backhoes and 40 m^3 dump truck combination was realised. Mining was conducted at Lero-Karta with the Lero Cutback, Lero South, Karta, Karta 4 and Camp de Base mineral deposits, all mined in the oxide zone. In addition to this, Kankarta West began to expose the first transitional and fresh ore at the LEFA Gold Mine, and Kankarta East saprolite portion was mined as well. The Bofeko mineral deposit, part of the Fayalala mineral resource, was also mined, with laterite and saprolite ore exposed.

In September 2008, the mining fleet was taken over by SMD due to multiple non compliances in the earthmoving contract by PMC. At the time of the preparation of this report, the mining fleet was owned, operated, and serviced by SMD, and was undergoing full life rebuilds.

In November 2008, the new SGS Lero on site laboratory was commissioned, adjacent to the CIL plant and offices. Since then, all samples have been prepared and assayed at the new laboratory.

At the time of the preparation of this report, mine ore production was approximately 10,000 – 15,000 tonnes per day, at varying gold grades, depending on operational requirements. Historic production at LEFA Gold Mine is presented in table 8.1.

Table 8.1 Production Statistics

Item	**Unit**	**2009[1]**	**2008**	**2007**	**Total/Average**
Ore Processed	tonnes	2,697,544	3,085,177	2,482,203	**8,264,924**
Gold Ore Grade	g/t	1.4	2.2	1.4	**1.7**
Gold Metallurgical Recovery	%	90.7	92.5	89.0	**90.7**
Gold Production	ounces	111,259	197,555	96,929	**405,743**

1. to 31 August 2009

9 GEOLOGICAL SETTING

9.1 Regional

The basement geology of the LEFA Gold Mine incorporates a Palaeo-Proterozoic sedimentary sequence, referred to as the Siguiri Basin, representing part of the Birimian volcano sedimentary series, which dominates the basement geology of the West African Shield. The Birimian series, including the Siguiri Basin, is under-plated by a cratonised block of Archaean-aged high-grade metamorphic and intrusive rocks, referred to as the Man Shield, which are exposed in southern Guinea, Liberia and Sierra Leone.

The Birimian is separated from the Man Shield by a belt of komatiitic volcanic rocks, referred to as the Nandian Chain, which are interpreted to have been deposited during early rifting along the margins of the cratonic nucleus. Subsequent compressional deformation during the Eburnean Orogeny, resulted in the Birimian Series over-thrusting the Man Shield, and the intrusion of granitoids in the neo-Proterozoic. This collisional environment resulted in development of dominantly greenschist facies metamorphism and regional northeast to northwest trending deformation zones, considered to be fundamental to the development of gold mineralisation in the Birimian Series, including the Siguiri Basin.

The Birimian Series of West Africa is host to some of the largest gold deposits in the world, including Sadiola, Yatela, Morila and Syama in Mali, Obuasi, Bogosu, Tarkwa and Bibyani in Ghana, and Siguiri in Guinea, with the latter deposit also lying within the Siguiri Basin.

9.2 Site

9.2.1 Lithologies

The basement geology of the LEFA Gold Mine is dominated by Palaeo-Proterozoic volcanic-derived sediments of the Birimian Series, comprising the Siguiri Basin. The basin can be subdivided into two distinct formations on the basis of geological mapping, remote sensing data and laterite composition:

- The upper Matagania Formation is dominated by inter-bedded claystones and siltstones, better represented throughout southern portions of the concession block;
- The lower, Siguiri Formation comprises intercalated siltstones and arkosic sandstones or greywackes, and occasional conglomerates, which are more prevalent in northern portions of the concession block.

At the regional scale, gold occurrences are more numerous in the coarser grained arkosic unit (Siguiri Formation).

The Birimian volcano-sedimentary series was extensively deformed and metamorphosed during the Eburnean Orogeny. However, this appears to have been substantially more subdued within the Siguiri Basin, compared with other West African Birimian terrains. Within the LEFA Corridor, the basement stratigraphy is essentially sub-horizontal to shallow dipping and significant fault offsets are rare. Primary mineral assemblages reflect low grade regional metamorphism from upper prehnite-pumpellyite to lower greenschist facies. The succession is strongly deformed and is characterised by tight isoclinal folding and flexural strike slip thrust faulting.

Syn to post-tectonic granitoids intrude the basement succession, but appear to be largely confined to the northern extremity of the project tenements, reflecting the deeper level of crustal exposure. A series of east to northeast trending dolerite dykes of presumed neo-Proterozoic age are evident on airborne magnetic images traversing the basement stratigraphy. Small, localised apophyses of these dolerites are exposed within the Lero-Karta and Banko pits, where in some instances they appear to pre-date mineralisation, and in other cases, postdate mineralisation.

Prominent remnant bluffs of the horizontally disposed Cambrian Balinko Formation, comprising sandstones and conglomerates, obscure the basement geology within isolated northern portions of the concession block. Being more resistant to erosion and lateritisation, these intrusions form prominent hills and bluffs within the northern half of the project, and their higher magnetic susceptibility can be readily distinguished in airborne magnetic data.

Throughout the Lero concession, exposures of the Birimian basement succession are extremely rare. Lateritisation is extensive, persisting up to 100 metres depth, with a typical profile incorporating up to ten metres of transported iron-indurated laterite or cuirasse, overlying pisolitic laterite, above a strongly developed mottled zone. In excess of 50m of saprolitic clays and indurated saprolite overlies the primary basement.

9.2.2 Structure

The gross structure of the concession relies heavily on interpretation of the airborne magnetic data and subsequent pit mapping and observations of mineralised structures. The most obvious primary feature is a series of anastomosing westnorthwest trending structures traversing the northern portion of the tenement block, which are postulated to represent shallow south-dipping thrusts, resulting from continental accretion and early compression during the Eburnean Orogeny.

Although locally difficult to discern due to the low magnetic susceptibility contrast within the Siguiri Basin succession, regionally extensive northeast trending lineaments appear to be frequently linked by east-trending structures, which collectively define a sinistral deformational regime and dissect the terrain into a series of rhomboids. This pattern is possibly mimicked by the Jurassic dolerites within the LEFA area, which may have preferentially invaded these zones of crustal weakness. Numerous arcuate lineaments within the LEFA Corridor and adjacent areas, which are frequently enhanced by drainage patterns, may variously reflect structural ‘rhombs’ within the basement terrain, the distribution and erosion of dolerite sills, or doming due to underlying granitoids.

The neo-Proterozoic dolerite dykes appear to be offset by late faulting with an apparent northwest orientation. Assessment of the local structure relies heavily on mapping within saprolitic exposures in the LEFA Corridor open pits, beneath the ubiquitous and amorphous upper laterite profile. Deformation comprises broad monoclinal folding, with axes trending east-northeast. In most situations, the dip rarely exceeds -45º to the south-southeast. However, this may become substantially more disrupted adjacent to major structures.

Consistent with the regional interpretation, a dominantly sinistral deformational regime is evident on all ‘primary’ structures identified to date within the LEFA Corridor (Karta Fault, Kankarta Fault, and Banko-Fayalala Fault). However, their orientation appears to vary markedly between deposits. ‘Primary’ structures appear to localise and/or offset mineralisation, but may not necessarily be mineralised in their own right. The ‘primary’ structure within the Karta deposit (Karta Fault) is represented by an open breccia and extensive associated fracturing, which appears not to have been significantly annealed by hydrothermal processes. This implies that it was active (possibly reactivated) late in the paragenetic history.

9.3 Local

The understanding of the geology of the Lero-Karta deposit has been derived through information from exploration drilling, grade control, and mapping of exposures within the various pits. Detailed mapping has been limited to areas where mining has occurred as part of the expansion project.

The initial first order structure is approximately a north-south trending structure found in the Karta pit, which is part of a regional north – northwest structure (340º) called the Karta Fault, and consists of brecciated zones which dip steeply (sub-vertical) to the east.

The understanding of the Fayalala deposit geology has relied heavily on mapping of saprolite exposures, within the pit, along with RC and diamond drilling associated with the exploration programmes of the last few years. The footprint of the Fayalala mineral resource extends for 1,400 m in a north-south orientation, and approximately 800 m along a 060° trend, incorporating the Fayalala East domain. Fayalala Far East is interpreted to be another 550 m to the east on the Fayalala Fault structure, a 060° trending quartz-haematite vein structure dipping to the south-east. This is the same structure providing the bulk of mineralisation at the Banko prospect, to the west-south-west of Fayalala.

The Kankarta open pits have exposed a stratigraphic sequence of metre scale tight to isoclinally folded siltstone, sandstone and greywacke rocks of the Proterozoic Birimian sequence. This is overlain by a mottled, transported clay horizon, which includes dolerite boulders and fragments. Bedding (S_o) has a shallow (15^o) to moderate (60^o) undulating dip orientated towards 190^o - 210^o. This is due to the folded nature of the stratigraphy and the proximity to an array of crosscutting brittle-ductile 340^o oriented faults, which are mineralised in the Kankarta East pit.

Geological interpretation of the Banora Prospect has been based around the assumption of a large contiguous quartz vein style mineralisation, with multiple offsets striking approximately 060° and dipping at -70° towards the southeast. The main quartz lode anastomoses, with the largest or widest quartz intercepts interpreted to be dilational zones filled by generally massive non-descript quartz. In these cases, the best grades were found on the hangingwall and footwall of the structure.

The geology at Banko comprises three large-scale west dipping recumbent folds plunging 45° towards 180° of layered tuffaceous metasediments. Gold is hosted within an ENE (080/50°S to 090/45°S), south dipping, crosscutting sinistral shear, which has been intersected by three, west dipping (35°) thrust planes that appear to be on the fold limbs, but are orientated on a 340° trend. The folds pre-existed thrusting, therefore, the fold hinges have been wrapped into the sinistral thrust planes. Where the fold limbs dip to the east, and intersect the ENE shear zone proximal to the thrust planes, is where the gold grade and width of mineralisation is highest.

10 DEPOSIT TYPES

10.1 Lero-Karta

At least four east-northeast (060º) trending, -65º south-southeast dipping mineralised structures are present within the Lero-Karta deposit, the largest of which is Camp de Base structure, with a strike length of 1,100 m. The mineralisation contained within the 060º structures is generally consistent along strike and down dip. However, as these structures approach the Karta Fault, they become less constrained with the mineralisation and more dispersed. With the intersection of the Karta Fault and the 060º structures, an area of dilation was created, and this led to brittle deformation and further brecciation through hydrothermal reactivation.

Higher-grade mineralisation is located along the 060º structures, while lower grades are encountered within the Karta Fault. One hypothesis is that there have been several deformation events which have reactivated the Karta Fault, and the mineralisation occurred during the Eburnean Orogeny. Gold bearing fluids were active along deep seated 340º structures, such as the Karta Fault, before becoming trapped within the 060º structures. During this process, and perhaps through later stages of reactivation, some of the mineralised fluids migrated along the Karta Fault. This is evident in cross section and in plan where there are broad zones of mineralisation (up to 60m), which have higher grade zones, which reflect the 060º structures.

Moderate to high-grade mineralisation is frequently devoid of quartz veining and has relatively high associated sulphide content. There is a strong correlation between the percentage of sulphides present and the tenor of gold. The predominant sulphide species is pyrite, with the gold occurring in the physical fractures of the pyrite matrix. Therefore, the gold is non-refractory and requires no sulphide liberation.

There may be some degree of supergene enrichment, as evidenced in the Lero and Lero South structures, where there are localised depletion fronts, followed by elevated grades in the oxide zone, when compared to the primary zone. Alteration is dominated by a haematite-albite-carbonate assemblage, which appears to be locally overprinted by a potassic event involving K-feldspar and sericite. Carbonate alteration is dominated by ferroan species, including ankerite, ferroan dolomite, and siderite.

Later stage post mineralising and syn-mineralisation dolerite dykes and sills intrude, and stope out mineralisation, with some higher grades encountered on the contacts where remobilised gold has accumulated.

10.2 Fayalala

The geology of Fayalala comprises a succession of intercalated sandstones, siltstones and subordinate poorly sorted conglomerates, possibly of a volcanic origin, deposited into a low energy basin. The sequence has been tightly folded and thrust faulted under a compressional regime into a regional trending strike of 310°, whereby the stratigraphy dips to the south-west. A series of tight asymetrical anticlinal folds occur at regular intervals at the point of maximum compression, which manifest into imbricate flexural thrust faults whereby fracturing and fluid propagation is at a maximum.

The asymetrical anticlines are also a mineralised site due to the amount of fracturing, and thus fluid porosity focused into the often overturned fold noses. Mapping has identified these broad 310º trending zones, with the Bofeko prospect to the south of Fayalala South displaying this orientation as the primary strike of mineralisation, adding further structural complexity to the Fayalala deposit.

The stratigraphic sequence is penetrated by a series of discontinuous north-south (350º to 010º) brittle fracture sets and quartz veining, which provide the bulk of the mineralisation. These north-south structures dip steeply to the east (60º to 85º) in the northern portion of the prospect, and repeat at regular intervals with several structures identified. To the south of the Fayalala Fault, the structure has undergone some rotation about the Fayalala Fault, with the mineralised structure dipping steeply to the west. The structures are independent of stratigraphy. However, they are preferentially developed in the porous sandstone units.

Further to these north-south structures, broad zones of low grade stockwork type mineralisation exist in the sandstone units of sheeted quartz-pyrite-tremolite-albite-chlorite veinlets, and associated penetrative alteration in the haloes surrounding the veins. The sandstones are more susceptible to brittle failure and dilation, have a higher porosity, and constitute a more chemically reactive mineral assemblage.

The alteration assemblage consists primarily of potassic alteration, which has infilled tension cracks in the sandstone to form a 'resille' structure of small scale stockworking, with lesser carbonate and haematite alteration.

The sulphide species is dominated by pyrite (usually 1% to 3%), which is developed along quartz vein margins and fractures, or as euhedral grains finely disseminated within alteration selvedges into the sandstone units. Gold is distributed into physical fractures in the pyrite matrix and is non-refractory. There is a direct correlation between pyrite percentage and gold grade.

The southern portions of the Fayalala deposit are under-plated by a thick post-mineralising Mesozoic dolerite sill, limiting the extent of mineralisation to approximately 130 m vertical depth.

10.3 Kankarta

Structural mapping has identified an array of narrow (0.5 – 2 m) brittle-ductile faults, which portray a strain ellipse model associated with a sinistral wrench/strike-slip system. Gold is hosted within three structures:

- Firstly, two stacked en echelon primary shears within a 5 – 10 metre wide primary shear, orientated northeast – southwest (050^{o}) and dipping 80^{o} - 85^{o} to the southeast; and,
- Secondly, within the reidel (R1) shear set, which has a north-northeast orientation, and dips 75^{o} to 85^{o} to the west.

At the intersection of sandstone horizons with the primary and reidel shears, the gold grades are higher and mineralisation is wider. This also coincides with the anticlinal fold hinge formed during S1 deformation, which is subparallel to bedding.

10.4 Firifirini

Firifirini (formerly known as Siguirini) mineralisation is contained within calcareous Birimian sediments, which have been contact metamorphosed by Birimian intrusive rocks mainly of monzodioritic to monzonitic composition, producing skarn type mineralisation. Typical calc-silicate skarn minerals, such as epidote, diopside and grossular garnet, are evident along the contacts with magnetite, blebby pyrite mineralisation and high gold grades. Lower grade gold is distributed throughout the calcareous sediments, contact metamorphically altered to skarn rock type.

The spatial distribution of gold can, therefore, be quite erratic with the sediments normal faulted, and strongly folded as they became in close contact with the intruding felsic rocks. In the fresh rock portion, strong magnetite alteration is disseminated throughout all the intrusive rocks, but is most pronounced where a K-feldspar rich intrusion exists.

10.5 Toume Toume

The understanding of the Toume Toume deposit (formerly known as Boubere) has developed due to the identification of the nearby Firifirini deposit, being a contact mineralised skarn style of mineralisation. From Reverse Circulation (RC) fragments and diamond drilling, the mineralised style at Toume Toume is identical to Firifirini, whereby Birimian intrusive rocks mainly of monzodioritic to monzonitic composition has contact metamorphosed calcareous Birimian sediments. These sediments consist of limestones, sandstones and siltstones, to produce skarn rock types with associated alteration minerals, such as magnetite, epidote, diopside, grossular garnet and blebby pyrite, with gold mineralisation. Disseminated magnetite is present in the earlier intrusions pseudomorphing ferromagnesian minerals.

10.6 Banora

The best mineralised intercepts are those associated with strongly developed laminations during multi-staging of the quartz vein emplacement. These are associated with concentrations of arsenopyrite and minor amounts of pyrite sulphide alteration within the fresh rock portions. In the weathered saprolitic zones, the mineralisation is dominated by strong yellow-brown goethitic clays. On the surface, there is only limited supergene enrichment of the laterite cap where it exists, oxidised gossan with visible gold has also been identified along the surface expression of the mineralisation.

10.7 Banko

The gold bearing ENE shear zone is brittle - ductile showing mylonitic and breccia fabrics. Gold grade and mineralisation widths range from 2 – 20 g/t and 1 – 10 m, respectively. On the footwall contact, a metre wide hematite-rich marker horizon has developed, which crosscuts an underlying 3-4 metre wide dolerite intrusive. The ore zone is predominantly a quartz vein with albite staining and hematite stringers. No resille has been recorded to date. Crosscutting the ore zone is late stage, steep, narrow (10-20 centimetres) sheeted quartz veins. These veins are anomalous in gold grade and coincide with the hinge zones of the recumbent folds (000 – 040/80° WNW and SSE).

11 MINERALISATION

Gold within the LEFA Gold Mine is mainly associated with mesothermal fractured and vein style mineralisation, entirely consistent with the majority of Archaean and Proterozoic terrains worldwide, including the Birimian Series of West Africa. This style of mineralisation is generally associated with regionally metamorphosed terrains that have experienced considerable deformation. As such, the deposits are invariably strongly structurally, rather than lithologically controlled. However, the dominance of structural control invariably increases in a manner commensurate with the metamorphic grade. Mineralisation within the LEFA Gold Mine is subtly different to the majority of other gold camps in West Africa in terms of the following:

- The diverse structural orientations within and between proximal deposits;
- The diverse mineralised zone orientations within and between proximal deposits; and,
- Many of the structural aspects are considered atypical of Proterozoic (including the Birimian) and Archaean gold camps, where deposits are usually developed along a preferred structural orientation, or can at least be attributed to subsidiary structures, or an interference pattern developed about a major controlling feature.

Potassic and sodic alteration assemblages are variously evident. Where both assemblages are present within the same deposit, they have been observed to overprint each other. However, the paragenetic relationship may be reversed in adjacent deposits. Similarly, considerable diversity is evident in the carbonate species, with both ferroan and non-ferroan varieties occurring within proximal deposits. These observations potentially imply a variation in fluid source and chemistry which, given the homogeneous nature of the sedimentary succession and the presence of albite-haematite alteration in several deposits, invokes a potential magmatic input into the hydrothermal process. While the basic genetic model for gold mineralisation is well understood, considerable additional work is required to understand the paragenesis within any given mineralised zone, and to determine possible structural or magmatic relationships between the various deposits.

At the macro scale, mineralisation is preferentially developed in the more permeable, altered, coarser grained sediments, within and/or adjacent to east-northeast oriented structures, and more consistently north to north-northwest trending vein/fracture zones. Mineralisation is localised by a combination of lithological and structural controls and, while the latter is predictably the more dominant, lithology appears to play a greater role, particularly at Fayalala in the 310º orientation. The dip and strike of mineralised zones, and to a lesser extent the style of mineralisation, varies considerably between deposits. Gold mineralisation is dominantly associated with stockwork and sheeted quartz–carbonate–sulphide veining, stockworks of albite-carbonate-sulphide veinlets, sulphidic haematitic fracture zones or skarn magnetite-epidote-pyrite mineralisation.

Pyrite is the dominant sulphide species, present as discreet poikilitic euhedra, ranging from a fraction to a few millimetres in size, largely confined to vein margins, or disseminated within alteration selvedges. Traces of other sulphides, principally chalcopyrite, galena, pyrrhotite, arsenopyrite, bornite, tennantite, linneite and mackinauwite are present as veins, fracture fillings and localised disseminations adjacent to veins, with the latter minerals explaining the weak antimony, cobalt and tungsten geochemical signature associated with mineralisation.

Gold is largely developed within fractures in pyrite grains, rarely larger than 50 microns, and is non-refractory. Extensive weathering and lateritisation of the mineralisation and surrounding host rocks has resulted in the development of mineralised laterite and saprolite gold deposits. Both transported and residual laterites, up to 15 m thick, host gold mineralisation, which typically averages gold grades of 0.5 to 2.0 g/t, over extensive lateral areas. Saprolite mineralisation tends to be of higher gold grade (1.5 to 5.0 g/t), but is generally developed over more restricted zones 2 to 30 m wide.

The base of oxidation commonly extends to over 100 m depth, more locally depressed within zones of fracturing and brecciation. Oxidation is evident along the Karta Fault at depths exceeding 200 m. However, there is a possibility this is due to deuteric hydrothermal alteration. Supergene enrichment is evident at Lero-Karta with the Lero and Lero South deposits displaying increased gold grades within the saprolite portion. However, most other mineral deposits appear to have remained unaltered by supergene movement of gold within the regolith.

Recent discoveries of the Firifirini and Toume Toume deposits have resulted in the identification of a significant new style of mineralisation not related to the other LEFA Corridor mineral deposits. Both these deposits represent contact metamorphism retrograde skarn styles of mineralisation, characterised by a felsic suite intruding calcareous sediments.

12 EXPLORATION

Data collection procedures for exploration at the LEFA Gold Mine are well documented, and carried out under the management of SMD expatriate geologists. The majority of data pertaining in the technical reports has been collected from 1998 onwards, and various comparisons of the more recent and historic data indicate no material issues. In addition, the majority of the historic data was collected in regions now depleted by subsequent mining activity.

All survey data is based on a local grid and datum, which is tied to Zone 29 of the Universal Transverse Mercator (UTM) grid, via the WGS 84 spheroid, using high precision differential GPS equipment. The broad terrain model within the LEFA corridor is based on an orthophoto interpretation, completed by recognised industry consultants in 1999.

Subsequent electronic distance measuring (EDM) surveys, associated with resource and mining areas, are generally consistent with ortho-photo contours. Where new EDM surveys, or individual pick-ups are completed, any minor inconsistencies in the orthophoto contours are reconciled back to the EDM results, providing a progressive improvement in the terrain model. Detailed EDM surveys have been completed in all resource and mining areas. These are updated on a daily, or weekly, basis within open pits to facilitate mine planning.

12.1 Collar Surveys

The X, Y and Z coordinates of all RC and diamond drill collars are determined by SMD's survey team, using EDM equipment, within days of the holes being completed. The data is then incorporated into the exploration survey database.

12.2 Downhole Surveys

Downhole surveys are undertaken by the drilling contractor under the supervision of SMD personnel, prior to the completion of each hole. Downhole surveys largely rely on Reflex single-shot digital cameras. In the case of RC holes, surveys are undertaken at nominal 30 to 50 m intervals, inside a 6 m stainless steel starter drill rod. A single shot camera is used to derive dip and azimuth readings as drilling proceeds. Each survey result is checked onsite before being entered into the survey file, and re-surveyed if a discrepancy between the planned and determined orientation is evident.

Holes typically deviate less than 5º in dip, but can move considerably in azimuth over a hole length of up to 500 m. The azimuth and dip can be readily determined through the bottom of the bit within diamond core holes. This information is also determined at nominal 30 to 50 m intervals downhole, and recorded in the database in a similar fashion.

Once the set-up orientation of the rigs is defined more accurately, the spatial distribution of data is well-controlled by anticipating the change in movement down the hole in areas where geological conditions dictate.

13 DRILLING

The supervision of all procedures and training of personnel involved with drilling, sampling, and logging routines, is undertaken by experienced expatriate personnel. However, direct responsibility for the onsite drilling operations lies with senior Guinean national geologists, who remain with their assigned rig at all times.

The majority of data pertaining to this report have been collected from 1998 onwards, and various comparisons of the more recent and historic data indicate no material issues. In addition, the majority of the historic data was collected in regions now depleted by subsequent mining activity.

13.1 Rotary Air Blast (RAB) and Air Core (AC) Drilling

First pass regional and LEFA Corridor reconnaissance drilling along with sterilisation (condemnation) drilling has been conducted under contract by West African Drilling Services (WADS) using truck-mounted KL150 RAB/AC rigs with onboard 250psi/650cfm compressor capacity. Drilling was undertaken on a 12 hour single day shift basis, under the supervision of expatriate drillers, and executed by Guinean national personnel. Drilling was conducted using 3” rods with 4” tungsten impregnated drill bits. Single or dual tube rods are applied in RAB and AC drilling respectively.

Samples are collected at 1 m intervals downhole via a cyclone mounted to the side of the rig, and sampled as 2 m composites. Holes are inclined at -50º, and are drilled to blade bit refusal (typically the top of fresh bedrock) on a nominal 200 x 50 m pattern. All holes are logged and sampled by trained national SMD geologists and field technicians, under the supervision of experienced expatriate geologists. The data collected via RAB drilling is used for geological interpretation, but is otherwise excluded from resource estimation.

13.2 Reverse Circulation (RC) Drilling

Over 80% of the existing mineral resources and mineral reserves has been defined utilising the practices adopted under the so called Large Exploration Program (LEP) strategy, and subsequent feasibility program which commenced in 2003. All future mineral resources will be defined under this regime.

RC and diamond drilling has been completed under a long-term contract to Oresearch Drilling Guinea Sarl (OSD), utilising two KWL880H drillrigs, both of which have universal (RC and diamond drilling) capacity. Prior to 2005, all mineral resource drilling was completed by WADS, with machines of similar capacity to OSD.

For the purposes of RC drilling, these rigs are equipped with a standard air capacity of 350psi and 900cfm, complemented by an auxiliary booster providing 750psi. RC drilling is undertaken on two 12-hour shifts. All rigs are operated by expatriate drillers, while the remaining crew comprises experienced Ghanaian and Guinean national personnel. RC drilling was completed using a 4.5” diameter rod string, fitted with a 5.25” diameter face-sampling hammer, to maximise sample volume and limit the potential for contamination.

One-metre samples are collected via a cyclone passing through a 12.5% rotating splitter, before collection into plastic bags. The cyclone is manually cleaned at the completion of each six-metre rod, and more thoroughly cleaned at the completion of each hole. RC holes are historically inclined at -50º, but more recently at -60º, and are initially drilled on a nominal 100 x 50 m grid, typically to a depth of 80 to 100 m, for exploration purposes. The drill spacing is progressively reduced to 50 x 25 m, and then to 25 x 25 m, to depths of up to 180 m downhole (150 m vertical), for resource definition purposes.

13.3 Diamond Drilling

Diamond core drilling is undertaken using the two KWL880H drillrigs. However, the oxidised portion of the hole is pre-collared with RC drilling, adopting the precise procedure as for RC drilling. An HQ3 (63.5 mm diameter, triple tube) core size is routinely adopted. Nonetheless, an NQ2 (47.6 mm diameter) drill string is available for deeper drilling, where more competent rock is encountered and high amounts of torque is experienced on the drill rods.

Diamond drilling is undertaken on two 12-hour shifts. Diamond holes are inclined at -50º to -60º, and are typically RC pre-collared to a point below the base of oxidation, to ensure maximum recovery and sample quality within the oxide profile. The drillhole spacing is variable depending on the level of detail desired within the deposit, and the mineral resource category required. The depth is also variable (80 to 500 m downhole), and holes are designed to maximise geological and/or geotechnical/metallurgical information for a particular deposit. Current practice is to allow RC drilling until water is unable to be held back, and then drilling is changed to HQ3 diamond coring to complete the hole.

A crayon core orientation spear is applied at the completion of every second drilling run, to enable the determination of structural orientations at a later date. At the completion of each drilling run, the core is removed from the barrel, placed in galvanised steel trays that are clearly labelled with the hole number, tray number, and interval. A driller's block is annotated with the depth and placed at the end of each run. The core trays are carefully stacked and transported to a dedicated core yard, adjacent to the old mine office for processing.

13.4 Drilling Quality

Current drilling practises include drilling of diamond core, only when wet drill conditions are encountered in the RC pre-collar portion of the hole. Notwithstanding uncertainties associated with the integrity of some wet RC drilling intervals in the 2002 program, all other RC and diamond drilling data applied in resource estimation is generally considered to be of a high quality, broadly consistent with international industry standards.

The general quality of RC drilling has progressively improved over time, particularly since more experienced and well-equipped contractors have become available in Guinea. Drilling practices are also benefiting from closer and more experienced exploration management, complimented by the appointment of independent auditors that routinely inspect the project to review the exploration procedures. The quality of diamond drilling is considered to be excellent.

All drill holes are planned to intersect the different mineralised structures at right angles but in some situations this is not possible. With ongoing mining, mapping, reconciliation and modelling, a stronger understanding of the nature and orientation of the mineralisation structures develops. Complicated and differing directions of the mineralised structures have meant that some holes have not been drilled with the most optimum dip or azimuth.

The orientation and dip of the mineralised structures is then modelled in 3 dimensions for future drill hole planning. Historic drilling is incorporated into the planning to optimise the drillhole orientation. Where a significant discrepancy exists between the mineralised structures and the orientation of the drilling, these holes are removed from the database for modelling and estimation purposes.

Samples are collected every metre. In RAB/AC sampling, 2 m composites are collected. For RC sampling, a sample is taken every metre. Diamond core sampling is more detailed, and is niche sampled, with the core marked up by the geologist logging the hole. The sample intervals may represent geological features of less than 1 m, or by default sampled at 1 m intervals.

13.5 RAB and RC Drillhole Logging

Once homogenised to some degree by splitting, a representative sample is collected from each one-metre RAB/RC drill sample, and wet screened to provide chips for logging by a Guinean national geologist. Representative one-metre washed chips from each RC drill sample are stored in partitioned and consecutively numbered hard plastic chip trays, which are stored to provide a permanent record of the geology of the hole for later reference.

Logging is recorded directly into either Excel or Field Marshal software, on hand-held field data-loggers, or logged onto paper, recording:

- Hole number;
- Interval (depth);
- Sample number;
- Lithology;
- Colour;
- Fabric style and intensity;
- Alteration mineralogy style and intensity;
- Quartz veining (or fracturing);
- Sulphide mineralisation, if present;
- Oxidation state; and,

- Drilling conditions.

The data-loggers are directly down-loaded or transferred into an Excel database by data clerks at a later date, and validated by the database manager, before being accepted into the master database, to await analytical results.

13.6 Diamond Core Logging

On arrival at the core yard, the diamond hole number is recorded and the trays laid out on the ground in consecutive order. The core is then placed in consecutive order on steel racks of suitable height, before being measured to determine the percentage recovery, and marked up into metre intervals. The core structure orientations are then recorded.

Rock quality designation (RQD) is undertaken to record the number and nature of natural breaks in the core (by metre interval), for subsequent geotechnical assessment. Geological logging of diamond drillholes is completed in a similar manner to RAB and RC drillholes, but to a greater degree of detail. The additional detail includes the description of specific structures and alteration styles, along with their width, intensity and associated mineral assemblage. Once logged, the individual trays are then photographed using a digital camera, and the images stored in a master database.

13.7 Logging Quality

All geological logging was conducted within suitable industry standards, based on systems set up similar to those used regularly in other gold producing countries.

14 SAMPLING METHOD AND APPROACH

14.1 RAB and AC Sampling

The one-metre RAB and AC field samples are collected off the cyclone and laid out on the ground in consecutive rows of 10 samples. Field technicians pour the entire field sample through a 3 tier Jones riffle splitter, collecting a representative 2 m sample, providing approximately 2 to 3 kg for laboratory submission. Pre-numbered sample ticket books are used to manually record the hole number and sample interval, and the sample number is written on the plastic sample bag, and the ticket stapled to the inside of the bag prior to tying with string.

In the situation where field samples become moist and spear sampling is not practical, manual scoop sampling is adopted. Approximately 1 in 50 samples are duplicated in the field via the collection of a second 2 to 3 kg composite sample, in order to monitor potential field sampling bias. Quality Assurance/Quality Control standard samples are also added and recorded for internal standards of the contract laboratory performance.

14.2 RC Sampling

The one-metre RC field samples are collected into plastic sampling bags, after passing through a rotating cone splitter clearly labelled with the sample number in indelible marking pen. The field residues of nominal 20 to 40 kg weight are laid out on the ground in rows of 10 samples.

The assay sample is collected into a labelled plastic bag with the pre-numbered sample ticket stapled inside. The bag is securely tied and segregated into larger plastic bags (by hole number), in preparation for delivery to the laboratory at the end of each shift. Approximately 3% (1:50) of samples are duplicated in the field via the collection of a second 3 kg split.

The cone splitter can collect two equal samples at the same time, which necessitates the need for re-handling the sample material. The cone splitter is cleaned thoroughly with a compressed air gun between each sample run during the dry season. However, in the wet season, the higher compressed air humidity tends to exacerbate potential splitter contamination problems, and alternative manual cleaning methods are adopted.

14.3 Diamond Core Sampling

Once all technical data has been derived from the core, individual billets are then halved lengthwise using a diamond saw, to consistently cut along the orientation line, before being correctly placed back into the tray. The half-core is then niche sampled by geological interest, or by metre interval, ensuring that the same side is consistently sampled, and placed into plastic bags labelled with the assigned sample number. The resulting samples are then submitted (by hole) to the laboratory for analysis. The residual half core is catalogued, and stored, in dedicated side-loading racks in the core yard for reference purposes. The trays are consecutively racked and clearly relabelled with the hole number, tray number, and interval.

14.4 Sample Recovery

Based on 4'' (101.6 mm) diameter RC drillholes, and the established average weighted bulk density, the notional volume recovery of dry samples should approximate 14 kg/m in saprolite, and 21 kg/m in the primary zone. Previously approximate sample volumes were routinely recorded in a graduated bucket, and weighed on bathroom scales, indicating that acceptable relative recoveries of approximately 70 to 80% were being achieved.

Diamond core recoveries are routinely recorded as part of the standard geological logging practice. The vast majority of diamond core is very competent and recoveries of 100% are regularly achieved, rarely falling below 90%, except in highly fractured zones. Minor core loss tends to occur due to washing and/or grinding at the commencement and completion of drilling runs, particularly within the partially oxidised portion of the profile, or within friable shear zones.

Given that the gold mineralization is developed on fracture surfaces, and locally disseminated within the rock adjacent to the fractures, some potential exists for preferential loss of gold, and hence under-estimation of grades. However, given the consistently high core recoveries, the opportunity for under-reporting grades is considered minimal.

14.5 Sample Quality

The sampling procedures adopted for all exploration activities are generally considered to be representative and unbiased. Samples afforded by diamond coring, within the primary zone, are of excellent quality, and the acceptable indicative recoveries generated by RC drilling provides confidence. Field duplicate RC samples are routinely collected to provide an indication of the potential field sampling error (or bias) once the laboratory error, determined from analysis of pulp duplicates, has been subtracted. On a 3 month rolling average RC field duplicates have a precision of +/- 10%, well within industry standards. No regional wide bias is evident in the field duplicate samples.

15 SAMPLE PREPARATION, ANALYSES AND SECURITY

15.1 Sample Security

The RC samples are prepared and collected from the drill rig. Then, they are delivered to the onsite core yard facility, or directly to the SGS pulp preparation laboratory, located near the old mine office, on a daily basis. Since November 2008, the samples have been taken directly to the new SGS Laboratory, adjacent to the ore processing plant. Similarly, the diamond core is transferred to the core yard for processing and sampling prior to submission. The entire procedure is undertaken by Guinean national geologists and field technicians, and is closely supervised by expatriate geological personnel.

Prior to early 2004, RSG Global was acting as independent advisor and auditor to the LEFA site, involving a quarterly assessment of all exploration results and quality control data, and a six-monthly site visit. Each site visit incorporated an audit of the now removed onsite laboratory (Transworld), and close scrutiny of drilling and sampling procedures. While numerous changes were recommended to the drilling, sampling and analytical protocols in order to optimise the quality and effectiveness of the program, at no time did RSG Global identify any instances of potential sample tampering or deliberately misleading practices.

Reference material for all samples is appropriately retained and stored, including chip trays derived from RC drilling, half-core and photographs generated by diamond drilling, and duplicate pulps and residues of all submitted samples. Assessment of the data indicates that the assay results are generally consistent with the logged alteration and mineralisation, and are entirely consistent with the historical and anticipated tenor of mineralisation.

15.2 Analytical Laboratories

Six different known laboratories have been utilised during the various phases of exploration. They include the Lero mine laboratory, Inchcape Testing Services (ITS) in Mandiana (Guinea), the SGS laboratory located at Siguiri (Guinea), and the SGS Lero onsite laboratory, constructed and commissioned in 2008. In addition, the previously site-based exploration laboratory managed under contract by Transworld Laboratory Services (Transworld) was terminated in 2004. Both, the ITS and SGS laboratories, are internationally certified by National Association of Testing Authorities (NATA), and under ISO 9000, while the Lero mine laboratory and Transworld are not.

In summary, the assay data can be subdivided as follows:

- Historic data collected by Bureau de Récherches Géologiques et Minières (BRGM) prior to 1998, and assayed by fire assay methodologies. Little detail or quality control data is available for this data, which is generally confined to the mined portions of the Lero-Karta and Fayalala mineral deposits;
- SMD exploration samples sent to the ITS laboratory for sample preparation and analysis between 1998 and mid-1999;

- SMD exploration samples processed through the SGS facility at Siguiri between mid-1999 and October 2000;

- SMD exploration samples submitted to the SMD mine Leachwell, and subsequently Pulverise and Leach (PAL) facility, during the approximate period from October 2000 to September 2001. Samples returning gold solution readings above 0.3 g/t were then forwarded to the ITS or SGS laboratories for re-assay;

- SMD exploration samples processed exclusively at the SGS facility at Siguiri between September 2001 and September 2002;

- The LEP exploration samples analysed under contract by Transworld at the separate exploration laboratory at the Lero mine site from September 2002 to July 2004. Excess samples and a program of re-assay were also completed at the Transworld Tarkwa facility in Ghana;

- The SGS facility at Siguiri was used from January 2004 to enable a reduction in the back log of assays, which had accumulated as a result of accelerated drilling programs. SGS were used as the principal laboratory from late July 2004 to October 2006;

- Since 2006, the pulps have been prepared at the old Transworld Laboratory, now managed by SGS, while the new SGS laboratory near the new CIL plant was being constructed. The pulps were then sent to the SGS laboratory in Siguiri or Kayes (Mali) for fire assay and aqua regia analysis; and,

- Since November 2008, all samples have been prepared and assayed at SGS's new laboratory facility on site in Lero, adjacent to the CIL plant and offices.

The majority of samples generated by BRGM and analysed prior to 1998 were derived from regions now depleted by mining. The data subsequently generated by the internationally accredited laboratories, SGS and ITS, are well documented, and analytical flow sheets are available. The analytical data generated by the SMD Lero mine facility is generally restricted to the lower grade portions of drillholes (gold grade < 0.3 g/t), with campaigns of check and umpire assaying completed by SGS to ensure quality.

15.3 Sample Preparation and Analytical Procedures

At the time of the preparation of this report, all aspects of the sample preparation had been conducted by SMD.

15.3.1 SGS

All exploration drilling samples were exclusively assayed at the SGS laboratories at either Lero, or Siguiri, in Guinea or in Kayes (Mali). From mid-1999 through to October 2000, all drilling samples were assayed at the ITS laboratory in Mandiana. After this period and through to September 2001, only campaign processing of samples for re-assay were undertaken at SGS, following initial assay screening at the Lero mine laboratory.

The SGS facility was again adopted exclusively for analysis of exploration samples between September 2001, and the commissioning of the Transworld onsite laboratory in September 2002. SGS also undertook significant assaying in 2004, including all assaying post July 2004.

The SGS sample preparation and analytical approach is summarised as follows:

- 2 to 3 kg field splits are oven dried at 105℃;
- Crushed in a hammer mill to a nominal 1 to 2 mm;
- 1 kg sub-sample collected via a riffle splitter; and,
- The 1 kg sub-sample pulverised in a homogenizing mill (LM2) to 90% -75μ. The oxide and primary pulps are then assayed via 50 g Aqua Regia or 50 g Fire Assay, respectively.

The 50 g Aqua Regia analytical procedures applied to the oxide pulps is summarised as follows:

- 50 g pulp fraction is weighed;
- Subjected to acid attack (aqua regia) to complete digestion;
- A 40 ml aliquot is taken and extracted into 5 ml DIBK;
- The resulting solutions (organic layer - DIBK) are then read on an AAS, with a stated detection limit of 10 ppb gold; and,
- Iron interference is dealt with by complexing into the aqueous phase, or by use of a background correction lamp on the AAS.

The 50 g Fire Assay analytical procedure applied to the transitional/primary pulps is summarised as follows:

- 50 g portion of pulverized sample is weighed;
- Sample fused in a fusion furnace to produce a lead button;
- Lead button is cupelled in a cupellation furnace;
- Resulting prill is subjected to acid dissolution; and,
- The resulting solutions are then read on an AAS, with a stated detection limit of 10 ppb gold.

15.3.2 SMD Lero Mine Laboratory

The SMD Lero mine laboratory was exclusively used for grade control analyses before SGS set up its preliminary laboratory at the old Transworld site, while awaiting the construction of the new laboratory at Fayalala. However, the majority of exploration samples were initially assayed at this facility between October 2000 and September 2001.

The analytical method involves a Leachwell tumbled cyanide leach without a residue assay. Duplicate pulps of oxide and primary samples, reporting a gold solution reading in excess of 0.3 g/t, were forwarded to the SGS laboratory facility at Siguiri, in Guinea, for re-assay via aqua-regia-AAS and fire assay methods, respectively.

15.3.3 Transworld

The Transworld-managed laboratory on site at Lero was dedicated to preparing and analysing samples, generated by exploration, and mineral resource definition drilling associated with the LEP and feasibility programs, since commencement in September 2002, up until late July 2004. Samples were submitted by hole, along with a submission sheet detailing the sample numbers. All samples generated from RC and diamond drilling (resource drilling) were exclusively prepared at the Transworld managed facility at Lero.

The majority of pulps were also analysed at this facility, with any excess being dispatched to the firm's primary assay laboratory at Tarkwa, in Ghana. All analyses were undertaken via the fire assay technique.

The sample preparation and analytical procedures for both, oxide and primary samples, adopted by Transworld at both, the Lero and Tarkwa laboratories, are summarised as follows:

- Numbered sample bags verified against the submission sheet and assigned a laboratory batch and sample number;
- Samples emptied into appropriately labelled aluminium trays and placed on trolleys in a gas-fired laboratory oven for drying overnight;
- RC samples submitted directly for pulverising;
- Diamond core first reduced to a nominal size of -4 mm via a jaw crusher;
- Entire sample (RC and diamond) pulverised in a Labtechnics LM2 ring mill to a nominal grind size of 80% passing 75μ;
- Softer (clayey) oxide RC samples pulverised for a standard 2 minutes;
- Harder lateritic oxide material prepared for a standard 4 minutes;
- Extreme care taken to avoid over-preparation of softer oxide samples that may potentially result in the creation of a coarse gold problem, where none previously existed;

- Harder primary RC and core samples prepared for standard periods of 4 minutes and 5 minutes, respectively;
- Dedicated oxide and primary pulverising stations utilised to facilitate this procedure;
- Pulverised samples coned and quartered to produce duplicate 200 g fractions, and placed in appropriately labelled cardboard Kraft packets; and,
- All pulps fire assayed in the conventional manner, prior to aqua regia digestion of the prill and gold determination via AAS.

15.3.4 ITS Mandiana

Prior to the closure of the ITS laboratory facility at Mandiana, in Guinea, all exploration samples from the RC and RAB drilling programs (as well as all soil samples) were submitted to ITS, for gold only analysis by aqua regia digest and DIBK extraction, between 1998 and mid-1999.

15.3.5 Adequacy of Procedures

Procedures associated with data generated by BRGM prior to 1998 cannot be assessed, as the relevant information is not available. Regardless, the vast majority of this data is encapsulated within mineral resources and mineral reserves that have already been mined, and the material impact of this apparent deficiency is therefore extremely limited.

Analyses derived via the cyanide leach process at the Lero mine laboratory cannot be relied on to any great extent, as residue assays were rarely undertaken, potentially resulting in a marginal level of conservatism in the results. The impact of this is similarly considered to be minor, as any sample pulps reporting gold solution readings > 0.3 g/t were re-assayed at the SGS facility at Siguiri.

Consistent negative bias was identified in the early LEP analytical data generated by Transworld at the Lero site laboratory. However, this problem was identified and rectified, including the re-assaying of mineralised pulps generated during this period. Since July 2004, samples have only been sent to either internationally accredited laboratories or verified by extensive umpire assaying, and are generally considered to be satisfactory and compatible with internationally accepted industry standards.

15.4 Quality Control Procedures

Current quality control procedures include the submission of internationally recognised standards, umpire assaying at two internationally recognised laboratories in Mali (SGS Kayes) and Burkina Faso (SGS Ouagadougou), duplicate and replicate sample analyses and the submission of RC field duplicate samples at a rate of 1:50, with the latter providing a comparison of the total sampling and analytical error. The assay quality control procedures applying to the various laboratories is summarised below.

15.4.1 SGS Siguiri July 2004 onwards-

All mineralised sample analysis during 2008 were sampled through SGS with the pulps prepared on site at Lero before being dispatched to Siguiri (Guinea), Tarkwa (Ghana) or

Kayes (Mali) facilities. These assays were applied to all resource updates completed for year end reporting 2008. The following procedures are consistent at each laboratory;

- A minimum of 5% (1:50) of the submitted samples in each batch, are duplicated in the field; and,

- Industry recognised solid standards (Rocklabs) are disguised and inserted at a rate of 1:50.

15.4.2 Review and Assessment of Quality Control Data

The assay quality control data, as they pertain to resource estimates completed on the basis of data available to 31 March 2009, have been subdivided into SGS Siguiri data, SGS Kayes data and SGS Tarwka data where samples were delivered during 2008. Rocklabs standards and blanks were sent to each laboratory, with each end of month report and dataset undergoing rigorous examination to identify any potential errors.

15.4.3 SGS Siguiri

The majority of exploration samples generated between 1st January 2008 and March 2009 were assayed at the SGS laboratory in Siguiri with the SGS Lero laboratory being commissioned in November 2008. A review of the standard assay results reveals no apparent bias. In addition, analyses of blanks were available to test for possible contamination. The blank assaying returned acceptable results, with little contamination noted. The total blank assay dataset displays similar characteristics, with the majority of data lying at or within twice the detection limit of 0.005g/t Au. RSG Global has assessed the analytical and total assay precision of the data generated by SGS on number occasions during various resource estimation studies undertaken between 1999 and 2003. From 2005-2008 this same process was conducted by the employees of SMD. In general, the analytical and total assay error noted for the SGS data is consistent with that generated by other laboratories with little variation noted between individual deposits.

15.4.4 Data Quality Summary

Detailed quality control assessment of the analytical data generated by all laboratories has not identified any material bias. The analytical precision for both assay repeat (laboratory replicates) and field duplicate data is acceptable, albeit marginally within the expected industry limits for gold deposits of this type for earlier exploration programmes. The RC field duplicates collected during 1999 and 2000 show lower levels of precision than would normally be expected, indicating a significant sampling error, however more rigorous recent sampling practices have improved precision to acceptable levels. The quality of the analytical data applied in resource estimation is generally considered consistent with industry standards.

A review of the Rocklab standards revealed no significant bias, with results generally consistent with a +/-10% accuracy expectation. Anomalies were consistently identified which appear to reflect incorrect labelling of the standard and hence indicate that supervision of this aspect of the sample submission was inadequate.

16 DATA VERIFICATION

A complete review of exploration data management procedures by Kenor, in 2001, culminated in the appointment of specialised consultants Maxwell Geoservices (Maxwells), to reconstruct a new database from first principles. The database generation incorporated all available information, including various digital data files, original laboratory data files, and assay certificates, and in the absence of this information, written assay logs. The database was compiled and validated by Maxwells using the Datashed database software. Datashed has been used continually, with personnel from Maxwells coming to site periodically (approximately once every year or two), to check and validate the database, install updates, and to provide training to on site users.

Messrs. Hepworth and Urbaez did not extensively verify the quality or interpretation of the source data as this data of geological nature was beyond the core expertise of either author. Therefore, Messrs. Hepworth and Urbaez relied upon the expert opinion of Mr Rohan Williams, SMD's Chief Geologist, for the verification of the quality of this data, considering his extensive experience in this field.

16.1 Source Data

The following source data has been utilised, or prepared, for the 2009 mineral resource estimates:

- Drillhole database, containing collar start point location, downhole survey, assay and geology;
- Regolith interpretation;
- Interpretation of the mineralisation domains;
- Pit mapping and documentation;
- QA/QC database;
- Density database;
- Final pit pickups as at 31 August 2009; and,
- Grade control database.

H&S relied upon the quality of this data before mineral resource estimation procedures commenced, and did not verify it in any way. All source data was collected and monitored by Mr Rohan Williams, SMD's Chief Geologist.

H&S considered the source data robust in that the collection of samples, logging, storage, database verification, and interpretation of mineralised structures and regolith horizons, was performed under the supervision of expatriate SMD geologists experienced in these tasks.

16.2 Drillhole Database

From the global SQL database, a series of MS Access format database, by deposit, was created, with each loaded into the Surpac software, and reviewed in detail as part of the mineral resource estimation process.

The database investigation undertaken by SMD geologists included:

- Review for completeness (hole exists in assay, collar, survey and geology files);
- Check for duplicated sample numbers;
- Check for duplicated collar coordinates;
- Check of azimuth and dip ranges;
- Review of assay results for consistency of recording, and flagging detection limit and unit, such as ppm results in ppb field;
- Compile and check missing intervals;
- Review high-grade assay intervals;
- Compile a list of geology codes for comparison with the geological legend;
- 3D co-ordinate generation and review;
- Incorrect collar survey data;
- Incorrect and incomplete downhole survey data;
- Errors in the assay fields, including transposition of fields, incorrect assignment of detection limit of ppb into ppm fields, and the reverse;
- Typographical errors;
- Errors in derived fields, such as average gold grade, where negative values had been determined; and,
- Inconsistencies in the geological coding due to multiple phases of exploration, and variations in geology codes and logging personnel. This data is predominantly confined to areas that have already been mined, and are therefore of little material importance.

In addition to drilling, where available, grade control data was used to aid the geological and mineralisation interpretation. Grade control data was derived via a combination of hand dug trenching, AC and RC drilling. However, the grade control data was excluded from the final mineral resource estimate.

16.2.1 Drilling Method

In general, there was no evidence of systematic bias associated with a particular drill method over another, which was consistent with completed visual reviews that indicated an acceptable level of consistency between data sets. Statistically, the diamond drilling often returned the highest average gold grade intervals, although this drilling was generally selectively targeted to intersect the mineralised structures. Furthermore, twin drilling was completed and assessed. Based on the available data, SMD elected to combine the data sets for the purpose of gold grade estimation, and believed combining the assay data for gold grade estimation represented a low risk.

16.2.2 Analysis of Wet RC/AC Drilling

The moisture content of AC and RC drill samples is estimated during the logging of the samples using the following classification: dry (D), moist (M), wet (W) and saturated (S).

The potential exists for significant data quality issues derived on the basis of wet percussion drilling and, as such, a review of the data was completed on a deposit-by deposit basis. The following is a summary of the analysis of wet and dry drilling:

- Lero-Karta - The majority of the drilling is RC, and where AC drilling falls within the mineralised domains, the composites were removed prior to the mineral resource estimation. Although the wet/saturated samples have a higher mean grade than the dry/moist samples, diamond drilling tends to confirm the grades identified in the wet/saturated drilling. Since 2004, it has been SMD's policy that no RC drilling is to continue once water has been intersected;

- Fayalala - Most of the samples collected were from RC drilling, and where AC drilling falls within the mineralised domains, the composites were removed prior to the mineral resource estimation. The combined data indicates that similar statistical properties exist for the predominantly dry composites (dry and moist), when compared to the predominantly wet composites (wet and saturated), indicating there is a low risk incorporating these in a gold grade estimate.

In summary, moist samples showed the highest mean gold grade compared to all other samples. This was attributed to the mineralised structure being water-bearing, and therefore, the moist/wet/saturated samples would have been expected to be of higher average gold grade. The close mean grades between the dry, wet and saturated samples provided confidence that wet drilling was not globally impacting on the results. To further clarify the impact of wet drilling, the dry samples were combined with the moist samples, and the wet samples were combined with the saturated samples, and analysed with the results. When the dry and moist were combined, a similar gold grade to the wet and saturated samples was identified.

No wet RC drilling has been conducted at the LEFA Gold Mine since 2004, for samples incorporated into mineral resource estimation, with a significant percentage of the drilling being high quality diamond drilling following water being encountered. All mineral resource extensions in 2008 were derived from high quality dry RC and diamond samples.

16.2.3 Sample Recovery Analysis

Volumetric sample recovery information was routinely recorded for the AC and RC drillholes. Analysis of the sample recovery data indicated some improvement in recoveries with the application of blow-backs. However, the notional sample recovery at the end of rod was consistently higher. This discrepancy reflected the nature of the geology in that the saprolite portion of the regolith could be very clayey, and therefore, getting full recovery was always difficult.

17 ADJACENT PROPERTIES

Located approximately 90 km to the East of the LEFA Gold Mine is the Siguiri Gold Mine, owned and operated by Anglogold Ashanti as the Société d'Ashanti Gold Mine.

The exploration permits of the Siguiri Gold Mine extend to the West of the LEFA Gold Mine and approach, but do not adjoin, the Kobedara East and Dantinia permits. The intervening ground between both parties has been applied for, but not yet granted.

The Siguiri Gold Mine hosts similar geology, alteration, and mineralisation styles to LEFA Gold Mine, whereby quartz veining and disseminated pyrite mineralisation has emplaced into Birimian Supergroup sediments. The operation uses conventional backhoe and dump truck combinations utilising Moolman as earthmoving contractors. A 10 million tonne per annum (Mtpa) CIL plant was fully commissioned in 2006, and was treating predominantly laterite and saprolite materials, with no transitional or fresh areas exposed within the open pits.

Annual gold production of Siguiri Gold Mine in 2008 was 333,000 ounces, following 280,000 in 2007. Mineral resources as at 31 December 2007 were 4.9 million ounces. This information was sourced from the Anglogold Ashanti website on August 2009.

A further 140 km south-east of LEFA Gold Mine is the Kiniero Gold Mine, owned and operated by a Canadian company called Semafo.

Ore production in 2008 was 573,300 t at an average gold grade of 3.24 g/t. The geology of Kiniero Gold Mine is typical Birimian style gold mineralisation, with quartz veining and disseminated pyrite mineralisation similar to LEFA Gold Mine.

Mineral resources at 31 December 2008 were 11,029 Mt at an average gold grade of 1.89 g/t, for 669,100 contained ounces. This information was sourced from the Semafo website on March 2009.

There are no other operations to the North or West of the LEFA Gold Mine.

Messrs. Hepworth and Urbaez have been unable to verify the information included in this section and such information is not necessarily indicative of the mineralisation on the properties which comprise the LEFA Gold Mine.

18 MINERAL PROCESSING AND METALLURGICAL TESTING

Section 18 mainly contains extracts from the following reports, and is also complemented by the opinion of Mr Ross Nairn, Manager of the LEFA Gold Mine processing plant:

- Lycopodium Pty. Ltd. Final Report “LEFA Corridor Project - Definitive Feasibility Study Process Design Criteria”, November 2004;
- Orway Mineral Consultants. Final Report “LEFA Corridor Project – Communition Circuit Evaluation”, August 2004; and,
- Wardell Armstrong International. Final Report “Preliminary Metallurgical tests on a sample of mineralization taken from the LEFA Gold Mine, Guinea”, December 2008.

The LEFA Gold Mine mineral processing facility was developed following the results of the November 2004 definitive feasibility study by Lycopodium, for an average annual throughput of some 6.0 Mt. The metallurgical testwork for the main mineral deposits at Lero-Karta and Fayalala was carried out by Lycopodium in 2004, and followed by Wardell Armstrong International Ltd. (Wardell) in 2008, for the Firifirini and Toume Toume mineral deposits.

The second hand Kelian Gold Mine (Kelian) plant, from Indonesia, was commissioned in January 2007 at the Lero Gold Mine, with some modifications to process the LEFA Corridor ores, as recommended in the February 2005 detailed diligence audit by Mineral Engineering Technical Services Pty. Ltd. (METS), which included condition, maintenance and operating history. The Kelian plant was examined module by module to determine its fitness in meeting the design criteria, and equipment selection requirements to meet the 6.0 Mtpa of ore throughput and other demands.

The METS audit determined there was a need for a Pebble crusher and second ball mill, but other than that, the Kelian plant met, or even exceeded, the needs of the LEFA Corridor Project. The second ball mill was commissioned with the LEFA Gold Mine plant (plant) in January 2007. However, at the time of the preparation of the 2009 LEFA Gold Mine Mineral Resources and Reserves statements, the plant was still at 75% of the desired capacity of 6.0 Mtpa.

The underperformance of the plant was mainly due to the availability of the SAG mills. Both SAG mills still required further refurbishment to be able to operate within the designed capacity. The extensive refurbishment program on both SAG mills was scheduled for 2009 – 2010, aiming to reach the target of 6.0 Mtpa in mid-2010, with some alteration of the ore feed blend. The Pebble crusher installation, which is expected to improve the plant throughput for the higher fresh to saprolite ore blends, will be investigated in 2010. Once the plant is operating at sustainable high levels, SMD believes the commissioning of the gravity circuit will be completed.

The metallurgical information for the LEFA project was available from test programs by Lycopodium, in laboratories in Australia during 2004, for the main mineral deposits at

Lero-Karta and Fayalala, as well as for 5 others minor mineral deposits, namely Kankarta, Tambico, Banko, Sanoukono and Folokadi. In 2008, further testwork was undertaken by Wardell on new samples from Firifirini, in its laboratory in England.

The LEFA Gold Mine processing circuit comprises:

- A Run-of-Mine (ROM) pad and crusher at Lero-Karta, with a 7 km overland conveyor to Fayalala;
- A ROM pad and crusher at Fayalala;
- Two Semi-Autogenous primary grinding (SAG);
- Two secondary Ball Mills;
- Hydro cyclone classification;
- Cyanide leaching;
- Carbon adsorption;
- Anglo American Research Laboratories (AARL) elution; and,
- Tailings disposal, which is to a two stage valley fill, with return water recovery.

18.1 Crushing

The LEFA Corridor plant location is at Fayalala. At Lero-Karta, a ROM pad and crusher provide the feed to the Fayalala plant site via a 7 km overland conveyor. The conveyor maximum capacity is some 4.0 Mtpa. Each crushing module at Lero-Karta and Fayalala comprises a grizzly screen and jaw crusher arrangement, to generate a -120 mm product, suitable for feeding to the SAG Mills.

The crushing, conveying and stockpile area is closely linked to the milling operation. Typically, the crushers will operate on-line with the mills, with the emergency stockpile being used only during unsteady operations. In order to maintain manageable equipment sizes, and also to avoid the use of an ore stream splitter, two crushing streams, or modules, are provided to suit the two SAG mills.

18.2 Grinding

The milling circuit comprises two 8.4 m diameter SAG mills, with twin 1,750 kW motor, and two 5.5 m diameter Ball mills, with 3,500 kW motor. The two stages grinding circuit is closed circuit, with hydro cyclone to produce p80 grind size of 150 µm. The arrangement between mills and cyclone piping system allows for any one mill to be shut down, without losing all production and adjustment to the feed tonnage. In fact, milling can proceed with a number of alternatives, such as 2, 3 or 4 mills, which is very flexible.

The ratio of transitional and fresh material proposed throughput through the plant will increase as the pits evolve. Therefore, the mine is undertaking a study to install a secondary crushing circuit in the grinding section of the plant, to mitigate this potential risk to throughput at nameplate capacity.

18.3 Carbon-in-Leach (CIL) Description

The cyanidation of the milled ore is carried out in Carbon-in-Leach circuit, which comprises a total of twelve baffled and mechanically agitated tanks (six leach stages and six carbon adsorption stages). The tanks are some 16 m in diameter and of varying height, from 20.7 m for tank 1, stepping down to 15.0 m for tank 12, providing a nominal residence time of 42 hours on design flows of 6.0 Mtpa, and 35 hours at 7.2 Mtpa, with an expected overall gold recovery of about 91%.

The Loaded carbon is treated in 10 tonnes capacity of AARL type elution circuit and electro winning circuit, to produce gold bullion with average 90% gold purity.

18.4 Ore Characterisation

The metallurgical recovery characteristics of different type of rocks, from all mineral deposits at LEFA Gold Mine are presented in Table 18.1.

Table 18.1 Metallurgical Recovery by Rock Type

Ore Lithology	**Gravity Recovery %**	**Leach Recovery %**	**Total Recovery %**
Lero-Karta			
Laterite	23.6	72.7	96.2
Oxide	10.3	82.0	92.3
Primary	38.8	51.0	89.7
Fayalala			
Laterite	38.0	59.3	97.3
Oxide	33.6	60.6	94.2
Primary	45.1	44.5	89.6
Minor Deposits			
Pharmacie	44.8	47.2	92.0
Kankarta	36.4	56.2	92.6
Tambico	60.6	34.2	94.8
Banko	25.4	68.8	94.2
Firifirini			
Oxide	10.5	83.4	93.9
Primary	11.9	82.9	94.8

Source: Lycopodium Report, November 2004 & Wardell Armstrong Report, December 2008

The metallurgical recovery characteristic of the old heap leach pads was estimated by SMD as follows:

Assuming a feed to heap leach averaging 2.5 g/t, and based on an average metallurgical recovery of 94%, if the ore had been treated through a CIL, the laterite and oxide ores would produce a final tail grade of 2.5 x 0.06 = 0.15 g/t.

There is potential for some improvement in metallurgical recovery, due to the long term conditioning of the ore in a cyanide solution. However, this would need to be confirmed via testwork. Therefore, the potential recoverable gold is the difference between the residual heap leach grade and 0.15 g/t. At an average gold head grade of 0.77 g/t, this equates to 80.5% recovery.

The metallurgical recovery characteristic of the old heap leach pads estimation helps to demonstrate the economic viability of the processing of the heap leach material. Considering the expected increase in recovery due to cyanide conditioning, the relatively small amount of material from the heap leach pads, and low gold grade, there is no provision for reduced recovery in the economic analysis.

18.4.1 Chemical Characteristics

The results of the chemical analyses by Lycopodium in 2004, and Wardell in 2008, are presented in Table 18.2, 18.3, and 18.4.

Table 18.2 Firifirini Chemical Characteristics

Species	Units	Weathered Ore	Fresh Ore	Fresh Wall
Au	g/t	1.68	0.89	0.04
Ag	g/t	< 0.01	1.00	< 0.01
$C_{ORGANIC}$	%	< 0.2	< 0.2	< 10.2
Fe	%	16.42	6.81	3.76
As	%	0.003	0.001	< 0.001
S_{TOTAL}	%	0.01	0.9	0.14
$S_{SULPHIDE}$	%	0.00	0.86	0.12

Source: Wardell Armstrong International Report, December 2008

18.4.2 Mineralogical Composition

Mineralogical composition analysis of the ore was carried out by Orway Mineral Consultants in 2004, as presented in Table 18.5.

Table 18.5 Mineralogical Composition

Source	Rock Type
Lero-Karta	
Oxide	Cuirasse/laterite/saprolite
Domain 1	Albite/Hematite silicification
Domain 2	Mylonite, some hematite/silica alteration
Domain 3	Very strong silica induration
Fayalala	
Oxide	Cuirasse/laterite/saprolite
Domain 1	Jim Zone - highly silicified
Domain 2	Sheeted Vein Swarm

Source: Orway Mineral Consultant Report, August 2004

18.4.3 Bond Index

Table 18.6 Bond Index

Source	Bond Rod Mill Index kWh/t	Bond Ball Mill Index kWh/t
Lero-Karta	24.8	24
Fayalala	21.6	19.1
Firifirini	14.3	16.9

Source: Orway Mineral Consultant Report, August 2004 & Wardell Armstrong International Report, December 2008

Table 18.3 Lero-Karta Chemical Characteristics

Species	Units	Domain 1	Domain 2	Domain 3
Au_1	g/t	1.47	1.46	1.67
Au_2	g/t	1.52	1.49	1.59
Ag	g/t	0.3	< 0.1	< 0.1
As	g/t	120 / 110	70	50
Bi	g/t	<10 / <10	< 10	
$C_{ORGANIC}$	%	<0.03 / <0.03	0.03	0.03
Cd	g/t	<5 / <5	< 5	< 5
Co	g/t	23 / 24	20	20
Cu	g/t	114 / 111	84	69
Hg	g/1000t	<10	10	10 / 10
Ni	g/t	173 / 178	129	101
$S_{SULPHIDE}$	%	0.61 / 0.54	0.51	0.47
Sb	g/t	<5 / <5	< 5	< 5
Te	g/t	0.4	0.2	0.2 / 0.2
Zn	g/t	59 / 64	62	62
Al	%	9.16 / 9.08	8.14	8.22
Ba	g/t	380 / 380	250	450
C_{TOTAL}	%	0.39 / 0.41	0.29	0.33
CO_3	%	1.95 /2.05	1.3	1.5
Ca	%	2.20 / 2.33	0.49	0.73
Cr	g/t	180 / 180	140	130
Fe	%	6.14 / 6.15	4.3	4.3
K	%	1.60 / 1.66	3.22	5.19
Li	g/t	17 / 17	17	22
Mg	g/t	8420 / 8423	9955	9974
Mn	g/t	622 / 642	252	472
Mo	g/t	<5 / <5	< 5	< 5
Na	%	1.71 / 1.73	2.72	2.07
P	g/t	500 / 540	590	630
Pb	g/t	<5 / <5	< 5	< 5
S_{TOTAL}	%	0.57 / 0.57	0.39	0.45
Sr	g/t	243 / 245	59	88
Ti	g/t	1305 / 1319	1396	1026
V	g/t	111 / 106	116	138
Y	g/t	51 /52	4	16
Zr	g/t	120 /119	109	119

Source: Lycopodium – Ammtec A9040 Report, April 2003

Table 18.4 Fayalala Chemical Characteristics

Species	Units	Domain 1	Domain 2
Au_1	g/t	1.77	2.06
Au_2	g/t	1.63	2.12
Ag	g/t	0.2 / 0.2	0.5
As	g/t	24 / 23	< 10
Bi	g/t	<10 / <10	< 10
$C_{ORGANIC}$	%	<0.04 / <0.03	0.05
Cd	g/t	<5 / <5	< 5
Co	g/t	29 / 30	13
Cu	g/t	110 / 112	30
Hg	g/1000t	<10 / <10	<10 / <10
Ni	g/t	104 / 113	40
Pb	g/t	41 / 38	6
$S_{SULPHIDE}$	%	0.86 / 0.78	0.18
Sb	g/t	<5 / <5	< 5
Te	g/t	1.6 / 1.6	0.4 / 0.4
Zn	g/t	57 / 67	17
Al	%	5.21 / 5.54	3.26
Ba	g/t	214 / 226	135
C_{TOTAL}	%	0.05 / 0.04	0.06
CO_3	%	0.05 / 0.05	0.05
Ca	%	390 /410	430
Cr	g/t	240 /260	140
Fe	%	4.02 /4.11	4.02
K	%	1.33 / 1.29	1.35
Li	g/t	57 / 61	9
Mg	g/t	1.58 /1.59	0.46
Mn	g/t	120 / 126	173
Mo	g/t	<5 / <5	< 5
Na	%	2.61 / 2.66	1.15
P	g/t	300 / 300	300
S_{TOTAL}	%	0.99 / 0.90	0.26
Sr	g/t	32 / 36	14
Ti	g/t	1610 / 1740	2410
V	g/t	142 / 153	103
Y	g/t	6 / 6	3
Zr	g/t	106 / 115	69

Source: Lycopodium – Ammtec A9040 Report, April 2003

18.4.4 Recommendation for Additional Metallurgical Testing

The metallurgical test work program for the LEFA Gold Mine was extensive, especially for the Lero-Karta and Fayalala mineral deposits. Accordingly, there are no suggestions or recommendations, for further test work in these areas.

However, further metallurgical test work is recommended for the Firifirini and Toume Toume mineral deposits, to investigate the effect of cyanide strength, solid concentration, and grind size, with respect to head grade, and test work to establish the metallurgical response of samples taken from various sections of the Firifirini and Toume Toume mineral deposits.

19 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

19.1 Mineral Resource Estimates

19.1.1 Bulk Density Measurements

A substantial database of bulk density data was collected using a variety of determination methodologies. The principal methodologies applied include the water displacement, and weight in water/weight in air approaches, as applied to diamond core, along with grab samples of hand specimen-sized samples, collected during mining advance.

SMD's geologists monitored and reviewed the appropriateness of the bulk density data, as part of the mineral resource estimation analysis, which was based on a number of data sources, derived via the following methodologies:

Method A – Water Displacement

- During grade control, or ore mining, a fist-sized sample is collected;
- The grab sample is oven dried;
- The grab sample is generally coated with paraffin wax. However, a significant number of determinations were completed without waxing due to a shortage of paraffin;
- The samples are then collectively weighed when immersed in water, allowing for the determination of their specific gravity.

Method B - Diamond Core Weight in Water and Weight in Air (data to September 2003)

- Two billets of core, representative of the range of lithologies, mineralisation styles, and alteration intensities, are routinely selected from each core tray with hole number and hole depth recorded;
- The core samples are dried in the site laboratory oven, and coated in paraffin wax to preserve any voids;
- The dried and waxed core billets are weighed in both, air and water, to permit estimation of the bulk density. A spring balance was initially used for weight determination, but has now been replaced with an electronic balance for improved accuracy.

Method C - Half Diamond Core Weight in Water and Weight in Air (data post-September 2003)

- Three billets of half core are selected from every fifth metre downhole and are weighed together in air;

- The three half-core samples are dried in a laboratory oven for 6 hours, at 105° to 110° Celsius;
- The dry samples are collectively weighed again in air;
- The samples are then collectively weighed when immersed in water;
- The samples are towelled dry, and collectively weighed in air again.

19.1.1.1 Bulk Density Data Review

RSG Global completed a thorough review of the available bulk density data, for Methods B and C, during mineral resource evaluation studies, between 1999 and 2003. Limited bulk density data collected via Method B was reviewed, but was reported in various SMD studies. The majority of bulk densities are derived from the various material types within the Lero-Karta and Fayalala mineral deposits, but with some additional determinations also completed on samples from the Kankarta, Banko, Folokadi, Firifirini, Toume Toume and Banora deposits.

RSG Global was concerned that the primary density data applied in the December 2002 mineral resource estimate, superficially appeared to be conservative for the various rock types. Therefore, SMD commissioned an independent external review at Genalysis, a laboratory in Canada, of the density data, and re-determination of some 186 core billets from Fayalala, and 103 from Lero Karta.

Based on the Genalysis derived results, the SMD methodology applied to early bulk density determination was considered flawed. A 6% negative bias was identified in determinations generated in the initial stages of the LEP, primarily due to the wrapping of low porosity primary core billets with plastic film, resulting in the entrapment of air, and hence an over-estimation of the volume. Subsequent density determination work appears to have rectified issues with the cling wrapping of core no longer practiced. SMD considered the adoption of mean bulk density value, grouped by regolith and deposit, as the most appropriate means of density assignment. The dry density assignment on a deposit by deposit basis is presented in Table 19.1.

Table 19.1 Dry Density Values

Deposit	**Laterite t/m^3**	**Saprolite t/m^3**	**Fresh t/m^3**
Lero-Karta	2.25	1.70	2.50
Fayalala	2.20	1.70	2.50
Kankarta	2.20	1.70	2.50
Firifirini	2.20	1.70	2.50
Toume Toume	2.20	1.70	2.50
Banora	2.20	1.70	2.50
Banko	2.20	1.70	2.50

19.1.2 Statistical Analysis

H&S undertook detailed statistical analysis for each of the evaluated mineral deposits, based on composites of the exploration data, and coded by the weathering profile and mineralised domains.

The drillhole database coded with the geology/estimation zone was regularised, or composited, as a mean of achieving a uniform sample support. Appropriate high grade cuts, or caps, were determined, and the statistics pre and post application of the high-grade cuts assessed.

19.1.2.1 Compositing and Data Coding

H&S took a consistent approach to compositing data for each mineral deposit, based on the following factors:

- The vast majority of the data was collected at 1 m sample intervals;
- All mineral resources would be mined via open pit method, using 2.5 m flitches;
- Maintenance of some of the short scale variability identified in the drilling, while reducing and stabilising the total sample variance; and,
- Run length, or down-the-hole, compositing was appropriate due to the varied drilling orientation present.

Based on the various investigations, typically a regular 2 m run length/downhole composite was selected as the most appropriate composite, given the 2.5 m flitch height mined at the LEFA Gold Mine. All missing intervals were excluded from the compositing process.

All data relevant to the mineral resource estimation analysis was coded to composites, including:

- Interpreted weathering;
- Mineralisation domains; and,
- Where appropriate, lithology, such as dolerites.

19.1.2.2 Lero-Karta Statistical Analysis

H&S completed statistical assessment for the composite data, grouped by regolith. The purpose of the investigation was to check if there was a requirement for segregation of the datasets, for the purpose of estimation. As presented in Tables 19.2, 19.3, and 19.4, H&S observed similar statistics for the saprolite, transitional and primary datasets, as with the median gold grades and Coefficients of Variation. The statistical investigation supported the geological interpretation, wherein H&S noted little difference in gold mineralisation for saprolite, transitional and primary mineralisation.

Table 19.2 Lero-Karta 2 m Composite Statistics, Gold Grade in g/t

Statistic	Laterite	Saprolite	Transitional	Primary
Count	1381	13943	2960	12192
Minimum	0.00	0.00	0.00	0.00
Maximum	88.50	143.21	92.04	167.42
Mean	0.76	1.57	1.25	1.30
Median	0.25	0.56	0.52	0.57
Standard Deviation	3.33	4.20	3.18	3.13
Variance	11.08	17.61	10.19	9.78
Coeff Var	4.37	2.67	2.54	2.40

Table 19.3 Lero-Karta 2 m Composite Statistics, Gold Grade in g/t, by Domain (1)

Statistic	Camp de Base				Lero		
	Dom1	Dom2	Dom3	Dom10	Dom4	Dom5	Dom6
Count	7959	2002	150	1564	330	4069	2423
Minimum	0.00	0.00	0.00	0.00	0.04	0.00	0.00
Maximum	143.22	25.52	141.51	85.94	17.20	124.50	88.50
Mean	1.10	0.63	2.96	0.55	1.43	2.10	0.90
Median	0.57	0.38	0.24	0.05	0.60	0.75	0.47
Standard Deviation	2.87	1.52	14.68	3.21	2.15	4.83	2.17
Variance	8.22	2.30	215.51	10.29	4.63	23.30	4.69
Coeff Var	2.62	2.39	5.01	5.85	1.51	2.29	2.40

Table 19.4 Lero-Karta 2 m Composite Statistics, Gold Grade in g/t, by Domain (2)

Statistic	Karta				Lero South		
	Dom7	Dom8	Dom9	Dom11	Dom12	Dom13	Dom14
Count	5025	3875	1387	1265	335	977	115
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	167.41	62.97	104.21	22.99	8.68	64.65	5.11
Mean	1.55	1.60	1.78	0.55	0.84	3.21	0.80
Median	0.65	0.66	0.66	0.21	0.37	0.78	0.37
Standard Deviation	3.88	3.20	3.89	1.16	1.33	6.22	1.13
Variance	15.03	10.24	15.11	1.35	1.78	38.74	1.27
Coeff Var	2.50	2.00	2.19	2.11	1.59	1.94	1.42

Summary statistics of the 2 m composites located within the domains, excluding missing samples and samples with length less than 1 m, are presented in Tables 19.2 and 19.3. The tightly constrained domains, namely Dom3, Dom5 and Dom13, displayed the highest mean gold grades. This was due to the fact that the domains were 060^{o} structures, which had limited contact with the Karta Fault.

19.1.2.3 Fayalala Statistical Analysis

H&S modelled the mineralisation at Fayalala as eight mineralised structural domains, and one peripheral mineralisation domain. Summary statistics of the 2 m composites located within the domains, and excluding missing samples and samples with length less than 1 m, are presented in Table 19.5.

The domains of Bofeko, Fayalala South–High Grade, and Fayalala North–High grade, had the highest mean gold grades. These domains had high Coefficients of Variation, suggesting that outliers might have contributed to the distortion of the mean.

However, H&S considered if a top cut, or the median, was used, too much metal would have been removed from the mineral resource model. This was a function of the Fayalala mineral deposit, whereby short scale variability was common, with a big contrast between high and low gold grades in a mineralised interval. A top cut of 20 g/t was applied to Domain 7, where the Coefficient of Variation was some 7.6, which H&S considered too high.

Table 19.5 Fayalala 2 m Composite Statistics, Gold Grade in g/t, by Domain

Statistic	BF Dom 1	FY_SLG Dom 2	FY_SHG Dom3	FY_F Dom4	FY_NLG Dom 5	FY_NHG Dom 6	FY_NMG Dom 7	FY_FE Dom 8
Count	2726	3284	5726	11082	3832	29720	10654	8087
Minimum	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Maximum	38.03	80.85	46.05	58.34	10.51	138.91	378.07	35.44
Mean	0.65	0.34	0.75	0.63	0.34	0.75	0.50	0.32
Median	0.16	0.10	0.16	0.29	0.13	0.19	0.11	0.09
Std. Dev.	1.75	1.60	1.83	1.26	0.57	2.09	3.81	0.98
Variance	3.06	2.55	3.35	1.58	0.32	4.38	14.50	0.96
Coeff Var	2.69	4.65	2.43	1.99	1.68	2.81	7.58	3.11

BF=Bofeko; FY_SLG=Fayalala South-Low Grade; FY_SHG=Fayalala South-High Grade; FY_F=Fayalala Fault; FY_NLG=Fayalala North-Low Grade; FY_NHG=Fayalala North-High Grade; FY_NMG=Fayalala North-Medium Grade; FY_FE=Fayalala Far East

For each domain, H&S calculated a series of 14 different cumulative probabilities of the entire domain, allocating a class mean and class median for every cumulative gold grade threshold. The different probability thresholds were 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 0.97 and 0.99. The data was then ranked with each composite given a value from 1 to 14, based on its gold grade within the probability thresholds.

19.1.2.4 Kankarta Statistical Analysis

H&S modelled the mineralisation at the Kankarta deposit as two distinct structural domains, namely Kankarta West and Kankarta East. Both of these domains consisted of sub-domains, which displayed similar geological characteristics, and were included as two distinct mineralised domains.

Sub-horizontally, three regolith sub-domains were modelled, namely laterite, saprolite, and fresh. Nevertheless, considering there was insufficient data to generate meaningful statistics for the variogram analysis and modelling process, as presented in Table 19.6, when combined, the two mineralised domains displayed similar geostatistics. Consequently, the two mineralised domains were collated together.

Table 19.6 Kankarta 2 m Composite Statistics, Gold Grade in g/t, by Domain

Statistic	Kankarta West	Kankarta East	Combined Domains	Peripheral Domain
Count	1499	3694	5193	22515
Minimum	0.00	0.00	0.00	0.00
Maximum	24.40	63.40	63.40	13.47
Mean	0.84	1.09	1.02	0.09
Median	0.31	0.40	0.38	0.03
Std. Dev.	1.64	2.33	2.16	0.30
Variance	2.70	5.44	4.66	0.09
Coeff Var	1.95	2.13	2.11	3.19

19.1.2.5 Firifirini Statistical Analysis

Due to its unique geological and geostatistical characteristics, H&S treated the Firifirini mineral deposit a little differently to the other mineral deposits. Because of the random scattering of gold grades found within the dataset, the construction of traditional wireframes for domaining and gold grade estimation was not possible.

All samples within the entire dataset were composited to 2 m. In order to generate meaningful statistical conclusions, the domains were broken down into one large mineralised domain, with sub-domains of the different regolith boundaries, namely laterite, saprolite, and fresh, as presented in Table 19.7.

Table 19.7 Firifirini 2 m Composite Statistics, Gold Grade in g/t, by Material Type

Statistic	Laterite	Saprolite	Fresh
Count	3935	9782	14440
Minimum	0.00	0.00	0.00
Maximum	22.65	59.20	134.00
Mean	0.16	0.43	0.25
Median	0.04	0.05	0.03
Standard Deviation	0.85	2.03	1.95
Variance	0.71	4.10	3.82
Coeff Var	5.14	4.72	7.96

Due to the single high grade outlier, H&S considered necessary to limit the 99th percentile bin of the statistics for the dataset. H&S decided that the value of 30 g/t would be suitable as a top cut in this area, and applied it.

19.1.2.6 Banora Statistical Analysis

H&S coded to composites all data relevant to mineral resource estimation analysis, with the mineralised structural domains coded to the database. H&S modelled the mineralisation at the Banora mineral deposit as two distinct structural domains.

Sub-horizontally, three regolith sub-domains were modelled, namely laterite, saprolite, and fresh. Nevertheless, and similarly to Kankarta, considering there was insufficient data to generate meaningful statistics for the variogram analysis and modelling process, as presented in Table 19.8, the two mineralised domains were collated together.

Table 19.8 Banora 2 m Composite Statistics, Gold Grade in g/t, by Domain

Statistic	Combined Domains	Mineralised Domains	Peripheral Domain
Count	8168	1817	6351
Minimum	0.00	0.01	0.00
Maximum	42.60	42.60	4.44
Mean	0.25	0.99	0.04
Median	0.03	0.31	0.02
Standard Deviation	1.21	2.40	0.13
Variance	1.45	5.77	0.02
Coeff Var	4.73	2.40	2.94

H&S visually inspected log Histogram and Probability plots. The composite data displayed positively skewed behaviour, typical of gold deposits. In general, the mineralisation followed a log normal distribution, except for some variability near the high-grade end of the distribution.

The 2 m composites located within the mineralised domains were also coded by weathering, based on a series of modelled weathering horizons, as presented in Table 19.9. The modelled weathering horizons included the base of the laterite, the base of the saprolite, with everything below the base of saprolite considered fresh rock.

Table 19.9 Banora 2 m Composite Statistics, Gold Grade in g/t, by Material Type

Statistic	Laterite	Saprolite	Fresh
Count	468	3576	4124
Minimum	0.00	0.00	0.00
Maximum	5.59	25.40	42.60
Mean	0.15	0.20	0.31
Median	0.04	0.02	0.03
Standard Deviation	0.47	1.06	1.37
Variance	0.22	1.11	1.88
Coeff Var	3.09	5.27	4.36

The mean gold grades for the fresh was the highest, with the saprolite domain higher than the laterite domain. H&S considered estimating domains with a hard boundary between the regolith types. However, the lack of data in the laterite regolith, and the gradational nature of the mineralised intercepts between the mineralised and peripherally mineralised domains, meant that soft boundaries were used.

A review of the histogram and probability plots, along with the mean and standard deviation plots, indicated the lack of outliers in all domains at Banora. As a result, no gold grade top cut was applied during the gold grade estimation process.

19.1.2.7 Banko Statistical Analysis

The mineralisation at the Banko mineral deposit was relatively simple for domaining, and the mineralisation was modelled as just one structural domain. Sub-horizontally, H&S modelled four weathered surfaces into sub-domains, namely laterite, saprolite, transitional, and fresh. However, considering there were insufficient data to generate meaningful statistics for the variogram analysis and modelling process, the saprolite and transitional regolith domains were collated together.

Visual investigation of the mineralised domain showed the significance influence of outliers on the mean, as presented in Table 19.10, significantly higher than the median, with a very high variance and standard deviation. Therefore, a top cut of 40 g/t was applied, to reduce the influence of these outliers. All sub-domains in the peripheral mineralisation domain were collated together.

Table 19.10 Banko 2 m Composite Statistics, Gold Grade in g/t, by Domain

Statistic	Mineralised	Peripheral	All Data
Count	1181	8295	9476
Minimum	0.00	0.00	0.00
Maximum	378.64	16.60	378.64
Mean	2.69	0.11	0.43
Median	0.39	0.03	0.04
Standard Deviation	13.53	0.48	4.87
Variance	182.98	0.23	23.73
Coeff Var	5.03	4.49	11.37

19.1.3 Variography

H&S used variography to describe the spatial variability, or correlation, of an attribute (gold, silver, sulphur, etc). The spatial variability is traditionally measured by means of a variogram, which is generated by determining the averaged squared difference of data points at a nominated distance (h), or lag. The averaged squared difference (variogram or $\gamma(h)$) for each lag distance is plotted on a bi-variate plot, where the X-axis represents the lag distance, and the Y-axis the average squared differences ($\gamma(h)$), for the nominated lag distance.

Therefore, the term variogram is used as a generic word, to designate the function characterising the variability of variables versus the distance between two samples. Both, a traditional measure and a correlogram, were applied for the estimation completed for the LEFA Gold Mine.

Fitted to the determined experimental variography is a series of mathematical models which, when used in the kriging algorithm, recreates the spatial continuity observed in the variography.

All variography for the mineral resource estimation was based on the 2 m composite gold grade data captured, within the investigated mineralised domains.

19.1.3.1 Lero-Karta Variography

H&S carried out variography using 2 m composite assay data. This data was coded by regolith and structural domains, based on gold grade of 0.3 g/t envelopes, and also geological domains, like dolerite. H&S combined the data when performing the variograms for each inclusive domain, due to the similarities in the datasets, relating to regolith between the saprolite, transition and primary material in each domain.

Several mineralisation domains exhibited similar domain geometries, mineralisation styles, and tenors of mineralisation. Therefore, some of the larger domain variography was used, where there was insufficient data in the smaller domains. These smaller size domains tend to be hanging wall structures to the main structure.

H&S generated and modelled indicator and grade variograms to allow both, to generate multiple indicator kriging gold grade estimates and to undertake a change of support analysis.

The following summarises the key aspects of the Lero-Karta variogram modelling:

- Relative nugget was modelled at between 0.02 and 0.56 for the indicator variography, and between 0.18 and 0.38 for the grade variograms;
- A reasonable level of directional anisotropy, representing the characteristics of the 060^{o} mineralisation, was present in the variogram models; and,
- At lower gold grade indicator thresholds, overall ranges were in excess of the current drill spacing, while for higher gold grade thresholds, ranges were modelled at, or less than, the current drill spacing.

19.1.3.2 Fayalala Variography

H&S carried out variography on 2 m composite assay data, grouped as laterite, saprolite, transitional and fresh, and sub-domained into the different regolith layers, similarly as for Lero-Karta. Rank indicator and gold grade variograms were generated, and modelled, to allow for multiple indicator kriging gold grade estimates.

Due to the lack of data in the Fayalala Far East saprolite domain, no meaningful variogram rosette maps were generated, given the small size of the dataset. Subsequently, the modelled variography for the North-South domain was applied for Fayalala Far East.

This was also the case for the laterite domains above Fayalala Far East, the laterite above the Fayalala Fault zone, and the laterite above the Bofeko domain. All of these laterite domains exhibited the same lateral consistency, and were given the same variography as the laterite domain above the North-South domain.

The variography modelled at Fayalala was consistent with observations made in both, the completed exploration programs and the current mining operations. The laterite mineralisation, when considering low gold cutoff grades, represented a significant body of mineralisation that could be adequately correlated both, downhole and between drill sections. However, the saprolite/primary mineralisation exhibited a high degree of short scale variability, wherein significant variation in gold grade was observed at close range, both, down the hole and also in adjacent drillholes. The implication of the modelled variography was that substantial drilling was required to adequately map the gold grade variation at Fayalala.

19.1.3.3 Kankarta Variography

H&S carried out variography on 2 m composite assay data. One set of variography was modelled for Kankarta West, while all sub-parallel structures for Kankarta East was also modelled, with the peripheral mineralisation allocated to the same variography as the Kankarta West Dom1 domain. Insufficient data for the saprolite and the fresh sub-domains, and considering that the structures were virtually identical in the regolith zones, meant that the saprolite and fresh zones had the same variography. Typical features of the Kankarta variography were thus:

- Nugget for the gold variograms relatively low at 0.13 and 0.22, indicating reasonable continuity; and,
- Indicator ranges were usually at, or greater than, the drill spacing, indicating continuity along strike.

19.1.3.4 Firifirini Variography

H&S carried out variography on indicative thresholds for the moving average of the entire dataset, using 2 m composite data. Indicator and gold grade variograms were generated, and modelled, to allow for both, multiple indicator kriging gold grade estimates and change of support analysis, to be determined. Variograms were created for 14 different indicator thresholds, as well as for each sub-domain combination. A single gold variogram of the entire data set was also created.

The following summarises the key aspects of the Firifirini variogram modelling:

- Relative nugget was modelled at between 0.27 and 0.42 for the indicator variography; and,
- Short range structures dominated the non-nugget variance, often with a range at, or less than, the average drill spacing, indicating the high gold grade and scattered nature of the deposit.

19.1.3.5 Toume Toume Variography

Variography for Toume Toume was treated very similarly to Firifirini, reflecting the similarities in their style of deposit and mineralisation. H&S also applied the moving average technique to the entire dataset of 2 m composites. Nugget value of 0.27 for the gold variogram, and up to 0.42 for the indicator thresholds with short ranges, indicated the high gold grade and scatty nature of the mineralisation.

19.1.3.6 Banora Variography

H&S carried out variography on 2 m composite assay data, constrained within the main modelled mineralisation envelope, in preparation for undertaking a Multiple Indicator Kriging estimation. Variography for the mineralised domain encompassed the saprolite and fresh portions of the regolith, as individually there was insufficient data to produce meaningful variography. Therefore, the variography was modelled with a moderately high relative nugget effect, which is typical of the narrow vein high gold grade nature of the deposit. Azimuths typically showed a 060° orientation in plan, with some short-range structures orientated at 340°.

19.1.3.7 Banko Variography

Variography for Banko was relatively simple with a singular, high grade structure modelled. The laterite variograph was typical of laterite style mineralisation with a sub-horizontal spread. Similar variography was applied to the saprolite, transitional and fresh zones of the mineralised structure. The same variography was applied to the peripherally mineralised portion of the deposit. At the upper thresholds, the nugget was high at 0.61, with very high ranges in the Easting direction, thus reflecting the high grade nature of the deposit on a 060° oriented structure.

19.1.4 Block Modelling

H&S generated a series of 3-dimensional block models for each mineral deposit, to enable grade estimation via Multiple Indicator Kriging (MIK).

MIK block models are proportional models with each block having a series of varying proportions above a certain cutoff grade. All the models constructed have 11 gold cutoff grades, ranging from 0.3 to 1.0 g/t, in increments of 0.1, and additional ones at 1.2 and 1.5 g/t. With an increase in gold cutoff grade, the proportional amount of tonnes in the block above that cutoff decreases. Because MIK block models are proportional models, dilution and ore losses due to mining practices are inherently built into the model. Therefore, these factors do not need to be applied in estimating mineral reserves from the mineral resource models.

These 3-dimensional block models were generated by, or under the supervision of, Mr Nicolas Johnson, from Hellman and Schofield. Mr Johnson has over 20 years experience working with the type of mineralisation, and grade control procedures, characteristics of the LEFA Gold Mine, and had estimated similar mineral resources in Australia, Asia and Africa.

H&S selected the block model block size in each case to represent the available data, the data characteristics (variability as defined by variography), and the mining practices targeted in the CIL project. Table 19.11 presents the block model definition for each mineral deposit.

H&S was responsible for building and updating the main LEFA Gold Mine block models: Lero-Karta, Fayalala, Kankarta, Firifirini, Banko, Folokadi, Toume Toume, and Banora. The Sanou Kono block model was built by RSG for the 2005 Technical report. The remaining block models, namely Diguili Bougoufe, Dar Salaam, Diguili North, Banora West, Hansaghere, Sikasso, and Solabe, were built by SMD in 2008.

Table 19.11 Block Model Definition

Deposit	Lower-Left Coordinate			Block Size (m)			Number of Blocks		
	East	North	RL	East	North	RL	East	North	RL
LEFA Corridor									
Lero-Karta	4,712.5	4,325.0	12.5	25	25	5	79	72	107
Fayalala	12,462.5	4,225.0	182.5	25	25	5	93	74	65
Kankarta	9,137.5	6,575.0	267.5	25	25	5	64	32	62
Firifirini	384,062.5	1,305,712.5	397.5	25	25	5	57	51	30
Banko	9,762.5	4,125.0	252.5	25	25	5	25	19	41
Folokadi	9,900.0	2,300.0	240.5	20	20	5	51	51	63
Toume Toume	380,563.5	1,306,512.5	402.5	25	25	5	15	18	22
Sanou Kono	9,123.75	8,148.75	601.25	15	15	5	41	27	17
Regional									
Banora	357,737.5	1,282,270.0	200.5	25	15	5	38	49	54
Diguili Bougoufe	365,012.5	1,283,512.5	255.0	25	25	10	20	20	20
Dar Salaam	389,012.5	1,290,012.5	205.0	25	25	10	25	120	30
Diguili North	363,012.5	1,288,012.5	205.0	25	25	10	80	120	30
Banora West	356,012.5	1,283,312.5	255.0	25	25	10	32	56	20
Hansaghere	364,612.5	1,293,612.5	255.0	25	25	10	56	32	20
Sikasso	393,012.5	1,296,912.5	305.0	25	25	10	24	20	23
Solabe	365,012.5	1,283,512.5	255.0	25	25	10	20	20	20

Block model development was completed in the Surpac software. The raw data was then imported into the GS3 Hellman and Schofield software to allow grade estimation. H&S established mineralised domain and weathering domain coding in the block model, based on the modelled wireframe constraints. In addition, sufficient variables were created to enable recording of the results from MIK, selective mining estimates, estimation statistics, density stratification, and resource classification.

All of the block models were trimmed using topography as of 31 August 2009, to define the surface within the regolith domain and the mineralised domain. The non-laterite mineralisation domains were truncated by the base of the argillaceous laterite surface. Topographies were cut and appended with the pit outlines as of 31 August 2009, to allow depletion of the resources for reporting purposes.

19.1.4.1 Lero-Karta Model

H&S constructed a block model for mineral resource estimation purposes, based on a 25 x 25 x 5 m panel size, which was approximately the drilling spacing, with no sub-blocking occurring.

The initial processing was performed in the Surpac software, and it involved creating wireframes based on mineralised envelopes and geology. H&S extracted composite data from the database using Surpac, and then imported it into GS3, where statistical analysis and the gold grade estimation were performed. After the creation of the model using

GS3, the information was then exported and brought back into Surpac, where verification and subsequent gold grade and tonnage reports were created.

Gold grade estimation was undertaken applying MIK, where interpolation was constrained within the domains, inclusive of the sub-domains of saprolite, transition and primary material, as well as the estimation of peripheral mineralisation. H&S carried out gold grade estimation in three passes, to represent the various mineral resource categories, as presented in Table 19.12.

Table 19.12 Lero-Karta Data Search Parameters

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	25.0	25.0	15.0	16	32	4
2	37.5	37.5	22.5	16	32	4
3	37.5	37.5	22.5	8	32	2

Table 19.13 Lero-Karta Change of Support Parameters

Domain	Variance Adjustment Factor
0	0.134
1	0.141
2	0.141
3	0.141
4	0.134
5	0.134
6	0.134
7	0.142
8	0.142
9	0.142
10	0.141
11	0.142
12	0.228
13	0.228
14	0.228

H&S used block variance adjustment factors, as determined from the variography, to emulate a 10 x 10 x 2.5 m specialised mining unit (SMU) considered the minimum mining recoverable proportion of the block, as presented in Table 19.13.

The shape of the modelling method applied was the Direct–Lognormal, which is typical of gold deposits, and the most conservative estimate of recoverable gold grade.

19.1.4.2 Fayalala Model

H&S constructed a block model for mineral resource estimation purposes, based on a 25 x 25 x 5 m panel size. No sub-blocking occurred due to the spatial variability of the

Fayalala data. H&S chose the parent block size for its representation of the drillhole spacing, variography, and mineralisation parameters.

The block model, mineralised solids, and the different regolith surfaces, were created in Surpac. This data was then further manipulated so it could be easily incorporated into GS3. Once in GS3, extensive statistical analysis, variogram modelling, and grade estimation were performed. The resultant file was then uploaded back into Surpac for mineral resource reporting, visual assessments and verification.

Gold grade estimation was undertaken applying MIK, where interpolation was constrained within the eight mineralised domains, inclusive of the sub-domains of laterite, saprolite, transition and primary material, as well as the estimation of peripheral mineralisation. H&S carried out gold grade estimation in three passes, to represent the various mineral resource categories, as presented in Table 19.14.

Table 19.14 Fayalala Data Search Parameters

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	25.0	25.0	15.0	16	48	4
2	32.5	32.5	19.5	16	48	4
3	32.5	32.5	19.5	8	48	4

H&S applied a minimum of 16 composites, and a maximum of 48, for the first pass, including a minimum of 4 octants from any one drillhole selected. The search radii for the first pass were 25 x 25 x 15 m. For the second pass, an expansion factor of 30% was applied. Therefore, the search distance for the minimum number of samples for a successful estimate was 32.5 x 32.5 x 19.5 m.

The third search, defining the inferred category, used the same search distances as the second search, but with much reduced data constraints on each panel. All mineralised and peripherally mineralised domain boundaries were hard with each other. Variance adjustment factors, as determined from the variography, were used to emulate a 5 x 5 x 2.5 m SMU, as presented in Table 19.15.

Table 19.15 Fayalala Change of Support Parameters

Domain	Variance Adjustment Factor
0	0.196
1	0.311
2	0.243
3	0.243
4	0.233
5	0.196
6	0.196
7	0.196
8	0.214

19.1.4.3 Kankarta Model

H&S constructed in Surpac a block model for mineral resource estimation purposes, based on a 25 x 25 x 5 m panel size. This panel size was slightly wider than the drilling spacing, as the Kankarta mineral deposit was essentially overdrilled across strike. All geostatistical analysis, variography modelling, and gold grade estimations was completed in GS3, and then incorporated back into Surpac. Hard boundaries were applied between the mineralised solids and the surrounding peripheral mineralisation.

Data search parameters for the three passes for the mineralised categories are presented in Table 19.16. The greater continuation for the search was along the Easting axis, as represented by 30 m along the Easting and 20 m along the Northing, simulating the continuation of the mineralisation along the 060^{o} – 080^{o} structures.

Table 19.16 Kankarta Data Search Parameters

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	30	20	15	16	32	4
2	45	30	22.5	16	32	4
3	45	30	22.5	8	32	2

19.1.4.4 Firifirini Model

The MIK estimate completed for Firifirini used a regular sample search on a 25 x 25 x 5 m block model. The sample search applied reflects the mineralised domain interpretation, with a minimum of 16 composites, and maximum of 32, used to provide the first and second pass estimates. A third, lower confidence estimate was then completed, which required only 8 composites. Parent blocks were discretised using 5 points in the east dimension, 5 in the north dimension, and 2 in the RL dimension, for a total of 50 discretisation points per block.

H&S applied a single domain to the entire dataset for gold grade estimation, with all composites considered, and no boundaries. Based on the modelled variography, variance adjustment factors were generated and applied, to emulate a 5 x 5 x 2.5 m SMU, via the indirect log normal change of support. Data search parameters are presented in Table 19.17. Search rotation of -30^{o} in the north direction, and -60^{o} in the RL direction, were also specified in the data search, for all three passes.

Table 19.17 Firifirini Data Search Parameters

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	25	25	10	16	32	4
2	32.5	32.5	13	16	32	4
3	32.5	32.5	13	8	32	4

19.1.4.5 Toume Toume Model

The MIK estimate completed for Toume Toume was virtually identical to Firifirini, reflecting their similarities in styles of mineralisation. The block sizes, search parameters for the different passes, and number of discretisation points were the same as the Firifirini model. Data search parameters for the Toume Toume model are presented in Table 19.18, with the rotation of the searchs as the only major difference with Firifirini, at -30^o in the north direction, and 30^o in the RL direction.

Table 19.18 Toume Toume Data Search Parameters

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	25.0	25.0	10	16	32	4
2	32.5	32.5	13	16	32	4
3	32.5	32.5	13	8	32	4

19.1.4.6 Banora Model

H&S constructed a block model for mineral resource estimation purposes, based on a 20 x 15 x 10 m panel size. This panel size was approximately half the drilling spacing. No sub-celling was applied. The mineral block model, mineralised solids, and the different regolith surfaces, were created in Surpac. All geostatistical analysis, variography modelling, and gold grade estimations, were completed in GS3, and then incorporated back into Surpac, for mineral resource reporting and visual assessments.

Gold grade estimation was undertaken applying MIK, where the interpolation was constrained within two mineralised domains, straddling the sub-domains of laterite, saprolite, and fresh. H&S used a three-pass search strategy in gold grade estimation, as presented in Tables 19.19 and 19.20.

Table 19.19 Banora Data Search Parameters for Mineralised Domain

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	35.0	15.0	30	16	32	4
2	52.5	22.5	45	16	32	4
3	52.5	22.5	45	8	32	4

Table 19.20 Banora Data Search Parameters for Waste Domain

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	50	20	10	16	32	4
2	75	30	15	16	32	4
3	75	30	15	8	32	4

Search rotation of -20° in the east direction, and 20° in the RL direction, were also specified in the data search, for all three passes, for all domains.

For the first pass, a minimum of 16 composites, and a maximum of 32, were applied, including a maximum of 4 octants from any one drillhole selected. Search radii for the first pass were 35 x 15 x 30 m. For the second pass, the minimum number of samples for a successful estimate was 52.5 x 22.5 x 45 m. This is the first pass estimation with an expansion factor of 50% on the original distances.

The third search, defining the inferred category, used the same search distances as the second search, but with much reduced data constraints on each panel. All domain boundaries were soft with each other with broad mineralised envelopes capturing the majority of the mineralisation, to reduce the effect of overestimating gold ounces on the margins of the mineralised solid. Other variance adjustment factors, as determined from the variography, were used to emulate an 8 x 3 x 2 m SMU, as presented in Table 19.21.

Table 19.21 Banora Change of Support Parameters

Domain	Variance Adjustment Factor
Mineralised	0.175
Waste	0.175

19.1.4.7 Banko Model

The mineral block model was constructed in Surpac, following the geostatistical, variographic modelling, and gold grade estimation performed in GS3. Block sizes of 25 x 25 x 5 m were employed, reflecting drilling spacing and density, with discretisation points of 5 x 5 x 2, making up 50 points per block.

Search parameters for the block model construction utilised a search of 25 x 25 x 15 m, with an expansion factor of 50%, as presented in Table 19.22. There was no rotation of the searches. Block variance adjustment factor was 0.219, with hard domains between the mineralised domain and the peripheral mineralisation.

Table 19.22 Banko Data Search Parameters

Pass	Search			Composites		Octants
	East	North	RL	Min.	Max.	No.
1	25.0	25.0	15.0	16	32	4
2	37.5	37.5	22.5	16	32	4
3	37.5	37.5	22.5	8	32	4

19.1.4.8 Stockpiles

SMD estimated the tonnages, gold grades, and mineral resource categories, relating to all stockpiles incorporated within the 31 August 2009 mineral resource statement. All stockpile material was either trench sampled or grade control drilled at 10 x 6 m, or closer spacing, with gold grade estimation based around conditional simulation techniques, using Hellman and Schofield's MP3 software. The mineralised rock was then interpreted based on the optimised mineralised outlines, and given to survey to mark out on the bench for extraction by mining. At the completion of every month, the LEFA Gold Mine survey department surveys the stockpiles for volume estimation.

A density was applied to the stockpiles for tonnage estimation, as presented in Table 19.23. SMD believes all stockpile material may be classified in the Measured category.

Table 19.23 Stockpile Dry Density Values

Laterite t/m^3	Saprolite t/m^3	Transitional t/m^3	Fresh t/m^3
2.025	1.55	2.025	2.25

Additional to the RoM stockpiles, SMD identified the potential of processing mineralised material remaining in the old heap leach pad. Prior to the commissioning of the CIL plant, gold was extracted at the LEFA Gold Mine by cyanide heap leaching, between 1995 and 2006.

Areas of the heap leach pad were drilled to ascertain whether an economic stockpile existed. SMD used an approximate spacing of 15 x 15 m, or closer, with vertical holes and samples taken every metre. The samples were assayed at the SGS Laboratory on site, using the same aqua regia methodology for grade control samples. The samples were composited according to their assay on a 2 m sample interval. Table 19.24 presents the statistics of the heap leach pad's drillhole composite samples.

Table 19.24 Basic Statistics of Heap Leach 2 m Composite Samples

Statistic	Value
No of Samples	14018
Minimum	0.000 g/t
Maximum	43.23 g/t
Mean	0.466 g/t
Variance	0.610
Standard Deviation	0.781
Co-efficient of Variation	1.678
Skewness	21.010
Kurtosis	858.476
Top Cuts applied	None

SMD block modelled the heap leach pad in Surpac, using the inverse distance squared method, with block dimension of 15 x 15 x 5 m, which is the same as the maximum drillhole spacing. The entire Heap Leach stockpile has not been drilled. Therefore, the estimation is based on the drilled areas only.

SMD considered the inversed distance squared method appropriate to model the drilled out portions of the heap leach pad, since there is no geological continuity. That is, due to the lack of geological structures observed within the heap leach pad, as it constitutes an amorphous stockpile. Details of the block model construction are presented in Table 19.25.

Table 19.25 Heap Leach Inverse Distance Block Model Construction Parameters

Parameter	Value Used
Data Constraints	Unconstrained
Model Constraints	Unconstrained
Search Radii	35 x 35 x 10 m
Major to Semi Major axis anisotropy	1:1
Major to Minor axis anisotropy	1:1
Maximum Search Distance of Major Axis	50 m
Maximum Vertical Search Distance	10 m
Maximum Number of Informing Samples	16
Minimum Number of Informing Samples	4

The topographic surface of the heap leach stockpile was surveyed by SMD, and with a pre-stacking topographic surface, a mass of some 13.4 Mt was estimated, based on a dry density of 1.5 t/m^3.

SMD believes that, considering the drilling, sampling and surveying techniques to be of sufficient quality, the heap leach stockpile material may be classified in the Indicated category.

19.1.5 Mineral Resource Statement

The Mineral Resource Statement, as at 31 August 2009, has been prepared and reported in accordance with Canadian National Instrument 43-101, Standards of Disclosure for Mineral Projects (the Instrument) and the classifications adopted by CIM Council in December 2005. These resources are subdivided by mineral deposit, material type, gold cutoff grade, and resource category, as presented in Table 19.26.

Mineral Resource estimates for Lero-Karta, Fayalala, Kankarta, Firifirini, Banko, Folokadi, Toume Toume, and Banora were generated by, or under the supervision of, Mr Nicolas Johnson, from Hellman and Schofield. Mr Johnson has over 20 years experience working with the type of mineralisation characteristic of the LEFA Gold Mine, and had estimated similar mineral resources in Australia, Asia and Africa. Mr Johnson is an independent qualified person applying all of the tests in section 1.4 of National Instrument 43-101.

Mineral Resource estimates for Stockpiles, Heap Leach, Diguili Bougoufe, Dar Salaam, Diguili North, Banora West, Hansaghere, Sikasso, and Solabe were generated by Mr Rohan Williams, SMD's Chief Geologist, under the supervision of Mr Hepworth. Mr Williams has over 5 years experience working with the LEFA Gold Mine mineralisation. Mr Williams is not an independent qualified person applying all of the tests in section 1.4 of National Instrument 43-101.

The Mineral Resource estimate for Sanou Kono was generated by RSG, and as previously filed by Guinor in the RSG Technical report in March 2005, since which time there has been no material change in the information. Mr Hepworth considers this estimate accurate and accepts it as such.

Table 19.26 Mineral Resources[1] by Classification

Deposit	Measured[3]			Indicated[3]			Inferred[2]		
	kt	g/t	k oz	kt	g/t	k oz	kt	g/t	k oz
LEFA Corridor									
Lero-Karta	26,819	1.4	1,227	13,065	1.5	639	2,784	1.3	117
Fayalala	46,390	1.0	1,465	5,042	1.0	155	3,877	1.1	132
Kankarta	2,844	1.4	129	1,171	1.3	48	99	1.3	4
Firifirini	3,779	1.6	188	1,951	1.4	85	1,084	1.6	54
Banko	975	1.9	58	446	1.3	18	223	0.9	6
Folokadi	545	1.5	27	1,746	1.7	93	689	2.0	45
Toume Toume	218	1.4	10	497	1.3	21	512	1.3	22
Sanou Kono				1,629	1.2	60			
Stockpiles	6,801	0.9	197						
Heap Leach				2,313	0.8	57			
Sub-total	**88,371**	**1.2**	**3,300**	**27,860**	**1.3**	**1,177**	**9,268**	**1.3**	**380**
Regional									
Banora	2,196	1.7	119	598	1.5	29	330	1.6	17
Diguili Bougoufe							273	2.1	18
Dar Salaam							522	1.1	18
Diguili North							1,782	1.4	78
Banora West							432	1.5	21
Hansaghere							511	1.1	18
Sikasso							584	1.4	26
Solabe							371	1.5	18
Sub-Total	**2,196**	**1.7**	**119**	**598**	**1.5**	**29**	**4,805**	**1.4**	**214**
TOTAL	**90,567**	**1.2**	**3,419**	**28,458**	**1.3**	**1,206**	**14,073**	**1.3**	**594**

1. Mineral resources are not mineral reserves and do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, socio-political, marketing, or other relevant issues.

2. The quantity and gold grade of reported Inferred resources in this estimation are uncertain in nature, and there has been insufficient exploration to define these Inferred resources as an Indicated or Measured mineral resource. Further exploration drilling is required to determine whether they can be upgraded to an Indicated or Measured mineral resource category.

3 The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Mineral Reserves.

The Whittle Four-X (Whittle) pit optimising software was used to generate pit shells for Lero-Karta, Fayalala, Kankarta, Firifirini, Folokadi, and Toume Toume, based on Measured, Indicated, and Inferred (MII) mineral resources, and the technical-economic parameters used to evaluate the mineral reserves, but at a gold price of USD 1,000/oz. These MII pit shells were used to limit the extent of the mineral resources, thus eliminating mineralised material with low potential for economic extraction by open pit method.

The LEFA Gold Mine estimated in-situ Measured and Indicated mineral resources are 109.9 Mt, at average gold grade of 1.2 g/t, for contained gold of 4.4 million ounces, excluding 9.1 Mt at 0.7 g/t of stockpiled rock. 97% of these resources are within the LEFA Corridor.

Total estimated Measured and Indicated mineral resources are 119.0 Mt, at average gold grade of 1.2 g/t, for contained gold of 4.6 million ounces.

Furthermore, the estimated Inferred mineral resources are 14.1 Mt, at average gold grade of 1.3 g/t, for contained gold of 0.6 million ounces, of which 66% are within the LEFA Corridor.

The cutoff grades used to report the LEFA Gold Mine mineral resource inventory are presented in Table 19.27.

Table 19.27 Mineral Resources Cutoff Grades by Material Type

Deposit	**Cutoff Grade – g/t**		
	Laterite	**Saprolite**	**Fresh**
Lero-Karta	0.5	0.4	0.5
Fayalala	0.5	0.4	0.5
Kankarta	0.4	0.4	0.5
Firifirini	0.5	0.5	0.6
Banko	0.4	0.4	0.5
Folokadi	0.4	0.4	0.5
Toume Toume	0.5	0.5	0.6

For comparison, the LEFA Gold Mine mineral inventory within the USD 1,000/oz MII pit shell, and at various gold cutoff grades, is presented in Table 19.28. This inventory excludes all regional models and stockpiles, and includes only the mineral resource models listed in Table 19.27.

Table 19.28 Mineral Inventory at Varying Cutoff Grades

Cutoff Grade g/t	**Measured**			**Indicated**			**Inferred**		
	Mass kt	**Grade g/t**	**Gold k oz**	**Mass kt**	**Grade g/t**	**Gold k oz**	**Mass kt**	**Grade g/t**	**Gold k oz**
0.4	93,830	1.1	3,281	27,391	1.3	1,110	11,325	1.1	410
0.5	78,121	1.2	3,054	23,563	1.4	1,055	9,153	1.3	379
0.6	65,662	1.3	2,835	20,494	1.5	1,001	7,507	1.4	350
0.7	55,510	1.5	2,623	17,940	1.6	948	6,315	1.6	325
0.8	47,104	1.6	2,421	15,786	1.8	896	5,373	1.7	302
0.9	40,087	1.7	2,229	13,928	1.9	845	4,610	1.9	281
1.0	34,362	1.9	2,054	12,314	2.0	796	3,999	2.0	263

19.2 Mineral Reserve Estimates

The LEFA Gold Mine open pit designs and subsequent mineral reserves estimation were carried out by, or under the supervision of, Mr Urbaez, using the mineral resource block models generated by H&S and SMD, and topographic data as of 31 August 2009, as provided by SMD. Mr Urbaez has over 10 years experience working in open pit and underground gold mining operations, planning and project development, with mineralisation characteristics similar to those found at the LEFA Gold Mine. Mr. Urbaez is an independent qualified person applying all of the tests in section 1.4 of National Instrument 43-101.

The mineral reserves were estimated at a USD 800/oz gold price. This gold price approximated the three year average gold price (London fix) as at 31 August 2009.

The methodology applied is summarised as follows:

- Pit shells were estimated using Whittle, and a set of technical and economic parameters;
- Final pit shells were selected from the Whittle pit shell series;
- The final pit shells were smoothed to eliminate non operational areas and for geometry; and,
- The smoothed pit shells were converted to practical pit designs, which were considered for mineral reserves reporting.

19.2.1 Pit Optimisation

Based on these mineral resource block models developed in the Surpac software, and a set of technical and economic parameters, Whittle used a Lerch-Grossmann based algorithm to generate pit shells, where the project operating profit margin, or cash flow, was maximized.

The Whittle process used the revenue and cost parameters as specified, to generate a series of incremental pit shells, for progressively increasing metal prices (revenue). At the economic pit limit, the incremental pit shells were at break even, where the revenue equals the operating costs. This was the economic final pit limit for each mineral deposit. The smaller nested pit shells were useful to help decide where mining was to be started, as these small pit shells were mining the highest profit areas of the mineral resources.

The parameter for generating the incremental pit shells was set to allow the evaluation of the different mineral resource block models at gold prices ranging from USD 600/oz, to USD 1,000/oz, in increments of USD 25/oz.

Whittle reported the results of each incremental nested pit shell on two basis, estimating:

1) The undiscounted cash flow; and

2) The discounted cash flow.

Typically, the ‘optimum’ pit shell is then chosen by inspecting these cash flows and selecting the pit shell with the maximum total cash flow. The maximum undiscounted cash flow is the pit shell where the incremental pit is breaking even, and is therefore the maximum economic pit in today’s revenue/cost terms. If a discount rate is used, the pit shell with the maximum discounted cash flow is always somewhat smaller. However, this smaller ‘final pit’ would be more profitable.

Using the discount factor specified, Whittle produces two cash flows based on different scheduling scenarios. The first case, namely the Best Case, assumes that mining progresses strictly according to a series of incremental nested pit shells. This scenario is optimistic, and is not practical, but it does indicate the highest possible project value that might be achievable. The second case, namely the Worst Case, assumes that mining progresses on a bench by bench basis, mining to the limit of the ‘final’ pit. This scenario indicates the lowest possible project value. In reality, the pit will operate somewhere between the two cases, where intermediate and practical cutbacks are defined and then mined in sequence.

If the discount factor is 0%, the cash flows for the best and the worst cases will be equal, and therefore the ‘optimum’ pit shell (maximum cash flow) will be the same.

The Lerch-Grossmann based algorithm is founded on mining whole blocks only. The resulting pit shells are quite irregular and do not incorporate ramps. The pit shell results are used for preliminary project economic analyses, to assess the sensitivity of the project due to changes to input parameters, and to guide intermediate and final pit design.

Pit optimisation inputs were estimated from first principles, and were mainly based on the LEFA Gold Mine productivity models and estimated preliminary budget costs for 2010. The metallurgical parameters were derived from laboratory testwork from representative ore samples.

Table 19.29 presents a summary of the main pit optimisation input parameters per pit/deposit. These parameters include the following:

- Pit slope angles: The recommended inter-ramp slope angles (at a factor of safety of 1.2) as given in Section 19.2.4. As Whittle requires an overall slope angle, an allowance of some 5° was used to account for access ramps, where appropriate;

- Mining cost: This cost item includes drilling, blasting, loading and hauling. The hauling cost of ore is to the surface ROM and that of waste is to surface waste dumps. A mining cost adjustment factor has been applied to simulate the increase in the mining cost due to longer haul distances as each pit gets deeper;

- Mining dilution and mining recovery: Ore dilution and losses, due to mining activities, are inherently built into the mineral resource models;

- Processing cost: This is the cost per tonne of ore for crushing and processing the ore in the CIL plant;

- Administration cost: It is the cost per tonne of ore of administration and overheads (G&A) for running the mining operation;

- Rehabilitation cost: This cost provides an allowance for rehabilitating the waste dumps, and for funding mine closure;

- Processing recovery: Process/metallurgical recovery factors have been estimated for each ore type, per deposit.

- Selling Costs/Royalty: This factor is based on 5.6% of revenue, plus USD 1.05 per gold ounce produced;

- Base Product Price: A gold price of USD 800/oz was used;

- Mineral resources: Only measured and indicated mineral resources were considered for ore potential in the pit optimisation exercise. Inferred mineral resources were treated as waste;

- Material types: Transition and fresh material types were grouped into one material type, namely Fresh.

Table 19.29 Pit Optimisation Parameters

Item	Unit	LK, FY	KK,BK,FL	FF	TT
Gold Price	USD/oz	800	800	800	800
Gold Price	USD/g	26	26	26	26
Royalty	USD/g	1.5	1.5	1.5	1.5
Discount Rate	%	10	10	10	10
Effective Gold Price	USD/g	24	24	24	24
CIL Ore Process Rate	Mtpa	6.0	6.0	6.0	6.0
Process Recovery - laterite	%	95.0	91.4	90.0	90.0
Process Recovery - saprolite	%	93.1	90.1	90.0	90.0
Process Recovery - fresh	%	89.9	89.5	90.0	90.0
Mining Ore Loss	%	0.0	0.0	0.0	0.0
Mining Dilution	%	0.0	0.0	0.0	0.0
Treatment Cost - laterite	$/t milled	8.7	6.9	6.9	6.9
Treatment Cost - saprolite	$/t milled	6.9	6.9	6.9	6.9
Treatment Cost - fresh	$/t milled	9.4	9.4	9.4	9.4
Grade Control Cost	$/t milled	0.7	0.7	0.7	0.7
Process Maintenance Cost	$/t milled	1.3	1.3	1.3	1.3
Crusher Feed Cost	$/t milled	0.2	0.2	0.2	0.2
Sustaining Capital	$/t milled	0.1	0.1	0.1	0.1
G&A Cost	$/t milled	3.2	3.2	4.8	5.5
Dump Rehabilitation Cost	$/t waste	0.2	0.2	0.2	0.2

LK=Lero-Karta, Camp de Base, Pharmacie; FY=Fayalala, Bofeko; KK=Kankarta; BK=Banko; FL=Folokadi; FF=Firifirini; TT=Toume Toume

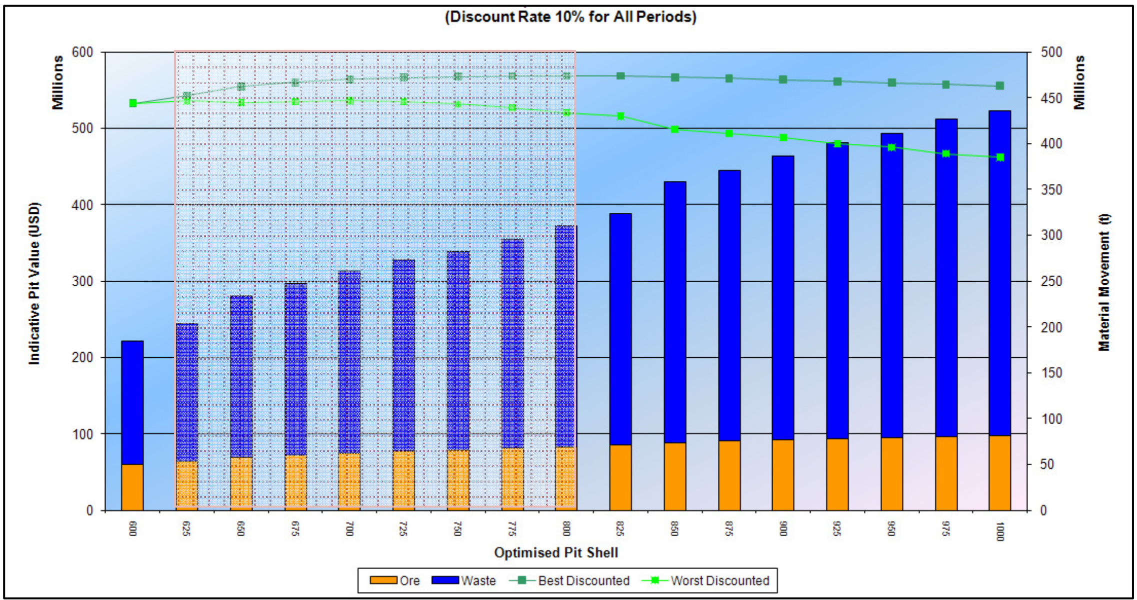
19.2.2 Pit Shell Selection

The resulting pit shell series is analysed to determine the discounted cash flow from each shell. Considering the relative mine life of each of the mineral deposits, waste to ore strip ratio profile, and incremental waste strip cost, optimum pit shells were selected for each pit, based on the discounted cash flow. The combined pit optimisation result, for all measured and indicated mineral resource models, is presented in Table 19.30, and illustrated in Figure 19.1.

Table 19.30 Whittle USD 800/oz Analysis, Based on Measured and Indicated Mineral Resources Only

Gold Price $/oz	Best Case M USD	Worst Case M USD	Waste Mt	Ore Mt	Gold g/t	Gold '000 oz	Strip t_{waste}:t_{ore}
600	533	533	134	50	1.58	2,537	2.7
625	543	535	150	53	1.56	2,676	2.8
650	555	534	176	58	1.55	2,879	3.0
675	560	535	187	60	1.54	2,970	3.1
700	564	536	199	62	1.53	3,059	3.2
725	566	535	208	64	1.52	3,128	3.3
750	568	532	217	66	1.51	3,185	3.3
775	568	527	228	67	1.50	3,254	3.4
800	569	520	241	69	1.50	3,323	3.5
825	568	516	253	71	1.49	3,385	3.6
850	566	499	285	74	1.48	3,521	3.9
875	565	493	295	75	1.48	3,569	3.9
900	564	488	310	77	1.47	3,628	4.0
925	561	480	323	78	1.47	3,680	4.1
950	559	475	332	79	1.46	3,715	4.2
975	557	467	346	80	1.46	3,761	4.3
1,000	555	462	355	81	1.46	3,787	4.4

Figure 19.1 Whittle USD 800/oz Analysis, Based on Measured and Indicated Mineral Resources Only



Considering the discounted cash flows for the Best and Worst cases, the pit shells of interest lie between gold price of USD 625 and 800/oz. This is the region where the cash flow for both cases peak. The cash flow analysis was performed on a mineral deposit by deposit basis, for Lero-Karta (Lero-Karta-CampdeBase and Pharmacie), Fayalala (Main, Mid, East 1 and 2, and Bofeko), Kankarta (East and West), Folokadi, Banko, Firifirini, and Toume Toume.

Furthermore, considering the number of practical cutbacks that could potentially be designed within each pit shell, the incremental waste stripping cost for each additional tonne of ore, and the time it would take to mine it, pit shells were selected for each of the different 7 mineral deposits. Consequently, pit shells corresponding to a long term gold price of USD 650/oz were selected for the Lero-Karta and Fayalala mineral deposits, whereas for the remaining mineral deposits, pit shells corresponding to a long term gold price of USD 750/oz were selected.

Figures 19.2 and 19.3 illustrate an interesting change in the in-pit material movement, in-situ gold ounces, and discounted cash flow at around a gold price of some USD 850/oz.

Therefore, assuming all technical-economic parameters remain constant, except for the assumed long term gold price, the selected pit shells are valid for a range of gold prices, up to USD 850/oz. A cutback analysis may be performed, to expand the pit limits, once this value is assumed as the long term gold price.

Figure 19.2 Whittle USD 800/oz Analysis - Pit Shell Inventory

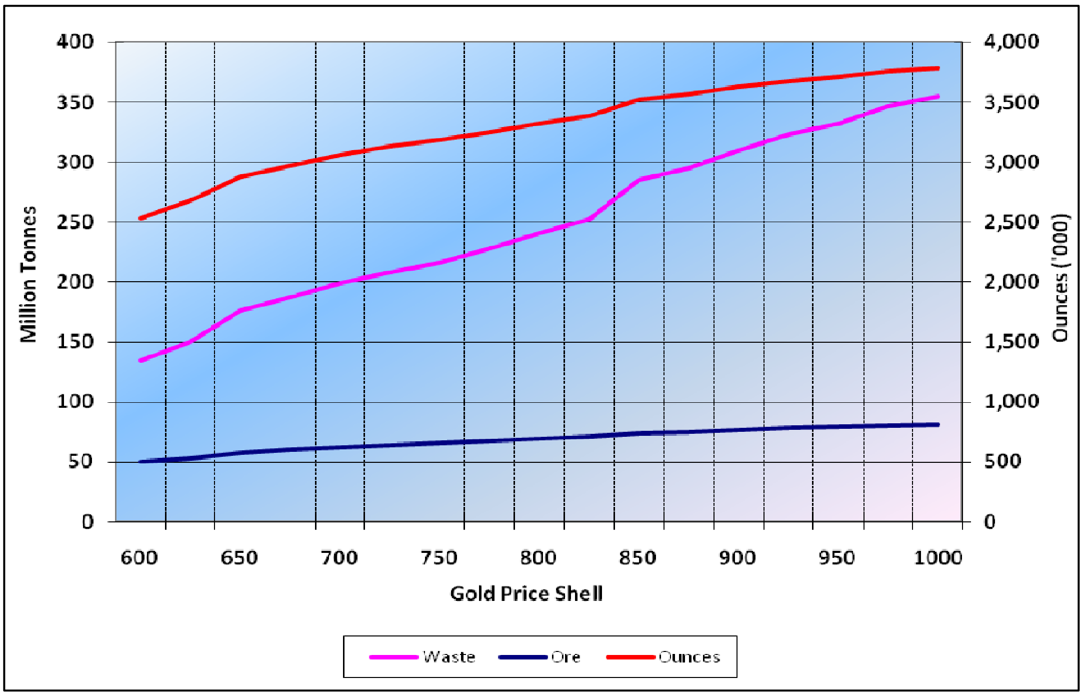
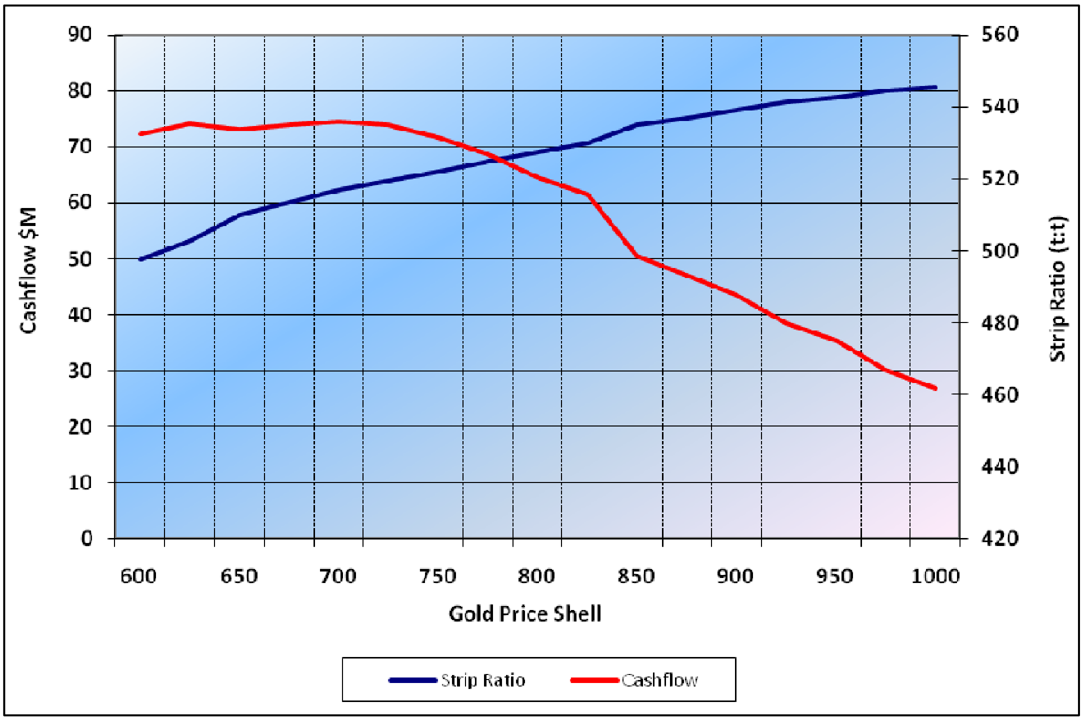


Figure 19.3 Whittle USD 800/oz Analysis - Pit Shell Discounted Cash Flow (Worst)



19.2.3 Pit Design

Following from the pit optimisation exercise, and considering the relative life of each pit, the selected pit shells were used as a template for the design of the practical pits.

The pit shells are based on mining whole ore and waste blocks from the mineral resource block model, which results in the pit shells being quite irregular in shape. The design of practical pits ensures that all material can be mined with a minimum of difficulty, and smoothes out the pit shells.

Practical pit designs endeavour to extract the majority of the economic ore within the pit shells. However, it is not always possible to practically mine all of the ore indicated by the pit shells. For example, this is most evident in the base of the pit shells, where the Whittle program infers that the pits will be mined down to a block. This is typically not possible with earth moving equipment, so the last few meters of the pit shells are often ignored, and the pits are designed with a flat floor large enough for the mining equipment to work in. The smallest area that the equipment can work in is referred to as the "minimum mining width".

The following are the main assumptions for the mining of the mineral deposits:

- Mining equipment with excavators in backhoe configuration;
- Pit wall configuration – as per geotechnical recommendations in Section 19.2.4; and,
- Surface access roads are developed linking the various pits and surface dumps.

In-pit ramps have been designed using the following parameters:

- Ramp width (major) 22m;
- Ramp width (minor) 18.5m and 15m; and,
- Ramp gradients 10%.

The pit designs were used to generate triangulated surfaces representing the end mining topography. These surfaces were then used to extract the mineral resource tonnages and grades, on a bench-by-bench basis, from the respective mineral resource block model.

Marginal gold cutoff grades used for estimating in-pit mineral reserves were based on considering all cost beyond the pit rim. Costs that have been included are the extra ore haulage beyond the pit, processing, general site administration, and royalties and selling costs.

The marginal gold cutoff grades, as presented in Table 19.31, were estimated using the equation:

$$\text{Cutoff Grade (g/t)} = \frac{\text{(Incremental mining cost + process related cost + G\&A Cost)} - \text{Rehab}}{\text{(Gold Price – Sales Cost/Royalty) x Metallurgical Recovery}}$$

The incremental mining cost is the extra cost that would be incurred (for example, grade control and haulage costs) should a block of material be defined as ore rather than waste. Any material with grade greater than, or equal to, the marginal gold cutoff grade was classified as ore. If the marginal gold cutoff grade was not met, then the material was classified as waste, or sub economic material.

Table 19.31 Mineral Reserves Marginal Gold Cutoff Grades

Deposit	**Laterite g/t**	**Saprolite g/t**	**Fresh g/t**
Lero-Karta	0.6	0.5	0.7
Fayalala	0.6	0.5	0.7
Kankarta	0.6	0.6	0.7
Firifirini	0.6	0.6	0.7
Banko	0.6	0.6	0.7
Folokadi	0.6	0.6	0.7
Toume Toume	0.7	0.7	0.8

Table 19.32 presents a summary of the material breakdown as contained within the final pit designs, by mineral deposit.

Table 19.32 In-Pit Inventory by Mineral Deposit

Area/Pit	Volume '000 m^3	Moved kt	Waste kt	Ore kt	Au g/t	Au '000 oz	Fresh %
Lero-Karta	64,869	135,257	109,469	25,789	1.7	1,394	76
Fayalala	35,253	73,772	51,384	22,388	1.2	865	53
Kankarta	8,554	19,997	17,542	2,455	1.7	134	94
Firifirini	10,663	21,803	17,762	4,041	1.7	219	33
Banko	864	1,591	1,223	368	3.2	37	39
Folokadi	3,301	6,542	5,075	1,467	2.0	95	45
Toume Toume	838	1,749	1,491	258	1.5	12	19
Total/Average	**124,343**	**260,712**	**203,945**	**56,767**	**1.5**	**2,756**	**63**

By mineral deposit, the Lero-Karta pits are the most important. The excavated material in these pits is the largest, at some 52% of the total for all pits. Furthermore, these pits contain 45% of the excavated ore tonnes, for approximately 51% of the in-situ gold ounces. The average waste to ore stripping ratio is some 4.2:1, tonne per tonne (t:t). Most of the identified ore tonnes in this area are in the transition and fresh rocks.

The Fayalala group of pits is the second largest, representing some 28% of the total excavated material. The pits in this area contain 39% of the excavated ore tonnes, for 31% of the in-situ gold ounces. The average waste to ore stripping ratio is the lowest at 2.3:1. The identified ore tonnes in this area are almost evenly split between oxide and transition/fresh rocks.

The third group, consisting of Kankarta, Folokadi, and Banko, represents 10% of the total excavated material. These pits contain 8% of the excavated ore tonnes, for 10% of the in-situ gold ounces. This group of pits contains the highest estimated average gold grades. The average waste to ore stripping ratio varies between 3.3:1 at Banko, and 7.1:1 at Kankarta.

Lastly, Firifirini and Toume Toume form the group of pits mining the skarn mineral resources. This group represents 9% of the total excavated material, and contain 8% of the excavated ore tonnes, for 8% of the in-situ gold ounces. The average waste to ore stripping ratio are some of the highest, at 4.4:1 at Firifirini, and 5.8:1 at Toume Toume.

19.2.4 Pit Wall Configuration

Section 19.2.4 was extracted from Sections 5 and 6 of the SW report, titled "LEFA Corridor Project – Geotechnical Pit Design Reviews", November 2009.

The following pit slope angle recommendations are only provided for use in planning of mining operations. They are not for use in construction and detailed pit design as they are derived largely from the field observations of the safer elements of the current operational pits and have not been analytically substantiated in respect to a slope design criteria of a FoS of >1.2. Note slope angle comments generally relate to angles within lithological units whereas inter-ramp angles are defined by the slope between the toe of successive benches.

- Laterites (all pits) – in transported laterites where profiles can be accommodated in a single bench, a cut-face slope of 25° and a minimum catch berm width equal to the bench height is recommended. In-situ laterites maybe considered as per saprolites.
- Saprolite slopes for Lero Karta Pits (including Camp de Base and Pharmacie)
    - 37° in saprolites are recommended in all but north west to north east slopes;
    - 30° inter-ramp slopes are recommended in permanently drained, (bedding controlled) northern, north eastern and north western slopes (i.e. not down gradient from the Lero river diversion), or any undrained slopes.
- Saprolite slopes for Fayalala Pit
    - an inter-ramp slope of 37° is recommended noting that this accords with previous recommendations of an overall slope angle of 40° in saprolite in the east walls of south pit, and field observations of pit west walls indicate the oldest of drained saprolite slopes also appear stable up to 40°;
    - north walls need to reflect the structural control of bedding day-lighting in the slope an overall slope of 27° is recommended as per previously.
- Saprolite slopes for Firifirini
    - An inter-ramp slope angle in the saprolites of 40° is recommended for the eastern slopes to reflect the structural context established for the pit from the generalised geological model, and an overall slope of 45° is recommended for all other slopes.
- Transition Zone
    - 39° inter-ramp slopes are recommended, as per previously in the transition zone in the Lero Karta pits;
    - a similar inter-ramp slope is also recommended for Fayalala given the performance of the current slopes;
    - a similar slope is also recommended for the proposed pits of Camp De Base, Pharmacie, Fayalala, Bofeco and Banko as they are considered to be located in a similar structural context;
    - 40° and 42° inter-ramp slopes are as previously recommended in the transition zone for Kankarta West and East pits respectively.
- Fresh Bedrock (all pits) – a 60° inter-ramp has been adopted in all pits as per previous recommendations. However, a 55° inter-ramp slope for all north western, northern and north eastern slopes is recommended and this will ultimately need to be designed taking into account the structures, bedding dip and the condition of the bedding planes. In addition, it is essential that slopes are drained by in pit dewatering

and that bench integrity is maintained by the adoption of pre-splitting to reduce face disturbance and maintain the design profile.

- Kankarta East
  - 40° inter ramp slopes above 505 mRL and 55° below 505 mRL, 60° in fresh rock and 55° in ROM on northern slopes where potentially structurally controlled are recommended and 30° inter-ramp slopes for the north wall pit slopes in the saprolites.
- Kankarta West
  - inter ramp slopes of 42° above 460 mRL and 45° below 460 mRL in ROAL are recommended and 60° in fresh rock and 55° in ROM on northern slopes where potentially structurally controlled.
- Bofeco
  - 30° inter-ramp slopes in the saprolites are recommended in the south east pit wall as it is assumed it is not drained, given the nearby unlined river diversion.
  - 37° inter-ramp slopes in the saprolites are recommended for all other pit walls.
- Banko
  - 37° inter-ramp slopes are recommended for the saprolites slopes.
- Folokadi
  - structural information is limited to determine if Folokadi is potentially similar to Fayalala or Lero Karta. 37° inter-ramp slopes and 27° overall slope on the northern pit saprolites slopes are recommended.
- Toume Toume
  - structural information is limited to determine if Toume Toume is potentially similar to Fayalala or Lero Karta. 37° inter-ramp slopes and 30° overall slope on the northern pit saprolites slopes are recommended.
- River sediments – in Camp de Base, Firifirini and Toume Toume pits river sediments need to be stripped back to ensure river diversions pick up surface and near surface interflows. Specific pit slopes are not defined, but allowances for overburden strip and diversion works need to be identified.

A total of over 50 pit slope sections, were inspected for the compliance check of final pit designs with geotechnical slope recommendations. The sections were selected typically at 250 m spacing on each pit wall. Within each section, a total of 359 lithological defined slopes were specifically checked with a total height of over 7,650 m - the results are summarised in Table 19.33.

Table 19.33 Summary of Compliant and Non-Compliant Slope Sections

NO. OF SECTIONS	LAT	LAT/ SAP	SAP	ROAL	ROM	Totals	%
Compliant Pit Slope Sections	9	0	46	27	130	**212**	**59**
Marginal Slope Non-compliance (>+2 deg but <10 m)	38	4	9	16	3	**70**	**24**
Marginal Angle Non-compliance (<+2 deg)	0	0	11	3	1	**15**	
Non-Compliant Pit Slope (> +2 deg and >10 m height)	23	2	30	6	1	**62**	**17**
Totals	**70**	**6**	**96**	**52**	**135**	**359**	**100**
Total Height of Compliant Sections (m)							
Total Compliant Pit Slope Height	80	0	1221	402	3753	5457	**71**
Marginal Slope Non-compliance (>+2 deg but <10 m)	285	40	71	83	14	493	**12**
Marginal Angle Non-compliance (<+2 deg)	0	0	320	38	70	428	
Non-Compliant Pit Slope (> +2 deg and >10 m height)	354	28	788	99	25	1293	**17**
Total Height of Pit Slopes by Lithology (m)	**719**	**67**	**2400**	**623**	**3862**	**7671**	**100**

A total of 59% of slopes were compliant with recommended slope angles. Of the non-compliant slopes, 24% of the slopes are marginal in that they are short inter-ramp slopes of less than 10 m in height or within 2 degrees of the recommended slope angle, and therefore, considered within the accuracy of the level of design. Accounting for total slope height for each lithology, the actual length of slopes that are considered compliant is 71% and those significantly non-compliant is 17%.

However, a comparison of the significance of the design slopes as compared to the recommendations suggests many compliant slopes are conservative as compared to the recommended slope angles, and many non-compliances would result in limited additional excavation. An estimate of these differences suggests the non compliant designs may be reducing the anticipated total pit excavation volumes by 2 Mm^3 but, the conservativeness of slopes in compliant areas may be leading to an additional excavation volume of 12 Mm^3.

In summary, the pit designs whilst including 17% of lithological slope non-compliances the designs are broadly compliant for the purposes of a mineral reserve estimate and planning.

19.2.5 Pit Dewatering

Pit dewatering is managed by using localised in-pit sumps in strategic locations, with diesel powered mobile pumps lifting the water to the surface, and connecting to a surface collection area with discharge to the receiving environment, if water quality parameters permit.

19.2.6 Waste Rock Disposal

Fresh and weathered waste rock materials are, and will continue to be, deposited in dedicated surface waste dumps adjacent to the pits.

The waste dumps are typically constructed in 10 m lifts with rehabilitated batter slopes of approximately 22º. A 10 m wide berm is left at every lift, to dissipate the velocity of water run-off from the dump. The required total waste dump capacity is presented in Table 19.34. However, the LEFA Gold Mine has capacity to deposit waste rock in excess of 150 million cubic metres.

As each waste dump reaches its final design limits, the faces will be progressively dozed down to the required angle, and then covered with suitable planting medium to allow the closure and land use plan to be implemented.

Backfilling of the pits, to reduce haulage costs, was not fully investigated due to the possibility of some of the pits expanding in all directions, and the long term sustainable development aim to use the pits as water reservoirs for agricultural projects.

Table 19.34 Waste Dump Capacity

Pit	**Mass** **kt**	**Compacted Density** **t/m^3**	**Volume** **'000 m^3**
Lero-Karta			
Main	106,037	1.72	61,777
Pharmacie	3,431	1.58	2,177
Fayalala			
Main	48,167	1.74	27,658
Bofeko	2,829	1.76	1,610
Mid	387	1.62	239
Kankarta			
East	13,582	1.96	6,918
West	3,960	1.85	2,138
Firifirini			
Main	17,762	1.72	10,331
Banko			
Main	1,223	1.50	817
Folokadi			
Main	5,075	1.63	3,107
Toume Toume			
Main	1,491	1.76	847
Total	**203,944**	**1.73**	**117,619**

19.2.7 Production Schedule

Some of the stockpiles are joined with waste dumps. However, the contact surface between the two rock categories is relatively small. During mining operations, stockpiled ore may be displaced, or "lost", and waste added to the ore. A small portion of the stockpiled ore is expected to be lost due to vertical and horizontal movement resulting from excavating activities. Therefore, a factor of 5% was assumed for the ore that will be lost to waste. At the same time that ore is lost, the void left by this ore may be filled with waste material. Therefore, a mining dilution factor of 5% was added. That is, the stockpiled ore tonnes were increased by 5%, after ore losses, but with waste at zero grade.

The production schedule was generated in Microsoft Excel, based on a bench by bench mining approach for each pit. In order to minimise the waste strip and maximise the ore exposed, several criteria needed to be satisfied. These include:

- mining fleet flexibility for campaign mining;
- identification of high grade areas; and,
- minimum number of working faces per period of time.

Applying a truck and excavator mining method for the operation satisfies these requirements. Table 19.35 presents the estimated Life of Mine (LoM) production schedule for the LEFA Gold Mine.

Table 19.35 Life of Mine Production Schedule

	Unit	2009[1]	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pits													
Total	Mt	8.7	24.5	26.7	30.2	23.2	22.4	23.9	23.2	22.9	24.6	20.7	9.8
Waste	Mt	6.4	17.6	21.0	24.4	17.9	17.4	19.0	18.6	18.6	20.0	16.3	6.7
Ore	Mt	2.3	6.9	5.7	5.9	5.2	5.0	4.9	4.6	4.3	4.5	4.4	3.1
Au grade	g/t	1.3	1.5	1.5	1.4	1.5	1.6	1.4	1.5	1.6	1.5	1.5	1.8
Fresh rock	%	30	42	42	60	51	61	81	79	68	68	100	89
S.R.	t:t	2.9	2.5	3.7	4.2	3.4	3.5	3.9	4.1	4.3	4.4	3.7	2.2
Stockpile													
from pits													
Ore	Mt		1.8	0.8	1.3	0.5	0.7	0.1					
Au grade	g/t		1.1	1.0	1.0	1.0	1.3	1.0					
Fresh rock	%		56	100	100	100	100	100					
to plant													
Ore	Mt		0.6	1.1	1.5	1.3	1.7	1.2	1.4	1.7	1.3		
Au grade	g/t		0.8	1.2	0.9	0.8	0.8	1.0	1.0	1.0	1.1		
Fresh rock	%		0	44	2	0	0	19	95	100	100		
Balance													
Ore	Mt	6.8	8.0	7.6	7.4	6.6	5.6	4.5	3.0	1.3			
Au grade	g/t	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1			
Fresh rock	%	12	22	27	45	58	81	98	100	100			
HLto plant													
Ore	Mt										0.2	1.6	0.5
Au grade	g/t										0.7	0.7	0.7
Fresh rock	%										0	0	0
Plant													
Ore	Mt	2.3	5.7	6.1	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.0	3.6
Au grade	g/t	1.3	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.6
Au content	K oz	93	284	288	265	270	274	264	273	276	274	251	185
Fresh rock	%	30	33	35	37	35	39	68	83	77	73	73	76

1. from 1 September 2009

The production schedule is designed to deliver ore to the plant at a rate of approximately 6 million tonnes per annum. It is based on equipment hours and productivities, to ensure a fully utilised fleet is maintained. Only Measured and Indicated mineral resources were used in the classification of ore tonnes.

In general, the production schedule yields some 65.9 Mt of ore, at an average gold grade of 1.4 g/t, for the next 10.5 to 11 years, at a waste to ore strip ratio of 3.6:1. On average, about 270 thousand gold ounces per annum are delivered to the CIL plant, for a LoM total of some 3.0 million ounces.

Rock excavating activities are conducted every month. Trucks are filled in 4 passes. Drilling and blasting is required to assist fragmentation and subsequent loading of most rock, waste and ore-bearing. On average, the mine will excavated some 25 Mt per annum.

5.2 Mt of ore, at average gold grade of 1.1 g/t, are sent to the stockpiles from the pits. In total, 14.3 Mt of ore, at average gold grade of 0.9 g/t, are rehandled, including 2.3 Mt of ore from the existing heap leach pad material.

Some 204 Mt of waste rock from the excavation areas is hauled to external waste dumping areas. The practicality of backfilling any of the final pits was not investigated, even though this could minimise transport costs and visual impact on the local environment.

19.2.8 Closure Plan

19.2.8.1 Pit Closure and Wall Stability

When mining is complete at each open pit, the access to vehicles and personnel will be restricted by a combination of removing surface roads, and constructing bunds around the entire pit circumference. These bunds will be a minimum of 20 m from the pit crest and will be a minimum of 2 m high. The pits will be allowed to fill with water, from both surface run in and ground water. This water will be used for irrigation for agricultural and potential aquaculture facilities. The agricultural projects are for both local consumption and cash crops, including bio-diesel. In consultation with the local communities, the pits can supply water to ponds that are stocked with local species of table quality fish, reeds and lilies, to provide food and shelter for the fish. It is possible that the pits with irrigation for agriculture and aquaculture can be a sustainable source of food, as well as a livelihood for the local communities.

19.2.8.2 Waste Dump Rehabilitation and ARD Management

The waste dumps will be progressively rehabilitated during the LEFA Gold Mine life, by battering down the final dump edges to 20º slopes. The slopes will be covered with suitable materials, to assist with the establishment of grasses and bushes, and will be shaped and drained to minimise erosion. From preliminary testwork, the excavated waste rock is not expected to have significant ARD potential.

However, if further testing indicates otherwise, then a management program will be instigated to manage this ARD. The risks associated with ARD will be mitigated through engineered waste dumps that ensure that acid generation is minimised, and any drainage that may result is contained and treated, before being released to the receiving environment. The monitoring and management of a waste dump producing ARD will extend beyond mine closure.

19.2.8.3 Removal of Infrastructure and Scrap

All infrastructure, that will not be retained for community use, will be removed by either relocating from the site, or demolished according to the construction of the structure. Concrete and steel reinforcement will be completely removed from the surface, and either buried in the waste dumps, or sold as scrap, depending on any potential secondary use of the products removed.

19.2.8.4 Removal of Access Roads

All access roads, that are not required for community use, will be ripped and sheeted with materials suitable for the regeneration of vegetation. These will primarily be within the mining areas. The haulage roads, and most of the site access roads, may remain in place post mining, for community use, as they may be considered a National asset.

19.2.8.5 Post Closure Monitoring

A monitoring procedure and commitment will be required in the Environmental Management Plan (EMP) that demonstrates how SMD will manage the LEFA Gold Mine site post closure. This will involve regular monitoring of ground and surface waters, and evaluating the condition of the rehabilitation works. Any shortcomings will need to be addressed post closure, to ensure that the LEFA Gold Mine does not have any long-term negative effects on the environment.

19.2.9 Economic Analysis

Table 19.36 presents a summary of the estimated Life of Mine cash flow for the LEFA Gold Mine, based on the technical-economic assumptions used to evaluate the Measured and Indicated mineral resources.

The LEFA Gold Mine economic analysis assumes some 2.7 million ounces of gold are recovered and sold, at an average LoM cash cost of USD 541 per ounce produced of gold. Considering a LoM average gold price of USD 800/oz, and at a discount rate of 10%, the project after-tax Net Present Value (NPV) is approximately USD 336 million.

When compared to the pit optimisation analysis, the project value decreased by approximately 35%. This was expected, primarily due to:

- Increased waste tonnage, when converting pit shells to pit designs;
- Exclusion of applicable taxes. The pit optimisation analysis assumes pre-tax cash flows; and,
- Exclusion of estimated capital expenditures. The pit optimisation analysis only included capital expenditures that would stop, if mining activities stop.

Nonetheless, the after-tax cash flow remains positive in every year of the LoM, supporting the economic viability of the identified ore tonnes, based on the initial set of technical-economic assumptions.

Table 19.36 Life of Mine Economic Analysis

	Unit	2009[1]	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pits													
Total	Mt	8.7	24.5	26.7	30.2	23.2	22.4	23.9	23.2	22.9	24.6	20.7	9.8
Waste	Mt	6.4	17.6	21.0	24.4	17.9	17.4	19.0	18.6	18.6	20.0	16.3	6.7
Ore	Mt	2.3	6.9	5.7	5.9	5.2	5.0	4.9	4.6	4.3	4.5	4.4	3.1
Stockpile													
to plant													
Ore	Mt		0.6	1.1	1.5	1.3	1.7	1.2	1.4	1.7	1.5	1.6	0.5
Plant													
Ore	Mt	2.3	5.7	6.1	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.0	3.6
Au content	K oz	93	284	288	265	270	274	264	273	276	274	251	185
Met. Rec.	%	89	89	89	89	89	89	89	89	89	89	89	89
Au Rec.	K oz	82	253	256	235	240	244	235	243	246	244	223	165
Revenue													
Gold Price	$/oz	900	900	900	800	800	800	800	800	750	750	720	700
Turnover	M$	74	228	231	188	192	195	188	194	184	183	161	116
Costs													
Mining	M$	-12	-34	-38	-43	-33	-32	-34	-33	-32	-35	-29	-14
Mill/G&A	M$	-33	-83	-88	-87	-87	-88	-87	-88	-88	-87	-87	-52
Selling	M$	-4	-13	-13	-11	-11	-11	-11	-11	-11	-10	-9	-7
Cash Cost	M$	-49	-131	-139	-141	-131	-131	-132	-131	-131	-132	-125	-72
Cash Cost	$/oz	**595**	**517**	**542**	**598**	**545**	**534**	**559**	**541**	**531**	**541**	**561**	**439**
Rehab.	M$									-3	-3	-2	-2
Capital	M$	-6	-30	-30	-12	-6	-6	-6	-6	-6	-6	-6	
Cash Flow													
CF PreTax	M$	19	68	61	36	55	59	51	57	45	42	28	41
Tax	M$			-2	-3	-5	-6	-4	-6	-3	-1		
CF	M$	**19**	**68**	**59**	**32**	**51**	**53**	**47**	**51**	**42**	**41**	**28**	**41**

1. from 1 September 2009

19.2.9.1 Taxes

The applicable tax rate is 30%, as per the Convention de Base, which serves as the foundation document for the mine site. SMD estimates there will be tax losses to be carried forward, as at 31 August 2009, of USD 100 million. This is reflected in 2009, 2010 and 2011 in the economic analysis, where SMD is allowed to offset profits made in those periods, against the carried forward losses.

19.2.9.2 Royalties and Other Payments

At the time of the preparation of this report, SMD paid royalties of 5.0% and 0.4% on gold sales, to the government of Guinea and to fund local development, respectively. SMD estimated a further 0.3% of gold sales would cover applicable refining charges, transportation costs, and applicable customs charges. Therefore, royalties and other payments, totalling 5.7% on gold sales, were applied to the project's economic analysis.

19.2.9.3 Capital and Operating Cost Estimates

Operating cost estimates were based on the preliminary budget figures for 2010. Since at the time of the preparation of this report the mine site was carrying out work at the CIL plant, has started the upgrading of the mining fleet and some general site improvements and restructuring, the preliminary 2010 budget figures were adjusted, as necessary, to reflect the estimated LoM operating cost.

The following capital cost estimates and assumptions were used in the preparation of the economic analysis:

- Total required capital expenditures of USD 120 million, with the major portion of these to occur in 2010 through 2012, to upgrade the fleet and provide critical spares to the plant and machinery; and,

- Net environmental and rehabilitation costs, totalling USD 10 million, to be incurred in the last four years of the mine life.

19.2.9.4 Sensitivity Analysis

The economic analysis of the LEFA Gold Mine experiences most sensitivity as a result of changes in revenue, which would primarily be affected by the prevailing gold price and / or process recovery. As presented in Tables 19.37 and 19.38, and illustrated in Figure 19.4, a 10% overall reduction in revenue would result in a 40% reduction in $NPV_{10\%}$. Tables 19.37 and 19.38 were developed based on an assumption of $NPV_{10\%}$.

Thereafter, the LEFA project is most sensitive to changes in milling and G&A costs - a 10% increase in these costs results in a reduction to the $NPV_{10\%}$ of 19%. An increase in mining and haulage costs has a similar effect, with a 10% increase in these costs resulting in a decrease in $NPV_{10\%}$ of 7.5%. The LEFA project's economic analysis shows least sensitivity to changes in capital expenditure.

Table 19.39 presents the NPV of the project at different gold prices and discount rates, as illustrated in Figure 19.5.

Table 19.37 Revenue-Cost Sensitivity in million USD for $NPV_{10\%}$ at USD 800/oz

Item	-10%	-5%	5%	10%
Mining and Haulage	332	320	297	286
Milling & G&A	367	338	279	250
Total Oper. Cost	390	349	268	227
Gold Price	185	247	370	432
CAPEX	318	313	304	300

Table 19.38 Revenue-Cost Sensitivity Percentage Change for $NPV_{10\%}$ at USD 800/oz

Item	-10%	-5%	5%	10%
Mining and Haulage	7.5	3.7	-3.7	-7.5
Milling & G&A	18.9	9.5	-9.5	-18.9
Total Oper. Cost	26.4	13.2	-13.2	-26.4
Gold Price	-40.0	-20.0	20.0	40.0
CAPEX	2.9	1.4	-1.4	-2.9

Figure 19.4 Revenue Cost Sensitivity in million USD for $NPV_{10\%}$ at USD 800/oz

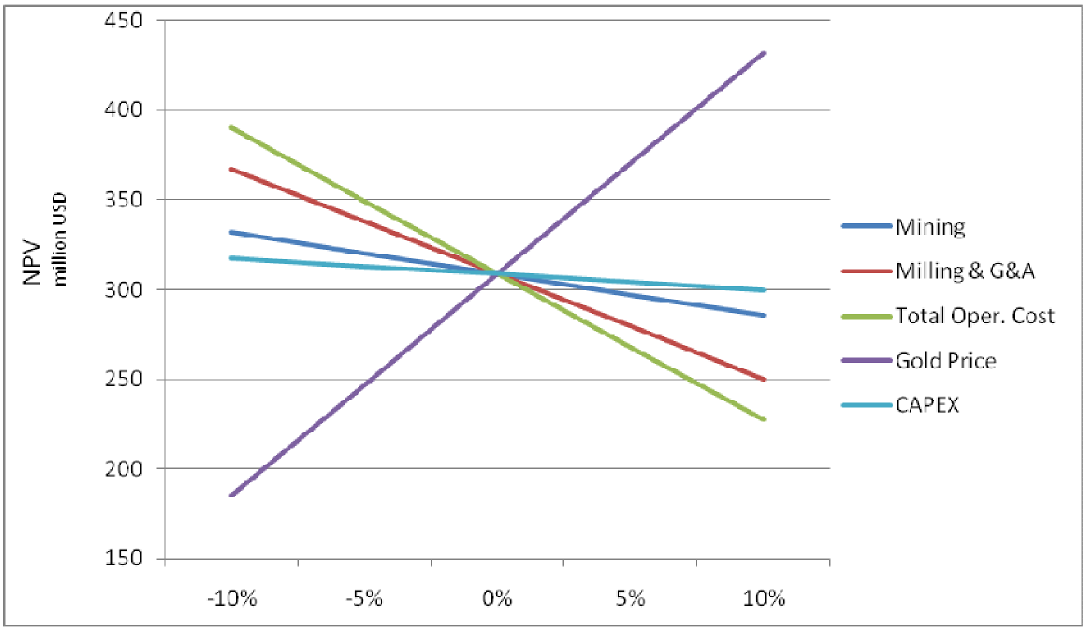
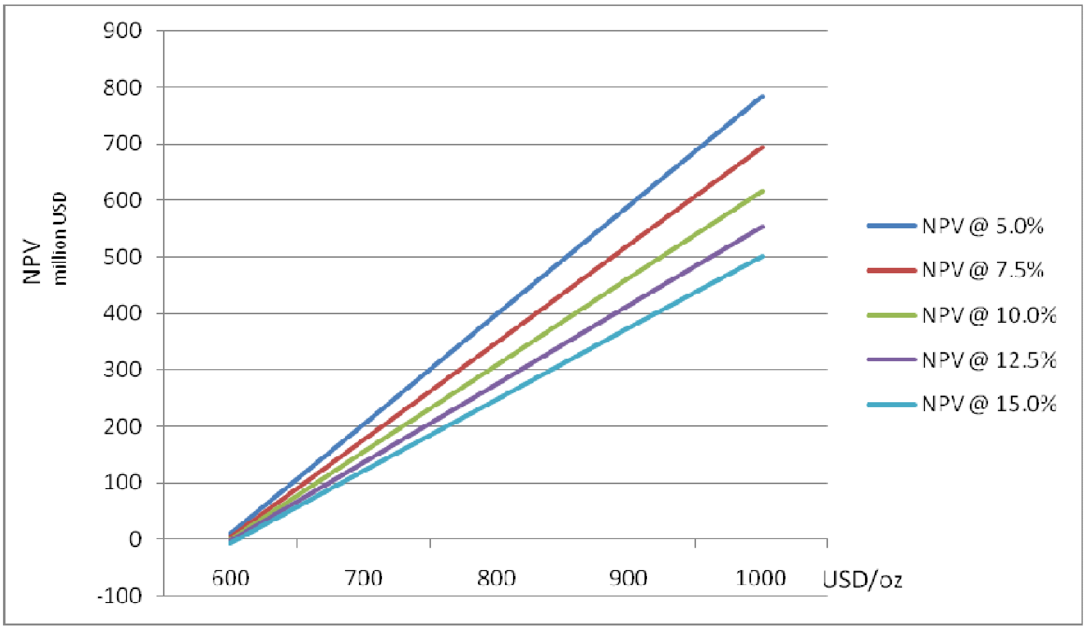


Table 19.39 Discount Rate-Gold Price Sensitivity in million USD

Item	USD 600/oz	USD 700/oz	USD 800/oz	USD 900/oz	USD 1000/oz
$NPV_{5\%}$	10	204	398	591	785
$NPV_{7.5\%}$	4	177	349	521	693
$NPV_{10\%}$	0	154	309	463	617
$NPV_{12.5\%}$	-3	136	275	415	554
$NPV_{15\%}$	-6	121	247	374	501

Figure 19.5 Discount Rate-Gold Price Sensitivity in million USD



19.2.10 Mineral Reserve Statement

The mineral reserves for the LEFA Gold Mine concessions are those mineralised materials, within practical engineered pits, using the marginal gold cutoff grades pertaining to the specific pits. Within each pit, the mineral resource category has been used as the guide to the classification of the mineral reserves. Measured mineral resources were generally converted to proven mineral reserves, and indicated mineral resources converted to probable mineral reserves. However, measured mineral resources within the Firifirini and Toume Toume pits were converted to probable mineral reserves. The main reason for the downgrade was some of the economic assumptions for these pits were not to the same level of accuracy represented by a measured mineral resource.

The estimated mineral reserves, as at 31 August 2009, by category and ore type are presented in Table 19.40.

Table 19.40 Mineral Reserves by Classification

Deposit	**Proven**			**Probable**			**Proven+Probable**			**Fresh**
	kt	**g/t**	**k oz**	**kt**	**g/t**	**k oz**	**kt**	**g/t**	**k oz**	**%**
Lero-Karta	17,697	1.7	941	8,092	1.7	453	25,789	1.7	1,394	76%
Fayalala	21,822	1.2	844	566	1.2	21	22,388	1.2	865	53%
Kankarta	1,911	1.7	106	544	1.6	28	2,455	1.7	134	94%
Firifirini				4,041	1.7	219	4,041	1.7	219	33%
Banko	334	3.2	34	34	2.7	3	368	3.2	37	39%
Folokadi	395	1.8	23	1,072	2.1	72	1,467	2.0	95	45%
Toume Toume				258	1.5	12	258	1.5	12	19%
Stockpiles	6,784	0.9	187	2,307	0.7	54	9,091	0.8	241	7%
TOTAL	48,943	1.4	2,136	16,914	1.6	862	**65,858**	**1.4**	**2,998**	56%

Any Inferred Mineral Resources within the pit have been excluded from the Mineral Reserve.

At a gold price of USD 800/oz, the LEFA Gold Mine estimated mineral reserves are 65.9 Mt, at average gold grade of 1.4 g/t, for contained gold of 3.0 million ounces. The overall average fresh to laterite/saprolite ratio is 1.3:1. That is, including the stockpiles, 56% of the estimated mineral reserves is fresh material.

20 OTHER RELEVANT DATA AND INFORMATION

Messrs. Hepworth and Urbaez are not aware of any other relevant data and information. Any technical aspect of the project not discussed in this report, remains the same as previously filed in the RSG Technical Report in March 2005, since which time there has been no material change in the information

21 INTERPRETATION AND CONCLUSIONS

Modern, systematic exploration techniques applied to the LEFA Gold property has seen the delineation of a substantial gold resource. This was the justification for the purchase and construction of a 6 million tonne per annum CIL treatment plant, and appropriate earthmoving equipment to mine and process the gold resource.

The palaeo-Proterozoic sediments of the Siguiri basin, in the Birimian Supergroup of West Africa in which the LEFA Gold Mine forms a part of, is host to several multi-million ounce gold deposits. Mesothermal shear hosted and retrograde - skarn style mineralisation has been observed on the property, and the regional terrain is considered very prospective to host further mineralisation. SMD considers that ongoing exploration will continue to delineate incremental increases in the gold resource.

- The geology of the LEFA Gold Mine mineral deposits is well known and understood, and there are sufficient adequate descriptions of the geology in previous reports. The geological model, including the interpretation adjustments done by H&S, is acceptable and represents adequately the laterite, saprolite, transition, and fresh zones;

- The mineral deposits are very well defined in all directions, so the exploration potential in the deposits' immediate vicinity is limited. However, SMD holds 2,552 km^2 of mining concessions, with exploration potential;

- The geostatistical mineral resource models, mineral resource classification, and mineral reserves estimation developed by SMD are reasonable, as per accepted current industry standards;

- The LEFA Gold Mine mineral deposits present favourable conditions for open pit mining, due to geometry, grade distribution, and geotechnical characteristics;

- The metallurgical testwork is considered sufficient for the definition of the processing flowsheet;

- Additional testwork and geotechnical analysis at Banora and Sanou Kono will be required to evaluate the economics of mining theses mineral deposits;

- Due to the isolated location of the project, the logistics of transporting supplies to the mine, and shipping products to their final destination is financially and technically challenging;

- The operating and capital costs were estimated based on reasonable assumptions and historical data, and reflect the current mining and processing methods;

- Average mine site direct operating costs for the project are estimated at USD 21.9 per tonne of ore processed, which is equivalent to an average of approximately USD 541 per ounce of gold produced;

- According to the governing document of the LEFA Gold Mine, the Convention de Base, new Environmental Impact Assessment is not required. Per the Convention de Base, SMD is required to protect the environment and reforest the lands used at the end of the operation;

- In general, the economic evaluation is considered to be conservative, at a gold price of USD 800/oz;

- The project economics are most sensitive to revenue (grade, recovery, gold price). The most relevant parameter being gold price, as gold grade and metallurgical recovery may not change much;

- The labour, power and cyanide acid costs are relevant. However, the impact on project economics is moderate.

The estimated LEFA Gold Mine mineral resources, as at 31 August 2009, inclusive of those mineral resources modified to produce the mineral reserves, are approximately 133 Mt, at an average gold grade of 1.21 g/t, for contained gold of 5.2 million ounces.

Total estimated Measured and Indicated mineral resources are 119.0 Mt, at average gold grade of 1.2 g/t, for contained gold of 4.6 million ounces. The estimated Inferred mineral resources are 14.1 Mt, at average gold grade of 1.3 g/t, for contained gold of 0.6 million ounces.

At a gold price of USD 800/oz, the LEFA Gold Mine estimated mineral reserves are 65.9 Mt, at average gold grade of 1.4 g/t, for contained gold of 3.0 million ounces. The overall average fresh to laterite/saprolite ratio is 1.3:1. That is, including the stockpiles, 56% of the estimated mineral reserves is fresh material.

22 RECOMMENDATIONS

Due to budgetary constraints the exploration programme was stopped during 2009. However, SMD estimates that an exploration budget of USD 2 million will be spent during 2010, for gold exploration with both near mine and regional targets being explored.

The rationale for exploration is to continue to delineate mineable resources near mine, using advanced drilling techniques, and to have a pipeline of regional targets becoming drill ready. This involves:

- Desktop compilation, analysis and interpretation of existing data including geophysical datasets and remote sensing techniques;
- Reconnaissance field investigations and geological mapping;
- Trenching, pitting and rock chip sampling;
- Stream sediment and geochemical grid sampling to low detection limits;
- Ground geophysical magnetics surveys;
- Auger interface drilling testing in situ anomalies below the transported horizon;
- Air Core and Rotary Air Blast drilling;
- Reverse Circulation and diamond exploration and resource definition drilling; and,
- Ongoing collection of geological, reconciliation, grade control, metallurgical and geotechnical data for resource block model construction and feasibility studies.

SMD considers that a continuation of these modern exploration techniques in a systematic and methodical manner will continue to provide gold mineral resources for mining and milling at the LEFA Gold Mine.

The Pebble crusher installation, which is expected to improve the plant throughput for the higher fresh to saprolite ore blends, must be investigated. Once the plant is operating at sustainable high levels, SMD believes the commissioning of the gravity circuit will be completed.

Further metallurgical test work is recommended for the Firifirini and Toume Toume mineral deposits, to investigate the effect of cyanide strength, solid concentration, and grind size, with respect to head grade, and test work to establish the metallurgical response of samples taken from various sections of the Firifirini and Toume Toume mineral deposits.

Recommendations for geotechnical analysis (extracted from the SW report, titled "LEFA Corridor Project – Geotechnical Pit Design Reviews", November 2009):

- Structural Geology - as pits will be developed in stages opportunities will occur for pit wall mapping and drilling geotechnical holes into the wall rocks. In each push-back, the wall rocks should be structurally mapped and orientated, with diamond drill holes to obtain geotechnical test samples in suspect weak areas. The ongoing geological mapping of benches should be expanded to include key discontinuity characteristics of joint roughness, joint alteration and persistence;

- Hydrogeology – routine records of pit water levels, pumping times and pumping equipment rates should be commenced together with the design of a water level monitoring array of ponds, rivers and boreholes. Piezometers should be installed in appropriate exploration boreholes or dedicated drilled boreholes;

- Pit slope monitoring – survey records shall be used in routine internal and external audits to ensure the compliance of constructed pit slopes with geotechnical designs and non-compliances reported before proceeding to the subsequent levels; and,

- Slope performance data – instances of geotechnical hazards arising from boudins or crest, bench, rock mass and structural failures should be recorded together with mitigation activities.

It is imperative that a programme of geotechnical observations, as outlined above, is implemented to verify through geotechnical analysis the parameters and slope geometry adopted for detailed design of the open pits.

23 REFERENCES

Knight Piésold Consulting Pty. Ltd. Final Report “LEFA Corridor Project – Environmental Impact Assessment”, December 2004.

Lycopodium Pty. Ltd. Final Report “LEFA Corridor Project - Definitive Feasibility Study Process Design Criteria”, December 2004.

Orway Mineral Consultants. Final Report “LEFA Corridor Project – Communition Circuit Evaluation”, August 2004.

RSG Global Ltd. Final Report. “Lero Gold Project, Guinea, West Africa - Independent Technical Report”, March 2005.

Scott Wilson Ltd. Final Report. “LEFA Corridor Project – Geotechnical Pit Design Reviews”, November 2009.

Wardell Armstrong International. Final Report “Preliminary Metallurgical tests on a sample of mineralization taken from the LEFA Gold Mine, Guinea”, December 2008.

24 DATE AND SIGNATURE PAGE

The effective date of this technical report, entitled “Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea – Technical Report Update”, is November 2009.

Neil Hepworth, CEng, IoMMM
VP Operations, Crew Gold Corporation Ltd
Dated this 11th day of December, 2009

Edgar Urbaez, MSc, MAusIMM
Consultant Mining Engineer, t/as In Silico Mining
Dated this 11th day of December, 2009

Kevan Stuart Walton, CEng, CGeol, IoMMM
Director, Kevan Walton Associates
Dated this 11th day of January, 2010

Nicolas Johnson, MAIG
Principal Geologist and Geostatistician, Hellman and Schofield Pty Ltd
Dated this 11th day of January, 2010

Certificate

As an author and reviewer of the report titled "Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea – Technical Report Update", dated November 2009 (the "Technical Report"), prepared on behalf of Crew Gold Corporation (the "Issuer"), I, **Neil Hepworth**, CEng, do hereby certify that:

1. I am currently employed as Vice President Operations for Crew Gold Corporation, Abbey House, Wellington Way, Weybridge, Surrey, KT13 0TT, United Kingdom.

2. I graduated with a degree in Geology from University of Witwatersrand, South Africa, in 1979. In addition, I have obtained a Masters degree (M.Sc) in Mining from University of Witwatersrand, South Africa, in 1985.

3. I am a Chartered Engineer and a Member of the Institute of Materials, Minerals and Mining, United Kingdom (49411).

4. I have worked in various roles, initially as a geotechnical engineer and more recently as a mining operations executive. I have been in the mining industry continuously since 1979 and have participated in the evaluation and operation of both, surface and underground mines, to produce commodities such as gold, copper, and other base metals. I have developed business plans for operating mines and mining projects in many of the mining districts of the world, including West and East Europe, Africa and South America.

5. I have read the definition of "Qualified Person" (QP) set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a recognised professional organisation (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a QP for the purpose of NI 43-101.

6. I am responsible for the overall preparation of the technical report titled "Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea - Technical Report Update" and dated November 2009 (the "Technical Report") relating to the LEFA Corridor property. I spent six (6) months on-site at the LEFA Corridor property in 2009.

7. I have had prior involvement with Crew Gold Corporation on the property that is the subject of the Technical Report, where I assumed group operational responsibility in May 2008.

8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9. I am not independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101. In addition to being an employee of the Issuer, I also hold share options albeit substantially less than 1% of the total issued.

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Signature Dated this 11th day of December, 2009

Certificate

As an author and reviewer of the report titled "Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea – Technical Report Update", dated November 2009 (the "Technical Report"), prepared on behalf of Crew Gold Corporation (the "Issuer"), I, **Edgar Urbaez**, MAusIMM, do hereby certify that:

1. I am a professional mining engineer trading as an independent consultant in PO Box 826, Cardiff, CF11 1GL, United Kingdom.

2. I graduated with a degree in Mining from Colorado School of Mines, USA, in 1995. In addition, I have obtained a Masters degree (M.Sc) in Mining from Colorado School of Mines, USA, in 1998.

3. I am a Member of the Australasian Institute of Mining and Metallurgy, Australia (224172). I am also a Founding Registered Member of the Society for Mining, Metallurgy, and Exploration, USA (4028399RM).

4. I have worked as a mining engineer in the mining industry continuously since 1997 and have participated in the evaluation and operation of both, surface and underground mines, to produce commodities such as gold, coal, nickel, copper, zinc, bauxite, iron ore, and other base metals. I have evaluated mining projects in many of the mining districts of the world, including North, Central and South America, East Europe, Asia, Middle East, West and South Africa.

5. I have read the definition of "Qualified Person" (QP) set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a recognised professional organisation (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a QP for the purpose of NI 43-101.

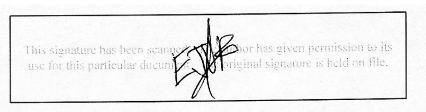
6. I am responsible for the overall preparation of the technical report titled "Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea - Technical Report Update" and dated November 2009 (the "Technical Report") relating to the LEFA Corridor property. I visited the LEFA Corridor property on August 2009 for 9 days.

7. I have had prior involvement with Crew Gold Corporation on the property that is the subject of the Technical Report. The nature of my prior involvement is preliminary assessment of the LEFA Corridor mineral reserves.

8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9. I am independent of the Issuer applying all of the tests in section 1.4 of National Instrument 43-101.

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.



Signature

Dated this 11th day of December, 2009

Certificate

To accompany the Report dated November 2009, entitled "Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea – Technical Report Update", (the "Technical Report"), prepared on behalf of Crew Gold Corporation (the "Issuer"), I, **Kevan Stuart Walton**, CEng, CGeol, do hereby certify that:

1. I am a full time employee of Kevan Walton Associates, Walnut Bank Lodge, Stodday , Lancaster, Lancashire, LA2 0AG, United Kingdom.

2. I graduated with a degree in Geology and Geography from the University of London, United Kingdom, in 1968. In addition, I have obtained a Masters degree (M.Sc) in Rock Mechanics and Engineering Geology from the University of Newcastle-upon-Tyne, United Kingdom, in 1969.

3. I am a Chartered Engineer and a Member of the Institute of Materials, Minerals and Mining, United Kingdom (1006510). I am also a Chartered Geologist and Fellow of the Geological Society of London, United Kingdom (44346).

4. I have worked as a geotechnical or production engineer in the mining and civil engineering industries continuously since 1970 and have participated in the evaluation and operation of both surface and underground mines to produce commodities such as gold, diamonds, fluorspar, aggregates, coal, copper and iron ore. I have geotechnically evaluated projects in many of the mining districts of the world, including West and East Europe, Asia, Middle East, West and Southern Africa.

5. I have read the definition of "Qualified Person" (QP) set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a recognised professional organisation (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a QP for the purpose of NI 43-101.

6. I am responsible for the preparation of section 19.2.4 "Pit Wall Configuration" in the technical report titled "Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea - Technical Report Update" and dated November 2009 (the "Technical Report") relating to the LEFA Corridor property. I have not visited the LEFA Corridor property.

7. I have not had prior involvement with Crew Gold Corporation on the property that is the subject of the Technical Report.

8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9. I am independent of the Issuer applying all of the tests in section 1.4 of National Instrument 43-101.

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

K. S. Walton.

Signature — Dated this 11th day of January, 2010

Certificate

To accompany the Report dated November 2009, entitled “Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea – Technical Report Update”, (the “Technical Report”), prepared on behalf of Crew Gold Corporation (the “Issuer”), I, **Nicolas Johnson**, MAIG, do hereby certify that:

1. I am a full time employee of Hellman and Schofield Pty Ltd, 102 Colin Street, Perth, West Australia, 6005, Australia.

2. I graduated with a degree in Geology from La Trobe University, Australia, in 1988.

3. I am a Member of the Australian Institute of Geoscientists.

4. I have worked as a resource geologist in the mining industry continuously since 1988 and have participated in the evaluation of mineral resources of both, exploration projects and operating mines, for commodities such as gold, silver, nickel, copper, zinc, and other base metals. I have estimated mineral resources, and implemented grade control procedures, for projects in many of the mining districts of the world, including Australia, Asia and Africa.

5. I have read the definition of “Qualified Person” (QP) set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a recognised professional organisation (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a QP for the purpose of NI 43-101.

6. I am responsible for the preparation of section 19.1 “Mineral Resource Estimates” in the technical report titled “Disclosure of Mineral Resources and Reserves, LEFA Gold Mine, Northeast Guinea - Technical Report Update” and dated November 2009 (the “Technical Report”) relating to the LEFA Corridor property. I have visited the LEFA Corridor property on April 2009 for 7 days.

7. I have had prior involvement with Crew Gold Corporation on the property that is the subject of the Technical Report. In addition to mineral resource estimation of the main LEFA Corridor mineral deposits, my involvement has included setting up mine grade procedures and provision of training to the mine geology staff in aspects of ore definition.

8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9. I am independent of the Issuer applying all of the tests in section 1.4 of National Instrument 43-101.

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Signature

Dated this 11th day of January, 2010