HARMONY GOLD MINING CO LTD
Form 6-K
April 28, 2004

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 6-K

REPORT OF FOREIGN PRIVATE ISSUER PURSUANT TO
RULE 13a-16 OR 15d-16 UNDER THE SECURITIES
EXCHANGE ACT OF 1934

For the Month of April 2004

Harmony Gold Mining Company
Limited

Suite No. 1
Private Bag X1
Melrose Arch, 2076
South Africa
(Address of principal executive offices)

(Indicate by check mark whether the registrant files or will file annual reports under cover of
Form 20-F or Form 40-F.)

Form 20-F X Form 40-F

(Indicate by check mark whether the registrant by
furnishing the information contained in this form
is also thereby furnishing the information to the
Commission pursuant to Rule 12g3-2(b) under the
Securities Exchange Act of 1934.)

Yes No X

THIS CIRCULAR IS IMPORTANT AND REQUIRES YOUR IMMEDIATE ATTENTION

1.

If you are in any doubt as to the action that you should take, please consult your broker, banker, accountant, legal adviser or other professional adviser immediately. If you have sold or otherwise disposed of all your shares in Harmony Gold Mining Company Limited ("Harmony") this document should be handed to the purchaser of such shares, or to the broker, banker or agent through whom the disposal was effected.

2.

Certificated shareholders and shareholders who hold dematerialised shares and have elected "own name" registration in the sub-register through a Central Securities Depository Participant ("CSDP") and who are unable to attend the general meeting of shareholders of Harmony, to be held at 10:00 on Friday, 7 May 2004, at Harmony's Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, but wish to be represented thereat, should complete and return the attached form of proxy (blue) in accordance with the instructions contained therein to the transfer secretaries of Harmony, Ultra Registrars (Pty) Limited, 11 Diagonal Street, Johannesburg, 2001 (PO Box 4844, Johannesburg, 2000) or Capita Registrars, The Registry, 34 Beckenham Road, Beckenham, Kent BR3 4TU England, so as to be received by not later than 10:00 on Wednesday, 5 May 2004.

3.

Shareholders who hold dematerialised shares through a CSDP or broker, other than those who have elected "own name" registration, and who wish to attend the general meeting must request their CSDP or broker to provide them with a Letter of Representation or should advise their CSDP or broker as to what action they wish to take. This must be done in terms of the agreement entered into between them and their CSDP or broker. Shareholders who have dematerialised their shares, other than those who have elected "own name" registration, must not complete and return the attached form of proxy.

Harmony Gold Mining Company Limited

(Incorporated in the Republic of South Africa)

(Registration number 1950/038232/06)

Share code: HAR

ISIN: ZAE 000015228

("Harmony")

CIRCULAR TO SHAREHOLDERS

relating to

-

agreement reached between Harmony, Anglovaal Mining Limited ("Avmin") and African Rainbow Minerals & Exploration Investments (Proprietary) Limited regarding a range of indivisible transactions which, if implemented, will result in the creation of the largest black controlled mineral resources company in South Africa;

-

the acquisition by Harmony of 42,1% of the issued share capital of Avgold Limited ("Avgold") from Avmin;

-

the offer by Harmony for the balance of Avgold's issued share capital, to be implemented by way of a scheme of arrangement in terms of section 311 of the Companies Act, 1973 (Act 61 of 1973), as amended, proposed by Harmony between Avgold and its shareholders, other than Harmony;

-

the proposed issue of convertible bonds to the value of up to R1,700 million, convertible into approximately 14 million new ordinary shares in Harmony, representing 5% of Harmony's issued ordinary share capital, by way of a specific issue for cash in terms of Rule 5.51 of the Listings Requirements of the JSE Securities Exchange South Africa;

and incorporating

-

a notice of general meeting of shareholders; and

-

a form of proxy for certificated and own name dematerialised shareholders.

Financial adviser and sponsor to Harmony
Attorneys to Harmony
Reporting accountants
Independent technical adviser
JPMorgan
PricewaterhouseCoopers Inc
Chartered Accountants (SA)
Registered Accountants and Auditors
(Registration no 1998/012055/21)
SRK Consulting
Engineers and Scientists
Date of issue: 15 April 2004

Corporate information

Company secretary
Marian van der Walt
B.Com (Law) LL.B; H Dip Tax; Dip (Ins Law)
Randfontein Office Park
Corner Main Reef Road and Ward Avenue
Randfontein, 1759
(PO Box 2, Randfontein 1760)

Registered office
Remaining extent of portion 3 of the farm
Harmony Farm 222
Private Road, Glen Harmony
Virginia, 9430
South Africa

Financial adviser
JP Morgan Chase Bank, Johannesburg Branch
1 Fricker Road, corner Hurlingham Road
Illovo, 2196
(PO Box 934, Johannesburg, 2000)

Sponsor
J.P. Morgan Equities Limited
(Registration number 1995/011815/06)
1 Fricker Road, corner Hurlingham Road
Illovo, 2196
(PO Box 934, Johannesburg, 2000)

Attorneys
Cliffe Dekker Inc.
(Registration number 1998/018173/21)
1 Protea Place
Sandown, 2196
(Private Bag X7, Benmore, 2010)

Commercial bankers
ABSA Bank Limited
(Registration number 1986/004794/06)
2nd Floor, ABSA Towers North
180 Commissioner Street
Johannesburg, 2001
(PO Box 7735, Johannesburg, 2000)

Reporting accountants
PricewaterhouseCoopers Inc.
(Registration number 1998/012055/21)
2 Eglin Road
Sunninghill, 2157
(Private Bag X36, Sunninghill, 2157)

Transfer secretaries
In South Africa
Ultra Registrars (Pty) Limited
(Registration number 2000/007239/07)
11 Diagonal Street
Johannesburg, 2001
(PO Box 4844, Johannesburg, 2000)

In England
Capital IRG plc
t/a Capita Registrars
The Registry
34 Beckenham Road
Beckenham
Kent BR3 4TU

Independent technical adviser
Steffen, Robertson and Kirsten
(South Africa) (Proprietary) Limited
(Registration number 1995/012890/07)
SRK House
265 Oxford Road
Illovo, 2196
(PO Box 55291, Northlands, 2116)

United Kingdom secretaries
St James's Corporate Services Limited
6 St James's Place
London SW1A 1NP

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Use of proceeds
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Definitions

Throughout this circular and the annexures hereto unless otherwise indicated:

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the words in the first column have the meanings stated opposite them in the second column; words in the singular include the plural and*vice versa*; words importing one gender include the other genders; and references to a person include references to a body corporate and *vice versa*;

- all monetary values are in South African Rands and cents; and
- all times indicated are South African local times.

"the Act"

the Companies Act, 1973 (Act 61 of 1973), as amended;

"acquisition"

collectively, the acquisition by Harmony of the entire issued share capital of Avgold pursuant to the implementation of the Avgold share exchange and the Avgold offer;

"Afrikander Lease"

The Afrikander Lease Limited, a public company incorporated in South Africa, the ordinary shares of which are listed on the JSE;

"Anglo South Africa"

Anglo South Africa Capital (Proprietary) Limited (registration number 1999/002391/07), a private company incorporated in South Africa;

"ARM Platinum"

African Rainbow Minerals Platinum (Proprietary) Limited (registration number 1999/018332/07), a private company incorporated in South Africa;

"the ARM voting agreement"

the agreement entered into between ARMI, Harmony and Clidet No. 454 (Proprietary) Limited, in terms of which ARMI will vote Harmony's shares in Avmin following implementation of the Transaction;

"ARMgold"

African Rainbow Minerals Gold Limited (registration number 1997/015869/06), a public company incorporated in South Africa and a wholly-owned subsidiary of Harmony;

"ARMI"

African Rainbow Minerals & Exploration Investments (Proprietary) Limited (registration number 1997/020155/07), a private company incorporated in South Africa;

"Assmang"

Assmang Limited (registration number 1935/007343/06), a public company incorporated in South Africa and a subsidiary of Avmin;

"Assore"

Assore Limited (registration number 1950/037394/06), a public company incorporated in South Africa and listed on the JSE;

"Avgold"

Avgold Limited (registration number 1990/007025/06), a public company incorporated in South Africa, the shares of which are listed on the JSE, Euronext Brussels in the form of International Depository Receipts and on the New York Stock Exchange Inc. in the form of American Depositary Receipts;

"Avgold consideration"

the consideration to be paid by Harmony to Avmin and to Avgold shareholders comprising 1 new Harmony share for every 10 Avgold shares held;

"Avgold offer"

the offer made by Harmony to Avgold shareholders, excluding Avmin, to acquire the entire issued share capital of Avgold which it does not already own by way of the scheme;

"Avgold offer conditions precedent"

the conditions precedent to which implementation of the Avgold offer is subject, as reflected in paragraph 5.3;

"Avgold shareholders"

holders of Avgold shares, other than Harmony;

"Avgold share exchange"
the transaction in terms of which Harmony will acquire 286 305 263 Avgold shares, comprising 42,1% of the issued share capital of Avgold, from Avmin, in exchange for the issue to Avmin of the Avgold consideration;
"Avgold share exchange agreement"
the agreement entered into between Harmony and Avmin in respect of the Avgold share exchange;
"Avgold share exchange conditions precedent"
the conditions precedent to which implementation of the Avgold share exchange is subject as reflected in paragraph 4.3;
"Avgold shares"
ordinary shares with a par value of 1 cent each in the issued share capital of Avgold;
"Avmin"
Anglovaal Mining Limited (registration number 1933/004580/06), a public company incorporated in South Africa, the shares of which are listed on the JSE and the LSE, which is to be renamed African Rainbow Minerals Limited;
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"Avmin shareholders"
holders of Avmin shares;
"Avmin shares"
ordinary shares with a par value of 5 cents each in the share capital of Avmin;
"business day"
any day other than a Saturday, Sunday or official public holiday in South Africa;
"circular"
this bound document, dated 15 April 2004, including the annexures attached hereto;
"Competition Authorities"
the authorities established in terms of the Competitions Act, 1998 (Act 89 of 1998), as amended;
"directors"
the directors of the company;
"Harmony" or "the company"
Harmony Gold Mining Company Limited (registration number 1950/038232/06), a public company incorporated in South Africa, the shares of which are listed on the JSE, the LSE and Euronext Paris and are quoted on Euronext Brussels in the form of International Depository Receipts and on the New York Stock Exchange, Inc. in the form of American Depositary Receipts;
"Harmony group"
Harmony and its subsidiaries;
"Harmony shares"
ordinary shares with a par value of 50 cents each in the share capital of Harmony;
"the JSE"
the JSE Securities Exchange South Africa;
"Kalgold"
Kalahari Goldridge Mining Company Limited (registration number 1982/002818/06), a public company incorporated in South Africa;
"Kalplats"
a platinum exploration project of Kalgold which comprises certain platinum discovery and associated mineral rights;
"last practicable date"
5 April 2004, being the last practicable date prior to finalisation of this circular;
"Nkomati"
a division of Avmin which, through the Nkomati mine, produces nickel, copper, cobalt and PGMs by-products;
"LSE"
London Stock Exchange plc;
"shareholders"
holders of Harmony shares;
"scheme" or "scheme of arrangement"
the scheme of arrangement proposed by Harmony between Avgold and the Avgold shareholders, in terms of section 311 of the Act;
"the scheme meeting"
the meeting of scheme members, convened in terms of an Order of Court, which is expected to be held at 10:00 at 56 Main Street, Johannesburg on Monday, 3 May 2004, at which meeting scheme members will consider and vote on the scheme;
"scheme members"
Avgold shareholders who are entitled to vote at the scheme meeting, being all Avgold shareholders registered as such on the voting record date, excluding Avmin, if the Avgold share exchange agreement has not been ratified;
"South Africa"
the Republic of South Africa;
"specific issue"
the specific issue for cash of convertible bonds to international investors to the value of up to R1,700 million, convertible into approximately 14 million Harmony shares, a summary of the terms and conditions of which are

reflected in Annexure 1;
"SRP"
the Securities Regulation Panel;
"SRP Code"
the Securities Regulation Code on Takeovers and Mergers and the Rules of the SRP;
"Transaction"
collectively, the indivisible transactions reflected in paragraph 2, excluding the specific issue;
"Transaction conditions precedent"
the conditions precedent to which implementation of the Transaction is subject, as reflected in paragraph 2.2;
"transfer secretaries"
in South Africa, Ultra Registrars (Proprietary) Limited (registration number 2000/007239/07) and in England, Capita IRG plc (registration number 2605568) trading as Capita Registrars;
"Two Rivers"
Two Rivers Platinum (Proprietary) Limited (registration number 2001/007354/07), a private company incorporated in South Africa and a subsidiary of Avmin;
"United Kingdom Secretaries"
St James's Corporate Services Limited; and
"voting record date"
the latest time and date for Avgold shareholders to be recorded in the register as shareholders of Avgold in order to vote at the scheme meeting, which is expected to be at 17:00 on Friday 30 April 2004.
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Harmony Gold Mining Company Limited
(Incorporated in the Republic of South Africa)
(Registration number 1950/038232/06)
Share code: HAR
ISIN: ZAE 000015228

Directors

P T Motsepe
Z B Swanepoel
F Abbott
Dr M M M M Bakane-Tuoane
F Dippenaar
V Fakude
T Grobicki
W M Gule
M W King
D S Lushaba
M F Pleming
Lord Renwick of Clifton KCMG*
C M L Savage
Dr S P Sibisi
D V Simelane
Dr R V Simelane
M V Sisulu
* British

Circular to shareholders

1.
INTRODUCTION AND BACKGROUND

In a detailed joint cautionary announcement published on 13 November 2003, shareholders were advised that Harmony, Avmin and ARMI had reached agreement in principle regarding a range of indivisible transactions which, if implemented, would result in the creation of the largest black controlled mineral resources company in South Africa, under the leadership of mining entrepreneur, Patrice Motsepe. In terms of the Transaction:

- Avmin will exchange its entire 42,1% interest in Avgold for the issue to it of new Harmony shares;
- Avmin will acquire from ARMI:

.

ARMI's entire indirect 13,6% interest in Harmony, for a cash consideration which will be applied by ARMI in subscription for new Avmin shares;

.

ARMI's 41,5% effective interest in the Modikwa Joint Venture, in exchange for the issue to ARMI of new ordinary shares in ARM Platinum;

-

Avmin will acquire Kalplats from Kalgold for a cash consideration. Kalgold will then apply the cash in the subscription for new Avmin shares in renounceable form and will renounce these shares to Harmony;

- ARMI will vote Harmony's remaining shares in Avmin, post the above transactions, through the ARM voting agreement.

The acquisition, by Harmony, of Avmin's stake in Avgold constitutes an affected transaction in terms of the SRP Code and, as a result, Harmony would be required to extend a mandatory offer to the Avgold shareholders on the same terms and conditions, *mutatis mutandis*, as those offered to Avmin. Harmony wishes to acquire 100% of Avgold and has therefore extended an offer to Avgold

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shareholders by way of the scheme, subject to the Avgold offer conditions precedent, prior to triggering a mandatory offer in terms of the SRP Code.

If the scheme does not become operative due to the non-fulfilment of the conditions to which it is subject and the Avgold share exchange agreement becomes unconditional, Harmony will be obliged to make a mandatory offer to the Avgold shareholders in terms of Rule 8.1 of the SRP Code on the same terms and conditions offered to Avmin. The Harmony shares comprising the consideration under such offer will first have to be registered under the U.S. Securities Act of 1933, as amended. Harmony has undertaken to the SRP to use its best endeavours to procure registration of the Harmony shares comprising the offer consideration with the SEC as a matter of urgency to enable it to make such mandatory offer without undue delay.

It was announced on 31 March 2004 that Harmony intends to issue convertible bonds to international investors to the value of up to R1,700 million. The proceeds of the specific issue will be used primarily to refinance Harmony's existing South African Rand debt, benefiting from the attractive financing opportunities currently available in the convertible bond market. Details of the specific issue are reflected in paragraph 9.

The convertible bonds will be issued pursuant to a specific issue for cash in terms of Rule 5.51 of the Listings Requirements of the JSE. Attached to this circular is a notice convening a general meeting of shareholders at which the ordinary resolutions necessary to implement the specific issue will be proposed.

The purpose of this circular is to provide shareholders with information regarding the Transaction, the Avgold offer and the specific issue. Shareholders should note that details regarding the Transaction are included for information purposes only and that the only action they are required to take is in respect of the specific issue.

2.

THE TRANSACTION

2.1

Description of the Transaction

Following the implementation of the Transaction, ARMI will become the effective controlling shareholder of a larger diversified and empowered Avmin, which will have significant holdings in gold, PGMs, nickel and ferrous metal assets. Avmin's gold interests will be held through its resultant 22% interest in Harmony. Pursuant to the Transaction, Avmin will change its name to African Rainbow Minerals Limited and will be well-positioned to secure adequate funding for its existing projects and to participate in further growth opportunities that the South African mining sector offers, taking advantage of its black economic empowerment controlled status.

The current structure of Harmony and Avmin is as follows:

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Avgold
(listed)
Assmang
(listed)
Avmin
(listed)
Harmony
(listed)
Two Rivers
Nkomati
Other assets
- Iron ore
- Manganese
- Chrome
- Assore (8,5%)
- AvAlloys (100,0%)
- Other (including exploration activities)

33,9%
42,1%
11,4%

50,3%
55,0%
100,0%

Following the implementation of the Transaction, the structure of Harmony, Avmin and ARMI will be as follows:
*Prior to implementation of Avgold offer.
The Transaction is subject to the fulfilment of the Transaction conditions precedent and is expected to be implemented by no later than 30 April 2004.

2.2

Transaction conditions precedent

The Transaction is subject to the fulfilment of the following conditions precedent:
- the requisite legal agreements necessary to implement the Transaction becoming unconditional;
-
the passing of the ordinary and special resolutions necessary to implement the Transaction by the Avmin shareholders in general meeting; and
- the approval of contractual third parties to the proposed change of control of Avgold.

2.3

The ARM voting agreement

In terms of the ARM voting agreement, ARMI will exercise the votes attaching to Harmony's entire holding of 40 789 761 Avmin shares (approximately 20% of Avmin) following implementation of the Transaction.

3.

RATIONALE FOR THE AVGOLD SHARE EXCHANGE AND AVGOLD OFFER

Avgold operates the Target Mine in the Free State which, at full production, is expected to produce 350 000 gold ounces per annum, at a cash cost below US$180 per ounce. In addition, an extensive exploration programme in an area known as Target North, which has a resource base of approximately 80 million ounces, is currently underway.
In July 2003, Harmony acquired 11,4% of the issued share capital of Avgold from Anglo South Africa in exchange for the issue to Anglo South Africa of renounceable letters of allocation representing the right to the issue of 6 960 964 new Harmony shares. The Avgold share exchange and the Avgold offer represent the final steps in the transaction in terms of which Harmony will acquire full control of the Target Mine. The acquisition of the Target Mine is expected to further enhance the overall quality of Harmony's production base.

4.

THE AVGOLD SHARE EXCHANGE

4.1

Terms and consideration

In terms of the Avgold share exchange agreement, subject to the fulfilment of the Avgold share exchange conditions precedent, Avmin will exchange its entire holding of 286 305 263 Avgold shares, comprising 42,1% of Avgold's issued share capital, for 28 630 526 new Harmony shares with effect from the date upon which all the Avgold share exchange conditions precedent are fulfilled, which date is expected to be on or before 30 April 2004.
This represents a ratio of 1 Harmony share for every 10 Avgold shares. The value attributable to the new Harmony shares is R2 893 687 263.

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Harmony
(listed)
Avgold
(listed)
Assmang
(listed)
Avmin
(listed)
Public and
institutional
shareholders
ARM Platinum
(unlisted)
Other assets

- Assore (8,5%)
- AvAlloys (100,0%)
- Other (including exploration activities)
- Nkomati (100,0%)
- Two Rivers (55,0%)
- Modikwa JV (41,5%)
- Kalplats (100,0%)
- Iron ore
- Manganese
- Chrome

37,0%
63,0%
22,0%
53,6%*
50,3%
20,0% of Avmin

ARM Control Structure

ARMI

43,0% of Avmin

4.2

Warranties

In terms of the Avgold share exchange agreement, Avmin has given Harmony limited warranties as to ownership and title to the Avgold shares sold by it and Harmony has given Avmin limited warranties as to its ability to allot and issue Harmony shares, which are normal in transactions of this nature.

4.3

Conditions precedent

The Avgold share exchange is subject to:

- the requisite legal agreements necessary to implement the Transaction becoming unconditional;
-
the passing of the requisite ordinary and special resolutions necessary to give effect to the Transaction by the shareholders of Avmin in general meeting (excluding the increase in authorised share capital and change of name of Avmin);
- the approval of the JSE to the listing of the Harmony shares comprising the Avgold offer consideration on the JSE; and
- the approval of contractual third parties to the proposed change of control of Avgold.

5.

THE AVGOLD OFFER

5.1

Terms of the Avgold offer

The acquisition by Harmony of Avmin's stake in Avgold constitutes an affected transaction in terms of the SRP Code and, as a result, Harmony would be required to extend a mandatory offer to the Avgold shareholders on the same terms and conditions, *mutatis mutandis*, as those offered to Avmin. Harmony wishes to acquire 100% of Avgold and has therefore extended an offer to Avgold shareholders by way of the scheme, subject to the Avgold conditions precedent, prior to triggering a mandatory offer in terms of the SRP Code.

If the scheme does not become operative due to the non-fulfilment of the conditions to which it is subject and the Avgold share exchange agreement becomes unconditional, Harmony will be obliged to make a mandatory offer to the Avgold shareholders in terms of Rule 8.1 of the SRP Code on the same terms and conditions offered to Avmin. The Harmony shares comprising the consideration under such offer will first have to be registered under the U.S. Securities Act of 1933 as amended. Harmony has undertaken to the SRP to use its best endeavours to procure registration of the Harmony shares comprising the offer consideration with the SEC as a matter of urgency to enable it to make such mandatory offer without undue delay.

5.2

Consideration paid pursuant to the Avgold offer

Pursuant to the Avgold offer, Avgold shareholders will receive a consideration equivalent to 1 Harmony share for every 10 Avgold shares held.

If successfully implemented, an aggregate amount of R3 239 286 577 will be paid in the form of Harmony shares, to the Avgold shareholders.

The aggregate number of new Harmony shares to be issued in terms of the Avgold offer is 32 049 932, representing approximately 11% of the Harmony issued share capital post the Avgold share exchange and prior to the implementation of the Avgold offer. The new Harmony shares issued will rank *pari passu* in all respects with the existing ordinary shares in Harmony.

It is expected that the listing of Avgold shares on the JSE will terminate on Tuesday 18 May 2004.

5.3

Avgold offer conditions precedent

The Avgold offer is subject to the fulfilment of the following conditions precedent:

5.3.1

the Avgold share exchange agreement becoming unconditional;

5.3.2

the approval of the scheme by a majority representing not less than 75% of the votes exercisable by the scheme members present and voting, either in person or by proxy, at the scheme meeting;

5.3.3
the High Court of South Africa (Transvaal Provincial Division) sanctioning the scheme;
5.3.4
a certified copy of the Order of Court sanctioning the scheme being registered by the Registrar of Companies in terms of the Act.
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6.
FINANCIAL EFFECTS OF THE ACQUISITION ON HARMONY
6.1
Pro forma financial effects for the Transaction and the Avgold offer

The table below sets out the illustrative pro forma financial effects of the Avgold share exchange and the Avgold offer based on the published consolidated financial results of Harmony for the six months ended 31 December 2003, and assumes that the Avgold share exchange and the Avgold offer were implemented for income statement purposes on 1 July 2003 and for balance sheet purposes on 31 December 2003:

	Pro forma after the Transaction (excluding Avgold offer)	**Pro forma after the Transaction (including Avgold offer)**	
Cents per Harmony share	**Before** (1)		**Change**
Basic earnings	(2) 50	34	(32%)
Headline earnings	(2) (129)	(129)	0%
Net asset value	(3) 6 350	7 352	16%
Net tangible asset value	(3) 5 265	5 850	11%
		(1) 7 326	15%
			5 566	6%

Weighted average number of
Harmony shares
231 707 291
262 023 354
293 715 856
Number of Harmony shares issued
258 350 934
288 666 997
320 359 499

Notes to table:

(1)
Extracted from the quarterly published unaudited financial results of Harmony for the six months ended 31 December 2003.

(2)
The pro forma effects on earnings and headline earnings per share after the Transaction excluding and including the Avgold offer have been prepared on the following assumptions:

-
the Transaction was effective 1 July 2003;

-
the Harmony share price for determining the purchase consideration was the share price at close of business on 19 March 2004, being R101,60 per share; and

-
for purposes of illustrating the pro forma effects after the Transaction including the Avgold offer, it has been assumed that all minorities accept the Avgold offer.

(3)
The pro forma effects on net asset and intangible asset value per Harmony share after the Transaction excluding and including the Avgold offer have been prepared on the following assumptions:

-
the Transaction was effective 31 December 2003;

-
the Harmony share price for determining the purchase consideration was the share price at close of business on 19 March 2004, being R101,60 per share; and

-
for purposes of illustrating the pro forma effects after the Transaction including the Avgold offer, it has been assumed that all minorities accept the Avgold offer.

6.2

Pro forma balance sheet and income statement of Harmony

The pro forma balance sheet and income statement of Harmony, before and after the acquisition, are set out in Annexure 2.

6.3

Independent reporting accountants' report

The independent reporting accountants' report on the pro forma financial information relating to the acquisition and on the pro forma balance sheet and income statement of Harmony, before and after the acquisition, is set out in Annexure 3. The interim financial results of Harmony are attached as Annexure 4.

The pro forma financial information reflected herein is the responsibility of the directors.

7.

INFORMATION IN RESPECT OF AVGOLD

7.1

Background

Avgold was incorporated in South Africa on 23 November 1990. Avgold has its primary listing on the JSE, with listings on Euronext Brussels in the form of International Depository Receipts and on the New York Stock Exchange,

Inc. in the form of American Depositary Receipts.
Avgold's registered address is:
56 Main Street
Johannesburg
2001
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7.2

Nature of business

The business of Avgold is to explore for, develop and operate gold mines. Following the sale of the ETC division, situated in the Mpumalanga province, on 15 June 2003, Avgold's assets comprise the Target Gold Mine situated in the Free State province and a significant unexploited resource north of the Target Mine.

7.3

Historical financial information

Historical financial information of Avgold and the interim financial information of Avgold is set out in Annexure 5 and Annexure 6, respectively.

A competent person's report containing information on the mining assets of Harmony including Avgold is set out in Annexure 7.

7.4

Material loans

The loans raised from a syndicate of banks to fund the completion of the Target Gold Mine were repaid in full on 30 June 2003. This was achieved by utilising existing cash resources, which included the proceeds from the sale of the ETC division. The balance of the funds were sourced by drawing down on a R200 million unsecured general term banking facility concluded with Standard Corporate and Merchant Bank.

7.5

Material contracts

Save for the Avgold share exchange agreement and the agreement in respect of the sale of the ETC division to Barberton Mines Limited on 15 June 2003, Avgold has not entered into any material contracts, other than in the ordinary course of business, during the two-year period immediately preceding the date of this circular.

The loans that were repaid on 30 June 2003 were secured in part by Rand gold hedges. On repayment of this loan, the Rand gold hedge book was restructured into Dollar gold commodity hedges by the purchase of Rand/Dollar forward exchange contracts.

7.6

Material changes

There have been no material changes in the financial or trading position of Avgold, other than as disclosed in this circular, between the date of the last audited financial statements of Avgold, being 30 June 2003, and the date of this circular.

7.7

Litigation statement

There are no legal or arbitration proceedings that are pending or threatened of which Avgold is aware which may have, or have had during the 12-month period preceding the date of this circular, a material effect on the financial position of Avgold.

8.

THE KALPLATS DISPOSAL

On 7 November 2003, prior to the announcement of the terms of the Transaction on 13 November 2003, Harmony announced that it had agreed to sell the entire issued share capital of Kalgold to Afrikander Lease for a purchase consideration of R275 million. However, on 17 March 2004, Harmony announced the cancellation of the sale agreement in respect of Kalgold. Consequently Kalgold remains a wholly-owned subsidiary of Harmony. As previously announced, Kalgold will sell Kalplats to ARM Platinum, which will become an Avmin subsidiary following implementation of the Transaction, for a consideration based on the weighted average traded price of an Avmin share for the seven trading days prior to the closing date of the sale, subject to a maximum of R100 000 000. The purchase consideration will be credited to a loan account in the books of Kalgold which loan account will be sold to Avmin for cash. Kalgold will use the cash to subscribe for renounceable letters of allocation in respect of 2 million new Avmin shares. Kalgold intends to renounce such letters of allocation in favour of Harmony so that the 2 million new Avmin shares will be held in Harmony.

9.

THE SPECIFIC ISSUE

9.1

Terms of the convertible bonds

Harmony intends to raise up to R1,700 million by way of a specific issue of convertible bonds for cash to international investors. The convertible bonds will be denominated in Rand and will be issued at 100% of their principal amount. Interest will be payable on the convertible bonds semi-annually in arrears at the rate of 4,875% per annum.

The convertible bonds may be converted into ordinary shares at the election of the holders at any time from the 41st day after their issue, expected to be on or about 21 May 2004, until the 7th day prior to the maturity date which is expected to be on or about 21 May 2009.

The convertible bonds may be converted into new Harmony shares issued as fully paid at a price, including premium, of R121,00 representing a premium of 22,7% to the closing price of Harmony shares on the JSE on 31 March 2004, the date of the launch of the offer for the convertible bonds.

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As the discount to current market price of Harmony shares will not be known at the time of their issue following conversion, the issue of the convertible bonds will be subject to the issue of a favourable fair and reasonable opinion regarding their terms from an independent professional expert acceptable to the JSE. Investec Bank Limited has been appointed and their opinion in this regard is expected by no later than 5 May 2004 so that it is available at the general meeting of shareholders on 7 May 2004.

To the extent that the convertible bonds are not converted, or redeemed early at the option of the company, they will be redeemed at the end of the five-year period following their issue, at their issue price.

Application will be made to list the convertible bonds on the LSE.

A summary of the terms and conditions of the convertible bonds is reflected in Annexure 1.

9.2

Pro forma financial effects for the specific issue

The table below sets out the illustrative pro forma financial effects of the specific issue on the published consolidated financial results of Harmony for the six months ended 31 December 2003, and assumes that the Avgold share exchange, the Avgold offer and the specific issue were implemented for income statement purposes on 1 July 2003 and for balance sheet purposes on 31 December 2003:

Cents per Harmony share	Before	Pro forma after the specific issue (1)	Change
Basic earnings	(2)	(1)	2 300%
Headline earnings	(2)	(131)	(126) 2%
Net asset value	(3)	7 326	7 400 1%
Net tangible asset value	(3)	5 566	5 639 1%
Weighted average number of Harmony shares	293 715 856	293 715 856	
Number of Harmony shares issued	320 359 499	320 359 499	

Notes to table:

1.

Extracted from the unaudited pro forma financial effects of Harmony for the six months ended 31 December 2003, assuming implementationof the Transaction and the Avgold offer, as set out in the "Pro forma after the Transaction (including the Avgold offer)" column presented in paragraph 6.1 above.

2.

The unaudited pro forma effects on earnings and headline earnings per Harmony share after the specific issue have been prepared on the assumption that the specific issue was effective on 1 July 2003.

3.

The unaudited pro forma effects on net asset and intangible asset value per Harmony share after the specific issue have been prepared on the following assumptions:

- the specific issue was effective 31 December 2003; and

the specific issue amount was allocated between long-term liabilities and equity, based on a market-related interest rate of 10%.

-

The pro forma financial information reflected herein is the responsibility of the directors. The independent reporting accountants' report on the pro forma financial information relating to the specific issue is set out in Annexure 8.

9.3

Shareholder approval

Attached hereto is a notice of general meeting convening a general meeting of Harmony shareholders to be held at Harmony's Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, at 10:00 on Friday, 7 May 2004. At the general meeting, ordinary resolutions will be proposed regarding the specific issue.

The issue of the convertible bonds and new Harmony shares following their conversion does not constitute an affected transaction as defined in the SRP Code.

The convertible bonds will not be issued to non-public shareholders.

9.4

Use of proceeds

The proceeds of the specific issue will be used primarily to refinance Harmony's existing South African Rand debt, hence benefiting from the attractive financing opportunities currently available in the convertible bond market.

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10. INFORMATION ON HARMONY

10.1

Background

Harmony was incorporated in South Africa on 25 August 1950. The primary listing of Harmony's shares is on the JSE. The Harmony shares are also listed on the LSE and Euronext Paris and are quoted on Euronext Brussels in the form of International Depository Receipts and on the New York Stock Exchange, Inc. in the form of American Depositary Receipts.

Harmony's registered address is:

Remaining extent of portion 3 of the farm Harmony Farm 222
Private Road
Glen Harmony
Virginia
Free State Province.

10.2

Nature of business

Harmony is a gold miner and producer with an international diversified portfolio of gold mining projects in South Africa, Australia and Papua New Guinea. Harmony adopts focused operational and management philosophies throughout the organisation. Its growth strategy is focused on building a leading international gold mining company through acquisitions, organic growth and focused exploration. The bulk of its assets are located in the Witwatersrand Basin of South Africa. The deep level gold mines located in this basin include those in the Free State province, the Evander gold mine in Mpumalanga province, the Randfontein and Elandskraal mines on the West Rand, goldfields in Gauteng province and the Orkney operations in North West province. In May 2003, Harmony and ARMgold, through a Harmony/ARMgold joint venture company, acquired 38 789 761 Avmin shares, in July 2003, Harmony acquired 77 540 830 Avgold shares, representing 11,4% of Avgold's issued share capital, from Anglo South Africa and in September 2003 Harmony acquired the entire issued share capital of ARMgold.

Harmony's international operations are held under Harmony Gold (Australia) (Proprietary) Limited and comprise the wholly-owned New Hampton Goldfields Limited and Hill 50 Limited, a 31,8% interest in the Bendigo Mining NL operation and an 83,2% shareholding in Abelle Limited.

On 15 March 2003, Harmony announced its intention to propose an off market cash offer to acquire all the ordinary shares and listed and unlisted options in Abelle Limited that it does not already own. The offer is subject to the fulfilment of certain conditions precedent and is valued at R620 million or A$125 million.

10.3

Prospects

Harmony is a growth oriented company in the gold production business and is distinguished by the focused operational and management philosophies which it employs throughout the organisation. Its growth strategy is focused on building a leading international gold mining company through acquisitions, organic growth and focused exploration.

Since undergoing a change in management in 1995, Harmony has employed a successful strategy of growth through a series of acquisitions and through the evolution and implementation of a simple set of management systems and philosophies, which Harmony refers to as the "Harmony Way" and which it believes is unique in the South African gold mining industry. A significant component of the success of Harmony's strategy to date has been its ability to acquire underperforming mining assets, mainly in South Africa, and within a relatively short time frame, to transform these mines into cost-effective production units.

Harmony is managed according to the philosophy that Harmony shareholders have invested in Harmony in order to hold a growth stock that will also participate in movements in the gold price. Accordingly, Harmony has consistently maintained a policy of not hedging its future gold production.

10.4

Material loans

The details of material loans to the Harmony group are reflected in Annexure 9.

10.5

Material contracts

Save for the merger agreement, dated 22 July 2003, entered into between Harmony, ARMgold and ARMI, whereby the parties undertook to merge their gold producing assets, the agreements relating to the acquisitions and disposals of companies, businesses and properties set out in Annexure 10 and the agreements referred to in this circular, Harmony has not entered into any material contracts, other than in the ordinary course of business, during the two-year period immediately preceding the date of this circular**.**

10.6

Material changes

The details of material changes in the financial or trading position of Harmony are reflected in Annexure 11.

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10.7

Litigation statement

There are no legal or arbitration proceedings that are pending or threatened of which Harmony is aware that may have, or have had during the 12-month period preceding the date of this circular, a material effect on the financial position of Harmony.

A claim has been instituted against Harmony by Wadethru Security Company (Proprietary) Limited (in liquidation) in respect of alleged damages arising out of the termination of a sale of business agreement in relation to Brand No. 2 Shaft. Even if successful, this is not expected to have a material effect on the financial position of Harmony.

10.8

Share capital

Harmony's authorised and issued share capital, at the last practicable date, was as follows:

BEFORE THE TRANSACTION AND THE AVGOLD OFFER

ZAR'm

Authorised

350 000 000 ordinary shares of 50 cents each

175

Issued

258 469 684 ordinary shares of 50 cents each

129

Following implementation of the Transaction and the Avgold offer, Harmony's authorised and issued share capital is expected to be as follows:

AFTER THE TRANSACTION, THE AVGOLD OFFER AND THE SPECIFIC ISSUE

ZAR'm

Authorised

350 000 000 ordinary shares of 50 cents each

175

Issued

320 805 079 ordinary shares of 50 cents each

160

Assuming full conversion of the convertible bonds into Harmony shares, Harmony's authorised and issued share capital is expected to be as follows:

AFTER THE TRANSACTION, THE AVGOLD OFFER AND THE SPECIFIC ISSUE

ZAR'm

Authorised

350 000 000 ordinary shares of 50 cents each

175

Issued

334 805 079 ordinary shares of 50 cents each

167

10.9

Price history of Harmony shares

The price history of Harmony shares is reflected in Annexure 12.

10.10 Major shareholders

At the last practicable date, the following shareholders beneficially held more than 5% of the issued ordinary share capital of Harmony:

Name of shareholder

Number of shares

Percentage

(million)

shareholding

The Bank of New York

113,5
43,9
ARMI
35,0
13,5
JPMorgan Chase Bank
15,3
5,9
Harmony has no controlling shareholder, as the shares held by The Bank of New York are held on behalf of shareholders who participate in Harmony's American Depositary Receipt program.
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10.11 Directors

10.11.1 Directors and management

The full names, business address and function of the directors are as follows:

Name	**Function**	**Address**
P T Motsepe (South African)	Non-executive Chairman	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
Z B Swanepoel (South African)	Chief Executive	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
F Abbott (South African)	Financial Director	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
Dr M M M M Bakane-Tuoane (South African)	Non-executive Director	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
F Dippenaar (South African)	Marketing Director	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
V N Fakude (South African)	Non-executive Director	1st Floor Block C, Sandhurst Office Park, corner Katherine Street and Rivonia Road, Sandton, PO Box 781220, Sandton, 2146
T S A Grobicki (South African)	Executive Director	Harmony Corporate Office, Level 1, 10 Ord Street, West Perth, WA, 6005
W M Gule (South African)	Executive Director	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
M W King (South African)	Non-executive Director	Harmony Corporate Office, Randfontein Office Park, Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa

D S Lushaba
Non-executive Director
522 Impala Road, Glenvista, 2058, PO Box 1127,
(South African)
Johannesburg, 2000
M F Pleming
Non-executive Director
30 Hydewoods, Townshend Road, Hyde Park, 2196
(South African)
Lord Renwick of Clifton KCMG
Non-executive Director
JPMorgan plc., 125 London Wall, London EC2Y 6AJ,
(British)
United Kingdom
C M L Savage
Non-executive Director
Harmony Corporate Office, Randfontein Office Park,
(South African)
Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
Dr S P Sibisi
Non-executive Director
Harmony Corporate Office, Randfontein Office Park,
(South African)
Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
D V Simelane
Executive Director
Harmony Corporate Office, Randfontein Office Park,
(South African)
Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
Dr R V Simelane
Non-executive Director
Harmony Corporate Office, Randfontein Office Park,
(South African)
Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
M V Sisulu
Non-executive Director
Harmony Corporate Office, Randfontein Office Park,
(South African)
Corner Main Reef Road and Ward Avenue, Randfontein, PO Box 2, Randfontein, 1760, South Africa
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Further details on the executive directors of Harmony are as follows:

Bernard Swanepoel (42) BSc (Mining Engineering), B Com (Hons), Chief Executive Officer and an Executive Director. Bernard has over 20 years' experience in the gold mining industry. He started his career in gold mining at Grootvlei in 1983. As part of his training he spent time on various Gengold operations including Kinross (Evander) and Barberton. He then moved into senior management with the Gengold group, culminating in his appointment as general manager and a director of Beatrix Mines in 1993. He joined Randgold in 1995 as Managing Director of Harmony and has been the driving force in making the company the fifth largest independent gold producer in the world and the largest in South Africa.

Frank Abbott (48), BCom, CA(SA), MBL, Chief Financial Officer and an Executive Director. Frank joined the Rand Mines/Barlow Rand Group in 1981, where he obtained broad financial management experience at operational level. He was appointed as financial controller to the newly formed Randgold in 1992 and was promoted to financial director of that group in October 1994. Until 1997, he was also a director of the gold mining companies Blyvooruitzicht, Buffelsfontein, Durban Roodepoort Deep and East Rand Proprietary Mines and a non-executive director of Harmony, which culminated in his appointment as financial director of Harmony in the same year.

Ferdinand Dippenaar (42), BCom, BProc, MBA, Marketing Director and an Executive Director. Ferdi started his career at the Buffelsfontein gold mine in 1983 and completed his degrees through part-time studies while employed in various financial and administrative capacities at the Gengold mines. In 1996, he became managing director of Grootvlei and of East Rand Proprietary Mines. Following Harmony's acquisition of Grootvlei and Cons Modder, he was appointed Marketing Director of Harmony in 1997. He oversees Harmony's refinery and direct marketing activities, as well as the company's investor relations programme.

Ted Grobicki (54), BSc (Hons) (Geology) MSc (Minerals Exploration) PrSciNat, FIMM, Executive Officer for Harmony's Australian operations and an Executive Director. After fulfilling various roles within mining and exploration companies in South Africa, Namibia and Zimbabwe, Ted was appointed chief executive of Texas Gulf Inc South Africa in 1979. He has since served at a senior executive level in a wide range of public and private companies in the mining sector and was appointed as non- executive director of Harmony in 1994. With Harmony's merger with Kalgold and West Rand Cons in 1999, he was appointed as executive director focusing on new business. Ted has 30 years' experience in all aspects of the mining industry, including exploration, evaluation, development, mine management and financial and corporate management.

Mangisi Gule (51), BA (Hons) and an Executive Director. Mangisi has 23 years' experience in training and human resources and is a member of the Association of Mine Human Resource Practitioners. Mangisi joined the company on 23 September 2003, following the ARMgold merger. He oversees the company's human resources and communication activities.

Dan Simelane (41) BA, LLB, LLM and an Executive Director. Dan Simelane has seven years' legal experience and acted as legal advisor to Avmin Limited and the Swaziland Electricity Board. He has extensive tax experience and was a senior tax consultant with Arthur Andersen. Dan joined Harmony on 23 September 2003 following the ARMgold merger.

Further details on the non-executive directors of Harmony are set out below:

Patrice Motsepe (41) BA (Legal), LLB, Non-executive Director. Founder and former Executive Chairman of ARMgold which merged with Harmony in 2003. Patrice is now Harmony's non-executive Chairman. In 2002 he was voted South Africa's Entrepreneur of the year. In the same year, he was voted by the CEO's of the top 100 companies in South Africa as South Africa's Business Leader of the Year. Patrice has significant entrepreneurial expertise and knowledge of the new business environment in South Africa and will be central in helping to steer Harmony to grow and be competitive. Patrice was a partner specialising in mining and business law at Bowman Gilfillan Inc, a leading South African law firm. He was employed for approximately four years by McGuire Woods LLP, a law firm in Richmond, Virginia, USA. He was initially based in Richmond and thereafter moved to South Africa where he was their legal consultant for their southern African legal practice. In 1994, he founded Future Mining (Proprietary) Limited which grew rapidly to become a competitive contract mining company. In 1998 he founded African Rainbow Minerals (Proprietary) Limited which in 2000 became ARMgold which was successfully listed on the JSE in 2002. In 2001, he founded African Rainbow Minerals Platinum (Proprietary) Limited and ARM Mining Consortium Limited which entered into a 50/50 joint venture with Anglo American Platinum Corporation Limited for the establishment of a new platinum mine. He was Senior Vice President of the Chamber of Mines and is a "Global Leader of Tomorrow"

of the World Economic Forum (WEF). He is a member of National Economic Development and Labour Council (NEDLAC), which is South Africa's primary institution for social dialogue between organised business, Government, labour and community on issues of social and economic policy. He is currently the President of the first non-racial, united and recognised business organisation in South Africa, namely Business Unity South Africa (BUSA), which is the "voice of business" in South Africa as well as President of the first non-racial, united and recognised organisation representing the various chambers of commerce and industry in South Africa, namely Chamber of Commerce and Industry South Africa (CHAMSA).

Dr Manana Bakane-Tuoane (55) PhD, BA, MA and independent non-executive Director. Dr Bakane-Tuoane has extensive experience in the economic disciplines as lecturer and professor at the University of Fort Hare, Eastern Cape. She has held various senior management positions in the public service and currently holds the post of Director General in the North West Provincial Government. Dr Bakane-Tuoane was appointed to the advisory Board of the African Economic Research Consortium, Nairobi, Kenya in 2000. Dr Bakane-Tuoane was appointed a non-executive director of the company on 23 September 2003 following the ARMgold merger.

Nolitha Fakude (39) BA (Hons) (Psychology, Education and English) and an independent non-executive director. Nolitha has been a director of Harmony since September 2002. Nolitha Fakude is the Managing Director of the Black Management Forum

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(BMF). Her role involves stakeholder management, policy formulation and advocacy work on issues of Black Economic Empowerment and organisational transformation. Nolitha was a Group Human Resources Manager for Retail at Woolworths, as well as head of Corporate Affairs, which included, amongst others, Communication and Community Affairs. She serves on various boards, including BMF Investment Company, The People's Bank, Business Partners as well as Wheat Trust. Nolitha was recently appointed by the Gauteng MEC for Economic Affairs as one for the Rainmakers for the Blue IQ project.

Simo Lushaba (37) BSc (Advanced Biochemistry), MBA, non-executive Director and an independent non-executive Director. Simo has been a director of Harmony since October 2002. Simo started his career at the University of Zululand in 1988 as a research technician. In 1990, he joined South African Breweries and two years later National Sorghum Breweries where he served as Divisional Executive of the Khangela Division nine coastal depots. In 1995, Simo was appointed by SpoorNet, where he worked for seven years in various managerial positions and ultimately as the General Manager for Rail and Terminal Services. In April 2002, Simo was brought into Rand Water to drive both business and social transformation in the organisation which included internal restructuring, focusing on creating a customer-driven organisation, as well as new business opportunities, both in South Africa and internationally. Simo also serves as non-executive Chairman of PIKITUP Johannesburg (Pty) Limited and as a non-executive director of Trans-Caledon Tunnel Agency (TCTA). He is currently the Chief Executive of Rand Water.

Lord Renwick of Clifton KCMG (66), an independent non-executive director. Lord Renwick has been a director of Harmony since December 1999. Having formerly served as British Ambassador to South Africa and the United States, Lord Renwick is Vice Chairman, Investment Banking, of JPMorgan plc. He is also Chairman of Flour Limited and serves on the boards of a number of other public companies including British Airways, SABMiller plc and Richemont.

Mike Pleming (68), Pr Eng, FIMM and an independent non-executive director. Mr Pleming has been a director of Harmony since September 1998. Mike started his career in mining engineering on the Zambian Copperbelt. He joined TransNatal (now Ingwe) in 1975 as general manager, Optimum Collieries and was later appointed project manager and consulting engineer. He joined Liberty Asset Management in 1982 where he was responsible for mining investment research. He retired in 1995 and has since undertaken a series of mining investment-related assignments. Following Harmony's acquisition of Evander in 1998, he joined the company as a non-executive director. He is also a director of Impala Platinum Holdings Limited. Mike also serves as a non-executive director of Highlands Gold Limited. Mike has approximately 31 years' mining and approximately 15 years' mining investment experience.

Michael King (66) CA(SA), FCA, Non-executive director. Michael King served articles with Deloitte, Plender, Griffiths, Annan & Co. (now Deloitte & Touche) and qualified as a Chartered Accountant (SA). He later became a Fellow of the Institute of Chartered Accountants in England and Wales (FCA). He joined Anglo American Corporation of South Africa as a manager in the finance division. In 1979, he became director of Anglo American Corporation and in 1980 an executive director and head of its finance division. In 1997, he was appointed executive deputy chairman of Anglo American Corporation. He was the executive vice-chairman of Anglo American plc, in May 1999, until his retirement in May 2001. Michael was appointed a non-executive director of Harmony on 23 September 2003 following the ARMgold merger.

Cedric Savage (64) BSc Eng, MBA, ISMP, an independent non-executive director. Cedric commenced his career in the United Kingdom in 1960 as a graduate engineer with Fairey Aviation and in 1963 returned to South Africa where he worked in the oil (Mobil), textile (Felt & Textiles) and the chicken (Rainbow Chickens Limited) industries. In 1993/1994, he was appointed President of the South African Chamber of Business. He has also served as Chairman of the Board of Governors on the Natal University Development Foundation and as a member of Council of the University of Natal. He joined the Tongaat- Hulett Group in 1977 as Managing Director of Tongaat Foods and thereafter progressed to Executive Chairman of the Building Materials Division, Chief Executive Officer of The Tongaat-Hulett Group Limited in 1991 and in May 2000, he assumed the dual roles of Chief Executive Officer and Executive Chairman. Cedric was appointed a non-executive director of Harmony on 23 September 2003 following the ARMgold merger.

Dr Sibusiso Sibisi (48) BSc (Hons), PhD, Non-executive Director. Dr Sibusiso Sibisi's working career commenced in 1983 in the software development industry with MEDC Limited, Cambridge, UK. His career developed to that of Systems Engineer at IBM (SA), lecturer and senior lecturer (Wits) and deputy vice-chancellor for research (University of Cape Town). He spent 1988 as a Fulbright Fellow at the California Institute of Technology where he collaborated with eminent researchers in computational chemistry and the development of associated medical diagnosis tools. In

1989, he took up a research position at Cambridge where he consolidated his academic research in mathematical modelling and computational simulations to environmental, geophysical and biomedical problems to develop solutions. This evolved to the formation of a start-up company dedicated to providing consulting services to Glaxo, Welcome, Fisons, Shell and Mobil. He entered the corporate world in 1997 as executive director of Plessey (SA), with the responsibility of managing and directing research and development in telecommunication technologies. As chairperson of the National Advisory Council on Innovations, he is involved in making recommendations on research and innovation policy to the Government. Dr Sibisi was appointed a non-executive directory of the company on 23 September 2003 following the ARMgold merger.

Dr Rejoice Simelane (51) BCom, MCom, PhD and an independent non-executive director. Dr Rejoice Simelane's career commenced as a lecturer at the University of Swaziland where she lectured from 1978 to 1997 on Development Economics, Micro-economics and Macro-economics Theory, Research Methods, Mathematical Economics, Econometrics, Economic Planning and Economic Integration. She then joined the Department of Trade and Industry as a macro-economist and later joined the National Treasury as a micro-economist (public utility regulation and pricing) before joining the Premiers Office in the Mpumalanga Province as an Economic Adviser. Dr Simelane was appointed a non-executive director of the company on 23 September 2003 following the ARMgold merger.

Max Sisulu (58) MPA, MSc and an independent non-executive director. Max was appointed as director of Harmony in August 2003. Max is currently the General Manager at Sasol and prior to that held the position of deputy chief executive officer at Denel, a post he held since November 1998. From 2001 to 2003 he was the chairperson of the South African Aerospace, Maritime and Defence Industries. He is also a council member of the Human Sciences Research Council and a member of the Premier of the Free State's Economic Advisory Council. From 1977 to 1981 Max served as the ANC representative in Hungary and was South Africa's representative in the "World Federation of Democratic Youth". In January 1995 he was elected to the National Executive Committee and National Working Committee of the ANC. From 1986, he helped establish the ANC economics department and was instrumental in developing the ANC's economic policy. In 1990 he spearheaded the drafting of the ANC's first policy statement on the environment. From 1992 to 1993 Max completed a Masters degree in Public Administration at the Kennedy School of Government at Harvard University in the United States. He returned to South Africa in September 1993 and took up the post of Director of the National Institute of Economic Policy until he became a Member of Parliament in 1994.

10.11.2 Directors' remuneration to 30 June 2003

Directors'	**Salaries and**	**Retirement**	**Bonuses paid**		
fees	**benefits**	**contributions**	**during year**	**Total**	
R'000	**R'000**	**R'000**	**R'000**	**R'000**	
Executive					
F Abbott					
-					
1 001					
110					
2 000					
3 111					
F Dippenaar					
-					
927					
119					
2 000					
3 046					
T S A Grobicki					
-					
1 770					
121					
2 000					
3 891					
Z B Swanepoel					
-					
1 640					
196					
3 000					

4 836
M Gule
-
-
-
-
-
D V Simelane
-
-
-
-
-
Total executive
5 338
546
9 000
14 884
Non-executive
P T Motsepe
-
-
-
-
-
Dr M M M M Bakane-Tuoane
-
-
-
-
-
V N Fakude
75
-
-
-
75
M W King
-
-
-
-
-
D S Lushaba
75
-
-
-
75
Dr R V Simelane
-

-
-
-
-
C M L Savage
-
-
-
-
-
M F Pleming
100
-
-
-
100
Lord Renwick of Clifton KCMG
100
-
-
-
100
Dr S P Sibisi
-
-
-
-
-
M V Sisulu
-
-
-
-
-
Total non-executive
350
-
-
-
350
Total directors' remuneration
350
5 338
546
9 000
15 234

The directors' remuneration will not change after the Transaction.

10.11.3 Directors' service contracts

Harmony's executive directors have standard service contracts, details of which are reflected in paragraph 11. None of the non-executive directors have service contracts.

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10.11.4 Directors' interests in Harmony shares

On the last practicable date, Harmony held 77 540 880 Avgold shares representing 11,4% of Avgold's issued share capital.

On the last practicable date, the directors held the following interests in Harmony shares:

Director	**Direct**	**Indirect**	**Percentage of Harmony shares**
Non-executive			
P T Motsepe	-	35 002 396	13,5
Dr M M M M Bakane-Tuoane	-	-	-
V N Fakude	-	-	-
M King	33 333	-	*
D S Lushaba	-	-	-
M F Pleming	-	-	-
Lord Renwick of Clifton KCMG	-	5 105	*
C M L Savage	-	-	-
Dr S P Sibisi	-	-	-
Dr R V Simelane	-	-	-
M V Sisulu			

-
-
-
Executive
Z B Swanepoel
-
-
-
F Abbott
-
-
-
F Dippenaar
-
-
-
T Grobicki
10 000
30 000
*
W M Gule
-
-
-
D V Simelane
-
-
-
* Indicates beneficial ownership of less than 1%.

On the last practicable date, the directors held the following interests in Harmony options:

Director	Number of options in issue	Percentage of total options	Issue date	Issue price (Rand)	Expiry date
F Abbott	73 400	0,35	20/11/2001	49,60	20/11/2011
F Dippenaar	36 700	0,18			

20/11/2001
49,60
20/11/2011
T S A Grobicki
20 000
0,50
21/09/1999
22,90
21/09/2010
87 400
20/01/2001
49,60
20/11/2011
Z B Swanepoel
128 800
0,60
20/11/2001
49,60
20/11/2011
P T Motsepe
-
-
-
-
-
Dr M M M M Bakane-Tuoane
-
-
-
-
-
M F Pleming
-
-
-
-
-
Lord Renwick of Clifton KCMG
-
-
-
-
-
V N Fakude
-
-
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D S Lushaba
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-
M W King
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-
-
-
C M L Savage
-
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-
-
-
W M Gule
-
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-
-
-
Dr S P Sibisi
-
-
-
-
-
D V Simelane
-
-
-
-
-
Dr R V Simelane
-
-
-
-
-
M V Sisulu
-
-
-
-
-

10.12 Directors' interests in the acquisition

On the last practicable date none of the directors of Harmony held any shares in Avgold.

Save as disclosed above, none of the directors have any material beneficial interests, whether direct or indirect, in the acquisition or in any other transactions entered into by Harmony during the current or immediately preceding financial year or during any previous financial year which remain outstanding or unperformed.

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11. CORPORATE GOVERNANCE

Introduction

The King II Report ("King II") became operative in March 2002 and goes beyond financial and regulatory aspects of Corporate Governance in that it advocates an integrated approach by including principles of sound social, ethical and environmental practice. This includes a shift in focus from the "single bottom line", i.e. financial, towards the "triple bottom line" approach, namely economic, social and environmental reporting. Furthermore, King II places major emphasis on enterprise risk management as the cornerstone of internal controls and, in directing its focus thereon, states that risk goes to the very essence of an organisation's ability to meet its objectives and sustain its existence.

The Harmony board of directors ("the board") are aware of all the onerous duties, responsibilities and personal liabilities which are imposed on them as directors under both common and statutory law, not only in South Africa, but also in the US, Australia and the UK, due to its operations in these countries and its listings in South Africa, London, Paris, Brussels, Berlin and New York. In addition to King II, the Sarbanes Oxley Act of 2002 ("SOx"), applicable to non-US companies which trade securities in the US, imposse additional prohibitions and responsibilities on all directors within Harmony.

To ensure compliance with the numerous legal requirements and to show Harmony's commitment to Corporate Governance, the company has adopted formal charters for the board and each of its committees to give clear guidance to all board members and employees on how governance should be put into practice. These charters were compiled in a way which enables Harmony to achieve a balance between performance and conformance of Corporate Governance principles. Harmony aims to adhere to the provisions and recommendations of King II and therefore these charters will be reviewed, updated and maintained on an on-going basis.

In addition to acting in good faith and with due diligence and care, the board supervises and monitors management to ensure that good Corporate Governance is part of doing business the Harmony Way.

Board structure

Harmony has a unitary board structure, comprising 17 directors, with a balance between executive and non-executive directors. Harmony has 11 non-executive directors, of whom 10 are independent. Harmony has six executive directors and no shadow directors. The non-executive and independent directors are of sufficient calibre and number for their views to carry significant weight in the board's decisions. In considering new appointments to the board, Harmony has cognisance of the gender and racial mix and believes that the company has achieved an acceptable balance of members on the board.

Chairman and Chief Executive

The roles of chairman and chief executive are not vested in the same person and their performances are subject to review by the Remuneration Committee at least once a year.

Board Charter

The board's fiduciary duties are incorporated in Harmony's Board Charter, which sets out the purpose and role of the board, its responsibilities, its authority, composition, meetings and self-assessment. The Board Charter stipulates that Harmony directors have to exercise leadership, enterprise, integrity and judgement based on fairness, accountability, responsibility and transparency.

The responsibility to ensure that Harmony complies with all the relevant laws, regulations and codes of best business practice vests in the board. For this purpose the board has direct access to the advice and services of the company secretary and they are also entitled to seek independent professional legal advice about Harmony's affairs at the company's expense.

The board is also responsible for identifying the principal risks and key performance indicators of Harmony's businesses and ensuring the implementation and regular evaluation of systems to manage those risks through the Audit Committee. Strategies are developed in such a way that the purpose is achieved, the company's values implemented and shareholders and other stakeholders are satisfied. The board also accepts responsibility for monitoring and supervising executive management and the induction of new or inexperienced directors. Harmony's non-executive directors also have access to management should they wish to discuss any matter separate from the executive directors. Harmony is dedicated to ensuring that the directors are familiar with Harmony's operations, its business environment and their fiduciary duties and responsibilities.

Internal control

The board is ultimately responsible for ensuring that Harmony remains a going concern and that it thrives. The board retains full and effective control over Harmony by monitoring and supervising its executive management, being involved in all material decisions affecting Harmony and ensuring that adequate systems of financial and operational internal controls are monitored. The procedures and systems which act as checks and balances on the information are reviewed by the board from time to time. An adequate budgeting and planning process exists and performance is monitored against these budgets and plans.

Self-assessment

The board conducts a self-assessment or self-evaluation annually. The chairman assesses the performance of the individual board members and the members evaluate the chairman, based on several factors, which include expertise, inquiring attitude, objectivity and independence, judgement, understanding of Harmony's business, understanding and commitment to the board's duties and responsibilities, willingness to devote the time needed to prepare for and participate in committee deliberations, timely responses and attendance at meetings.

In keeping with good Corporate Governance, the board has agreed that a Nomination Committee should assist in the evaluation of the board members.

Meetings

The board meets at least four times a year. The number of meetings held during a period is sufficient to ensure that the board meets its objectives and all members are required to attend all meetings. Dates of meeting are planned annually in advance.

Directors' terms of employment

Executive directors

Harmony's executive directors have standard employee service agreements and none may give notice of less than one month. Their employment letters also do not make provision for pre-determining compensation on termination of an amount which equals or exceeds one year's salary and benefits in kind. The executive directors have waived their rights to directors' fees. Executive directors participate in the company's share scheme and a discretionary Executive Profit Share Scheme, provided that in respect of the latter, certain profit targets (set by the Remuneration Committee) are achieved. The executive directors also benefit from pension contributions, life insurance and medical aid.

Non-executive directors

None of the non-executive directors have service contracts with Harmony. The non-executive directors are entitled to fees as agreed at Harmony's annual general meeting, reimbursement of out-of-pocket expenses incurred on the company's behalf, and remuneration for other services, such as serving on committees. Currently, each non-executive director is entitled to R20 000 per quarter, plus R5 000 per quarter for each committee on which he or she serves.

Rotation

The articles of association of Harmony provide that the longest serving one-third of directors retire from office at each annual general meeting. Retiring directors making themselves available for re-election are re-elected at the annual general meeting at which they retire.

Board committees

To enable the board to properly discharge its onerous responsibilities and duties, certain responsibilities have been delegated to board committees. The creation of committees does not, however, reduce the board's overall responsibility and therefore all committees must report and make recommendations to the board. All the board committees are chaired by an independent non-executive director.

The various board committees are as follows:

Audit Committee

Harmony's Audit Committee provides additional assurance to the board regarding the quality and reliability of financial information used by the board and the financial statement issued by the company. The committee assists the board in the discharge of its responsibilities with regard to safeguarding our assets, maintenance of accounting records and maintenance of an effective system of control. An Audit Committee Charter has been established which sets out the role, responsibilities, duties, authority, membership and meetings of the Audit Committee. All non-audit services provided by our external auditors must be, and are, pre-approved by the Audit Committee.

The Audit Committee meets periodically with Harmony's external and independent internal auditors and executive management to review accounting, auditing and financial reporting matters so as to ensure that an effective control environment is maintained. The committee also monitors proposed changes in accounting policy, reviews the internal audit function and discusses the accounting implications of major transactions. In terms of SOx the Audit Committee is directly responsible for the appointment, compensation and oversight of any auditor employed by the company. All members of the committee are knowledgeable about company affairs and have a working familiarity with finance and accounting practices. Certain members of management also attend the Audit Committee meetings to answer any questions posed by members. The Audit Committee always has at least one financial expert present during meetings.

The members of the committee are:
M W King *(Chairman)*
D S Lushaba
C M L Savage
M F Pleming
Dr R V Simelane

Nomination Committee

In terms of the requirements of King II, a Nomination Committee was formed to ensure that the procedures for appointments to the board are formal and transparent, by making recommendations to the board on all new appointments. The Nomination Committee Charter which sets out the role and responsibilities of the Nomination Committee, has been adopted and implemented.
The members of the Nomination Committee are:
P T Motsepe *(Chairman)*
Dr R V Simelane
Lord Renwick of Clifton KCMG
M V Sisulu
V N Fakude.

Remuneration Committee

The Remuneration Committee meets at least once a year and comprises three independent non-executive directors. The primary purposes of the Remuneration Committee are to ensure that the group's directors and senior executives are fairly rewarded for their individual contributions to Harmony's overall performance, to demonstrate to all stakeholders that the remuneration of senior executive members are set by a committee of board members who have no personal interest in the outcomes of their decisions, and who will give due regard to the interests of the shareholders as well as the financial and commercial health of Harmony. The Remuneration Committee's primary objectives are to serve as a party to monitor and strengthen the objectivity and credibility of Harmony directors' and senior executives' remuneration system and to make recommendations to the board on remuneration packages and policies applicable to directors.
The committee meets whenever it is necessary to make recommendations relating to the remuneration of senior executives and executive directors. A Remuneration Committee Charter has been adopted which sets out the objectives, role, responsibilities, authority, membership and meeting requirements of the committee.
The members of the committee are:
P T Motsepe *(Chairman)*
M F Pleming
C M L Savage
Dr R V Simelane
Dr M M M M Bakane-Tuoane

Health, Safety and the Environmental Audit Committee

The Health, Safety and Environmental Audit Committee ("HSE") monitors health, safety and environmental performance and makes recommendations to the board where it deems particular attention is required. The committee operates in accordance with specific terms of reference confirmed by the board. The committee meets periodically.
The members of the committee are:
M F Pleming *(Chairman)*
V N Fakude
Dr S P Sibisi
Dr M M M M Bakane-Tuoane

Investment Committee

The Investment Committee was formed in January 2004 and will focus on major capital projects and acquisitions or mergers. The board is in the process of approving an Investment Committee Charter.
The members of the committee are:
Dr S P Sibisi *(Chairman)*
M F Pleming

C M L Savage
Dr M M M M Bakane-Tuoane
D S Lushaba
M W King
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Empowerment Committee

The Empowerment Committee was formed in January 2004 and will focus on ensuring that the company meets its empowerment targets. The board is in the process of approving an Empowerment Committee Charter.

The members of the committee are:

V N Fakue *(Chairwoman)*

M V Sisulu

M F Pleming

P T Motsepe (Ex Officio)

Company secretary

Harmony's company secretary, M P van der Walt, plays a pivotal role in the achievement of good Corporate Governance and the board has empowered her accordingly. The company secretary supports the chairman in ensuring the effective functioning of the board, provides guidance to the chairman and the board and the directors of Harmony's subsidiaries on their responsibilities and duties within the prevailing regulatory and statutory environment, provides the board with guidance as to how they can, in the best interest of the company, discharge these responsibilities and duties, and is expected to and does raise matters that may warrant the attention of the board.

12. SIGNIFICANT CONTRACTS

Save as set out in paragraph 10.5, the company has not entered into any contract, other than in the ordinary course of business, within the period of two years immediately preceding the date of this circular which is or may be material to the company nor has it entered into any other contract, other than in the ordinary course of business, and the company has not entered into any contract which contains provisions, in terms of which there are any obligations or entitlements, which are material to the company.

13. WORKING CAPITAL

The directors are of the opinion that the working capital available to the Harmony group, including Avgold, is sufficient for its present requirements, that is for the next 12 months from date of issue of this circular.

14. EXPENSES

The costs of the scheme, including fees payable to professional advisers, the JSE, the SRP and printing and advertising costs will be borne and paid by Avgold. The cost of this circular, printing and posting will be borne and paid by Harmony and is estimated to be in the region of R1 450 000. Other costs to be paid by Harmony in connection with the Transaction include: R350 000 to the Reporting Accountants (PricewaterhouseCoopers Inc.); R1 970 000 to the Attorneys (Cliffe Dekker Inc.) and a success-based completion fee, still to be agreed, to the Financial Advisers (JP Morgan Chase Bank, Johannesburg Branch).

15. CONSENTS

PricewaterhouseCoopers Inc. and SRK have given, and have not withdrawn, their consents to the inclusion of their names and reports in this circular in the form and context in which they appear.

16. OPINION OF THE DIRECTORS OF HARMONY

The directors are of the opinion that the terms and conditions of the acquisition are fair and reasonable to shareholders.

17. DIRECTORS' RESPONSIBILITY STATEMENT

The directors, whose names appear on page 5 of this circular, collectively and individually, accept full responsibility for the accuracy of the information given in this circular and certify that, to the best of their knowledge and belief there are no facts that have been omitted which would make any statement in this circular false or misleading, and that all reasonable enquiries to ascertain such facts have been made and that this circular contains all information required by the JSE Listings Requirements.

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18. DOCUMENTS AVAILABLE FOR INSPECTION

Copies of the following documents will be available for inspection during normal business hours on any weekday (Saturdays, Sundays and public holidays excepted) from 15 April 2004 (the date of issue of this circular) up to and including 7 May 2004, at the registered office of Harmony and the company's United Kingdom Secretaries:

- a signed copy of this circular;
- the memorandum and the articles of association of Avgold;
-
the written consents of advisers to Harmony to the publication of their names in this circular in the form and context in which they appear;
- a copy of the Avgold share exchange agreement;
- a copy of the ARM voting agreement;
- a summary of the terms and conditions of the convertible bonds;
- the audited annual reports of Harmony for the three financial years ended 31 December 2003; and
- the report of PricewaterhouseCoopers Inc. on the pro forma financial information of Harmony.

By order of the board

Marian van der Walt

Secretary

Virginia

15 April 2004

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Annexure 1

Summary of the terms and conditions of convertible bonds

ZAR1,700 million Harmony Gold Mining Company Limited

Convertible Bonds due 2009

Issuer:

Harmony Gold Mining Company Limited.

Underlying shares:

New ordinary shares of Harmony.

Issue size:

Up to ZAR1,700,000,000.

Over allotment option:

None.

Status:

Direct, unconditional, unsubordinated and unsecured obligations of the Issuer.

Maturity date:

21 May 2009.

Issue price:

100%.

Coupon:

4.875% payable semi-annually in arrear on 21 November and 21 May of each year, commencing 21 November 2004.

Yield to maturity:

4.875% at the closing date, which is expected to be 21 May 2004 (the "Closing Date").

Redemption price:

100%.

Conversion price:

ZAR121.00.

Conversion ratio:

8,264.4628.

Conversion period:

From the 41st day after the Closing Date until the 7th day prior to the Maturity Date.

Early redemption:

Callable on or after 5 June 2007 at par plus accrued interest, subject to the daily VWAP of Harmony shares exceeding 130% of the Conversion Price for a period of 20 out of 30 consecutive trading days.

Callable at any time if less than 15% of the Bonds remain outstanding.

Tax call:

Gross-up and tax call at higher of (a) par plus accrued or (b) parity plus make-whole, unless investors opt for Bonds to remain outstanding and receive coupons net of withholding tax. Make-whole will be based on a formula aiming to approximate lost premium to parity.

Anti-dilution protection:

Standard Euromarket anti-dilution provisions dealing with, *inter alia,* share consolidations, share splits, capital distributions, rights issues and bonus issues.

Extraordinary dividend protection:

Dividend in any given year exceeds higher of (a) 110% of previous year's dividend and (b) 4% of the average share price over the 180-day period preceding the payment. Adjustment to the Conversion Price by the amount of the excess.

Change of control protection:

Investors will be entitled to convert the Bonds for a period of 60 days at a price that may be adjusted downward in accordance with a ratcheting mechanism.

Negative Pledge:

Yes, in line with Euromarket standard (covering Issuer and Material Subsidiaries).

Events of default:
Yes, in line with outstanding ZAR1,200,000,000 13% Bonds 2001 - 2006 (covering Issuer and Material Subsidiaries and including higher cross-default threshold of ZAR[100,000,000]).
Lock-up:
For 90 days following the Closing Date subject to carve-outs including the announced transaction with Avgold Limited.
Form:
Registered.
The Convertible Bonds are not for distribution into or in the United States, Canada, Australia, Italy or Japan or to U.S., Canadian, Australian, Italian or Japanese persons.

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Annexure 2

Pro forma balance sheet and income statement of Harmony

Pro forma financial information

The unaudited pro forma balance sheet of Harmony at 31 December 2003 and income statement for the six months then ended, are set out below and have been prepared to illustrate the effect of the Transaction. The unaudited pro forma balance sheet and income statement have been prepared for illustrative purposes only and, because of their nature, may not give a fair view of Harmony's financial position or the effect on earnings going forward.

Excluding offer to minorities

	Harmony	**Pro forma**	**Before the**	**After the**
Income statements			**Transaction**	
	Avgold	**Avmin**	**Transaction**	
	R' million	**Note 1**	**Note 2**	**Note 3**	**Note 4**
Revenue	4 454	447	-	-	4 901
Cash operating costs	(3 966)	(268)	-	-	(4 234)
Cash operating profit	488	179	-	-	667
Other income - net	54	-	-	60	114
Employment termination and restructuring costs	(32)	-			

-
-
(32)
Corporate, marketing and
new business expenditure
(74)
-
-
-
(74)
Exploration expenditure
(49)
-
-
-
(49)
Profit on sale of listed investments
522
5
(2)
-
525
Interest paid
(162)
(4)
-
-
(166)
Cash profit
747
180
(2)
60
985
Depreciation and amortisation
(388)
(127)
(69)
-
(584)
Provision for rehabilitation costs
(28)
-
-
-
(28)
Mark-to-market of financial instruments
(161)
(183)
46
-

(298)
Income from associates
(41)
-
-
15
(26)
Income before tax
129
(130)
(25)
75
49
Taxation expense
(6)
(4)
(7)
-
(17)
Net income before minority interests
123
(134)
(32)
75
32
Minority interests
(6)
62
-
-
56
Net income
117
(72)
(32)
75
88
Weighted average issued shares
231 707 291
-
-
-
262 023 354
Basic earnings per share (cents)
50
-
-
-
34
Basic headline earnings per share (cents)
(129)

-
-
-
(129)

Notes:

(1) Extracted from the quarterly published unaudited financial results of Harmony for the six months ended 31 December 2003.

(2) Extracted from the quarterly published unaudited financial results of Avgold for the six months ended 31 December 2003.

(3)
Amortisation on fair value adjustments and consolidation adjustments relating to the acquisition of Avgold. For purposes of determining the purchaseconsideration the Harmony share price at close of business on 19 March 2003 was used, being R101,60.

(4)
Adjustments relating to the acquisition by Avmin of ARMI's 41,5% effective interest in the Modikwa Joint Venture, the disposal of Kalplats to Avmin andthe resulting dilution in the equity accounted loss from Avmin.

(5) The pro forma income statement has been prepared on the assumption that the Transaction was effective on 1 July 2003.

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Harmony
Pro forma
Before the
After the
Balance sheets
Transaction
Avgold
Avmin
Transaction
R' million
Note 1
Note 2
Note 3
Note 4
ASSETS
Non-current assets
21 376
2 480
2 843
60
26 759
Tangible assets
14 911
2 455
1 310
(40)
18 636
Intangible assets
2 803
-
1 532
-
4 335
Investments
3 662
25
-
100
3 787
Current assets
1 964
(1)
-
-
1 963
Net current liabilities - excluding cash
(924)
(2)
-
-

(926)
Cash and cash equivalents
2 888
1
-
-
2 889
Total assets
23 340
2 479
2 843
60
28 722
EQUITY AND LIABILITIES
Ordinary shareholders' interest
16 251
2 154
1 604
60
20 069
Outside shareholders' interest
155
-
999
-
1 154
Total shareholders' interest
16 406
2 154
2 603
60
21 223
Long-term borrowings
2 863
-
-
-
2 863
Deferred taxation
2 779
-
232
-
3 011
Deferred financial liabilities
432
286
8
-
726
Long-term provisions

860
39
-
-
899
Total equity and liabilities
23 340
2 479
2 843
60
28 722
Shares in issue
258 350 934
-
-
-
288 666 997
Net asset value per share (cents)
6 350
-
-
-
7 352
Net tangible asset value per share (cents)
5 265
-
-
-
5 850

Notes:

(1) Extracted from the quarterly published unaudited financial results of Harmony for the six months ended 31 December 2003.

(2) Extracted from the quarterly published unaudited financial results of Avgold for the six months ended 31 December 2003.

(3) Fair value and consolidation adjustments relating to the acquisition of Avgold. For purposes of determining the purchase consideration the Harmony share price at close of business on 19 March 2003 was used, being R101,60 per share.

(4) Adjustments relating to the acquisition by Avmin of ARMI's 41,5% effective interest in the Modikwa Joint Venture and the disposal of Kalplats to Avmin.

(5) The pro forma balance sheet has been prepared on the assumption that the Transaction was effective on 31 December 2003.

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Including offer to minorities
Harmony
Pro forma
Before the
After the
Income statements
Transaction
Avgold
Avmin
Transaction
R' million
Note 1
Note 2
Note 3
Note 4
Revenue
4 454
447
-
-
4 901
Cash operating costs
(3 966)
(268)
-
-
(4 234)
Cash operating profit
488
179
-
-
667
Other income - net
54
-
-
60
114
Employment termination and
restructuring costs
(32)
-
-
-
(32)
Corporate, marketing and
new business expenditure
(74)
-

-
-
(74)
Exploration expenditure
(49)
-
-
-
(49)
Profit on sale of listed investments
522
5
(5)
-
522
Interest paid
(162)
(4)
-
-
(166)
Cash profit
747
180
(5)
60
982
Depreciation and amortisation
(388)
(127)
(129)
-
(644)
Provision for rehabilitation costs
(28)
-
-
-
(28)
Mark-to-market of financial instruments
(161)
(183)
86
-
(258)
Income from associates
(41)
-
-
15
(26)

Income before tax
129
(130)
(48)
75
26
Taxation expense
(6)
(4)
(12)
-
(22)
Net income before minority interests
123
(134)
(60)
75
4
Minority interests
(6)
-
-
-
(6)
Net income
117
(134)
(60)
75
(2)
Weighted average issued shares
231 707 291
-
-
-
293 715 856
Basic earnings per share (cents)
50
-
-
-
(1)
Basic headline earnings per share (cents)
(129)
-
-
-
(131)
Notes:
(1) Extracted from the quarterly published unaudited financial results of Harmony for the six months ended 31 December 2003.

(2) Extracted from the quarterly published unaudited financial results of Avgold for the six months ended 31 December 2003.

(3)

Amortisation on fair value adjustments and consolidation adjustments relating to the acquisition of Avgold. For purposes of determining the purchaseconsideration the Harmony share price at close of business on 19 March 2003 was used, being R101,60.

(4)

Adjustments relating to the acquisition by Avmin of ARMI's 41,5% effective interest in the Modikwa Joint Venture, the disposal of Kalplats to Avmin and the resulting dilution in the equity accounted loss from Avmin.

(5) The pro forma income statement has been prepared on the assumption that the Transaction was effective on 1 July 2003.

(6)

For purposes of illustrating the pro forma effects, After the Transaction, including the offer to minorities, it has been assumed that all minorities accept the offer.

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Harmony
Pro forma
Before the
After the
Balance sheets
Transaction
Avgold
Avmin
Transaction
R' million
Note 1
Note 2
Note 3
Note 4
ASSETS
Non-current assets
21 376
2 480
5 289
60
29 205
Tangible assets
14 911
2 455
2 451
(40)
19 777
Intangible assets
2 803
-
2 838
-
5 641
Investments
3 662
25
-
100
3 787
Current assets
1 964
(1)
-
-
1 963
Net current liabilities - excluding cash
(924)
(2)
-
-

(926)
Cash and cash equivalents
2 888
1
-
-
2 889
Total assets
23 340
2 479
5 289
60
31 168
EQUITY AND LIABILITIES
Ordinary shareholders' interest
16 251
2 154
4 851
60
23 316
Outside shareholders' interest
155
-
-
-
155
Total shareholders' interest
16 406
2 154
4 851
60
23 471
Long-term borrowings
2 863
-
-
-
2 863
Deferred taxation
2 779
-
419
-
3 198
Deferred financial liabilities
432
286
19
-
737
Long-term provisions

860
39
-
-
899
Total equity and liabilities
23 340
2 479
5 289
60
31 168
Shares in issue
258 350 934
-
-
-
320 359 499
Net asset value per share (cents)
6 350
-
-
-
7 326
Net tangible asset value per share (cents)
5 265
-
-
-
5 566

Notes:

(1) Extracted from the quarterly published unaudited financial results of Harmony for the six months ended 31 December 2003.

(2) Extracted from the quarterly published unaudited financial results of Avgold for the six months ended 31 December 2003.

(3)
Fair value and consolidation adjustments relating to the acquisition of Avgold. For purposes of determining the purchase consideration the Harmony share price at close of business on 19 March 2003 was used, being R101,60 per share.

(4) Adjustments relating to the acquisition by Avmin of ARMI's 41,5% effective interest in the Modikwa Joint Venture and the
disposal of Kalplats to Avmin.

(5) The pro forma balance sheet has been prepared on the assumption that the Transaction was effective on 31 December 2003.

(6)
For purposes of illustrating the pro forma effects, After the Transaction, including the offer to minorities, it has been assumed that all minorities accept the offer.

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Annexure 3

Independent reporting accountants' report on the pro forma financial information of Harmony

"The Directors
Harmony Gold Mining Company Limited
PO Box 2
Randfontein
1760
7 April 2004

Dear Sirs

INDEPENDENT REPORTING ACCOUNTANTS' REPORT ON THE UNAUDITED PRO FORMA FINANCIAL INFORMATION OF HARMONY GOLD MINING COMPANY LIMITED ("Harmony")

Introduction

Harmony has reached agreement for the following transactions:

- the acquisition of 42,1% of the issued share capital of Avgold Limited ("Avgold") from Anglovaal Mining Limited ("Avmin"); and
- the disposal of its Kalplats platinum discovery project and associated mineral rights (collectively, "the Transactions").

In addition, Harmony is making an offer for the balance of Avgold's issued share capital, to be implemented by way of a scheme of arrangement in terms of section 311 of the Companies Act, 1973 (Act 61 of 1973), as amended, proposed by Harmony between Avgold and its shareholders, other than Harmony ("the Avgold Offer").

We report on the unaudited pro forma balance sheets, income statements and financial effects of Harmony after the Transactions and Avgold Offer ("the pro forma financial information"), included in paragraph 6.1 and as Annexure 2 to the circular to shareholders to be dated on or about 15 April 2004 (the "Circular").

The unaudited pro forma financial information has been prepared for illustrative purposes only and to provide information as to how the Transactions and the Avgold Offer will impact on the financial position and results of Harmony. Because of its nature, the unaudited pro forma financial information may not give a fair reflection of Harmony's financial position nor the effect on future earnings.

At your request, and for purposes of the Transactions and the Avgold Offer, we present our report on the pro forma financial information of Harmony in compliance with the Listings Requirements of the JSE Securities Exchange South Africa ("JSE").

Responsibilities

The directors of Harmony are solely responsible for the preparation of the pro forma financial information to which this independent reporting accountants' report relates, and for the financial statements and financial information from which it has been prepared.

It is our responsibility to form an opinion on the unaudited pro forma financial information and to report our opinion to you. We do not accept any responsibility for any reports previously given by us on any financial information used in the compilation of the pro forma financial information, beyond that owed to those to whom those reports were addressed at their dates of issue.

Basis of opinion

Our work, which did not involve any independent examination of any of the underlying financial information, consisted primarily of comparing the unadjusted financial information to the unaudited published quarterly financial results of Harmony for the six months ended 31 December 2003, considering the evidence supporting the adjustments to the unaudited pro forma financial information, recalculating the amounts based on the information obtained and discussing the pro forma financial information with the directors of Harmony.

Because the above procedures do not constitute an audit or a review in accordance with Statements of South African Auditing Standards, we do not express any assurance on the fair presentation of the unaudited pro forma financial information.

Had we performed additional procedures or had we performed an audit or review of the financial statements in accordance with Statements of South African Auditing Standards, other matters might have come to our attention that would have been reported to you.

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Opinion

In our opinion:

- the unaudited pro forma financial information has been properly compiled on the basis stated;
- such basis is consistent with the accounting policies of Harmony; and
- the adjustments are appropriate for the purposes of the unaudited pro forma financial information in terms of Section 8.29 of the JSE

Listings Requirements.

Yours faithfully

PricewaterhouseCoopers Inc.

Chartered Accountants (SA)

Registered Accountants and Auditors

Sunninghill"

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Annexure 4

Interim financial results of Harmony

1.

TOTAL OPERATIONS FINANCIAL RESULTS

(Rand/Metric) - unaudited

	Quarter ended	**Quarter ended**	**Six**	**Six**
	31 December	**30 September**	**months**	**months**
	2003	**2003**	**ended**	**ended**
	(including	**(excluding**	**31 December**	**31 December**
	ARMgold)	**ARMgold)**	**2002**	**2003**
Ore milled				
t'000	**8 183**	6 854	13 941	15 037
Gold produced				
kg	**29 294**	22 725	48 852	52 019
Gold price received				
R/kg	**85 139**	86 258	103 362	85 623
Cash operating costs				
R/kg	**75 888**	76 693	68 302	76 241
R'm				

R'm
R'm
R'm
Gold sales
2 494
1 960
5 049
4 484
Cash operating costs
2 223
1 743
3 337
3 966
Cash operating profit
271
217
1 713
488
Income from associates
(34)
(7)
-
(41)
Amortisation
(246)
(142)
(271)
(388)
Profit on sale of Highland & High River
522
-
-
522
Profit on sale of Aurion Gold shares
-
-
469
-
Mark-to-market of financial instruments
11
(172)
77
(161)
Rehabilitation cost provision
(18)
(10)
(21)
(28)
Employment termination costs
(20)
(12)

(27)
(32)
Other income net
65
70
101
135
Minority interest
(6)
-
-
(6)
Interest paid
(107)
(55)
(119)
(162)
Corporate, marketing and new business expenditure
(43)
(31)
(58)
(74)
Exploration expenditure
(35)
(14)
(57)
(48)
Foreign exchange losses
(50)
(31)
-
(81)
Mark-to-market of listed investments
-
-
(506)
-
Profit before taxation
310
(187)
1 301
123
South African normal taxation - Current tax
(84)
(18)
(245)
(102)
- Deferred tax
10
86
(173)

96
Net earnings
236
(119)
883
117
Earnings per share (cents)*
- Basic earnings
92
(62)
509
50
- Headline earnings
(66)
(67)
500
(129)
- Fully diluted earnings**
92
(62)
500
51
Dividends per share (cents)
- Proposed interim
40
-
125
40
Reconciliation of headline earnings
Net earnings
236
(119)
883
117
Adjustments:
Profit on sale of assets
(3)
(9)
(16)
(12)
Profit on sale of Highland & High River, net of tax
(444)
-
-
(444)
Amortisation on goodwill
41
-
-
42
Headline earnings

(170)
(128)
867
(298)
Prepared in accordance with International Financial Reporting Standards.
*
Calculated on weighted number of shares in issue at quarter-end December 2003: 257,9 million (September 2003: 192,3 million) (December 2002: 173,6 million).
**
Calculated on weighted average number of diluted shares in issue at quarter-end December 2003: 256,5 million (September 2003: 190,9 million) (December 2002: 176,5 million).

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2.

ABRIDGED BALANCE SHEETS

(Rand) - unaudited

	At 31 December 2003	**At 30 September 2003**	**At 31 December 2002**
	R'm	**R'm**	**R'm**
EMPLOYMENT OF CAPITAL			
Mining assets after amortisation	**14 911**	14 729	8 945
Intangible assets	**2 803**	2 843	-
Investments	**1 098**	1 260	1 409
Investments in associates	**2 564**	2 896	-
Short-term investments - Placer Dome	**-**	-	723
Net current liabilities, excluding cash	**(924)**	(1 300)	(431)
Cash	**2 888**	2 561	1 439
Total assets	**23 340**	22 989	12 085
CAPITAL EMPLOYED			
Shareholders' equity			

16 251
15 937
7 863
Loans
2 863
2 881
2 009
Long-term provisions
860
840
698
Minority interest
155
139
-
Unrealised hedging loss
432
450
736
Deferred tax
2 779
2 742
779
Total equity and liabilities
23 340
22 989
12 085

Basis of accounting

The unaudited results for the quarter have been prepared on the International Financial Reporting Standards ("IFRS") basis. These consolidated quarterly statements are prepared in accordance with IFRS 34, Interim Financial Reporting. The accounting policies are consistent with those applied in the previous financial year.

Issued share capital: 258,4 million ordinary shares of 50 cents each (September 2003: 257,9 million shares) (December 2002: 174,6 million).

3.

CONDENSED STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY - unaudited

At
At
31 December
31 December
2003
2002
R'm
R'm
Balance at beginning of financial year
8 628
7 963
Currency translation adjustment and other
-
(455)
Issue of share capital
7 798

213
Net earnings
117
883
Dividends paid
(292)
(741)
Balance at end of December
16 251
7 863
Prepared in accordance with IFRS.

33

4.

ABRIDGED CASH FLOW STATEMENTS - unaudited

	Six months ended 31 December 2003	**Six months ended 31 December 2002**
	R'000	**R'000**
Cash flow from operating activities	**133**	1 251
Cash utilised in investing activities	**1 350**	(618)
Cash utilised in financing activities	**(282)**	(635)
Increase/(Decrease) in cash and equivalents	**1 201**	(2)
Opening cash and equivalents	**1 687**	1 441
Closing cash and equivalents	**2 888**	1 439

Prepared in accordance with IFRS.

Hedging

Maturity schedule of the Harmony group's commodity contracts by type at 31 December 2003:

	30 June 2005	**30 June 2006**	**30 June 2007**	**30 June 2008**	**30 June 2009**	**Total**
Forward sales agreements						
Ounces	175 000	108 000	147 000	100 000	100 000	630 000
A$/ounce	513	510	515	518		

518
514,27
Calls contracts sold Ounces
127 100
40 000
-
-
-
167 100
A$/ounce
513
552
-
-
-
522
302 100
148 000
147 000
100 000
100 000
797 100

These contracts are classified as speculative and the marked-to-market movement is reflected in the income statement. During the quarter 62 900 ounces of the hedge books were closed out at a cost of R5 million (US$1 million). The market-to-market of the remaining contracts was a negative R380 million (US$57 million) at 31 December 2003. These values were based on a gold price of US$414 (A$552) per ounce, exchange rates of US$/R6.70 and A$/US$0.75 and prevailing market interest rates at the time. These valuations were provided by independent risk and treasury management experts.

Gold lease rates

Harmony holds certain gold lease rate swaps which were acquired through its acquisitions of New Hampton and Hill 50. These instruments are all treated as speculative. The mark-to-market of the above contracts was a negative R10 million (US$1.5 million) at 31 December 2003, based on valuations provided by independent treasury and risk management experts.

Interest rate swaps

The group has interest rate swap agreements to convert R600 million of its R1, 2 billion fixed rate bond to variable rate debt. The interest rate swap runs over the term of the bond, interest is received at a fixed rate of 13% and the company pays floating rate based on JIBAR plus a spread raging from 1,8% to 2,2%.

These transactions which mature in June 2006 are designated as fair value hedges. The marked-to-market value of the transactions was a negative R42 million (US$6 million) at 31 December 2003, based on the prevailing interest rates and volatilities at the time.

Dividend

A dividend No. 78 of 40 cents per ordinary share being the interim dividend for the six-month period ended 31 December 2003, has been declared payable on 8 March 2004 to those shareholders registered as such in the books of the company at the close of business on 5 March 2004.

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Annexure 5

Historical financial information of Avgold

The salient financial information set out below has been extracted without adjustment from the audited annual financial statements of Avgold for the three financial years ended 30 June 2003:

FINANCIAL INFORMATION FOR THE YEARS ENDED 30 JUNE 2003, 2002 AND 2001

1.

INCOME STATEMENTS

Notes
2003
2002
2001
R'000
R'000
R'000

Revenue
1 and 2
999 480
363 802
217 864

Costs and expenses
889 560
346 468
189 614

- operating
673 344
265 137
163 394

- amortisation and depreciation
186 900
57 389
19 737

- retrenchments
-
4 747
165

- general and administration
29 316
19 195
5 981

- exploration
-
-
337

Operating profit
3
109 920
17 334
28 250

Investment income
4

12 987
2 147
10 654
Finance cost
5
57 946
8 419
-
Foreign exchange gain
6
66 745
30 335
-
Unrealised non-hedge derivatives
7
(102 715)
-
-
Income before exceptional item
28 991
41 397
38 904
Exceptional items
8
7 085
-
-
Income before taxation
36 076
41 397
38 904
Taxation
9
9 207
5 000
-
Net earnings for year
26 869
36 397
38 904
Additional information:
Net earnings for year excluding unrealised non-hedge derivatives
129 584
36 397
38 904
Headline earnings
25 385
36 397
38 904
Headline earnings before unrealised non-hedge derivatives
128 100

36 397
38 904
Earnings per share (cents)
10
4,0
5,4
6,5
Headline earnings per share (cents)
3,8
5,4
6,5
Headline earnings per share before unrealised non-hedged derivatives (cents)
19,0
5,4
6,5
Weighted number of shares in issue (million)
674,0
670,2
595,4
Reconciliation of earnings and headline earnings:
Earnings per income statement
26 869
36 397
38 904
Exceptional items:
- Profit on sale of ETC
(7 085)
-
-
- Recoupments tax on sale of ETC
5 601
-
-
Headline earnings
25 385
36 397
38 904

35

2.

BALANCE SHEETS

Notes

2003

2002

2001

R'000

R'000

R'000

ASSETS

Non-current assets

2 569 795

2 931 207

2 551 085

Property, plant and equipment

11

2 543 841

2 883 336

2 506 592

Investments

12

25 954

47 871

44 493

Current assets

84 382

208 742

137 021

Inventories

13

46 407

44 761

33 247

Trade and other receivables

37 214

55 171

47 867

Deposits and cash

761

108 810

55 907

Total assets

2 654 177

3 139 949

2 688 106

EQUITY AND LIABILITIES

Capital and reserves

Share capital

6 765

6 729

6 658
Share premium
2 219 900
2 206 385
2 183 589
Retained income/(accumulated loss)
43 827
16 958
(19 439)
Total shareholders' equity
2 270 492
2 230 072
2 170 808
Non-current liabilities
144 639
630 105
378 594
Long-term loans
14
-
548 072
302 453
Non-hedge derivatives
7
102 715
-
-
Long-term provisions
15
41 924
82 033
76 141
Current liabilities
239 046
279 772
138 704
Trade and other payables
16
104 126
153 343
134 044
Overdrafts and short-term borrowings
17
134 920
126 429
4 660
Total equity and liabilities
2 654 177
3 139 949
2 688 106

36

3.

CASH FLOW STATEMENTS

Notes	**2003**	**2002**	**2001**
	R'000	**R'000**	**R'000**
Cash generated from/(utilised by) operations			
Operating profit	**109 920**	17 334	28 250
Non-cash items and adjustments:			
Provisions	**(5 546)**	7 788	8 078
Profit on sale of property, plant and equipment	**(1 519)**	(3 709)	-
Amortisation and depreciation	**186 900**	57 389	19 737
	289 755	78 802	56 065
Net withdrawals from/(payments to) environmental trust fund	**3 925**	(4 151)	(3 161)
Retrenchment payments	**-**	(5 873)	(6 587)
Investment income	**12 987**	2 147	10 654
Finance charges	**(57 946)**	(8 419)	-
Taxation	**-**	-	(2 910)

248 722
62 506
54 061
Cash provided by/(reinvested in) working capital
Inventories
(18 351)
(11 514)
(4 179)
Trade and other receivables
13 578
(7 303)
6 476
Trade and other payables
(30 390)
10 155
(1 355)
Net cash generated from operating activities
213 558
53 844
55 003
Cash utilised in investment activities
Property, plant and equipment acquired
18
(124 364)
(345 645)
(599 051)
Investments acquired
(483)
(1 124)
853
Proceeds on disposal of property, plant and equipment
3 558
9 240
1 199
Proceeds on sale of ETC mine
8
251 817
-
-
130 528
(337 529)
(596 999)
Cash provided by financing activities
Net increase in shareholders' funding
13 551
22 868
498 200
(Decrease)/Increase in long-term loans
19
(376 189)
191 952

300 000
(Decrease)/Increase in overdrafts and short-term borrowings
20
(77 658)
121 768
(201 829)
(440 296)
336 588
596 371
(Decrease)/Increase in cash and cash equivalents
(96 210)
52 903
54 375
Cash and cash equivalents at beginning of year
108 810
55 907
1 532
Translation adjustment
(11 839)
-
-
Cash and cash equivalents at end of year
761
108 810
55 907

37

4.

STATEMENTS OF CHANGES IN EQUITY

	Ordinary share capital and premium	**Retained income**	**Total 2003**	**Total 2002**	**Total 2001**
	R'000	**R'000**	**R'000**	**R'000**	**R'000**
Changes in shareholders' equity					
Balance at beginning of year	2 213 114	16 958	**2 230 072**	2 170 808	1 633 704
Shares allotted - rights issue	-	-	**-**	-	500 355
Share options exercised	13 584	-	**13 584**	22 867	6 507
Expenses written-off against share premium	(33)	-	**(33)**	-	(8 662)
Net earnings for year	-	26 869	**26 869**	36 397	38 904
Balance at end of year					

2 226 665
43 827
2 270 492
2 230 072
2 170 808
Details of shares
2003
2002
2001
Share capital and premium
Authorised
1 000 000 000 ordinary shares of one cent each
10 000
10 000
10 000
(2002: 1 000 000 000 ordinary shares of one cent each)
(2001: 1 000 000 000 ordinary shares of one cent each)
Issued
676 453 556 ordinary shares of one cent each
6 765
6 729
6 658
(2002: 672 943 402 ordinary shares of one cent each)
(2001: 665 784 171 ordinary shares of one cent each)
Share premium
2 219 900
2 206 385
2 183 589
2 226 665
2 213 114
2 190 247
The unissued shares of 323 546 444 (2002: 327 056 598, 2001: 334 215 829), of which 33 822 678 (2002: 33 647 170, 2001: 33 289 209) shares are specifically reserved for purposes of the share incentive scheme, are under the control of the directors.
ACCOUNTING POLICIES
The annual financial statements are prepared in accordance with the historical cost convention except for financial instruments, which are accounted for at fair value, and in accordance with South African Statements of Generally Accepted Accounting Practice and the requirements of the Companies Act. The principal accounting policies, set out below, have been consistently applied, except those relating to financial instruments following the implementation of AC 133 - "Financial Instruments: Recognition and Measurement" from 1 July 2002.
Revenue recognition
Revenue comprises the Rand amount received and receivable in respect of the supply of metals mined. Revenue is recognised when the risks and rewards of ownership transfer.
Other revenues earned are recognised on the following bases:
- Interest income: as it accrues.
- Dividend income from industry-related investments: when received.
Borrowing costs
Borrowing costs that are directly attributable to the acquisition or construction of mining assets that require a substantial period of time to prepare for their intended use, are capitalised.
Borrowing costs are expensed from the time that mining production becomes commercially viable.

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Deferred taxation

Deferred taxation is provided using the balance sheet liability method on all temporary differences between the carrying amounts for financial reporting purposes and the amounts used for taxation purposes, except for differences relating to the initial recognition of assets which affect neither accounting nor taxable profit.

The tax value of losses and unredeemed capital expenditure expected to be available for utilisation against future taxable income are set-off against the deferred tax liability. Deferred tax assets are recognised only when it is probable that the related tax benefit will be realised.

Deferred tax is calculated at the mining cost formula rate. The effect on deferred tax of any changes in tax rates is charged to the income statement.

Exploration and development

Exploration costs are expensed as incurred. When it has been established that a mineral property has development potential and following a positive detailed economic evaluation, further development, exploration and other expenditure prior to the commencement of commercial production is capitalised.

Ongoing development expenditure on existing mines is expensed as incurred. Major development and exploration expenditure incurred to expose the ore, increase production or extend the life of an existing mine is capitalised.

Financial instruments

Financial instruments recognised on the balance sheet include cash and cash equivalents, non-hedge forward exchange contracts, investments, trade receivables, trade creditors and borrowings. Initial recognition is at cost. Subsequent recognition is at fair value. The recognition methods adopted are disclosed in the individual policy statements associated with each item.

Non-hedge derivatives

Non-hedge forward exchange contracts are mark-to-market at financial reporting dates and changes in their fair values are included in the income statement. Gains or losses on contracts maturing between reporting dates are recognised in revenue.

Hedging

The company enters into hedging transactions on a portion of its planned gold production to ensure a degree of certainty on future gold sales prices and to provide a guaranteed minimum cash flow for known major capital expenditures and debt servicing.

Gains and losses on derivative instruments that effectively establish the prices for future production are recognised in revenue when the related production is delivered. In the event of early settlement of hedging contracts, gains and losses are taken to revenue at the date of settlement. Any potential loss on hedge positions below the current cost of production is recognised in the period in which it arises.

Property, plant and equipment

Mining assets are recorded at cost of acquisition less sales, recoupments and amounts written-off. Interest on borrowings, specifically to finance the establishment of mining assets, are capitalised until commercial levels of production are achieved.

Depreciation and amortisation is provided over the useful life of mine assets from the time that mining production becomes commercially viable, as follows:

-

Where orebodies are well-defined, assets are amortised using the units of production method based on the estimated proved and probable ore reserves.

- Where orebodies are not well-defined, the straight-line method is used based on the estimated life of each mine, limited to

25 years.

- Other assets are depreciated to estimated net realisable values using the straight-line method over their expected useful lives.

Land and mineral rights prior to production are not depreciated.

Impairment

The recoverability of the long-term assets is reviewed by management on a continuous basis, based on estimates of future net cash flows. These estimates are subject to risks and uncertainties including future metal prices and exchange

rates. It is therefore possible that changes could occur which may affect the recoverability of the long-term assets. Where the estimated recoverability is less than net book value, the impairment is charged against income to reduce the carrying value of the asset.

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Investments

- Unlisted investments are stated at cost less amounts written-off where there has been a permanent diminution in value.
-

Environmental trust fund investments are stated at cost. Annual payments are made to the environmental trust fund in accordance with statutory requirements.

Cash and cash equivalents

For the purposes of the cash flow statement, cash and cash equivalents comprise cash in hand and deposits held with banks.

Foreign currencies

Foreign currency transactions are recorded at the exchange rate ruling at the transaction date. Assets and liabilities designated in foreign currencies are translated at exchange rates ruling at the balance sheet date. Both realised and unrealised gains and losses arising from exchange differences are recognised in operating results.

Inventories

Gold inventory is carried at the lower of weighted average cost and net realisable value and includes work-in-progress at the earliest stage of production when reliable estimates of quantities and costs are capable of being made, including the breaking of ore in the stopes.

By-products are carried at the lower of the estimated variable cost associated with their production and net realisable value.

Consumables and stores are carried at weighted average cost with due allowance for obsolete and slow-moving items.

Trade receivables

Trade receivables are carried at anticipated realisable value. An estimate is made for doubtful receivables based on a review of all outstanding amounts at year-end. Bad debts are written-off during the year in which they are identified.

Provisions

Provisions are recognised when the company has a present legal or constructive obligation as a result of past events where it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate of the amount of the obligation can be made.

Employee post-retirement obligations

The company participates in defined contribution retirement plans for employees. The pension plans are funded by payments from the employees and by the company and charged to income as incurred. The assets of the different plans are held by independently managed trust funds. These funds are governed by the Pension Funds Act, 1956, as amended. Certain employees and retired employees are entitled to post- retirement medical benefits. The estimated cost of these benefits is charged to income based on actuarial valuations made every three years.

Environmental rehabilitation

The estimated cost of final rehabilitation, comprising liabilities for decommissioning and restoration, is based on current legal requirements, existing technology and costs and is re-assessed annually.

Decommissioning costs

The estimated cost of future decommissioning obligations at the end of the operating life of the mines is included in long-term provisions. These estimated costs are reviewed regularly and adjusted for legal, technological and environmental circumstances that affect the estimates of the decommissioning obligations.

Restoration costs

The estimated cost of restoration at the end of the operating life of the mines is included in long-term provisions. Cost estimates are not reduced by the potential proceeds from the sale of assets.

Expenditure on ongoing rehabilitation is charged to the income statement as incurred.

Comparative figures

Where necessary, comparative figures have been adjusted to conform with changes in presentation in the current year.

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NOTES TO THE ANNUAL FINANCIAL STATEMENTS

	2003	**2002**	**2001**
	R'000	**R'000**	**R'000**
1.			
REVENUE			
Gold sales	**998 217**	362 709	217 647
By-products	**1 263**	1 093	217
	999 480	363 802	217 864
2.			

GOLD HEDGING

The company entered into US dollar gold and Rand gold forward sales contracts as a result of the financing of the Target Mine. These contracts are not recognised on the balance sheet as financial assets and liabilities. The revenue is recognised when the related production is delivered. The company purchased Rand/US Dollar forward exchange contracts ("FEC's") to convert the Rand gold forward sales contracts into Dollar gold commodity hedges. The negative mark-to-market value of these non-hedge FEC's of R103 million are included in the income statement (refer note 7). At 30 June 2003 the total hedge book had a negative mark-to-market value of R192 million. This was calculated at a gold price of US$346,15/oz and an exchange rate of US$1.00: R7,51.

The hedge book at 30 June 2003, after the restructuring, was as follows:

	2004	**2005**	**2006**	**2007**
Net dollar forward sales contracts:				
Quantity sold				
kg	9 162	9 137	4 403	-
oz	294 579	293 762	141 545	-
US$/oz	313	316	323	

-

The company does not use derivative instruments for speculative purposes. All forward sales contacts are unmargined.

2003
2002
2001
R'000
R'000
R'000

3.
OPERATING PROFIT IS STATED AFTER

Auditors' remuneration
- audit fees
820
899
809

Directors' emoluments
- executive directors
6 184
5 128
3 307
- non-executive directors
327
334
126

Operating lease expenditure
- buildings/equipment
1 856
160
187

Amortisation and depreciation
186 900
57 389
19 737

Profit on sale of property, plant and equipment
1 519
3 709
-

4.
INVESTMENT INCOME

Interest received
11 996
1 973
1 104

Dividends received
966
-
207

Surplus on realisation in Rand Refinery Limited
-
-
5 029

Other
25
174
4 314
12 987
2 147
10 654
5.
FINANCE COST
Interest paid
57 946
47 801
7 741
Capitalised to pre-mining assets
-
(39 382)
(7 741)
57 946
8 419
-

41
2003
2002
2001
R'000
R'000
R'000
6.
FOREIGN EXCHANGE GAIN
Realised foreign exchange gain
66 745
-
-
Unrealised foreign exchange gain
-
30 335
-
66 745
30 335
-
Foreign exchange gains are recorded on the translation and repayment of the US Dollar denominated loans raised to fund the completion of Target Mine.
7.
UNREALISED NON-HEDGE DERIVATIVES
Forward exchange contracts
- Cost
-
-
-
- Fair value adjustment at year-end - unrealised
102 715
-
-
Forward exchange contracts entered into to convert Rand gold hedges are fair valued in terms of AC 133, based upon the year-end Rand/US Dollar exchange rate of US$1.00: R7,51.
8.
EXCEPTIONAL ITEMS
The profit realised on the sale of ETC Mine is calculated as follows:
Assets
314 479
-
-
- property, plant and equipment
274 920
-
-
- investments
18 475
-
-

- inventories
16 705
-
-
- receivables
4 379
-
-
Liabilities
69 747
-
-
- long-term provisions
34 563
-
-
- trade and other payables
28 034
-
-
- overdrafts and short-term borrowings
7 150
-
-
Net assets at date of sale
244 732
-
-
Net cash received on sale
251 817
-
-
Net profit on sale
7 085
-
-
Gross cash received on sale
255 000
-
-
Less: Attributable expenses
3 183
-
-
Attributable expenses include legal and professional fees, bonuses to employees and other administrative costs.
9.
TAXATION
9.1
Non-mining tax
3 603

-
-
The South African normal tax rate of 30 per cent (2002: 30 per cent) is applied on the non-mining taxable income which consists primarily of interest received.
9.2
Mining tax
Income from gold mining is taxable at a rate determined by the following formula: y = 37 - 185/x where y is the calculated percentage tax rate and x is the ratio of taxable income from mining to total revenue from mining expressed as a percentage. Taxable income is determined after the deduction of mining capital expenditure.
Estimated mining recoupments tax attributable to the sale of Hartebeestfontein Mine
-
5 000
-
Estimated mining recoupments tax attributable to the sale of ETC Mine
5 601
-
-
Estimated unredeemed capital expenditure carried forward for deduction from future mining taxable income amounts to
3 578 100
3 280 200
2 449 000

42

To date of commencement of commercial production the only temporary difference arising on Target relates to the Section 36(11)(c) allowance on the unredeemed capital expenditure. This deductible temporary difference amounts to R1,3 billion. A deferred tax asset was not recognised due to the fact that the above temporary difference does not affect either accounting profit or taxable profit on initial recognition of the assets.

9.3

Secondary Taxation on Companies ("STC")

The company did not elect to be exempt from the payment of STC. Currently, the applicable rate for STC is 12,5 per cent of dividends paid.

9.4

Tax assessments

The company has not been assessed since 1996. All returns of income, including June 2001, have been submitted. The 2002 return has been finalised and will be submitted shortly.

The tax authorities have allocated specific resources to ensure that the outstanding assessments are brought up to date.

2003
2002
2001
R'000
R'000
R'000

10. EARNINGS PER SHARE

Earnings per share are calculated by dividing the net income attributable to shareholders by the weighted number of ordinary shares in issue during year.

Net income attributable to shareholders
26 869
36 397
38 904

Weighted average number of ordinary shares in issue (millions)
674,0
670,2
595,4

Earnings per share (cents)
4,0
5,4
6,5

11. PROPERTY, PLANT AND EQUIPMENT

Pre-
Mine
Plant
mining
Furniture
develop-
and
Mineral
Mine
costs
and
ment machinery
rights properties capitalised equipment
2003
2002

2001
R'000
R'000
R'000
R'000
R'000
R'000
R'000
R'000
R'000
Cost
Opening balance
1 772 049
732 065
142 824
31 367
307 602
82 966
3 068 873
2 635 880
2 042 708
Additions
50 730
48 344
-
1 277
12 246
11 767
124 364
439 664
604 216
Disposals
481
403
-
1 828
-
-
2 712
6 671
11 044
Sold with ETC Mine
300 016
104 101
131
4 186
-
8 018
416 452
-
-

Reclassification
187 506
(30 040)
(706)
(421)
(150 980)
(5 359)
-
-
-
1 709 788
645 865
141 987
26 209
168 868
81 356
2 774 073
3 068 873
2 635 880
Amortisation and depreciation
Opening balance
126 891
43 388
53
5 316
1 904
7 985
185 537
129 288
119 395
Charge for year
109 342
57 510
49
1 549
9 719
8 731
186 900
57 389
19 737
Disposals
178
53
-
442
-
-
673
1 140
9 844
Sold with ETC Mine

99 557
35 503
50
200
-
6 222
141 532
-
-
Reclassification
10 070
2 668
(52)
(14)
(11 623)
(1 049)
-
-
-
146 568
68 010
-
6 209
-
9 445
230 232
185 537
129 288
Net book value at 30 June 2003
1 563 220
577 855
141 987
20 000
168 868
71 911
2 543 841
2 883 336
2 506 592
*
A register of land and buildings is available for inspection at the registered office.
-
R311 million (2002: R283 million, 2001: R2 159 million), capitalised in respect of properties which have not yet commenced production, are included in mineral rights and pre-mining costs capitalised.

43
2003
2002
2001
R'000
R'000
R'000
12. INVESTMENTS
Unlisted mining industry investments - cost
2 374
1 891
767
Environmental trust fund
The balance in the environmental trust fund is as follows:
Balance at beginning of year
45 980
43 726
38 668
Contributions
2 889
2 923
954
Interest earned
5 458
4 822
4 104
Payments made for work completed
(12 272)
(5 491)
-
Sold with ETC Mine
(18 475)
-
-
Balance at end of year
23 580
45 980
43 726
Total investments
25 954
47 871
44 493
12.1
Directors' valuation of unlisted mining industry investments
4 471
3 926
2 690
12.2
The environmental trust fund is recognised separately from
the related liability on the balance sheet.
13. INVENTORIES

At cost:
Gold in process
25 435
29 362
21 523
Consumable stores
20 972
15 399
11 724
46 407
44 761
33 247
14. LONG-TERM LOANS
Secured syndicated loan to fund Target completion
- Rand loans
-
250 242
150 000
Long-term loan
-
300 290
150 000
Short-term portion
-
(50 048)
-
- US dollar loan expressed in Rand
-
297 830
152 453
Long-term loan
-
357 396
152 453
Short-term portion
-
(59 566)
-
-
548 072
302 453
15. LONG-TERM PROVISIONS
Long-term provisions consist of the following:
15.1
Environmental rehabilitation obligation
Provision for decommissioning:
Gross liability at beginning of year
30 253
34 299
32 055
Revision in estimate

-
(4 312)
-
Sold with ETC Mine
(8 014)
-
-
Net provision for year
(5 499)
266
2 244
Gross liability at end of year
16 740
30 253
34 299
Provision for restoration:
Gross liability at beginning of year
46 162
36 224
27 897
Sold with ETC Mine
(24 304)
-
-
Additional obligation recognised
-
4 312
-
Payments made
(4 975)
(1 702)
-
Net provision for year
4 917
7 328
8 327
Gross liability at end of year
21 800
46 162
36 224
Total environmental rehabilitation obligation
38 540
76 415
70 523

44
2003
2002
2001
R'000
R'000
R'000
The provisions are based on management's best estimates of the cost of all known obligations. It is, however, reasonable to expect that changes will occur in rehabilitation costs as a result of changes in regulations or cost estimates. Cost estimates are not reduced by potential proceeds from the sale of assets or from future revenue from the clean up of gold plants in view of the uncertainty in estimating those proceeds. Environmental liabilities not directly relating to rehabilitation are expensed as incurred.
15.2
Post-retirement medical benefits
Balance at beginning of year
5 618
5 618
5 618
Sold with ETC Mine
(2 234)
-
-
Balance at end of year
3 384
5 618
5 618
The company has obligations to provide specific post-retirement medical benefits to certain of its employees and pensioners.
The liability is assessed periodically by an independent actuarial survey which uses assumptions consistent with those adopted in determining pension costs and, in addition, includes long-term estimates of the increases in medical costs at appropriate discount rates.
15.3
Retrenchment
Balance at beginning of year
-
-
7 183
Payments made during year
-
-
(6 422)
Re-allocation to short-term provisions
-
-
(761)
Balance at end of year
-
-
-
16. TRADE AND OTHER PAYABLES
Trade payables

53 934
87 990
95 797
Accruals
6 517
15 915
17 126
Taxation payable
14 207
5 000
-
Other payables
29 468
44 438
21 121
104 126
153 343
134 044
17. OVERDRAFTS AND SHORT-TERM BORROWINGS
Overdrafts
604
1 404
-
Short-term borrowings
134 316
15 411
4 660
Current portion of long-term borrowings:
Foreign
-
59 566
-
Local
-
50 048
-
134 920
126 429
4 660
18. PROPERTY, PLANT AND EQUIPMENT ACQUIRED
Opening balance
2 883 336
2 506 592
1 923 313
Non-cash flow movements:
Depreciation
(186 900)
(57 389)
(19 737)
Interest accrued
-

10 017
2 453
Foreign exchange losses capitalised
-
84 002
2 711
Property, plant and equipment sold
(2 039)
(5 531)
(1 199)
Assets sold with ETC Mine
(274 920)
-
-
Closing balance
(2 543 841)
(2 883 336)
(2 506 592)
Property, plant and equipment acquired
(124 364)
(345 645)
(599 051)

45
2003
2002
2001
R'000
R'000
R'000
19. (DECREASE)/INCREASE IN LONG-TERM LOANS
Opening balance
(548 072)
(302 453)
-
Non-cash flow movements:
Foreign exchange loss capitalised
-
(84 002)
-
Foreign exchange gain
59 891
30 335
-
Transferred to short-term loans
111 992
-
-
Closing balance
-
548 072
300 000
Increase in long-term loans
(376 189)
191 952
300 000
20. (DECREASE)/INCREASE IN OVERDRAFTS AND SHORT-TERM BORROWINGS
Opening balance
(126 428)
(4 660)
(206 489)
Liabilities sold with ETC business
7 150
-
-
Transferred from long-term borrowings
(111 992)
-
-
Translation adjustments and foreign exchange gains
18 693
-
-

Closing balance
134 919
126 428
4 660
(Decrease)/Increase in overdrafts and short-term borrowings during year
(77 658)
121 768
(201 829)
21. COMMITMENTS AND CONTINGENT LIABILITIES
21.1
Capital expenditure authorised by the directors
Contracted for - Target
12 666
22 242
139 527
- Other
-
3 249
891
Not contracted for
- Target
30 940
-
171 791
- Other
-
16 520
20 065
43 606
42 011
332 274
Capital commitments will be funded from cash generated by operations.
21.2
Contingent liabilities
Arising from an agreement with LTA Process Engineering where under the company is liable for the erection costs of a tailings dam, should a dump reclamation project at ETC be cancelled
-
518
1 543
22. RETIREMENT FUNDS
The company participates in two retirement funds for its employees. These funds are defined contribution funds and are governed by the Pension Funds Act, 1956, as amended. Contributions paid for retirement benefits are charged to the income statement as they are incurred
13 985
4 793
3 167
23. RELATED PARTY TRANSACTIONS
Related party transactions occurred at arm's length.
The only significant related transaction is:
Anglovaal Mining Limited - provision of services
2 273

2 862
1 056

Annexure 6
Interim financial information of Avgold
UNAUDITED FINANCIAL RESULTS FOR THE QUARTER AND HALF-YEAR ENDED 31 DECEMBER 2003
1.
INCOME STATEMENTS

	Audited	**Unaudited**	**Unaudited**
	Year	**Quarter ended**	**Half-year ended**
	ended		
	December	**December September**	**December**
	December		
	June		
	2003	**2002***	**2003**
	2003	**2002***	**2003***
Revenue	**202 717**	241 635	244 190
	446 907	502 363	999 480
- gold revenue	**202 389**	241 170	243 933
	446 322	501 708	998 217
- by-products	**328**	465	257
	585	655	1 263
Costs and expenses	**193 839**	225 230	201 300
	395 139	452 784	

889 560
- gold operating
132 486
176 053
127 360
259 846
348 663
673 344
- amortisation
58 768
42 918
68 343
127 111
92 030
186 900
- administration and general
2 585
6 259
5 597
8 182
12 091
29 316
Operating profit
8 878
16 405
42 890
51 768
49 579
109 920
Investment income
284
3 469
572
856
6 582
12 987
Finance cost
972
14 991
2 902
3 874
29 128
57 946
Foreign exchange gain
-
62 573
-
-
52 075
66 745
Unrealised non-hedge derivatives

(59 785)
-
(123 730)
(183 515)
-
(102 715)
Income/(Loss) before exceptional item
(51 595)
67 456
(83 170)
(134 765)
79 108
28 991
Exceptional items
-
-
4 661
4 661
-
7 085
Income/(Loss) before taxation
(51 595)
67 456
(78 509)
(130 104)
79 108
36 076
Taxation
-
-
3 750
3 750
-
9 207
Net earnings/(loss) for period
(51 595)
67 456
(82 259)
(133 854)
79 108
26 869
Additional information:
Net earnings for period excluding unrealised
non-hedge derivatives
8 190
67 456
41 471
49 661
79 108
129 584
Headline earnings/(loss)

(51 395)
67 456
(83 170)
(134 765)
79 108
25 385
Headline earnings before unrealised non-hedge derivatives
8 190
67 456
40 560
48 750
79 108
128 100
Headline earnings/(loss) per share (cents)
(8)
10
(12)
(20)
12
4
Headline earnings per share before unrealised non-hedge derivatives (cents)
1
10
6
7
12
19
Earnings/(Loss) per share (cents)
(8)
10
(12)
(20)
12
4
Weighted number of shares in issue (million)
679
674
677
678
674
674
Reconciliation of earnings and headline earnings:
Net earnings/(loss) per income statement
(51 595)
67 456
(82 259)
(133 854)
79 108
26 869

Exceptional item:
Profit on sale of ETC Mine
-
-
(4 661)
(4 661)
-
(7 085)
Recoupments tax:
On sale of ETC Mine
-
-
3 750
3 750
-
5 601
(51 595)
67 456
(83 170)
(134 765)
79 108
25 385
46

2.
BALANCE SHEETS
Unaudited
Audited
31 December
30 June
2003
2003*
R'000
R'000
ASSETS
Non-current assets
2 480 241
2 569 795
Property, plant and equipment
2 454 841
2 543 841
Investments
25 400
25 954
Current assets
94 205
84 382
Inventories
46 280
46 407
Trade and other receivables
47 003
37 214
Deposits and cash
922
761
Total assets
2 574 446
2 654 177
EQUITY AND LIABILITIES
Capital and reserves
Share capital
6 801
6 765
Share premium
2 236 766
2 219 900
Retained income/(Accumulated loss)
(90 027)
43 827
Total shareholders' equity
2 153 540
2 270 492
Non-current liabilities
324 770

144 639
Non-hedge derivatives
286 230
102 715
Long-term provisions
38 540
41 924
Current liabilities
96 136
239 046
Trade and other payables
92 549
104 126
Short-term borrowings
3 587
134 920
Total equity and liabilities
2 574 446
2 654 177
* Comparative figures for December 2002 include ETC. The year ended 30 June 2003 figures include ETC to 15 June 2003.
47

3.
CASH FLOW STATEMENTS
Audited
Unaudited
Year
Half-year ended
ended
December
December
June
2003
2002*
2003*
R'000
R'000
R'000
Cash generated from/(utilised by) operations
Operating profit
51 768
49 579
109 920
Non-cash items and adjustments
Amortisation and depreciation
127 111
92 030
186 900
Provisions
(2 908)
(808)
(5 546)
Profit on sale of property, plant and equipment
-
-
(1 519)
175 971
140 801
289 755
Net withdrawal from environmental trust fund
-
-
3 925
Investment income
938
6 582
12 987
Finance charges
(3 874)
(29 128)
(57 946)
173 035
118 255

248 721
Cash provided by/(reinvested in) working capital
Inventories
127
(10 740)
(18 351)
Trade and other payables
(15 327)
(34 457)
(30 390)
Trade and other receivables
(9 789)
1 043
13 578
Net cash generated from operating activities
148 046
74 101
213 558
Cash utilised in investment activities
Property, plant and equipment acquired
(50 050)
58 584
(124 364)
Investments acquired
(2)
-
(483)
Property, plant and equipment sold
16 598
1 777
3 558
Proceeds on sale of ETC Mine
-
-
251 817
(33 454)
(56 807)
130 528
Cash provided by financing activities
Net increase in shareholders' funding
16 902
7 910
13 551
Leased assets
-
(691)
(1 434)
Decrease in long-term loans
-
-
(376 189)

(Decrease)/Increase in overdrafts and short-term borrowings
(131 333)
3 776
(76 224)
(114 431)
10 995
(440 296)
Increase/(Decrease) in cash balances
161
28 289
(96 210)
Cash and cash equivalents at beginning of period
761
108 810
108 810
Translation adjustment
-
(3 712)
(11 839)
Cash and cash equivalents at end of period
922
133 387
761
4.
STATEMENTS OF SHAREHOLDERS' EQUITY
Retained
Unaudited
Audited
Ordinary
income/
Half-year ended
Year ended
share capital (Accumulated
December
December
June
and premium
loss)
2003
2002
2003
R'000
R'000
R'000
R'000
R'000
Changes in shareholders' equity
Balance at beginning of period
2 226 665
43 827
2 270 492

2 230 072
2 230 072
Share options exercised
16 932
-
16 932
7 936
13 584
Derivative instruments
(30)
-
(30)
-
-
Expenses written-off against share premium
-
-
-
(26)
(33)
Transfer to equity reserves
-
-
-
(3 301)
-
Net earnings/(loss) for period
-
(133 854)
(133 854)
79 108
26 869
Balance at end of period
2 243 567
(90 027)
2 153 540
2 313 789
2 270 492
* Comparative figures for December 2002 include ETC. The year ended 30 June 2003 figures include ETC to 15 June 2003.
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Hedging

At 31 December 2003, Avgold's hedge book represented 72 per cent of forecast gold production to June 2006 and had a mark-to market value of a negative R394 million. This was calculated at a gold price of US$414.82/oz and an exchange rate of US$1.00:ZAR6, 65. This mark-to-market valuation is inclusive of a negative R286 million pertaining to the Rand/US$ forward exchange contracts utilised to convert the Rand gold hedges into Dollar gold hedges. The fair value adjustment on these FEC's has been included in the income statement. The hedges are unmargined and Avgold is maintaining its policy of not using derivatives instruments for speculative purposes.

Earnings are significantly distorted as a result and do not present an accurate economic picture of the company's results during the reporting period.

Subsequent changes to exchange rates will result in adjustments to the income statement thereby creating further variability in earnings.

Borrowings

Net borrowings reduced significantly during the quarter to R3 million (R46 million) following continuing positive cash flows from Target.

Prospects

We remain confident about achieving our production objective of 350 000 oz for the year to 30 June 2004 and are committed to maintain the critical path and optimise the orebody extraction. We are fully focused on achieving cost efficiencies and will minimise our cash costs. Earnings will, however, continue to be affected by future fluctuations in the Rand/US$ exchange rate.

Dividend policy

The dividend policy will be reviewed pending the outcome of the Harmony offer referred to below.

Accounting policies

The accounting policies used are in accordance with South African Statements of Generally Accepted Accounting Practice and are consistent with those applied in the previous financial year.

50

50

Annexure 7

A COMPETENT PERSON'S REPORT CONTAINING INFORMATION ON THE MINING ASSETS OF HARMONY INCLUDING AVGOLD

AN INDEPENDENT COMPETENT PERSON'S REPORT ON CERTAIN MINING ASSETS OF HARMONY GOLD MINING COMPANY LIMITED AND AVGOLD LIMITED

Prepared for:

HARMONY GOLD MINING COMPANY LIMITED

AND

AVGOLD LIMITED

Prepared by:

Steffen, Robertson and Kirsten
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METALLURGY
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Harmony Free State Tax Entity: Total Assumed TEPs

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Annexure 7

AN INDEPENDENT COMPETENT PERSON'S REPORT ON CERTAIN MINING ASSETS OF AVGOLD LIMITED AND HARMONY GOLD MINING COMPANY LIMITED

1.

INTRODUCTION

1.1

Background

Steffen, Robertson and Kirsten (South Africa) (Pty) Limited ("SRK") is a subsidiary of the international Group holding company, SRK Global Limited (the "SRK Group"). SRK has been commissioned by the Directors of Avgold Limited ("Avgold") and Harmony Gold Mining Company Limited ("Harmony") to prepare an independent competent person's report ("CPR") on certain mining assets (the "Mining Assets") of Avgold and Harmony (the "Companies").

The Mining Assets of Avgold include:

.
a 100% interest in the Target Gold Mine ("Target Mine") located in the Free State Province, South Africa; and
.
a 100% interest in Target North, Oribi and Sun South deposits to the north of the existing Target Mine.

The Mining Assets of Harmony include:

.
a 100% interest in Free Gold Joint Venture Company (Proprietary) Limited ("Free Gold");
.
a 100% interest in Joel Mine situated in the Free State Goldfield, South Africa, hereinafter defined as ("Joel"). Ownership of this assets is held at the Harmony level;
.
a 100% interest in Randfontein Estates Limited ("Randfontein");
.
a 100% interest in Evander Gold Mining Company Limited ("Evander");
.
a 100% interest in Kalahari Goldridge Mining Company Limited ("Kalgold"). Harmony is in the process of disposing of its entire interest in Kalgold to Afrikander Lease Limited ("Aflease"). The sale will be effective after all the legal conditions of the transaction have been met, which is anticipated by the end of February 2004. Conditional to the sale is that Harmony retains its interests in the company's Kalplats platinum discovery and associated mineral rights;
.
a 100% interest in Harmony Gold (Australia) Proprietary Limited ("Harmony Australia");
.
a 100% interest in Harmony Gold (Canada) Inc ("Harmony Canada");
.
a 100% interest in various mining operations situated in the Free State Goldfield, South Africa, hereinafter defined as ("Harmony Free State"). Ownership of these assets is held at the Harmony level;
.
a 100% interest in various significant exploration properties, notably the Rolspruit gold project ("Rolspruit"), the Poplar gold project ("Poplar") and the Kalplats PGM project ("Kalplats");
.
a 100% interest in the mining operations situated in Orkney, South Africa, previously owned and operated by African Rainbow Minerals Gold Limited ("ARMgold") herein defined as ("Harmony Orkney"). Ownership of these assets is currently held at Harmony level; and
.
a 100% interest in the mining operations situated in Welkom, South Africa, previously owned and operated by ARMgold herein defined as ("Harmony Welkom"). Ownership of these assets is currently held at Harmony level.

In addition, Harmony holds interests in wholly-owned, joint venture and associate companies via direct and indirect subsidiaries. These interests comprise dormant companies, exploration companies, investment holding companies, management service companies, marketing companies, beneficiation companies, mineral rights holding companies and property holding companies.

All assets incorporating operating mines and exploration properties, for which Harmony holds less than 100% and/or does not have legal rights to disclose information, other than that already reported in the public domain, have therefore been excluded from the collective term Mining Assets and do not form part of this CPR. Specifically, Harmony's material interests that are not reported upon in this CPR, include:

.

a 33.9% interest in Anglovaal Mining Limited ("Avmin") which was recently acquired through an ARMgold/Harmony joint venture. The principal assets in Avmin include:

-

50.3% of Assmang Limited which operates various manganese ore, iron ore and chrome ore operations located in the Republic of South Africa ("South Africa");

-

55.0% of Two Rivers Platinum (Proprietary) Limited ("Two Rivers") which is currently developing a platinum mining operation located in Mpumalanga Province, South Africa;

- 100% of the Nkomati nickel mine ("Nkomati") located in Mpumalanga Province, South Africa;

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.

Harmony's 87% interest in Abelle Limited ("Abelle") a company listed on the Australian Stock Exchange Limited ("ASX"), which operates a gold mining operation in Australia and has various interests in exploration properties in Australia and Papua New Guinea; and

.

Harmony's 31.8% interest in Bendigo Mining NL ("Bendigo") a company listed on the ASX which owns a single gold development project in Australia.

Appendage 1 to this report includes brief technical summaries of these assets, which have been reproduced from information lawfully contained in the public domain. SRK has not had access to either the underlying information or supporting data, therefore no opinion has been provided herein.

1.2

Requirement for the CPR

SRK has been informed that Avgold and Harmony have reached an agreement, in terms of a merger agreement (the "Merger"). It is intended that the Merger will be implemented by means of a Scheme of Arrangement (the "Scheme") to be proposed by Avgold, between Harmony and its shareholders.

This CPR principally comprises a technical-economic appraisal of the Mining Assets and has been prepared in compliance with the Listings Requirements of the JSE Securities Exchange, South Africa (the "JSE"), specifically Sections 12.3, 12.8, 12.9 and 12.14.

A copy of this CPR will be included in the Scheme document and circular to be dispatched to the Companies' shareholders. In this CPR, SRK provides assurances to the directors of the Companies that the technical- economic projections ("TEPs"), including production profiles, operating expenditures and capital expenditures, of the Mining Assets as provided to SRK by the Companies and reviewed by SRK are reasonable, given the information currently available.

1.3

Structure of the CPR

For reporting purposes SRK note that the valuations of the Mining Assets have been grouped in accordance with the following Tax Entities, herein referred to as ("the Tax Entities") and that all entries (including text, tables and other data) are quoted assuming 100% ownership and not on an attributable basis according to the respective shareholdings:

.

the tax entity within which Target Mine is assessed ("Target Tax Entity");

.

the tax entity within which Free Gold is assessed ("Free Gold Tax Entity");

.

the tax entity within which Joel is assessed ("Joel Tax Entity");

.

the tax entity within which Harmony Free State is assessed ("Harmony Free State Tax Entity");

.

the tax entity within which Harmony Welkom is assessed ("Harmony Welkom Tax Entity");

.

the tax entity within which Randfontein Estates Limited is assessed ("Randfontein Tax Entity");

.

the tax entity within which Evander Gold Mines Limited is assessed ("Evander Tax Entity");

.

the tax entity within which Harmony Orkney is assessed ("Harmony Orkney Tax Entity");

.

the tax entity within which Kalahari Goldridge Mining Company Limited is assessed ("Kalgold Tax Entity"); and

.

Harmony Australia comprising:

- the tax entity within which Mt. Magnet & Cue is assessed ("Mt. Magnet & Cue Tax Entity"); and
- the tax entity within which South Kalgoorlie is assessed ("South Kalgoorlie Tax Entity").

Technical descriptions of the Mining Assets have been grouped into operations that broadly reflect the management structures and/or common geographical location. The Mining Assets are grouped into the following operations:

. Target Operations: Includes Target Mine, Target North and Extensions and Oribi;

. Free Gold Operations;

. Harmony Free State Operations;

. Welkom Operations;

. West Wits Operations includes Randfontein, Elandsrand and Deelkraal;

. Evander Operations;

. Orkney Operations;

. Kalgold Operation; and

. International Operations, sub-divided into Harmony Australian Operations and Harmony Canadian Operations.

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In accordance with the Listings Requirements of the JSE and the SAMREC Code, this CPR has been prepared under the direction of the Competent Person (the "CP") which assumes overall professional responsibility for the document (Section 1.4). The CPR, however is published by SRK, the commissioned entity, and accordingly SRK assumes responsibility for the views expressed herein. On this basis, all references to SRK mean the CP and *vice versa*.

1.4

Valuation Date and Base Technical Information

The Mining Assets have been valued based on cash flow projections commencing 1 January 2004 which is dependent upon the following:

.

technical information as generated by the Companies in accordance with their annual planning process defined as the Base Information Date ("BID"): 1 July 2003; and

.

adjustments to all technical information to reflect depletion and historical performance from the respective BIDs to 31 December 2003.

The LoM plans and associated Mineral Reserve statements for the Mining Assets have been derived as follows:

Avgold: The LoM plans and associated Mineral Reserve statements for Target Mine have been derived using a gold price of ZAR107,000/kg. No sensitivity is currently available to assess the impact on the Mineral Reserves at current (approximately ZAR80,000/kg in December 2003) gold price; which represents a 25% reduction. This aspect is discussed further in Section 4 of this CPR; and

Harmony: The LoM plans and associated Mineral Reserve statements for the Mining Assets have been derived using a gold price of ZAR93,000/kg for the Mining Assets located in South Africa and AUS$522/oz for the Mining Assets located in Australia.

The post-tax pre-finance cash flows from each Tax Entity have been developed on the basis of a US$ gold price increasing in constant money terms from US$366/oz in 2004 to US$382/oz in 2005 and macro-economic factors as defined in Table 1.1.

1.5

Verification, Validation and Reliance

The valuation as reported herein is dependent upon technical, financial and legal aspects. The technical information as provided to and taken in good faith by SRK has not been independently verified by means of recalculation. SRK has however conducted:

.

inspection visits to surface and underground operations, processing facilities, surface structures and associated infrastructure at each of the Mining Assets during November 2003 for the Avgold Assets and between May and June 2003 for the Harmony Assets;

.

discussion and enquiry following access to key personnel based at the individual Business Units ("BUs") and head office;

.

a review and, where considered appropriate by SRK, modification of the Companies' estimates and their classification of Mineral Resources and Mineral Reserves;

.

a review of the Companies' plans and supporting documentation and, where considered appropriate by SRK, modification of the Companies' LoM plans and the associated TEPs, including assumptions regarding future operating costs, capital expenditures and gold production of the Mining Assets;

.

an examination of historical information and results made available by the Companies in respect of the Mining Assets the forecasts contained in the LoM plans and one-year budgets; and

.

an update undertaken in January 2004 to reflect the latest opinion of the Financial Advisors on the macro- economic parameters including commodity prices, exchange rates and inflation factors as presented in Table 1.1. In addition SRK has considered any material departures from the projections provided to and reviewed by SRK during the inspection visits to the Harmony Assets completed during May and June 2003. In addition SRK has accounted for depletion that has taken place during the six-month period that has elapsed between June 2003 and December 2003. SRK's approach in undertaking a review of the Mineral Resource and Mineral Reserve estimations and classifications is detailed in Section 4 of this CPR. In summary, SRK has reported Mineral Resource and Mineral Reserve statements based on a review of the LoM plans and the methodologies applied for estimation and classification of both Mineral Resources and Mineral Reserves.

SRK consider that with respect to all material technical-economic matters it has undertaken all necessary investigations to ensure SAMREC compliance, both in terms of level of investigation and level of disclosure. In doing so SRK has not reproduced the information provided to it by the Companies without due consideration or appropriate modification. Notwithstanding this comment, SRK has not recalculated the base

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information supporting the Mineral Resource estimates as derived from bore-hole and assay data, this given the generally extensive history of the Mining Assets and geological investigations undertaken by the Companies, however has undertaken sufficient checks through the course of its investigations to enable an appropriate level of reliance to be placed on such data, as provided.

Where fundamental base data has been provided (LoM plans, capital expenditures, operating budgets etc) for the purposes of review, SRK recognise the requirements of 12.3(e) and accordingly state that SRK has performed all necessary validation and verification procedures deemed appropriate in order to to place an appropriate level of reliance on such information.

1.5.1

Technical Reliance

SRK places reliance on the Companies CPs that all technical information provided to SRK at the time of writing is both valid and accurate for the purpose of compiling this CPR.

The information with respect to Mineral Resources and Mineral Reserves as defined by the Companies has been prepared under the direction of the following individuals:

.

Avgold: Dr F Camisani-Calzolari, PrSciNat (SACNASP), FSAIMM, MAuIMM, FGSSA, CRIRSCO (Combined Reserve International Report Standards Committee of CMMI). Dr Camisani-Calzolari has over 30 years' experience in the mining industry and was responsible for Mineral Resource and Mineral Reserve reporting at Avmin for a number of years until recently, and is currently retained as a consultant to Avmin on a part-time basis; and

.

Harmony: Mr Graham Briggs, Pr. Sci. Nat, BSc (Hons) Geology. Mr Briggs is responsible for ore reserve management, organic growth and capital projects on the executive committee of Harmony. He has 29 years' experience in the gold mining industry and is a registered geological scientist.

1.5.2

Financial Reliance - the Companies

In consideration of all financial aspects relating to the valuation of the Mining Assets and the Summary equity valuation of the Companies, SRK has placed reliance of the Financial Officers of the Companies that the following information for the Tax Entities and the Companies is accurate at 1 January 2004:

.

unredeemed capital balances;

.

assessed losses;

.

opening balances for debtors, creditors and stores;

.

working capital and taxation logic;

.

values ascribed to interests in unlisted and listed entities; and

.

balance sheet items, specifically cash on hand, debt and mark-to-market value of derivative instruments (currency and commodity hedges).

The information with respect to the above financial data as defined by the Companies has been prepared under the direction of the following individuals:

.

Avgold: Mr Michael Arnold, BSc Eng (Mining Geology), CA(SA). Mr Arnold is the Chief Financial Officer for Avgold; and

.

Harmony: Mr Frank Abbot, BCom, CA(SA). MBL is the chief financial officer for Harmony and has 22 years' experience in financial management, 22 years of which has been within the mining industry.

1.5.3

Financial Reliance - Deutsche Bank (South Africa)

In generating the valuation of the Mining Assets, SRK has relied upon the commodity price and macro- economic forecasts as included in Table 1.1 below, which have been generated by Deutsche Bank South Africa. In respect of compliance with 12.3(e) of the Listings Requirements of the JSE, SRK has secured the JSE's dispensation from providing details of the individuals responsible for the generation of the information as presented in Table 1.1.

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Table 1.1 Base Case Macro-Economic Parameters
Parameter
Units
2004
2005
2006
2007
2008
Gold Price - Nominal
(US$/oz)
366
386
390
394
398
(ZAR/kg)
91,659
111,797
125,823
134,929
143,309
(AUS$/oz)
487
499
499
492
485
RSA CPI
(%)
2.55%
4.10%
4.77%
4.50%
4.50%
AUS CPI
(%)
2.40%
2.40%
2.40%
2.40%
2.40%
US CPI
(%)
1.38%
1.03%
1.00%
1.00%
1.00%

Nominal Exchange Rate
(US$:ZAR)
7.80
9.01
10.04
10.66
11.21
(US$:AUS$)
1.33
1.32
1.34
1.34
1.34
(AUS$:ZAR)
5.85
5.95
6.08
6.21
6.34

Table 1.1 summaries the base-case macro-economic projections as generated by Deutsche Bank (South Africa), Financial Advisors to Avgold. Taking cognisance of the volatile nature of both the gold price (US$/ozt) and the exchange rate between the US$ and both the ZAR and AU$, SRK has run sensitivities on revenue ranging between -30% and +30% to these macro-economic projections as discussed in the risks and opportunities in Section 12 of this CPR.

1.5.4

Legal Reliance

In consideration of all legal aspects relating to the valuation of the Mining Assets SRK has placed reliance on the following representatives of the Companies that the following legal aspects are correct at 1 January 2004:

.

in respect of 12.8(e) and 12.10(g) that "a statement by the Directors of any legal proceedings that may have an influence on the rights to explore for minerals, or an appropriate negative statement" has been included in the body of the various circulars relating to the Transactions;

.

in respect of 12.10(e) that the legal ownership and of all mineral and surface rights has been verified;

.

in respect of 12.14(a)(xii) that no significant legal issue exists which would effect the "likely viability of a project and/or on the estimation and classification of the Mineral Reserves and Mineral Resources" as reported herein; and

.

The information with respect to the above legal data as defined by the Companies has been prepared under the direction of the following individuals:

.

Avgold: Mr Pieter Coetzee, BProc. Mr Coetzee is the general manager legal services for Avmin and has 20 years' experience in the mining industry,

.

Harmony: Mr Mike Wasserfall B.Com (Hons) LLM is legal advisor to Harmony and has 20 years experience, all of which is in the mining industry. Mr Wasserfall is assisted by Mr George Edward Warren de Wit who is the Group Surveyor for Harmony.

1.6

Valuation Techniques

The summary equity valuation for the Companies is based on a sum-of-the-parts approach comprising net asset values ("NAV") for the Mining Assets and supplemental information as provided by the Companies (Balance sheet items and

interests in listed and unlisted companies).

The NAVs for the Mining Assets have been derived using discounted cash flow ("DCF") techniques applied on a post-tax pre-finance basis for the individual Tax Entities. These are based on the various LoM plans and where appropriate are sub-divided into valuations based on Mineral Reserves alone and Mineral Reserves and Mineral Resources where such LoM plans have been generated accordingly.

In respect of non-LoM Mineral Resources, these have not been valued separately and commentary is limited to technical disclosure requirements in accordance with the Listings Requirements of the JSE.

The post-tax pre-finance cash flows from each Tax Entity have been developed on the basis of the commodity price and macro-economic projections as presented in Table 1.1. For each Tax Entity SRK has developed Financial Models ("FM"), the results of which are presented in Section 13 and Section 14 of this CPR. The FMs are based on annual cash flow projections ending 30 June and technical-economic input parameters ("TEP") stated in 1 January 2004 money terms. As the valuation date is 1 January 2004, the cash flow projections for the first period present a six-month forecast to 30 June 2004.

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1.7

JSE Compliance

This CPR principally comprises a technical-economic appraisal of the Mining Assets and has been prepared in compliance with the Listings Requirements of the JSE, specifically Sections 12.3, 12.8, 12.9 and 12.14. In addition to the Mining Assets, technical information on a number of exploration properties has also been included.

In compliance with 12.6, Table 1.2 presents a cross-reference between the Listings Requirements of the JSE and the primary sections as included in this CPR.

Table 1.2 JSE Compliance cross-reference

CPR Section

Listings Requirements

1

12.3(a), 12.3(b), 12.3(c), 12.3(e); 12.6, 12.8(a), 12.9(a), 12.9(b), 12.9(c), 12.9(d), 12.9(e), 12.9(f); 12.11(a), 12.11(b) 12.14(a) - (viii), (xi), (xii), (xvi), (xvii), (xviii); 12.14(b) - (iv), (xvii)

2

12.10(d), 12.10(g), 12.10 (h) - (i), (ii), (iii); 12.10(i), 12.10(j) 12.11(a), 12.11(b) 12.14(a) - (ix), (x), (xii), (xvii)

3

12.10(a) - (xi); 12.10(b) - (i); 12.10(d)

4

12.10(a) - (i), (ii), (iii), (iv), (v), (vi), (vii), (viii), (ix), (x), (xii), (xiii), (xv), (xvi), 12.10(b) - (ii), (iii), (iv); 12.10(b) - (vi) - (1), (2), (3), (4), (5), (6), (7), (8), (9); 12.10(d); 12.10(f) - (i), (ii); 12.14(a) - (ii), (iii), (iv), (xii), (xiv), (xv); 12.14(b) - (ii)

5

12.10(b) - (v); 12.10(d); 12.14(a) - (iv), (x), (xii)

6

12.10(b) - (v); 12.14(a) - (v), (vi), (vii), (x), (xii); 12.14(b) - (iii)

7

12.14(a) - (xii)

8

12.14(a) - (viii); 12.14(b)(vi)

9

12.14(a) - (xii)

10

12.14(a) - (xii)

11

12.10(c), 12.14(a) - (i), (viii), (xii)

12

12.14(a) - (viii); 12.14(b) - (v), (vi)

13

12.10(b) - (v); 12(b) - (i), (iii), (iv), (vi), (viii), (ix), (xi), (xiv), (xv), (xvi), (xvii)

14

12.14(a) - (ii), (xiii), (xviii), (xix); 12.14(b) - (vi), (x), (xii), (xiii), (xvi), (xviii)

Glossary

12.10(k)

In respect of specific compliance items SRK note the following:

.

12.10(e) - (i), (ii): A detailed list of the Companies mineral and surface rights will be made available at the corporate offices of each of the respective companies. Dispensation has been granted in this regard from inclusion in the CPR for practical purposes of volume;

.

12.8(e); 12.10(g): A detailed statement of all legal proceedings which may have an influence on the rights to explore for minerals or an appropriate negative statement has been included in the body of the circulars;

.

12.14(a)(xvi): The Companies are in effect mature operating companies with a track record of operating history and accordingly, other than brief summaries of Directors (as included in the body of the Circular), details relating to qualifications of key technical and managerial staff have been excluded from this CPR. Dispensation has been granted in this regard from inclusion into this CPR for practical purposes relating to volume of information; and

.

12.10(x)(i), 12.10(d): SRK has, during the course of its investigations, reviewed technical plans in order to support its opinions on the geology, Mineral Resource and Mineral Reserves, mining plans and processing facilities, these together with land holdings, lease areas and surface infrastructure. Due to pure volume and scale of these plans it is not appropriate to include copies into this CPR for the 75 business units operated by Avgold and Harmony. Dispensation has been granted in this regard from inclusion into this CPR; however these plans are available for inspection at various company operating offices where they remain due to the fact that many are working plans required for the continual management of the respective business units.

1.8

Warranties and Limitations

SRK's opinion is effective 1 January 2004 and is based on information provided by the Companies throughout the course of SRK's investigations, which in turn reflect various technical-economic conditions prevailing at the time of writing. These conditions can change significantly over relatively short periods of time and as such the information and opinions contained in this report may be subject to change.

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In this CPR, SRK provides assurances to the Directors of the Companies that the technical-economic projections ("TEPs"), including production profiles, operating expenditures and capital expenditures, of the Mining Assets as provided to SRK by the Companies and reviewed by SRK are reasonable, given the information currently available. The achievability of LoM plans, budgets and forecasts are neither warranted nor guaranteed by SRK. The forecasts as presented and discussed herein have been proposed by the Companies' management and cannot be assured; they are necessarily based on economic assumptions, many of which are beyond the control of the Companies. Future cash flows and profits derived from such forecasts are inherently uncertain and actual results may be significantly more or less favourable.

This report includes technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, SRK does not consider them to be material.

1.9

Disclaimers and Cautionary Statements for US Investors

In considering the following statements SRK notes that the term "Mineral Reserve" for all practical purposes is synonymous with the term "ore reserve".

The United States Securities and Exchange Commission (the "SEC") permits mining companies, in their filings with the SEC, to disclose only those mineral deposits that a company can economically and legally extract or produce from. Certain terms are used in this report, such as "resources", that the SEC guidelines strictly prohibit companies from including in filings.

Mineral Reserve estimates are based on many factors, including, in this case, data with respect to drilling and sampling. Mineral Reserves are determined from estimates of future technical factors, future production costs, future capital expenditure, future product prices and the exchange rate between the South African Rand ("ZAR") and the United States Dollar ("US$"). The Mineral Reserve estimates contained in this report should not be interpreted as assurances of the economic life of the Mining Assets or the future profitability of operations. Because Mineral Reserves are only estimates based on the factors and assumptions described herein, future Mineral Reserve estimates may need to be revised. For example, if production costs increase or product prices decrease, a portion of the Mineral Resources, from which the Mineral Reserves are derived, may become uneconomical to recover and would therefore result in lower estimated Mineral Reserves.

The LoM plans and the TEPs include forward-looking statements that are required in compliance with the JSE Listings Requirements. These forward-looking statements are necessarily estimates and involve a number of risks and uncertainties that could cause actual results to differ materially.

1.10 Qualifications of Consultants

The SRK Group comprises 500 staff, offering expertise in a wide range of resource engineering disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project. This permits the SRK Group to provide its clients with conflict-free and objective recommendations on crucial judgment issues. The SRK Group has a demonstrated track record in undertaking independent assessments of resources and reserves, project evaluations and audits, CPRs and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with a large number of major international mining companies and their projects, providing mining industry consultancy service inputs. SRK also has specific experience in commissions of this nature.

This CPR has been prepared based on a technical and economic review by a team of 30 consultants sourced from the SRK Group's offices in South Africa, the United Kingdom and Australia over a two-month period. These consultants are specialists in the fields of geology, resource and reserve estimation and classification, underground and open pit mining, rock engineering, metallurgical processing, hydrogeology and hydrology, tailings management, infrastructure, environmental management and mineral economics.

Neither SRK nor any of its employees and associates employed in the preparation of this report has any significant beneficial interest in the Companies or in the assets of the Companies. SRK will be paid a fee for this work in accordance with normal professional consulting practice.

The individuals who have provided input to this CPR, who are listed below, have extensive experience in the mining industry and are members in good standing of appropriate professional institutions:

.

Andrew Pooley, Pr. Eng, MSAIMM, AMIMM, B.Eng (Mining);

.

Andrew Smithen, Pr. Eng., MBL, MSAICE, MSAIAE, MSAIMM, MSc;

.

Andrew Vigar, FAusIMM, BSc (Applied Geology);

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Awie Swart, MSAIMM, MSANIRE, COM Adv. Rock Eng. Cert. B.Eng.;

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Boet van der Vyfer, FMVS, Adv. Cert. Mine Env. Control;

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Dawood Wepener, BSc Eng., MSAIME, Govt. Cert of Comp.;
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Ian Home, MIAIA, MSc;
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Iestyn Humphreys, AM.I.Min.E, AIME, PhD;
.
Jim Williams, ACSM, C.Eng., FAusIMM;
.
Jonathan Suthers, B.Eng.;
.
John Miles, C. Eng., MIMMM, MSc;
.
Kenneth Owen, FSAIMM, MAMMSA, MSc Eng;
.
Kirsty Sells, CPEnv, FAuSIMM, BSc, MBS;
.
Lee Barnes, C.Eng, MIMMM, MSc;
.
Louis Voortman, CPGeo, FAusIMM, MAIG, MGAA, MGASA, SIA(aff), AIM(Aff), Sc MSc;
.
Louie Human, COM Adv. Rock Eng. Cert., NHD (Geology);
.
Mark Campadonic, FGS, AIQ, Msc;
.
Michael Armitage, C. Eng., C. Geol., MIMM, PhD;
.
Michael Boylett, C.Eng, MA (Met.), MSAIMM, MIMMM;
.
Michael Harley, Pr. Sci Nat., MSAIMM, MAusIMM, PhD;
.
Michael McWha, Pr.Sci Nat., FGSSA, MSAIMM, BSc Hons;
.
Oskar Steffen, Pr. Eng. (ECSA)., MSAIMM, PhD;
.
Peter Munro, MAuSIMM, B. Appl. Sc., B. Comm, B. Econ;
.
Richard Clayton, C.Geol, FGS, Msc;
.
Robert Wilson, Pr. Eng, FSAIMM, B.Sc.Eng.(Mech.);
.
Roger Dixon, Pr. Eng, FSAIMM, BSc (Mining);
.
Victor Hills, Pr.Eng., MSAIMM, B.Eng.;
.
Wally Waldeck, Pr. Eng (reg. ECSA), MSAIMM, BSc (Mining), MBA; and
.
William Schoeman, Pr. Eng, MSAIME, BSc.Eng (Mech).

In compliance with Section 12.3 of the JSE Listings Requirements, the following CPs are presented:

.

the Competent Person with overall responsibility for the compilation of this CPR is Mr H G Waldeck, Pr. Eng registered with the Engineering Council of South Africa ("ECSA") who is an employee of SRK. Mr Waldeck is a mining engineer with 28 years' experience in the mining industry and has supervised numerous due-diligence reviews and various technical studies on the Witwatersrand Basin during the past five years. In compliance with the SAMREC requirements, Mr. Waldeck also assumes responsibility for the reporting of Mineral Reserves as included in this CPR; and

.

in compliance with the SAMREC requirements and definitions, the Competent Person with overall responsibility for Mineral Resources is Dr Michael Harley, Pr. Sci Nat., MSAIMM, MAusIMM, PhD who is an employee of SRK. Dr Michael Harley is a mining geologist with 14 years' experience in the mining industry and has been responsible for the reporting of Mineral Resources on various properties in South Africa and internationally during the past five years.

1.11 Valuation Summary

The summary equity valuation for the Companies is presented in Section 14 of this CPR, specifically Table 14.1 for Avgold, Table 14.2 for Harmony. In respect of the Kalgold Tax Entity, a DCF valuation is included; however reference is made to the circular which details the terms and associated proceeds relating to the disposal of Kalgold by Harmony.

In addition SRK has been informed by Harmony that it has recently disposed of its interests in the following companies:

.

Harmony's 31.7% interest in Highland Gold Mining Limited ("Highland Gold"). In October 2003, Harmony disposed of its 31.7% shareholding in Highland Gold in a placing arranged by City Capital Corporation Limited in London; and

.

Harmony's 17.0% interest in High River Gold Mines Limited ("High River"). In October 2003 Harmony disposed of its 17% shareholding in High River in a placing arranged by BMO Nesbitt Burns in Canada.

No summary equity valuation has been included and any proceeds have been incorporated into the net cash position of Harmony at 31 December 2003.

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2.
MINING ASSETS
2.1
Introduction
This section gives a brief overview of the Companies and their respective Mining Assets including, location and historical company development, property description, mining methods and operating results. Specifically where reference is made to legal compliance within the regulatory environment in which the Companies operate, SRK has placed reliance on the Companies and their respective legal advisers.
2.2
The Companies and Operating Structures
2.2.1
Avgold
Avgold is a South African-based mining, development and exploration company, publicly listed on the JSE (primary listing), with International Depositary Receipts ("IDR") traded on the Brussels Bourse. Table 2.1 gives the recent historical company development of Avgold to date. By measure of annual gold production attributable to the company, Avgold is ranked 22nd in terms of the world's gold mining companies. Avgold states its core business as that directly associated with a gold mining and gold exploration whose activities include operating the recently commissioned Target Mine (May 2002) and the continued exploration in an area known as Target North.
Avgold's executive office is located at 56 Main Street, Johannesburg 2001, Gauteng Province South Africa. In addition Avgold has an operations office located at Target Mine situated between the towns of Bothaville and Welkom.
Table 2.1 Avgold: Company Development
Date
Activity
Late 1980s
Surface exploration intersected payable reef horizons in the Target area.
November, 1990
Target Exploration Company Limited ("Target Exploration") incorporated.
February, 1991
Target Exploration listed on the JSE.
January, 1993
23 surface boreholes completed at the Target area.
April, 1995
Commenced an underground exploration decline at Target from the Lorraine u/g workings.
July, 1996
106,000m of u/g exploration drilling completed and scope of Target Project increased to a 105ktpm mine.
November, 1996
Target Exploration changed its name to Avgold Limited and acquired the gold assets of Avmin, namely ETC Operations, Hartebeestfontein Mine and Lorraine Mine.
January, 1998
Acquired the Fairview Mine from Goldfields.
August, 1998
Mining operations at Lorraine ceased and No.1 Shaft became the principal access for the Target Project.
April, 1999
Mining Licence obtained for Target.
August, 1999
Disposed of the Hartebeestfontein Mine.
May, 2002

Target Mine commissioned.
February, 2003
Entered into an agreement to sell the assets of ETC.
June, 2003
Announcement of completion of surface drilling of Target North.
June, 2003
Disposal of ETC division to Metorex.
September, 2003
Announcement of completion of pre-feasibility study on Northern Free State.
November, 2003
Announcement that: Anglovaal Mining Limited ("Avmin") will dispose of its entire 42.2% interest in Avgold to Harmony.
Table 2.2 gives the historical operating statistics attributable to Avgold from 2001 through to 31 December 2003, inclusive.

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Table 2.2 Avgold: Salient Historical Operating Statistics
Statistic
(2)
Units
2001
2002
2003
2004
(1)
Production
Tonnes Milled
(kt)
492
782
1,389
540
Yield
(g/t)
3.0
6.6
8.6
11.1
Gold Production
(koz)
47
165
383
192
Development
(m)
5,144
6,022
14,677
4,226
Productivity TEC
(No.)
1,177
1,355
2,907
1,088
Milling
(t/TEC/month)
35
48
40
83
Gold Production
(g/TEC/month)

105
316
341
917
Health and Safety
Fatalities
(No.)
2
0
0
0
Fatality Rate
(per mmhrs)
0.35
0
0
0
LTIFR
(per mmhrs)
9
9
11
6
Expenditures
Cash Operating Costs
(ZARm)
290
523
673
260
Capital Expenditure
(ZARm)
521
102
123
50
Cost Performance
Cash Operating Costs
(ZAR/t)
589
669
485
481
(ZAR/kg)
189,949
98,496
56,588
43,409
Capital Expenditure
(ZAR/t)
1,059

130
88
93
(ZAR/kg)
341,252
19,181
10,329
8,361
(1)
2004 reports six-month actual results to December 2003.
(2)
Production from ETC mines is included, however those assets were sold during 2003.

2.2.2

Harmony

Harmony is a public listed company. Its primary listing is on the JSE and secondary listings are on the LSE, the Paris Bourse, with IDRs traded on the Brussels Bourse and an American Depositary Shares ("ADS") programme on the New York Stock Exchange, Inc. ("NYSE").

Harmony, through wholly-owned subsidiaries or joint venture agreements, manages and operates BUs, comprising operating and developing underground, open pit and surface reclamation operations in three countries. In addition, Harmony's exploration programme, targeting gold and PGEs, extends its country presence (through direct and indirect subsidiaries) into a total of five countries.

Harmony's company ownership comprises holdings in direct subsidiaries, indirect subsidiaries, direct and indirect joint venture companies and indirect associate companies. These comprise dormant companies, exploration companies, gold mining companies, investment holding companies, management service companies, marketing companies, beneficiation companies, mineral rights holding companies and property holding companies.

Harmony's operating structure principally comprises two reporting entities represented by South African Operations and International Operations. South African Operations are sub-divided into nine reporting entities: Free Gold Operations, Harmony Free State Operations, Welkom Operations, West Wits Operations (including Randfontein, Elandsrand and Deelkraal), Evander Operations, Orkney Operations, Kalgold Operations and International Operations (sub-divided into two operations, namely the Australian Operations and Canadian Operations).

Harmony's principal executive offices are located at 4 High Street, First Floor, Melrose Arch, Melrose North 2196, Johannesburg, Gauteng Province, South Africa.

Table 2.3 gives the historical company development of Harmony to date. By measure of attributable annual gold production Harmony is ranked 6th and by attributable total cash costs ranked 6th in terms of the world's gold mining companies. Harmony's core business is gold mining whose activities include the exploration, development and operation of gold mines, including direct interests in the marketing of gold and indirect interests in the manufacturing and retailing of gold jewellery.

Table 2.4 gives historical operating statistics attributable to Harmony from 2001 through to 31 December 2003, inclusive, with figures reported on a financial year basis.

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Table 2.3 Harmony: Company Development

Date	**Activity**
August, 1950	Harmony Gold Mining Company Limited incorporated and registered as a public company in South Africa.
1994	Management agreement between Randgold & Exploration Company Limited ("Randgold") and Harmony cancelled and replaced with service agreement.
1997	Service agreement between Randgold and Harmony cancelled resulting in Harmony operating as a completely independent gold mining company.
1997	Acquisition of Lydenburg Exploration Limited ("Lydex") for a consideration of ZAR204m.
June, 1998	Acquisition of Bissett gold mine from the liquidators of Rea Gold corporation for a consideration of ZAR26m.
July, 1998	The acquisition of Evander Gold Mines Limited for a consideration of ZAR545m.
October, 1999	Acquisition of Kalahari Goldridge Mining Company Limited and West Rand Consolidated Mines Limited for a consideration of ZAR321m.
March, 2000	Acquisition of Randfontein Estates Limited for a consideration of ZAR931m.
April, 2001	Acquisition of the Elandskraal mining operations from AngloGold Limited for a consideration of ZAR1,053m.
April, 2001	Acquisition of New Hampton Goldfields Limited for a consideration of ZAR229m.
September, 2001	Acquisition of 31.8% of the issued share capital of Bendigo Mining NL for a consideration of ZAR292m.
December, 2001 (effective date 3 January 2002)	Acquisition of 50% of the issued share capital of Free Gold which purchased the Free Gold operations and certain other assets for approximately ZAR1,4bn.
April, 2002	Acquisition of Hill 50 Limited for a consideration of ZAR1,419m.
May, 2002	Acquisition of 32.5% of the ordinary share capital of Highland Gold Limited for a consideration of ZAR188m.
October, 2002	Joint acquisition by Free Gold of St. Helena BUs from Gold Fields Limited for a gross sale consideration of ZAR127m.
November, 2002	Harmony lists on the New York Stock Exchange ("NYSE").
November, 2002	Acquisition of 21% of the ordinary share capital of High River Gold Limited for a consideration of ZAR141m.
January, 2003	Randfontein Estates Limited ("Randfontein"), entered into agreement with Africa Vanguard Resources (Pty) Ltd ("AV"), in terms of which Randfontein sold 26% of its mineral rights in respect of Doornkop Mining Area to AV for a purchase consideration of R250m. Randfontein and AV entered into a JV agreement to jointly conduct mining operations at Doornkop.

February, 2003
Harmony announces offer for Abelle Limited ("Abelle") which values Abelle at ZAR689m.
May, 2003
Announcement of merger with ARMgold.
May, 2003
Announcement of an acquisition by Free Gold of 34.5% of the shares of Avmin for a consideration of ZAR844m in which Harmony and ARMgold each have 50%.
August 2003
Shareholder approval of the merger between Harmony and ARMgold for which 64,000,000 Harmony shares were issued to ARMgold, in the ratio of 2 Harmony shares for every 3 ARMgold shares.
August 2003
The arrangements between Randfontein and AV were implemented, and purchase price paid as per the agreement drawn up in January 2003. Gold at UK£2.05 per share valuing the shareholding at ZAR830.0m.
October 2003
Harmony disposed of its 17.0% shareholding in High River Gold at C$1.75 per share valuing the shareholding at ZAR156.7m.
November 2003
Announcement that: Anglovaal Mining Limited ("Avmin") will dispose of its entire 42.2% interest in Avgold to Harmony, Harmony will dispose of its Kalplats platinum discovery and associated mineral rights to Avmin.
November 2003
Harmony announced the sale of its Kalgold Operations to The Afrikander Lease Limited ("Aflease") for a consideration of ZAR275m. In terms of the agreement, Aflease will pay Harmony ZAR137.5m in cash, with the remaining ZAR137.5m being funded with the issue of ordinary shares. The sale will be effective after all legal conditions of the deal have been met, by approximately the end of February 2004. Harmony excluded its Kalplats deposit interests from this transaction.

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Table 2.4 Harmony: Salient Historical Operating Statistics
(1), (2)
Statistic
Units
2001
2002
2003
2004
(3)
Production
Area Mined
(m
2
)
2,027,043
2,286,395
3,301,125
1,690,296
Tonnes Milled
(kt)
17,074
22,934
35,259
16,777
Yield
(g/t)
3.9
3.6
3.6
3.5
Gold Production
(koz)
2,140
2,668
4,040
1,911
Development
(m)
128,625
152,006
207,272
109,746
Productivity
TEC
(No.)
43,448
46,873
58,886

59,451
Centares
(m
2
/TEC/month)
3.9
4.8
4.7
4.7
Milling
(t/TEC/month)
32
41
50
47
Gold Production
(g/TEC/month)
125
147
178
167
Health and Safety
Fatalities
(No.)
26
37
38
21
Fatality Rate
(per mmhrs)
0.28
0.35
0.30
0.28
LTIFR
(per mmhrs)
28
23
25
19
Expenditures
Cash Operating Costs
(ZARm)
3,822
5,215
8,673
4,486
Capital Expenditure
(ZARm)
424
735

773
445
Cost Performance
Cash Operating Costs
(ZAR/t)
224
227
246
267
(ZAR/kg)
57,419
62,853
69,030
75,479
Capital Expenditure
(ZAR/t)
25
32
22
27
(ZAR/kg)
6,370
8,859
6,154
7,486
(1)
TEC and productivity statistics exclude the Canadian operations as TEC figures unavailable.
(2)
Health and Safety statistics for Canadian and Australian Operations for 2001 are unavailable.
(3)
2004 reports actual results to December 2003.

2.3

Overview of the Mining Assets

2.3.1

Target Operations

Target Operations comprise Target Mine, Target North and Extensions and Oribi Exploration Property situated near the town of Allanridge in the Free State Province, South Africa, some 270km southwest of Johannesburg. Located at approximately latitude 28°00'S and longitude 26°30'E on the northern limit of the Welkom Goldfields, the site is accessed via the R30 situated between the towns of Bothaville and Welkom.

The Target Operations area was initially explored through surface drilling in the late 1980s with further exploration being undertaken from a 5.6km long decline, commenced in 1995, driven from 203L at Lorraine No.1 shaft. A positive feasibility study into the development of a 105ktpm operation was produced in May 1998 resulting in the decision to develop Target Mine. A detailed mine design was produced in 2000 and the mine officially opened in May 2002. Upon the closure of Loraine Mine in August 1998 the Lorraine No.1 and No.2 shafts were transferred to Target Mine becoming Target No.1 Shaft and Target No.2 Shaft, respectively.

Mining operations comprise one primary underground mine commissioned in May 2002 making use of information systems and mechanisation, combined with process-driven organisational design that relies on a multi-skilled workforce. The majority of the production is derived from mechanised mining; however conventional stoping is still employed primarily to de-stress areas ahead of the mechanised mining. The mining operations feed one central process facility, namely the Target Gold Plant.

Table 2.5 gives the salient operating statistics and Table 2.6 gives the historical operating statistics for Target Mine from 1 July 2001 through to 31 December 2003, inclusive.

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Table 2.5 Target Operations - Target Mine: Salient Operating Statistics
Maximum
Design
Operating
Production Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
(years)
Business Units
Target Mine
1,500
1,404
17
Long-life
Total Hoisting Capacity
1,500
1,404
17
Long-life
Surface Sources
Processing Plants
Target Gold Plant
1,260
1,285
17
Long-life
Total Processing Capacity
1,260
1,285
17
Long-life
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.
Table 2.6 Target Operations - Target Mine: Salient Historical Operating Statistics
Statistic
Units
2001
2002
2003
2004
(1)
Production
Tonnes Milled

(kt)
492
782
1,068
540
Yield
(g/t)
3.0
6.6
8.6
11.1
Gold Production
(koz)
47
165
294
192
Development
(m)
5,144
6,022
7,431
4,226
Productivity
TEC
(No.)
1,177
1,355
1,119
1,088
Milling
(t/TEC/month)
35
48
31
83
Gold Production
(g/TEC/month)
105
316
262
917
Health and Safety
Fatalities
(No.)
2
0
0
0
Fatality Rate
(per mmhrs)

0.35
0
0
0
LTIFR
(per mmhrs)
9
9
11
6
Expenditures
Cash Operating Costs
(ZARm)
290
523
470
260
Capital Expenditure
(ZARm)
521
102
101
48
Cost Performance
Cash Operating Costs
(ZAR/t)
589
669
440
482
(ZAR/kg)
189,949
98,496
51,327
43,461
Capital Expenditure
(ZAR/t)
1,059
130
94
89
(ZAR/kg)
341,252
19,181
10,982
8,002
(1)
2004 reports six-month actual results to December 2003.
2.3.2
Free Gold Operations

The Free Gold Operations are situated in the Free State Province, South Africa, some 270km southwest of Johannesburg. Located at approximately latitude 28°00'S and longitude 26°30'E, the site is accessed via the national highway N1 between Johannesburg and Bloemfontein.

Exploration, development and production history in the area dates from the early 1940s, leading to commercial production by 1947. Subsequent consolidation and restructuring led to the formation of Free State Consolidated, which in addition to HJ Joel, became a wholly-owned subsidiary of AngloGold Limited ("AngloGold") in June 1998. Free Gold acquired the assets from Anglogold in December 2001 and St. Helena BUs from Goldfields during May 2002.

Mining operations comprise nine underground mining BUs: Tshepong, Phakisa, Bambanani, West, Eland, Sable & Kudu, Nyala, Joel and St. Helena (comprising BUs No.2, No.4, No.8 and No.10). Phakisa is currently a project for which capital is committed and is anticipated to commence in 2004. The mining operations feed four process facilities: FS1 Plant; FS2 Plant; Joel Plant and St. Helena Plant.

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Table 2.7 gives the salient operating statistics and Table 2.8 gives the historical operating statistics for Free Gold Operations from 1 January 2001 through to 31 December 2003, inclusive. Note that 2001 is reported on a calendar year, 2002 comprises six-months to 30 June 2002 and 2003 comprises 12-month actual results to June 2003 and 2004 is reports actual results to 31 December 2003.

Table 2.7 Free Gold Operations: Salient Operating Statistics

Business Unit	**Maximum Design Capacity (ktpa)**	**Operating Capacity (ktpa)**	**Life of Mine (1)**	**Classification**
Production Shafts				
Tshepong BU	2,400	3,026	16	Long-Life
Bambanani BU	2,340	1,835	8	Medium-life
West BU	960	306	4	Short-life
Eland BU	840	385	3	Short-life
Kudu & Sable BU	1,440	247	4	Short-life
Nyala BU	3,360	606	7	Medium-life
Joel North & South BU				

4,200
544
11
Long-Life
Phasika BU
1,800
1,400
19
Long-Life
St. Helena BU
4,020
618
5
Medium-life
Total Hoisting Capacity
21,360
7,079
20
Long-Life
Surface Sources
3,547
4
Short-life
Processing Plants
FS1 Plant - Milling
5,280
5,006
20
Long-Life
FS1 Plant - Leaching
5,280
5,006
20
Long-Life
FS2 Plant - Milling
3,240
3,240
4
Short-life
FS2 Plant - Leaching
3,600
3,600
4
Short-life
Joel Plant - Milling
1,620
1,458
11
Long-Life
Joel Plant - Leaching
1,800

1,458
11
Long-Life
St. Helena Plant - Milling
1,080
34
1
Short-life
St. Helena Plant - Leaching
1,200
1,120
3
Short-life
Total Processing Milling Capacity
11,220
9,561
20
Long-Life
Total Processing Leaching Capacity
11,880
11,007
20
Long-Life
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.
Table 2.8 Free Gold Operations: Salient Historical Operating Statistics
Statistic
Units
2001
2002
2003
2004
(1)
Production
Area Mined
(m
2
)
1,045,758
395,496
964,142
508,968
Tonnes Milled
(kt)
8,479
4,371
9,362
6,997
Yield
(g/t)
4.4

4.0
3.8
4.8
Gold Production
(koz)
1,199
558
1,155
1,085
Development
(m)
41,455
19,324
53,551
29,231
Productivity
TEC
(No.)
20,368
14,722
16,106
17,119
Centares
(m
2
/TEC/month)
4.3
4.5
5.0
5.0
Milling
(t/TEC/month)
35
49
48
68
Gold Production
(g/TEC/month)
153
197
186
329
Health and Safety
Fatalities
(No.)
11
10
6
5
Fatality Rate
(per mmhrs)

0.35
0.24
0.15
0.25
LTIFR
(per mmhrs)
17
15
15
20
Expenditures
Cash Operating Costs
(ZARm)
2,409
883
2,125
2,290
Capital Expenditure
(ZARm)
58
32
63
135
Cost Performance
Cash Operating Costs
(ZAR/t)
284
202
227
327
(ZAR/kg)
64,619
50,879
59,141
67,847
Capital Expenditure
(ZAR/t)
7
7
7
19
(ZAR/kg)
1,555
1,827
1,746
4,010
(1)
2004 reports six-month actual results to December 2003.

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2.3.3
Harmony Free State Operations
The Harmony Free State Operations are situated in the Free State Province, South Africa, some 270km southwest of Johannesburg. Located at approximately latitude 28°10'S and longitude 26°30'E, the site is accessed via the national highway N1 between Johannesburg and Bloemfontein.
Exploration, development and production history in the area dates from the early 1940s. Harmony's Free State Operations commenced with amalgamation of Harmony, Virginia and Merriespruit mining operations. Subsequent acquisitions included: Unisel BU in 1996; Saaiplaas BU in 1997; Brand BUs in 1998 and Masimong in 1998.
Table 2.9 gives the salient operating statistics and Table 2.10 gives the historical operating statistics for Harmony Operations from 1 January 2001 through to 31 December 2003, inclusive. Note that 2003 comprises twelve-month actual results to June 2003 and 2004 reports the actual results to 31 December 2003.
Table 2.9 Harmony Free State Operations: Salient Operating Statistics
Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
Production Shafts Harmony No.2 BU
2,724
550
5
Medium-life
Harmony No.3 BU
1,080
0
0
Not in use
Harmony No.4 BU
1,752
0
0
Not in use
Merriespruit No.1 BU
1,548
597
9
Medium-life
Merriespruit No.3 BU
2,364
826
9
Medium-life

Virginia No.2 BU
1,236
0
0
Not in use
Unisel BU
1,644
751
11
Long-Life
Saaiplaas No.3 BU
2,112
327
10
Long-Life
Brand No.2 BU
1,440
0
0
Not in use
Brand No.3 BU
1,440
461
5
Medium-life
Brand No.5 BU
1,812
0
0
Not in use
Masimong No.4 BU
840
341
10
Long-Life
Masimong No.5 BU
960
946
15
Long-Life
Total Hoisting Capacity
20,952
4,504
15
Long-Life
Surface Sources
2,822
13
Long-Life
Processing Plants Central Plant - Milling
2,160

2,160
11
Long-Life
Central Plant - Leaching
2,880
2,880
11
Long-Life
Virginia Plant - Milling
1,980
1,944
9
Medium-life
Virginia Plant - Leaching
2,160
1,944
9
Medium-life
Saaiplaas Plant - Milling
1,800
1,823
15
Long-Life
Saaiplaas Plant - Leaching
2,640
2,663
15
Long-Life
Total Processing Milling Capacity
5,940
5,927
15
Long-Life
Total Processing Leaching Capacity
7,680
7,487
15
Long-Life
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.

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74
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Table 2.10 Harmony Free State Operations: Salient Historical Operating Statistics

Statistic	**Units**	**2001**	**2002**	**2003**	**2004**
	(1)				
Production					
Area Mined	(m 2)	721,709	738,793	767,555	427,929
Tonnes Milled	(kt)	5,289	4,536	5,338	2,950
Yield	(g/t)	4.0	4.2	3.6	3.5
Gold Production	(koz)	686	612	611	330
Development	(m)	50,027	51,188	53,691	28,047
Productivity					
TEC	(No.)	15,668	12,776	11,178	12,673

Centares
(m
2
/TEC/month)
3.8
4.8
5.7
5.6
Milling
(t/TEC/month)
28
30
40
39
Gold Production
(g/TEC/month)
114
124
142
135
Health and Safety
Fatalities
(No.)
9
8
2
6
Fatality Rate
(per mmhrs)
0.26
0.27
0.07
0.51
LTIFR
(per mmhrs)
35
26
24
21
Expenditures
Cash Operating Costs
(ZARm)
1,385
1,351
1,518
852
Capital Expenditure
(ZARm)
120
95
126

26
Cost Performance
Cash Operating Costs
(ZAR/t)
262
298
284
289
(ZAR/kg)
64,883
70,978
79,875
82,995
Capital Expenditure
(ZAR/t)
23
21
24
9
(ZAR/kg)
5,622
4,991
6,631
2,515
(1)
2004 reports six-month actual results to December 2003.
2.3.4
Welkom Operations
The Welkom Operations are situated in the Free State Province, South Africa, some 270km southwest of Johannesburg. Located at approximately latitude 28°00'S and longitude 26°30'E, the site is accessed via the national highway N1 between Johannesburg and Bloemfontein.
Exploration, development and production history in the area dates from the 1940s leading to commercial production by 1947. Mining operations comprise six underground mining BUs: BU No.1; BU No.2; BU No.3, BU No.4; BU No.6 and BU No.7 which have a combined rock hoisting capacity of 313ktpm. The mining operations process their ore via a toll agreement with Free Gold.
Table 2.11 gives the salient operating statistics and Table 2.12 gives the historical operating statistics for Welkom Operations from 1 January 2001 through to 31 December 2003, inclusive. Note that 2001 is reported on a calendar year, 2002 comprises six months to 30 June 2002 and 2003 comprises 12-month actual results to June 2003 and 2004 reports the actual results to 31 December 2003.
Table 2.11 Welkom Operations: Salient Operating Statistics
Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)

Production Shafts
No.1 BU
816
305
3
Short-life
No.2 BU
648
66
2
Short-life
No.3 BU
660
76
3
Short-life
No.4 BU
660
49
2
Short-life
No.6 BU
816
105
3
Short-life
No.7 BU
816
288
8
Medium-life
Total Hoisting Capacity
4,416
864
8
Medium-life
No Surface Sources
Processing Plants
No operational plant
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.

75
75
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Table 2.12 Welkom Operations: Salient Historical Operating Statistics
Statistic
Units
2001
2002
2003
2004
(1)
Production
Area mined
(m
2
)
73,178
38,065
104,571
58,764
Tonnes Milled
(kt)
340
224
577
315
Yield
(g/t)
5.1
4.9
3.4
3.6
Gold Production
(koz)
56
35
63
36
Development
(2)
(m)
1,296
1,483
5,843
459
Productivity
TEC
(No.)
1,492
1,786
2,348

2,179
Centares
(m
2
/TEC/month)
4.1
3.6
3.7
4.5
Milling
(t/TEC/month)
19
21
20
24
Gold Production
(g/TEC/month)
97
102
69
86
Health and Safety
Fatalities
(No.)
4
1
2
0
Fatality Rate
(per mmhrs)
0.92
0.38
0.35
0
LTIFR
(per mmhrs)
17
10
12
15
Expenditures
Cash Operating Costs
(ZARm)
144
101
203
115
Capital Expenditure
(ZARm)
10
7

30
0
Cost Performance
Cash Operating Costs
(ZAR/t)
425
449
352
366
(ZAR/kg)
82,737
92,093
104,211
102,703
Capital Expenditure
(ZAR/t)
28
33
51
0
(ZAR/kg)
5,444
6,778
15,236
0
(1)
2004 reports actual results to December 2003.
(2)
During 2003 high-speed development team was contracted for a specific development project required to improve ventilation aspects at BU No.1.
2.3.5
West Wits Operations
The West Wits Operations principally comprise Elandsrand BU, Deelkraal BU, Cooke 1 BU, Cooke 2 BU, Cooke 3 BU and Doornkop BU and the non-operational Randfontein No.4 BU. Elandsrand BU and Deelkraal BU are situated in the Gauteng and North West Province, South Africa, some 85km southwest of Johannesburg. Located at approximately latitude 26°00'S and longitude 27°00'E, the site is accessed via the national highway N12 between Johannesburg and Kimberley. Cooke BUs and Doornkop BU are situated in the Gauteng Province, South Africa, some 50km west of Johannesburg. Located at latitude 26°22'S and longitude 27°42'E, the site is accessed via the local R28 highway between Randfontein and Westonaria.
Exploration, development and production history in the West Wits area dates from 1930, leading to large-scale production by the 1940s whilst exploration, development and production history in the Cooke BUs and Doornkop BU areas dates back to 1889.
Table 2.13 gives the salient operating statistics and Table 2.14 gives the historical operating statistics for West Wits Operations from 1 January 2001 through to 31 December 2003, inclusive. Note that 2003 comprises 12-month actual results to June 2003 and 2004 reports the actual results to 31 December 2003.

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Annexure 7
Table 2.13 West Wits Operations: Salient Operating Statistics
Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
Production Shafts
Elandsrand BU
3,972
2,168
20
Long-Life
Deelkraal BU
2,244
837
6
Medium-life
Cooke 1 BU
2,112
672
6
Medium-life
Cooke 2 BU
2,244
853
16
Long-Life
Cooke 3 BU
3,180
1,186
16
Long-Life
Cooke 4 BU
1,788
0
0
Not in use
Doornkop BU
2,400
2,383
19
Long-Life

Total Hoisting Capacity
17,940
6,605
20
Long-Life
Surface Sources
2,250
6
Medium-life
Processing Plants
Elandsrand Plant - Milling
2,280
1,775
20
Long-Life
Elandsrand Plant - Leaching
2,280
1,775
20
Long-Life
Deelkraal Plant - Milling
1,260
720
6
Medium-life
Deelkraal Plant - Leaching
1,260
720
6
Medium-life
Cooke Plant - Milling
3,360
3,173
19
Long-Life
Cooke Plant - Leaching
3,360
3,173
19
Long-Life
Doornkop Plant - Milling
2,400
2,220
2
Short-life
Doornkop Plant - Leaching
2,700
2,220
2
Short-life
Total Processing Milling Capacity

9,300
7,444
20
Long-Life
Total Processing Leaching Capacity
9,600
7,444
20
Long-Life
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.
Table 2.14 West Wits Operations: Salient Historical Operating Statistics
Statistic
Units
2001
2002
2003
2004
(1)
Production
Area Mined
(m
2
)
870,966
946,311
806,649
373,309
Tonnes Milled
(kt)
6,991
8,078
7,862
3,893
Yield
(g/t)
3.8
4.0
3.4
3.1
Gold Production
(koz)
846
1,038
859
394
Development
(m)
47,738
59,155
57,355

35,884
Productivity
TEC
(No.)
17,640
16,907
15,110
14,131
Centares
(m
2
/TEC/month)
4.1
4.7
4.4
4.4
Milling
(t/TEC/month)
33
40
43
46
Gold Production
(g/TEC/month)
124
159
147
144
Health and Safety
Fatalities
(No.)
12
20
20
5
Fatality Rate
(per mmhrs)
0.32
0.47
0.54
0.23
LTIFR
(per mmhrs)
24
23
23
22
Expenditures
Cash Operating Costs
(ZARm)
1,400

1,963
1,869
1,017
Capital Expenditure
(ZARm)
115
262
169
134
Cost Performance
Cash Operating Costs
(ZAR/t)
200
243
238
261
(ZAR/kg)
53,187
60,819
69,973
83,048
Capital Expenditure
(ZAR/t)
16
32
22
34
(ZAR/kg)
4,369
8,117
6,335
10,915
(1)
2004 reports six-month actual results to December 2003.

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Annexure 7
2.3.6
Evander Operations
Evander Operations are situated in the Mpumalanga Province, South Africa, some 120km east- southeast of Johannesburg. Located at latitude 28°28'S and longitude 29°06'E, the site is accessed via the local R29 road between Leandra and Bethel in the vicinity of Kinross.
Exploration, development and production history in the area dates from 1903, leading to full-scale production by 1955. Evander Operations originally comprised Kinross, Bracken, Leslie and Winkelhaak that were merged in 1996 due to declining Mineral Reserves. In August 1998, Harmony acquired Evander as a wholly-owned subsidiary.
Table 2.15 gives the salient operating statistics and Table 2.16 gives the historical operating statistics for Evander Operations from 1 January 2001 through to 31 December 2003 inclusive. Note that 2003 comprises 12-month actual results to June 2003 and 2004 reports the actual results to 31 December 2003.
Table 2.15 Evander Operations: Salient Operating Statistics
Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
Production Shafts
Evander No.2 BU
828
615
10
Long-Life
Evander No.3 BU
240
0
0
Not in use
Evander No.5 BU
1,128
332
10
Long-Life
Evander No.7 BU
1,272
602
11
Long-Life
Evander No.8 BU
1,764
824
15

Long-Life
Evander No.9 BU
996
235
4
Short-life
Total Hoisting Capacity
6,228
2,545
15
Long-Life
Surface Sources
237
9
Medium-life
Processing Plants
Kinross Plant - Milling
1,920
1,576
15
Long-Life
Kinross Plant - Leaching
2,400
2,428
15
Long-Life
Winkelhaak Plant - Milling
816
852
10
Long-Life
Winkelhaak Plant - Leaching
0
0
0
Not in use
Total Processing Milling Capacity
2,736
2,428
15
Long-Life
Total Processing Leaching Capacity
2,400
2,428
15
Long-Life
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.
Table 2.16 Evander Operations: Salient Historical Operating Statistics
Statistic
Units

2001
2002
2003
2004
(1)
Production Area Mined
(m
2
)
434,368
403,543
350,391
183,029
Tonnes Milled
(kt)
2,481
2,352
2,127
1,113
Yield
(g/t)
5.7
5.5
5.3
5.3
Gold Production
(koz)
458
415
360
188
Development
(m)
30,861
32,002
28,435
14,074
Productivity
TEC
(No.)
8,805
8,639
6,906
7,203
Centares
(m
2
/TEC/month)
4.1
3.9
4.2

4.2
Milling
(t/TEC/month)
23
23
26
26
Gold Production
(g/TEC/month)
135
125
135
135
Health and Safety
Fatalities
(No.)
5
6
4
3
Fatality Rate
(per mmhrs)
0.27
0.33
0.23
0.41
LTIFR
(per mmhrs)
22
24
34
30
Expenditures
Cash Operating Costs
(ZARm)
693
723
796
441
Capital Expenditure
(ZARm)
69
98
98
49
Cost Performance
Cash Operating Costs
(ZAR/t)
279
307
374

396
(ZAR/kg)
48,628
55,960
71,006
75,433
Capital Expenditure
(ZAR/t)
28
42
46
44
(ZAR/kg)
4,842
7,585
8,776
8,405
(1)
2004 reports six-month actual results to December 2003.

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Annexure 7
2.3.7
Orkney Operations
The Orkney Operations are situated in North West Province, South Africa, some 175km south-west of Johannesburg. Located at approximately latitude 26°30'S and longitude 26°45'E, the site is accessed via the national highway N12 between Johannesburg and Kimberley.
Exploration, development and production history in the area dates from 1886 and following dormant periods, large-scale production commenced during the 1940s with the formation of Vaal Reefs Gold Mining and Exploration Company Limited ("Vaal Reefs") in 1944.
Mining operations comprise six underground mining BUs: BU No.1, BU No.2, BU No.3, BU No.4, BU No.6 and BU No.7. BU No.1 will shortly become non-operational and BU No.5 has been closed. The mining operations process their ore via a toll agreement with Vaal River Operations ("VRO") belonging to AngloGold.
Table 2.17 gives the salient operating statistics and Table 2.18 gives the historical operating statistics for Orkney Operations from 1 January 2001 through to 31 December 2003, inclusive. Note that 2001 is reported on a calendar year basis, 2002 comprises six-months to 30 June 2002 and 2003 comprises 12-month actual results to June 2003 and 2004 is reported as the actual results to 31 December 2003.
Table 2.17 Orkney Operations: Salient Operating Statistics
Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
Production Shafts No.1 BU
1,644
0
0
Not in use
No.2 BU
1,704
468
3
Short-life
No.3 BU
1,560
279
4
Short-life
No.4 BU
1,920
443
5
Medium-life
No.5 BU

1,320
0
0
Not in use
No.6 BU
1,620
218
8
Medium-life
No.7 BU
1,620
108
8
Medium-life
Total Hoisting Capacity
11,388
1,484
8
Medium-life
No Surface Sources
Processing Plants No operational plant
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.
Table 2.18 Orkney Operations: Salient Historical Operating Statistics
Statistic
Units
2001
2002
2003
2004
(1)
Production
Area Mined
(m
2
)
348,345
164,939
307,817
138,297
Tonnes Milled
(kt)
2,060
942
1,761
783
Yield
(g/t)
7.1
7.6
7.2

6.4
Gold Production
(koz)
468
232
408
161
Development
(m)
6,944
2,628
4,398
2,053
Productivity
TEC
(No.)
6,579
6,174
5,854
4,696
Centares
(m
2
/TEC/month)
4.4
2.2
4.4
4.9
Milling
(t/TEC/month)
26
13
25
28
Gold Production
(g/TEC/month)
184
97
180
178
Health and Safety
Fatalities
(No.)
10
7
4
2
Fatality Rate
(per mmhrs)
0.56
0.48

0.48
0.45
LTIFR
(per mmhrs)
28
24
24
15
Expenditures
Cash Operating Costs
(ZARm)
730
407
788
345
Capital Expenditure
(ZARm)
30
23
6
4
Cost Performance
Cash Operating Costs
(ZAR/t)
355
432
447
440
(ZAR/kg)
50,195
56,450
62,125
68,827
Capital Expenditure
(ZAR/t)
15
24
4
5
(ZAR/kg)
2,076
3,152
490
856
(1)
2004 reports six-month actual results to December 2003.

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Annexure 7

2.3.8

Kalgold Operation

Kalgold Operation is currently subject to sale as described in more detail within the circular. Until such time as the sale agreement has become unconditionally effective, the asset still forms part of Harmony. As at the base valuation date of 31 December 2003, Kalgold was still contributing to the equity value of Harmony as reported in Section 14. Notwithstanding this statement, the valuation as reported in Section 14 considers the combined Mining Asset valuation with and without Kalgold.

The Kalgold Operation is situated some 50km southwest of Mafikeng in the North West Province, South Africa, some 300km west of Johannesburg. Located at latitude 26°10'S and longitude 26°14'E, the site is accessed via the local R49 road between Mafikeng and Vryburg.

The gold deposits at Kalgold were discovered by Shell South Africa (Pty) Limited ("Shell") in 1991 following an exploration programme focused on the poorly exposed Archaean Greenstone belts of the Kraaipan Group, which occur in the area. In 1995 a feasibility study was conducted by West Rand Consolidated Mines Limited ("WRCM") who acquired the mineral and surface rights leading to the development of an open pit operation in July 1996. Harmony acquired Kalgold in July 1999.

Table 2.19 gives the salient operating statistics and Table 2.20 gives the historical operating statistics for Kalgold Operations from 1 January 2001 through to 31 December 2003, inclusive. Note that 2003 comprises 12-month actual results to June 2003 and 2004 reports the actual results to 31 December 2003.

Table 2.19 Kalgold Operation: Salient Operating Statistics

Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
Business Units Processing Operations
1,620
1,572
4
Short-life

(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.

Table 2.20 Kalgold Operation
(1)
: Salient Historical Operating Statistics

Statistic
Units
2001
2002
2003
2004
(2)

Production
Waste Tonnes Mined
(kt)
8,542
7,323
7,711
4,763
Tonnes Milled
(kt)
959
961
1,084
694
Yield
(g/t)
1.6
2.0
2.1
2.0
Gold Production
(koz)
49
62
75
46
Stripping Ratio
(t
waste:
t
ore
)
8.9
7.6
7.1
6.9
Productivity
TEC
(No.)
453
444
501
533
Milling
(t/TEC/month)
176
180
180
217
Gold Production
(g/TEC/month)
282

363
386
445
Health and Safety
Fatalities
(No.)
0
0
0
0
Fatality Rate
(per mmhrs)
0.00
0.00
0.00
0.00
LTIFR
(per mmhrs)
7
13
4
9
Expenditures
Cash Operating Costs
(ZARm)
98
130
150
99
Capital Expenditure
(ZARm)
33
25
39
1.8
Cost Performance
Cash Operating Costs
(ZAR/t)
102
135
138
143
(ZAR/kg)
63,844
67,218
64,583
69,845
Capital Expenditure
(ZAR/t)
34
26

36
3
(ZAR/kg)
21,498
12,927
16,785
1,232
(1)
The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.
(2)
2004 reports six-month actual results to December 2003.

80
80
Annexure 7
2.3.9
Harmony Australian Operations
The two main operating groups of Harmony Australia are the Mt. Magnet & Cue Operations and the South Kalgoorlie Operations. Mt. Magnet & Cue Operations are situated in the Murchison region, Western Australia whilst the South Kalgoorlie operations are located as part of the Eastern Goldfields near the town of Kalgoorlie. Mt. Magnet Operation comprises a number of open pits and decline operations at Morning Star and Hill 50 and the processing of surface stockpiles. The Cue Operation comprises a number of open pits at Big Bell, Cuddingwarra, Golden Crown and Tuckabianna. The Big Bell underground operation was recently closed. The South Kalgoorlie operations comprise the Jubilee and New Celebration facilities, the Mt. Marion mine comprises an underground and open pit operations. Exploration, development and production history at Mt. Magnet & Cue and South Kalgoorlie areas dates from 1896 and 1937, respectively. Mining at Mt. Magnet began with the discovery of gold in 1896 and up to 30 June 2002 some 5Moz has been produced. Gold mining at Big Bell in the Cue area commenced in 1937 but closed between 1955 and 1989 and up until 30 June 2002 gold sales exceeded 2Moz. Mining at South Kalgoorlie substantively commenced in 1987 and up until 30 June 2002 gold production of some 2Moz has been realised.
Table 2.21 gives the salient operating statistics and Table 2.22 gives the historical operating statistics for Harmony Australia Operations from 1 January 2001 through to 31 December 2003 inclusive. Note 2003 comprises 12-month actual results to June 2003 and 2004 reports the actual results to 31 December 2003.
Table 2.21 Harmony Australian Operations: Salient Operating Statistics
Maximum
Design
Operating
Business Unit
Capacity
Capacity
(1)
Life
Classification
(ktpa)
(ktpa)
Business Units
Mount Magnet & Cue Plant
5,940
2,496
7.3
Medium-life
Jubilee Plant
1,320
1,176
3.0
Short-life
New Celebration Plant
1,656
504
0.3
Short-life
Total
8,916
4,176

7.3
Medium-life
(1)
Maximum Operating Capacity represents the maximum planned annual throughput for the LoM period.
Table 2.22 Harmony Australian Operations: Salient Historical Operating Statistics

Statistic	**Units**	**2001**	**2002**	**2003**	**2004**
(1)					
Production					
Tonnes Milled	(kt)	1,088	4,782	7,148	2,545
Yield	(g/t)	1.6	1.6	2.2	2.4
Gold Production	(koz)	56	253	510	193
Productivity					
TEC	(No.)	882	882	882	917
Milling	(t/TEC/month)	103	452	675	463
Gold Production	(g/TEC/month)	164	743	1,498	1,092

Health and Safety
Fatalities
(No.)
0
0
0
0
Fatality Rate
(per mmhrs)
0.00
0.00
0.00
0.00
LTIFR
(per mmhrs)
na
15
2
15
Expenditures Cash Operating Costs
(ZARm)
135
608
1,226
431
Capital Expenditure
(ZARm)
18
233
242
95
Cost Performance
Cash Operating Costs
(ZAR/t)
124
127
171
169
(ZAR/kg)
77,990
77,265
77,311
71,643
Capital Expenditure
(ZAR/t)
17
49
34
37
(ZAR/kg)
10,399

29,610
15,274
15,798
(1)
2004 reports six-month actual results to December 2003.

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81
Annexure 7
2.3.10 Harmony Canadian Operations
Harmony's Canadian Operations comprise the Bisset gold mine located near Bisset in the Manitoba Province, Canada. Mining activities were suspended in the second quarter of 2002 for economic reasons. The first mining at Bisset commenced in 1932 and continued until operations were ceased in June 1998 following the liquidation of the Bisset Gold Mine Company. Bisset had sold some 1.3Moz up until June 1995.
Table 2.23 gives the historical operating statistics for Harmony Canadian Operations from 1 July 2001 through to 31 December 2003, inclusive. For 2003, there was no production due to suspension of mining operations in the previous year.
Table 2.23 Harmony Canadian Operations: Salient Historical Operating Statistics
Statistic
Units
2001
2002
2003
2004
Production
Tonnes Milled
(kt)
266
39
na
na
Yield
(g/t)
5.2
6.6
na
Gold Production
(koz)
44
8
na
Productivity
TEC
(No.)
na
na
na
na
Milling
(t/TEC/month)
na
na
na
na
Gold Production
(g/TEC/month)
na

na
na
na
Health and Safety
Fatalities
(No.)
0
0
na
na
Fatality Rate
(per mmhrs)
0.00
0.00
na
na
LTIFR
(per mmhrs)
37
32
na
na
Expenditures
Cash Operating Costs
(ZARm)
111
9
na
na
Capital Expenditure
(ZARm)
49
-10
na
na
Cost Performance
Cash Operating Costs
(ZAR/t)
417
231
na
na
(ZAR/kg)
80,552
35,019
na
na
Capital Expenditure
(ZAR/t)
184
-256

na
na
(ZAR/kg)
35,559
-38,911
na
na

2.4

Significant Exploration Properties

2.4.1

Avgold

The Target North Project considers options to exploit the Sun South area comprising the Paradise, Siberia and Mariasdal blocks of ground located immediately north of the Eldorado block of the existing Target Mine. From the south, the Blast Fault separates the Eldorado and Paradise blocks whilst the Siberia Fault separates the Paradise and Siberia blocks. The Mariasdal block adjoins the Siberia block and is bounded to the north by the Mariasdal Fault. The Sun South area comprises an extension of the Elsburg and Dreyerskuil reefs mined at Target Mine. Mineral Resources (Table 4.9 in Section 4) have been identified, of which 60% are classed as Inferred. High-level pre-feasibility/scoping studies have been completed by Avgold that consider three options for possible future development:

.

a "greenfields" development comprising a newly developed two shaft system to exploit all the blocks;

.

the "brownfields" development comprising an initial twin shaft system sunk to 2,500m below surface adjacent to the Target Mine ground handling infrastructure at 282L, a third "North Shaft" to be sunk to 2,500m below surface located towards the north of the Siberia block. The twin shaft system would exploit the Paradise block and certain material of the Siberia block whilst the North Shaft would be used to exploit the remainder of the Siberia block and the Mariasdal block. Ground between 2,500m and 3,000m would be accessed by vehicle ramps; and

.

the "brownfields" development comprising an initial single shaft sunk to 2,500m below surface, adjacent to the Target Mine ground handling infrastructure at 282L (South Shaft) and a subsequent North Shaft located towards the north of the Siberia block. The South Shaft would cater for men, material, ventilation and limited rock handling facilities. These shafts, together with access ramps for ground between 2,500m and 3,000m, would be used to exploit the blocks of the Sun South area.

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Annexure 7

High-level indicative cash flows derived negative NPVs for the first two options; however the third option did realise a positive NPV. For Option 3, the first phase of the two-shaft system would utilise the existing ground handling facilities of Target Mine to recover 120ktpm of high-grade ore whilst 40 ktpm of low-grade material would be hoisted directly by the South Shaft, resulting in overall production of some 160ktpm. Mining would be concentrated on material above 2,500m from the Target workings and the Paradise block. Phase 2 would focus on development into the Paradise and Siberia blocks and expand production to some 220ktpm. The final third phase would introduce the North Shaft for the provision of men, material and ventilation to the northern blocks maintaining production at some 220ktpm.

Installing the initial single shaft for Phase 1 is estimated, by Avgold, to cost ZAR0.9billion, a further ZAR1.5 billion is estimated for the expanded infrastructure to cater for a 220ktpm operation of Phase 2 and an additional ZAR4billion for Phase 3. A feasibility study will commence during 2004 to further define the technical and economic parameters of the project to ascertain the NPV prior to making any capital commitments.

Until such time as the appropriate level of technical detail has been completed no Mineral Reserves and associated DCF valuation can be applied and as such only reports Mineral Resources.

2.4.2

Harmony

Harmony has three significant exploration properties: namely Poplar, Rolspruit and Kalplats.

The **Poplar Project** considers the green-fields development through installation of a twin shaft system to some 1,200m below surface to access ore some 20km from the existing Evander Operations. Mineral Resources have been estimated and the project is currently the focus of a pre-feasibility study.

The **Rolspruit Project** considers the exploitation of deeper resources of the Kimberley Reef adjacent to the No.8 BU at Evander Operations. Harmony has recently (March 2003) completed a feasibility study, which assesses two distinct options:

.

green-fields option:

the installation of a twin shaft system from surface; and

.

brown-fields option:

the installation of a twin sub-vertical shaft system at No.8 BU.

Given the high capital expenditure requirements and long lead-time to full production, current focus is on improving project economic performance.

The **Kalplats Project** is situated some 90km southwest of Mafikeng in the North West Province, South Africa, some 340km west of Johannesburg. The project is located some 40km to the west of the Kalgold Operation and accessed via the local R49 road between Mafikeng and Vryburg.

Kalplats is a platinum group metal ("PGM") prospect that was discovered during the course of gold prospecting in the Kraaipan greenstone belt in 2000. Mineralisation is contained in some seven separate ore zones with strike lengths between 500m to 1,000m and widths between 15m and 45m. Exploration has been completed and comprised a combination of Rotary Air Blast, Reverse Circulation and Diamond Drilling and a Pre-feasibility Study was completed in July 2002.

The Pre-feasibility Study concluded that the future viability of commissioning a mining operation at Kalplats depended on selectively mining the higher-grade reef zones. A Feasibility Study was commissioned in 2003 and work included the excavation of a 500t bulk sample for metallurgical testing of anticipated flotation recoveries and concentrate grades. Harmony is currently commissioning a Feasibility Study in order to assess the potential development of an open pit mining operation.

2.5

Mining Authorisations and Mining Leases

SRK has not reviewed the various agreements relating to mineral rights, authorisations and leases from a legal perspective and has consequently relied on advice by the Companies to the effect that the Companies are entitled to

mine all material falling within their respective mineral rights and/or mining rights and that all the necessary statutory mining authorisations are lawfully in place.

Notwithstanding this statement, SRK has been provided with sufficient documentation and a supporting letter confirming that following the completion of a recent and comprehensive internal audit all mineral rights, mynpatchen, claims and mining leases being in respect of said mining leases have been duly validated and verified by the individuals as identified in Section 1 and employed by Harmony's legal services.

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2.5.1

South African Law: Current Status

Ownership of mineral rights and statutory mining rights in South Africa may be affected through the common law or by statute. Under the common law, mineral rights vest with the owner of the land. The common law recognises the principal that mineral rights may be severed from title to land, rendering it possible for the surface rights, the rights to precious metals and the rights to base minerals to be owned by different persons.

Earlier mining legislation, which has since been repealed, granted, by way of mining leases, statutory rights to mine for precious metals. Despite the repeal of this earlier legislation, mining leases continue to be valid under the terms of the Minerals Act (Act 50 of 1991) (the "Act"). Registration of title to mineral rights ensures that real rights are constituted in and to the minerals concerned. Upon registration, those rights (either common law mineral rights or statutory mining rights) become effective against third parties. Registered title may be obtained in a number of ways. For example, where mineral right ownership has been separated from land ownership, registered title to the common law mineral rights is obtained by the registration of such ownership in the Deeds Registry Office. Alternatively, where a person has acquired statutory mining rights pursuant to a mining lease, registered title to the statutory mining rights is effected after receipt of the necessary consent from the Minister of Minerals and Energy and by registration of those rights in the Mining Titles Office.

The Act currently governs prospecting and mining activities in South Africa. The Act provides that statutory mining rights supersede common law mineral rights. Thus, pursuant to the Act, the holders of statutory mining rights are deemed to be the common law holders of the mineral rights.

2.5.2

South African Law: The Minerals and Petroleum Resources Development Act

The Minerals and Petroleum Resources Development Act (Act 28 of 2002) was promulgated by the South African Parliament during July 2002 as the Minerals Act (the "Minerals Act"). The Minerals Act sets out to "make provision for the equitable access and sustainable development of the nation's mineral and petroleum resources" by bringing the country's mining law up to internationally accepted standards. It is also expected to provide many opportunities for recognised empowerment exploration and mining companies.

The legislation will enforce the "use it or lose it" principle of mineral exploration and development. In platinum, in particular, it unlocks stagnant areas currently owned by private owners of mineral rights unwilling or unable to bring them to account and by mining companies wishing to hold reserves and resources for the next 30 years and longer. Government's view is that in order to redress the wrongs of the past, it needs to promote industry to provide employment and to generate revenue for the country-wide Reconstruction and Development Initiative.

The Minerals Act seeks to address the issue of Historically Disadvantaged South Africans ("HDSA") ownership. The South African Government's Mining Charter embodies the policy of facilitating the transfer of ownership within the South African mining industry to HDSA within the next 10 years. All stakeholders have agreed a target of 26% empowerment status to be achieved in a transparent manner and at fair market value.

The Mining Charter also aspires to achieve employment equity and targets of at least 40% HDSA participation in management within five years, with 10% being participation by women.

2.5.3

South African Law: Prospecting Permits

Prospecting is governed by the Act and is defined as "intentionally searching for any mineral by means which disturb the surface of the earth, including the portion under the sea or under other water or of any tailings, by means of excavation or drilling necessary for that purpose".

Section 5(2) states that no person may prospect or mine without the necessary authorisations. This requirement departs from the common law principles governing ownership of minerals and restricts the right of owners to prospect and exploit mineral resources that fall within their ownership. It is a requirement that the applicant for a prospecting permit be the holder of the mineral right or has acquired the written consent of the mineral right holder to prospect for his own account. The prospector may not remove or dispose of any mineral found during prospecting operations unless the Director of Mineral Development has given permission for such removal. Under the Act the Director of

Mineral Development has the power to issue prospecting permits. A prospecting application must be submitted and be accompanied by proof of right to the minerals, details about the manner in which the applicant intends to prospect and rehabilitate disturbances of the surface which may be caused by the intended prospecting operations and particulars concerning the applicant's ability to make the necessary provision to rehabilitate disturbances of the surface which may be caused by the intended prospecting operations.

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The details of the manner in which the applicant intends to rehabilitate disturbances of the surface are to be submitted in the form of an environmental management programme ("EMP") for approval by the Director of Minerals Development. Such approval is in addition to the approval of the prospecting permit and no prospecting operation may commence without approval of the EMP.

A prospecting permit is issued for a period of 12 months but may be granted for longer should it be so determined by the Director of Minerals Development and can be renewed. The Act restricts and prohibits prospecting on certain lands including National Parks, townships or urban areas, land comprising public roads, a railway or cemetery and land that has been reserved for public purposes.

2.5.4

South African Law: Mining Authorisations

Under the Act, no person or mining entity may mine for minerals without being granted a mining authorisation, either temporary or permanent. Prior to granting a mining authorisation, two requirements must be fulfilled. Firstly, the mining entity must either be the registered holder of the mineral rights or have obtained the written consent of the registered holder of the mineral rights to mine the minerals concerned, for its own account. Secondly, the Department of Minerals and Energy must be satisfied with the scale, manner and duration of the intended mining operations and must approve an Environmental Management Programme Report ("EMPR").

The Act provides for two forms of permanent mining authorisations, namely mining permits and mining licences. A mining permit is issued where the minerals occur in limited quantities or will be mined on a limited scale and on a temporary basis. A mining licence is issued where the minerals occur in more than limited quantities or will be mined on a larger than limited scale and for a period longer than two years.

The Act allows a temporary mining authorisation to be issued either to ensure the continuation of existing operations or to accommodate circumstances where approval of an EMPR is outstanding. Temporary mining authorisations are generally issued for limited periods but are renewable until the EMPR has been approved.

2.5.5

South African Law: The Royalty Bill

On 10 March 2003, the Royalty Bill was released for public comment. The Royalty Bill is currently being revised and the date of release of the revised version is unknown.

The Royalty Bill proposes to impose a 3%, 4% and 8% revenue-based royalty on the South African gold mining sector, platinum sector and diamond sector respectively, payable to the South African Government. Under the terms of the Royalty Bill released for comment, the royalty is to take effect when companies convert to New Order Mining Rights in accordance with the New Minerals Act, although the Minister has indicated that the royalty is not expected to take effect until the transitional period for the conversion of mining rights under the New Minerals Act expires. If adopted, the Royalty Bill may have an impact on the operating results (technical) and will have a negative impact on the financial performance, hence valuation of the Mining Assets.

2.5.6

Australian Law

In Australia, with few exceptions, all onshore mineral rights are reserved to the government of the relevant state or territory. Exploration for and mining of minerals is regulated by the mining legislation of that state or territory and controlled by the relevant state or territory department. Where native title has not been extinguished, native title legislation may apply to the grant of tenure and some subsequent administrative processes. Heritage legislation may operate to preclude or regulate the disturbance of a particular area. In most Australian states, if the holder of an exploration license establishes indications of an economic mineral deposit and expends a minimum level of investment, it may apply for a mining lease which gives the holder exclusive mining rights with respect to all minerals on the property. It is possible for one person to own the surface of the property and for another to own the mineral rights. The maximum initial term of a mining lease is 21 years and the holder has the right to renew the lease for a further period of 21 years. Subsequent renewals are subject to the minister's discretion and the lease can only be assigned with the consent of the relevant minister. Royalties are payable as specified in the relevant legislation in each state or territory. A general-purpose lease may also be granted for one or more of a number of permitted purposes.

These purposes include erecting, placing and operating machinery in connection with mining operations, depositing or treating minerals or tailings and using the land for any other specified purpose directly connected with mining operations.

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2.5.7
Avgold: Current Status
Avgold classifies their land holding position into three main categories: existing mining authorisation; contiguous mineral rights for which extensions may be applied; and all non-contiguous mineral rights. On approval of areas currently under consideration for extension Avgold will have mining authorisations totalling 4,151Ha.
Details relating to the EMPR status as required by section 39(1) of the Minerals Act are also included in Section 11 of this CPR.
Table 2.24 Avgold: Land Holdings
Existing Mining
Extension
Contiguous
Non-Contiguous
Mining Area
Authorisation
Application
Mineral Rights
Mineral Rights
(Ha)
(Ha)
(Ha)
(Ha)
Target
4,151
Sun - Target North
23,200
Oribi
3,251
Total
4,151
23,200
3,251
2.5.8
Harmony: Current Status
Harmony currently classifies their land holding position into four main categories: existing mining authorisation; area for which extensions have been applied; all contiguous mineral rights; and all non- contiguous mineral rights. On approval of areas currently under consideration for extension Harmony will have mining authorisations totalling 122,615Ha.
Being effectively lease bound, Harmony's South African mining operations do not include any significant mineral rights external to the current lease areas.
Details relating to the EMPR status as required by section 39(1) of the Minerals Act are also included in Section 11 of this CPR.
Table 2.25 Harmony: South African Operations Land Holdings
Existing Mining
Extension
Contiguous
Non-Contiguous
Tax Entity
Authorisation

Application				
Mineral Rights	**Mineral Rights**	**(Ha)**	**(Ha)**	**(Ha)**
Free Gold including Joel	21,204	9,162	4,877	24,484
Harmony Free State	22,583	1,815	3,256	4,094
Welkom	5,511	0	0	0
Randfontein	24,266	0	3,006	572
Evander	(1)	36,898	2,262	2,837
Orkney Operations	9,317	0	0	0
Harmony Free State	22,583	1,815	3,256	4,094
Kalgold	(2)	615	3,810	0
Total	**142,977**			

18,864
17,232
34,706
(1)
Evander excludes prospecting rights granted of 162,237Ha.
(2)
Kalgold is currently the subject of a sale agreement.
Harmony Australian Operations control exploration and mineral rights over a total area of 298,355Ha, of which the active mining areas currently total 75,516Ha.
In Australia, most mineral rights belong to the government and mining companies must pay royalties to the government based on production. There are, however, limited areas where the government granted freehold estates without reserving mineral rights. Harmony has freehold ownership of its Jubilee mining areas, but the other mineral rights in Harmony Australian Operations belong to the Australian Government and are subject to royalty payments. In addition, current Australian law generally requires native title approval to be obtained before a mining license can be granted and mining operations can commence. Harmony Australian Operations have approved mining leases for most of their Mineral Reserves, including all Mineral Reserves that are currently being mined and Mt. Magnet & Cue Operations, which have an approved mining license for the current development area. If Harmony Australia Operations expand into additional areas under exploration, these operations would need to convert the relevant exploration licenses prior to commencing mining and that process could require native title approval. There can be no assurance that any approval would be received.

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Table 2.26 Harmony: Australian Operations Land Holdings
(1)
Mt.Magnet &
Sth.
Regulatory Area
Units
Totals
Cue
Kalgoorlie
Other
Western Australia
Mining Lease
Active Permits
(1)
Areas/Blocks
(No.)
65,577
38,199
27,379
0
Total Area
(Ha)
655
382
274
0
Pending Permits
Areas/Blocks
(No.)
54,951
17,114
37,837
0
Total Area
(Ha)
550
171
378
0
Prospecting Licence
Active Permits
Areas/Blocks
(No.))
16,664
8,096
8,568
0
Total Area

(Ha)
167
81
86
0
Pending Permits
Areas/Blocks
(No.)
9,285
2,578
5,138
1,569
Total Area
(Ha)
93
26
51
16
Exploration Licence
Active Permits
Areas/Blocks
(No.)
311
127
185
0
Total Area
(Ha)
870
372
498
0
Pending Permits
Areas/Blocks
(No.)
454
198
218
38
Total Area
(Ha)
1,264
566
589
109
Miscellaneous Licence
Active Permits
Areas/Blocks
(No.)
6,848
532

6,316
0
Total Area
(Ha)
68
5
63
0
Pending Permits
Areas/Blocks
(No.)
177
97
80
0
Total Area
(Ha)
56
1
55
0
General Purpose Lease
Active Permits
Areas/Blocks
(No.)
936
936
0
0
Total Area
(Ha)
9
9
0
0
Pending Permits
Areas/Blocks
(No.)
0
0
0
0
Total Area
(Ha)
0
0
0
0
Special Lease
Active Permits
Areas/Blocks

(No.)
2,226
0
2,226
0
Total Area
(Ha)
22
0
22
0
Pending Permits
Areas/Blocks
(No.)
0
0
0
0
Total Area
(Ha)
0
0
0
0
(1)
The Mineral Reserves supporting the valuation reported in Section 14 are contained within the Active Permits and are valid for the LoM period.

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Figure 2.1 Mining Assets: General Location Map

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Figure 2.2 Avgold: Location Map and Lease Area for Target Operations

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Figure 2.3 Harmony: Location Map and Lease Area Harmony Free Gold Operations, Free State Operations and

Welkom Operations

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Figure 2.4 Harmony: Location Map and Lease Area for Evander Operations

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Figure 2.5 Harmony: Location Map and Lease Area for Orkney Operations

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Figure 2.6 Harmony: Location Map and Lease Area for West Wits Operations, Elandsrand and Deelkraal

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Figure 2.7 Harmony: Location Map and Lease Area for West Wits Operations, Randfontein Estates

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3.

GEOLOGY

3.1

Introduction

This section describes the geology of the Mining Assets. The nature and geometry of the orebodies being or planned to be mined, their structural complexity and the variability of grades is also discussed. In addition to this, a brief description of the geological potential is presented.

3.2

South African Goldfields

Witwatersrand Basin Geology: Witwatersrand Basin operations are mostly deep-level underground mines exploiting gold bearing, shallow dipping tabular bodies, which have collectively produced over 50kt (1,608Moz) of gold over a period of more than 100 years.

The Witwatersrand Basin comprises a 6km vertical thickness of argillaceous and arenaceous sedimentary rocks situated within the Kaapvaal Craton, extending laterally for some 300km east-northeast and 150km south-southeast. The sedimentary rocks generally dip at shallow angles towards the centre of the basin though locally this may vary. The basin sediments outcrop to the south of Johannesburg but further to the west, south and east these are overlain by up to 4km of Archaean, Proterozoic and Mesozoic volcanic and sedimentary rocks. The Witwatersrand Basin sediments themselves are considered to be between 2,700 and 3,100 million years old.

Gold mineralisation in the Witwatersrand Basin occurs within laterally extensive quartz pebble conglomerate horizons, termed reefs. These occur within seven separate goldfields located along the eastern, northern and western margins of the basin. These goldfields are known as the Evander Goldfield, the East Rand Goldfield, the Central Rand Goldfield, the West Rand Goldfield, the Far West Rand Goldfield, the Klerksdorp Goldfield and the Free State Goldfield. As a result of faulting and other primary controls on mineralisation, the goldfields are not continuous and are characterised by the presence or dominance of different reef units. The reefs are generally less than 2m in thickness and are widely considered to represent laterally extensive braided fluvial deposits or unconfined flow deposits, which formed along the flanks of alluvial fan systems that developed around the edge of what was effectively an inland sea.

All major reef units are developed above unconformity surfaces. The extent of unconformity is typically greatest near the basin margin and decreases toward more distal areas. Complex patterns of syn-depositional faulting have caused complex variations in sediment thickness within the basin. Sub-vertical to over-folded reef structures is a characteristic of basin margin features within certain areas.

Most early theories believed the gold to be deposited syngenetically with the conglomerates, but recent research has confirmed that the Witwatersrand Basin has been subject to metamorphism and that some post- depositional redistribution of gold has occurred. Other experts regard the gold to be totally epigenetic and to have been deposited solely by hydrothermal fluids some time after deposition of the reef sediments.

Despite these varied viewpoints, the most fundamental control to the gold distribution remains the association with quartz-pebble conglomerates on intra-basinal unconformities. The reefs are extremely continuous, as a consequence of the regional nature of the erosional surfaces. Bedrock (footwall) controls have been established governing the distribution of many of the reefs. Preferential reef development within channel systems and sedimentary features such as facies variations and channel frequency assist in mapping out local gold distributions. In all cases the grade of the orebodies varies above and below the pay limit. Consequently, the identification and modeling of erosional/sedimentary features is the key to in-situ resource estimation.

3.2.1

Free State Goldfield

The Free State Goldfield lies some 270km southwest of Johannesburg on the southwest rim of the Witwatersrand Basin. Exploration within the Free State Goldfield dates from the mid-1940s when values within the Basal Reef, the predominant economic reef in the district, were intersected.

Structurally, the Free State Goldfield lies within a north-south trending syncline forming an apex in the southwestern corner of the Witwatersrand Basin. The northerly plunging syncline is roughly divided by two major faults into three major blocks: the Odendaalsrus section to the west of the De Bron fault, the Central Horst, between the De Bron and Homestead faults and the Virginia Section east of the Homestead Fault. The Central Horst was uplifted and the Central Rand Group rocks eroded away prior to Ventersdorp time.

The Central Rand Group in the Free State comprises some 2,000m of sedimentary sequences deposited over successive unconformity surfaces in an expanding depositional area. The lack of major faulting and folding of Central Rand Group age has led to the conclusion that subtle tectonic warping of the basin with granite doming on the margins controlled deposition.

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The auriferous horizons are most typically conglomeratic units deposited at the base of each depositional sequence, although they may also occur as scours within a given formation. The principal reefs mined in the Free State are the Basal Reef, the Saaiplaas Reef, the Leader Reef, the `B' Reef, the `A' Reef, Elsburg Reefs and the Dreyerkuil Reefs. The Basal Reef is the most extensive, continuous and economically significant reef in the Free State Province, accounting for over one-half of all of the gold produced there to date.

3.2.2

West Rand Goldfield

The Cooke BUs and Doornkop BU of the West Wits Operations are situated in the West Rand Goldfield, the structure of which is dominated by the Witpoortjie and Panvlakte Horst blocks which are superimposed over broad folding associated with the southeast plunging West Rand Syncline. The northern limb of the syncline dips in a south-south-westerly direction and the southern limb in an east-south-easterly direction. The fold axis of the West Rand Syncline is located along a line that runs from the West Rand Consolidated Mines Limited lease area near Krugersdorp and trends south- eastwards through the northern part of the Doornkop section.

The structural geology in the north section of the Cooke shafts is dominated by a series of northeast trending dextral wrench faults. The most significant of these are the Roodepoort/Panvlakte Fault and the Saxon Fault, which have downthrows of 550m to the southeast and the Doornkop Fault which has a 250m down throw to the southeast. Several other smaller scale faults have downthrows ranging from 20m to 150m. Pilanesburg, Bushveld and Ventersdorp age doleritic dykes are also present. These strike in a northerly direction, with the exception of some of the latter dykes, some of which strike in an easterly direction.

At Cooke Section two major fault trends are present. The first set parallel the Panvlakte Fault striking NNE. These faults are steeply dipping, generally have small throws and do have any noticeable lateral movement to displace payshoots. A second major fault system, however trends north-westerly to east- west, which significantly displace these payshoots. They have small throws and tend to be water bearing showing a connection to the dolomites and indicating a Transvaal age. Many of them are mylonite or dyke filled.

Six main reef groupings have been identified at West Wits Operations on the West Rand Goldfield, the Elsburg Formations, the Kimberleys, the Black Reef, the Livingstone Reefs, the Ventersdorp Contact Reef (the "VCR") and the South Reef. Within these, a total of nine economic reef horizons have been mined at depths below surface between 600m and 1,260m.

3.2.3

Far West Rand Goldfield

Three primary reefs are exploited in the Far West Rand Goldfield, the VCR located at the top of the Central Rand Group, the Carbon Leader Reef near the base and the Middelvlei Reef, which occurs some 50m to 75m above the Carbon Leader Reef. Secondary reefs also occur in the area but the only examples of any significance are individual bands within the Mondeor Conglomerate Reef Zone that sub-crop beneath the VCR at Deelkraal BU and on the western side of Elandsrand BU.

The separation between the VCR and Carbon Leader Reef increases east to west from 900m to over 1,300m as a result of the relative angle of the VCR unconformity surface to the regional stratigraphic strike and dip. The Carbon Leader Reef strikes west-southwest and dips to the south at 25°. The VCR strikes east-northeast and has a regional dip of 21° to the south-southeast. Local variations in dip are largely due to the terrace-and-slope palaeotopographic surface developed during VCR deposition. In the location of the Mining Assets the Carbon Leader Reef occurs too deep to allow mining from current infrastructure and is lower in grade than elsewhere on the Far West Rand Goldfield. Consequently the VCR is the only reef currently exploited.

There are a series of east trending, north dipping normal faults with throws of up to 40m and a series of north-northeast striking normal faults with generally smaller displacements in the northwest. The original displacements on these faults are occasionally increased as a function of subsequent post-Bushveld displacement but overall faulting is much less prevalent than it is in other Witwatersrand goldfields. There are, for example, no major faults with throws of the order of several hundred meters or more. Moving to the eastern sections of the Far West Rand Goldfield the structure becomes simpler with few major faults. Most faults are high-angle normal faults trending

north- northwest and eastwards and having throws of less than 70m.

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3.2.4

Evander Goldfield

The Evander Basin is a tectonically preserved sub-basin outside of the main Witwatersrand basin, the Devon Dome, a large granitoid cupola, separates it from the main Witwatersrand Basin. It is the most easterly mined Witwatersrand gold occurrence. The basin forms an asymmetric syncline, with the fold axis between No.5 BU and No.6 BU, plunging to the northwest and contains only one economic reef system, the Kimberley Reef.

The Evander Basin was a part of the main Witwatersrand Basin until post-Booysens shale times. It was separated from the East Rand and South Rand Basins by uplift in the areas now marked by the basement Devon and Cedarmont Domes. Deeper within the basin, the Central Rand Group is overlain by Ventersdorp Lavas and Transvaal Sequence sedimentary rocks. West Rand Group rocks are present beneath the Central Rand Group. A poorly mineralised reef, stratigraphically above the Kimberley Reef, termed the Intermediate Reef, is also developed but is not economic, except where it has eroded the sub-cropping Kimberley Reef in the south and west of the basin.

The Evander Basin is one of the more structurally complicated parts of the Witwatersrand. Mining and drilling have defined the larger elements of the structure of the shallow southern and western basin margins. The northern and north-eastern extent of the basin is poorly drilled because of the depth to the Kimberley Reef and because of poor grades encountered to the north. The geological structure there has been inferred from two-dimensional seismic survey lines.

3.2.5

Klerksdorp Goldfield

The Klerksdorp Goldfield is located on the northwest margin of the Witwatersrand Basin and lays some 150km south-southwest of Johannesburg. Exploration, development and production history in the area dates from 1886 and following dormant periods, large-scale production commenced during the 1940s.

The Witwatersrand Basin sedimentary rocks are overlain by up to 2,000m of cover rocks and the reefs themselves occur at depths of between 80m and 4,000m and, with the exception of the VCR, which dips moderately steeply west-northwest, generally dip gently to the southeast.

The most significant structural features of the Klerksdorp Goldfield are northeast striking normal faults, which dip to the northwest and southeast and have throws of several hundred metres. These features break up the stratigraphy containing the stratiform orebodies into a series of horsts and grabens, which vary in width from several hundred metres to over a thousand metres. These horsts and grabens are internally disturbed by small-scale faults sympathetic to the major faults, which typically have throws of tens of metres and break up the reef into continuous blocks of up to 100m in width. These brittle faults can be identified by drilling from access development and as the dip of the stratigraphy is reasonably consistent, can usually be negotiated without significant difficulty. There are, however, smaller-scale faults in the immediate vicinity of these larger faults, which disrupt the reefs and can result in increased losses and dilution.

All mining to date in the Klerksdorp Goldfield has taken place to the northwest of one of the major northeast-southwest striking normal faults, the Jersey Fault, which has a down throw to the southeast of up to 1,000m, displacing the Vaal Reef down to a depth below surface exceeding 3,000m. Two further sub-parallel faults occur to the southeast of the Jersey Fault displacing the reefs down to more than 5,000m below surface.

Two primary conglomerate reefs are exploited within the Klerksdorp Goldfield, namely the Vaal Reef and the VCR. The Vaal Reef and VCR reef horizons occur at depths between 80m and 4,000m. The VCR dips moderately steeply west-northwest, the Vaal Reef generally dips gently to the southeast. Other, secondary reefs, including the Black Reef, Zandpan Marker and Denny's Reef exist; however they are not currently considered to be economically viable.

3.3

Deposit Geology

Most of the operations can be described as mature mining operations with good underlying geological models backed up with grade models based on vast amounts of historical mining and sampling data. The electronic capture of sampling data over the past ten-years has allowed a far greater understanding of the grade and payshoot characteristics of the orebodies than was possible previously. The Companies Indicated and Inferred Mineral Resources are more

reliant on the projection of geological or facies models than the Measured Mineral Resources due to the much lower density of sampling data in these areas.

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3.3.1
Target Operations
The gold mineralisation currently exploited by Target Mine is contained within a succession of Elsburg and Dreyerskuil quartz pebble conglomerate reefs hosted by the Van den Heeversrust and Dreyerskuil Members of the Eldorado Formation, respectively. Additional Mineral Resources have been delineated in the Big Pebble Reefs of the Kimberley Formation but these are not planned to be exploited in the current LoM plan.
The individual Elburg Reefs are separated by quartzite beds and form a a wedge shaped stacked sequence which strikes north north-west and comprises some 35 separate reef horizons interpreted to have been deposited in an alluvial fan system similar in nature to present day river deltas. This sequence of Elsburg Reefs and quartzites is truncated by an unconformity with the overlying younger Dreyerskuil Member. Immediately below the sub-crop with the Dreyerskuil the Elsburg Reefs and quartzites dip steeply to the east becoming progressively shallower dipping resulting in a structure analogous with a recumbent syncline, verging to the west, with the upper limb removed. This synclinal structure plunges shallowly at 10° to the north. In the more proximal areas to the sub- crop the thickness of the intervening quartzites reduces and many of the individual Elsburg Reefs coalesce to form reef packages that are exploited by the massive mining methods employed at Target Mine. Gold grades in the Elsburg Reefs are also higher in the proximal areas decreasing down dip until reaching an economic limit some 200m to 450m from the sub-crop.
The majority of the Mineral Reserves at Target Mine are contained within the Eldorado fan, a structure with dimensions of some 135m vertically, 450m down-dip and 500m along strike. The Eldorado fan is similar in nature to the fans historically mined at Loraine gold mine to the south. The Eldorado fan is connected to the subsidiary Zuurbron fan, located between Target Mine and Loraine, by a thinner and lower grade sequence of Elsburg reefs termed the Interfan area. The economic mineralisation in the Interfan is less persistent distally than within the fans and does not contribute significantly to the reserves. To the north of the Eldorado fan a number of other fans have been intersected by surface drilling of which the Siberia and Mariasdal fans are the most significant. These fans are subject to ongoing technical studies and do not form part of the current Target Mine LoM Mineral Reserve.
The Dreyerskuil Member consists of a series of stacked reefs, dipping shallowly to the east, that are less numerous but laterally more continuous than the underlying Elsburg Reefs. At Loraine this unit correlates stratigraphically with the Uitkyk Member that consists of an immature conglomerate informally termed the `Boulder Beds'. These beds did not contain significant gold mineralisation and were therefore not mined at Loraine. Towards the north the Uitkyk Member grades into a series of reworked conglomerates and quartzites, similar in nature to the Elsburgs, which becomes the Dreyerskuil Member in the vicinity of Target Mine. The conglomerate reefs contain economic mineralisation, some of which may have been derived through the erosion and reworking of Elsburg Reefs at the sub-crop.
The Big Pebble Reefs are found in the Kimberley Formation, which is overlain by the Eldorado Formation. The BP6a Reef, which has been historically mined at Loraine No.2 Shaft, lies on the unconformity at the base of the upper member of the Kimberley Formation (the Earl's Court Member). This overlies the Big Pebble Reef Member, the base of which comprises a series of argillaceous quartzites and several well-developed conglomerates. These are collectively referred to as the Big Pebble Zone ("BPZ"), which varies in thickness between 1m and 15m. The BPZ conglomerates are well developed at Target Mine and Loraine and coalesce into thick multiple conglomerate reef units close to their western subcrop position. Although resources have been delineated in the BPZ in the Loraine and Target Mine areas, these are not exploited in the current LoM plan.
A number of faults that displace the reefs at Target Mine have been identified of which the most prominent are the north-south trending Eldorado fault and the east-west trending Dam and Blast faults. The Eldorado uplifts the more distal portions of the Elsburg and Dreyerskuil Reefs while the Blast fault forms the northern boundary of Target Mine. The structure is known to a reasonable degree of confidence through a combination of underground drilling and mapping augmented by surface seismic surveys.
The plunging synclinal feature at Target Mine continues northwards, where the geological setting is similar and additional non-LoM resources have been delineated on the Elsburgs, Dreyerskuil and Big Pebble Reefs. In the Target North area low-grade mineralisation has also been intersected on the Maraisdal Reef and the Sun Reef, which are

thought to be the equivalent of the `B' Reef and Basal Reef, respectively, elsewhere in the Free State Goldfield. An erratically developed reef has been intersected in some surface boreholes in an area to the far north of the Target Mine at the base of the Ventersdorp Conglomerate Formation, which overlies the Eldorado Formation. This is interpreted to be the VCR, which is present in the Klerksdorp, West Rand and Far West Rand Goldfields but not elsewhere in the Free State Goldfield. The VCR is a coarse to very coarse quartz pebble conglomerate, which appears to be highly channelised and varies in thickness from almost zero to 4m.

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Target North is sub-divided into the Paradise, Siberia and Maraisdal areas by the east-west trending Siberia and Maraisdal faults. To the north of the Siberia Fault, the Eldorado Fault continues trending more to the northwest and an additional north-south trending fault, the Twin fault has uplifted the distal portions of the reefs. North of the Maraisdal fault the reef horizons are at a depth greater than 2,500m below surface and a farm boundary sub-divides this area into Maraisdal and Kruidfontein. The large-scale structure in the Target North area is known to a reasonable degree of confidence through the surface boreholes and extensive three-dimensional seismic surveys. Resources have been delineated on strike up to 15km north of Target Mine.

Approximately 40 km north of Target Mine, surface boreholes have intersected gold bearing reefs in the Oribi area close to the town of Bothaville. Resources have been delineated at Oribi on the VCR and Elsburgs at depths of approximately 2.75km below surface.

3.3.2

Free Gold Operations

The primary reef mined at Tshepong BU is the Basal Reef with minor contribution from the `B' Reef, which lays some 140m stratigraphically above the Basal Reef. The `B' Reef is highly channelised in nature with a much more erratic grade distribution than the Basal Reef. The relatively incompetent Khaki Shale overlies the Basal Quartzite, which occurs in the upper portion of the Basal Reef. The Basal Quartzite provides natural support to the Khaki Shale and where the thickness of this is less than 60cm, mining dilution can and does increase dramatically.

The Basal Reef dips at shallow angles to the east and is intersected by two significant north-south striking faults, the Dagbreek and the Ophir Faults. These faults dip at moderate angles to the west and have significant strike-slip and up-dip throws of the order of 1,000m to 2,000m and 200m to 300m, respectively.

Economic grades at Tshepong BU are constrained within a broad payshoot, which trends east- southeast. Currently a geological model of the Basal Reef facies variations is used for grade estimation. The method of assigning facies type is a scoring system developed in conjunction with Leeds University, UK. Scoring is based on geological type (Lorraine Facies or Black Chert Facies), presence of Waxy Brown Quartzite ("WBQ"), which is thought to trap fluids in the underlying reef, presence of micro-thrusting, which is thought to encourage fluid flow into the reef and presence of reducing minerals such as sulphides and carbon, which are thought to encourage the precipitation of gold mineralisation.

Phakisa BU is situated immediately to the east of Tshepong BU where shaft-sinking operations ceased prior to completion. The resources at Phakisa comprise the Basal Reef and represent the down-dip extension from Tshepong BU.

The primary reefs mined at Bambanani include the Basal Reef and in particular the Steyn Facies which covers approximately 90% of the mine area. The Khaki Shale in the north and the Waxy Brown Quartzite in the south overlie the Basal Reef. Secondary reefs such as the Leader Reef have been mined on a small scale historically but have always been found to be low grade.

The whole package dips at angles of between 25° and 45° to the east and is generally between 1m and 3m thick.

The lease area is bound to the west by the Stuurmanspan Fault and to the east by the De Bron Fault. The Harrison Fault, parallel and to the west of the De Bron Fault demarcates the eastern mining limit. Both of these are significant north-south striking normal faults, which dip at moderate angles to the west and have throws of over 100m. Faults sympathetic to these occur with displacements of up to 50m, as do east-west faults with lateral shifts of up to 400m on the northern edge of the mining area.

Joel BU exploits two distinct forms of a single reef, developed on a single unconformity surface. These are known as the Beatrix Reef and the Beatrix-VS5 Composite Reef. The reefs dip to the northeast at 15° and the composite reef sub-crops against the overlying Karoo Supergroup just to the north of Joel South BU, defining the southern limit of the orebody.

The Beatrix Reef conglomerates are found throughout the mine area and generally have multiple basal degradation and internal scour surfaces, often thinning to a single pebble lag on paleotopographic highs. The Beatrix-VS5 Composite Reef represents a re-working of the Beatrix Reef accompanied by a mixing with lower grade VS5 material. This occupies a 500m to 1,000m wide channel running almost north south through the centre of the lease area, which

is interpreted to widen to the northeast of Joel North BU.

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A deep erosional channel of Waterpan sedimentary rock, known as the Klippan Channel, truncates the reef some 1.8km to the northeast of Joel South BU. This washout is wedge-shaped with its apex to the west and widens to the southeast. The estimated dimension from the apex to the eastern property boundary is approximately 1.8km. The reefs have been shown to be continuous to the north of this transgressive feature.

Where untouched by the Klippan Channel, the reefs are bound to the east by the De Bron Fault, which strikes north-northeast. The CD Fault, which strikes northeast and is roughly halfway between the two shafts, has a 320m sinistral lateral displacement, which has moved ground south of the fault towards the northeast.

The complex nature of the reef, due to the multiple pulses of detrital influx and scouring, paleo- topographic highs and mixing between the Beatrix and Beatrix-VS5 Composite Reef, has resulted in a highly irregular distribution of gold throughout the mining area. There are broad low and high- grade zones on the scale of 100's of metres, which are likely to repeat beyond current development, however, the detailed grade distribution within these zones remains very unpredictable.

For the purposes of resource estimation, a detailed facies model is used and is based on detailed sedimentological observations and absence of well-mineralised reef at paleo-topographic highs.

Eland BU, Kudu & Sable BU and Nyala BU are contiguous to the south and west of Tshepong BU and Basal Reef is mined almost exclusively. The geological setting is similar to that described for Tshepong BU, however, faulting in the mining lease is the most intense to be found at the Free Gold Operations (excluding Joel BU). The Dagbreek fault intersects Eland BU lease area and the Rheedersdam thrust fault forms the western boundary of the remaining three BUs. These and other generally north striking normal faults including the Eureka, Rietpan and Wesselia faults represent the dominant the structures in the area. The reef in the Rheedersdam fault zone has been multiply repeated by thrusting which has resulted in stacks of up to eight reef repeats.

Further variability in reef occurrence has been caused by changes in palaeotopographic slope, which controlled the nature of sedimentation and subsequent mineralisation potential.

The Basal Reef is particularly carbonaceous at Eland BU, Kudu & Sable BU and Nyala BU and the gold tends to concentrate strongly on the kerogen-rich footwall contact and visible gold has been observed in several areas. The best grades were historically mined at Kudu & Sable BUs. The Nyala BU area is characterised by marginal grades.

Eland BU and Kudu & Sable BU are predominantly remnant operations with short lives and the extensive historical mining and the nature of the remaining Basal Reef Mineral Resources minimise uncertainties regarding grade, structural complexity and loss of ground. Nyala BU has only recently re-opened and the LoM plan is focused on exploiting the Basal Reef shaft pillar.

The St. Helena BU has a complex geological structure with faults generally trending north south with downthrows of up to 2,000m and dips of between 30° and 50°. Reverse and thrust faulting is present, sometimes resulting in local duplication of reef. Two economic reefs are present within the mine property with the Basal Reef being the most economically important unit and the Leader Reef, which lies some 15m above the Basal Reef.

St. Helena is predominantly a remnant operation with extensive historical mining and the nature of the remaining Basal Reef Mineral Resources minimise uncertainties regarding grade, structural complexity and loss of ground.

Surface sources at the Free Gold Operations comprise numerous Waste Rock Dumps ("WRDs") and Slimes Dams, which in addition to various plant clean-up tonnages, are processed at FS1 Plant, FS2 Plant and to some degree at Joel Plant. WRDs comprise both waste material and reef material, the latter of which is sourced from cross-tramming of mined ore. Typical grades range between 0.5g/t and 1.0g/t, which are either processed directly or pre-screened to ensure Run of Mine ("RoM") grades in excess of 1g/t.

Slimes Dams may also contain significant gold grades owing to occasional sub-optimal metallurgical performance, which resulted in gold being sent to tails. Grade distribution within WRDs and Slimes Dams can vary significantly owing to fundamental changes in mining, hoisting and processing methods, which have been implemented over prolonged years of mining.

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3.3.3
Harmony Free State Operations
At these operations mining was originally established to exploit the rich Basal Reef, but, as reserves in this orebody became depleted, production is being increasingly sourced from the more erratically mineralised and lower grade Leader Reef, Middle Reef, `A' Reef and the `B' Reef. The Basal Reef is a high grade, generally thin (<100cm) reef, which has been payable across most of its exposed extent. In the south, at both Harmony No.2 BU and Unisel BU, the reef pinches out against elevated footwall and grades deteriorate. The Leader Reef, `A' Reef, `B' Reef and Middle Reef are only payable in distinctive and often extensive payshoots and discrete pods where these reefs overlie the Basal Reef. Where the Leader Reef truncates the Basal Reef east of the so-called "line of coalescence" at Harmony, it is more uniformly payable.
The mineralised meta-conglomerates mined at Masimong are the Basal Reef, `B' Reef and `A' Reef. The Basal is mined at all three of the Masimong BUs while the `A' Reef is mined at Masimong No.4 BU and the `B' Reef at Masimong No.5 BU . At Masimong No.4 BU and Saaiplaas No.3 BU the Basal Reef is present as the Steyn facies, comprising three to four upward fining sedimentary cycles. The lower cycle, being the primary gold carrier comprises a basal conglomerate with an overlying protoquartzite. Carbon seams, which carry most of the gold, occur locally on the bottom contacts. Channel widths are generally below 70cm but in places only the carbon contact between the hanging BU wall and footwall exists. A north-south trending payshoot extending through the Saaiplaas No.3 BU towards the north along the western side of Masimong No.4 BU forms the main target area for the Basal Reef.
The black chert facies Basal Reef at Masimong No.5 BU comprises two upward fining cycles, of which the lower carbonaceous unit is the primary gold carrier. Channel widths average 60cm. The target area for this facies is a northwest-southeast trending payshoot that cuts through the shaft and is truncated to the east by younger leader quartzites.
The `A' Reef at Masimong No.4 BU lies 140m to 160m above the Basal Reef and is characterised by a highly channelised series of conglomerate bands that are generally only payable in locations where one or more bands exist within the channel itself. These oligomictic conglomerates are dark in colour with abundant, mostly fine pyrite and occasional carbon. Channel thickness is highly variable but can be up to 1.8m, with gold values highly dependent on the reef thickness and the presence of carbon.
The `B' Reef, lying 110m above the Basal Reef, comprises complex sedimentologically controlled gold mineralisation within a wide east-west trending channel that cuts through the Masimong No.5 BU area. Within this channel very high grade lenticular gravel bars contain abundant visible gold and form the targets for mining. Gold grades are erratic and extremely nuggety, while the channel widths also vary from zero to approximately 1.8m.
The two conglomerate horizons at Harmony No.2 BU, the Basal Reef and `A' Reef, are separated by 140m of mostly quartzites and conglomerate. The reefs dip 5° to 15° towards the west, becoming steeper to the west approaching the De Bron Fault. Numerous east-west trending dykes cut the reef, resulting in up throw and lateral shift. The Basal Reef occurs as thin bands of upward fining conglomerates, with full channel widths of up to 120cm. The payable reefs are often associated with carbon. Weak shales overlie the Basal Reef and must either be undercut or removed with the reef. The footwall to the `A' Reef at Harmony No.2 BU is the 1m to 15m thick Big Pebble Marker, which, where thinnest, is associated with better developed `A' Reef. Better gold grades are associated with thicker channels greater than 1m thick.
Brand No.1 BU and Brand No.3 BU are characterised by large north-south trending faults with lateral movement. The `A' Reef is the predominantly targeted reef and is found in wide fault displaced east west pay trends. The Basal Reef belongs to the former `Basal Placer' facies and is predominantly found in the form of a thin reef, rich in carbon. Pebbles are not always present. The reef thickness seldom exceeds 20cm and is generally less than 10cm.
Brand No.5 BU is sub-divided into fault blocks, with complex north-south structural trends intersected by normal north-northeast-south-southwest trending faults. Vertical fault displacements are minor, whereas right-lateral displacements are significant. The reefs on average, dip 40° to the east. The main reefs mined at Brand No.5 BU are the Basal Reef and Leader Reef. The Steyn Facies Basal Reef comprises four sedimentological conglomerate sub-facies, with gold best developed at the base of the conglomerates and associated with pyrite. The Leader Reef,

lying between 7m and 16m above the Basal Reef is highly channelised with thickness increasing from east to west. This upwardly fining sequence comprises three sub-facies that can be up to 400cm thick. Gold is generally distributed evenly throughout the reef package.

The reefs at Unisel BU dip 30° to the East and are structurally complex due to fault intersections and the presence of sills in the vicinity of the Basal Reef. The principal reefs mined are the Basal Reef and the Leader Reef. The Basal Reef has been divided into three distinct sedimentological facies, with gold mainly associated with moderate-to-well developed buckshot pyrite. The Leader Reef is highly channelised with limited sedimentological information and shows an erratic grade distribution.

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The Merriespruit area is structurally complex with extensive north-south and east-west trending faults, with vertical displacements of up to 650m. Igneous intrusive are associated with the structurally complex areas. In general the reefs structures strike northeast southwest and dip 20° to the north. The Basal Reef is typically thin (<1m) and channelised, with payable grades located in northeast- southwest trending payshoots. This upwardly fining conglomerate is poorly to well mineralised with the local occurrence of buckshot pyrite. Locally mineralised Middle Reef, found above the Basal Reef in the hanging wall quartzites, is only payable when adjacent to Basal Reef or overlying Leader Reef. The Leader Reef comprises a series of conglomerate bands separated by pebbly quartzite bands that are variably mineralised, with typically poor to moderate grades. Payable grades are often located in NE-SW trends. In general the gold is dispersed throughout the package, with gold associated with the pyrite.

Surface sources at the Harmony Operations comprise numerous WRDs, Slimes Dams and Other Sources, which in addition to various plant clean-up tonnages, are processed at the Central, Virginia and Saaiplaas Plants. WRDs comprise both waste material and reef material, the latter of which is sourced from cross-tramming of mined ore. Typical grades range between 0.4g/t and 1.0g/t.

Slimes Dams may also contain significant gold grades owing to occasional and historical sub-optimal metallurgical performance, which resulted in gold being sent to tails. Grade distribution within WRDs and Slimes Dams can vary significantly owing to fundamental changes in mining, hoisting and processing methods, which have been implemented over prolonged years of mining.

3.3.4

Welkom Operations

The Welkom Operation lease area is centrally located within the Free State Goldfield in an area containing several other mature operations. The property is bounded to the south by the Free Gold Operation's St. Helena, Harmony Free State Operation's President Brand and President Steyn Gold Mines Limited's President Steyn Mine and the property is bounded to the north by Free Gold Operation's Eland BU, Kudu & Sable BU, Nyala BU and Tshepong BU.

The Basal Reef is the main reef exploited at Welkom Operation. In addition to the Basal Reef, No.6 BU also exploits the Leader Reef, lying some 15m above the Basal Reef. No.7 BU plans to exploit the Saaiplaas Reef or `pyrite stringers' as it is commonly referred to at this mine. This consists of thick (up to 6m), low-grade channels superimposed on the Basal Reef.

The Basal Reef strikes north to north-northwest and generally dips to the east between 20° and 40°. The reef is bounded on the west by the north trending Rheedersdam Fault system and sub-crops against the Karoo Supergroup along a northward trending line representing the basin margin. To the east the north trending De Bron Fault bound the reef. Two major faults, the Dagbreek and Ararat further dissect the reef into three contiguous blocks.

No.1 BU and No.2 BU are situated within the easternmost of these three blocks, between the De Bron and the Ararat Faults. No.3 BU and No.4 BU are situated within the central block between the Dagbreek and Ararat Faults and No.6 BU and No.7 BU are situated within the western most block.

The Leader Reef also varies in thickness between 0.3m and 1.7m and comprises a well-packed, small- to-medium pebble conglomerate with white quartz and black chert clasts and a moderate percentage of buckshot and crystalline pyrite.

One other reef, the Middle Reef, has been exploited in a very small, opportunistic way. The Middle Reef is an impersistent, lensoid, cherty and/or quartz-pebble conglomerate unit within the Middling Quartzite of the Harmony formation. While sometimes of very high grade, individual lenses are typically less than 30m in planar dimensions and as such too small to systematically drill for, generally resulting in accidental discovery.

3.3.5

West Wits Operations

The economic horizons change from north to south along the length of the Doornkop-Cooke-Western Areas part of the Witwatersrand Basin, from a few lower Central Rand unconformities in the north to the development of multiple upper Central Rand unconformities in the south. The structural and depositional history of the goldfield is still not fully understood due to the complicated pattern of stacked sub-cropping reefs, the syndepositional tectonics; however the individual orebodies have detailed grade models that assist evaluation.

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A key feature of reef development at Cooke Section is the thickening of the Westonaria Formation to the east of the anticline and importantly to the south. This wedging of formations indicates that syndepositional uplift along the Panvlakte trend (before the anticline developed) had an effect on reef formation. The area to the west of the crest of the current anticline is characterised by narrow single band UE1A reef overlying a pronounced unconformity, whereas to the east the Elsburg A1 to A5 stacked package of conglomerate horizons forms a wedge interleaved with barren quartzites. This wedge opens out to the east and to the south with greater thicknesses of barren quartzites separating the individual reef horizons. To the east the conglomerates become increasingly distal in nature, to the south more individual horizons are developed.

The Main orebodies on the Cooke 1, 2 and 3 Section shafts of the West Wits Operations are the UE1A and the Elsburg A5 Reefs. Cooke 4 in the south mined 10 individual horizons including Elsburg Reefs and the VCR. On Doornkop the Kimberley Reefs and the South Reef are being mined. Moving further, the primary orebodies on the adjoining Central Rand goldfield were the Lower Central Rand Group orebodies the Main Reef Leader and the Main Reef.

A pronounced feature of the grade distribution at the Cooke shafts is the location of what were previously described as fan entry points into the basin. These pronounced fan shaped grade distributions on the grade plans are due in part to the presentation of the two different aged orebodies, the UE1A and A1, on the same plans; and the lack of palinspastic reconstruction of payshoots that terminate along these younger lateral movements.

The area covered by the original exploration pattern on the Cooke Shafts has now largely been mined out. Mining is now concentrating on pillars and areas on the periphery of the initial exploration area that are poorly explored from surface drilling.

Doornkop has been mining the Kimberley Reefs but attention is now focusing on the South Reef, which has been previously exploited on nearby operations. The South Reef comprises broad south-easterly trending shoots (palaeodepressions) separated by lower grade zones (palaeo-highs). One of these ore shoots, indicated by surface drilling and confirmed by recent stoping, runs through the Doornkop area.

Elandsrand BU and Deelkraal BU exploit the VCR, which unconformably overlies the Mondeor and Elsburg Formations of the Central Rand Group. These footwall sediments primarily comprise siliceous quartzites there are four major polymictic conglomerate zones within the Mondeor, which have supported minor stoping on Deelkraal.

The VCR is overlain by the lava of the Alberton Formation, which forms the basal unit of the Klipriviersberg Group of the Ventersdorp Supergroup. The dip of the VCR at Deelkraal BU is relatively consistent at 24° although there is some postulation of a slight flattening of dip at depth at Elandsrand.

The VCR sits on a highly-incised unconformity surface exhibiting a marked palaeotopography. The unconformity (erosion) surface was covered with a residue of mature quartz pebble conglomerates (reef) preserved on fluvial terraces and slopes. These now reflect as local variations in the dip and strike of the reef. Terrace reef (being originally close to horizontal) has the attitude of the regional dip and it tends to be thicker and accompanied by higher gold accumulations. Terraces are preferentially mined. Slope reef is indicated where the attitude of the reef now departs significantly from the regional dip. Slope reef represents the inter-terrace slope areas, the reef is thin, has less conglomerate and less total gold. Slope reef gold values are generally below the paylimit.

The VCR is present throughout the Elandsrand BU lease area, but at Deelkraal BU there is a limit of deposition running roughly north-south through the centre of the lease area. The VCR is poorly developed to the west of this line.

The facies and morphological models encompassing the Mining Assets have been developed through reef mapping in stopes and on-reef development mapping. They are used in the estimation of Mineral Resources to constrain the interpolation of grade into geologically homogenous areas.

Mondeor Conglomerate bands sub-crop beneath the VCR on the western side of Elandsrand BU and on Deelkraal BU. They have been mined in places underneath or close to their sub-crop on Deelkraal BU.

Structures present at Deelkraal BU and Elandsrand BU include faults, dykes and sills. The sills occur in the footwall in many areas adjacent to dykes; however, these only affect the reef horizon in old, mined out areas near Elandsrand BU. The faults and dykes are classified according to the relative geological ages and comprise Pre-VCR, Early Ventersdorp, Late Ventersdorp, Bushveld and Pilanesberg Structures.

The structural model at Elandsrand BU has been developed from information compiled over many years, from continual mapping of footwall haulages, cross-cuts, on-reef raises, winzes, development drives and stopes. In contrast at Deelkraal, where the low angle faulting is more common, a relatively poor structural database exists, as it was previously not consistently recorded. Ongoing mapping and re-interpretation is rectifying this situation and enabling the development of a more detailed model.

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3.3.6
Evander Operations
Within the Evander Operations lease area the Kimberley Reef dips predominantly northwards. There are several distinct fault styles developed within the mine lease. Earliest faults tend to have thrust movements, resulting in duplication of the reef. These faults strike northwards to westwards and are generally consistent with thrust movement into the basin. Throws of up to 150m have been encountered within the mine workings. The predominant faulting within the mine is a series of extensional faults. The resulting shallow-dipping faults trend west-northwest and have up throws to the north. This is an extremely fortuitous situation as the successive up throws maintain the Kimberley Reef at a consistently shallow depth below surface throughout the main part of the Evander lease. Significant fault losses are, however, associated with these faults. There has been only minor lateral movement along these faults. Channels can normally be traced across them with only minor displacements.
Vertical and overturned Kimberley Reef is present in the BU No.6 area in the southeast corner of the mine. This structurally complex area represents a basin margin structure, in many ways analogous to the structural regimes observed on the Western Margin of Free State Goldfield. The vertically dipping reef sub-crops against the overlying Karoo Sequence rocks. Complex wrench faulting is also developed within the No.6 BU area.
Ventersdorp, Bushveld and Karoo age dykes and sills are present within the mining lease. Bushveld age intrusives occur as dykes and sills, Ventersdorp and Karoo intrusives occur as predominantly north trending dykes. By far the most problematic is a doleritic footwall sill that varies from 30m to 70m in thickness. In several areas this sill steps upwards and occupies the same stratigraphic position as the Kimberley Reef, in places splitting the reef into two separate components. Fortunately interference from the sill is generally localised in areas such as the southern portion of the previous Winkelhaak mine and specific areas in the western part of Kinross.
Gold in the Kimberley Reef is associated with heavy minerals on re-activation surfaces specifically associated with the more robust, clast supported oligomictic quartz pebble conglomerates, or in association with flyspeck carbon. The gold generally occurs in native form often associated with pyrite and carbon. Pyrite, chromite, rutile, zircon and leucoxene have been identified within the Kimberley Reef. Pyrite dominates the heavy mineral suite and displays several distinct forms. Pyrite grains displaying detrital characteristics are common. Rounded balls of porous pyrite are also recognised, as are secondary remobilised pyrites. These latter minerals may occupy fractures across pre-existing pebbles, as well as overgrowing existing detrital pyrites within the sand matrix. Uraninite is present within the Kimberley Reef, but in concentrations so low that routine sampling for uranium is not practiced.
Carbon is generally rare within the more robust Kimberley Reef, becoming common in the distal areas as flyspeck carbon on the footwall contact. This has an effect on gold grades. As the channel width of the reef decreases the gold accumulation (cmg/t) does not change significantly. This is attributed to high gold grades associated with the carbon.
3.3.7
Orkney Operations
The Orkney Operation mining area is bounded to the east and north by the North West Operations owned by Durban Roodepoort Deep, Limited ("DRD"), to the west by AngloGold's Tau Lekoa and to the south by AngloGold's Vaal River Operations ("VRO") and the course of the Vaal River.
The major faults within the lease area are: the Nooitgedacht and Buffelsdoorn faults occurring in No.6 BU and No.7 BU areas; the Witkop Fault between No.6 BU and No.7 BU; the WK22 and No.3 BU Faults between No.7 BU and No.3 BU; the No.5 BU Fault; and the No.2 BU South Fault. The horsts and grabens are further disturbed by faults sympathetic to the major faults which typically have throws of tens of metres and further divide the reef into blocks of up to 100m in width. Drilling from access development can identify these brittle faults, as the dip of the stratigraphy is reasonably constant (15° to 20°).
The Vaal Reef is by far the most significant reef mined at the Orkney operations and is the major contributor to gold production. The reef strikes northeast, dipping to the southeast and is heavily faulted to form a series of graben structures. The dip is generally less than 30° but can vary locally in direction and magnitude to exceed 45°. Gold is present throughout the reef horizon; however it tends to be concentrated close to the basal contact where carbon commonly occurs as thin seams. Well-mineralised carbon seams occur most commonly in three stacked sequences.

The VCR is exploited solely at BU No.3, BU No.6 and BU No.7 and, like the Vaal Reef, can occur as a composite reef consisting of several distinct sedimentary packages. In an attempt to improve grade estimation in such packages, a terrace and slope-based geological model was developed by AngloGold and has been retained by the geologists now employed by Harmony. The model divides

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the orebody into a main channel; lower; middle and upper terraces and also involves delineation of certain higher-grade reworked channels. The reef is clearly identifiable and its location at the contact between the overlying Klipriviersberg Lavas and the underlying Witwatersrand Supergroup Rocks renders the footwall and hangingwall rocks distinct from the reef, except in areas where Elsburg conglomerates sub-outcrop against the VCR. The contrasting lithologies aids fault negotiation and have facilitated the use of three-dimensional seismic survey techniques to image the gross reef topography in the past.

The Elsburg Reefs are exploited at BU No.6 and No.7, usually in conjunction with the overlying VCR, against which it sub-outcrops along a northeast trending band, south of and sub-parallel to the Buffelsdoorn Fault. The sedimentological characteristics of the Elsburg Reefs in the region of the sub-outcrop are similar to those exhibited by the VCR.

3.3.8

Kalgold Operations

The Kalgold Operation is situated on the Kraaipan granite-greenstone belt, which is a typical gold-bearing greenstone formation. It has undergone intense structural deformation that has led to its dislocation into separate units. Within the mining lease area six steeply dipping zones of mineralisation have been identified. The discrete mineralised ore zones are the result of the percolation of mineralised fluids into the Banded Ironstone Formation ("BIF") host rocks.

The zones comprise the A, A-West, D, Mealie Field, Watertank and Windmill zones and the mineral resources of the A, D, Windmill and Watertank Zone have been comprehensively evaluated. The D-Zone is the first area to be exploited by open pit mining over a strike length of 1,400m and an ore zone width of between 15m and 40m.

Gold mineralisation is associated with pyrite and pyrrohotite, which was developed as a replacement mineral within a BIF and also within extensional, cross-cutting quartz veins within the ironstone.

3.3.9

Harmony Australian Operations

Gold mineralisation at the Mt. Magnet operation occurs in the southern tip of the Mt. Magnet Greenstone Belt in the Murchison Province of the Achaean Yilgarn cratonic block. The belt consists of a series of tholeiitic and komatiitic volcanics and associated ultramafic volcanics and mafic tuffs. Several folding events led to the formation of the Boogardie Synform and, after a major period of ductile deformation, selective fracturing of brittle rocks introduced gold mineralisation synchronous with certain deformation events. Shearing of the country rock usually provided a conduit for mineralising fluids.

The majority of the gold mineralisation is hosted by BIF that are cross-cut by faults, at or near the contact of ultramafic and mafic rocks with felsic intrusions. Fault zones and shears are generally north-south to north-northeast trending and selective fracturing appears to form a major trap-site for gold mineralisation. Crossing of several shear directions appear to enhance mineralisation, which is often characterised by an epigenetic pyrrhotite-pyrite alteration.

At Hill 50, the bulk of the mineralisation is hosted in a thick sequence of intercalated sedimentary BIF with both komatiitic and tholeiitic volcanics and associated ultra-mafic volcanics and mafic tuffs. The mineralisation is characterised by pyrrhotite-pyrite wall rock alteration. The BIF's are locally offset by faults with offsets ranging from one to two metres to up to tens of metres.

At Morning Star, mineralisation is hosted within quartz-carbonate veins containing molybdenite, scheelite and stibnite in a series of pyritic, sericite-altered mafic and felsic schists. The gold mineralisation is strongly associated with large vein packages and detailed geological mapping has indicated that the mineralisation can be correlated from level to level with a high degree of confidence.

Mineralised zones are primarily defined on the basis of geological mapping while stope designs are also based on detailed sampling and mapping. Wire framing based on geological mapping and interpretation is routinely carried out and grade shells are then defined within the geological domains.

In the Cue area, approximately 85km north of Hill 50 and Morning Star, the Big Bell deposit is hosted in a steeply dipping and locally overturned northeast trending extension of the Achaean Meekatharra- Wydgee Greenstone belt. This belt forms the west limb of a north-plunging regional anticlinal structure. At Cue, towards the east of Big Bell, the anticlinal structure changes to a north-plunging regional synclinal structure. In the Big Bell area, three main zones

are recognised in the regional volcano-sedimentary sequence, a lower sequence of ultramafics, graphitic sediments and BIF, gradationally overlain by a felsic volcanic sequence of andesitic, dacitic and rhyolitic rocks and then by a sequence of mainly submarine basaltic flows.

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The free-milling gold mineralisation at Big Bell is mainly hosted by a sub-vertical series of potassium- altered metamorphic schists with some mineralisation occurring in hanging wall biotite schists. In the Cuddingwarra area, gold mineralisation is related to a major phase of porphyritic intrusive activity.

At South Kalgoorlie Operations gold mineralisation was discovered in the Archaean Norseman-Wiluna granite-greenstone terrain in the late 1890s consisting of extensive volcanic sedimentary rocks deposited in an extensional environment. The stratigraphy is characterised by mafic/ultramafic rocks and komatitic basalt flows with intercalated sediments of the Kalgoorlie Group, conformably overlain by a thick series of felsic volcanics and intercalated sedimentary rocks of the Black Flag Group. The discovery of gold led to the exploitation of major historic gold mines in the Kalgoorlie "Golden Mile" and to the south at Jubilee.

Jubilee forms part of a major 4km strike length mineralised system that includes the Celebration, Mutooroo, Hampton Boulder, Mt. Martin, Dawns Hope, White Hope and Golden Hope open pit and underground mines. There are many sub-parallel northsouth trending tectonic zones in the granite- greenstone terrain with a multitude of deposits occurring further towards the west near Coolgardie.

Mineralisation is hosted along brittle-ductile shear contacts between biotite schist and ultramafics (Mt. Marion), in brittle shear in granite (Trojan open pit), along the Boorara shear in felsic porphyry (Goldenridge open pit), in biotite-tremolite schist (Freddo open pit), in shears in quartz dolerite and gabbro (Scrubby Tank) or quartz diorite (Rose Hill) or in Archaean basalts or paleo-channels (Lake Cowan open pits).

At Mt. Marion, mineralisation is hosted in "lode gneiss" along the Kunanulling Shear, within a sub- vertical package of gneiss and ultramafics that is footwall as well as hangingwall lode and has a lower grade core. Mineralised zones are defined on the basis of geological mapping and drilling. Mineralisation occasionally extends from the hangingwall gneiss into the ultramafic hanging wall and appears to be moving further into the hangingwall with increasing depth. The footwall contact of mineralisation generally coincides with the footwall contact of the gneiss and is most consistent.

3.3.10 Harmony Canadian Operations

The orebodies at Bisset are located within the Red lake Archaen greenstone belt and comprise two major sets of shear related quartz veins occurring within a steeply dipping intrusive host. One set of veins consists of stockwork breccias and the other narrower, fault-controlled veins cross-cutting the stockwork. Gold mineralisation occurs in both sets of veins but is enriched at the intersection of the two vein types.

3.4

Exploration Potential

The majority of the operations are mature and well explored and as such SRK consider there to be limited opportunity for discovering any new mineralised horizons or areas within the existing property boundaries within South Africa. Some potential does however exist for the Target, Free Gold, Evander and Harmony Australia Operations:

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the eastern extension in the Dreyerskuil Reefs at Target Mine;

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the southern extension in Basal Reef at Bambanani BU, the northern extension of certain facies at Tshepong BU and ongoing surface drilling at Joel BU, which is designed to delineate extensions to the Joel North BU area;

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the development of the Poplar and Rolspruit projects at the Evander Operations, where exploration has defined significant additional resources and are currently being investigated in the form of pre-feasibility and feasibility studies;

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at Harmony Australian Operations there is significant potential for new discoveries in the vicinity of the existing areas and an extensive conceptual exploration programme based on detailed regional geological mapping is underway. This potential is enhanced by the consolidation of all available information in the hands of one organisation. The ore in the South Kalgoorlie area can, however be less free-milling than the Mt. Magnet & Cue ores, signalling a potentially higher risk with regard to the maintenance of the current metallurgical recoveries; and

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the tenements in the South Kalgoorlie area are located just north of the well-known Kambalda nickel sulphide deposits where over a million tonnes of contained Ni metal has been produced to date. Portions of the tenements cover strike extensions of the Kambalda Dome stratigraphy and komatites along the Wildcatter's Shear Zone and are considered highly prospective for nickel sulphide deposits. A number of nickel sulphide deposits have been recognised on the Harmony South Kalgoorlie tenements.

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4.
MINERAL RESOURCES AND MINERAL RESERVES
4.1
Introduction
This section summarises the methods used by Avgold and Harmony to derive and classify the latest Mineral Resource and Mineral Reserve estimates for the Mining Assets. It also presents SRK's comments and opinions on the reasonableness of these estimates. In addition this section sets out SRK's view regarding any potential for proving up of further Mineral Resources and Mineral Reserves at the Mining Assets.
4.2
Review Procedures
SRK has not re-estimated the Mineral Resources and Mineral Reserves as estimated by the Companies for each of the Mining Assets. SRK has, however, undertaken sufficient check calculations and where appropriate, made necessary adjustments to the estimates to derive the statements presented herein and supporting the respective LoM plans.
The tables in this section summarise the audit process in support of the presented Statements of Mineral Resources and Mineral Reserves. The terms and definitions are those given in the March 2000 South African Code for Reporting of Mineral Resources and Mineral Reserves. This is known as the SAMREC Code ("SAMREC") and is published by the South African Mineral Resource Committee under the auspices of The South African Institute of Mining and Metallurgy.
Avgold and Harmony both report Mineral Resources and Mineral Reserves in accordance with the SAMREC Code. Harmony uses stricter criteria to limit its Measured and Indicated Mineral Resources than other South African gold mining companies. The limit of the Indicated Mineral Resource is 60m from current stoping, whereas certain other South African gold mining companies classify Indicated Mineral Resource utilising confirmed drill intersections which may be at a distance considerably further than 60m.
Within the scale of current mining operations this approach does not affect short-term term planning, nor does it impact on the long-term potential for the operations with large Inferred Resources based on sound geological models. It does, however introduce a problem with respect to reporting SAMREC compliant financial valuations where only projections derived from Proved and Probable Mineral Reserve areas can be presented.
For this reason it is necessary to stress the confidence in the underlying resource models and to include Inferred Mineral Resources into certain of the base case LoM projection and associated cash flow models.
Further, in presenting the Mineral Resource and Mineral Reserve statements the following points apply:
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the Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Mineral Reserves. Accordingly Mineral Resource statements are sub-divided into those Mineral Resources which have been modified to produce Mineral Reserves (designated by the suffix 1) and those which have not (designated by suffix 2);
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Mineral Resources are quoted at an appropriate in-situ economic cut-off-grade with tonnages and grades based on the planned minimum mining width;
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Mineral Reserves for Target Mine are based on a gold price of US$375/oz and ZAR:US$ exchange rate of 8.87 (ZAR107,000/kg);
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all Mineral Reserves for the Harmony's South African Mining Assets are based on a gold price of US$350/oz and ZAR:US$ exchange rate of 8.26 (ZAR93,000/kg). Harmony's Australian Assets use a US$350/oz and AUD:US$ exchange rate of 1.49 (AUD523/ozt);
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all Mineral Resources and Mineral Reserves were estimated as part of the Companies annual planning cycle dated 1 July 2003, the statements as reported herein have been adjusted for depletion that has occurred during the six months that have elapsed and are now dated 1 January 2004;

- unless otherwise stated all Mineral Reserves and Mineral Resources are quoted as 100% and not attributable with respect to ownership;
- all Mineral Reserves quoted in terms of RoM grades and tonnage as delivered to the metallurgical processing facility and are therefore fully diluted;
- Mineral Reserve statements include only Measured and Indicated Mineral Resources modified to produce Mineral Reserves and planned for extraction in the LoM plans;
- Mineral Reserve sensitivities have been derived from application of the relevant cut-off-grades to the underlying block listings. Accordingly, these have not been based on detailed depletion schedules and should be considered as incremental changes to the Base Case; and
- all references to Mineral Resources and Mineral Reserves relate to the SRK estimates stated in accordance with the SAMREC Code.

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Surface sources at the Mining Assets comprise WRDs, Slimes Dams and other surface sources such as spillage and small stockpiles. WRDs are notoriously difficult to sample, given the range of particle sizes commonly present and the heterogeneity of grade. In the majority of instances, SRK has classified those WRDs with sufficient information as Indicated Mineral Resources. In instances where the grade and/or the density are known with insufficient confidence, SRK has classified these as Inferred Mineral Resources. In contrast to WRDs, slimes dams, in general tend to have more homogeneously distributed grades and the smaller particle size facilitates sampling. With adequate sampling and in-situ determinations, SRK consider that slimes dams as such may be classified as Measured Mineral Resources. In instances where the grade and/or the density are known with insufficient confidence, SRK has classified these as Indicated Mineral Resources.

4.3

South African Deposits: Mineral Resource and Mineral Reserve Estimation Methodologies

Mineral Resource and Mineral Reserve estimation and classification is dependent upon the quality and quantity of data, block definition, grade and tonnage estimation, grade control and reconciliation. Such parameters are considered by SRK to be typical of Witwatersrand Basin gold mines at most operations.

Unlike most other Witwatersrand deposits, the stacked nature of the reefs at Target Mine in combination with the bulk mining methods utilised, are condusive to three dimensional computerised geological modelling. As a result of this and the fact that a significant amount of drilling has been completed at Target Mine relative to other mines, the approach used to estimate the Mineral Resources and Reserves at Target Mine differs in some regards from that used at most other Witwatersrand mines.

The majority of resources in the Target North and Oribi areas have been estimated using standard two-dimensional classical statistical methods employed at other Witwatersrand mines where the reefs have been intersected by surface drilling only. At Loraine and to the immediate north of Target additional underground information has enabled a three-dimension computerised approach to be used similar to that employed at Target Mine.

Given the similar nature of the majority of the South African Mining Assets, the following sub-section summarises the general techniques commonly used by Avgold and Harmony for estimation.

4.3.1

Quality and Quantity of Data

Avgold: The Mineral Resource at Target Mine is primarily based on underground exploration drilling. Limited surface drilled intersections also exist as well as chip sampling in areas of the mine with underground development. The underground exploration holes were drilled from a footwall decline on sections lines 50m apart. The holes were drilled on a fan pattern at 15° intervals resulting in drill coverage of between 15m and 80m. Due to the fan nature of the drilling the broader coverage occurs in stratigraphically higher reefs as well as more proximal and distal areas to the sub-crop. Over 35 individual reef horizons have been intersected within the Eldorado Fan between 20 and 200 drillhole intersections per reef. The use of underground drilling has resulted in a significantly larger amount of sampling data being available in areas not yet accessed by underground development compared to most other Witwatersrand deep-level operations.

The Mineral Resource at Target North and Oribi is primarily based on surface exploration drilling. At Loraine 33 underground exploration drillholes and small quantities of chip samples form the basis of the Mineral Resource. The surface drillholes in the Target North area have been drilled on an irregular pattern, forming a drillhole grid spacing of between approximately 500m in the south up to 2,000m in the north. In the Oribi area 7 surface boreholes have been drilled over a strike length of 10km. Due to the geometry and geological characteristics of the individual reefs and reef packages these surface drillhole grids do not necessarily apply to all reefs or reef packages.

Arithmetic means of the short deflections in each surface borehole have been used for the true thickness and gold accumulation value of that borehole. Long deflections were treated as separate intersections, however, data were declustered by taking the arithmetic mean of borehole values for the same reef falling within 100m of each other on plan.

In the case of surface drillholes, the core is halved using a diamond saw, one-half is retained as a geological record and one-half is assayed. For underground drillholes, the core diameter is considered to be too small to allow the core

to be split and to yield a sufficiently large sample to allow assaying and, in this instance, the entire core is assayed. Assaying on the exploration samples was undertaken using fire assay techniques by ISO accredited laboratories with the use of blanks, standards and check assays for quality control. Inter-laboratory checks were also performed with the full process having been independently audited by external consultants.

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Given the density of drillhole data, the assaying and quality control procedures applied, together with the operating history to date at Target Mine, in SRK's opinion the quality and quantity of the data available is sufficient to support the Mineral Resource and Reserve estimates as derived.

Harmony: The resource estimation process at all of the underground operations is based on surface drilling, underground drilling and underground channel sampling. Unless cropping out the reefs are initially explored by drilling from surface on regular 500m to 2,000m grids. Once underground access is available, infill development drilling may be undertaken from access haulages and cross-cuts to provide a 30m by 60m grid of intersections. Evaluation is then by extrapolation from or interpolation between stoping and development sampling.

In the case of surface drillholes, the core is halved using a diamond saw, one-half is retained as a geological record and one-half is assayed. For underground drillholes, the core diameter is considered to be too small to allow the core to be split and to yield a sufficiently large sample to allow assaying and, in this instance, the entire core is assayed.

Within the underground workings, exposures of the reef are channel sampled. Individual channels are cut from the wall rocks using a hammer and chisel or diamond saw and the cuttings are caught using steel pans. A detailed sampling record is kept showing the reef geometry at each section.

Current channel sampling standards comprise development sampling at 2m intervals and stope face sampling at 5m intervals. Channels are defined perpendicular to the reef plane and individual sample lengths of 10cm to 30cm are taken to reflect the internal geometry of the reef. The sample size collected is in the order of 0.3kg. Two adjacent samples spanning the footwall contact may be taken in order to double the sample volume of this part of the reef that frequently contains the highest grades. This is important where the reef is `bottom-loaded', providing more confidence in the high-grade values at the footwall contact.

The Evander and West Wits operations use private assay laboratories. All other operations rely on mine owned and managed laboratories.

Two different assaying techniques are utilised at the Mining Assets. The Aztec Analysis is an automated technique for analysing underground chip samples using non-destructive energy dispersive X-Ray analysis ("EDAX") that gives rapid quantitative analyses for gold and uranium. Check assaying is carried out on a proportion of the samples, which are analysed by fire assay with gravimetric finish. The fire assay method is used for the analysis of reef and waste dump samples as well as for checking Aztec analysis results. The samples are dried, sorted, crushed and pulverised then approximately 180g flux is used for a 50g-sample aliquot. A gravimetric finish is used for reef samples and atomic absorption finish is used for waste samples.

As part of Quality Control and Quality Assurance procedures checks are conducted on the assay laboratories and sample preparation plants. Blank samples and repeat assays are part of the external check process undertaken regularly which ensures that the laboratory adheres to assaying standards and procedures.

In SRK's opinion, the long mining history and the quantity and quality of data upon which the Mineral Resource estimates at the Mining Assets are based, is sufficient to support the Mineral Resource and Mineral Reserve estimates as derived. All of the current operations comprise mature operating BUs and consequently Mineral Resource and Mineral Reserve estimates are based largely on underground stope development and pillar sampling.

The Companies are in the process of rationalising and updating their mining software systems. Currently a mixture of computer systems are being used for survey pegs, sampling data, measuring, geological structure, facies, geozones, ore reserve management and mine planning. These systems comprise different versions of commercial packages and proprietary systems. The proprietary systems are being phased out (for support reasons) in favour of the commercial products.

The majority of the Mining Assets have their sampling data in digital format. MS Excel spreadsheets are used for Mineral Reserve and Mineral Resource data management. Specifically "Optimiser" which is used to calculate optimum grade cut-off and "CLS" which is used to generate Mineral Resource and Reserve statements.

At Free Gold Operations, Joel uses a newly established computerised system, utilising a mining software package allowing the completion of all blocking, statistics, geostatistics and grade and tonnage estimation in a fully integrated evaluation system. This system is currently being developed and managed centrally with specialised support staff. Bambanani BU, West BU, Tshepong BU and Phakisa BU use more established 2D CAD computer systems, which

have been developed to suit the tabular nature of the Witwatersrand gold deposits. At all these operations all survey data and sampling information is captured digitally and stored in electronic database.

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4.3.2
Orebody and Block Definition
Avgold: At Target Mine a computerised three-dimensional geological model of the reefs and interbedded quartzites has been developed using stratigraphic correlation between the boreholes. Underground geological mapping and high-resolution seismic surveys are also used to supplement the stratigraphic and structural data from the drilling. This enables the reef and quartzite models to be truncated against faults and dyke contacts maintaining the three-dimension volume integrity of the model.
The geological model is subsequently used to constrain a block model into which grades are interpolated. This model utilises a block size of 20m along strike, 10m normal to strike and 5m vertically. Volume integrity is maintained through the use of 2m by 1m by 1m sub-cells, which are assigned the grade of the parent block.
At Target North and Oribi the geometry of the orebodies is difficult to interpret with a high-level of confidence given the relative sparsity of the reef intersections from the surface boreholes. The Mineral Resources are as such appropriately classified as either Indicated or Inferred. Fans similar in geometry to the Eldorado Fan at Target Mine have therefore been postulated to exist at reasonable north- south intervals. The characteristics and geometry of this fan together with the borehole intersections have been used to define the limits of the Elsburgs and Dreyerskuil Reef orebodies.
For the Big Pebble Reefs the syncline has been sub-divided into four zones from west to east to account for the separation of the distal reefs. This enables the resource estimation process to account for the probability that in the west the reefs would be mined in a single cut, while in the east the reefs would be mined individually in separate cuts.
In the case of the VCR the geological models have been based solely on the coverage of the surface borehole intersections on that reef.
The geological models developed as described above have been used as the basis of two-dimensional resource polygons constrained by surface borehole coverage and the regional structural model for each reef or reef package.
Where more information is available at Loraine and immediately to the north of Target Mine, computerised three-dimensional geological models of the reefs and interbedded quartzites or total reef packages have been developed using stratigraphic correlation between the boreholes and underground mapping if available. In these cases the three-dimensional models have been used to constrain a block model into which grades are interpolated as at Target Mine.
Harmony: Once the geological structure of an area and reef have been defined, the resource is blocked out on 2-D plan projections using major geological features such as faults, facies boundaries, channel structures and payshoots to define zones of homogeneity. These initial macro- scale blocks are referred to as `geozones'.
Mining blocks are determined once the geozones have been defined. Stoping is blocked out per panel in 30m mining blocks; development will be blocked out for 10m. Major geological features such as faults, facies boundaries and payshoots are used to define zones of homogeneity and to terminate blocks. In some circumstances, the intersection line between the reef and a certain access elevation (e.g. a mine level) may also be used.
The geozones are used to define and separate data populations within the sampling database for further statistical and geostatistical studies. Once geozones and mining blocks have been defined they are digitised for use in computer-aided grade and tonnage evaluation.
4.3.3
Grade and Tonnage Estimation
Avgold: At Target Mine the assay data for each reef have been analysed statistically following the production of reef composites using the geological model. The reef grade populations exhibit positively skewed distributions therefore the cutting of high-grades has been applied to the dataset prior to grade estimation in order to limit the influence of these high grades. The individual reefs within the reef packages demonstrate variable statistical characteristics supporting their evaluation as separate entities.
The cut composites have been subject to geostatistical spatial analyses using semi-variograms calculated in a best-fit plane for the reefs. These analyses indicate the presence of two structures with minor ranges in the order of 40m to 100m and major ranges from 100m to 200m. A nugget effect of 20% has been modelled. As with the statistical

characteristics the individual reefs display marked geostatistical differences in range and anisotropy.

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Grade has been directly interpolated into the blocks by means of ordinary kriging using parameters derived from the semi-variogram analyses. Each individual reef horizon has been separately estimated. The search parameters in the plane of the reef correspond closely to the semi-variogram ranges. The search normal to the reef plane varies between 50m and 80m in order to accommodate the throw of the faults and the synclinal structure of the fan. A second longer range kriging run has been used to interpolate grades into peripheral blocks not assigned a grade by the initial run. Grade has also been interpolated into the intervening quartzite horizons in order to assess the diluting grade of this material when it is incorporated as internal dilution into the massive stopes.

In the case of the two-dimensional resource estimates the declustered gold accumulation data which falls within each resource polygon are plotted on a log-normal probability plot. If deemed necessary a third constant beta parameter is estimated and a three parameter log-normal distribution assumed. If necessary using the log-probability plots any high outliers are then cut to fit the distribution. The gold accumulation estimate (cmg/t) is then derived for each resource polygon using the lower value of the arithmetic mean and sichel `t' estimate.

In the case of the three-dimensional models at Loraine and Target North a similar methodology is used as at Target Mine. However, due to the sparser nature of the data, grade is interpolated into the blocks by means of a sichel `t' estimate using search radii derived from the variography of each reef horizon. In the case of Target North the semi-variograms used at Target Mine form the basis of the search radii, while at Loraine semi-variograms have been modelled using the limited underground chip sampling available (although this is not used in the estimation itself). A minimum of three samples is required for the block to be estimated. As at Target Mine, a second longer range run is used to interpolate grades into peripheral blocks not assigned a grade by the initial run.

For the two-dimensional polygons an average dip for the steeper west limb and shallower east limb of the syncline has been estimated, together with a proportional split between the two, from cross- sections to derive a true reef area for each polygon. The arithmetic mean of the declustered data is used to derive an average thickness and therefore a volume. If the thickness is below 100cm a minimum mining width of 100cm is used in this process.

Tonnage estimates are derived through the application of tonnage factors for each reef package as follows:

- Elsburg: 2.70t/m
3
;
- Dreyerskuil: 2.76t/m
3
;
- Big Pebble/Kimberley: 2.73t/m
3
; and
- VCR: 2.70t/m
3
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As the small-scale structure in the Target North, Loraine and Oribi is not as well-known as at Target Mine and the estimates are based on two-dimensional models, a 10% tonnage discount factor has been applied to all resources in these areas to account for reef losses.

Harmony: Resource estimation techniques at the Mining Assets follow the same basic principles; however different computer software packages are employed.

At Kudu & Sable BU, Nyala BU, Eland BU and St. Helena BU data capture and estimation is paper based.

Where data is captured digitally each mine uses its defined geozones to sub-divide the reef data into discrete populations that have distinct grade distribution characteristics. Statistical analyses of the metal accumulation values are undertaken so as to substantiate the different grade populations in each domain. The data will often be log transformed to allow a lognormal or compound lognormal model to be applied. In some cases other parameters such as channel width and stope width will be analysed, to look for trends that could be investigated further with

geostatistics.

Data are checked and validated and any extreme values investigated to ensure there are no transcription errors. Despiking and grade cutting techniques are used on some of the secondary reef data to assist with further statistical and geostatistical studies.

Point variograms are calculated and modelled from underground channel sample metal accumulation values (and borehole data) for each domain. The data generally provide well-structured, two component spherical variograms with high nugget effects (50% to 80%) and ranges of 10m to 20m and 60m to 90m, these variograms are usually isotropic. This indicates a high random variability in sample grades and an underlying spatial control on sample grades whose zone of influence extends for up to 90m in all directions.

Further variography is carried out on data to be used in the macro-kriging process. These data are used to construct variograms comprising regularised channel sample data, diamond drillhole intersections and underground drillhole intersections.

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The variograms from these datasets provide a larger scale control on block grade estimation. The large-block regularised data tends to give excellent structure with little or no nugget effect and produces larger ranges, which can exceed 1,500m.

At Tshepong BU, Phakisa BU, Bambanani BU and West BU kriging is undertaken separately for each geostatistical domain. Channel sample data is used to estimate grade into 10m by 10m blocks using ordinary kriging based on the point variograms and a search radius equivalent to the short range in the variograms. Only those blocks with a high statistical confidence (regression slope greater than 0.6) are evaluated by this method.

Next, 30m by 30m blocks are used to house values generated by a simple kriging process which incorporates the local area mean (based on the ordinary kriged values) into the estimate and therefore smoothes data more than the ordinary kriging, but gives more confidence to the kriged values in those blocks which were not estimated by the ordinary kriging process. The search radius used is approximately 30m and therefore restricts the 30m by 30m block estimates to the vicinity of well- sampled areas. Again, only those blocks with a high statistical confidence within a 3-by-3 neighbourhood search range are evaluated by this method.

A third method is used to extrapolate grades much further using the large-block regularised channel sample data and incorporating the diamond drillhole intersection data which is more dispersed. This kriging is based on 250m by 250m blocks and a large search radius. The data is then co-kriged. The blocks from each of the three block models are combined so as to result in high confidence estimates in the vicinity of the channel sampling using 10m by 10m and 30m by 30m blocks which contribute to the Measured Resource and well founded long range estimates which contribute to the Indicated and Inferred Resource.

The kriging technique utilised by Harmony and Joel BU differs to that stated above. Three prototype block models are created prior to grade estimation, a 15m by 15m Measured model, a 30m by 30m Indicated model and a 60m by 60m Inferred model. The kriged estimates of the Measured model are restricted by the range of the semi-variogram and including a minimum of 15 sample points within the search radius. The kriged estimates of the Indicated model are restricted by two times the range with a minimum of two sample points. In general the sichel `t' estimate technique and application of calculated additive constants is used for estimation of the Inferred model. The three grade models are then combined to form one overall grade model. Channel widths are also estimated using the same technique.

Resource blocks are assigned grades from the block models using the respective software packages. Resource blocks are kept as an inventory listing with several attributes recorded for each. Availability and status record whether or not the ground has been abandoned, whether the area is currently accessible and the time required accessing a currently inaccessible area.

Each block is assigned a stoping width, which is based on the expected mining width in virgin ground, or otherwise the stoping widths encountered historically in the vicinity of that block which accounts for the hangingwall dilution often incurred at these mines. In addition, the square metres of the block are corrected for dip and discounted for fault losses on the basis of previously encountered factors and incorporating the results of a fractal analysis of fault frequency and displacement. The volume described by the resultant square metres and the stoping width is multiplied by the respective tonnes per cubic metre in order to estimate the block tonnage.

Harmony's Welkom and Orkney Operations, Eland BU, Kudu & Sable BU, Nyala BU and St. Helena BU do not use a computerised system for resource and reserve estimation. The Eland BU shaft pillar has been kriged using 30m by 30m blocks, using separate runs for each of the two facies identified in that area, namely the Geduld and the BCF. All other areas are estimated using either a weighting method or simple stretch averages. These methods are considered to be adequate given the high pillar content of the resource and therefore the high density of samples available. The virgin areas at Nyala BU have been estimated using a value contour technique.

Block listing data is generally managed using MS Excel, using company template spreadsheets that perform simple calculations and present data in common formats.

4.3.4

Classification

Avgold: The individual resource blocks have been classified on a block by block basis as Measured, Indicated or Inferred as defined by the SAMREC Code. At Target Mine blocks are classified as Measured Resources where the

drillhole spacing is less than that which equates to the point on the semi-variograms where the variance is two-thirds of the total sample variance. Indicated Resources extend beyond the Measured Resource to include all those remaining blocks estimated by the first interpolation run. Inferred Resources comprise blocks estimated by the second longer range interpolation run and also resource areas with very limited sample data.

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At Target North and Loraine where the resources have been modelled in three-dimensions Indicated Resources are defined as those blocks into which grade is interpolated in the first estimation run and Inferred Resources are defined as those blocks estimated by the second longer range interpolation run.

In the case of the resources modelled in two-dimensions the resource polygons, and therefore the basis of the classification, have generally been delineated based on borehole coverage. Indicated Resources are broadly defined as those blocks containing a reasonable coverage of surface borehole intersections (usually a minimum of 10 intersections on a minimum approximate borehole grid spacing of 1km). Inferred Resources are those containing fewer intersections and where the continuity of blocks has been inferred using geological interpretation to major structural features. The Inferred Resources are therefore generally situated in the far north of Target North and at Oribi or closer to Target Mine on reefs that have not been intersected by many surface boreholes.

SRK considers that given the quantity and quality of the sample data available, together with the grade and tonnage estimation methodology applied, the classification applied by Avgold is appropriate and in accordance with the SAMREC Code.

Harmony: The individual resource blocks have been classified as Measured, Indicated or Inferred as defined by the SAMREC Code.

Where paper estimation methods are employed resource blocks that are adjacent to sampled developments, including current production and ongoing sampling, are classified as Measured. Blocks that are generally close to sampled developments, but are themselves usually sampled by only a few underground drillholes, are classified as Indicated. The remaining blocks, remote from underground developments where the estimation of tonnage and grade is based upon extrapolation of known geological features such as payshoots/channels as well as faults, are thus classified as Inferred.

Classification of Indicated and Inferred Mineral Resources at Tshepong BU and Phakisa BU is based on the kriging variance applied to the resource block. This is used to derive percentage values, which represent the maximum theoretical difference between the estimated grade and the actual grade of a block at 95% confidence. The limit of the Measured blocks is determined by the extent of the simple kriged 30m by 30m blocks.

Harmony Freestate Operations, Joel BU, Bambanani BU, West BU, West Wits Operations and Evander Operations classify resource blocks based on the following criteria. Measured Mineral Resources are blocked out to 30m or against structures and payshoots and are adjacent to sampled stoping. Indicated Mineral Resources are blocked out to 60m from sampled stoping and within geozones. Inferred Mineral Resources are within large blocks defined by facies, structure and the mining lease boundaries.

SRK considers the Harmony interpretation of the Indicated and Inferred classification boundary to be conservative relative to the approach used at other Witwatersrand deep level gold operations. This has particular impact where an operation has large areas of Inferred Mineral Resources, which are structurally simple and have high payability, such as Joel BU, Bambanani BU, Elandsrand BU and Evander Operations. As the SAMREC Code states that Inferred Mineral Resources cannot be converted into Mineral Reserves this approach may in turn lead to conservative estimates of the Mineral Reserve at these operations.

4.3.5

Selective Mining Units

Avgold: Theoretically the minimum selective mining unit ("SMU") applied at Target Mine is the individual 20m by 10m by 5m blocks used for the grade estimation. However, in practice the reserve is defined through the superimposition of practical stope designs on the block model. While the individual blocks are used to determine the margins of these stopes they are not planned to be mined in isolation but rather as aggregations of blocks within the stope design.

Harmony: The choice of SMU is dependent upon the mining method to be applied. In the case of narrow reef mining used at the Mining Assets, the SMU is an agglomeration of contiguous panels, each of dimension 30m by 30m. For practical reasons at this block size, mining of both pay and unpay material is unavoidable and the halting of stope faces is only triggered by unacceptably high levels of unpay ore being mined.

For remnant extraction, the pillar dimensions define the SMU. Due to the relatively small volumetric size of such remnant and/or pillar area, the sampling density available from previous mining activities facilitates a high degree of confidence for grade estimation.

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4.3.6
Grade Control and Reconciliation
Avgold: Grade control practices at Target Mine are based on the results of development chip sampling and underground infill drilling and are used primarily to aid stope definition especially in areas where the fan drilling has resulted in larger spaced sample coverage. In the areas where conventional narrow reef mining methods are applied such as in the Dreyerskuil reefs, stope face sampling and surveying is undertaken as is standard practice on other Witwatersrand mines. In the massive Elsburg stopes a cavity monitoring system is employed which assess the degree of stope overbreak and resulting dilution. Hoisted grade is reconciled back to the mined grade to derive a Shaft Call Factor ("SCF"). The grade reported by the mill is compared to the hoisted grade to derive a Plant Call Factor ("PCF"). These two factors are then combined to derive a Mine Call Factor ("MCF"). Over the last 11 months the MCF has been in excess of 100%.
SRK considers the grade control and reconciliation practices employed at Target Mine to be appropriate for the nature of the orebody and mining methods employed. The high mine call factor may well be a function of underestimation of the grade in the higher-grade proximal areas of the Eldorado fan as a result of the smoothing inherent in the grade interpolation procedure. In SRK's opinion this is likely to reduce over time as mining progresses to lower grade, more distal areas.
Harmony: Grade control and reconciliation practices follow similar procedures to those applied elsewhere in Witwatersrand Basin gold mining operations. The reefs and the hangingwall and footwall lithologies are visually identifiable and channel sampling ensures that the face grade is monitored accordingly. As part of the reconciliation exercises, physical factors, including stope widths, dilution, MCFs and Block Factors ("BF"s) are monitored and recorded on a monthly basis. The results are used to reconcile Mineral Reserve estimates with actual mined tonnages and grades.
As stopes are mined, surveyors monitor the stope width and face advance to provide an accurate stope tonnage estimate. The channel samples taken within the stope are reconciled against the pre- mining grade estimate based on the kriging described above. The difference in gold metal is recorded as a BF, which is a combination of bias in the resource estimate and mining losses. BFs tend to approximate 100% and accordingly no further adjustment has been made.
Belt samplers at the shaft head also record grade and tonnage. These figures are compared back to the surveyed estimates on a monthly basis to give a SCF, which multiplied with the PCF gives the MCF. Generally SRK consider that the underlying grade control and reconciliation processes are appropriate and do not materially affect the underlying Mineral Resource estimates as presented herein.
4.3.7
Reserve Estimation
Avgold: The Mineral Resources at Target Mine together with the survey outlines of the existing stopes, excavations and development tunnels form the basis of the engineering design of the Mineral Reserves. The Mineral Reserves are based on the Measured and Indicated Resources that exceed a cut-off grade ("CoG"), that is determined for each mining method, have been the subject of engineering design and have consequently been classified into Proved and Probable Reserves.
Datamine is used for all GIS and 3-D modelling of the orebody outlines and stope design at Target Mine and the survey outlines are imported from StopeCAD. In terms of the mechanised section a mining method is assigned to a particular area of ground within a block and the design parameters applicable to the method are used as a basis for developing the stope outline. The stope design considers aspects such as maximum drill hole length, the angle of repose, location of drill drive and loading drive as well as backfill, ventilation and equipment resource constraints. The stope outline may in places not be coincident with the orebody outline and result in planned dilution and/or ore losses. Internal waste between reef packages is also incorporated into the stope design where necessary. Once the design is complete the material contained within the stope outline becomes an Engineered Resource and subsequent to the application of further factors associated with un-planned dilution and ore loss with for the Mineral Reserve. The Narrow Reef Mining ("NRM") reserves are determined in a similar but simpler manner in that an appropriate stoping

width is selected and the planned dilution represents the difference between this width and the channel width of the Mineral Resource.

A portion of the Inferred Resources has been modified to form the not in reserve ("NIR") category of material contained in the latter years of the LoM plan.

Harmony: The procedure for estimating Mineral Reserves involves the definition of appropriate SMU's, the application of appropriate survey factors based on tonnage, volume and grade reconciliation exercises, the use of cut-off-grade policies and technical-economic investigations leading through to the development of an appropriately detailed and engineered LoM plan.

Tables 4.1 through to 4.6 give the various mine planning parameters utilised in the derivation of cut-off-grades and the modification of Mineral Resources to Mineral Reserves for each mine separately.

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All factors relate solely to underground resources and primarily utilise BF, MCF, Stoping Width ("SW") and Milling Width ("MW"). The BF is a correction factor used to account for historical variance between the in-situ estimate of the mining block and the average block grade post-sampling during block depletion. The MCF is the estimated historical discrepancy between the gold estimated to have been broken from the stoping faces to that back allocated post-metallurgical metal accounting as received at the plant as a head grade. The SW is the average in-stope mining width achieved during extraction. Finally the MW is estimated as the total tonnage delivered to the plant from underground divided into the total stope area depleted over the same period. The difference between MW and SW expressed as a ratio to MW is the measure of dilution. Surface sources are processed directly and are generally not screened. As such no modifying factors are applicable for conversion to RoM grades. BUs that supply RoM material to the same metallurgical plant are assigned the same Metallurgical Recovery Factor ("MRF").

The modifying factors as given below are based on historical reconciliation exercises and as such are considered valid for the purpose of reporting Mineral Reserves for the Mining Assets. The seemingly large range in certain modifying factors is as a result of mining several different reef types and under different operating conditions combining virgin ground, remnant pillars and delivering ore to one or a selection of processing plants. The factors are determined by historical records over significant period of time. For new projects, factors have been selected on the basis of comparable operations working the same reefs.

Table 4.1 Target Operations - Target Mine: Assumed Modifying Factors

Business Units
BF
MCF
(1)
Un-planned
Un-planned
Dilutant
Stope
Development
Grade
Dilution
Dilution
(%)
(%)
(%)
(%)
(g/t)
Target
100
93.6
7
10
0
(1)

A certain quantity of dilution and ore loss is contained within the stope outlines and is not quantified. The dilution and MCF reflected above represent an allowance for additional dilution and ore loss respectively.

Table 4.2 Free Gold Operations: Assumed Modifying Factors

Business Units
BF
MCF
SW

MW (%)	(%)	(cm)	(cm)
Tshepong BU			
100	88	102	143
Phakisa BU			
100	88	102	143
Bambanani BU			
100	72	151	233
West BU			
100	72	160	188
Eland BU			
100	73	141	209
Kudu & Sable BU			
100	73	167	214
Nyala BU			
100	80	134	155
St. Helena BU			
100	68	137	177
Joel BU			
100	84	139	167

Table 4.3 Harmony Free State Operations: Assumed Modifying Factors

Business Units	**BF**	**MCF**	**SW**	**MW**
	(%)	**(%)**	**(cm)**	**(cm)**
Harmony No.2 BU	100	77	178	188
Harmony No.3 BU	100	na	na	na
Harmony No.4 BU	100	na	na	na
Merriespruit No.1 BU	100	72	164	188
Merriespruit No.3 BU	100	71	202	217
Virginia No.2 BU	100	na	na	na
Unisel BU	100	77	179	236
Saaiplaas No.3 BU	100	78	158	175
Brand No.2 BU	100			

na
na
na
Brand No.3 BU
100
78
193
223
Brand No.5 BU
100
78
201
265
Masimong No.4 BU
100
78
139
179
Masimong No.5 BU
100
78
131
168

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Table 4.4 Welkom Operations: Assumed Modifying Factors
Business Units
BF
MCF
SW
MW
(%)
(%)
(cm)
(cm)
No.1 BU
100
64
119
140
No.2 BU
100
64
140
154
No.3 BU
100
70
151
253
No.4 BU
100
60
150
158
No.6 BU
100
65
130
217
No.7 BU
100
75
150
189
Table 4.5 West Wits Operations: Assumed Modifying Factors
Business Units
BF
MCF
SW
MW
(%)
(%)

(cm)
(cm)
Elandsrand BU
100
87
126
152
Deelkraal BU
100
93
170
227
Cooke 1 BU
100
83
172
205
Cooke 2 BU
100
72
144
177
Cooke 3 BU
100
73
159
195
Randfontein No.4 BU
100
na
na
na
Doornkop BU
100
93
244
366

Table 4.6 Evander Operations: Assumed Modifying Factors

Business Units
BF
MCF
SW
MW
(%)
(%)
(cm)
(cm)
No.2 BU
100
75
162

209
No.5 BU
100
75
111
177
No.7 BU
100
75
135
217
No.8 BU
100
70
120
160
No.9 BU
100
65
116
163

Table 4.7 Orkney Operations: Assumed Modifying Factors

Business Units	**BF**	**MCF**	**SW**	**MW**
	(%)	**(%)**	**(cm)**	**(cm)**
No.2 BU	100	85	164	210
No.3 BU	100	84	200	210
No.4 BU	100	78	120	181
No.6 BU	100	84	154	193

No.7 BU
100
91
112
152
4.4
International Deposits: Mineral Resource and Mineral Reserve Estimation Methodologies
The International Operations in Australia and Canada principally focus on small and shallow orebodies and orezones where the gold is hosted by banded iron formations and quartz veins are steeply dipping. The Mineral Resource and Mineral Reserve estimation methodology is similar at these operations and it is therefore not described separately. It should be noted that the procedures and methodologies discussed below are current only for the Harmony Australian Operations as Bisset, the only asset of Harmony's Canadian Operations, is currently on care and maintenance.
4.4.1
Quality and Quantity of Data
A large quantity of data exists at the various operations that comprise a combination of historic and current drilling and sampling data. Drilling and sampling methods include open-hole, reverse circulation, diamond drilling, face and stockpile sampling. Limited information is available on historic quality assurance and quality control procedures and Harmony employs ongoing data validation procedures when completing the geological modelling and resource estimation. A check analysis is performed for every 20 sludge holes drilled. All current sampling takes place under geological control and, where applicable, older geological codes are converted to newer codes.

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4.4.2
Orebody Definition
At the underground operations detailed underground geological and structural mapping is undertaken that forms the basis for geological modelling, the understanding of the ore genesis and the mapping of gaps within the sub-vertical oreshoots. In the open pits, results from reverse circulation, diamond and earlier open-hole (if available) drilling are used to define geological wire-frames and grade shells that conform to the geological boundaries. As a standard, the reverse circulation and diamond drilling is composited to standard 1m or 2m lengths. Top-cutting of grades is used as a standard.
4.4.3
Grade and Tonnage Estimation
Mineral Resource estimation procedures are based on ordinary kriging or inverse distance methods. When using inverse distance methods for open pits inverse distance squared or inverse distance cubed weightings are used. The block models are based on information from different sampling and drilling support without extensive QA/QC control and monitoring. Where applicable, the search neighbourhoods for the inverse distance methods are based on the results of geological modelling.
In the open pit mines, optimised pit outlines are designed around the resource block models. In many of the orebodies there is a significant nugget effect and dense sampling grids are required to estimate resources with a high degree of confidence and the search neighbourhoods employed during estimation are therefore of critical importance.
Tonnage modelling is based on average dry bulk density values that are, in places, based on a limited number of samples but have shown to be realistic when compared to density values obtained from mining reconciliation between underground and open pits.
Mineral Resource models for many of the underground orebodies are not based on block models but on the projection of historical averages. At a number of the underground mines there is history of a large variation in the thickness of the undulating sub-vertical oreshoots in the vertical plane that is difficult to predict from the available drillhole spacing. It has been found that, in these cases, the downward projection of the average mine tonnages and grades obtained from extensive current mine development is more appropriate than generating a block model. In terms of the projection of tonnages, gaps in the mineralisation identified by geological mapping of current mine development, are taken into account in the model. SRK concurs that, at this stage, the method of downward plunge projection of tonnage and grade from well developed mine production levels provides the best method for resource modelling for the deeper portions of the mines.
4.4.4
Grade Control and Reconciliation
Grade control drilling in the open pits consists of angled reverse circulation drilling and takes place at different drillhole spacing, locally down to a spacing of 5m by 5m. Reconciliation in the open pits is carried out on each pit level and compared with grade control drilling or sampling. Channel samples are taken and used as the basis of grade control and reconciliation at the underground operations whilst grab samples are taken at the surface stockpiles.
Reconciliation between production data and block models shows that tonnages and grade reconcile reasonably well over longer periods. However, on a local scale over short time periods there are significant deviations in the reconciliations, which is usual for inverse distance weighting estimation. The production results from open pits is also compared with the grade from the upper underground levels (where possible) and confirms the average gold grades indicated by the available sampling data.
4.4.5
Reserve Estimation
In the underground mines, resources are converted to reserves by designing stopes on a panel-by- panel basis using different cut-off-grades, determining a practical extraction and adding a percentage for mining dilution. Stopes and development outlines are designed using computerised mine design software. Cross-sections, long-sections and plans are generated as required that reflect a combination of drilling results, assays and geology and interpretations and are used to reflect the stopes, development ends and Mineral Reserves.

In the open pit mines, an optimised pit outline is developed to represent the economically extractable reserves. The Mineral Resources are derived from engineered pit designs, based on the optimal pit outlines.

4.5

Mineral Resource and Mineral Reserve Statements

The Mineral Reserves quoted are sensitive to changing operating costs and gold price. Tables within each sub- section show the Mineral Reserves at eight different gold prices including the Base Case. These sensitivities are presented to give an indication of the changes relative to gold price. SRK has shown a range that relates the extremes in gold price (hence in-situ cut-off grades appropriate to satisfy the context of "potentially

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economically viable") over the past few years and into the future and to give an indication of the gold price required to report resources equivalent to 250cmg.t as per Harmony's Annual Report. In this way SRK does not consider the range to reflect the dynamics of international currency exchange and fluctuations in dollar based gold price.

Note that these sensitivities are approximations only and accordingly at different gold prices alternative mining strategies may be pursued to exploit payable material in a more optimal manner. In turn, these may also affect the operating cost structure and cut-off-grades owing to changes in scale of operation, reflecting the dynamic nature of the mining process.

At Target Mine the impact on the Mineral Reserve of different gold prices is not presented due to the complex, interactive mine planning methodology.

The Mineral Resource and Mineral Reserve statements as presented herein differ from those generated by the Companies due to the following:

-

the Companies present Mineral Resources for the South African assets at an in-situ cut-off-grade of 250cmg/t or between 0g/t and 3g/t. SRK has reported Mineral Resources at in-situ cut-off-grades which are reflective of current macro-economic and specific technical-economic parameters at each of the individual BUs;

-

SRK has adjusted the Companies Mineral Resource and Mineral Reserve Statements for depletion that has occurred during the six-months that have elapsed since their respective generation. The statements presented herein are dated 1 January 2004; and

-

Mineral Reserve statements include only Measured and Indicated Mineral Resources modified to produce Mineral Reserves and planned for extraction as projected in the respective LoM plans.

In considering the Mineral Resource and Mineral Reserve statements SRK note the following:

-

with respect to the classification of Mineral Reserves by Harmony SRK considers that at the majority of the South African operations the boundary between Indicated Mineral Resources and Inferred Mineral Resources is conservatively defined and that for primary reef units reclassification could increase Indicated Mineral Resources and potentially the Probable Mineral Reserves;

- the LoM plans in certain instances rely on significant contribution from the Inferred Mineral Resource category and reported at RoM tonnage and grades. Given the generally conservative classification potential exists to significantly increase the Indicated Mineral Resource and consequently the Probable Mineral Reserve. SRK has on a high-level basis determined the relative impact on value should mining operations extract only that material currently defined as Mineral Reserves. This assessment crudely assumes that all Inferred Mineral Resources are depleted in the later part of the respective LoM plans. The resulting NPVs should be viewed on a comparative basis only and by definition reflect a lower level of technical planning than the LoM plans as the base case projections presented by the Companies;
- Mineral Resources classified by the suffix (1) represent those groupings of Mineral Resources which have been used as a base for modification to produce Mineral Reserves or those Inferred Resources which have been modified to produce material included for depletion in the respective LoM plans. Conversion in this instance is dependent upon all modifying factors inclusive of MCF, dilution, extraction and other planning considerations. In certain instances, specifically where groupings of Mineral Resources contain a high portion of remnant pillars, only a relatively small portion of the reported Mineral Resource is currently planned for extraction. Where this is the case such as Free Gold Operations there is an apparent overall low conversion to Mineral Reserves;
- the Mineral Resources not modified to produce Mineral Reserves as defined by the suffix (2), generally include:

.

reef horizons not currently planned to be extracted in the current LoM plans;

.

groupings of pillars and other resource blocks for which insufficient technical work has been completed to allow conversion to Mineral Reserves.

In such instances, opportunity also exists for future modification to Mineral Reserve status. In contrast, risks also exist that further technical assessments may render portions of these Mineral Resources to be excluded from the Mineral Resource base on technical grounds; and

- vamping tonnages and grades are not currently included in the following statements, SRK consider there to be insufficient investigations to base continued contribution at current levels of production and hence warrant inclusion in the Mineral Resource and Mineral Reserve statements as presented herein. This represents further potential for increasing both the Mineral Resource and Mineral Reserve statements; and

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the Mineral Resource statements as presented for Harmony Canada Operations have only been reviewed by SRK on a desk top basis alone. SRK note however, that the operation is currently under care and maintenance with no near term intent to recommence operations.

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4.5.1
Target Operations
Table 4.8 Target Operations: Target Mine - Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
5,190
7.4
1,227
- u/g (1)
5,545
9.4
1,674
Subtotal
5,190
7.4
1,227
Subtotal
5,545
9.4
1,674
Probable
Indicated
- u/g (1)
11,656
6.3
2,374
- u/g (1)
12,910
9.3
3,840
Subtotal
11,656
6.3

2,374
Subtotal
12,910
9.3
3,840
Total Reserves
16,846
6.6
3,601
Total
18,455
9.3
5,514
M+I+Inf in LoM
Inferred
- u/g (1)
3,098
6.4
641
- u/g (1)
6,720
7.5
1,630
- s/f (1)
11,980
0.6
227
Subtotal
3,098
6.4
641
Subtotal
18,700
3.1
1,857
Total in LoM Plan
19,944
6.6
4,242
TOTAL
37,155
6.2
7,371

The impact of different gold prices on the Mineral Reserve is not presented for the Target Mine. Given the number of mining methods employed and the sensitivity of these to changes in mining costs and potential revenues, a significant amount of re-design work would be required to produce the optimum mining layout and hence a Mineral Reserve estimate for each price. Further, given that a very high percentage of the Target Mine Mineral Resource is converted to Mineral Reserve in the current statement, there is limited potential for the Mineral Reserve to increase with a higher gold price, such as that used as the basis of the Mineral Reserve at Harmony. In addition, while any decrease in price would more likely change the ratio between the mining methods employed, and reduce the operating margins, there would again be less of an impact on the Mineral Reserve itself.

Table 4.9 Target Operations: NFSEC - Mineral Resource and Mineral Reserve Statement

Mineral Reserve Category	**Mineral Resource Category**	**Tonnage**	**Grade**	**Gold**	**Tonnage**	**Grade**	**Gold**
		(kt)	**(g/t)**	**(koz)**	**(kt)**	**(g/t)**	**(koz)**
Probable	**Indicated**						
u/g - Loraine							
u/g - Loraine		11,190	6.5	2,338			
u/g - Target North							
u/g - Target North		69,950	7.0	15,676			
Subtotal		**0**	**0.0**	**0**			
Subtotal		**81,140**	**6.9**	**18,015**			
Total Reserves		**0**	**0.0**	**0**			
Total		**81,140**	**6.9**	**18,015**			
M + I + INF in LoM							
	Inferred						
u/g - Target North							
u/g - Target North		52,200	8.4	14,073			
u/g - Oribi							
u/g - Oribi		46,890					

6.5
9,792
Subtotal
0
0.0
0
Subtotal
99,090
7.5
23,865
Total in LoM Plan
0
0.0
0
TOTAL
180,230
7.2
41,880

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4.5.2
Free Gold Operations
Table 4.10 Free Gold Operations: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
15,688
8.1
4,082
- u/g (1)
26,252
12.9
10,930
- u/g (2)
507
11.0
179
- s/f (1)
2,687
0.5
43
- s/f (1)
2,694
0.5
44
Subtotal
18,375
7.0
4,125
Subtotal
29,453
11.8
11,153
Probable

Indicated
- u/g (1)
45,101
6.9
10,000
- u/g (1)
63,355
10.5
21,391
- u/g (2)
1,237
7.2
287
- s/f (1)
7,674
0.8
196
- s/f (1)
10,095
0.7
233
Subtotal
52,775
6.0
10,196
Subtotal
74,688
9.1
21,911
Total Reserves
71,150
6.3
14,321
Total
104,141
9.9
33,064
M+I+Inf in LoM
- u/g (1)
7,456
6.5
1,566
- u/g (1)
122,126
9.1
35,551
- u/g (2)
83,508
4.8
12,987
Subtotal

7,456
6.5
1,566
Subtotal
205,634
7.3
48,538
Total in LoM Plan
78,605
6.3
15,887
TOTAL
309,774
8.2
81,602

In addition to the stated Mineral Resources and Mineral Reserves, over the LoM period Free Gold Operations plan to deliver to the plant some 892kt of material recovered from vamping operations at an average grade of 4.5g/t. This material is included in the LoM plan projections, however has not been classified as either Mineral Resources or Mineral Reserves.

Table 4.11 summarises the sensitivity of the Mineral Resources and Mineral Reserves at a range of gold prices. The results exclude the material projected from vamping operations.

Table 4.11 Free Gold Operations: Mineral Resource, Mineral Reserve and LoM plan Sensitivity

Gold Price
(ZAR/kg)
46,500
69,750
93,000 116,250 139,500 186,000
232,500
279,000
Mineral Resources - Total
Tonnage
(kt)
94,528
211,691
309,774 363,861
547,743 969,333 1,180,394 1,221,461
Grade
(g/t)
9.1
9.0
8.2
7.6
5.4
3.5
3.1
3.1
Metal
(koz)
27,768
61,478
81,602

88,718
95,662
109,093
118,732
120,957
Mineral Reserves - Total
Tonnage
(kt)
31,880
52,532
71,150
77,356
177,606 343,457
347,242
348,756
Grade
(g/t)
8.7
7.6
6.3
6.0
2.8
1.6
1.6
1.6
Metal
(koz)
8,912
12,752
14,321
14,857
16,178
17,980
18,174
18,237
LoM Plan - Total
Tonnage
(kt)
32,857
57,380
78,605
85,943
187,279 354,446
367,312
369,227
Grade
(g/t)
8.7
7.6
6.3
6.0

3.0
1.7
1.7
1.7
Metal
(koz)
9,196
13,928
15,887
16,551
17,927
19,767
20,193
20,275

120
120
Annexure 7
4.5.3
Harmony Free State Operations
Table 4.12 Harmony Free State Operations: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
11,449
4.6
1,700
- u/g (1)
21,415
7.5
5,180
- u/g (2)
981
7.6
239
- s/f (1)
13,241
0.4
151
- s/f (1)
13,412
0.4
151
Subtotal
24,690
2.3
1,851
Subtotal
35,808
4.8
5,570
Probable

Indicated
- u/g (1)
11,946
4.7
1,792
- u/g (1)
15,413
7.3
3,636
- u/g (2)
174
7.3
41
- s/f (1)
6,003
0.6
114
- s/f (1)
6,080
0.6
114
Subtotal
17,949
3.3
1,906
Subtotal
21,668
5.4
3,791
Total Reserves
42,638
2.7
3,758
Total
57,475
5.1
9,362
M+I+Inf in LoM
- u/g (1)
18,949
4.6
2,774
- u/g (1)
37,980
6.3
7,645
- u/g (2)
22,423
6.0
4,348
Subtotal

18,949
4.6
2,774
Subtotal
60,403
6.2
11,992
Total in LoM Plan
61,587
3.3
6,532
TOTAL
117,878
5.6
21,354

In addition to the stated Mineral Resources and Mineral Reserves, over the LoM period Harmony Freestate Operations plan to deliver to the plant some 1,431kt of material recovered from vamping operations at an average grade of 3.3g/t. This material is included in the LoM plan projections, however has not been classified as either Mineral Resources or Mineral Reserves.

Table 4.13 summarises the sensitivity of the Mineral Resources and Mineral Reserves at a range of gold prices. The results exclude the material projected from vamping operations.

Table 4.13 Harmony Free State Operations: Mineral Resource, Mineral Reserve and LoM plan Sensitivity

Gold Price (ZAR/kg)
46,500
69,750
93,000 116,250 139,500 186,000
232,500
279,000
Mineral Resources - Total
Tonnage (kt)
5,813
31,499
117,878
191,958 305,413 623,364
791,815
960,722
Grade (g/t)
14.0
7.4
5.6
5.2
4.6
3.3
2.9
2.5
Metal (koz)

2,621
7,488
21,354
32,245
45,410
66,133
73,260
76,741
Mineral Reserves - Total
Tonnage
(kt)
2,281
13,819
42,638
52,838
69,238 159,963
237,340
242,443
Grade
(g/t)
8.0
4.4
2.7
2.7
2.6
1.4
1.1
1.1
Metal
(koz)
584
1,956
3,758
4,537
5,887
7,430
8,434
8,619
LoM Plan - Total
Tonnage
(kt)
2,416
15,976
61,587
92,822 122,596 252,775
337,201
352,822
Grade
(g/t)
8.1
4.5

3.3
3.2
3.5
2.0
1.6
1.6
Metal
(koz)
627
2,295
6,532
9,667
13,620
16,542
17,822
18,310

121
121
Annexure 7
4.5.4
Welkom Operations
Table 4.14 Welkom Operations: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
1,426
4.5
205
- u/g (1)
1,486
9.4
449
- u/g (2)
5,825
9.1
1,700
Subtotal
1,426
4.5
205
Subtotal
7,311
9.1
2,149
Probable
Indicated
- u/g (1)
1,645
3.2
171
- u/g (1)
1,585
5.8

297
- u/g (2)
4,935
7.8
1,232
Subtotal
1,645
3.2
171
Subtotal
6,520
7.3
1,529
Total 3,071
3.8
376
Total
13,831
8.3
3,678
M+I+Inf in LoM Plan
Inferred
- u/g (2)
1,307
7.1
298
Subtotal
0
0.0
0
Subtotal
1,307
7.1
298
Total in LoM Plan
3,071
3.8
376
TOTAL
15,138
8.2
3,975

In addition to the stated Mineral Resources and Mineral Reserves, over the LoM period Welkom Operations plan to deliver to the plant some 97kt of material recovered from vamping operations at an average grade of 4.8g/t. This material is included in the LoM plan projections, however has not been classified as either Mineral Resources or Mineral Reserves.

Table 4.15 summarises the sensitivity of the Mineral Resources and Mineral Reserves at a range of gold prices. The results exclude the material projected from vamping operations.

Table 4.15 Welkom Operations: Mineral Resource, Mineral Reserve and LoM plan Sensitivity

Gold Price
(ZAR/kg)

46,500
69,750
93,000 116,250 139,500 186,000
232,500
279,000
Mineral Resources - Total
Tonnage
(kt)
4,434
9,093
15,138
23,454
46,641
51,774
64,162
78,813
Grade
(g/t)
12.2
9.5
8.2
6.9
5.4
5.1
4.5
3.9
Metal
(koz)
1,741
2,782
3,975
5,167
8,068
8,545
9,232
9,845
Mineral Reserves - Total
Tonnage
(kt)
634
2,153
3,071
3,292
3,446
3,542
3,644
3,653
Grade
(g/t)
5.6
4.2

3.8
3.7
3.6
3.6
3.5
3.5
Metal
(koz)
115
291
376
393
401
405
408
408
LoM Plan - Total
Tonnage
(kt)
634
2,153
3,071
3,292
3,446
3,542
3,644
3,653
Grade
(g/t)
5.6
4.2
3.8
3.7
3.6
3.6
3.5
3.5
Metal
(koz)
115
291
376
393
401
405
408
408

122
122
Annexure 7
4.5.5
West Wits Operations
Table 4.16 West Wits Operations: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
9,686
6.6
2,048
- u/g (1)
12,045
10.5
4,078
- u/g (2)
10,435
9.8
3,288
- s/f (1)
441
2.7
38
- s/f (1)
729
2.4
55
Subtotal
10,127
6.4
2,086
Subtotal
23,208
9.9
7,422
Probable

Indicated
- u/g (1)
14,612
8.1
3,814
- u/g (1)
18,947
11.7
7,143
- u/g (2)
5,540
9.1
1,624
- s/f (1)
2,201
1.1
75
- s/f (1)
5,530
0.8
147
Subtotal
16,812
7.2
3,889
Subtotal
30,016
9.2
8,914
Total Reserves
26,939
6.9
5,974
Total
53,225
9.5
16,336
M+I+Inf in LoM
- u/g (1)
39,814
6.0
7,695
- u/g (1)
66,724
8.3
17,744
- u/g (2)
3,063
4.4
430
Subtotal

39,814
6.0
7,695
Subtotal
69,787
8.1
18,174
Total in LoM Plan
66,754
6.4
13,670
TOTAL
123,012
8.7
34,510

In addition to the stated Mineral Resources and Mineral Reserves, over the LoM period West Wits Operations plan to deliver to the plant some 5,714kt of material recovered from vamping operations at an average grade of 5.2g/t. This material is included in the LoM plan projections, however has not been classified as either Mineral Resources or Mineral Reserves.

Table 4.17 summarises the sensitivity of the Mineral Resources and Mineral Reserves at a range of gold prices. The results exclude the material projected from vamping operations.

Table 4.17 West Wits Operations: Mineral Resource, Mineral Reserve and LoM plan Sensitivity

Gold Price
(ZAR/kg)
46,500
69,750
93,000 116,250 139,500 186,000
232,500
279,000
Mineral Resources - Total
Tonnage
(kt)
23,812
60,825
123,012 362,200
577,241 890,124 1,026,596 1,104,682
Grade
(g/t)
14.9
10.8
8.7
4.6
3.7
2.9
2.8
2.7
Metal
(koz)
11,427
21,167
34,510

53,823
69,218
83,728
91,565
95,851
Mineral Reserves - Total
Tonnage
(kt)
8,695
19,084
26,939
47,766
56,738
65,399
71,807
75,688
Grade
(g/t)
11.0
8.2
6.9
4.5
4.2
3.9
3.7
3.6
Metal
(koz)
3,071
5,042
5,974
6,899
7,708
8,223
8,524
8,666
LoM Plan - Total
Tonnage
(kt)
15,373
35,356
66,754 126,908 179,626 223,788
256,426
269,957
Grade
(g/t)
10.0
7.6
6.4
4.4
3.8

3.4
3.1
3.0
Metal
(koz)
4,928
8,645
13,670
17,905
21,843
24,316
25,942
26,424

123
123
Annexure 7
4.5.6
Evander Operations
Table 4.18 Evander Operations: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
3,112
5.5
550
- u/g (1)
4,102
10.7
1,405
- u/g (2)
854
11.2
307
Subtotal
3,112
5.5
550
Subtotal
4,956
10.7
1,712
Probable
Indicated
- u/g (1)
36,124
7.3
8,471
- u/g (1)
37,159
14.2

16,926
- u/g (2)
12,889
11.4
4,744
- s/f (2)
210,306
0.3
2,257
Subtotal
36,124
7.3
8,471
Subtotal
260,354
2.9
23,927
Total Reserves
39,237
7.2
9,021
Total
265,311
3.0
25,639
M+I+Inf in LoM
- u/g (1)
4,715
5.2
789
- u/g (1)
17,466
9.9
5,532
- u/g (2)
43,337
10.2
14,232
- s/f (2)
1,290
0.3
13
Subtotal
4,715
5.2
789
Subtotal
62,093
9.9
19,777
Total in LoM Plan

43,952
6.9
9,810
TOTAL
327,404
4.3
45,416

Table 4.18 include Mineral Reserves for the Rolspruit Project amounting to 25,951kt at an average grade of 7.9g/t, which is contained in the Probable Reserve category. A final decision to proceed with the Rolspruit Project has not been made and as such the Mineral Reserves and associated capital are excluded from the Evander TEPs, Section 12 and TEMs, Section 13.

In addition to the stated Mineral Resources and Mineral Reserves, over the LoM period Evander Operations plan to deliver to the plant some 1,525kt of material recovered from vamping operations at an average grade of 6.2g/t. This material is included in the LoM plan projections, however has not been classified as either Mineral Resources or Mineral Reserves.

Table 4.19 summarises the sensitivity of the Mineral Resources and Mineral Reserves at a range of gold prices. The results exclude the material projected from vamping operations.

Table 4.19 Evander Operations: Mineral Resource, Mineral Reserve and LoM plan Sensitivity

Gold Price
(ZAR/kg)
46,500
69,750
93,000 116,250 139,500 186,000
232,500
279,000
Mineral Resources - Total
(1)
Tonnage
(kt)
4,770
61,388
327,404
356,976 396,897 435,227
457,581
524,022
Grade
(g/t)
17.4
12.0
4.3
4.4
4.5
4.4
4.4
4.2
Metal
(koz)
2,665
23,627
45,416
51,016

57,172
61,671
64,256
70,294
Mineral Reserves - Total
Tonnage
(kt)
2,632
12,958
39,237
42,651
50,205
59,645
74,519
82,600
Grade
(g/t)
9.0
7.8
7.2
6.8
6.2
5.5
4.8
4.5
Metal
(koz)
761
3,267
9,021
9,355
10,021
10,570
11,529
11,855
LoM Plan - Total
Tonnage
(kt)
3,084
16,191
43,952
53,180
65,241
78,128
94,670
103,439
Grade
(g/t)
8.9
7.4
6.9

6.2
5.5
4.9
4.4
4.1
Metal
(koz)
878
3,877
9,810
10,657
11,624
12,362
13,397
13,749
(1)
Sensitivities include a large contribution of surface sources that influence the collective grade at higher gold prices.

124
124
Annexure 7
4.5.7
Orkney Operations
Table 4.20 Orkney Operations: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
4,457
4.6
653
- u/g (1)
5,712
6.3
1,160
- u/g (2)
17,294
8.4
4,655
Subtotal
4,457
4.6
653
Subtotal
23,005
7.9
5,815
Probable
Indicated
- u/g (1)
1,208
6.0
234
- u/g (1)
1,308
10.2

428
- u/g (2)
95,932
3.6
11,219
Subtotal
1,208
6.0
234
Subtotal
97,240
3.7
11,647
Total Reserves
5,666
4.9
888
Total
120,245
4.5
17,462
M+I+Inf in LoM
- u/g (2)
1,041
8.3
279
Subtotal
0
0.0
0
Subtotal
1,041
8.3
279
Total in LOM Plan
5,666
4.9
888
TOTAL
121,286
4.5
17,740

In addition to the stated Mineral Resources and Mineral Reserves, over the LoM period Orkney Operations plan to deliver to the plant some 90kt of material recovered from vamping operations at an average grade of 3.5g/t. This material is included in the LoM plan projections, however has not been classified as either Mineral Resources or Mineral Reserves.

Table 4.21 summarises the sensitivity of the Mineral Resources and Mineral Reserves at a range of gold prices. The results exclude the material projected from vamping operations.

Table 4.21 Orkney Operations: Mineral Resource, Mineral Reserve and LoM plan Sensitivity

Gold Price
(ZAR/kg)

46,500
69,750
93,000 116,250 139,500 186,000
232,500
279,000
Mineral Resources - Total
Tonnage
(kt)
10,855
38,039
121,286 153,090
210,426 293,081
308,011
334,616
Grade
(g/t)
11.1
7.1
4.5
4.2
3.7
3.4
3.3
3.3
Metal
(koz)
3,872
8,671
17,740
20,577
25,239
32,096
32,999
35,593
Mineral Reserves - Total
Tonnage
(kt)
1,125
3,443
5,666
6,978
16,612
19,779
21,865
24,974
Grade
(g/t)
7.3
5.8
4.9
4.5

2.7
2.5
2.4
2.2
Metal
(koz)
266
642
888
1,001
1,433
1,602
1,685
1,801
LoM Plan - Total
Tonnage
(kt)
1,125
3,443
5,666
6,978
16,612
19,779
21,865
24,974
Grade
(g/t)
7.3
5.8
4.9
4.5
2.7
2.5
2.4
2.2
Metal
(koz)
266
642
888
1,001
1,433
1,602
1,685
1,801

125
125
Annexure 7
4.5.8
Kalgold Operation
Table 4.22 Kalgold Operations
(1)
: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- s/f (1)
994
1.2
38
- s/f (1)
1,113
1.3
45
- o/p (1)
4,986
2.3
365
- o/p (1)
12,446
2.1
843
- o/p (2)
11,334
1.1
413
Subtotal
5,980
2.1
403
Subtotal
24,893
1.6

1,301
Probable
Indicated
- o/p (2)
4,485
1.5
217
Subtotal
0
0.0
0
Subtotal
4,485
1.5
217
Total Reserves
5,980
2.1
403
Total
29,378
1.6
1,518
M+I+Inf in LoM
- o/p (2)
14,804
1.8
851
Subtotal
0
0.0
0
Subtotal
14,804
1.8
851
Total in LoM Plan
5,980
2.1
403
TOTAL
44,182
1.7
2,369
(1)
The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.

4.5.9

Harmony Australian Operations

Table 4.23

Harmony Australia Operations - Mt. Magnet & Cue: Mineral Resource and Mineral Reserve Statement

Mineral Reserve Category	**Mineral Resource Category**	**Tonnage**	**Grade**	**Gold**	**Tonnage**	**Grade**	**Gold**
		(kt)	**(g/t)**	**(koz)**	**(kt)**	**(g/t)**	**(koz)**
Proved	**Measured**						
	- u/g (1)	388	4.6	57			
	- u/g (1)	4,035	3.8	499			
	- s/f (1)	1,256	1.0	39			
	- s/f (1)	2,787	1.0	94			
	- o/p (1)	0	0.0	0			
	- o/p (1)	144	2.8	13			
	Subtotal	**1,643**	**1.8**	**96**			
	Subtotal				**6,966**	**2.7**	**606**
Probable	**Indicated**						
	- u/g (1)						

3,413
5.7
624
- u/g (1)
2,114
12.4
846
- s/f (1)
1,027
0.9
31
- s/f (1)
776
1.0
24
- o/p (1)
581
3.2
59
- o/p (1)
16,748
2.3
1,213
Subtotal
5,021
4.4
714
Subtotal
19,638
3.3
2,083
Total Reserves
6,664
3.8
811
Total
26,604
3.1
2,689
M+I+Inf in LoM
- u/g (1)
3,021
6.5
632
- u/g (1)
10,310
5.5
1,834
- o/p (1)
3,918
1.9

243
- o/p (1)
10,798
1.9
663
Subtotal
6,940
3.9
875
Subtotal
21,108
3.7
2,497
Total in LoM Plan
13,604
3.9
1,685
TOTAL
47,712
3.4
5,186

126
126
Annexure 7
Table 4.24
Harmony Australian Operations - South Kalgoorlie: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
664
4.8
102
- u/g (1)
1,041
5.1
172
- s/f (1)
428
0.8
11
- s/f (1)
2,140
1.0
70
- o/p (1)
113
2.0
7
- o/p (1)
2,870
2.4
224
Subtotal
1,205
3.1
120
Subtotal
6,051

2.4
465
Probable
Indicated
- u/g (1)
561
4.3
77
- u/g (1)
1,419
4.1
186
- s/f (1)
0
0.0
0
- s/f (1)
937
0.7
22
- o/p (1)
829
2.5
68
- o/p (1)
33,636
1.7
1,829
Subtotal
1,390
3.2
145
Subtotal
35,992
1.8
2,036
Total Reserves
2,595
3.2
265
Total
42,043
1.9
2,501
M+I+Inf in LoM
Inferred
- u/g (1)
297
4.6
44
- u/g (1)

3,174
3.4
343
- s/f (1)
0
0.0
0
- s/f (1)
176
0.7
4
- o/p (1)
292
1.8
17
- o/p (1)
45,991
1.3
1,888
Subtotal
589
3.2
61
Subtotal
49,341
1.4
2,235
Total in LoM Plan
3,184
3.2
326
TOTAL
91,384
1.6
4,737

4.5.10 Harmony Canadian Operations

Table 4.25 Harmony Canadian Operations: Mineral Resource and Mineral Reserve Statement

Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)

Proved
Measured
- u/g (1)
- u/g (1)
533
7.3
126
Subtotal
Subtotal
533
7.3
126
Probable
Indicated
- u/g (1)
- u/g (1)
755
8.3
202
Subtotal
Subtotal
755
8.3
202
Total Reserves
Total
1,288
7.9
328
M+I+Inf in LoM
Inferred
- u/g (1)
- u/g (1)
817
9.2
241
Subtotal
Subtotal
817
9.2
241
Total in LoM Plan
TOTAL
2,105
8.4
569

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127
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4.5.11 Avgold
Table 4.26 Avgold: Mineral Resource and Mineral Reserve Statement
Mineral Reserve Category
Mineral Resource Category
Tonnage
Grade
Gold
Tonnage
Grade
Gold
(kt)
(g/t)
(koz)
(kt)
(g/t)
(koz)
Proved
Measured
- u/g (1)
5,190
7.4
1,227
- u/g (1)
5,545
9.4
1,674
Subtotal
5,190
7.4
1,227
Subtotal
5,545
9.4
1,674
Probable
Indicated
- u/g (1)
11,656
6.3
2,374
- u/g (1)
12,910
9.3
3,840
- u/g (2)
81,140
6.9
18,015

Subtotal
11,656
6.3
2,374
Subtotal
94,050
7.2
21,855
Total Reserves
16,846
6.6
3,601
Total
99,595
7.3
23,529
M+I+Inf in LoM
Inferred
- u/g (1)
3,098
6.4
641
- u/g (1)
6,720
7.5
1,630
- u/g (2)
99,090
7.5
23,865
- s/f (1)
0
0.0
0
- s/f (1)
11,980
0.6
227
Subtotal
3,098
6.4
641
Subtotal
117,790
6.8
25,722
Total
19,944
6.6
4,242
TOTAL

217,385
7.0
49,251

4.5.12 Harmony

Table 4.27 Harmony: Mineral Resource and Mineral Reserve Statement

Mineral Reserve Category	**Mineral Resource Category**	**Tonnage**	**Grade**	**Gold**	**Tonnage**	**Grade**	**Gold**
		(kt)	**(g/t)**	**(koz)**	**(kt)**	**(g/t)**	**(koz)**
Proved	**Measured**						
		- u/g (1)			46,869	6.2	9,398
		- u/g (1)			76,621	9.7	23,998
		- u/g (2)			35,895	9.0	10,369
		- s/f (1)			19,047	0.5	320
		- s/f (1)			22,875	0.6	459
		- o/p (1)			5,099	2.3	372
		- o/p (1)			15,460	2.2	1,080
		- o/p (2)			11,334		

1.1
413
Subtotal
71,015
4.4
10,090
Subtotal
162,185
7.0
36,319
Probable
Indicated
- u/g (1)
114,610
6.8
25,184
- u/g (1)
142,056
11.2
51,055
- u/g (2)
120,707
4.9
19,147
- s/f (1)
16,904
0.8
416
- s/f (1)
23,418
0.7
540
- s/f (2)
210,306
0.3
2,257
- o/p (1)
1,410
2.8
127
- o/p (1)
50,383
1.9
3,041
- o/p (2)
4,485
1.5
217
Subtotal
132,924
6.0

25,726
Subtotal
551,357
4.3
76,257
Total Reserves
203,939
5.5
35,816
Total
713,541
4.9 112,576
M+I+Inf in LoM
Inferred
- u/g (1)
74,253
5.7
13,500
- u/g (1)
258,597
8.3
68,890
- u/g (2)
154,680
6.5
32,573
- s/f (1)
0
0.0
0
- s/f (1)
176
0.7
4
- s/f (2)
1,290
0.3
13
- o/p (1)
4,210
1.9
260
- o/p (1)
56,789
1.4
2,551
- o/p (2)
14,804
1.8
851
Subtotal

78,463
5.5
13,760
Subtotal
486,335
6.7 104,881
Total
282,401
5.5
49,576
TOTAL
1,199,876
5.6 217,457

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4.6

Mineral Resource and Mineral Reserve Potential

The majority of the deep-level gold operations are mature and other than for re-classification of Inferred and Indicated Mineral Resources together with conversion of Mineral Resources currently classified by suffix (2) to Mineral Reserves, SRK considers there to be limited opportunity for significant increases in Mineral Resources or Mineral Reserves. Some potential does however exist for:

- outlining higher-grade components of areas currently classified as Inferred Mineral Resources and Indicated Mineral Resources;
- focusing exploration activity on all of the secondary reef horizons such as the Leader Reef and the "A" Reef, specifically the "B" Reef at Tshepong BU and secondary reefs at the West Wits Operations;
- exploration into the Jeannette mine and the Basal Reef, directly northeast of Tshepong BU; and
- further potential for increasing the Mineral Resource tonnage relies on the reductions in cut-off-grades.

5.

MINING

5.1

Introduction

This section includes discussion and comment on the mining engineering and related aspects of the LoM plans associated with the Mining Assets. Specifically, comments are given on the mine planning process, mining methods, geotechnics, mine ventilation and the impact of the foregoing on future mining operations.

5.2

Mine Planning

The mine planning process at the Mining Assets is dependent upon input from the geology/resource management departments. Responsibility is assigned for addition/revision and depletion sign-off on the Mineral Resource, which forms the basis for subsequent design, planning and extraction sequencing incorporated into the LoM plan. In the majority of instances this is completed using a combination of computerised geological modelling, mine planning and production scheduling utilising various in-house and external software packages.

The planning cycle commences with the ratification of key input parameters, prior to producing a SAMREC compliant Mineral Resource statement, adjusted for all resource depletion. On completion of the resource update, the planning process commences, incorporating:

- targets, objectives and guidelines that are defined by the Companies' respective corporate teams;
- detailed short-term (one year) operating plans extending stoping and development layouts from current mining face positions. Reliance is placed on historically achieved production parameters such as development rates, mining widths and dilution together with metal accounting factors such as mine call factors, ore losses and metallurgical recovery; and
- an extension to the short-term plan resulting in a three-year strategic plan detailing any planned production build-ups or mine expansion programmes. At Target Mine engineering design and computer scheduling software depletes the available Mineral Resources within the constraints of existing infrastructure. At Harmony's Mining Assets, beyond the three-year period, LoM projections are developed on a factorised depletion of the available Mineral Resources.

In conjunction with the above, a detailed (one year) operating and capital cost budget is subsequently produced and where appropriate extended for the LoM production schedule. The one-year budget is generally prepared on a monthly basis, extending into quarterly periods and annually thereafter. Of critical importance is the utilisation of historically achieved data for productivity and operating costs against which operating business units are benchmarked. Where this is not available, zero-based costing is applied. Specific capital projects are evaluated on individual merits to demonstrate the anticipated return on investment.

SRK consider that, despite being in line with general industry practice, a more progressive approach to planning would better assist in assessing the risk profiles and project value drivers of the various operations. SRK consider that future assessment should extend the business window beyond the current three years, to ensure that due recognition of

the longer-term risk environment is considered. Detailed planning generally only extends between one and three years for assets where no specific project capital is anticipated; with detailed planning profiles extending over the capital spend profiles for the specific capital projects. The LoM projections for each business unit vary between three and twenty years within the same Tax Entity. In the absence of detailed cost projections beyond the specific period, SRK has assessed the unit operating costs taking cognisance of increasing depth and distance from shaft infrastructure and a general allowance for age of infrastructure and associated additional maintenance costs. Labour (contributing between 40% and 50% of the total costs) has been assessed taking a view on the achievable productivity over the LoM period. Consumables have been split into a fixed and variable component and projected forward using cost drivers such as development meters and stoping area (accounting for variation in stoping width).

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5.3
Overview of Mining Operations
5.3.1
Target Operations - Target Mine
The Target orebody is relatively complex comprising of a number of reefs of varying widths, grades and inclinations stacked above one another and separated by layers of quartzite. The LoM planning process is therefore critically dependent on geological input, specifically in terms of structure, geometry and distribution of reef packages and gold content. The main orebody comprises the Eldorado Fan, the Interfan and the Zuurbron Fan systems that strike north-south and the access decline system is located to the west.
The Elsburg Formation sub-crops against the Dreyerskuil Formation and the lowest reef in this group, the DK1A, is exploited by conventional deep-level gold mining techniques. The mining of the Dreyerskuil leads to over-stoping of the Elsburg Formation and the de-stressing of the ground to accommodate the long-hole drilling and large-scale stoping methods that are employed.
The LoM plan essentially comprises 5 main working areas:
- Block 1: located at the south of the Eldorado Fan formation and principally at the centre of the orebody;
- Block 2: located some 250m to the north of Block 1 and in the Eldorado Fan formation and is accessed from sub-levels driven off of the access ramp located in the east;
- Block 3: located within the Eldorado Fan formation to the north of the Damn Fault which forms the boundary between Block 2 and Block 3 and is estimated to have an average down throw of approximately 30m; and
- Block 4 and Block 5: located to the south of Block 1 and principally define the Interfan and Zuurbron Fan formations. The grade of the Mineral Resources in Block 4 and Block 5 is approximately 3g/t lower than that the Mineral Resources comprising Blocks 1 to 3. Consequently Block 4 and Block 5 only form only a minor tonnage and are currently scheduled for depletion later in the LoM plan.

Production and support activities for the underground operations are coordinated from a central, surface based, operations room, which is also responsible for emergency procedures. The control room is also used to monitor, operate and control the major plant such as the conveyor system, pump stations and refrigeration units.
Access and Infrastructure: The No.1 Shaft is used for the transport of men, material and rock to and from surface to the 203L from where a single decline is installed to the 255L some 2,050m below surface. The decline splits at 255L into a conveyor decline and a vehicle decline, descending to the extent of development currently at the 282L, some 2,300m below surface. Two jaw crushers are located at the base of the declines directly beneath surge passes with approximately 4hrs production capacity. The crushers are fed by a vibrating feeder and a 200mm screen ensures only the oversize material is crushed. The undersize is directed straight to the conveyor system. Each crusher can operate at a throughput of some 310tph, which is significantly more than the operating capacity of the hoisting system. The conveyor system comprises six conveyors of various lengths over a distance of some 6km. The conveyor system is designed to operate at 2.5m/s to enable man riding on the 900mm wide belts. The design throughput of the system is 225tph and the conveyors tip rock into one of two 2,000t capacity storage facilities located adjacent to the main shaft on the 203L.
During 2003 the hoisting capacity of the shaft was increased by improving skip cycle time and payload and now hoists at a rate of 23-24 skips per hour (previously 20-21 skips per hour) with 9.5t skips (previously 9.1t) thus at an average hoisting time of 20hr/day the shaft capacity equates to 4,300tpd equivalent to some 125ktpm. Hoisting has only averaged 90ktpm during 2003 principally due to lower massive stope production than planned.
There are no dedicated facilities to separate ore and waste in terms of storage before the conveyor system, and if required one of the two main orepasses together with a crusher would need to bededicated to effect separate waste transportation and hoisting. Operationally the existing facilities make waste separation impractical and therefore waste, that is not backfilled, is hoisted as dilution to ore.
Alternative access to surface, in the event of an emergency, is via the No.1C sub-vertical shaft on the 255L to the No.2 Shaft on the 208L located some 3km from No.1 Shaft. Access to the 255L from the workings is via the conveyor

decline and vehicle decline or the return airway decline. No.5 Shaft is utilised as a return airway.
Materials and equipment are transported from the station on 203L to the underground working by an overhead mono-rail system that principally uses an electric drive unit and a diesel back-up. The mono-rail currently operates to the 255L although the second phase of the installation to the 282L is currently in progress. Utility vehicles are used to transfer material and equipment from the mono-

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rail station. The main declines are used to provide services, such as water, power, backfill slurry and also houses pump columns as well as being the main air intakes. Due to the limited need for compressed air there is no compressed air reticulation network in the mine and small compressor units are used where necessary. Communication is via a telephone network and radio communication via a leeky feeder system.
Mining Methods: Initial development and mining commenced in Block 1, located in the southern portion of the Eldorado Fan system. A cross-cut was developed from the main decline system to a ramp located to the east of the orebody which provides access across the centre of Block 1. The ramp is located in the east due to unfavourable ground conditions in the west. The mining methods employed at Target Mine comprise long-hole open stoping, drift and fill mining and Narrow Reef Mining ("NRM").
The long-hole open stoping methods are further classified into a number of stope types that are principally defined by stope size: massive open stoping ("MOS"); wide open stoping ("WOS"), dwarf open stoping ("DOS") and narrow open stoping ("NOS"):
-
MOS is conducted in the upper parts of the orebody principally comprising the sub-crop of the Eldorado Fan against the Dreyerskuil Formation. The primary reef package comprising EA7A to EA13A forms the focus of the stope outlines. The DK1A is principally advanced as a de-stress cut before massive stoping of the primary reef package can commence. As the MOS advances into the areas where the DK1A has been extracted, the old workings occasionally collapse into the MOS resulting in large rocks and old mine support reporting to the drawpoints. In areas where the de-stress cut is not essential the DK1A reef is therefore added to the MOS and mined as one package. The MOS design comprises two levels, a lower drilling and loading level and an upper drilling level. The faces are advanced in sequence on a retreat basis (where possible) to limit hangingwall deterioration from undercutting;
-
WOS is principally conducted in the main part of the block in areas where the thickness is greater than 10m and the dip greater than 20°. The dip of this area of the orebody in Block 1 varies between 25° to 30°. WOS is also applied to exploit the EA7A to EA13A reef zones which are typically mined in a sequence from the lowest stope upwards. Each stope is drilled and loaded from a single strike drive at the base of the orebody and generally on a retreat basis, although hangingwall drives and additional adjacent loading tunnels have been experimented with. On depletion of the stope backfill is placed prior to repeating the cycle at the next higher level. Block 1 WOS comprises four sequenced stopes the last of which is located adjacent to the bottom MOS. The development drives are developed within the shadow of the de-stressed zone of the NRM;
- **DOS** is a recent innovation and has principally arisen following a need to improve upon drift and fill mining, originally planned in areas where reef packages were not anticipated to be as thick as currently encountered. The DOS design is principally the same as the WOS; and
- **NOS** is planned to be utilised in thin (less than 3m), steeply dipping (greater than 45°) reef packages, these areas are principally confined to discrete EA1 to the EA3 reefs below the main reef package. The mining method uses an upper and lower strike drift to define the limits of the orebody for drilling. The lower drift is used for up-hole drilling and ore loading. No NOS has yet been undertaken.
Drift and fill stoping is undertaken by mechanised short-hole drilling methods utilising development jumbo rigs. The mining is fully trackless in both drilling and loading operations. Drift and Fill is employed in narrow (less than 10m) and shallow dipping (less than 20°) reefs and is principally confined to reefs to the east of the WOS blocks. The method of stoping is principally to develop drifts, up to 60m in length and some 5m in width, on an apparent dip in the orebody. The drift can be widened by a further 3m on a retreat basis before backfilling. Adjacent drifts are only mined after backfilling of the depleted stope is complete.
Production drilling in the open stopes is undertaken with Tamrock Solo rigs that drill 64mm or 76mm diameter holes of up to 30m in length. The principal blasting agent is ammonium nitrate and fuel oil ("ANFO") delivered by a mobile charging vehicle. Emulsion is also used where necessary. The ore is loaded and transported by LHDs into orepasses located in the main crosscut pillar of Block 1. Tramming distances for Block 1 are typically less than 150m and, as operations advance away from primary infrastructure, trucks will be introduced to tram ore from the further blocks

back to these orepasses. The ore is directed to permanent rock breakers and a 600mm grizzley located on the 278L before being fed to the crusher passes.

Fragmentation in the massive stopes is good providing there are no hangingwall problems. Recently, however big rocks associated with the relaxation of an upper stope through undercutting, are creating problems by breaking into the old NRM areas. Fragmentation issues are also enhanced by poor drilling practice. The future designs and stope schedules have been modified accordingly, specifically drilling to design specification.

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NRM is undertaken by conventional methods using short-hole hand held hydro-power driven rock drills for blast-hole drilling and scraper winches for cleaning; support is by the use of mine poles, elongates and packs. NRM is preferred on the narrow DK1A reef located at the base of the Dreyerskuil Formation and at the subcrop to the Elsburg Formation. The DK1A occurs on an anticline where the dips range between 0° along the anticline axis and 20° on the east and west limb.

All level development for the massive stopes is undertaken by trackless methods using electric- hydraulic jumbo drill rigs, LHDs, mechanised roofbolting machines and explosive charging vehicles. Dump trucks are used for cleaning development ends at longer distances to the ore passes or old stopes. All access and stope drives are excavated 4.5m by 4.5m in dimension to accommodate mechanised vehicles and the designed ventilation volumes. Development advance is typically 4m per round. Sundry development includes slot raises, ventilation passes and rock passes and is generally undertaken by contractors.

A typical force-exhaust ventilation system is used for development and normal support is in the form of split sets. Shotcrete and/or 6m rope anchors are installed in certain development ends and excavations where necessary.

Development waste backfilling has steadily increased over the last twelve months to its currently level of approximately 10ktpm. This assists the backfill requirement from the surface plant, which is limited to some 800m 3 /day of cemented fill and also reduces unnecessary dilution.

Rock Engineering: The main Eldorado Fan is situated between 2,200m and 2,500m below surface at which depths the principal stress will be of the order of 60Mpa. SRK is generally confident that the de-stressing approach and massive mining methods proposed by Avgold do not present any geotechnical risks more significant than those normally faced in operations at this depth utilising the mining methods proposed.

Further, SRK has assessed the stability of the massive open stope designs proposed by Avgold and is confident that it will be possible to maintain stable openings of this size at the required depth below surface.

Rock engineering input has been taken into account in the mine planning and sequencing. Numerical modelling is carried out on a routine basis and the rock engineering department is adequately staffed with well trained and experienced personnel.

A Code of Practice to combat rockfall and rockburst incidents has been prepared in terms of the Mine Health and Safety Act. This document identifies potential hazards and also strategies to counteract these.

While seismicity is not expected to be significant at Target, a seismic monitoring system is due to be installed and SRK consider this prudent.

Ventilation: The ventilation design at Target Mine is based on an objective to achieve:

- an average wet bulb temperature of 25.5°C;
- a maximum wet bulb temperature of 27.5°C; and
- a reduced presence of pollutants from diesel fumes to comply with the requirements of the Minerals Act. The original design was to limit total diesel equipment to some 3.6MW.

The mean summer wet bulb and dry bulb temperature is 17°C and 27°C, respectively, whilst the virgin rock temperature at the underground workings is some 51°C.

Main intake ventilation is via the conveyor and vehicle declines, of 21m 2 and 15m 2 cross-section areas respectively. The return airway to surface is via No.5 Shaft that is connected to the return airway decline (27m 2 cross-sectional area) by both new and old raisebore holes together with airflow directed through old workings. The ventilation infrastructure limits the primary ventilation capacity to 250m 3

/sec.

Mine cooling is required and effected by primary bulk coolers, located on 255L adjacent to the refrigeration plant and to a lesser extent by secondary coolers, tertiary coolers and the use of chilled service water closer to the underground workings. The planned capacity of the refrigeration system is some 28MW compared to an original design of 24MW. The refrigeration capacity comprises five 3MW units and three 4.5MW units. A ninth unit has also been installed for maintenance and servicing requirements. Two of the 4.5MW are still being commissioned and are expected to be operational during January 2004.

The main fans are located at the head of No.5 Shaft and are assisted by a number of underground booster fans located at 208L and 255L. Secondary ventilation is effected through various fans, ventilation ducting, ventilation passes, regulators and controls principally on a force-exhaust basis.

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An increase in the number of working places and an increase in the total rated diesel capacity of the equipment at the mine (some 7.1MW versus the 3.6MW in the Feasibility Study) has led to a relaxation of the planned wet bulb temperature to some 27.5°C and an increase in the re-use of air in the workings. Current wet bulb temperatures experienced in the first quarter of 2004 average some 25.0°C and 27.7°C for development and stoping respectively. Once the two additional 4.5MW refrigeration plants are operational the cold water dam temperature is expected to decrease from the current 6.7°C to the 5°C originally planned; which should lead to an ability to maintain the new standard into the future.
LoM Plan: The latest LoM plan comprises ore from a combination of massive stoping, NRM and development ore. Ore from development contributes some 20% to the hoisted tonnage with the majority of the stoping tonnage derived from the three massive mining methods. NRM tonnage is planned to be undertaken according to the de-stressing requirements for the massive stoping programme.
The tonnage derived from massive mining stopes is planned to increase from 50ktpm to 75ktpm once additional stope faces are brought on stream. Individual MOS and WOS can at peak production produce in excess of 30ktm in any one month; the average is between 15ktpm and 20ktpm on an ongoing basis, thus requiring several concurrent stoping areas to make-up the target production.
Although the conveyor and hoist system can in theory handle 125ktpm the tonnage in the mine plan has been capped at 117ktpm. Provision is made in the LoM plan for some 10ktpm of waste backfilling; however separate waste hoisting is not practical and additional waste reports as dilution to the ore stream. Depending on the success of the waste backfilling, the spare hoisting capacity may be taken up by waste not backfilled.
A mine recovery factor ("MRF") has been historically applied at some 92% to account for gold losses occurring during blasting operations. The MRF has, however consistently exceeded 100% during the last twelve months and for the year-to-date averages 110%. SRK consider that the high MRF is related to a positive Block Factor associated with the higher-grade massive stopes that have been mined during this period.
There should be minimal gold loss associated with blasting of a package of reefs in a massive mining method and only a small provision for un-planned ore losses (principally associated with under- breaking of the long-hole stopes) should be included in Mineral Reserve modifying factors. Investigation of the stope volume reconciliation's indicates that un-planned ore loss averages 4%.
5.3.2
Free Gold Operations
Free Gold Operations: comprise a complex of nine mature operating underground mines, namely Tshepong BU, Phakisa BU, Bambanani BU, West BU, Eland BU, Kudu & Sable BUs and Nyala BU, Joel BU, St. Helena BU, various surface sources and tailings re-treatment operations. The individual business units range in planned operational life between 3 years and 19 years thus classifying the collective Free Gold Operations as a long-life asset.
Underground production is mainly sourced from shallow dipping tabular narrow orebodies, in particular, the Basal Reef supplemented by secondary orebodies such as the Leader Reef. The only exception to this is Joel BU, where production is sourced from the Beatrix-VS5 Composite Reef.
Access to and egress from the various reef horizons is via numerous surface shafts and various sub-vertical shafts at the deeper operations. The same access and egress is used for labour, material and production.
RoM ore is hoisted to surface and thereafter transported by conveyor, rail or road to one or more of the four metallurgical processing facilities (FS1 Plant, FS2 Plant, St. Helena Plant and Joel Plant). At shafts where the infrastructure permits waste to be hoisted separately, then it is conveyed to WRDs, generally situated close to shaft heads.
Mining methods at Free Gold Operations include variations on conventional narrow reef mining methods, such as scattered breast, down dip and remnant extraction. The longer-life BUs, Tshepong, Phakisa, Bambanani and Joel predominantly mine virgin ground at increasing depth with West BU, St. Helena BUs, Eland BU, Kudu & Sable BUs and Nyala BU extracting higher portions of remnants, including shaft pillars.
Mine ventilation systems at the Free Gold Operations are well established and have been extensively planned and operated in the past. Operating conditions vary in accordance with the scattered nature of the working places, the

operating depths and the virgin rock temperature ("VRT") and control of airflow. The VRT varies from the greatest value at Bambanani B U (62°) to the minimum value at Joel BU (35.6°). Refrigeration plants are installed at Bambanani BU, Tshepong BU and Joel BU.

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The control, containment and removal of fire generated toxins creates the greatest challenge to the ventilation team at Bambanani BU, this together with the sealing off old abandoned areas that no longer require cooling or ventilation but are currently getting both.

Geotechnical input at Free Gold Operations is typical of mining environments in the Free State Goldfield, where mining depths range from shallow-intermediate (Joel BU) to deep (Bambanani BU). Bambanani BU, Eland BU, Nyala BU, Kudu & Sable BUs are classed as seismically active operations with seismic monitoring systems installed and activity generally located in the vicinity of remnant operations and/or geological structures. External consultants ISSI supply all seismic systems, which are managed by GeoHydroSeis. Localised ground control issues include the impacts of a weak hangingwall member, the Khaki Shale on exposure and scaling in main orepasses. In such instances mine specific strategies have been implemented either through design modifications and/or remedial repairs.

Tshepong BU: Mining operations at Tshepong BU are conducted at average depths of 1,925m below surface and currently extend to 66L. The current LoM plan includes the sub-66L project, which involves the sinking of a twin decline system from 66L to 71L in order to access ground to the west of current operations. The sub-66L project is planned to commence during 2003 and be completed by 2007. Production build-up is the focal point of the latest LoM plan, following the introduction of Conops in the next two years and the additional production on completion of the sub-66L project.

Phakisa BU: The shaft at Phakisa BU was sunk to 79L and subsequently mothballed by Anglogold. Free Gold plans to complete the work and has initiated a project to complete sinking of the shaft by a further 178m to 81L. The shaft will be equipped to hoist men and material from surface to enable mining to be conducted to 77L and to allow additional rock hoisting to 55L, utilising an underground Koepe hoist. The ore and waste will be transferred at this level to Nyala BU for hoisting to surface. Project capital expenditure over the life of the BU is estimated to be ZAR540m and planned to commence in the second quarter of 2004.

Bambanani BU: Bambanani BU's mining operations extend between 1,200m and 3,000m below surface. Access to the deeper levels is via a surface shaft and then by a sub-vertical shaft, which extends to the lowermost 107L. Mining conditions are considered to be difficult due to low mining flexibility, distance of workings from the shaft, seismicity and high VRT's. The mine is prone to fires, a number of which are currently active and affecting production at both Bambanani BU and West BU.

West BU: The West BU, which was mothballed by AngloGold during the latter half of calendar 2001, was re-commissioned in 2002. Mining operations at West BU are small-scale and focused on Basal Reef pillars and some mining of the Leader Reef.

Eland BU, Kudu & Sable BUs and Nyala BU: The Eland BU and Nyala BU are interlinked on a number of levels and have connections with Tshepong BU, Welkom Operations and President Brand. Mining operations occur at average depths of 1,700m below surface and are focused on the extraction of remnant pillars and shaft pillars. The tramming distance and production continuity from scattered remnants at these mines offers the most challenging aspects to counter against rising operating costs.

St. Helena BUs: St. Helena BU comprises three operating BUs: No.2 BU, No.4 BU and No.8 BU. No.2 BU is currently operating on a marginal basis and is undergoing investigation as to its sustainable contribution in the immediate future. Mining is principally focused on remnant mining operations from Basal Reef pillars and a small contribution from the LDR at an average production rate of 50ktpm, this production is significantly below the shaft hoisting capacity. Mining is conducted at some 1,500m below surface.

The extensive historical mining areas, accessed via kilometres of interlinked tunnels, excavations and connections between the Free Gold and Welkom BUs led to an elevated risk of fire and an increase in illegal mining activity, and allegedly the two are linked. Management believe there to be a high number of illegal miners operating at the mine, which creates its own operational issues. Counter-measures are being given serious consideration, however due to the extensive nature of the abandoned underground workings, in which the activities are taking place and taking cognisance of a high-level of collusion, policing these illegal activities is considered to be extremely difficult.

Joel BU: Joel BU has two shafts: South BU and North BU. Currently mining operations are conducted solely from South BU at an average depth of 1,000m below surface, where a three-barrel decline system extends to the 117L. A

holing to North BU from 100L provides a second means of egress. North BU was partially sunk to 20m below 145L and the primary sinking equipment is still in place.

The LoM plan assumes commencement of the installation of hoisting facilities in the North BU during 2004, to be operational by 2005. Access to ground below 121L is currently achieved via a winze from South BU in order to confirm grades. Although production is small the working places are far from the shaft and the transport of men, material and rock is complicated via the belted inclines.

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The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Free Gold Operations, as follows:

- minimising the risk of further underground fires at Bambanani BU and West BU and managing appropriate fire mitigation measures at the other highly scattered remnant operations, particularly where illegal mining is known to occur;
- timely completion of the four main capital projects, namely:
  - the completion of the sub-66L project at Tshepong BU, which will enable access to ore from the deeper levels;
  - the completion of the Phakisa Project;
  - the completion of the upgrade to the shaft at Nyala BU to enable the extraction of the shaft pillar and the hoisting of rock to surface from the Phakisa Project; and
  - the completion and commissioning of Joel BU's North shaft;
- continuation of infrastructure rehabilitation programmes, specifically to address ventilation conditions and orepass integrity at Bambanani BU. Development waste is hoisted with mined ore;
- continued vigilance with respect to minimising seismic activity, specifically with respect to:
  - remnant extraction at Bambanani BU; and
  - shaft pillar extraction programmes at the Nyala BU;
- the achievement of additional unit cost reductions at Free Gold Operations above those realised through post the formation of Free Gold; and
- the realisation of the planned productivity improvements associated with the introduction of Conops, which is still subject to negotiation with the NUM.

5.3.3

Harmony Free State Operations

Harmony Free State Operations comprise a complex of nine mature operating mines: Brand BU No.1/3, Brand No.5 BU, Harmony No2 BU, Merriespruit No1 BU, Merriespruit No.3, BU Masimong No.4 BU, Masimong No.5 BU, Saaiplaas No.3 BU and Unisel No.1 BU, which are managed as individual business units. Collectively Harmony Free State Operations will continue for 15 years, thus classifying Harmony Free State Operation as a long-life asset. Underground production is mainly sourced from shallow dipping tabular narrow orebodies, principally the Basal Reef and Leader Reef, with increasing contributions from the `A' Reef, `B' Reef and Middle Reef as the mines near depletion. The RoM contribution from specific reefs plays an important role in achieving the planned cash flows taking cognisance of the variation in insitu grade and the highly channelised nature of the secondary reef horizons. Access to and egress from the reef horizons is from surface shafts. The shafts are utilised for men, materials and production. Mining operations are conducted at depths between 1,500m and 2,200m below surface. Mining is undertaken at Harmony Free State Operations both in virgin areas and through the extraction of various remnants and pillars and the proportion of remnant to virgin mining varies between 20% and 40% at the different mines. Current underground mining is being conducted at some 426ktpm. Access for rock hoisting and the provision of ventilation, services, men and materials is provided through each of the surface shafts although the ore from Brand

BU No.3 is transported underground to Brand BU No.1 for hoisting to surface as mining is being conducted on the shaft pillar. Underground waste is generally separated from the ore however where this is not the case the proportion of waste is relatively low.

Mining operations at Harmony Free State Operations are conducted principally by conventional narrow stoping methods with tracked haulages on a 2-shift basis although a move to Conops is also being considered. Stope production is supplemented by vamping of old gold and contractors are typically employed for this and for other non-core activities such as the provision of permanent support. No mining is currently being conducted at Brand No.2 BU, however contract mining is currently being considered.

The operations are mature and small-scale projects and investigations are predominately focused on extending mining life and/or lowering the cost of production at the various mines. Increased production is being planned from reefs considered to be secondary to the Basal Reef at certain BUs; these reefs include "A" Reef, "B" Reef, Leader Reef and Middle Reef.

The Masimong BU Expansion Project provides for the increase in production and grade at the Masimong No.5 BU through the development of a significant area of Basal Reef to the east and west

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of the current workings. No material increase to the primary infrastructure is required and development of the new raise lines is anticipated to commence within the next two to three years.

A limited number of surface sources of ore exist at the Harmony Free State Operations in the form of WRDs and tailings dams and these are processed at production levels dictated by economic conditions. Ore is transported by a number of modes to one of the three process plants, Central Plant, Virginia Plant and the Saaiplaas Plant.

Mine ventilation systems at Harmony Free State Operations are well established and have been extensively planned and operated in the past. Due to the low tonnages the ventilation infrastructure is considered adequate for the relatively shallow operations, thus SRK consider there to be no material ventilation issues.

Due to the shallow depths of operations, seismicity and rock mechanics aspects are, in general, not considered to be a serious concern and seismic events although experienced are infrequent. The extraction of the Harmony No.2 BU shaft pillar is in progress and total extraction is currently planned. Mining is being undertaken in conjunction with sufficient geotechnical consideration and design and the area is being monitored by an ISSI seismic system. Although the seismic impacts are adequately recognised by management and external consultants have reviewed the mining practice, the high extraction ratio still presents a risk to the planned extraction.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Harmony Free State Operations, as follows:

- achievement of planned production, which historically has fallen short at the operations where the contribution from remnant areas is material;
- maintaining the planned blend of primary reef extraction to secondary reefs, both in terms of ore tonnage and head grade; and
- achievement of planned development targets to ensure that sufficient flexibility is achieved, specifically for the highly channelised reefs, which have historically proven difficult to work in terms of sustaining the planned grade over the budgeted period.

5.3.4

Welkom Operations

Welkom Operations has six operating BUs: No.1 BU, No.2 BU, No.3 BU, No.4 BU, No.6 BU and No.7 BU. Mining operations at Welkom Operations occur at average depths of between 1,000m and 1,200m below surface and, collectively, have a life of eight years, thus classifying Welkom Operations as a medium-life asset.

Underground production is mainly sourced from shallow dipping tabular narrow orebodies; in particular the Basal Reef with smaller quantities from the higher-grade channels of the Leader Reef located some 15m above the Basal Reef. Access to the reef horizons, including men, materials and production is currently from surface shafts and sub-vertical shafts. RoM ore at all operations is hoisted to surface and thereafter transported directly to Free Gold Operations FS1 Plant. Underground waste is not separated from the ore due to the economic viability of re-equipping waste handling facilities and the relatively low development tonnage. RoM ore delivered to the plant from contractor operations is treated separately for apportionment purposes. The trucks are weighed and the ore delivered is sampled on the conveyor belt to provide an estimate of the gold on surface for each BU.

Mining at Welkom Operations is undertaken by variations on conventional narrow reef mining methods including breast and "undercut" mining. The latter is utilised by Welkom Operations to enable mining in areas where the strong quartzite middling between the Basal Reef and the weak Khaki Shale is less adequate. At BU No.1, where the majority of production is and will continue to be concentrated, the undercut mining method is responsible for some 60% of total production. Core mining activity at BU No.1 is conducted directly by Welkom Operations, while at all other BUs contractors undertake mining and reclamation activities. Mine ventilation systems at Welkom Operations are well established and have been extensively planned and operated in the past. Due to the low tonnages and the large

volumes of air that are being circulated in the various sections, the air ratios are considerably greater than industry norms. In SRK's opinion, the installed ventilation and refrigeration infrastructure is adequate to meet all planned requirements.

Fires at Welkom Operations are considered by SRK to represent a material issue and whilst causes are reported as being unknown, the presence of illegal miners is believed to increase the risk of fires. Illegal mining is an increasing phenomenon in Free State Goldfield and is particularly concentrated in high carbon rich remnant panels as found within the Welkom Operations.

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SRK and ISSI, which are retained on a contractual basis, provide geotechnical input at Welkom Operations. ISSI provide a seismic monitoring service and SRK is responsible for geotechnical input in all other respects. The main geotechnical issues at Welkom Operations include those typically associated with remnant mining operations and the influence of the weak Khaki Shale.

Mining on the Basal Reef at Welkom Operations is characterised by a largely mined-out orebody extending over vast areas, the extraction of numerous small and highly stressed remnant pillars, an environment of intense faulting and numerous intrusive features, the moderate depth of the workings and the concomitant high levels of induced stress. The primary rock engineering issues are thus those related to the protection of personnel and infrastructure and the maintenance of acceptable levels of production in the face of sometimes fairly adverse mining conditions.

A thin quartzitic layer and then weak Khaki Shale, which varies in thickness from a few centimetres up to many metres, overlie the Basal Reef. This weak and talcose horizon has the capacity to yield, transferring stress away for immediate abutments. Depending on the thickness and integrity of the Basal quartzite middling this creates hangingwall control problems in the areas where it is undercut, which vary from moderate to severe. In such situations mining discipline is critical to ensure safe working conditions and sustained production with minimal dilution.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Welkom Operations, as follows:

- minimising the impacts of illegal miners and potential fire risks; and
- minimising economic risk through further cost control.

5.3.5

West Wits Operations

West Wits Operations comprise a complex of six mature mines: Elandsrand BU, Deelkraal BU, Cooke No.1 BU, Cooke No.2 BU, Cooke No.3 BU and Doornkop BU, which are managed as individual business units. Underground operations at the Cooke No.4 BU and the open pit mining at Lindum have ceased. The West Wits operations have a collective life of 19 years, thus classifying West Wits Operations as a long-life asset.

Underground production is mainly sourced from shallow dipping tabular narrow orebodies, including the Elsburg Reef and Upper Elsburg Reef, VCR and Kimberley Reef. Mining operations at Elandsrand BU and Deelkraal BU focus on extraction of VCR, those at the Cooke BUs are principally on the Elsburg and Upper Elsburg Reefs and the Kimberley Reef at Doornkop BU. Access to the reef horizons including men, material and production is from surface shafts. Mining operations at the Elandsrand BU have been conducted at depths between 1,600m and 2,800m below surface with future production planned at some 3,300m below surface and 2,750m below surface at Deelkraal BU. At the Cooke BUs and Doornkop BU, mining has historically been conducted between some 600m and 1,260m below surface. Mining is undertaken at West Wits Operations both in virgin areas and through the extraction of various remnants and pillars, although the proportion of remnant to virgin mining varies from some 50% - 80% at the different mines.

Current underground mining is being conducted at some 433ktpm. Access for rock hoisting and the provision of ventilation, services, men and materials are provided through each of the surface shafts. Underground waste is generally separated from the ore, although waste development in the remnant mining areas is relatively low.

Mining operations at West Wits Operations are conducted principally by conventional narrow stoping methods with tracked haulages on a 2-shift basis. A move to continuous operations ("Conops") is being considered at a number of mines and negotiations are currently being conducted with the NUM. A semi-trackless mining method is practiced at Cooke No.3 BU, which accounts for only some 10% of the production at this BU. The method combines conventional stoping with LHD and truck cleaning on reef drives as opposed to tracked haulages. It is reported that the method is being phased out for cost reasons. A trackless and semi-trackless mining method is practiced at Doornkop BU which in total accounts for some 40% of the mine's production. Stope production is supplemented by vamping operations and contractors are typically employed for this and for other non-core activities, such as the installation of permanent support.

A number of projects exist to extend mining life and/or lower the cost of production at the various mines including: a shaft deepening project at Elandsrand; the development to the Kimberley Reef at Cooke No.1 BU in three target areas with expected raise development in the next six months; and the Doornkop feasibility study. The sub-Shaft Deepening Project at Doornkop BU involves the

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deepening of the main shaft from 132L to 212L; this following the completion of a raise bore hole and the re-equipping of the sub-vertical shaft. The project is anticipated to take between four and five years to complete.

A number of surface sources exist at the West Wits Operations in the form of WRDs and tailings dams. Production from surface sources typically accounts for a third of the total rock currently processed and contributes 10% of the total gold produced. The Deelkraal Plant is dedicated to processing the surface sources and certain waste development from the underground operations at West Wits Operations. Ore is transported by a number of modes to one of the three process plants dedicated for ore treatment: Elandsrand Plant, Cooke Plant and the Doornkop Plant.

Mine ventilation systems at West Wits Operations are well established and have been extensively planned and operated in the past. Due to the low tonnages the ventilation infrastructure is considered adequate, however the depth at a number of the shafts and the scattered nature of the remnant mining activities requires that ventilation and refrigeration management remains a core activity.

Seismicity and rock mechanics aspects are of a particular concern at Elandsrand BU and Deelkraal BU due principally to the greater depth of mining. Mining at Elandsrand is being conducted on a sequential grid basis, which has successfully improved regional stability. Current stope support consists of pre-stressed elongated timber props and approximately 50% of all stopes are backfilled. The width of stabilising pillars for future mining is based on the assumption that all stopes will be backfilled, although it is not apparent that there is sufficient backfill to achieve this objective. The staffing level and qualification appears adequate at Elandsrand BU and a system of geophones is used to monitor seismicity at the mine. Although a sequential grid design should be fully utilised at Deelkraal BU scattered and long-wall mining is still being used in conjunction with large mining spans. SRK consider that inadequate regional support is the main cause for an increase in seismicity at the mine. On certain levels on the VCR footwall, SRK consider the development is too close to the reef and this is likely to lead to a deterioration of the excavations during over stoping activities. Precautions need to be taken.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at West Wits Operations, as follows:

- the lowering of working costs, improvement in productivity and increased mining flexibility;
-
the realisation of the planned productivity improvements associated with the introduction of Conops which is subject to negotiation with and approval by the NUM;
-
ensuring that sufficient backfill is able to be placed in the stopes at the Elandsrand to adhere to the planned mine design with regard to regional stability when mining at increased depth. If insufficient backfill is placed then SRK consider that the width of the stabilising pillars should be reviewed;
-
ensuring that the move to a sequential grid mining is made at Deelkraal and a greater emphasis is placed on the incorporation of geotechnical considerations with regard to the planning and design is made; and
-
controlling capital expenditure and the timely completion of the sub-Shaft Deepening Project at Doornkop BU and other projects.

5.3.6

Evander Operations

Evander Operations comprise a complex of six mature shafts: Evander No.2 BU, Evander No.5 BU, Evander No.7 BU, Evander No.8 BU and Evander No.9 BU, which are managed as business units and the Rolspuit and Poplar projects. Operations at the Evander No.3 BU have ceased and any remaining mining from the No.1 BU and No.3 BU areas is affected through No.2 BU. The Evander Operations have a combined life of 15 years, thus classifying Evander Operations as a long-life asset.

Underground production is sourced from the shallow dipping tabular narrow orebodies comprising the Kimberley Reef. Numerous sills and dykes complicate mining layouts, whilst the reef dips typically at some 20° to 25° at most of the BUs increasing to some 40° in certain areas at Evander No.8 BU. Mining at Evander Operations, in general, is relatively shallow and conducted at depths between 500m and 2,000m below surface. The deepest mining is principally undertaken at Evander No.8 BU from the No.2 BU decline area. Mining is undertaken at Evander BUs both in virgin areas and through the extraction of various remnants and pillars. The proportion of remnant to virgin mining varies from some 30% to 60% at the different BUs.

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Current underground mining is being conducted at some 185ktpm (ore and waste) with production from No.8 BU contributing the most at some 60ktpm of ore. Access for rock hoisting and the provision of ventilation, services, men and materials is provided through each of the surface shafts although rock from No.8 BU is transported underground on 15L for hoisting at No.7 BU, located adjacent to the process plant. Underground waste is generally separated from the ore, although waste development in the remnant mining areas is relatively low.

Mining operations at Evander Operations are conducted by conventional narrow stoping methods with tracked haulages on a two-shift basis, although a move to Conops is also being considered at a number of the sections. Stope production is supplemented by vamping operations and contractors are typically employed for this and for other non-core activities such as the provision of permanent support. Mining is characterised by scattered workings often a long distance from the shaft stations and in general, old and poorly maintained shaft and engineering infrastructure and insufficient engineering spares. At a number of BUs there is a reliance on single pumping columns and systems.

A principal project at Evander Operations is the Rolspruit Deep's Project, which considers the exploitation of deeper resources of the Kimberley Reef adjacent to No.8 BU, through either the installation of a twin shaft system, from surface or a twin sub-vertical shaft system at No.8 BU. Harmony undertook a project feasibility study commencing July 2002, based on the provision of a men and material shaft and a rock and ventilation shaft to 267L, some 2,670m below surface, to exploit eight ore zones between 1,890m and 2,590m below surface at some 200ktpm (ore and waste) over some 15 years. The study estimated capital expenditure of some ZAR5,200m and projected an IRR of some 9% and 12% post and pre-tax, respectively. The project is considered to be marginal, but of relatively low technical risk, hence the consideration of the twin sub-vertical shaft alternative from No.8 BU as an optimisation. The incremental value at the Base Case discount factor to the Evander Tax Entity is negligible and the project go-ahead will be directly linked to the availability of funding.

The Poplar Project considers the green-fields development through installation of a twin shaft system to some 1,200m below surface to access ore some 20km from the existing Evander Operations. SRK consider the level of this study to be conceptual.

Surface sources at Evander Operations are only processed to enable the plants to operate efficiently. Ore is transported to either the Kinross or Winkelhaak process plants for treatment.

Mine ventilation systems at Evander Operations are well established and have been extensively planned and operated in the past. Due to the low tonnages the ventilation infrastructure is considered adequate and in conjunction with the relatively shallow operations, ventilation concerns are considered limited.

Seismicity and rock mechanics aspects are in general, due to the shallow depths, not considered to be a serious concern and seismic events, although experienced, are infrequent. The partial extraction of the Evander BU No.8 shaft pillar and the over-stoping of the decline area to the north can be considered to be a risk in terms of seismicity at the mine. A risk assessment has been conducted on the overall strategy and SRK consider that in order to ensure that the planned extraction is achieved a greater emphasis needs to be placed on the individual stope sequencing and strategy.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Evander Operations, as follows:

- improving profitability through the lowering of working costs and improvement in productivity;

the realisation of the planned productivity improvements associated with the introduction of Conops, which is subject to negotiation with and approval by the NUM;

-

-

a more detailed strategy with regard to the partial mining of the shaft pillar at Evander No.8 BU and the influence of geological structures on ground control and seismicity;

-

the commitment of sufficient funds to improve the spares and maintenance situation at the various shafts and a focus on improved maintenance practices, particularly with respect to No.2 BU, No.5 BU and No.8 BU; and

-

a positive decision on the development of the Rolspruit and Poplar projects subsequent to the completion of the necessary feasibility studies.

5.3.7

Orkney Operations

Orkney Operations comprise a complex of six mature BUs: No.1, BU No.2 BU, No.3 BU, No.4 BU, No.6 BU and No.7 BU, which are managed as a business unit. No.5 BU was closed in July 2002, principally due to depletion of reserves and for seismic reasons. These operations have a combined life of eight years, thus classifying Orkney Operations as a medium-life asset.

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Underground production is mainly sourced from shallow dipping tabular narrow orebodies, including the Vaal Reef, VCR and Elsburg Reefs. Mining operations at No.1 BU, No.2 BU and No.4 BU focus on extraction of the Vaal Reef, the VCR at No.3 BU and the VCR and Elsburg Reefs at No.6 BU and No.7 BU. Access to the reef horizons for men, material and production is via surface shafts. Production at Orkney Operations, particularly on the Vaal Reef, is mainly derived from the extraction of a host of remnant pillars. By their nature these are small, isolated, scattered and difficult pieces of ground situated at great depth and surrounded by significant mined-out areas.

Mining is undertaken at average depths of between 1,600m and 2,000m below surface. Access for rock hoisting and the provision of ventilation, services, men and materials is provided through each of the surface shafts. Underground waste is not separated from the ore due to the economic viability of re-equipping waste handling facilities and the relatively low development tonnage. Orkney Operations currently has no surface rights to dump waste material and as such would have to seek permission from AngloGold to utilise their WRDs in the event of Orkney Operation's management implementing waste separation.

Orkney Operations and VRO's BUs are interlinked on a number of levels and as a consequence share access ways. In certain instances VRO supply other production services including, compressed air, water and power. RoM ore is transported from the individual shafts to the No.1 Gold Plant via VRO's surface transport network. RoM ore from No.6 BU areas is hoisted at the No.7 BU where it is fed directly by conveyor into the plant.

At Orkney Operations Harmony has entered into various agreements with VRO, which govern right of access, in addition to toll treatment the supply/sharing of production services. Further, major critical spares are pooled between the two groups, however both parties maintain, at their own cost, monitoring systems for emergencies such as fire, flood and seismic events.

Mining methods at Orkney Operations include scattered breast mining methods, up-dip mining, remnant extraction, pillar mining and vamping. Contractor operators are utilised for non-core activities such as development, support and vamping, with stoping undertaken by Orkney Operations personnel. Stope support is with conventional sticks and packs, however at No.2 BU backfill is utilised which is supplied by VRO.

Mine ventilation systems at Orkney Operations are well established and have been extensively planned and operated in the past. Due to the low tonnages and the large volumes of air that are being circulated in the various sections, the air ratios are considerably greater than industry norms. In SRK's opinion, the installed ventilation and refrigeration infrastructure is adequate to meet all planned requirements.

GeoHydroSeis, Rockcon Services and SRK are retained on a contractual basis to provide geotechnical input at Orkney Operations. GeoHydroSeis provide a seismic monitoring service. Rockcon Services are responsible for geotechnical input to No.6 BU, No.7 BU and a portion of No.3 BU. SRK is responsible for geotechnical input in all other areas.

The main strategic rock engineering issue faced by management at Orkney Operation's is the maintenance of acceptable levels of production out of highly stressed, seismically active pillars and remnants. Shaft pillar extraction is in progress at No.2 BU and No.4 BU.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Orkney Operations, as follows:

- continued vigilance with respect to minimising seismic activity;
-
ensuring economic viability during the latter half of the LoM plan at significantly reduced production rates when only No.6 BU and No.7 BU are operating; and
-
continuation of and adherence to the current agreements between Orkney Operations and VRO so as to ensure uninterrupted production.

Other than increases in Mineral Reserves due to reduction in operating costs and increased extraction, SRK consider there to be no other significant opportunities at Orkney Operations.

5.3.8

Kalgold Operation

Kalgold Operations comprise an open pit mine that has a life of approximately four years, thus classifying Kalgold Operations as a short-life asset.

Several steeply dipping ore zones exist at Kalgold Operations and current mining operations are focused on the D-Zone, which has a strike length of 1,400m and a width between 15m and 40m

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Mining operations are conducted by normal open pit methods by the use of excavators and trucks. The ore mining and waste stripping is undertaken by a contractor. The current term of the contract is five years commencing in 2001 and the contractor is reimbursed on a rate per cubic metre. Ore is trucked to the plant from either the North-pit or South-pit and stockpiled according to various grade categories before being blended for treatment. The short-term and strategic stockpiles are re-handled using a wheel loader.

The business plan is based on a pit optimisation that seeks to maximise the NPV of the D-Zone. It is planned to make the high-wall steeper following the installation of support anchors enabling access to more high-grade ore. Waste stripping requirements are elevated in the first six months of the plan beyond which stripping requirements will reduce to levels comparable with historical values. A number of ramp modifications to the pit exits and location of switchbacks are planned by Kalgold Operations in order to reduce waste hauling costs. The final pit depth is currently planned at some 155m and 235m below surface for the North-pit and South-pit, respectively and further mining of the orebody by underground methods may be considered.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable, however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Kalgold Operations, as follows:

- improvement in working costs and productivity;
- maintenance of slope stability and ensuring a continuous supply of ore at the planned grade; and
- the observance to strict grade control guidelines and ore reserve management.

5.3.9

Harmony Australian Operations

Harmony Australian Operations comprise two principal operations, namely Mt. Magnet & Cue and South Kalgoorlie, mining from various underground and open pit mines. The Mt. Magnet operations comprise a number of open pits, decline operations at Morning Star and Hill 50 and the processing of surface stockpiles. Open pit, underground and surface stockpiles are treated at similar production rates. The Cue operation comprises a number of open pits at Big Bell, Cuddingwarra, Golden Crown and Tuckabianna. The Big Bell underground operation was recently closed. These operations have a combined life of approximately seven years, thus classifying Mt. Magnet & Cue operations as a medium-life asset.

The South Kalgoorlie Operations comprise the Jubilee and New Celebration facilities, the Mt. Marion underground mine and various open pits. These operations have a combined life of three years, thus classifying South Kalgoorlie operations as a short-life asset.

At Mt. Magnet underground mining is the principal contributor to gold production with open pit mining restricted to the near surface oxidised resources. The underground and open pit mines are contractor operated, however mine personnel undertaken the planning and mine design. The side slopes of the open pit mines are steep, at some 60° to 70°. A divergence in plan has resulted through problems with the licensing and approvals at one of the open pits although alternative production has been sourced. Underground access is via separate declines at the Morning Star and Hill 50 mines, installed at a gradient of 1 in 7 and accessed from portals close to the base of the open pits. The pit bottoms are 900m and 1,000m deep, respectively. An up-hole benching method is employed at both mines in the steeply dipping orebodies from levels installed at 25m vertical intervals at Morning Start and 30m at Hill 50. The ore is loaded by LHDs into trucks that transport the ore to surface, which is then stockpiled before treatment. The depleted stopes are backfilled with development waste. Operations at Hill 50 are currently restricted due to a collapse of a main return airway and this together with a planned vertical advance rate of 100m per year underground production are currently below budget.

The numerous open pit mines at Cue are considered small and have short lives. Contractors are employed to mine the ore and waste and RoM ore is transported from the mine to the plant using road trains.

The Jubilee and New Celebration operations have been combined to form South Kalgoorlie Operations. Ore contribution is split: 75% from open pit mining; 20% from underground mining; and the remainder from the low-grade surface stockpiles. The underground steeply dipping orebody at Mt. Marion is accessed via a decline from

surface and extends along strike some 250m to 300m. A sub-level caving system has recently been introduced utilising mechanised drilling and loading equipment producing at 45ktpm. The average mining depth is relatively shallow at some 500m below surface; however mineralisation has been demonstrated to some 1,000m below surface. The planned future conditions and production rates are comparable to that currently achieved and no material concerns are noted by SRK.

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Open pit mining at South Kalgoorlie is concentrated at the Trojan and Golden Ridge. Mineral Reserves at Trojan will be depleted during 2003. Numerous un-planned slips and failures at Golden Ridge are resulting in significant under-performance in terms of ore production and flatter slope angles, necessitated by the failures, have resulted in significant additional stripping.

Mine ventilation systems at the underground operations at Mt. Magnet and Mt. Marion are well established and have been extensively planned and operated in the past. Apart from unexpected airway failures, thought to be associated with seismicity, no material ventilation concerns are anticipated by SRK. The increasing depth of operations coupled with high extraction ratios and massive mining methods have led, it is reported, to a number of seismic events at the underground operations and a focus on control and monitoring is being made in an effort to limit adverse production impacts. Seismicity and rock mechanics aspects are, considered by SRK to be, of a low risk although the costs of increased support may impact on profitability.

The Mineral Reserves as reported in Section 4 and depleted to generate the cash flows presented in Section 12 and Section 13 are deemed by SRK to be appropriate and both technically and economically achieveable; however certain aspects mainly relating to operational management may impact individually or collectively on the execution of mining operations at Harmony Australian Operations to diligently manage production, cost, safety and dilution aspects at the Mt. Magnet underground operations at the deeper mining levels.

5.4

Contribution to LoM Production

The following table presents the projected contribution of various production sources to the individual LoM plans for each operation making up the total Mineral Reserves for the Mining Assets.

Table 5.1 Mining Assets: Production Contribution to LoM Plans

MINING ASSETS

Tonnage

Grade

Content

(kt)

(g/t)

(koz)

Total Target Operations - Target Mine

LoM Ore ug

19,944

6.6

4,242

Total to Plant

19,944

6.6

4,242

Total Free Gold Operations

LoM Ore ug

68,244

7.1

15,647

LoM Vamping

892

4.5

129

LoM SS

10,361

0.7
240
Total to Plant
79,497
6.3
16,016
Total Harmony Free State Operations
LoM Ore ug
42,343
4.6
6,267
LoM Vamping
1,431
3.3
152
LoM SS
19,244
0.4
265
Total to Plant
63,018
3.3
6,684
Total Welkom Operations
LoM Ore ug
3,071
3.8
376
LoM Vamping
97
4.8
15
Total to Plant
3,168
3.8
391
Total West Wits Operations
LoM Ore ug
64,112
6.6
13,557
LoM Vamping
5,714
5.2
955
LoM SS
2,642
1.3
112
Total to Plant
72,468

6.3
14,625
Total Evander Operations
LoM Ore ug
18,001
5.5
3,182
LoM Vamping
1,525
6.2
304
Total to Plant
19,520
5.6
3,486

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MINING ASSETS
Tonnage
Grade
Content
(kt)
(g/t)
(koz)
Total Orkney Operations
LoM Ore ug
5,666
4.9
888
LoM Vamping
90
3.5
10
Total to Plant
5,756
4.9
898
Total Kalgold Operations
(1)
LoM Ore op
4,986
2.3
365
LoM SS
994
1.2
38
Total to Plant
5,980
2.1
403
Total Mt. Magnet Operations
LoM Ore ug
6,822
6.0
1,313
LoM Ore op
4,500
2.1
302
LoM SS
2,282
1.0
70
Total to Plant

13,604
3.9
1,685
Total South Kalgoolie Operations
LoM Ore ug
1,522
4.6
223
LoM Ore op
1,233
2.3
92
LoM SS
428
0.8
11
Total to Plant
3,184
3.2
326
(1)
The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.

6.
METALLURGY

6.1
Introduction

This section includes discussion and comment on the metallurgical processing aspects associated with the Mining Assets. Specifically, detail and comment is given on the process metallurgy and process engineering aspects relating to plant capacity, metallurgical performance and metal accounting practices as incorporated in the LoM plans.

6.2
Processing Facilities

Metallurgical processing facilities at the Mining Assets include fifteen operating plants in South Africa with a combined milling and treatment capacity of 2,660ktpm and 2,760ktpm, respectively, plus four operating plants in Australia with a combined milling capacity of 660ktpm. The plants currently process ore from underground and open pit mining operations, low-grade stockpiles, WRDs, reclaimed slime and a variety of other surface accumulations. Schematic flow diagrams for each of three primary plant types that are operated by the Companies are provided in Figures 6.1 to 6.3 inclusive at the end of this Section.

6.2.1
Target Operations - Target Mine

Target Plant was commissioned towards the end of 2001 and currently treats only underground ore. The process route comprises primary crushing, open circuit primary SAG milling, secondary ball milling closed with hydrocyclones, thickening, cyanide leaching, CIP adsorption, elution, electrowinning, smelting and tailings disposal. The milling circuit incorporates gravity concentration, the concentrates from which are processed via intensive cyanidation and electrowinning. Gold bullion is despatched to the Rand Refinery.

Target Plant was designed with a capacity of 105ktpm (1,260ktpa). Certain sections of the plant were sized for a future expansion to 160ktpm (1,920ktpa), however this capacity is not required for the current LoM plan. Maximum projected LoM throughput (1,285ktpa) slightly exceeds the design capacity. The ability of the plant to operate continuously at the design capacity has not yet been proven, largely due to ore supply constraints. Irrespective of the feed from mining activities, it is noted that the SAG mill feed rate and the ball mill product size has rarely achieved design specification. The reasons for this are still receiving attention but indications are that feed characteristics and

the proportion of waste in the feed differ from design assumptions. Notwithstanding the coarser milled product size, overall recovery has generally exceeded design expectations. This has partly been assisted by the higher than planned grades being realised but in the main shows recovery to be less sensitive to grind than originally anticipated. This significantly compensates for the below specification mill performance. The risk of not achieving projected throughput, albeit at a coarser milled product size, is considered to be low.

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Overall leach/CIP recovery, as already mentioned, generally exceeds design expectations, despite the leach component being significantly lower than expected. The reasons for the lower leach recovery are receiving attention, with initial indications suggesting the presence of a mild reversible preg robber in the ore. Overall recovery has however; consistently exceeded the projection of approximately 97% and this is likely to continue, with a slight drop off as the head grade reduces towards the end of the mine life.

Plant housekeeping was observed to be of a high standard. Being new, the plant is generally in good condition both mechanically and structurally and subject to adequate ongoing maintenance should meet the LoM requirements.

6.2.2

Free Gold Operations

FS1 Plant processes underground ore, waste rock and various surface accumulations, delivered by either road or rail. The plant was commissioned in 1986 and comprises three independent modules, each consisting of four feed silos, two RoM mills, two conventional thickeners, cyanide leach, carbon in pulp ("CIP") adsorption, AARL elution, zinc precipitation and smelting. Loaded carbon is also received from Joel for elution and regeneration.

The fully autogenous reef milling capacity is 390ktpm. It is proposed to increase mill throughput to 440ktpm through the addition of steel ball grinding media, at which stage leach/CIP becomes limiting. Maximum projected LoM throughput 5,006ktpa. Projected gold recoveries from metal contained in reef and waste of 97% and 88% respectively, with due consideration for head grade effect over the LoM period, are in line with recent performance.

SRK consider the plant to be generally in good condition both mechanically and structurally and subject to adequate ongoing maintenance should meet the LoM requirements. FS1 plant is projected to be in use until 2023 when underground operations cease.

FS2 Plant is largely dedicated to the treatment of surface sources, although it does toll treat reef on behalf of Welkom Operations and also processes ore from Eland BU and Kudu & Sable BU. The plant was commissioned in the early 1950s and employs conventional technology of that era comprising crushing, ball and pebble milling, thickening, leaching, filtration, zinc precipitation and smelting.

FS2 has a reef milling capacity of 300ktpm, which reduces to its current operating capacity of approximately 270ktpm when processing reef and waste. Maximum projected LoM throughput of 3,240ktpa of reef and waste (milling) and 3,600ktpa of reef, waste and slimes (treatment). Overall recovery is a function of the mix of feed ore, as surface sources tend to have a lower recovery than underground reef. SRK consider that the projected reef recoveries of approximately 95%, WRD recoveries of approximately 80% and slime recoveries of approximately 60% are appropriate considering the recent operating performance.

Considering its age, FS2 appears to be in a fair condition, both mechanically and structurally. Filter maintenance is good but this will have to be sustained if current efficiencies are to be maintained. FS2 is projected to be in use until 2007 when surface operations cease. Providing that routine maintenance is sustained, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

Joel Plant processes underground ore and waste rock both of which are delivered to the plant by road. Joel Plant was commissioned in 1987 with a circuit comprising conventional RoM milling, leach, CIP adsorption, elution, electrowinning and smelting. Due to the observed "preg robbing" characteristics of the ore, the leach and adsorption circuit was reconfigured as a CIL circuit to realise improved metallurgical recoveries. In a recent development, elution has been discontinued at Joel Plant and loaded carbon is transported to FS1 for elution.

Joel Plant was originally designed as a fully autogenous reef mill with a capacity of 120ktpm. Following certain modifications the reef capacity was increased to 150ktpm with the mills running semi-autogenously. Current operating capacity, including waste, is approximately 120ktpm with the potential to increase to 135ktpm. Maximum projected LoM throughput is 1,458ktpa. Projected reef and WRD recoveries of approximately 95% and 87% respectively are in line with recent performance with due allowance for the impact of head grade variation over the LoM period.

Generally the plant is considered to be in good condition both mechanically and structurally although the level of housekeeping offers room for improvement. Joel Plant is projected to be in use until 2014 when underground operations cease.

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St. Helena Plant was commissioned in 1978. Older plant facilities, which began operating in the 1950s, have since been demolished. The current circuit comprises RoM milling, thickening, leaching, filtration, zinc precipitation and smelting.

Presently only two of the five original milling circuits are operational. On the basis of semi-autogenous operation, current reef milling capacity is approximately 100ktpm, which reduces to the present operating capacity of approximately 90ktpm processing reef and waste. Maximum projected LoM throughput is 1,120ktpa. St. Helena Plant will process a range of surface sources in its remaining life, for which varying recoveries projected to be between 50% and 90% are considered appropriate by SRK.

The plant is generally in good condition although there are signs of corrosion, particularly in the leach area. Planned filter overhauls have fallen behind schedule and will have to be reinstated if current efficiencies are to be maintained.

St. Helena Plant is planned to be in use until 2006 when surface operations cease. Providing that routine maintenance is sustained, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

6.2.3

Harmony Free State Operations

Central Plant processes underground ore and it is planned to utilise spare treatment capacity to process reclaimed slime in the future. The plant was commissioned in 1986 and comprises RoM milling, thickening, cyanide leaching, CIP adsorption, elution and electrowinning. Loaded carbon is received from Virginia and Saaiplaas Plants for elution and regeneration. Following commissioning of the Harmony refinery, smelting was discontinued and cathode slime is now processed at Central Plant to refined gold products.

The plant was designed to mill 150ktpm of reef at moderate steel addition and has demonstrated an operating reef milling capacity of 180ktpm at higher steel addition. Installed treatment capacity equates to 240ktpm and this differential will be used to process reclaimed slime. Maximum projected reef and slime LoM throughput is 2,160ktpa of reef and waste and 2,880ktpa for treatment including slimes. Projected reef recoveries of approximately 95% are in line with recent performance. Recoveries of 55% are anticipated on the reclaimed slime component of the feed and SRK consider this recovery to be achievable.

Central Plant is planned to be in use until 2014 when underground operations cease. Generally the plant is considered to be in good condition both mechanically and structurally and providing that routine maintenance is sustained, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

Saaiplaas Plant processes underground ore and it is planned to utilise spare treatment capacity to process reclaimed slime in future. The plant was commissioned in the late 1950s employing conventional technology of that era. In the early 1980s RoM milling was introduced and part of the leach was converted to a carousel CIL circuit earlier this year. Loaded carbon is transported to Central Plant for elution and regeneration.

Saaiplaas Plant has a reef milling capacity of 150ktpm and installed treatment capacity of 220ktpm. Spare treatment capacity will be used to process reclaimed slime. Maximum projected reef and slime LoM throughput is 1,800ktpa of reef and waste and 2,663ktpa for treatment including slimes. Projected reef recoveries of 95% to 96% are in line with recent performance. Recoveries of 55% are anticipated on the reclaimed slime component of the feed and 88% on the WRD. SRK consider these recoveries to be achievable.

Saaiplaas Plant is planned to be in use until 2018 when underground operations cease. Generally the plant is considered to be in good condition both mechanically and structurally and providing that routine maintenance is sustained, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

Virginia Plant processes underground ore and waste. The plant was commissioned in 1986 and comprises RoM milling, thickening, cyanide leaching and CIP adsorption. Local elution and electrowinning facilities have been decommissioned and loaded carbon is transported to Central Plant for elution and regeneration.

The plant was designed to mill 150ktpm of reef at moderate steel addition and has demonstrated an operating reef milling capacity of 180ktpm at higher steel addition. Virginia has a current operating capacity of approximately 165ktpm processing reef and waste. Maximum projected LoM throughput is 1,944ktpa. Projected reef and waste recoveries of approximately 96% and 85%, respectively, are in line with recent performance.

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The mills are generally in good condition although certain structural steelwork is showing signs of corrosion. Leach tanks are not in good condition and there have been recent failures. The installation of in-house leach reactors has consequently been necessary to enhance leach kinetics and maintain dissolution. The CIP circuit, being a converted uranium leach circuit, is showing its age and is not in good condition. Both the leach and CIP circuits will have to be refurbished or replaced if extended operations are intended. A capital allowance of ZAR10m has been included to complete the work deemed necessary by SRK to sustain the projected plant performance. Virginia Plant is required until 2012 when underground operations cease. Providing that routine maintenance is sustained and the capital is expended as provisioned, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

6.2.4

Welkom Operations

RoM ore from Welkom Operations is processed at Freegold Operation's FS2 Plant. FS2 Plant has a nominal reef milling capacity of 300ktpm. Freegold Operations use excess capacity to treat its own material. Ore is delivered to FS2 Plant by road.

6.2.5

West Wits Operations

Ore is delivered to Elandsrand Plant by conveyor from Elandsrand BU and by road from Deelkraal BU. Elandsrand Plant also operates a waste washing section, with washed fines joining the reef feed and oversize being stockpiled. The plant was commissioned in 1978 and comprises RoM milling, thickening, cyanide leaching and CIP adsorption. A pumpcell CIP circuit was commissioned as an upgrade in 1999. Loaded carbon is transported some 50km to the Cooke Plant for elution and regeneration. A portion of the tailings is cycloned ahead of disposal to produce backfill. Elandsrand Plant has a maximum reef milling capacity of 190ktpm. Maximum projected LoM throughput is 1775ktpa. Projected reef recoveries of 96% are in line with recent performance and taking cognisance of the projected increase in head grade over the LoM period.

Elandsrand Plant is required until 2023 when underground operations cease. Generally the plant is in excellent condition both mechanically and structurally and providing that routine maintenance is sustained, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

Deelkraal Plant was commissioned in 1978 with a circuit comprising RoM milling, thickening, leaching, filtration, zinc precipitation and smelting. A portion of the tailings is cycloned ahead of disposal to produce backfill. Deelkraal Plant has a design reef milling capacity of 135ktpm and a current operating capacity of 105ktpm when processing waste, largely limited by the condition of the filter plant. In recent years, Deelkraal Plant has primarily treated waste, with Deelkraal underground ore having been transported to the Elandsrand Plant for treatment. It is planned to commission a new 60ktpm pumpcell CIP plant to process Deelkraal BU underground ore from 2004. This decision is partly motivated by the need for backfill at Deelkraal BU. An appropriate capital allowance has been included in the strategic plan for the CIP conversion. Maximum projected LoM throughput is 720ktpa. Projected reef recoveries of 92% should be achievable following the conversion to CIP.

The plant is generally in a fair condition, with the exception of the filter plant and general maintenance will have to be reviewed/improved to prevent disruptions over the LoM period. The Deelkraal Plant is required until 2009 when underground operations cease. Providing that routine maintenance is sustained, SRK consider the plant is in adequate condition to meet the requirements of the LoM projections.

Cooke Plant processes only underground ore delivered from Cooke No.1 BU, No.2 BU and No.3 BU and the Doornkop BU. The plant was commissioned in 1977 as a Gold and Uranium plant. Uranium operations ceased in 1989 and parts of the Uranium plant were utilised to convert from filtration and zinc precipitation to CIP/CIL. The current operation comprises RoM milling, thickening and cyanidation in a hybrid CIP/CIL circuit, elution and electrowinning. Loaded carbon from Doornkop Plant is added to the CIL circuit for further loading and loaded carbon from Elandsrand Plant is separately eluted and regenerated. Electrowon gold slime is transferred to the Harmony refinery.

The plant was designed as a 250ktpm gold and uranium plant, the capacity of which was increased to 300ktpm in 1982 with 280ktpm mill capacity as the current limit. Maximum projected LoM throughput is 3,173ktpa. Projected reef recoveries of 96% to 97% are in good agreement with current performance. The Cooke Plant is planned to be used until 2022. Generally the plant is considered to be in good condition both mechanically and structurally and subject to adequate ongoing maintenance should meet the LoM requirements.

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Doornkop Plant is currently dedicated to processing waste rock and other surface accumulations. The plant was commissioned in 1985 and comprises RoM milling, thickening, cyanide leaching and CIP adsorption. Loaded carbon is transported to Cooke Plant for further loading ahead of elution and regeneration.

Doornkop Plant was commissioned with an initial reef milling capacity of 100ktpm. This was expanded to its current reef milling capacity of 225ktpm in 1987, which equates to a waste milling capacity of around 200ktpm. Maximum projected LoM throughput is 2,220ktpa. In line with recent performance, recoveries are projected at approximately 90%.

The plant is required until the final quarter of FYE 2005.

Generally the plant is considered to be in very good condition both mechanically and structurally and subject to adequate ongoing maintenance should meet the LoM requirements.

6.2.6

Evander Operations

Winkelhaak Plant was commissioned in 1958. Only two RoM mills, a thickener and transfer pumping facilities to pump pulp to Kinross Plant are still operational. The Kinross Plant was commissioned in 1967 and comprised three RoM mills followed by conventional leach, filtration and zinc precipitation. In the early 1980s, two further mills were added and the treatment section was modified to incorporate CIP adsorption, elution and electrowinning.

The Winkelhaak Plant and Kinross Plant largely treat underground reef with minor waste inclusion. The Winkelhaak Plant has a reef milling capacity of 68ktpm whilst the reef milling capacity of the Kinross Plant is 160ktpm. The Kinross Plant treatment capacity of 200ktpm limits overall throughput. Maximum projected LoM throughput of 2,428ktpa. Projected reef recoveries of 96% to 97% are in line with recent achievements.

Winkelhaak Plant and Kinross Plant are planned to be used until 2013 and 2018 respectively and are planned to operate close to capacity. Both Winkelhaak Plant and Kinross Plant require some attention in the shaft conveyor and mill feed silo areas if continued operation is intended. The Kinross Plant is otherwise showing its age and will require ongoing attention. Some ZAR6m has been budgeted in the next financial year to cover the needed repairs, however the plants will still need to be better maintained if planned operations are to be met when running at full capacity.

6.2.7

Orkney Operations

RoM ore from Orkney Operations is toll processed at VRO's No.1 Gold Plant. Ore is transported to No.1 Gold Plant by rail from all but Orkney No.2 BU and Orkney No.7 BU, which is conveyed directly to the plant. The circuit comprises two semi autogenous mills, one closed by a hydrocyclone and the other closed by a linear screen, a single closed circuit ball mill, thickening, pre-leaching, carousel CIL adsorption, residue disposal, acid washing of loaded carbon, Zadra elution and electrowinning. Cathode gold is stripped from the washable stainless steel cathodes and transported at the risk of Harmony to No.8 Gold Plant for smelting. Eluted carbon is thermally reactivated before being recycled to the CIL adsorption circuit. Any mill gold recovered during relining is also transported to No.8 Gold Plant for smelting. Gold due to Harmony is determined from metal accounting procedures.

The No.1 Gold Plant has a nominal milling capacity of 180ktpm, and contractually ore from Orkney Operations is processed at a maximum of 6ktpd. VRO are able to use any unutilised milling capacity for processing other material, typically waste rock. In addition, the plant has greater treatment capacity than milling capacity, which allows for the processing of an additional 50ktpm of reclaimed slimes.

In the event of prolonged stoppages, breakdowns or other outages and with Harmony's written consent, the ore may be processed at one or a combination of VRO's other gold plants. Such processing is subject to the provision that process efficiency and throughput would not be lower than that achievable in No.1 Gold Plant.

Various agreements between Harmony and VRO govern supply and quality of RoM ore and gold apportionment. Further, SRK has been informed by Harmony that VRO takes ownership and assumes liability for the treatment, stockpiling and rehabilitation of all residues emanating from No.1 Plant. This includes environmental liability, but specifically excludes Harmony from participating in the recovery of gold or other minerals from secondary processing of residues.

6.2.8

Kalgold Operations

Kalgold Plant processes open pit ore. The plant was commissioned in 1998 and comprises three stage crushing, ball milling, thickening, leaching, CIL adsorption, elution, electrowinning and smelting.

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Kalgold Plant was designed to treat 85ktpm and has recently commissioned a third ball mill and additional leach tanks which has increased capacity to 135ktpm. Maximum projected LoM throughput is 1,363ktpa. Variable recovery is experienced in treating the open pit ore and the trend in recent years has been for recoveries to drop to approximately 81%. The recent expansions will result in similar mill product size distribution but will increase the leach residence time. Recoveries are expected to improve slightly to 82% based on performance over the past three years.

Kalgold Plant is generally in good condition; both mechanically and structurally and subject to adequate ongoing planned maintenance should meet the LoM requirements.

6.2.9

Harmony Australian Operations

Checker Plant processes underground ore, open pit ore, low-grade ore from surface stockpiles and tailings from previous operations at Hill 50. Ore from the various sources is separately stockpiled on the RoM pad and reclaimed by a front-end loader to a blend specification, usually on the basis of hardness. The process route comprises two stage jaw crushing, ore blending, primary SAG milling with recycle pebble crushing, closed circuit secondary ball milling, closed circuit tertiary ball milling, cyanide leach enhanced by oxide injection, CIP adsorption, split AARL elution, electrowinning, smelting and tailings disposal. The milling circuit includes centrifugal gravity concentration, the concentrates of which are forwarded to intensive cyanidation in an InLine Leach Reactor ahead of solution electrowinning.

Checker Plant was commissioned in 1989 and designed to treat 125ktpm, however the capacity was increased to 225ktpm in 1999. Projected reef recoveries of 93% are in good agreement with current performance.

Generally the plant is considered to be in good condition both mechanically and structurally and subject to adequate ongoing planned maintenance should meet the LoM requirements.

Big Bell Plant processes underground and open pit ore and is currently in the process of closure. Ore is stockpiled on the RoM pad and reclaimed by a front-end loader to achieve the desired blend on the basis of grade and ore type. The process route comprises gyratory crushing, primary SAG milling with recycle pebble crushing, secondary ball milling closed by hydrocyclones, cyanide leach enhanced by oxygen injection, CIP adsorption, pressure Zadra elution, electrowinning, smelting and tailings disposal.

Plant capacity is 250ktpm on softer oxidised ore and 170ktpm on harder primary ore. Gold recovery is typically 85%.

New Celebration Plant processes underground ore, open pit ore and low-grade ore from surface stockpiles. Ore from the various sources is separately stockpiled on the RoM pad and reclaimed by a front-end loader to achieve a required blend. The process route comprises primary jaw crushing, secondary and tertiary cone crushing closed by screens, ball milling closed by hydrocyclones, thickening, cyanide leaching, CIP adsorption, split AARL elution, electrowinning and smelting.

New Celebration Plant was commissioned in 1986 and has a design treatment capacity of 125ktpm on blended ore. Projected reef recoveries of 92% are in good agreement with current performance.

Generally the plant is considered to be in good condition both mechanically and structurally and subject to adequate ongoing maintenance should meet the LoM requirements.

Jubilee Plant processes underground ore, open pit ore and low-grade ore from surface stockpiles. Ore from the various sources is separately stockpiled on the RoM pad and reclaimed by a front-end loader to achieve a required blend. The process route comprises primary jaw crushing, secondary and tertiary cone crushing closed by screens, primary SAG milling, closed circuit secondary ball milling, cyanide leaching, CIP adsorption, split AARL elution, electrowinning, smelting and tailings disposal.

Jubilee Plant was commissioned in 1987 and has a design treatment capacity of 110ktpm on blended ore. Projected reef recoveries are slightly below the 92% achieved at the New Celebration Plant.

Generally the plant is considered to be in good condition both mechanically and structurally and subject to adequate ongoing planned maintenance should meet the LoM requirements.

6.2.10 Harmony Canadian Operations

The Bisset Plant is currently on care and maintenance.

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Annexure 7

6.3

Sampling, Analysis, Gold Accounting and Security

6.3.1

Avgold

At the Target Mine, adequate attention is generally given to sampling, sample preparation and metal accounting. A regularly calibrated mass flow system installed on the thickener underflow serves as the principal measurement of plant feed tonnage. A single idler belt weightometer installed on the ore silo feed conveyor serves as a check. Thickener underflow is automatically sampled ahead of leach and CIP and gold content in the leach feed is determined as the product of the thickener underflow grade and mass flow. Gravity gold content is determined from a volumetric measurement and grade of the solution sent to electrowinning after intensive cyanidation. Plant head content is determined as the sum of leach feed content and gravity gold content. A manual sample of the SAG mill discharge serves as a check as does the calculated head grade reconstituted from the gold recovery plus residue content. Final residue is automatically sampled with gold content in the residue being determined as the product of the residue grade and the thickener underflow tonnage.

The previous mine analytical function has been privatised. The laboratory employs fire assay with gravimetric finish for gold analysis, with all samples being parted. Internal laboratory controls are fairly standard including check assaying of certified reference materials. In terms of external quality control, four laboratories in the Free State participate in a round robin sample exchange.

Whilst metal accountability shows fairly high variability at the monthly level, longer-term accountability is acceptable, albeit with room for improvement.

A full security audit was beyond the scope of this review. The security system was however noted to include state of the art monitoring and access control technology and to rely strongly on procedural compliance. In an environment where theft is known to be prevalent, ongoing vigilance and upgrading of systems and procedures will be important. Security facilities and procedures at the process plants of the Mining Assets are considered to be well directed at attempting to minimise the risk of theft.

Security facilities and procedures at the process plants of the Mining Assets are considered to be well directed at attempting to minimise the risk of theft. Notwithstanding the above comment, all forward projections are based on historically achieved Mine Call Factors which will ultimately include any historical gold loss through theft, with the security in place this situation is not deemed to deteriorate and as such the projections are considered valid.

6.3.2

Harmony

Generally across the group adequate attention is given to sampling and sample preparation. Whilst there are accounting anomalies that require further investigation, good accounting procedures are largely in place. All plant feed sources are individually sampled. Underground ore is generally sampled at the shaft head or on the main plant feed conveyor with the aid of Go-Belt samplers. Waste rock is generally sampled from a plant feed conveyor with Go-Belt samplers. Where manual samples are taken, particularly in the case of third party samples, detailed procedures have been laid down and are followed. Daily composites of Go-Belt and other bulk samples are prepared in dedicated sample preparation plants.

Plant head and residue samples are almost exclusively taken automatically with cross-stream pulp cutters or in-stream poppet samplers, composites are accumulated and prepared in the standard way. In most cases, actual gold recovered is apportioned to the various sources in proportion to the estimated content in each source after allowance has been made for any differential metallurgical recovery. The latter is determined from bottle roll tests on monthly composite samples.

Because of the fact that many of the plants treat numerous ore types from different sources, metal accounting is often the subject of some debate, specifically when final gold allocations are made back to each source. SRK consider that there may be inherent inaccuracies in gold allocation which may ultimately impact on the planning factors such as MCF. However, at a collective tax entity level, the allocated gains and losses cancel each other out and over extended time periods the individual BUs feeding the plants will be allocated with the appropriately estimated recovered gold.

A full security audit was beyond the scope of this review. SRK notes that whilst security measures are in place at the Mining Assets, these vary in both management focus and the applied technology. In general, however, mine management is continuing to refine security measures. Security facilities and procedures at the process plants of the Mining Assets are considered to be well directed at attempting to minimise the risk of theft.

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6.4
Plant Clean-Up
There are two aspects to gold lock up that need to be considered. Firstly any change in the in-plant gold inventory and secondly the recovery of lock up gold when the plants are finally closed and cleaned up. The quantity of clean-up gold that can be anticipated on closure of a plant is uncertain. Reported figures for South African plants have shown an order of magnitude difference, varying between 0.04% and 0.40% of the total gold produced through the plant during its life. Factors affecting the quantity of gold that is eventually recovered are plant age, installed treatment route, plant layout and detailed design features, plant operational management and the procedure and efficiency of the plant clean-up.
The recorded figures confirm that plants incorporating large crushing and milling circuits will release more gold on closure than compact RoM milling plants. Prediction of the quantity of gold that is likely to be recovered is difficult and will always be subjective. As a guideline, SRK has assumed 0.15% for older crushing and milling plants, 0.10% for more recent, relatively clean plants and 0.04% for RoM milling plants. Where low-level waste has been processed in the latter years of a plants life, significant gold purging is likely to have occurred and lower gold accumulations can be expected.
It is considered that parameters derived from South African experience would considerably overstate the clean-up gold potential of Western Australian processing plants, largely due to their more recent design, shorter operating history and more compact plant layout. SRK has accordingly made no allowance for the recovery of lock up gold in these instances. Estimated clean-up gold for the Mining Assets operations is shown in Table 6.1.
Table 6.1 Mining Assets: Clean-up Gold Estimates
Operation
Clean-up Gold
(koz)
Target Operations - Target Mine
7
Free Gold Operations
103
Harmony Free State Operations
22
Welkom Operations
0
West Wits Operations
76
Evander Operations
19
Orkney Operations
0
Kalgold Operations
(1)
1
Mt. Magnet & Cue Operations
0
South Kalgoorlie Operations
0
Total
228
Avgold
7

Harmony
221
(1)
The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.

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Figure 6.1 Avgold/Harmony: Schematic Flow Diagram of a Typical Carbon in Pulp Plant

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Figure 6.2 Avgold/Harmony: Schematic Flow Diagram of a Typical Carbon in Leach Plant

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Figure 6.3 Avgold/Harmony: Schematic Flow Diagram of a Typical Filtration and Zinc Precipitation Plant

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7.
TAILINGS
7.1
Introduction
This section includes discussion and comment on the tailings engineering aspects associated with the Mining Assets. Specifically, detail and comment is focused on the design, construction, geotechnical integrity, remaining capacity and management practices governing the tailings facilities. Key source data for the review comprised the engineering design constraints, where available, as prepared by the appointed tailings dam review consultants at each of the operations (including in certain cases SRK). Site-specific issues are summarised below.
7.2
Target Operations - Target Mine
The Target Operation currently comprises a single tailings dam divided into two compartments known as Dam 1 (the northern section) and Dam 2 (the southern section). The tailings dam is currently built up to an average height of approximately 34m above the surrounding original ground level. By the end of 2020 the tailings dam is likely to rise a further 9.5m. The average height above the original ground level will then be 44m, which is acceptable.
During the last inspection, undertaken during March 2003, an improvement was observed to the general condition of the dam walls, in that the level of toe seepage had reduced from that noted in previous inspections; however this may be attributed to a spell of prevailing drier weather as opposed to successful implementation of a remedial programme.
The current LoM plan projects 19.9Mt of processed/tailings material evenly spread over the next 17-year period. The Mine has indicated that 40% of the total tailings stream will be placed back underground as backfill in order to support stoped-out areas required for continued mining operations. SRK note, however, that 40% has not always been achieved and has been low as 20% (therefore 16.0Mt reporting to the tailings). For review purposes SRK has assumed a conservative 20% level of backfill placement to assess tonnage loading on the tailings dam. With 20% reporting to underground, the rate of rise ("RoR") on an annual basis ranges between 0.4m/yr and 0.6m/yr. These rates are not perceived by SRK as being excessive; in fact by normal standards can be considered low. The tailings dam has however exhibited toe seepage emissions, and is likely to display further seepage in the future, specifically during seasons with above average rainfall; as such strict monitoring control must be implemented throughout the year. As a general rule of thumb, SRK consider that a tailings facility with no toe seepage emissions should operate at a RoR of 1.5m/yr without any associated stability problems. As Target has exhibited seepage, it is not advisable to increase the RoR beyond 0.8m/yr without undertaking a detailed stability analysis.
7.3
Free Gold Operations
Free Gold Operations currently include four tailings dam complexes, namely FS North, FS South, St. Helena and Joel Slimes Dams, which facilitate deposition of residue from FS1 Plant, FS2 Plant, St. Helena Plant and Joel Plant. FS North includes seven tailings dams, two of which are operational (FS North 1 and FS North 2), with the other five (FS North 3B, FS North 4, FS North 5 and FS North 6) being dormant. FS North facilitates tailings deposition from FS2 Plant, which includes material treated on behalf of Free Gold Operations and Welkom Operations. FS South includes nine tailings dams, five of which are operational (FS South 1, FS South 2, FS South 4, FS South 8W and FS South 8E), with the other four (FS South 3, FS South 5, FS South 6, FS South 7 and President Brand C) being dormant. FS South facilitates tailings deposition from FS1 Plant and also toll deposition from President Steyn.
The St. Helena tailings dam comprises a single facility known as Dam 4, although very little deposition is taking place on the dam at present, St. Helena plant is planned to treat surface sources for the next three years.
Joel Slimes Dam is also a single facility, which is currently operational, comprising an unlined facility where deposition occurs in accordance with appropriate rates of rise and design specifications.
The current LoM plans for collective Free Gold Operations require a total placement of approximately 89.0Mt. The total remaining capacity as at 31 December 2003 is projected at some 123.8Mt, which is adequate to meet the overall requirements of the LoM plan. At the individual facilities this may require certain re-routing of tailings from the current configuration incurring additional costs for pipes, valves and pumping.

The tailings dam complexes are currently operated managed and controlled in a responsible and diligent manner, although maintenance is needed on the solution trenches and paddocks of a number of dams. Noticeable seepage was observed along the common contact and southern sides of South 8E and South 8W dams, as well as along the perimeter toe-line of the St. Helena tailings dam, both should be investigated. No impairment to the integrity of the dams is anticipated, provided that practices, levels of management and control are maintained at a high-level of diligence with all necessary remedial measures undertaken in a timely manner.

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7.4

Harmony Free State Operations

The Harmony Free State Operations comprise the Harmony, Saaiplaas and Merriespruit tailings facilities. The Harmony facility comprises three dams, the H1, H2 and H4 tailings dams, of which only H4 is currently active. The Saaiplaas tailings facilities principally comprise two complexes, which include a total of six dams situated to the east of Welkom of which only three are currently active. The Merriespruit tailings facilities principally comprise five active tailings dams, No.30 (V10), No.30A (V10), No.4b, No.5b, No.5a, situated to the south-east and south-west of Virginia of which only five are currently active.

The current LoM plan for Harmony Free State Operations requires a total placement of some 63.0Mt. The remaining capacity at 31 December 2003 is projected at some 65.2Mt, which is adequate to meet the overall requirements of the LoM plan. At the individual facilities this will require some re-routing of tailings from the current configuration, specifically from the Saaiplaas Plant and is likely to lead to additional costs for pipes, valves and pumping.

The tailings dam complexes are currently operated managed and controlled in a responsible and diligent manner, although maintenance is needed to the solution trenches and paddocks of a number of dams. No impairment to the integrity of the dams is anticipated, provided that practices and levels of management and control are maintained at a high-level of diligence with all necessary remedial measures undertaken in a timely manner.

7.5

Welkom Operations

In line with the toll processing arrangements, Welkom Operations are not responsible for tailings dam deposition.

7.6

West Wits Operations

The West Wits Operations comprise the Elandsrand, Deelkraal, Cooke and Doornkop tailings facilities. The Elandsrand facility comprises two dams located on a hillside with one down slope from the other; both are currently active. The Deelkraal tailings facility also comprises two dams located on a hillside with one down slope from the other; and both are currently active. The Cooke and Doornkop facilities each comprise a single dam both of which are active.

The current LoM plan for Elandsrand and Deelkraal requires a total placement of some 27.3Mt. The remaining capacity as at 31 December 2003 is projected at some 38.2Mt, which is adequate to meet the overall requirements of the LoM plan.

The current LoM plan for Cooke and Doornkop operations requires a total placement of some 45.2Mt. The remaining capacity as at 31 December 2003 is projected at some 51.4Mt, which is adequate to meet the overall requirements of the LoM plan. The RoR for the Doornkop dam is forecast in excess of 2m/yr however considering that the LoM for the Doornkop facilities is less than two years SRK consider that this can be managed.

The tailings dam complexes are currently operated managed and controlled in a responsible and diligent manner, although maintenance is needed to the solution trenches and paddocks at some of dams. No impairment to the integrity of the dams is anticipated, provided current practices and levels of management and control are maintained with all necessary remedial measures undertaken in a timely manner.

7.7

Evander Operations

The Evander Operations comprise the Winkelhaak and Kinross tailings facilities. The Winkelhaak facility comprises four dams, No.1, No.2, No.3 and No.4, located in a cluster of which two dams, No.3 and No.4, are currently active. The Kinross tailings facility comprises three dams located on a gently sloping hillside and all are currently active.

The current LoM plan for Evander Operations requires a total placement of some 19.5Mt. The remaining capacity as at 31 December 2003 is projected at some 25.2Mt, which is adequate to meet the overall requirements of the LoM plan. A high RoR in excess of 2m/yr is forecast at the Winkelhaak No.4 dam although SRK consider that, in conjunction with sufficient monitoring, this can be managed.

The tailings dam complexes are currently operated managed and controlled in a responsible and diligent manner, although maintenance is needed to the solution trenches and paddocks at some of dams. No impairment to the

integrity of the dams is anticipated, provided current practices and levels of management and control are maintained with all necessary remedial measures undertaken in a timely manner.

7.8

Orkney Operations

In line with the toll processing arrangements, Orkney Operations are not responsible for tailings dam deposition.

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7.9
Kalgold Operation
The Kalgold Operation comprises a single tailings dam that was commissioned in 1998 subsequent to the replacement of the heap leach operation with a CIL plant. The current LoM plan for Kalgold Operations requires a total placement of some 6.0Mt. The remaining capacity at 31 December 2003 is projected at some 6.2Mt, which is adequate to meet the overall requirements of the LoM plan.
The tailings dam complex is currently operated, managed and controlled in a responsible and diligent manner and no impairment to the integrity of the dam is anticipated, provided current practices and levels of management and control are maintained with all necessary measures undertaken in a timely manner.
7.10 Harmony Australian Operations
Checker Plant un-thickened tailings are pumped to one of two operating tailing storage facilities. Both uses the paddock system where tailings is deposited by spigotting around the perimeter to form a beach with supernatant water reclaimed by a central decant tower. An under drain in the new dam is also used for water collection. Walls are raised by upstream lifts using waste rock as the construction material. Analyses of water from bores around the periphery of the dam are reported to be within applicable limits for pH, total dissolved solids, weak acid dissociable cyanide and prescribed heavy metals. The first tailing storage facility at the modern Mt. Magnet operations has finished its service life with trials underway on capping the surface to test methods for rehabilitation.
The current LoM plan for the Checker Plant requires a total placement of some 13.6Mt. Cell No.3 of the current tailings storage facility as at 31 December 2003 is projected to have a service life until 2009 when raised to its design height. This is marginal to meet the overall requirements of the LoM plan.
Big Bell Plant is planned to discontinue operations shortly though the tailings design is based on the underflow from the tailings screen being pumped to the tailings storage facility which is divided into two cells, for deposition of solids and reclamation of water for re-use in the plant.
New Celebration Plant and Jubilee Plant un-thickened tailings are pumped to separate operating tailings storage facilities. Both uses the paddock system where tailings are deposited by spigotting around the perimeter to form a beach with supernatant water reclaimed by a central decant tower. Mine waste was used for the initial starter walls with upstream construction using dried tailings.
The current LoM plan for New Celebration requires a total placement of some 0.1Mt. The remaining capacity of the tailings dams at 31 December 2003 is adequate to meet the overall requirements of the LoM plan.
The current LoM plan for Jubilee requires a total placement of some 3.1Mt. The remaining capacity of the tailings dams at 31 December 2003 is projected at some 4.8Mt when using the Golden Hope North pit, which is adequate to meet the overall requirements of the LoM plan.
The tailings storage facilities are currently operated managed and controlled according to standard gold mining industry practice in Western Australia. No impairment to the integrity of the dams is anticipated, provided acceptable levels of management and control are maintained with all necessary remedial measures undertaken in a timely manner.
7.11 Harmony Canadian Operations
Harmony's Canadian Operations are currently mothballed and as such no assessment has been undertaken of the Tainling Facilities as no future production is currently planned.
7.12 LoM Tailings Deposition Assessment
Table 7.1 summarises the LoM deposition projections and comparable available capacities for each of the operations. Cognisance should be taken that the total deposition includes material that is treated on toll basis; this material is not included in the Companies total LoM projections. Collectively, the Companies toll treats some 10.2Mt from external sources.

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Table 7.1 Mining Assets: Assessments of Tailings Storage Capacity for LoM Plans
Operations
LoM Deposition
Available Capacity
Surplus/Shortfall
(Mt)
(Mt)
(%)
Target Operations - Target Mine
(1)
Target Plant and Active Dams
15,955
19,932
Subtotal Target Operations
15,955
19,932
25
Free Gold Operations
(2)(3)
FS1 Plant and Active Dams
62,894
84,581
FS2 Plant and Active Dams
12,600
22,391
St. Helena Plant and Active Dams
1,913
3,950
Joel Plant and Active Dams
11,557
12,902
Subtotal Free Gold Operations
88,964
123,824
39
Harmony Free State Operations
Central Plant and Active Dams
22,553
21,867
Virginia Plant and Active Dams
11,018
24,139
Saaiplaas Plant and Active Dams
29,447
19,182
Subtotal Harmony Free State Operations
63,018
65,188

3
West Wits Operations
Cooke Plant and Active Dams
42,771
15,342
Doornkop Plant and Active Dams
2,381
36,070
Elandsrand Plant and Active Dams
23,374
21,544
Deelkraal Plant Active Dams
3,942
16,613
Subtotal West Wits Operations
72,468
89,569
24
Evander Operations
Kinross Plant and Active Dams
19,526
25,204
Subtotal Evander Operations
19,526
25,204
29
Kalgold Operation
Kalgold Plant and Active Dams
5,980
6,200
Subtotal Kalgold Operations
5,980
6,200
4
International Operations
Checker Plant and Active Dams
13,604
12,981
Big Bell Plant and Active Dams
na
na
Jubilee Plant and Active Dams
3,121
4,808
New Celebration Plant and Active Dams
63
63
(1)
Assumes 20% to Backfill - LoM plant throughput 19.9Mt.
(2)
Includes Welkom Operations.

(3)
Includes Toll Treatment from non-Harmony mines.
Where additional capital expenditure is required to sustain tailings operations in relation to the LoM projections as presented, such capital expenditure has been allowed for in the individual Tax Entity valuations.

8.

ENGINEERING INFRASTRUCTURE AND CAPITAL PROJECTS

8.1

Introduction

This section includes discussion and comment on the infrastructure and related aspects of the LoM plans associated with the Mining Assets. Specifically, detail and comment is focused on the existing on-mine infrastructure and capital expenditure programmes necessary for execution of the LoM plans, as presented.

8.2

Engineering Infrastructure of the Mining Assets

Engineering infrastructure at the Mining Assets includes a wide range of operating technology, which varies in age and extent of mechanisation.

Underground mining operations comprise access infrastructure to convey personnel, materials and equipment to and from the working areas and associated services to support mining operations. Horizontal infrastructure includes cross-cut haulages, footwall haulage levels and declines/inclines. Infrastructure required for ore flow and services include ore and waste passes, conveyor belts, high speed rail

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conveyances, crushing stations, ore bins, loading stations, water dams, pump stations, backfill stations, backfill transportation and placement systems, secondary ventilation and refrigeration plant, workshops and power and water reticulation systems. Surface infrastructure includes headgears and winding systems, primary ventilation and refrigeration plants, process facilities, office blocks and training centres, workshops and stores, lamp rooms, change houses and accommodation. At the Mining Assets there are also a number of services and supply centres. These include compressed air supply stations and minor workshops for small repairs to plant and equipment.

Notwithstanding the age of the general infrastructure, SRK consider that all surface and underground infrastructure is reasonably maintained and equipped. In conjunction with planned maintenance programmes including specific remedial action, the current infrastructure is considered by SRK to be adequate to satisfy the requirements of the LoM plans. Further, the power generation and distribution systems, water sourcing and reticulation systems are appropriate for operations as envisaged in the individual LoM plans. Where this has not been the case SRK has allocated appropriate capital provision, which have been included in the TEPs as presented in Section 12.

8.3

LoM Capital Expenditures Programmes

The capital expenditure programmes are the Companies' current projections for the Mining Assets. SRK has reviewed these estimates and consider them appropriate as inputs to the valuation, as incorporated at Tax Entity level. The accuracy of these estimates are of the order of ±15% for the major capital projects, as expected of feasibility level studies and for the provisions for ongoing capital SRK consider these to be in the order of ±25%.

Table 8.1 summarises the latest capital requirements for the Mining Assets, excluding off-mine exploration costs. Where appropriate the estimates have been modified by SRK to include any additional capital requirements as identified in Section 5 through to Section 7. SRK note that all capital estimates are exclusive of financing charges and unless otherwise stated are considered by SRK to be adequate to meet the requirements of the current LoM plan.

Capital projects at the Mining Assets are principally aimed at sustaining the integrity of primary infrastructure required for the underground operations. As described in Section 5 through to Section 7 these include the following:

- **at Target Mine:** All major capital projects have now been commissioned and as such no additional specific project capital is projected/required to exploit the Mineral Reserves as depleted in the LoM plan. A provision amount is however included amounting to approximately 7% of the direct operating costs or equivalent to R32/t milled. This amount is considerably higher, in unit rate per tonne terms, compared to other Free State operations, however reflects the level of mechanisation and required fleet replacement during the 18-year mine life**;**
- **at Free Gold Operations:**

.

the sub-66L project at Tshepong BU will enable access to the deeper levels. It includes the development of a twin decline system to 71L, planned to commence during 2003 and commissioned at design throughput by 2007;

.

the completion of 178m (vertical) of shaft sinking to the 81L at Phakisa BU and the necessary equipping of the shaft as a men, material and rock hoisting facility at some 150ktpa, this following the installation of a Koepe hoist on the 55L for the transfer of ore and waste to Nyala BU for hoisting to surface. The project is scheduled to commence in the second quarter 2004;

.

infrastructural improvements at Bambanani BU and West BU;

.

the installation of hoisting facilities at Joel North BU to support mining operations below 121L. This is planned to be fully commissioned by 2005; and

.

shaft pillar mining at Nyala BU following associated modification to the shaft hoisting installation;

- **at Harmony Free State Operations:**

.

the Masimong expansion project at No.5 BU to access high-grade areas of Basal Reef to east and west of the current workings. The capital is required to extend flat-end haulage development utilising the existing shaft capacity;

- **at Welkom Operations:** no future capital expenditures are currently forecast;
- **at West Wits Operations:**

.

the South Reef Project at Doornkop BU includes the deepening of the main shaft to 212L and re-equipping of the sub-vertical shaft and is expected to attain maximum production by 2009; and

.

the Sub-shaft Project at Elandsrand BU accessing ore from 102L to 113L which is projected to be complete by 2007;

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-
at Evander Operations: no specific capital projects are planned, however the majority of shafts have continued ongoing capital provisioned amounting to ZAR608m, which includes provision for the plants of ZAR6.4m. The Roslpruit Project, currently excluded from the Base Case valuation, considers the green- fields development of an extension to the Kimberley Reef, adjacent to No.8 BU, through installation of a twin shaft system from surface or from underground. The feasibility study as completed by Harmony projects capital expenditure requirements of ZAR5.2billion;
-
at Orkney Operations: capital projections are generally of a routine nature and primarily reflect capital development and/or provisions for unforeseen expenditures;
-
at the Kalgold Operations: capital projections are generally of a routine nature and primarily reflect capital development and/or provisions for unforeseen expenditures;
-
at the Harmony Australian Operations: capital projections are project related and focused towards exploration and underground development at the underground operations and also includes certain mine closure related costs; and
-
at the Harmony Canadian Operations: no capital expenditure is currently forecast with Bisset being placed on care and maintenance.
The total estimated capital expenditure for the Mining Assets over the LoM period are summarised in Table 8.1.
Table 8.1 Mining Assets: Estimated Capital Expenditures
Operations
Capital Expenditure
(ZARm)
Target Operations - Target Mine
582
Free Gold Operations
1,756
Harmony Free State Operations
370
Welkom Operations
0
West Wits Operations
1,734
Evander Operations
555
Orkney Operations
33
Kalgold Operations
(1)
0
Mt. Magnet & Cue Operations
204
South Kalgoorlie Operations
26
Total
5,262
Avgold

582
Harmony
4,680
(1)
The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.

9.
HUMAN RESOURCES

9.1
Introduction

This section includes discussion and comment on the human resources related aspects associated with the Mining Assets. Specifically, information as provided by the Companies is included on the current organisational structures and operational management, recruitment, training, productivity initiatives and remuneration policies, industrial relations and productivity projections.

9.2
Legislation

Various regulatory authorities, in addition to mining and labour codes, govern labour legislation in South Africa. In general these are well-established and in conjunction with the Companies operating policies, form the cornerstone of human resource management.

During 1999, many changes and initiatives took effect, primarily in response to the recently promulgated provisions of South African labour legislation. The Labour Relations Act regulates the relationship between employees and trade unions, establishes dispute resolution mechanisms, promotes collective bargaining and protects employees from unfair dismissal. Separation may be carried out on the basis of genuine economic, technological, structural or similar needs of an employer. Consultation, with full disclosure of relevant information, is required with trade unions prior to employers effecting separation programmes. The other major statutes in force in South Africa are:

- the Basic Conditions of Employment Act, which prescribes minimum conditions of employment, excluding wages;

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- the Occupational Diseases in the Mines and Work Act;
-
the Compensation of Occupational Injury and Diseases Act, which provides a mechanism for compensating employees who have been incapacitated as a result of injury or disease arising from the performance of work;
-
the Occupational Health and Safety Act and Mine Health and Safety Act, which impose a duty on employers to provide a safe and healthy working environment;
-
the Employment Equity Act, which prohibits unfair discrimination and places an obligation on employers to implement affirmative action measures. In this instance Employment Equity forums have been established with all unions in an effort not only to give effect to the Employment Equity Act, but also to address, through appropriate policies and procedures, the total development of human resources; and
- the Skills Development Act, which seeks to enable the development of the skills of the local workforce.

Through a process of negotiation with regulatory authorities and representative bodies, including organised labour, mine management has initiated various programmes to ensure compliance with the various regulatory statutes. The Companies have informed SRK that, with respect to the revised legislation, the Mining Assets are materially compliant and that pro-active involvement to seek appropriate exemptions through a negotiated process will be pursued.

9.3

Organisational Structures and Operational Management

SRK has been informed that the organisational structure currently in place, together with operational management, will remain until such time as planned shaft closures occur, following which, downsizing will be assessed. The Mining Assets are adequately resourced with the appropriate levels of technically qualified and experienced personnel in production and related support functions. Table 9.1 gives the historical and the 2004 manpower requirements or Total Employees Costed ("TEC") for the Mining Assets.

Table 9.1 Mining Assets: Historical TECs

Mining Operations	**2001**	**2002**	**2003**	**2004**
	(1)			
	(No.)	**(No.)**	**(No.)**	**(No.)**
Target Operations - Target Mine	1,177	1,355	1,119	1,088
Free Gold Operations	20,368	14,722	16,106	17,119
Harmony Free State Operations	15,668			

12,776
11, 178
12,673
Welkom Operations
1,492
1,786
2,348
2,179
West Wits Operations
17,640
16,907
15,110
14,131
Evander Operations
8,805
8,639
6,906
7,203
Orkney Operations
6,579
6,174
5,854
4,696
Kalgold Operations
453
444
230
223
Harmony Australia Operations
882
882
882
882
Total
73,064
63,685
59,733
60,194
Avgold
1,177
1,355
1,119
1,088
Harmony
71,887
62,330
58,614
59,106
(1)
2004 reports six-month actual TECs to December 2003.
9.4

Recruitment, Training, Productivity Initiatives and Remuneration Policies

Recruitment, training, productivity initiatives and remuneration policies are, in general, typical of operating practices and strategies as implemented within the South African gold mining industry.

- **training**: Training initiatives have focused on the development of both technical and managerial skills of senior and middle management. At the operational level, training initiatives include mine managements commitment to the Adult Basic Education and Training ("ABET") initiatives;
- **productivity initiatives**: Mine management continually reviews and implements various productivity initiatives which reflect the operational conditions and remuneration policies within the individual labour markets; and
- **remuneration policies**: Levels generally comply with industry-wide salary scales. In addition to basic components, employees receive additional entitlements, which are related to accommodation and medical and employee benefit plans in the form of pension/provident schemes.

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9.5
Industrial Relations
The Companies 2004 business plans require some 57,235 mine workers with approximately 80% being members of registered trade unions. Industrial relations at the Mining Assets are managed in accordance with key driving factors. These include the prevailing legislative requirements, regulatory bodies, labour repre- sentation, collective bargaining arrangements and regional/operational specific employee-employer agreements.
Historically, trade unions in South Africa have had, due to links with political parties, a significant influence over social and political reform as well as the collective bargaining process. Presently the situation is manageable; however, it is uncertain whether labour disruptions will be used to advocate such political causes in the future.
Mine management has embarked on a process involving all labour representatives (unions and management) to ensure appropriate and timely interaction to resolve industrial relations issues, including communication and joint decision-making, bonus strategies and procedures. Depending on fluctuations in the US$ gold price and exchange rates together with the rising (above CPI) cost of employment due to recent wage negotiations, future workforce reductions may be required. In this instance, SRK consider that appropriate procedures are in place and, other than periodic action during wage negotiations, consider industrial relations risks to be manageable.
9.6
Productivity Assumptions
Productivity initiatives are primarily focused on restructuring of staffing structures and working practices as part of the Companies' overall strategy. This strategy is based on the recent success of both the "*Harmony Way*" and Avgold's normal operating principles. The importance of maintaining economic production levels, where labour cost contributes significantly in a highly regulated labour market (South Africa Region) is the principal focus and is recognised in all strategies. Labour cost constitutes between 40% and 60% of the total working costs.
Table 9.2 gives historical and projected productivity indices for the Mining Assets.
Table 9.2 Mining Assets: Historical Productivity Initiatives
Statistic
2001
2002
2003
2004
(2)
Centares
Target Operations - Taregt Mine
(m
2
/TEC/month)
na
na
na
na
Free Gold Operations
(m
2
/TEC/month)
4.3
4.5
5.0
5.0
Harmony Free State Operations

(m
2
/TEC/month)
3.8
4.8
5.7
5.6
Welkom Operations
(m
2
/TEC/month)
4.1
1.8
3.7
4.5
West Wits Operations
(m
2
/TEC/month)
4.1
4.7
4.4
4.4
Evander Operations
(m
2
/TEC/month)
4.1
3.9
4.2
4.2
Orkney Operations
(m
2
/TEC/month)
4.4
2.2
4.4
4.9
Tonnes Milled
Target Operations - Target Mine
(t/TEC/month)
35
48
31
83
Free Gold Operations
(t/TEC/month)
35
49
48

44
Harmony Free State Operations
(t/TEC/month)
28
30
40
39
Welkom Operations
(t/TEC/month)
19
10
20
24
West Wits Operations
(t/TEC/month)
33
40
43
46
Evander Operations
(t/TEC/month)
23
23
26
26
Orkney Operations
(t/TEC/month)
26
13
25
28
Kalgold Operations
(1)
(t/TEC/month)
176
180
392
519
Harmony Australia Operations
(t/TEC/month)
103
452
675
481
Gold Production
Target Operations - Target Mine
(g/TEC/month)
105
316
262
917

Free Gold Operations
(g/TEC/month)
153
197
186
171
Harmony Free State Operations
(g/TEC/month)
114
124
142
135
Welkom Operations
(g/TEC/month)
97
51
69
86
West Wits Operations
(g/TEC/month)
124
159
147
144
Evander Operations
(g/TEC/month)
135
125
135
135
Orkney Operations
(g/TEC/month)
184
97
180
178
Kalgold Operations
(1)
(g/TEC/month)
282
363
839
1,063
Harmony Australia Operations
(g/TEC/month)
164
743
1,498
1,136
(1)

The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.

(2)

2004 reports six-month actual results to December 2003.

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Future production is in part reliant upon the achievement of productivity initiatives currently underway at Free Gold Operations. Termed Continuous Operations ("Conops"), this initiative seeks to increase the amount of labour time at the working face by increasing the number of shifts from the current eleven day fortnight to the maximum allowed, taking due cognisance of all legal requirements and statutory conditions. Conops broadly projects an increase of between 20% and 30% in production (by measure of tonnes milled) for an increase of between 10% and 15% in labour costs. Note that labour costs are approximately 50% of the total operating expenditures.

Conops is currently in place at Harmonys' Orkney and Welkom Operations, however the intention is to implement Conops at all the Companies' South African operations, commencing with Free Gold Operations.

9.7

Separation Liability

The total separation liability for the Mining Assets has been estimated by application of an average unit separation cost multiplied by the projected TEC at the time of either downsizing or closure.

Table 9.3 summarises the estimated separation costs to be expended on either closure or down sizing of the Mining Assets.

Table 9.3 Tax Entities: Separation Costs

Tax Entities

Terminal Separation Benefits Liability

(ZARm)

Target Tax Entity

10

Free Gold Tax Entity

200

Joel Tax Entity

18

Harmony Free State Tax Entity

188

Harmony Welkom Tax Entity

32

Randfontein Tax Entity

272

Evander Tax Entity

104

Harmony Orkney Tax Entity

72

Kalgold Tax Entity

(1)

8

Mt. Magnet & Cue Tax Entity

0

South Kalgoorlie Tax Entity

0

Total

904

Harmony

894

Avgold

10

(1)

The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.

10. HEALTH AND SAFETY

10.1 Introduction

This section includes discussion and comment on the safety and health related aspects associated with the Mining Assets. Current and historical health and safety statistics are presented with discussion on the more significant measures in progress to deal with identified risks.

10.2 Legislation

Health and safety in South Africa is governed by various regulatory bodies and mining and labour legislation. In general these are well established and, in conjunction with management's operating policies, form the cornerstone of health and safety management. Key legislation changes as noted in the various operating regions are summarised below.

In South Africa, following publication of the Leon Commission Report in 1994 all aspects of health and safety on mines is governed by the Mine Health and Safety Act No.29 of 1996 ("the Mine Health and Safety Act") which came into effect on 15 January 1997. The Mine Health and Safety Act was the result of intensive discussion and consultations between Government, employees and employee representatives over an extended period of time and, whilst leaving room for self-regulation, also provides for strict control by Government. In complying with the Mine Health and Safety Act, mine management has established risk management and medical surveillance systems in addition to the health and safety committees to which workplace representatives have been elected. In summary this provides for various health and safety measures and provides for employee participation in these matters with stated objectives, *inter alia*:

- to protect the health and safety of persons at mines;

to require employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at mines;

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- to ensure compliance with both domestic and international law and regulations on health and safety at mines;
-
to provide for employee participation in matters of health and safety through health and safety representatives and health and safety committees at mines;
- to provide for effective monitoring of health and safety and working conditions at mines;
- to provide for enforcement of health and safety measures at mines;
- to provide for investigations and inquiries to improve health and safety at mines;
- to promote:
.
a health and safety culture in the mining industry; and
.
training in health and safety in the mining industry; and
- co-operation and consultation on health and safety between the regulatory bodies, employers, employees and their representatives.

With respect to the Harmony Australian Operations, they are operated in accordance with the relevant regulatory codes and practices governing Australian mining operations.

10.3 Statistics

Table 10.1 presents safety statistics for the Mining Assets and includes the total number of fatalities, fatality rate and the lost time injury frequency rate ("LTIFR") for 2001 to 2003 inclusive. Table 10.2 presents similar statistics for the Companies.

The overall safety performance of the Mining Assets during calendar 2003 (measured against performance during calendar 2002) is summarised as: a decrease in the number of fatalities by 16%; a decrease in the fatality rate by 30% and a decrease in the LTIFR by 10%.

Table 10.1 Mining Assets: Historical Safety Statistics

Statistics
2001
2002
2003
2004
(2)
Fatalities (no.)
Target Operations - Target Mine
2
0
0
0
Free Gold Operations
11
10
6
5
Harmony Free State Operations
9
8
2
6
Welkom Operations
4

1
2
0
West Wits Operations
12
20
20
5
Evander Operations
5
6
4
3
Orkney Operations
10
7
4
2
Kalgold Operations
(1)
0
0
0
0
Harmony Australian Operations
0
0
0
0
Fatality Rate (fatalities per mmhrs)
Target Operations - Target Mine
0.35
0.00
0.00
0.00
Free Gold Operations
0.35
0.24
0.15
0.25
Harmony Free State Operations
0.26
0.27
0.07
0.51
Welkom Operations
0.92
0.35
0.35
0
West Wits Operations

0.32
0.47
0.54
0.23
Evander Operations
0.27
0.33
0.23
0.41
Orkney Operations
0.56
0.48
0.48
0.45
Kalgold Operations
(1)
0.00
0.00
0.00
0.00
Harmony Australian Operations
0.00
0.00
0.00
0.00
LTIFR (mmhrs)
Target Operations - Target Mine
9
9
11
6
Free Gold Operations
17
15
15
20
Harmony Free State Operations
35
26
24
21
Welkom Operations
17
12
12
15
West Wits Operations
24
23
23
22

Evander Operations
22
24
34
30
Orkney Operations
28
24
24
15
Kalgold Operations
(1)
7
13
4
9
Harmony Australian Operations
na
15
2
15
(1)
The contribution from Kalgold is subject to a current sale agreement which may see a 100% disposal of the asset in the near future.
(2)
2004 reports six-month actuals to December 2003.

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10.4 Health and Safety Management

Health and safety management of the Mining Assets is focused on the development of company wide health and safety policies, taking cognisance of the legislation and regulatory environment. The Companies' Health and Safety policies are broadly aligned and state that the Companies will endeavour to:

- comply with all applicable laws, regulations and standards and where adequate laws do not exist, develop and apply standards that reflect the Companies commitment to safety and health;
- manage risk by implementing systems to identify, assess, monitor and control hazards and to review performance;
- maintain a consultative process with employees through Health and Safety Representatives and Committees in all aspects related to safety and occupational health;
- provide employees with information, instruction, training and supervision which is necessary to enable them to perform their work safely and without risk to health;
- actively practice a comprehensive Risk Management Safety Programme aimed at continuous improvement of safety and occupational health;
- protect property, equipment, materials and natural assets from damage by fires, explosions, pollution, contamination or any other down grading incident;
- support relevant occupational health and safety research;
- actively participate in the Environmental Management Programmes and compliance with the requirements of its' Nuclear Licence;
- keep abreast of new developments and technology.

The Companies have informed SRK that all health and safety departments adhere to both the provisions of the Mine, Health and Safety Act and the Minerals Act with full-time, as well as part-time safety representatives employed at all the Mining Assets. In accordance with the provisions of the Mine, Health and Safety Act, a number of baseline risk assessments, continuous risk assessments and physical conditions ratings are conducted. Managerial instructions, emergency procedures and codes of practice are reasonably in place. Specific health and safety hazards identified include water, dust, fire, seismicity and falls of ground, explosions, insufficient emergency power equipment and occupational hygiene issues.

The HIV/AIDS infection rate of approximately 28% at the Companies' South African operations is representative of South Africa's mining industry. In order to mitigate against the likely impact and consequence of the occurrence of HIV/AIDS, the Companies have embarked on the following activities:

- awareness programmes in all operating regions;
- company wide wellness programmes;
- medical assistance to repatriated employees; and
- separation packages for employees who wish to return home.

Further, actuarial assessments by the Companies indicate that the cost of addressing the disease at the Mining Assets may peak at approximately 2% of the total cost of production, which equates to approximately US$4/oz. At current levels of infection and taking cognisance of remedial action taken, the net cost has been estimated by the Companies at approximately US$1.20/oz. This cost has, however not been included into the cash flow projections for each Tax Entity for the purpose of valuatio