

Mineral resources

AngloGold has adopted internationally accepted mineral resource classification standards, which are broadly aligned with the Australian Code for Reporting Identified Mineral Resources and Ore Reserves as well as with the latest draft of the South African Code for Reporting of Mineral Resources and Mineral Reserves. This approach has been adopted both for clarity of reporting to shareholders and for facilitating ore body management by the company.

This system is a strictly confidence-based resource categorisation and estimation procedure. The mineral resource is sub-divided into areas of greater or lesser confidence in the estimate, ultimately based both on the geo-statistical characteristics of the ore body and on the proximity, type and amount of geological and sampling data that might have been used to extrapolate values into particular blocks. Different geo-statistical techniques are applied as appropriate and the quality of the estimates is tested by cross-validation and reconciliation.

Owing to differences in the definition of resources and reserves, the mineral resources segment has been divided into four separate sections:

- South African operations
- Other African operations
- American operations
- Ergo

Abridged definitions

Mineral resource: a mineral deposit that may eventually be economically and legally extracted. Mineral resources reported in this document are restricted to the portion included in the life of mine plan and are sub-divided into:

Inferred mineral resource: a mineral resource where sampling and other data are insufficient to permit interpretation of the geological framework or to enable prediction of the continuity of mineralisation with any degree of confidence.

Indicated mineral resource: the spacing of sampling and geological data points affords a degree of confidence high enough to give a reasonable indication of continuity of mineralisation.

Measured mineral resource: the sampling and geological data points are spaced such that continuity of geological character and grade may be estimated with a high degree of confidence.

Mineral reserve: that part of a mineral resource which could be technically, economically and legally mined under conditions existing at the time of reporting.

Mineral reserve (South African operations): reflects the payable component of the mineral resource as calculated under conditions pertaining in December 1998. It should be noted that these conditions will change and therefore pay limits will change in the future. In addition, the long-range mining plan will mine a mixture of 'payable reserve' and 'marginal resource'. Mineral reserves are sub-divided into:

Probable mineral reserve: that part of the indicated mineral resource above a pay limit calculated in December 1998.

Proved mineral reserve: that part of the measured mineral resource above a pay limit calculated in December 1998.

The tonnages quoted as reserves and/or resources are in situ and are estimated over a stoping width. Grades are also in situ and estimated over a stoping width with *no allowance* being made for additional dilution or gold loss.

It follows from these definitions that there are components of the mineral deposit that are unlikely to be economically and legally extracted in the foreseeable future and which are therefore not reported as part of the mineral resource.

Mineral reserve (Other African operations): reflects the estimated tonnage and grade as delivered to the treatment facility and *includes allowances* made for additional dilution or gold loss.

Mineral reserve (Ergo): reflects the estimated tonnage and grade of the mineral resource in the slimes dams and sand dumps, or portions thereof, that are currently technically and economically treatable.

Total mineral reserves – (proved plus probable)

		Metric			Imperial		
		Tonnes million	Grade g/t	Contained gold tonnes	Tons million	Grade oz/t	Contained gold million oz
South African operations [†]	1998	204,8	17,03	3 488,5	225.6	0.497	112.1
	1997	211,0	17,08	3 603,2	232.8	0.498	116.0
Other African operations ^{**}	1998	15,3	3,06	46,8	16.9	0.089	1.5
	1997	17,7	3,10	54,9	19.5	0.092	1.8
American operations ^{**}	1998	140,8	2,08	292,5	155.3	0.061	9.4
	1997	–	–	–	–	–	–
Ergo	1998	206,2	0,39	79,8	227.3	0.011	2.6
	1997	256,1	0,39	99,7	282.3	0.011	3.2
Total	1998	567,1	6,89	3 907,6	625.1	0.201	125.6
	[§] 1997	484,8	7,75	3 757,8	534.6	0.226	121.0

[†] Excludes Driefontein

[§] Excludes American operations

^{**} Reserves attributable to AngloGold

Total mineral resources* – (measured plus indicated)

* Includes proved and probable mineral reserves

		Metric			Imperial		
		Tonnes million	Grade g/t	Contained gold tonnes	Tons million	Grade oz/t	Contained gold million oz
South African operations [†]	1998	356,8	12,55	4 478,7	393.4	0.366	144.1
	1997	389,1	12,66	4 924,9	429.1	0.368	158.1
Other African operations ^{**}	1998	39,2	2,35	92,3	43.2	0.068	2.9
	1997	40,1	2,37	95,2	44.1	0.068	3.0
American operations ^{**}	1998	282,3	2,38	670,8	311.3	0.069	21.7
	1997	–	–	–	–	–	–
Ergo	1998	395,6	0,34	135,4	436.1	0.010	4.4
	1997	441,1	0,34	151,5	486.2	0.010	4.9
Total	1998	1 073,9	5,01	5 377,2	1 184.0	0.146	173.1
	[§] 1997	870,3	5,94	5 171,6	959.4	0.173	166.0

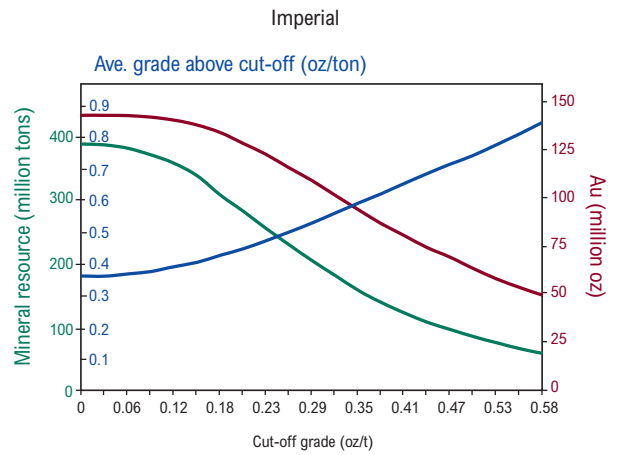
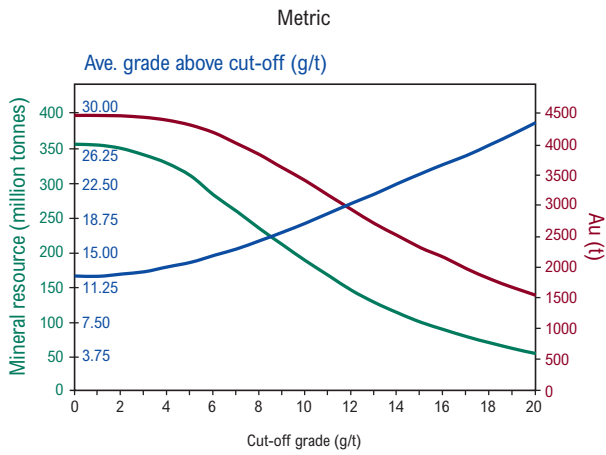
[†] Excludes Driefontein

[§] Excludes American operations

^{**} Resources attributable to AngloGold

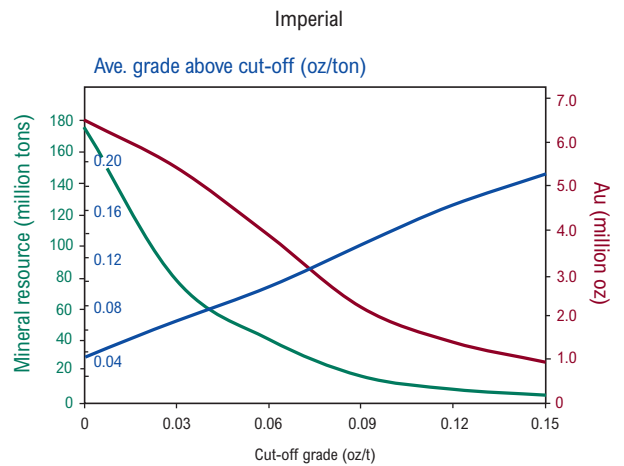
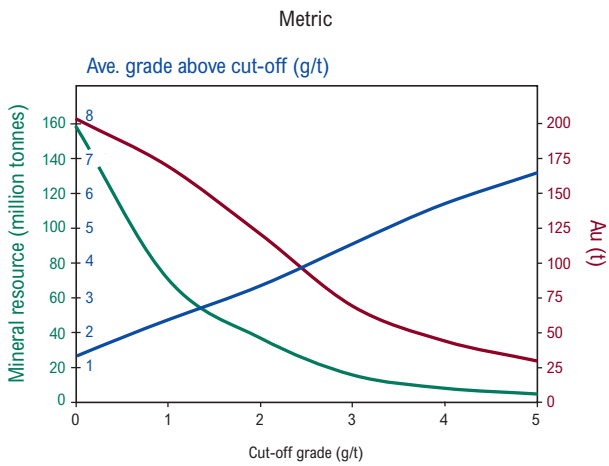
Mineral resources continued

South African operations*



*Excludes Driefontein

Other African operations



Reconciliation

The year on year reconciliation of the total mineral resource (measured plus indicated) is reflected below:

South African underground operations*

	Metric		Imperial	
	Tonnes million	Contained gold tonnes	Tons million	Contained gold million oz
1997	389,1	4 924,9	429.1	158.1
Depletion	-13,2	-199,3	-14.7	-6.5
Structure	-15,3	-121,4	-17.0	-3.8
Transfers	-39,2	-379,6	-43.3	-12.2
To/from LOM (+/-)	-24,8	-394,5	-27.3	-12.7
Abandoned	-0,9	-11,7	-1.0	-0.4
Adjustment	61,1	660,3	67.6	21.6
1998	356,8	4 478,7	393.4	144.1

* Excludes Driefontein

Other African operations

	Metric		Imperial	
	Tonnes million	Contained gold tonnes	Tons million	Contained gold million oz
1997	76,5	196,8	84.3	6.3
Depletion	-6,1	-17,7	-6.7	-0.6
Change in stockpile	0,5	1,3	0.6	0.0
Adjustment	4,5	11,4	4.9	0.4
1998	75,4	191,8	83.1	6.1

Life of mine milling potential

The estimated life of mine milling potential at a starting average gold price in January 1999 of R58 400 per kilogram or \$298 per ounce with declining annual throughput is set out below. The estimate is based on data and assumptions which are continually being reviewed and milling potential could change significantly.

		Metric				Imperial			
		Milled tonnes million	Recovery g/t	Gold prod. tonnes	Estimated life years	Milled tons million	Recovery oz/t	Gold prod. million oz	Estimated life years
South African underground operations*	1998	348,8	8,41	2 932,2	32	384.6	0.245	94.4	32
	1997	387,0	8,22	3 180,6	33	426.6	0.240	102.2	33
Other African operations	1998	35,9	3,19	114,5	7	39.6	0.093	3.7	7
	1997	41,4	3,21	133,1	8	45.6	0.092	4.2	8

* Excludes Driefontein

Mineral resources continued

Additional resources not contained in any of the preceding figures

Bambanani

The Basal Reef below 103 level (3 100m below surface), comprises an estimated 3,5 million tonnes at an average grade of 12,7 grams per tonne containing 45 tonnes of gold (3.9 million tons at an average grade of 0.4 ounces per ton containing 1.5 million ounces of gold). This resource is 36 per cent lower than the figure quoted in the previous year because of the realignment of the De Bron fault, as determined by the long hole underground drilling programme.

A feasibility study is required to assess the viability of mining these very deep mineral resources, which would require the sinking of a tertiary sub-shaft.

Tshepong

Following the termination of development at the Tshepong South sinking shaft, part of the Tshepong mineral resource was reclassified as non-life of mine and is thus not reflected in the above figures for 1998. This amounts to 9,5 million tonnes at an average grade of 13,6 grams per tonne containing 129,3 tonnes of gold (10,5 million tons at an average grade of 0.4 ounces per ton containing 4.2 million ounces of gold). A feasibility study will be conducted to determine the viability of mining portions of the resource from Tshepong North shaft and from the Eland shaft of Matjhabeng mine.

Kopanang

An indicated mineral resource of 12,6 million tonnes at an average grade of 4,6 grams per tonne containing 57,6 tonnes of gold (13.9 million tons at a grade of 0.13 ounces per ton containing 1.9 million ounces of gold) on the Vaal Reef is estimated in the Grootdraai area to the west of the current Kopanang boundary.

Tau Lekoa

The Weltevreden Block to the south of Tau Lekoa is estimated to contain 77,6 million tonnes of VCR at an average grade of 2,8 grams per tonne containing 213,1 tonnes of gold (85.3 tons at a grade of 0.08 ounces per ton containing 6.9 million ounces of gold).

Other South African resources

Through agreements with Anglo American Corporation group companies, AngloGold has access to extensive mineral rights in South Africa. Such mineral rights, falling into the inferred and pre-inferred categories, cover some 300 square kilometres and are estimated to contain 160 million ounces of gold.

In addition, there are 587 square kilometres of mineral rights which have recognised potential for gold mineralisation. However, estimates have not yet been carried out.

Yatela

The Yatela project in Mali is currently in the pre-feasibility stage. Provisional resource figures of the soft oxide material at a cut-off of 1,0 gram per tonne are an indicated resource of 17,9 million tonnes at a grade of 3,1 grams per tonne containing 55,5 tonnes of gold (19.7 million tons at 0.09 ounces per ton containing 1.8 million ounces of gold) and an inferred resource of 2,6 million tonnes at a grade of 1,6 grams per tonne containing 4,2 tonnes of gold (2.9 million tons at 0.05 ounces per ton containing 0.1 million ounces of gold).

Exploration

Bambanani

A long hole underground drilling programme is in progress at Bambanani East shaft to upgrade estimates of the Basal Reef resource below 103 level.

Tshepong

Exploratory underground development on the 'B' Reef is continuing on 57 level at Tshepong with the objective of generating available reserves and establishing a sound ore body model. It is encouraging to note that a well-mineralised, carbon-rich reef has been intersected.

A 3D seismic survey has been completed over the eastern side of Tshepong and processing of the data is currently in progress. Initial indications of the results are very encouraging. The objective of the survey is to improve the accuracy and reliability of the structural model in the area, which will have a major impact on mine planning and strategic mine design.

Western Ultra Deep Levels

A potential 30-million-ounce opportunity has been delineated adjacent to the southern lease boundaries of Western Deep Levels and Driefontein mines. Both Carbon Leader and VCR are the target ore bodies lying at depths of between 3 500 and 5 000 metres below surface.

A major exploration programme was begun during the year, with two surface holes and two underground drill holes (from Western Deep Levels South mine) in progress. A further six surface drill holes are to be started during 1999 and the underground programme will extend to an additional 15 holes as access points become available.

Sadiola

Exploration for replacement oxide resources within the Semos-Sadiola Exploitation Area commenced early in 1998. Six major (as well as some minor) gold in soil anomalies were delineated and encouraging drill intercepts were reported from five of the six anomalies drilled.

Tanzania

Follow-up exploration continued at Buzwagi and Nyamulilima Hill. Latest indications are a resource of 1.8 million ounces at Buzwagi and 2.1 million ounces at Nyamulilima Hill.