

African Mineral Standards

Certificate of Analysis

Carbonate Hosted Low Grade Gold Ore

Reference Material

AMIS0012

**Certified Concentration and two "Between Laboratory"
Standard Deviations**

Gold: 0.450 ± 0.033 g/t

**Provisional Measurement at two "Between Laboratory"
Standard Deviations**

Specific Gravity: 2.83 ± 0.17 g/cc

Intended Use: AMIS0012 is suitable for monitoring the accuracy of a single analysis of gold ores hosted by carbonate rich rocks. The material can be used for routine quality control by inserting within a batch of samples, method development and for the calibration of equipment.

The recommended mean and "Between Lab" standard deviations for this standard reflect the average results from the laboratories that participated in the round robin. Slight variations in analytical procedures between laboratories will reflect as slight biases to the recommended concentrations and this is acceptable. Good laboratories however will report results within the two standard deviation levels with a failure of <10 %.

Origin of Material: This standard was made using ore sourced from the AngloGold Ashanti Limited - Navachab Gold Mine, situated in Namibia, 10km southwest of Karibib and 170km west northwest of Windhoek. The orebody is located in the Central Zone of the Pan-African Damara Orogen. Gold mineralization is hosted by a steeply dipping metamorphosed sequence of interbedded siliciclastic and carbonate rocks. All lithological units contain mineralization to some extent within sheeted quartz veins. The calc-silicate/marble unit (MC) hosts higher-grade replacement skarnoid mineralization. Carbonate-rich ore for this material was blended from RC borehole chips taken from the "Grid A" satellite body (Level 39) and from the main Navachab pit (Level 63).

Approximate Mineral and Chemical Composition: The major gangue minerals are dolomite, calcite, feldspar and quartz with minor garnet, hornblende, diopside, ilmenite, biotite and tremolite. Sulphides comprise pyrrhotite; subordinate pyrite, chalcopyrite and traces of bismuth, bismuthinite, sphalerite and galena. Gold occurs as free gold with minor maldonite (gold-bismuth alloy). Approximately ±75% of the gold is <54µ.

Chemical composition is as follows.

CaO %	SiO2 %	MgO %	AL2O3 %	Fe2O3 %	K2O %	MnO %	Na2O %	TiO2 %
35.34	15.75	9.15	3.00	1.97	1.14	0.50	0.34	0.19

Cr2O3 %	S %	P2O5 %	CL %	LOI %
0.15	0.14	0.11	0.01	32.51

Appearance: The material is a very fine powder coloured Very Light Grey - Munsell N8, to Light Grey - Corstor 5Y 7/1).

Method of Preparation: The material was crushed, dry-milled and air-classified to 100% <54µm. Wet sieve particle size analysis of random samples confirmed the material was 100% <54µm. It was then blended in a bi-conical mixer, systematically divided and then sealed into 1kg Laboratory Packs. Explorer Packs are subdivided from the Laboratory packs as required. Samples were randomly selected for homogeneity testing and third party analysis. Statistical analysis of both homogeneity and the consensus test results were carried out by independent statisticians.

Method of Analysis: ICP-OES or ICP-MS, Pb collection for Au. Specific gravity either by gas pycnometer or by water displacement using a pycnometer bottle.

Method of Certification: Fourteen laboratories were each given eight randomly selected packages of sample. The results from those laboratories were used for the Au determinations. Results were as set out below:

Lab Code	ppb	SG
A	469	2.78
A	450	2.74
A	459	2.75
A	471	2.73
A	485	2.74
A	442	2.71
A	459	2.74
A	471	2.74
B	430	2.89
B	430	2.89
B	435	2.89
B	435	2.88
B	440	2.89
B	440	2.89
B	400	2.89
B	425	2.88
C	470	2.87
C	470	2.86
C	450	2.88
C	510	2.86
C	460	2.86
C	460	2.88
C	410	2.85
C	470	2.84
D	448	
D	447	
D	443	
D	467	
D	456	
D	455	
D	448	
D	452	
E	469	
E	473	
E	482	
E	452	
E	474	
E	478	
E	535	
E	462	
F	530	
F	510	
F	520	
F	520	
F	500	
F	510	
F	530	
F	540	
G	440	2.93
G	430	2.90
G	460	2.88
G	470	2.92
G	440	2.96
G	430	3.01
G	460	2.88
G	470	2.97
H	444	2.78
H	451	2.82
H	442	2.78
H	443	2.76
H	451	2.63
H	448	2.74
H	447	2.68
H	444	2.70

Lab Code	ppb	SG
I	460	
I	440	
I	450	
I	430	
I	460	
I	460	
I	450	
I	420	
J	423	
J	430	
J	430	
J	423	
J	429	
J	435	
J	425	
J	426	
K	440	2.87
K	440	2.87
K	460	2.86
K	450	2.85
K	440	2.84
K	450	2.86
K	450	2.86
K	450	2.85
L	450	2.90
L	460	2.87
L	460	2.87
L	470	2.88
L	450	2.86
L	440	2.90
L	450	2.87
L	450	2.88
M	490	
M	460	
M	470	
M	460	
M	480	
M	480	
M	470	
M	470	
N	431	2.57
N	433	2.55
N	450	2.58
N	451	2.54
N	435	2.57
N	422	2.62
N	429	2.60
N	441	2.57

n	112	64.00
Mean Au ppb	456	2.81
Std. Dev.	26	0.11
RSD, %	5.78	4.07
Mean +2SD	509	3.04
Mean -2SD	403	2.58
Mean +3SD	535	3.15
Mean -3SD	377	2.47

The mean and standard deviation for all data was calculated. Outliers were defined as samples beyond the mean ± 2 Standard Deviations from all data. These outliers were removed from the data (italicized) and a new mean and standard deviation was determined. This method is different from that used to calculate the Confidence Interval shown on many Government-produced standards in that the actual "between-laboratory" standard deviation is used in the calculations. This produces upper and lower limits that reflect actual individual analyses rather than a grouped set of analyses. The limits can therefore be used to monitor accuracy from individual analyses, unlike the Certified Limits published on other standards which quote a Confidence Interval.

Note that this certificate replaces one issued on 17 November 2005 for which only thirteen of the laboratories had reported. The final report allowed for a slight downward adjustment for the gold value (2 ppb) and a slight upward adjustment for the specific gravity (0.01 g/cc).

Participating Laboratories: (Not in same order as in the table of assays)

Anglo American Research Laboratories (Pty) Ltd
ACME Analytical Laboratories Ltd
Assayers Canada
ALS Chemex South Africa (Pty) Ltd
ALS Chemex Labs Ltd. (Vancouver)
Genalysis Laboratory Services (Pty) Ltd
Geoservices Assay Laboratory, Geological Survey of Finland (GTK)
Mintek Analytical Services
Omac Laboratories Limited
Performance Laboratories
Set Point Laboratories (Pty) Ltd
SGS Lakefield Research Africa
SGS Lakefield Research Ontario
Ultra Trace (Pty) Ltd

Availability: This product is available in Laboratory Packs containing 1kg of material or in Explorer Packs containing client specified weights of material up to 250g. Laboratory Packs are sealed bottles delivered in sealed foil pouches. Explorer Packs contain material in standard geochem envelopes placed into foil pouches that are nitrogen flushed and vacuum sealed.

Legal Notice: This certificate and the reference material described in it have been prepared with due care and attention. However AMIS, Set Point Technology (Pty) Ltd, Mike McWha, Dr Barry Smee and Smee and Associates Ltd; accept no liability for any decisions or actions taken following the use of the reference material.

24 January 2006

Certifying Officers:



African Mineral Standards: _____
Mike McWha
BSc (Hons), FGSSA, MAusIMM, Pr.Sci.Nat



Geochemist: _____
Barry W. Smee
BSc, PhD, P.Geo, (B.C.)