

# African Mineral Standards

## Certificate of Analysis

Gold Ore Reference Material AMIS0004

### Recommended Concentrations and two "Between Laboratory" Standard Deviations

Gold:  $0.427 \pm 0.037$  g/t

U<sub>3</sub>O<sub>8</sub>:  $104 \pm 9.4$  ppm

**Intended Use:** AMIS-4 is suitable for monitoring the accuracy of a single analysis of gold ores hosted by Witwatersrand or other similar siliceous 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 gold tailings material from the Klerksdorp area.

**Approximate Mineral and Chemical Composition:**

AMIS-4 comprises quartz with minor clays and sulphides. The gold occurs as micron-sized grains associated with the clays and rarely within the sulphides. The material is slightly oxidized.

Fe <sub>2</sub> O <sub>3</sub> %	MnO %	Cr <sub>2</sub> O <sub>3</sub> %	TiO <sub>2</sub> %	CaO %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	MgO %	Na <sub>2</sub> O %	K <sub>2</sub> O %
4.39	0.05	0.13	0.27	0.53	82.4	8.3	0.3	<0.1	0.43

P <sub>2</sub> O <sub>5</sub> %	V <sub>2</sub> O <sub>5</sub> %
0.01	0.01

**Appearance:** The material is a very fine powder coloured pale yellowish brown (Munsell 10YR 6/2) to very pale yellowish brown (Corstor 10YR 6/4).

**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.

Fusion ICP-MS for U<sub>3</sub>O<sub>8</sub>.

**Method of Certification:** Ten laboratories were each given eight randomly selected packages of sample. The results from nine of those laboratories were used for the Au determinations and seven for the U<sub>3</sub>O<sub>8</sub>. Results were as set out below:

Lab Code	ppb	ppm
	Au	U <sub>3</sub> O <sub>8</sub>
A	409	110
A	421	110
A	398	107
A	394	106
A	390	104
A	418	111
A	406	106
A	412	107
B	410	
B	420	
B	410	
B	420	
B	420	
B	420	
B	420	
B	430	
C	460	111
C	460	103
C	460	109
C	450	108
C	460	106
C	450	108
C	450	106
C	460	106
D	430	108
D	442	110
D	427	109
D	447	110
D	445	112
D	433	108
D	435	111
D	419	112
E	410	104
E	425	102
E	420	103

Lab Code	ppb	ppm
	Au	U3O8
E	430	101
E	425	103
E	410	105
E	425	101
E	425	101
F	451	105
F	439	102
F	458	104
F	441	101
F	457	103
F	455	100
F	448	99
F	454	102
G	413	101
G	419	96
G	442	99
G	431	102
G	425	108
G	411	108
G	422	110
G	445	97
H	415	
H	400	
H	410	
H	422	
H	390	
H	405	
H	380	
H	405	
I	419	98
I	420	94
I	410	96
I	408	103
I	426	105
I	428	103
I	427	94
I	422	96
J		
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The mean and standard deviation for all data was calculated. Outliers were defined as samples beyond the mean  $\pm$  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.

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

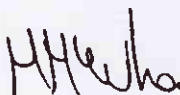
Anglo American Research Laboratories ( Pty ) Ltd  
ACME Analytical Laboratories Ltd  
ALS Chemex South Africa ( Pty ) Ltd  
Amdel Laboratories Perth  
Genalysis Laboratory Services ( Pty ) Ltd  
Set Point Laboratories ( Pty ) Ltd  
SGS Lakefield Research Africa  
SGS Lakefield Research Ontario  
Ultra Trace ( Pty ) Ltd

**Availability:** This product is available in Laboratory Packs containing 1kg of material and Explorer Packs containing 110g or 160g of material. The Laboratory Packs are sealed bottles delivered in sealed foil pouches. The Explorer Packs contain material in standard geochem envelopes, nitrogen flushed and vacuum sealed in foil pouches. Other packaging is available on application.

**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.

19 July 2005

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