ORE RESEARCH & EXPLORATION

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CERTIFICATE OF ANALYSIS FOR

BASALT BLANK CHIP
CERTIFIED REFERENCE MATERIAL
OREAS 26b

Table 1. Certified Values, SDs, 95% Confidence and Tolerance Limits for OREAS 26b.

Constituent	Certified Value	1SD	95% Confidence Limits		95% Tolerance Limits	
			Low	High	Low	High
Fire Assay						
Gold, Au (ppb)	< 1	IND	IND	IND	IND	IND
Borate Fusion XRF						
Al_2O_3, Aluminium oxide (wt.%)	14.39	0.088	14.33	14.45	14.31	14.47
CaO, Calcium oxide (wt.%)	8.57	0.051	8.53	8.61	8.50	8.64
Cr_2O_3, Chromium oxide (ppm)	524	41	509	540	442	606
Fe, Iron (wt.%)	8.05	0.057	8.01	8.08	7.98	8.11
FeO*, Iron(II) oxide (wt.%)	10.35	0.074	10.31	10.40	10.27	10.44
K_2O, Potassium oxide (wt.%)	0.833	0.006	0.830	0.837	0.821	0.845
MgO, Magnesium oxide (wt.%)	7.38	0.120	7.30	7.45	7.27	7.49
MnO, Manganese oxide (wt.%)	0.149	0.003	0.147	0.151	0.147	0.151
Na_2O, Sodium oxide (wt.%)	3.16	0.028	3.14	3.18	3.13	3.18
P, Phosphorus (wt.%)	0.146	0.003	0.143	0.148	0.144	0.148
P_2O_5, Phosphorus(V) oxide (wt.%)	0.334	0.008	0.329	0.339	0.329	0.339
SiO_2, Silicon dioxide (wt.%)	51.22	0.183	51.12	51.31	51.03	51.40
TiO_2, Titanium dioxide (wt.%)	1.85	0.016	1.84	1.86	1.84	1.87
Thermogravimetry at 1000°C						
LOI, Loss On Ignition (wt.%)	0.535	0.087	0.484	0.586	0.459	0.611
4-Acid Digestion						
Al, Aluminium (wt.%)	7.47	0.163	7.33	7.61	7.31	7.62
Ba, Barium (ppm)	255	7	250	259	249	261
Be, Beryllium (ppm)	0.99	0.054	0.97	1.02	0.92	1.07
Ca, Calcium (wt.%)	5.92	0.224	5.76	6.09	5.80	6.05
Ce, Cerium (ppm)	36.3	0.91	35.6	36.9	34.3	38.2
Co, Cobalt (ppm)	44.4	1.76	43.2	45.6	42.9	45.9

*Total Fe as FeO

Table 1 continued.

Constituent	Certified Value	1SD	95% Confidence Limits		95% Tolerance Limits	
			Low	High	Low	High
4-Acid Digestion continued						
Cr, Chromium (ppm)	293	43	261	325	258	328
Cs, Cesium (ppm)	0.67	0.07	0.61	0.72	0.63	0.71
Cu, Copper (ppm)	43.7	2.54	42.5	45.0	41.6	45.9
Fe, Iron (wt.%)	7.74	0.271	7.53	7.95	7.56	7.93
Ga, Gallium (ppm)	20.2	0.69	19.7	20.7	19.6	20.8
Hf, Hafnium (ppm)	3.50	0.199	3.34	3.66	3.39	3.60
In, Indium (ppm)	0.061	0.004	0.059	0.063	IND	IND
K, Potassium (wt.%)	0.679	0.021	0.664	0.695	0.658	0.701
La, Lanthanum (ppm)	17.4	0.56	16.9	17.9	16.5	18.3
Li, Lithium (ppm)	6.38	0.600	5.73	7.03	6.19	6.57
Mg, Magnesium (wt.%)	4.30	0.143	4.20	4.41	4.21	4.40
Mn, Manganese (wt.%)	0.110	0.006	0.106	0.114	0.108	0.112
Mo, Molybdenum (ppm)	1.43	0.078	1.38	1.49	1.35	1.51
Na, Sodium (wt.%)	2.34	0.099	2.27	2.42	2.27	2.41
Nb, Niobium (ppm)	21.3	0.80	20.9	21.8	20.8	21.9
Ni, Nickel (ppm)	149	3	147	151	145	153
P, Phosphorus (wt.%)	0.141	0.003	0.139	0.144	0.137	0.145
Pb, Lead (ppm)	2.81	0.32	2.56	3.06	2.58	3.03
Rb, Rubidium (ppm)	20.1	0.69	19.6	20.6	19.6	20.6
S, Sulphur (wt.%)	0.010	0.002	0.009	0.011	IND	IND
Sc, Scandium (ppm)	19.6	1.24	18.7	20.5	18.9	20.2
Sn, Tin (ppm)	1.83	0.31	1.64	2.02	1.41	2.25
Sr, Strontium (ppm)	412	17	400	423	403	420
Ta, Tantalum (ppm)	1.36	0.123	1.26	1.45	1.32	1.40
Th, Thorium (ppm)	2.60	0.097	2.54	2.66	2.52	2.67
Ti, Titanium (wt.%)	1.06	0.032	1.03	1.08	1.02	1.09
Tl, Thallium (ppm)	0.059	0.008	0.054	0.065	IND	IND
U, Uranium (ppm)	0.65	0.057	0.61	0.69	0.62	0.67
V, Vanadium (ppm)	155	10	147	162	148	162
W, Tungsten (ppm)	0.50	0.07	0.45	0.55	IND	IND
Y, Yttrium (ppm)	21.2	0.77	20.6	21.8	20.6	21.8
Zn, Zinc (ppm)	110	5	107	114	107	113
Zr, Zirconium (ppm)	135	7	129	140	131	138

Note: Intervals may appear asymmetric due to rounding.

Table 2. Indicative Values for OREAS 26b.

Constituent	Unit	Value	Constituent	Unit	Value	Constituent	Unit	Value
Borate Fusion XRF								
As	ppm	*< 10*	Cu	ppm	*45.0*	Sr	ppm	*403*
BaO	ppm	*287*	Ni	ppm	*192*	V_2O_5	ppm	*320*
Cl	ppm	*124*	S	wt.%	*0.008*	Zn	ppm	*115*
Co	ppm	*55*	Sn	ppm	*< 10*	Zr	ppm	*135*
Thermogravimetry								
H_2O-	wt.%	*0.5*						

Table 2 continued.

Constituent	Unit	Value	Constituent	Unit	Value	Constituent	Unit	Value
4-Acid Digestion								
Ag	ppm	*0.04*	Gd	ppm	*5.4*	Sb	ppm	*0.06*
As	ppm	*0.8*	Ge	ppm	*0.6*	Se	ppm	*1*
Bi	ppm	*0.01*	Ho	ppm	*0.84*	Sm	ppm	*4.9*
Cd	ppm	*0.06*	Lu	ppm	*0.29*	Tb	ppm	*0.8*
Dy	ppm	*4.4*	Nd	ppm	*19.8*	Te	ppm	*< 0.05*
Er	ppm	*2.1*	Pr	ppm	*4.56*	Tm	ppm	*0.29*
Eu	ppm	*1.7*	Re	ppm	*< 0.05*	Yb	ppm	*1.8*

INTRODUCTION & SOURCE MATERIALS

OREAS reference materials are intended to provide a low cost method of evaluating and improving the quality of analysis of geological samples. To the geologist they provide a means of implementing quality control in analytical data sets generated in exploration from the grass roots level through to prospect evaluation, and in grade control at mining operations. To the analyst they provide an effective means of calibrating analytical equipment, assessing new techniques and routinely monitoring in-house procedures.

OREAS 26b is a basalt blank chip certified reference material (CRM) supplied, prepared and certified by Ore Research & Exploration Pty Ltd. The material was sourced from a quarry containing fresh olivine tholeiite (Newer Volcanics Province), near Melbourne (Victoria), Australia. Table 1 above contains 52 certified values by borate fusion XRF, LOI at 1000°C, Au by fire assay and full ICP-OES/MS suite by 4-acid digestion. The analytical data for these analytes have been processed by robust statistical procedures to determine certified values, 95% confidence intervals and tolerance limits. Indicative values for 34 additional elements are also provided (Table 2). Performance gates (based on the pooled SD) are also provided as a guide to QC monitoring (Table 3). Tabulated round robin laboratory results of all elements together with analytical method codes, uncorrected means, medians, standard deviations, relative standard deviations and per cent deviation of lab means from the corrected mean of means (PDM^3) are presented in the detailed certification data for this CRM (**OREAS 26b Datapack.xlsx**).

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 26b was prepared in the following manner:

- drying to constant mass at 105° C;
- crushing to achieve a nominal particle size of minus 6mm to simulate RC drill chip samples;
- homogenisation via three passes through rotary splitters;
- packaging in 500g units into sealed robust barrier bags. 20kg buckets and 200kg drums are also available.

ANALYTICAL PROGRAM

Ten commercial analytical laboratories participated in the program to characterise the elements reported in Table 1. The following methods were employed:

- Au via 25-50g fire assay with ICP-MS (2 labs) or ICP-OES (5 labs) finish;
- borate fusion with XRF for Al_2O_3, CaO, Cr_2O_3, Fe, K_2O, MgO, MnO, Na_2O, P, SiO_2, TiO_2 and LOI at 1000ºC (10 labs);
- full elemental suite via four acid digestion (HNO_3-$HClO_4$-HCl-HF) with ICP-OES and ICP-MS finish (10 labs).

For the round robin program 1kg samples were taken at 10 predetermined sampling intervals during packaging and are considered representative of the entire batch of OREAS 26b. These 10 samples were pulverised (to 95% passing 75 microns), homogenised and each split into six 50g subsamples. Six 50g samples were submitted to each laboratory for analysis made up from paired samples from each of 3 separate sampling intervals. This enabled a nested ANOVA to compare within and between unit variance (see 'ANOVA Test' below) in addition to characterisation of the CRM.

STATISTICAL ANALYSIS

Certified Values, Confidence Limits, Standard Deviations and Tolerance Limits (Table 1) have been determined for each analyte following removal of individual, laboratory dataset (batch) and 3SD outliers (single iteration). For individual outliers within a batch the z-score test is used in combination with a second method that determines the per cent deviation of the individual value from the batch median. Outliers in general are selected on the basis of z-scores > 2.5 and with per cent deviations (i) > 3 and (ii) more than three times the average absolute per cent deviation for the batch. In certain instances statistician's prerogative has been employed in discriminating outliers. Each laboratory data set mean is tested for outlying status based on z-score discrimination and rejected if > 2.5. After individual and laboratory data set (batch) outliers have been eliminated a non-iterative 3 standard deviation filter is applied, with those values lying outside this window also relegated to outlying status. For Tolerance Limits only individual outliers have been removed.

Certified Values are the means of accepted laboratory means after outlier filtering (Table 1). Indicative (uncertified) values (Table 2) are provided where i) a laboratory reported analytes beyond those requested (as part of a full ICP suite package at the same cost as the requested key analytes); ii) the number of laboratories reporting a particular analyte is insufficient (< 5) to support certification; iii) inter-laboratory consensus is poor; or iv) a significant proportion of results are outlying.

95% Confidence Limits are inversely proportional to the number of participating laboratories and inter-laboratory agreement. It is a measure of the reliability of the certified value. A 95% confidence interval indicates a 95% probability that the true value of the analyte under consideration lies between the upper and lower limits. *95% Confidence Limits should not be used as control limits for laboratory performance.*

Standard Deviation values (1SDs) are reported in Table 1 and provide an indication of a level of performance that might reasonably be expected from a laboratory being monitored by this CRM in a QA/QC program. The SD's take into account errors attributable to measurement uncertainty and CRM variability. For an effective CRM the contribution of the latter should be negligible in comparison to measurement errors. The SD values thus include all sources of measurement uncertainty: between-lab variance, within-run variance (precision errors) and CRM variability. OREAS prepared reference materials have a level of homogeneity such that the observed variance from repeated analysis has its origin almost exclusively in the analytical process rather than the reference material itself.

The SD for each analyte's certified value is calculated from the same filtered data set used to determine the certified value, i.e. after removal of any individual, lab dataset (batch) and 3SD outliers (single iteration). These outliers can only be removed after the absolute homogeneity of the CRM has been independently established, i.e. the outliers must be confidently deemed to be analytical rather than arising from inhomogeneity of the CRM. **The standard deviation is then calculated for each analyte from the pooled accepted analyses generated from the certification program.**

In the application of SD's in monitoring performance it is important to note that not all laboratories function at the same level of proficiency and that different methods in use at a particular laboratory have differing levels of precision. Each laboratory has its own inherent SD (for a specific concentration level and analyte-method pair) based on the analytical process and this SD is not directly related to the round robin program.

The majority of data generated in the round robin program was produced by a selection of world class laboratories. The SD's thus generated are more constrained than those that would be produced across a randomly selected group of laboratories. To produce more generally achievable SD's the 'pooled' SD's provided in this report include inter-lab bias. This 'one size fits all' approach may require revision at the discretion of the QC manager concerned following careful scrutiny of QC control charts.

Table 3 shows **Performance Gates** calculated for two and three standard deviations. As a guide these intervals may be regarded as warning or rejection for multiple 2SD outliers, or rejection for individual 3SD outliers in QC monitoring, although their precise application should be at the discretion of the QC manager concerned. A second method utilises a 5% window calculated directly from the certified value. Standard deviation is also shown in relative percent for one, two and three relative standard deviations (1RSD, 2RSD and 3RSD) to facilitate an appreciation of the magnitude of these numbers and a comparison with the 5% window. Caution should be exercised when concentration levels approach lower limits of detection of the analytical methods employed as performance gates calculated from standard deviations tend to be excessively wide whereas those determined by the 5% method are too narrow.

Tolerance Limits (ISO Guide 3207) were determined using an analysis of precision errors method and are considered a conservative estimate of true homogeneity. The meaning of tolerance limits may be illustrated for copper (by 4-acid digestion) where 99% of the time ($1-\alpha=0.99$) at least 95% of subsamples ($\rho=0.95$) will have concentrations lying between 41.6 and 45.9 ppm. This means that if the same number of subsamples were taken and analysed in the same manner repeatedly, 99% of the tolerance intervals so constructed would cover at least 95% of the total population, and 1% of the tolerance intervals would cover less than 95% of the total population (ISO Guide 35).

Table 3. Performance Gates for OREAS 26b

Constituent	Certified Value	Absolute Standard Deviations					Relative Standard Deviations			5% window	
		1SD	2SD Low	2SD High	3SD Low	3SD High	1RSD	2RSD	3RSD	Low	High
Fire Assay											
Au, ppb	< 1	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
Borate Fusion XRF											
Al_2O_3, wt.%	14.39	0.088	14.21	14.57	14.13	14.65	0.61%	1.22%	1.84%	13.67	15.11
CaO, wt.%	8.57	0.051	8.47	8.67	8.42	8.72	0.59%	1.18%	1.77%	8.14	9.00
Cr_2O_3, ppm	524	41	442	606	401	647	7.82%	15.64%	23.46%	498	550
Fe, wt.%	8.05	0.057	7.93	8.16	7.88	8.22	0.71%	1.42%	2.13%	7.65	8.45
FeO, wt.%	10.35	0.074	10.21	10.50	10.13	10.57	0.71%	1.42%	2.13%	9.84	10.87
K_2O, wt.%	0.833	0.006	0.821	0.845	0.815	0.851	0.73%	1.45%	2.18%	0.791	0.875
MgO, wt.%	7.38	0.120	7.14	7.62	7.02	7.74	1.62%	3.24%	4.86%	7.01	7.75
MnO, wt.%	0.149	0.003	0.142	0.156	0.139	0.159	2.28%	4.57%	6.85%	0.141	0.156
Na_2O, wt.%	3.16	0.028	3.10	3.21	3.07	3.24	0.89%	1.79%	2.68%	3.00	3.32
P, wt.%	0.146	0.003	0.139	0.152	0.136	0.156	2.26%	4.52%	6.78%	0.138	0.153
P_2O_5, wt.%	0.334	0.008	0.319	0.349	0.311	0.357	2.26%	4.52%	6.78%	0.317	0.351
SiO_2, wt.%	51.22	0.183	50.85	51.58	50.67	51.76	0.36%	0.71%	1.07%	48.66	53.78
TiO_2, wt.%	1.85	0.016	1.82	1.88	1.80	1.90	0.88%	1.76%	2.64%	1.76	1.94
Thermogravimetry at 1000°C											
LOI, wt.%	0.535	0.087	0.361	0.709	0.274	0.796	16.28%	32.57%	48.85%	0.508	0.562
4-Acid Digestion											
Al, wt.%	7.47	0.163	7.14	7.79	6.98	7.96	2.18%	4.36%	6.55%	7.09	7.84
Ba, ppm	255	7	241	269	234	276	2.78%	5.57%	8.35%	242	268
Be, ppm	0.99	0.054	0.88	1.10	0.83	1.15	5.48%	10.96%	16.44%	0.94	1.04
Ca, wt.%	5.92	0.224	5.47	6.37	5.25	6.59	3.78%	7.57%	11.35%	5.63	6.22
Ce, ppm	36.3	0.91	34.4	38.1	33.5	39.0	2.52%	5.05%	7.57%	34.4	38.1
Co, ppm	44.4	1.76	40.9	47.9	39.1	49.7	3.96%	7.92%	11.88%	42.2	46.6
Cr, ppm	293	43	207	380	163	424	14.80%	29.60%	44.40%	279	308
Cs, ppm	0.67	0.07	0.53	0.81	0.46	0.88	10.26%	20.52%	30.79%	0.64	0.70
Cu, ppm	43.7	2.54	38.7	48.8	36.1	51.4	5.80%	11.60%	17.40%	41.6	45.9
Fe, wt.%	7.74	0.271	7.20	8.29	6.93	8.56	3.50%	7.00%	10.50%	7.36	8.13
Ga, ppm	20.2	0.69	18.8	21.6	18.1	22.3	3.41%	6.82%	10.23%	19.2	21.2
Hf, ppm	3.50	0.199	3.10	3.90	2.90	4.10	5.70%	11.40%	17.10%	3.32	3.67
In, ppm	0.061	0.004	0.052	0.070	0.048	0.074	7.17%	14.35%	21.52%	0.058	0.064
K, wt.%	0.679	0.021	0.638	0.721	0.617	0.741	3.05%	6.10%	9.15%	0.645	0.713

Table 3 continued.

Constituent	Certified Value	Absolute Standard Deviations					Relative Standard Deviations			5% window	
		1SD	2SD Low	2SD High	3SD Low	3SD High	1RSD	2RSD	3RSD	Low	High
4-Acid Digestion continued											
La, ppm	17.4	0.56	16.3	18.5	15.7	19.1	3.23%	6.47%	9.70%	16.5	18.3
Li, ppm	6.38	0.600	5.18	7.58	4.58	8.18	9.40%	18.80%	28.19%	6.06	6.70
Mg, wt.%	4.30	0.143	4.02	4.59	3.87	4.73	3.32%	6.65%	9.97%	4.09	4.52
Mn, wt.%	0.110	0.006	0.098	0.121	0.093	0.127	5.18%	10.36%	15.55%	0.104	0.115
Mo, ppm	1.43	0.078	1.28	1.59	1.20	1.67	5.44%	10.88%	16.33%	1.36	1.50
Na, wt.%	2.34	0.099	2.14	2.54	2.05	2.64	4.23%	8.46%	12.69%	2.23	2.46
Nb, ppm	21.3	0.80	19.7	22.9	18.9	23.8	3.75%	7.51%	11.26%	20.3	22.4
Ni, ppm	149	3	142	156	138	159	2.32%	4.63%	6.95%	141	156
P, wt.%	0.141	0.003	0.135	0.148	0.132	0.151	2.30%	4.61%	6.91%	0.134	0.148
Pb, ppm	2.81	0.32	2.18	3.44	1.86	3.75	11.23%	22.46%	33.68%	2.67	2.95
Rb, ppm	20.1	0.69	18.7	21.5	18.0	22.2	3.44%	6.88%	10.32%	19.1	21.1
S, wt.%	0.010	0.002	0.007	0.013	0.005	0.015	15.90%	31.79%	47.69%	0.009	0.010
Sc, ppm	19.6	1.24	17.1	22.1	15.9	23.3	6.34%	12.67%	19.01%	18.6	20.6
Sn, ppm	1.83	0.31	1.22	2.44	0.92	2.75	16.64%	33.28%	49.92%	1.74	1.93
Sr, ppm	412	17	378	445	361	462	4.11%	8.22%	12.32%	391	432
Ta, ppm	1.36	0.123	1.11	1.60	0.99	1.73	9.04%	18.09%	27.13%	1.29	1.43
Th, ppm	2.60	0.097	2.40	2.79	2.31	2.89	3.73%	7.46%	11.20%	2.47	2.73
Ti, wt.%	1.06	0.032	0.99	1.12	0.96	1.15	3.03%	6.06%	9.09%	1.00	1.11
Tl, ppm	0.059	0.008	0.044	0.075	0.036	0.082	13.02%	26.03%	39.05%	0.056	0.062
U, ppm	0.65	0.057	0.53	0.76	0.48	0.82	8.77%	17.54%	26.31%	0.61	0.68
V, ppm	155	10	134	176	123	186	6.76%	13.51%	20.27%	147	163
W, ppm	0.50	0.07	0.35	0.64	0.28	0.72	14.57%	29.14%	43.71%	0.47	0.52
Y, ppm	21.2	0.77	19.7	22.7	18.9	23.5	3.64%	7.28%	10.91%	20.1	22.3
Zn, ppm	110	5	100	120	96	125	4.41%	8.82%	13.22%	105	116
Zr, ppm	135	7	120	149	113	156	5.34%	10.68%	16.02%	128	141

Note: Intervals may appear asymmetric due to rounding.

ANOVA Test

The sampling format for OREAS 26b was structured to enable nested ANOVA treatment of the round robin results. Each of the ten round robin laboratories received six samples per CRM and these samples were made up of paired samples from three different, non-adjacent sampling intervals. The purpose of the ANOVA evaluation is to test that no statistically significant difference exists in the variance between-units to that of the variance within-units. This allows an assessment of homogeneity across the entire prepared batch. The test was performed using the following parameters:

- 10 laboratory data sets (60 samples made up from 10 laboratories providing analyses on 3 pairs of samples);
- Significance Level $\alpha = P$ (type I error) = 0.05;
- Null Hypothesis, H_0: Between-unit variance is no greater than within-unit variance (reject H_0 if *p*-value < 0.05);
- Alternative Hypothesis, H_1: Between-unit variance is greater than within-unit variance.

P-values are a measure of probability where values less than 0.05 indicate a greater than 95% probability that the observed differences in within-unit and between-unit variances are real. The dataset was filtered for both individual and laboratory data set (batch) outliers prior to the calculation of the *p*-value. This process derived no significant *p*-values other than Cr and Mg by 4-acid digestion, Cr_2O_3 and MgO by fusion XRF and LOI at 1000°C. These anomalies have been investigated by looking at the distribution of results for each of the 10 sampling interval lots. If contamination or heterogeneity were present the distribution of results for the lots would trend the same for both analytical methods (ie. For Cr, the 4-acid digestion and fusion XRF results would trend in the same pattern). The lots show no correlation between the methods for neither Mg nor Cr. The absence of a correlation suggests that the data is showing a false positive. **This aberration is therefore considered to be due to random factors rather than actual heterogeneity of the CRM.**

It is important to note that ANOVA is not an absolute measure of homogeneity. Rather, it establishes whether or not the analytes are distributed in a similar manner throughout the packaging run of OREAS 26b and whether the variance between two subsamples from the same unit is statistically distinguishable to the variance from two subsamples taken from any two separate units. A RM therefore, can possess poor absolute homogeneity yet still pass a relative homogeneity test if the within-unit heterogeneity is large and similar across all units. Based on the statistical analysis of the results of the inter-laboratory certification program it can be concluded that OREAS 26b displays a high level of homogeneity and is fit-for-purpose as a certified reference material (see 'Intended Use' below).

PARTICIPATING LABORATORIES

1. ALS Brisbane, QLD, Australia
2. ALS Vancouver, BC, Canada
3. ALS IOTC, Perth, WA, Australia
4. Bureau Veritas Geoanalytical, Adelaide, SA, Australia
5. Bureau Veritas Geoanalytical, Cardiff, NSW, Australia
6. Intertek Genalysis, Perth, WA, Australia
7. Intertek Testing Services, Cupang, Muntinlupa, Philippines
8. Nagrom, Perth, WA, Australia
9. PT Intertek Utama Services Jakarta Timur, DKI Jakarta, Indonesia
10. SGS Lakefield Research Ltd, Lakefield, Ontario, Canada

PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

Reference material OREAS 26b has been prepared, certified and is supplied by:

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It has been packaged in 1kg units into sealed robust barrier bags.

INTENDED USE

OREAS 26b is intended for the following uses:

- for the monitoring of sample preparation procedures in a laboratory environment;
- for the monitoring of laboratory performance in the analysis of geological samples for the analytes reported in Table 1;
- for the verification of analytical methods for analytes reported in Table 1.

STABILITY AND STORAGE INSTRUCTIONS

OREAS 26b was prepared from fresh, barren basalt aggregate material. In its unopened state under normal conditions of storage it has a shelf life beyond ten years.

INSTRUCTIONS FOR CORRECT USE

The certified values for OREAS 26b refer to the concentration levels i) on a sample dry basis (105° C) for the borate fusion XRF data, and ii) in its packaged state for the fire assay and 4-acid digestion data.

HANDLING INSTRUCTIONS

OREAS 26b contains a portion of fine powder. Fine powders pose a risk to eyes and lungs and therefore standard precautions such as the use of safety glasses and dust masks are advised.

TRACEABILITY

The analytical samples were selected in a manner to represent the entire batch of prepared CRM. This 'representivity' was maintained in each submitted laboratory sample batch and ensures the user that the data is traceable from sample selection through to the analytical results that underlie the consensus values. Each analytical data set has been validated by its assayer through the inclusion of internal reference materials and QC checks during analysis. The laboratories were chosen on the basis of their competence (from past performance in inter-laboratory programs) for a particular analytical method, analyte or analyte suite, and sample matrix. Most of these laboratories have and maintain ISO 17025 accreditation. The certified and non-certified (indicative) values presented in this report are calculated from the means of accepted data following robust statistical treatment as detailed in this report.

LEGAL NOTICE

Ore Research & Exploration Pty Ltd has prepared and statistically evaluated the property values of this reference material to the best of its ability. The Purchaser by receipt hereof releases and indemnifies Ore Research & Exploration Pty Ltd from and against all liability and costs arising from the use of this material and information.

QMS ACCREDITED

ORE Pty Ltd is accredited to ISO 9001:2008 by Lloyd's Register Quality Assurance Ltd for its quality management system including development, manufacturing, certification and supply of CRMs.

CERTIFYING OFFICER

Craig Hamlyn (B.Sc. Hons - Geology), Technical Manager - ORE P/L

REFERENCES

ISO Guide 30 (1992), Terms and definitions used in connection with reference materials.

ISO Guide 31 (2000), Reference materials – Contents of certificates and labels.

ISO Guide 3207 (1975), Statistical interpretation of data - Determination of a statistical tolerance interval.

ISO Guide 35 (2006), Certification of reference materials - General and statistical principals.