ORE RESEARCH & EXPLORATION P/L ABN 28 006 859 856
37A Hosie Street · Bayswater North · VIC 3153 · AUSTRALIA
61 3 9729 0333 61 3 9729 8338
info@ore.com.au www.ore.com.au

OREAS
Certified Reference Materials

CERTIFICATE OF ANALYSIS FOR

RHYODACITE BLANK CHIP

CERTIFIED REFERENCE MATERIAL

OREAS 27b

Table 1. Certified Values, SDs, 95% Confidence and Tolerance Limits for OREAS 27b.

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
4-Acid Digestion						
Al, Aluminium (wt.%)	7.44	0.263	7.12	7.76	7.16	7.72
As, Arsenic (ppm)	5.53	0.64	5.11	5.95	IND	IND
Ba, Barium (ppm)	3089	139	2974	3205	2989	3190
Be, Beryllium (ppm)	3.28	0.137	3.14	3.41	3.10	3.46
Ca, Calcium (wt.%)	1.34	0.057	1.29	1.40	1.29	1.40
Cd, Cadmium (ppm)	0.29	0.026	0.27	0.30	IND	IND
Ce, Cerium (ppm)	90	8.3	79	101	83	97
Co, Cobalt (ppm)	2.25	0.221	2.01	2.49	2.05	2.44
Cs, Cesium (ppm)	7.32	0.610	6.64	8.00	7.04	7.59
Cu, Copper (ppm)	5.61	1.15	4.57	6.65	IND	IND
Fe, Iron (wt.%)	2.74	0.165	2.60	2.88	2.64	2.84
Ga, Gallium (ppm)	23.2	0.96	22.2	24.2	22.4	24.1
Hf, Hafnium (ppm)	7.23	0.559	6.49	7.97	6.81	7.65
In, Indium (ppm)	0.065	0.008	0.059	0.071	IND	IND
K, Potassium (wt.%)	3.07	0.054	3.01	3.12	3.04	3.10
La, Lanthanum (ppm)	45.0	6.1	36.9	53.1	43.0	47.0
Li, Lithium (ppm)	28.6	1.13	27.5	29.6	27.3	29.9
Mg, Magnesium (wt.%)	0.116	0.010	0.106	0.127	IND	IND
Mn, Manganese (ppm)	336	15	325	347	301	371
Mo, Molybdenum (ppm)	3.22	0.38	3.00	3.44	2.91	3.53
Na, Sodium (wt.%)	2.91	0.142	2.72	3.09	2.84	2.97
Nb, Niobium (ppm)	19.8	1.09	18.4	21.3	19.0	20.7
P, Phosphorus (ppm)	280	14	267	292	268	292
Pb, Lead (ppm)	26.3	1.67	25.1	27.5	24.7	27.9
Rb, Rubidium (ppm)	143	6	137	149	137	149
Sb, Antimony (ppm)	1.17	0.100	1.10	1.24	1.07	1.27
Sc, Scandium (ppm)	4.05	0.129	3.90	4.20	3.75	4.34
Sn, Tin (ppm)	4.02	0.180	3.88	4.17	3.74	4.30
Sr, Strontium (ppm)	189	8	181	197	185	193
Ta, Tantalum (ppm)	1.40	0.22	1.15	1.65	1.32	1.48
Th, Thorium (ppm)	15.2	1.28	14.1	16.2	14.4	15.9
Ti, Titanium (wt.%)	0.109	0.002	0.108	0.111	0.105	0.114
Tl, Thallium (ppm)	0.71	0.024	0.70	0.72	0.65	0.77
U, Uranium (ppm)	6.18	0.471	5.80	6.56	5.89	6.47
V, Vanadium (ppm)	2.63	0.57	2.11	3.15	IND	IND
W, Tungsten (ppm)	1.62	0.23	1.54	1.71	IND	IND
Y, Yttrium (ppm)	15.1	1.7	13.3	17.0	14.7	15.6
Zn, Zinc (ppm)	118	7	113	124	113	124
Zr, Zirconium (ppm)	266	6	261	270	258	274

Note: Intervals may appear asymmetric due to rounding.

INTRODUCTION

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.

SOURCE MATERIALS

OREAS 27b is a rhyodacite blank chip certified reference material (CRM) supplied, prepared and certified by Ore Research & Exploration Pty Ltd. The material was sourced from a quarry east of Melbourne (Victoria), Australia. Table 1 above contains 39 certified values by 4-acid digestion and Au by fire assay together with their associated 1SD's, 95% confidence and tolerance limits. Table 2 shows 95 indicative values for the major and trace elements and performance gates are provided as a guide to QC monitoring in 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 27b DataPack.xlsx**).

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 27b 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 rotary splitting;
- packaging into 20kg (plastic buckets) and 200kg units (plastic lined 44 gallon drum).

ANALYTICAL PROGRAM

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

- Au via 25-50g, trace level fire assay with ICP-MS (3 labs) or ICP-OES (5 labs) finish;
- Full elemental suite via four acid digestion (HNO_3-$HClO_4$-HCl-HF) with ICP-OES and ICP-MS finish (8 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 27b. These 10 samples were pulverised (to 90% passing 75 microns), homogenised and each split into six 110g subsamples. Six 110g 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.

Table 2. Indicative Values for OREAS 27b.

Constituent	Unit	Value	Constituent	Unit	Value	Constituent	Unit	Value
Pb Fire Assay								
Pd	ppb	*5*	Pt	ppb	*5*			
Borate Fusion XRF								
Al_2O_3	wt.%	*15.02*	Fe_2O_3	wt.%	*3.83*	Pb	ppm	*25.0*
As	ppm	*< 10*	K_2O	wt.%	*3.79*	SiO_2	wt.%	*68.86*
Ba	ppm	*2970*	MgO	wt.%	*0.230*	Sn	ppm	*20.0*
CaO	wt.%	*1.86*	MnO	wt.%	*0.050*	SO_3	wt.%	*0.009*
Co	ppm	*7.50*	Na_2O	wt.%	*3.92*	TiO_2	wt.%	*0.184*
Cr	ppm	*270*	Ni	ppm	*< 10*	U	ppm	*< 10*
Cu	ppm	*< 10*	P_2O_5	wt.%	*0.067*	Zn	ppm	*115*
Borate Fusion XRF								
LOI^{1000}	wt.%	*1.58*						
Laser Ablation ICP-MS								
Ag	ppm	*0.075*	Ho	ppm	*0.47*	Sn	ppm	*5.10*
As	ppm	*5.00*	In	ppm	*0.075*	Sr	ppm	*192*
Ba	ppm	*2935*	La	ppm	*52*	Ta	ppm	*1.60*
Be	ppm	*3.30*	Lu	ppm	*0.065*	Tb	ppm	*0.76*
Bi	ppm	*0.060*	Mn	wt.%	*0.034*	Te	ppm	*< 0.2*
Cd	ppm	*0.30*	Mo	ppm	*3.00*	Th	ppm	*15.7*
Ce	ppm	*93*	Nb	ppm	*19.1*	Ti	wt.%	*0.114*
Co	ppm	*2.30*	Nd	ppm	*38.9*	Tl	ppm	*0.60*
Cr	ppm	*256*	Ni	ppm	*5.00*	Tm	ppm	*0.13*
Cs	ppm	*7.22*	Pb	ppm	*24.0*	U	ppm	*6.36*
Cu	ppm	*4.00*	Pr	ppm	*11.2*	V	ppm	*3.00*
Dy	ppm	*4.25*	Rb	ppm	*147*	W	ppm	*1.58*
Er	ppm	*1.19*	Re	ppm	*0.008*	Y	ppm	*16.5*
Eu	ppm	*1.32*	Sb	ppm	*0.90*	Yb	ppm	*0.53*
Ga	ppm	*22.6*	Sc	ppm	*3.95*	Zn	ppm	*110*
Gd	ppm	*5.94*	Se	ppm	*< 5*	Zr	ppm	*276*
Hf	ppm	*8.40*	Sm	ppm	*7.81*			
4-Acid Digestion								
Ag	ppm	*0.18*	Ge	ppm	*0.5*	S	ppm	*< 50*
Bi	ppm	*0.07*	Ho	ppm	*0.5*	Se	ppm	*< 2*
Cr	ppm	*190*	Lu	ppm	*0.07*	Sm	ppm	*7.5*
Dy	ppm	*3.6*	Nd	ppm	*40*	Tb	ppm	*0.8*
Er	ppm	*1*	Ni	ppm	*2.7*	Te	ppm	*< 0.1*
Eu	ppm	*1.4*	Pr	ppm	*11*	Tm	ppm	*0.10*
Gd	ppm	*6.1*	Re	ppb	*< 2*	Yb	ppm	*0.5*

Note: the number of significant figures reported is not a reflection of the level of certainty of stated values. They are instead an artefact of ORE's in-house CRM-specific LIMS.

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). The Certified Values are the means of accepted laboratory means after outlier filtering.

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.

Indicative (uncertified) values (Table 2) are provided for the major and trace elements determined by borate fusion XRF (Al_2O_3 to Zn) and laser ablation with ICP-MS (Ag to Zr) and are the means of duplicate assays from Bureau Veritas, Perth. Additional indicative values by other analytical methods are present where the number of laboratories reporting a particular analyte is insufficient (< 5) to support certification or where inter-laboratory consensus is poor.

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 below 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.

Table 3. Performance Gates for OREAS 27b

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
Pb Fire Assay											
Au, ppb	< 1	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
4-Acid Digestion											
Al, wt.%	7.44	0.263	6.91	7.97	6.65	8.23	3.54%	7.08%	10.62%	7.07	7.81
As, ppm	5.53	0.64	4.25	6.82	3.60	7.46	11.63%	23.25%	34.88%	5.26	5.81
Ba, ppm	3089	139	2811	3368	2672	3507	4.50%	9.01%	13.51%	2935	3244
Be, ppm	3.28	0.137	3.00	3.55	2.86	3.69	4.19%	8.37%	12.56%	3.11	3.44
Ca, wt.%	1.34	0.057	1.23	1.46	1.17	1.51	4.23%	8.46%	12.69%	1.28	1.41
Cd, ppm	0.29	0.026	0.24	0.34	0.21	0.37	8.84%	17.67%	26.51%	0.27	0.30
Ce, ppm	90	8.3	73	106	65	115	9.27%	18.54%	27.81%	85	94
Co, ppm	2.25	0.221	1.81	2.69	1.59	2.91	9.82%	19.65%	29.47%	2.14	2.36
Cs, ppm	7.32	0.610	6.10	8.54	5.49	9.15	8.34%	16.68%	25.02%	6.95	7.68
Cu, ppm	5.61	1.15	3.31	7.91	2.15	9.06	20.53%	41.06%	61.59%	5.33	5.89
Fe, wt.%	2.74	0.165	2.41	3.07	2.24	3.23	6.02%	12.05%	18.07%	2.60	2.87
Ga, ppm	23.2	0.96	21.3	25.1	20.4	26.1	4.13%	8.25%	12.38%	22.1	24.4
Hf, ppm	7.23	0.559	6.11	8.35	5.56	8.91	7.72%	15.45%	23.17%	6.87	7.59
In, ppm	0.065	0.008	0.050	0.081	0.042	0.088	11.79%	23.57%	35.36%	0.062	0.068
K, wt.%	3.07	0.054	2.96	3.17	2.91	3.23	1.76%	3.51%	5.27%	2.91	3.22
La, ppm	45.0	6.1	32.8	57.2	26.7	63.3	13.56%	27.12%	40.68%	42.8	47.3
Li, ppm	28.6	1.13	26.3	30.8	25.2	32.0	3.96%	7.93%	11.89%	27.1	30.0
Mg, wt.%	0.116	0.010	0.097	0.136	0.087	0.146	8.55%	17.10%	25.66%	0.111	0.122
Mn, ppm	336	15	306	366	291	381	4.49%	8.97%	13.46%	319	353
Mo, ppm	3.22	0.38	2.46	3.98	2.08	4.36	11.78%	23.57%	35.35%	3.06	3.38
Na, wt.%	2.91	0.142	2.63	3.19	2.48	3.33	4.87%	9.73%	14.60%	2.76	3.05
Nb, ppm	19.8	1.09	17.7	22.0	16.6	23.1	5.51%	11.02%	16.53%	18.9	20.8
P, ppm	280	14	252	307	238	321	4.97%	9.94%	14.91%	266	294

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											
Pb, ppm	26.3	1.67	23.0	29.6	21.3	31.3	6.34%	12.69%	19.03%	25.0	27.6
Rb, ppm	143	6	131	155	125	161	4.24%	8.47%	12.71%	136	150
Sb, ppm	1.17	0.100	0.97	1.37	0.87	1.47	8.53%	17.06%	25.59%	1.11	1.23
Sc, ppm	4.05	0.129	3.79	4.30	3.66	4.43	3.18%	6.37%	9.55%	3.84	4.25
Sn, ppm	4.02	0.180	3.66	4.38	3.48	4.56	4.47%	8.94%	13.41%	3.82	4.22
Sr, ppm	189	8	173	204	166	212	4.09%	8.18%	12.26%	179	198
Ta, ppm	1.40	0.22	0.96	1.83	0.75	2.05	15.52%	31.04%	46.56%	1.33	1.47
Th, ppm	15.2	1.28	12.6	17.7	11.3	19.0	8.46%	16.92%	25.38%	14.4	15.9
Ti, wt.%	0.109	0.002	0.106	0.113	0.104	0.115	1.61%	3.23%	4.84%	0.104	0.115
Tl, ppm	0.71	0.024	0.67	0.76	0.64	0.78	3.30%	6.61%	9.91%	0.68	0.75
U, ppm	6.18	0.471	5.24	7.12	4.77	7.59	7.61%	15.23%	22.84%	5.87	6.49
V, ppm	2.63	0.57	1.49	3.77	0.92	4.34	21.64%	43.27%	64.91%	2.50	2.76
W, ppm	1.62	0.23	1.17	2.08	0.94	2.30	13.96%	27.92%	41.88%	1.54	1.70
Y, ppm	15.1	1.7	11.8	18.4	10.2	20.1	10.95%	21.91%	32.86%	14.4	15.9
Zn, ppm	118	7	105	132	98	139	5.70%	11.39%	17.09%	112	124
Zr, ppm	266	6	253	279	247	285	2.39%	4.78%	7.16%	253	279

Note: Intervals may appear asymmetric due to rounding.

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 zinc (by 4-acid digestion) where 99% of the time (1-α=0.99) at least 95% of subsamples (ρ=0.95) will have concentrations lying between 113 and 124 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).

ANOVA Test

The sampling format for OREAS 27b was structured to enable nested ANOVA treatment of the round robin results. As mentioned earlier, 10 x 1kg samples were selected at set intervals during packaging to maximize representation and these were to be used as samples for the round robin program following pulverisation and splitting into 110g subsamples. Each of the eight round robin laboratories received six samples of the 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:

- 8 laboratory data sets (48 samples made up from 8 laboratories providing analyses on 3 pairs of samples);
- Significance Level α = 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 for Mn and Mo. Both of these analytes are present in low concentrations where reading resolution errors can help generate false positives. These anomalies have also been investigated by looking at the distribution of results for each of the 10 sampling intervals. The distributions do not show any extreme results so if in fact between-unit variance > within-unit variance for Mn and Mo the variance is constrained within manageable limits. The significant *p*-values for Mn and Mo are considered aberrations of the data and likely 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 27b 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 27b displays a high level of homogeneity and is fit-for-purpose as a certified reference material (see 'Intended Use' below).

PARTICIPATING LABORATORIES

1. ALS, Perth, WA, Australia
2. ALS, Vancouver, BC, Canada
3. Bureau Veritas Geoanalytical, Adelaide, SA, Australia
4. Bureau Veritas Geoanalytical, Perth, WA, Australia
5. Intertek Genalysis, Adelaide, SA, Australia
6. Intertek Genalysis, Perth, WA, Australia
7. Intertek Testing Services, Cupang, Muntinlupa, Philippines
8. SGS Australia Mineral Services, Perth, WA, Australia

PREPARER AND SUPPLIER

Certified reference material OREAS 26a is prepared, certified and supplied by:

ORE RESEARCH & EXPLORATION

ORE Research & Exploration Pty Ltd
37A Hosie Street
Bayswater North VIC 3153
AUSTRALIA

Tel: +613-9729 0333
Fax: +613-9729 8338
Web: www.ore.com.au
Email: info@ore.com.au

It is available in 20kg buckets and 200kg drums.

INTENDED USE

OREAS 27b 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 27b was prepared from fresh rhyodacite rocks. 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 27b refer to the concentration in its packaged state for the fire assay and 4-acid digestion data.

HANDLING INSTRUCTIONS

OREAS 27b contains a small 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.