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CERTIFICATE OF ANALYSIS FOR

Zn-Pb-Ag REFERENCE MATERIAL

OREAS 133a

Summary Statistics for Key Analytes (see Table 1 for additional certified values).

Constituent (ppm)	Certified Value	1SD	95% Confidence Limits		95% Tolerance Limits	
			Low	High	Low	High
4-Acid Digestion						
Ag, Silver (ppm)	99.9	2.42	98.4	101.5	98.0	101.8
Pb, Lead (wt.%)	4.90	0.162	4.81	4.99	4.83	4.97
Zn, Zinc (wt.%)	10.87	0.354	10.68	11.07	10.61	11.14

Please note: intervals may appear asymmetric due to rounding.

Table 1. Certified Values, SD's, 95% Confidence and Tolerance Limits for OREAS 133a.

Constituent	Certified Value	1SD	95% Confidence Limits		95% Tolerance Limits	
			Low	High	Low	High
Fusion ICP*						
Al_2O_3, Aluminium(III) oxide (wt.%)	6.80	0.143	6.68	6.92	6.68	6.92
Ba, Barium (ppm)	785	64	722	847	769	800
CaO, Calcium oxide (wt.%)	5.67	0.266	5.45	5.89	5.61	5.73
Cu, Copper (ppm)	302	14	291	313	288	316
Fe, Iron (wt.%)	7.92	0.503	7.52	8.32	7.81	8.03
MgO, Magnesium oxide (wt.%)	3.85	0.154	3.73	3.97	3.78	3.92
Pb, Lead (wt.%)	4.84	0.254	4.65	5.04	4.80	4.89
S, Sulphur (wt.%)	10.82	0.921	10.32	11.32	10.16	11.48
Sb, Antimony (ppm)	175	34	129	221	170	180
SiO_2, Silicon dioxide (wt.%)	34.36	1.500	33.14	35.58	33.67	35.05
Zn, Zinc (wt.%)	10.67	0.281	10.44	10.89	10.53	10.81
4-Acid Digestion						
Ag, Silver (ppm)	99.9	2.42	98.4	101.5	98.0	101.8
Al_2O_3, Aluminium(III) oxide (wt.%)	7.11	0.272	6.95	7.26	6.98	7.23
As, Arsenic (ppm)	139	15	131	147	135	144
CaO, Calcium oxide (wt.%)	5.50	0.298	5.32	5.69	5.38	5.62
Cd, Cadmium (ppm)	296	23	284	309	289	303
Co, Cobalt (ppm)	23.9	4.4	21.6	26.1	22.6	25.1
Cu, Copper (ppm)	323	15	315	331	313	334
Fe, Iron (wt.%)	8.10	0.251	7.97	8.23	7.99	8.22
MgO, Magnesium oxide (wt.%)	3.80	0.186	3.69	3.91	3.74	3.85
Pb, Lead (wt.%)	4.90	0.162	4.81	4.99	4.83	4.97
S, Sulphur (wt.%)	11.13	0.316	10.82	11.44	10.91	11.35
Sb, Antimony (ppm)	171	18	161	180	161	181
Zn, Zinc (wt.%)	10.87	0.354	10.68	11.07	10.61	11.14
Aqua Regia Digestion						
Ag, Silver (ppm)	96.9	5.72	93.6	100.3	94.2	99.7
Al_2O_3, Aluminium(III) oxide (wt.%)	1.39	0.132	1.30	1.48	1.35	1.43
As, Arsenic (ppm)	140	15	132	148	133	147
CaO, Calcium oxide (wt.%)	5.39	0.247	5.21	5.56	5.28	5.50
Cd, Cadmium (ppm)	297	16	287	307	289	305
Co, Cobalt (ppm)	23.3	2.11	22.1	24.5	21.9	24.7
Cu, Copper (ppm)	324	19	313	335	314	334
Fe, Iron (wt.%)	7.92	0.287	7.72	8.11	7.71	8.12
MgO, Magnesium oxide (wt.%)	3.56	0.240	3.41	3.70	3.47	3.64
Pb, Lead (wt.%)	4.86	0.203	4.76	4.97	4.74	4.98
S, Sulphur (wt.%)	10.73	0.928	10.06	11.40	10.44	11.01
Sb, Antimony (ppm)	147	28	131	162	140	154
Zn, Zinc (wt.%)	10.60	0.596	10.27	10.93	10.27	10.93
Infrared Combustion						
S, Sulphur (wt.%)	10.95	0.256	10.76	11.15	10.80	11.11

*except for Ba where two laboratories used pressed powder pellet with XRF.
Please note: intervals may appear asymmetric due to rounding.

Table 2. Indicative Values for OREAS 133a.

Constituent	Unit	Value	Constituent	Unit	Value	Constituent	Unit	Value
Fusion ICP								
Ag	ppm	*95.5*	K	wt.%	*3.21*	Sr	ppm	*21.8*
As	ppm	*132*	LOI^{1000}	wt.%	*14.85*	Ti	ppm	*1487*
Be	ppm	*2.20*	Mn	ppm	*1274*	V	ppm	*37.0*
Cd	ppm	*298*	Na	ppm	*1246*	Y	ppm	*13.2*
Co	ppm	*24.1*	P	ppm	*415*	Zr	ppm	*70*
Cr	ppm	*90*	Sc	ppm	*5.80*			
4-Acid Digestion								
B	ppm	*12.2*	La	ppm	*17.3*	Sn	ppm	*2.14*
Ba	ppm	*< 800*	Li	ppm	*29.8*	Sr	ppm	*16.2*
Be	ppm	*2.68*	Lu	ppb	*180*	Ta	ppb	*100*
Ce	ppm	*35.8*	Mn	ppm	*1223*	Tb	ppb	*380*
Cr	ppm	*22.2*	Mo	ppm	*2.80*	Te	ppb	*190*
Cs	ppm	*2.12*	Na	ppm	*880*	Th	ppm	*5.73*
Dy	ppm	*1.78*	Nb	ppm	*4.34*	Ti	ppm	*1196*
Er	ppm	*1.20*	Nd	ppm	*17.1*	Tl	ppm	*62*
Eu	ppb	*680*	Ni	ppm	*24.2*	Tm	ppb	*200*
Ga	ppm	*18.4*	P	ppm	*403*	U	ppm	*2.19*
Gd	ppm	*2.62*	Pr	ppm	*4.28*	V	ppm	*32.5*
Ge	ppb	*1000*	Rb	ppm	*89*	W	ppm	*1.03*
Hf	ppb	*1790*	Re	ppb	*< 1*	Y	ppm	*10.5*
Ho	ppb	*420*	Sc	ppm	*5.80*	Yb	ppb	*1180*
In	ppm	*4.76*	Se	ppm	*4.94*	Zr	ppm	*61*
K	wt.%	*3.01*	Sm	ppm	*3.12*			
Aqua Regia Digestion								
Au	ppb	*< 0.5*	K	wt.%	*0.448*	Sn	ppm	*1.36*
B	ppm	*6.20*	La	ppm	*15.3*	Sr	ppm	*18.0*
Ba	ppm	*< 100*	Li	ppm	*20.2*	Ta	ppb	*< 50*
Be	ppm	*1.04*	Lu	ppb	*100*	Tb	ppb	*300*
Ce	ppm	*26.9*	Mn	ppm	*1395*	Te	ppb	*108*
Cr	ppm	*12.6*	Mo	ppm	*2.75*	Th	ppm	*5.24*
Cs	ppm	*1.14*	Na	ppm	*167*	Ti	ppm	*110*
Dy	ppm	*1.70*	Nb	ppm	*< 0.1*	Tl	ppm	*45.8*
Er	ppm	*0.92*	Nd	ppm	*11.8*	Tm	ppb	*100*
Eu	ppb	*520*	Ni	ppm	*24.0*	U	ppm	*1.42*
Ga	ppm	*4.15*	P	ppm	*382*	V	ppm	*14.6*
Gd	ppm	*2.08*	Pr	ppm	*3.04*	W	ppm	*0.26*
Ge	ppb	*100*	Rb	ppm	*33.5*	Y	ppm	*7.00*
Hf	ppb	*740*	Re	ppb	*1*	Yb	ppb	*820*
Hg	ppb	*4487*	Sc	ppm	*2.38*	Zr	ppm	*26.6*
Ho	ppb	*300*	Se	ppm	*4.76*			
In	ppm	*4.67*	Sm	ppm	*2.34*			

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.

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 133a is one of eight pigeon paired CRM's prepared from zinc-lead mineralised material from Xstrata's Black Star and George Fisher orebodies located in Mt Isa in NW Queensland, Australia. OREAS 133a contains a 3.2% and 4.2% lower relative offset in Pb and Zn grades respectively, to OREAS 133b. The orebodies are sediment hosted 'SEDEX' Zn-Pb-Ag deposits located within the Urquart Shale Formation of the Mount Isa Group, a weakly metamorphosed, 5 km thick sequence composed predominantly of Mesoproterozoic carbonate siltstones, mudstones and shales. The Urquart Shale consists of a sequence of alternating pyrite-rich dolomitic siltstone and shale beds up to 1000 metres thick and was deposited in a lacustrine setting within an intracratonic rift basin. The orebodies lie within the upper 650m and are bounded by the Mount Isa fault on the west and by volcanic greenstones to the east. Comprising galena and sphalerite with pyrite and pyrrhotite, the lead-zinc-silver orebodies are concordant with carbonaceous dolomitic sediments and interfinger with the silica-dolomitic mass hosting copper. OREAS 133a was prepared from a blend of Black Star waste rock, Black Star ore and George Fisher ore.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 133a was prepared in the following manner:

- drying to constant mass at 65°C;
- crushing and milling to 100% minus 30 microns;
- homogenisation and bagging into 20kg lots;
- packaging into 10g units sealed under nitrogen in laminated foil pouches.

ANALYTICAL PROGRAM

Fifteen commercial laboratories participated in the analytical program to certify Ag, Al_2O_3, As, Ba, CaO, Cd, Co, Cu, Fe, MgO, Pb, S, Sb, SiO_2 and Zn by a range of analytical methods. Tabulated results of all elements together with 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 133a DataPack.xlsx**).

The intent of the certification program was to characterise the analytes by:

- fusion methods - sodium peroxide fusion or lithium borate fusion with ICP (except for Ba where two laboratories used pressed powder pellet with XRF);
- four acid (HF-HCl-HNO_3-$HClO_4$) digest with ICP or AAS;
- aqua regia digest with ICP or AAS;

- Leco for sulphur only.

It is important to note that in the analytical industry there is no standardisation of the aqua regia digestion process. Aqua regia is a partial empirical digest and differences in recoveries for various analytes are commonplace. These are caused by variations in the digest conditions which can include the ratio of nitric to hydrochloric acids, acid strength, temperatures, leach times and secondary digestions. Recoveries for sulphide-hosted base metal sulphides approach total values, however, other analytes, in particular the lithophile elements, show greater sensitivity to method parameters. This can result in lack of consensus in an inter-laboratory certification program for these elements. The approach applied here is to report certified values in those instances where reasonable agreement exists amongst a majority of participating laboratories. The results of specific laboratories may differ significantly from the certified values, but will, nonetheless, be valid and reproducible in the context of the specifics of the aqua regia method in use. Users of this reference material should, therefore, be mindful of this limitation when applying the certified values in a quality control program.

For the round robin program a batch of five 25g vacuum-packed pulp samples was submitted to each of the participating laboratories for analysis. The five samples comprising each batch were scoop-split from a random selection of five of ten or more 400g master samples. The latter were taken at regular intervals during the bagging stage and immediately following homogenisation. Table 1 presents the 38 certified values together with their associated 1SD's, 95% confidence and tolerance limits and Table 2 shows 113 indicative values. Table 3 provides performance gate intervals for the certified values of each method group based on their pooled 1SD's.

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 laboratory 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.

Certified Values are the means of accepted laboratory means after outlier filtering. Indicative (uncertified) values (Table 2) are provided where i) the number of laboratories reporting a particular analyte is insufficient (< 5) to support certification; ii) inter-laboratory consensus is poor; or iii) 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 values include all sources of measurement uncertainty: between-lab variance, within-run variance (precision errors) and CRM variability. For an effective CRM the contribution of the latter should be negligible in comparison to measurement errors. OREAS 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 per cent 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 Zn 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 10.61 and 11.14 wt.%. Put more precisely, 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 133a.

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
Fusion ICP*											
Al_2O_3, wt.%	6.80	0.143	6.51	7.09	6.37	7.23	2.11%	4.22%	6.32%	6.46	7.14
Ba, ppm	785	64	656	913	591	978	8.21%	16.41%	24.62%	745	824
CaO, wt.%	5.67	0.266	5.14	6.20	4.87	6.47	4.70%	9.40%	14.10%	5.39	5.95
Cu, ppm	302	14	274	329	261	343	4.54%	9.08%	13.62%	287	317
Fe, wt.%	7.92	0.503	6.91	8.92	6.41	9.43	6.35%	12.70%	19.06%	7.52	8.31
MgO, wt.%	3.85	0.154	3.54	4.16	3.39	4.31	3.99%	7.98%	11.97%	3.66	4.04
Pb, wt.%	4.84	0.254	4.34	5.35	4.08	5.61	5.25%	10.50%	15.74%	4.60	5.09
S, wt.%	10.82	0.921	8.98	12.66	8.06	13.58	8.51%	17.02%	25.53%	10.28	11.36
Sb, ppm	175	34	107	243	73	277	19.41%	38.82%	58.23%	166	184
SiO_2, wt.%	34.36	1.500	31.36	37.36	29.86	38.86	4.36%	8.73%	13.09%	32.64	36.08
Zn, wt.%	10.67	0.281	10.11	11.23	9.82	11.51	2.63%	5.27%	7.90%	10.13	11.20
4-Acid Digestion											
Ag, ppm	99.9	2.42	95.1	104.8	92.7	107.2	2.42%	4.83%	7.25%	94.9	104.9
Al_2O_3, wt.%	7.11	0.272	6.56	7.65	6.29	7.92	3.83%	7.66%	11.48%	6.75	7.46
As, ppm	139	15	109	169	94	184	10.82%	21.65%	32.47%	132	146
CaO, wt.%	5.50	0.298	4.91	6.10	4.61	6.40	5.42%	10.83%	16.25%	5.23	5.78
Cd, ppm	296	23	251	342	228	365	7.69%	15.38%	23.07%	282	311
Co, ppm	23.9	4.4	15.2	32.6	10.8	36.9	18.25%	36.49%	54.74%	22.7	25.1
Cu, ppm	323	15	292	354	277	369	4.74%	9.48%	14.22%	307	339
Fe, wt.%	8.10	0.251	7.60	8.60	7.35	8.86	3.09%	6.18%	9.28%	7.70	8.51
MgO, wt.%	3.80	0.186	3.42	4.17	3.24	4.35	4.90%	9.79%	14.69%	3.61	3.99
Pb, wt.%	4.90	0.162	4.58	5.23	4.42	5.39	3.30%	6.60%	9.91%	4.66	5.15
S, wt.%	11.13	0.316	10.50	11.76	10.18	12.08	2.84%	5.69%	8.53%	10.57	11.69
Sb, ppm	171	18	135	206	117	224	10.41%	20.83%	31.24%	162	179
Zn, wt.%	10.87	0.354	10.17	11.58	9.81	11.94	3.25%	6.51%	9.76%	10.33	11.42
Aqua Regia Digestion											
Ag, ppm	96.9	5.72	85.5	108.4	79.8	114.1	5.90%	11.80%	17.70%	92.1	101.8
Al_2O_3, wt.%	1.39	0.132	1.13	1.66	1.00	1.79	9.48%	18.97%	28.45%	1.32	1.46
As, ppm	140	15	111	169	96	184	10.42%	20.84%	31.26%	133	147
CaO, wt.%	5.39	0.247	4.89	5.88	4.65	6.13	4.58%	9.16%	13.74%	5.12	5.66
Cd, ppm	297	16	264	330	248	346	5.54%	11.09%	16.63%	282	312
Co, ppm	23.3	2.11	19.1	27.5	17.0	29.6	9.05%	18.09%	27.14%	22.2	24.5
Cu, ppm	324	19	286	362	267	381	5.86%	11.73%	17.59%	308	340
Fe, wt.%	7.92	0.287	7.34	8.49	7.05	8.78	3.63%	7.26%	10.89%	7.52	8.31
MgO, wt.%	3.56	0.240	3.08	4.04	2.84	4.28	6.74%	13.47%	20.21%	3.38	3.74
Pb, wt.%	4.86	0.203	4.46	5.27	4.25	5.47	4.18%	8.35%	12.53%	4.62	5.11
S, wt.%	10.73	0.928	8.87	12.58	7.94	13.51	8.65%	17.30%	25.95%	10.19	11.26
Sb, ppm	147	28	91	202	64	230	18.87%	37.74%	56.62%	140	154
Zn, wt.%	10.60	0.596	9.41	11.79	8.81	12.39	5.63%	11.25%	16.88%	10.07	11.13
Infrared Combustion											
S, wt.%	10.95	0.256	10.44	11.47	10.18	11.72	2.34%	4.68%	7.02%	10.41	11.50

*except for Ba where two laboratories used pressed powder pellet with XRF.

Note: intervals may appear asymmetric due to rounding.

Based on the statistical analysis of the results of the inter-laboratory certification program it can be concluded that OREAS 133a is fit-for-purpose as a certified reference material (see 'Intended Use' below).

PARTICIPATING LABORATORIES

1. Bureau Veritas Commodities Canada Ltd, Vancouver, BC, Canada
2. Actlabs, Ancaster, Ontario, Canada
3. ALS, Brisbane, QLD, Australia
4. ALS, Johannesburg, South Africa
5. ALS, Perth, WA, Australia
6. ALS, Vancouver, BC, Canada
7. Bureau Veritas Geoanalytical, Adelaide, SA, Australia
8. Bureau Veritas Amdel Laboratories, Perth, WA, Australia
9. Intertek Genalysis, Perth, WA, Australia
10. PT Intertek Utama Services, Jakarta Timur, DKI Jakarta, Indonesia
11. Intertek Testing Services, Cupang, Muntinlupa, Philippines
12. SGS Australia Mineral Services, Perth, WA, Australia
13. SGS Lakefield Research Ltd, Lakefield, Ontario, Canada
14. SGS Mineral Services, Townsville, QLD, Australia
15. Bureau Veritas Geoanalytical, Perth, WA, Australia

PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

Reference material OREAS 133a has been prepared, certified and is supplied by:

ORE Research & Exploration Pty Ltd
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AUSTRALIA

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Email: info@ore.com.au

It is available in 10g units sealed under nitrogen in laminated foil pouches.

INTENDED USE

OREAS 133a is intended for the following uses:

- for the monitoring of laboratory performance in the analysis of analytes reported in Table 1 in geological samples;
- for the verification of analytical methods for analytes reported in Table 1;
- for the calibration of instruments used in the determination of the concentration of analytes reported in Table 1.

STABILITY AND STORAGE INSTRUCTIONS

OREAS 133a has been prepared from a blend of sulphide-bearing Black Star waste, Black Star ore and George Fisher ore. To prolong its shelf life it has been packaged under nitrogen in robust foil laminate pouches. It is considered to have long-term stability under normal storage conditions. Its stability will be monitored at regular intervals and purchasers notified if any changes are observed.

INSTRUCTIONS FOR CORRECT USE

The certified values for OREAS 133a refer to the concentration level in its packaged state. It should not be dried prior to weighing and analysis.

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.

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.

HANDLING INSTRUCTIONS

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.

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.

CERTIFYING OFFICER

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

Date of certification: March 14, 2008

First revision: April 11, 2016

Reasons: i) The Standard Deviations (SD's) were revised to bring them into line with the method used for all other OREAS CRMs (pooled SD method). The original certification used a different method (involving standardising the laboratory means) that generated SD's that were overly constrained for practical use; ii) Indicative values have been added (see Table 2).

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.

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