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CERTIFICATE OF ANALYSIS FOR

COPPER ORE REFERENCE MATERIAL OREAS 98

SUMMARY STATISTICS OREAS 98

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High	Low	High
4 Acid					
Silver, Ag (ppm)	45.1	44.1	46.1	44.3	45.9
Bismuth, Bi (ppm)	97.2	92.5	102	94.6	99.9
Cobalt, Co (ppm)	121	115	126	117	124
Copper, Cu (wt %)	14.8	14.6	15.0	14.6	15.0
Lead, Pb (ppm)	345	327	362	337	352
Sulphur, S (wt %)	~15.5	IND	IND	IND	IND
Antimony, Sb (ppm)	20.1	18.2	22.0	19.5	20.7
Selenium, Se (ppm)	158	146	170	149	167
Tin, Sn (ppm)	206	197	215	203	209
Zinc, Zn (ppm)	1355	1300	1409	1315	1394
Aqua Regia					
Silver, Ag (ppm)	42.8	40.4	45.2	41.9	43.7
Bismuth, Bi (ppm)	92.8	87.8	97.8	90.0	95.6
Cobalt, Co (ppm)	111	103	119	108	114
Copper, Cu (wt %)	14.7	14.4	15.0	14.4	15.0
Lead, Pb (ppm)	343	321	364	334	351
Antimony, Sb (ppm)	14.7	11.4	18.0	14.0	15.4
Selenium, Se (ppm)	143	128	158	138	148
Tin, Sn (ppm)	171	150	192	166	176
Zinc, Zn (ppm)	1302	1238	1367	1267	1338
Sulphur by LECO (wt %)	16.0	15.6	16.3	15.7	16.2

~ - approximate only; IND – indeterminate; intervals may appear asymmetric due to rounding

Prepared by:
Ore Research & Exploration Pty Ltd
February 2006

REPORT 06/556I

INTRODUCTION

OREAS certified reference materials (CRMs) are intended to provide a low cost method of evaluating and improving the quality of precious and base metal analysis of geological samples. To the analyst they provide an effective means of calibrating analytical equipment, assessing new techniques and routinely monitoring in-house procedures. 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.

SOURCE MATERIAL

Reference material OREAS 98 is one of a suite of nine copper CRMs (OREAS 90 to OREAS 98) prepared from material from the CSA mine located near the town of Cobar in central western New South Wales, Australia. The copper ore body is hosted by the Early Devonian CSA Siltstone, a thinly bedded turbiditic sequence of carbonaceous siltstones and mudstones with minor coarser units. The CSA Siltstone is part of the Cobar Supergroup, consisting of lower syn-rift sediments and upper post-rift sag phase sediments. The mineralisation is structurally controlled and confined to a number of steeply dipping bodies within a major shear zone on the eastern margin of the Early Devonian Cobar Basin. It is characterised by low-grade greenschist alteration and epigenetic low-grade mineralisation enveloping higher-grade shoots of vein complexes or sub-massive to massive sulphides. The sulphides include chalcopyrite, pyrrhotite, pyrite, sphalerite, galena, bornite and cubanite. Iron-rich chlorite and silica are prominent alterations in the siltstone host.

Table 1. Indicative (uncertified) major and trace element composition of OREAS 98 (values are means of duplicate determinations; SiO_2 to C in wt.%, As to Zr in ppm).

Constituent	Mean value	Constituent	Mean value	Constituent	Mean value
SiO_2	33.4	As	49.7	Ni	35.3
Al_2O_3	7.53	Ba	231	Pr	7.11
CaO	0.26	Be	1.27	Rb	81.7
Fe_2O_3	28.0	Cd	3.00	Re	<0.1
K_2O	1.44	Ce	63.5	Sb	17.6
MgO	2.25	Cs	3.43	Sc	6.00
Na_2O	0.05	Dy	3.28	Sm	4.87
P_2O_5	0.15	Er	1.78	Sr	12.8
SO_3	41.3	Eu	0.78	Ta	0.40
TiO_2	0.40	Ga	8.53	Tb	0.57
MnO	0.08	Gd	3.80	Te	0.20
LOI	8.02	Hf	2.07	Th	10.2
		Ho	0.67	Tl	0.50
C	0.06	In	15.1	Tm	0.25
		La	31.8	U	3.10
		Li	18.8	W	4.50
		Lu	0.24	Y	16.8
		Mo	0.50	Yb	1.70
		Nb	6.50	Zr	66.7
		Nd	25.5		

The approximate major and trace element composition of OREAS 98 has been determined by various total methods. These values, presented in Table 1, are based on the means of duplicate determinations at one laboratory and are uncertified. The constituents SiO_2 to MnO (excluding Na_2O) have been determined by borate fusion X-ray fluorescence analysis, LOI by thermo-gravimetric analysis, C by total combustion analysis, Na_2O, Co, Ni and Sc by 4-acid ICPOES and the remaining trace constituents by 4-acid ICP-MS.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 98 was prepared in the following manner:

a) drying to constant mass at 65^0 C;
b) crushing;
c) milling to minus 75 microns;
d) homogenisation;
e) packaging into 10g lots sealed under nitrogen in laminated foil pouches.

ANALYTICAL PROGRAM FOR OREAS 98

Sixteen commercial laboratories participated in the analytical program to certify Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn by both total and partial methods. Their results together with uncorrected means, medians, one sigma standard deviations, relative standard deviations and percent deviation of lab means from the corrected mean of means (PDM^3) are presented in an appendix (Tables A2 – A22). The analytical methods employed by each laboratory are indicated as codes at the head of each laboratory data set and explained in Table A1 of the appendix.

The intent of the certification program was to characterise the analytes by a) total methods (mainly HF-HCl-HNO_3-$HClO_4$ digest ICP-OES and ICP-MS), and b) aqua regia digest ICP-OES, ICP-MS or AAS. A batch of five dried and vacuum-packed samples were submitted to each of the participating laboratories for analysis. Each batch was composed of two 10g sub-samples scoop-split from each of two separate 1kg test units taken during the bagging stage and immediately following homogenisation. This two-stage nested design for the interlaboratory programme was amenable to analysis of variance (ANOVA) treatment and enables a comparative assessment of within- and between-unit homogeneity. A fifth randomly chosen sample was included from a third 1kg test unit to make up batches of five samples.

STATISTICAL EVALUATION OF OREAS 98

Recommended Value and Confidence Limits
The certified value is the mean of means of accepted replicate values of accepted participating laboratories computed according to the formulae

$$\bar{x}_i = \frac{1}{n_i} \sum_{j=1}^{n_i} x_{ij}$$

$$\ddot{x} = \frac{1}{p} \sum_{i=1}^{p} \bar{x}_i$$

where

x_{ij} *is the jth result reported by laboratory i;*
p is the number of participating laboratories;
n_i *is the number of results reported by laboratory i;*
$\bar{x}_i$ *is the mean for laboratory i;*
$\ddot{x}$ *is the mean of means.*

The confidence limits were obtained by calculation of the variance of the consensus value (mean of means) and reference to Student's-*t* distribution with degrees of freedom (*p*-1).

$$\hat{V}(\ddot{x}) = \frac{1}{p(p-1)} \sum_{i=1}^{p} (\bar{x}_i - \ddot{x})^2$$

$$\text{Confidence limits} = \ddot{x} \pm t_{1-x/2}(p-1)(\hat{V}(\ddot{x}))^{1/2}$$

where $t_{1-x/2}(p-1)$ *is the 1-x/2 fractile of the t-distribution with (p-1) degrees of freedom.*

The distribution of the values are assumed to be symmetrical about the mean in the calculation of the confidence limits.

The test for rejection of individual outliers from each laboratory data set was based on *z* scores (rejected if $|z_i| > 2.5$) computed from the robust estimators of location and scale, *T* and *S*, respectively, according to the formulae

$$S = 1.483 \underset{j=1.\ldots n}{\text{median}} / x_j - \underset{i=1.\ldots n}{\text{median}} (x_i) /$$

$$z_i = \frac{x_i - T}{S}$$

where

T is the median value in a data set;
S is the median of all absolute deviations from the sample median multiplied by 1.483, a correction factor to make the estimator consistent with the usual parameter of a normal distribution.

Individual outliers and, more rarely, laboratory means deemed to be outlying are shown in bold in the tabulated results (Appendix) and have been omitted in the determination of recommended values. The magnitude of the confidence interval is inversely proportional to the number of participating laboratories and interlaboratory agreement. It is a measure of the reliability of the recommended value, i.e. the narrower the confidence interval the greater the certainty in the recommended value.

Table 2. Recommended values and 95% confidence intervals for OREAS 98

Constituent	Recommended value	95% Confidence Interval	
		Low	High
4 Acid			
Silver, Ag (ppm)	45.1	44.1	46.1
Bismuth, Bi (ppm)	97.2	92.5	102
Cobalt, Co (ppm)	121	115	126
Copper, Cu (wt %)	14.8	14.6	15.0
Lead, Pb (ppm)	345	327	362
Sulphur, S (wt %)	~15.5	IND	IND
Antimony, Sb (ppm)	20.1	18.2	22.0
Selenium, Se (ppm)	158	146	170
Tin, Sn (ppm)	206	197	215
Zinc, Zn (ppm)	1355	1300	1409
Aqua Regia			
Silver, Ag (ppm)	42.8	40.4	45.2
Bismuth, Bi (ppm)	92.8	87.8	97.8
Cobalt, Co (ppm)	111	103	119
Copper, Cu (wt %)	14.7	14.4	15.0
Lead, Pb (ppm)	343	321	364
Antimony, Sb (ppm)	14.7	11.4	18.0
Selenium, Se (ppm)	143	128	158
Tin, Sn (ppm)	171	150	192
Zinc, Zn (ppm)	1302	1238	1367
Sulphur by LECO (wt %)	16.0	15.6	16.3

~ - approximate only; IND – indeterminate; intervals may appear asymmetric due to rounding

Statement of Homogeneity

The standard deviation of each laboratory data set includes error due to both the imprecision of the analytical method employed and to possible inhomogeneity of the material analysed. The standard deviation of the pooled individual analyses of all participating laboratories includes error due to the imprecision of each analytical method, to possible inhomogeneity of the material analysed and, in particular, to deficiencies in accuracy of each analytical method. In determining tolerance intervals the component of error attributable to measurement inaccuracy was eliminated by transformation of the individual results of each data set to a common mean (the uncorrected grand mean) according to the formula:

$$x'_{ij} = x_{ij} - \bar{x}_i + \frac{\sum_{i=1}^{p} \sum_{j=1}^{n_i} x_{ij}}{\sum_{i=1}^{p} n_i}$$

where

x_{ij} *is the jth raw result reported by laboratory i*;

x'_{ij} *is the jth transformed result reported by laboratory i*;

n_i *is the number of results reported by laboratory i*;

p *is the number of participating laboratories*;

$\bar{x}_i$ *is the raw mean for laboratory i.*

The homogeneity of each constituent was determined from tables of factors for two-sided tolerance limits for normal distributions (ISO 3207) in which

$$\text{Lower limit is } \ddot{x} - k'_2(n, p, 1-\alpha)s''_g$$
$$\text{Upper limit is } \ddot{x} + k'_2(n, p, 1-\alpha)s''_g$$

where

n *is the number of results*;

$1-\alpha$ *is the confidence level*;

p *is the proportion of results expected within the tolerance limits*;

k'_2 *is the factor for two-sided tolerance limits* (m, α *unknown*);

s''_g *is the corrected grand standard deviation.*

The meaning of these tolerance limits may be illustrated for copper by 4 acid digest, where 99% of the time at least 95% of subsamples will have concentrations lying between 14.6 and 15.0 % (see Table 3). 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 (IS0 Guide 35).

The corrected grand standard deviation, s_g'', used to compute the tolerance intervals is the weighted means of standard deviations of all data sets for a particular constituent according to the formula:

$$s''_g = \frac{\sum_{i=1}^{p}\left(s_i\left(1-\frac{s_i}{s'_g}\right)\right)}{\sum_{i=1}^{p}\left(1-\frac{s_i}{s'_g}\right)}$$

where

$1-\left(\frac{s_i}{2s'_g}\right)$ *is the weighting factor for laboratory i ;*

s'_g *is the grand standard deviation computed from the transformed (i.e. means - adjusted) results*

Table 3. Recommended values and tolerance limits for OREAS 98

Constituent	Recommended value	Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High
4 Acid			
Silver, Ag (ppm)	45.1	44.3	45.9
Bismuth, Bi (ppm)	97.2	94.6	99.9
Cobalt, Co (ppm)	121	117	124
Copper, Cu (ppm)	14.8	14.6	15.0
Lead, Pb (ppm)	345	337	352
Sulphur, S (wt %)	~15.5	IND	IND
Antimony, Sb (ppm)	20.1	19.5	20.7
Selenium, Se (ppm)	158	149	167
Tin, Sn (ppm)	206	203	209
Zinc, Zn (ppm)	1355	1315	1394
Aqua Regia			
Silver, Ag (ppm)	42.8	41.9	43.7
Bismuth, Bi (ppm)	92.8	90.0	95.6
Cobalt, Co (ppm)	111	108	114
Copper, Cu (wt %)	14.7	14.4	15.0
Lead, Pb (ppm)	343	334	351
Antimony, Sb (ppm)	14.7	14.0	15.4
Selenium, Se (ppm)	143	138	148
Tin, Sn (ppm)	171	166	176
Zinc, Zn (ppm)	1302	1267	1338
Sulphur by LECO, (wt %)	16.0	15.7	16.2

~ - approximate only; IND – indeterminate; intervals may appear asymmetric due to rounding

according to the formula:

$$s'_g = \left[\frac{\sum_{i=j}^{p} \sum_{j=i}^{n_i} (x'_{ij} - \bar{x}'_i)^2}{\sum_{i=1}^{p} n_i - 1} \right]^{1/2}$$

where $\bar{x}'_i$ is the transformed mean for laboratory i

The weighting factors were applied to compensate for the considerable variation in analytical precision amongst participating laboratories. Hence, weighting factors for each data set have been constructed so as to be inversely proportional to the standard deviation of that data set. A weighting factor of zero was applied to those data sets where $s_l / 2s_g' > 1$ (i.e. where the weighting factor $1 - s_l / 2s_g' < 0$). It should be noted that estimates of tolerance by this method are considered conservative as a significant proportion of the observed variance, even in those laboratories exhibiting the best analytical precision, can presumably be attributed to measurement error. Outliers were removed prior to the calculation of tolerance intervals and a weighting factor of zero was applied to those data sets where $s_l / 2s_g' > 1$ (i.e. where the weighting factor $1 - s_l / 2s_g' < 0$).

Performance Gates

Performance gates provide an indication of a level of performance that might reasonably be expected for a particular analyte from a laboratory being monitored by this standard in a QA/QC program. They incorporate errors attributable to measurement (analytical bias and precision) and standard variability. For an effective standard the contribution of the latter should be negligible in comparison to measurement errors. Two methods have been employed to calculate performance gates.

Table 4. Performance gates for OREAS 98

Constituent	Recommended value	Performance Gates							
		1σ		2σ		3σ		5%	
		Low	High	Low	High	Low	High	Low	High
4 Acid									
Silver, Ag (ppm)	45.1	43.4	46.7	41.8	48.4	40.2	50.0	42.8	47.3
Bismuth, Bi (ppm)	97.2	91.7	103	86.1	108	80.6	113.9	92.4	102
Cobalt, Co (ppm)	121	111	130	102	139	93	148	114	127
Copper, Cu (wt %)	14.8	14.4	15.2	13.9	15.7	13.5	16.1	14.1	15.6
Lead, Pb (ppm)	345	314	375	284	406	253	436	327	362
Sulphur, S (wt %)	~15.5	13.9	17.1	12.3	18.7	10.7	20.3	14.7	16.3
Antimony, Sb (ppm)	20.1	16.9	23.3	13.8	26.4	10.6	29.6	19.1	21.1
Selenium, Se (ppm)	158	138	178	117	199	97	219	150	166
Tin, Sn (ppm)	206	192	220	177	235	163	249	196	216
Zinc, Zn (ppm)	1355	1204	1505	1054	1656	903	1806	1287	1423
Aqua Regia									
Silver, Ag (ppm)	42.8	39.9	45.7	37.1	48.5	34.2	51.4	40.7	44.9
Bismuth, Bi (ppm)	92.8	81.2	104	69.6	116	58.0	128	88.2	97.4
Cobalt, Co (ppm)	111	97.7	124	84.5	137	71.3	151	105	116
Copper, Cu (wt %)	14.7	14.2	15.2	13.7	15.6	13.3	16.1	14.0	15.4
Lead, Pb (ppm)	343	312	373	282	404	251	435	326	360
Antimony, Sb (ppm)	14.7	9.90	19.5	5.13	24.2	0.35	29.0	14.0	15.4
Selenium, Se (ppm)	143	121	165	98.9	187	77	209	136	150
Tin, Sn (ppm)	171	139	203	107	235	75	266	162	179
Zinc, Zn (ppm)	1302	1196	1409	1089	1515	983	1622	1237	1368
Sulphur by LECO (wt %)	16.0	15.4	16.5	14.8	17.1	14.2	17.7	15.2	16.8

~ - approximate only; IND – indeterminate; intervals may appear asymmetric due to rounding

The first method uses the standard deviation of the pooled individual analyses generated from the certification program. All individual and lab dataset (batch) outliers are removed prior to determination of the standard deviation. These outliers can only be removed if they can be confidently deemed to be analytical rather than arising from inhomogeneity of the CRM. Performance gates have been calculated for one, two and three standard deviations of the accepted pool of certification data and are presented in Table 4. As a guide these intervals may be regarded as informational (1σ), warning or rejection for multiple outliers (2σ), or rejection for individual outliers (3σ) in QC monitoring although their precise application should be at the discretion of the QC manager concerned.

For the second method a ±5% error bar on the recommended value is used as the window of acceptability (refer Table 4).

Both methods should be used with caution 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.

PARTICIPATING LABORATORIES

Acme Analytical Laboratories, Vancouver, BC, Canada
Activation Laboratories, Ancaster, ON, Canada
Actlabs Pacific, Redcliffe, WA, Australia
ALS Chemex, Malaga, WA, Australia
ALS Chemex, Stafford, QLD, Australia
ALS Chemex, North Vancouver, BC, Canada
Amdel Laboratories, Thebarton, SA, Australia
Amdel Laboratories, Wangara, WA, Australia
Genalysis Laboratory Services, Maddington, WA, Australia
Intertek Testing Services, Jakarta, Indonesia
Kalgoorlie Assay Laboratories, Kalgoorlie WA, Australia
McPhar Geoservices (Phil.) Inc., Makati, Philippines
OMAC Laboratories, Loughrea, Co. Galway, Ireland
SGS, Don Mills, Ontario, Canada
SGS, Welshpool, WA, Australia
Ultra Trace Laboratories, Canning Vale, WA, Australia

PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

The siltstone reference material OREAS 98 has been prepared and certified and is supplied by:

Ore Research & Exploration Pty Ltd
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It is available in unit sizes of 10g in laminated foil packets.

INTENDED USE

OREAS 98 is a reference material intended for the following:

i) for the calibration of instruments used in the determination of the concentration of Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn;
ii) for the verification of analytical methods for Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn;
iii) for the preparation of secondary reference materials of similar composition;

STABILITY AND STORAGE INSTRUCTIONS

OREAS 98 has been prepared from a sediment-hosted sulphide-bearing copper 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.

INSTRUCTIONS FOR THE CORRECT USE OF THE REFERENCE MATERIAL

The recommended values for OREAS 98 refer to the concentration levels of Ag, Bi, Co, Cu, Pb, S, Sb, Se, Sn and Zn after removal of hygroscopic moisture by drying in air to constant mass at the reduced temperature of 65^0 C. If the reference material is not dried prior to analysis, the recommended value should be corrected to the moisture-bearing basis.

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

Dr Paul Hamlyn

CERTIFICATION DATE

February 25, 2006

REFERENCES

ISO Guide 35 (1985), Certification of reference materials - General and statistical principals.
ISO Guide 3207 (1975), Statistical interpretation of data - Determination of a statistical tolerance interval.
Kleeman, A. W. (1967), *J. Geol. Soc. Australia*,

APPENDIX

Analytical Results for OREAS 98

Table A1. Explanation of abbreviations used in Tables A2 – A22.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM[3]	percent deviation of lab mean from corrected mean of means
-	outlying values shown in bold
AF	alkali fusion
BF	borate fusion
4A	four acid (HF-HNO3 -HClO4 -HCl) digestion
AR	aqua regia digest
OES	inductively coupled plasma optical emission spectrometry
MS	inductively coupled plasma mass spectrometry
AAS	atomic absorption spectrometry
Leco	Leco infrared furnace

Table A2. Analytical results for 4 acid silver in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	45.5	45.5	43.3	52.2	48.1	44.5	44.6	46.1	43.8	53.2	NR	46.3	43.6	45.2	>10	44.0
2	45.0	45.3	43.3	56.9	47.4	45.2	42.1	45.7	43.7	53.8	NR	47.0	43.6	45.3	>10	44.0
3	44.0	47.2	43.5	54.1	47.8	47.5	42.7	46.9	**44.2**	54.1	NR	47.7	44.1	45.2	>10	44.0
4	46.5	45.9	44.2	54.2	47.3	45.9	42.1	45.8	43.6	53.5	NR	47.8	**31.8**	45.5	>10	43.0
5	44.5	46.2	**40.3**	54.7	**40.4**	44.3	43.1	46.1	43.5	52.5	NR	49.2	43.9	45.1	>10	44.0
Mean	45.1	46.0	42.9	**54.4**	46.2	45.5	42.9	46.1	43.8	**53.4**		47.6	41.4	45.3	>10	43.8
Median	45.0	45.9	43.3	54.2	47.4	45.2	42.7	46.1	43.7	53.5		47.7	43.6	45.2	>10	44.0
Std.Dev.	1.0	0.7	1.5	1.7	3.3	1.3	1.0	0.5	0.3	0.6		1.1	5.4	0.2	-	0.4
Rel.Std.Dev.	2.13%	1.62%	3.52%	3.09%	7.05%	2.84%	2.40%	1.08%	0.62%	1.17%		2.27%	13.0%	0.34%	-	1.02%
PDM[3]	0.02%	2.06%	-4.81%	20.7%	2.46%	0.87%	-4.81%	2.26%	-2.95%	18.4%		5.57%	-8.18%	0.38%	-	-2.86%

Table A3. Analytical results for 4 acid bismuth in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	99	89	92	100	95	118	92	99	108	95	NR	87	93	99	95	NR
2	96	89	92	101	97	122	90	92	106	95	NR	88	99	103	94	NR
3	96	90	92	104	89	**126**	92	92	109	97	NR	89	97	102	95	NR
4	98	**85**	93	101	92	119	91	96	106	95	NR	87	**68**	100	90	NR
5	98	88	**87**	103	99	119	91	99	107	94	NR	87	96	101	92	NR
Mean	97	88	91	101	95	**121**	91	96	107	95		88	91	101	93	
Median	98	89	92	101	95	119	91	96	107	95		87	96	101	94	
Std.Dev.	1	2	3	2	4	3	1	3	1	1		1	13	2	2	
Rel.Std.Dev.	1.23%	2.14%	2.81%	1.62%	4.03%	2.56%	1.13%	3.60%	1.22%	1.25%		0.77%	14.0%	1.57%	2.23%	
PDM[3]	0.21%	-9.43%	-6.23%	4.21%	-2.73%	24.1%	-6.37%	-1.41%	10.3%	-2.17%		-9.91%	-6.76%	3.90%	-4.17%	

Table A4. Analytical results for 4 acid cobalt in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	130	122	120	119	122	133	**119**	113	127	119	NR	120	117	115	107	130
2	127	117	120	122	120	143	113	118	125	121	NR	121	113	110	103	130
3	128	121	120	124	121	147	113	121	128	122	NR	123	113	110	102	130
4	126	118	121	123	121	140	112	125	125	119	NR	123	**82**	113	100	130
5	126	117	112	124	120	146	114	118	126	119	NR	125	110	111	100	130
Mean	127	119	119	122	121	142	114	119	126	120		122	107	112	102	130
Median	127	118	120	123	121	143	113	118	126	119		123	113	111	102	130
Std.Dev.	2	2	4	2	1	6	3	4	1	1		2	14	2	3	0
Rel.Std.Dev.	1.31%	1.89%	3.13%	1.70%	0.69%	3.97%	2.43%	3.75%	1.03%	1.12%		1.59%	13.2%	1.94%	2.90%	0.00%
PDM[3]	5.71%	-1.34%	-1.59%	1.39%	0.23%	17.7%	-5.24%	-1.21%	4.71%	-0.36%		1.56%	-11.2%	-7.24%	-15.1%	7.87%

Table A5. Analytical results for 4 acid copper in OREAS 98 (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	15.2	15.9	14.8	NR	14.1	14.9	14.8	13.5	14.9	14.9	NR	14.5	14.5	14.9	14.7	14.1
2	15.0	16.0	14.7	NR	14.2	14.8	15.3	13.3	15.1	15.1	NR	14.6	15.0	14.6	14.7	14.0
3	15.4	16.3	14.7	NR	14.3	14.9	15.0	13.5	15.4	14.4	NR	15.0	15.0	14.6	14.5	14.3
4	15.2	16.3	14.6	NR	14.2	14.7	15.9	13.3	14.9	14.7	NR	15.5	14.7	14.7	14.5	14.1
5	15.3	16.1	14.8	NR	14.1	14.8	15.8	13.6	15.5	14.8	NR	15.5	15.5	14.8	14.7	14.5
Mean	15.2	**16.1**	14.7		14.2	14.8	15.4	**13.4**	15.2	14.8		15.0	14.9	14.7	14.6	14.2
Median	15.2	16.1	14.7		14.2	14.8	15.3	13.5	15.1	14.8		15.0	15.0	14.7	14.7	14.1
Std.Dev.	0.1	0.1	0.1		0.1	0.1	0.5	0.1	0.3	0.3		0.5	0.4	0.1	0.1	0.2
Rel.Std.Dev.	0.97%	0.92%	0.44%		0.66%	0.66%	3.14%	1.00%	1.84%	1.81%		3.09%	2.53%	0.89%	0.75%	1.41%
PDM[3]	2.76%	8.89%	-0.82%		-4.46%	0.17%	3.71%	-9.25%	2.36%	-0.18%		1.55%	0.87%	-0.55%	-1.29%	-4.12%

Table A6. Analytical results for 4 acid lead in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	325	309	312	350	310	329	**315**	372	387	381	NR	370	392	348	324	342
2	322	313	311	354	307	344	304	346	385	380	NR	377	402	353	321	341
3	329	320	314	363	315	341	306	336	392	387	NR	382	387	367	331	343
4	325	300	318	355	307	318	305	359	390	377	NR	385	383	366	306	346
5	327	310	**293**	364	312	322	303	356	391	375	NR	391	395	356	312	345
Mean	326	310	310	357	310	331	307	354	389	380		381	392	358	319	343
Median	325	310	312	355	310	329	305	356	390	380		382	392	356	321	343
Std.Dev.	3	7	10	6	3	11	5	14	3	5		8	7	8	10	2
Rel.Std.Dev.	0.80%	2.33%	3.12%	1.70%	1.10%	3.42%	1.57%	3.82%	0.75%	1.21%		2.09%	1.87%	2.31%	3.10%	0.60%
PDM[3]	-5.50%	-9.92%	-10.1%	3.67%	-9.97%	-4.01%	-11.0%	2.73%	12.9%	10.3%		10.6%	13.7%	3.90%	-7.48%	-0.34%

Table A7. Analytical results for S by total methods 4 acid digest and Leco (2 labs) in OREAS 98 (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	16.8	NR	14.9	NR	>10.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	>5	NR
2	16.6	NR	14.5	NR	>10.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	>5	NR
3	17.0	NR	14.7	NR	>10.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	>5	NR
4	17.2	NR	14.0	NR	>10.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	>5	NR
5	16.9	NR	12.5	NR	>10.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	>5	NR
Mean	16.9		14.1		>10.0										>5	
Median	16.9		14.5		>10.0										>5	
Std.Dev.	0.2		1.0		-										-	
Rel.Std.Dev.	1.32%		6.79%		-										-	
PDM[3]	9.00%		-9.00%		-										-	

Table A8. Analytical results for 4 acid antimony in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	21.2	22.5	26.4	19.7	15.8	20.9	22.8	22.3	NR	19.5	NR	17.9	19.6	NR	16.3	16.0
2	**20.1**	22.6	26.5	19.7	15.7	20.2	21.5	21.2	NR	19.1	NR	16.7	20.6	NR	14.2	17.0
3	21.2	22.9	26.5	**20.3**	15.3	23.6	22.0	21.9	NR	**18.4**	NR	18.5	21.0	NR	15.3	18.0
4	21.4	22.3	26.8	19.8	15.6	22.6	22.0	23.3	NR	19.0	NR	16.4	**15.4**	NR	15.3	**9.0**
5	**22.6**	**21.7**	**24.9**	19.9	**16.5**	22.0	22.1	**18.6**	NR	19.2	NR	15.4	19.9	NR	16.8	19.0
Mean	21.3	22.4	26.2	19.9	15.8	21.9	22.1	21.5		19.0		17.0	19.3		15.6	15.8
Median	21.2	22.5	26.5	19.8	15.7	22.0	22.0	21.9		19.1		16.7	19.9		15.3	17.0
Std.Dev.	0.9	0.5	0.8	0.3	0.5	1.3	0.5	1.8		0.4		1.2	2.2		1.0	4.0
Rel.Std.Dev.	4.17%	2.04%	2.87%	1.30%	2.92%	6.17%	2.11%	8.24%		2.07%		7.25%	11.7%		6.47%	25.1%
PDM[3]	5.94%	11.3%	30.4%	-1.18%	-21.6%	8.72%	9.82%	6.80%		-5.29%		-15.5%	-4.01%		-22.5%	-21.4%

Table A9. Analytical results for 4 acid selenium in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	140	166	120	160	200	NR	150	166	138	137	NR	139	154	NR	174	200
2	130	166	170	165	190	NR	140	167	142	140	NR	137	148	NR	169	197
3	135	172	170	168	190	NR	150	170	146	141	NR	145	163	NR	169	198
4	135	171	120	163	190	NR	140	174	139	138	NR	140	**117**	NR	162	**180**
5	135	166	160	167	147	NR	140	173	143	133	NR	148	147	NR	168	196
Mean	135	168	148	164	183		144	170	142	138		142	146		168	194
Median	135	166	160	165	190		140	170	142	138		140	148		169	197
Std.Dev.	4	3	26	3	21		5	4	3	3		5	17		4	8
Rel.Std.Dev.	2.62%	1.80%	17.5%	1.87%	11.3%		3.80%	2.22%	2.27%	2.25%		3.21%	11.9%		2.54%	4.16%
PDM[3]	-14.5%	6.49%	-6.30%	4.08%	16.1%		-8.83%	7.69%	-10.4%	-12.8%		-10.2%	-7.69%		6.61%	22.9%

Table A10. Analytical results for 4 acid tin in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	210	199	202	203	137	208	201	207	214	232	NR	186	205	NR	232	192
2	207	200	204	205	136	211	190	204	215	234	NR	185	197	NR	232	191
3	203	**204**	204	213	136	206	194	203	218	236	NR	186	200	NR	234	178
4	215	199	206	208	136	218	190	208	216	228	NR	182	136	NR	**218**	174
5	206	197	**189**	210	145	**196**	196	202	216	225	NR	184	**197**	NR	**223**	194
Mean	208	200	201	208	138	208	194	205	216	231		185	187		228	186
Median	207	199	204	208	136	208	194	204	216	232		185	197		232	191
Std.Dev.	5	2	7	4	4	8	5	3	1	4		2	29		7	9
Rel.Std.Dev.	2.19%	1.12%	3.41%	1.91%	2.84%	3.92%	2.37%	1.41%	0.69%	1.85%		0.91%	15.3%		3.05%	4.91%
PDM[3]	1.05%	-2.99%	-2.44%	0.86%	-33.2%	0.86%	-5.74%	-0.59%	4.74%	12.1%		-10.4%	-9.24%		10.6%	-9.82%

Table A11. Analytical results for 4 acid zinc in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	1410	1453	1400	NR	**1305**	1500	1250	1270	1360	1452	NR	1360	1580	1352	1280	1310
2	1390	1447	1450	NR	1280	1500	1180	1230	1340	1454	NR	1370	1940	1348	1270	1290
3	1410	1466	1380	NR	1280	1500	1200	1250	1350	1427	NR	1410	1800	1362	1270	1300
4	1390	1472	1400	NR	1285	1500	1180	1230	1360	1433	NR	1420	1150	1360	**1210**	1280
5	1400	1462	1400	NR	1295	1500	1180	1270	1380	1434	NR	1440	2020	1353	1240	1300
Mean	1400	1460	1406		1289	1500	1198	1250	1358	1440		1400	**1698**	1355	1254	1296
Median	1400	1462	1400		1285	1500	1180	1250	1360	1434		1410	1800	1353	1270	1300
Std.Dev.	10	10	26		11	0	30	20	15	12		34	349	6	29	11
Rel.Std.Dev.	0.71%	0.69%	1.85%		0.84%	0.00%	2.53%	1.60%	1.09%	0.85%		2.42%	20.5%	0.43%	2.30%	0.88%
PDM[3]	3.33%	7.76%	3.78%		-4.86%	10.7%	-11.6%	-7.74%	0.23%	6.28%		3.33%	25.3%	0.01%	-7.44%	-4.34%

Table A12. Analytical results for aqua regia silver in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	43.0	44.5	NR	>25	25.0	50.2	36.0	44.7	43.6	46.3	NR	43.4	21.9	43.2	>10	NR
2	42.6	45.3	NR	>25	25.3	50.7	36.2	43.0	43.8	47.0	NR	44.6	21.4	42.6	>10	NR
3	42.5	43.5	NR	>25	24.5	**34.7**	36.0	41.5	43.3	44.8	NR	45.2	21.7	42.6	>10	NR
4	41.8	44.5	NR	>25	24.7	51.0	36.4	40.5	43.6	45.8	NR	45.1	21.6	42.5	>10	NR
5	42.5	43.3	NR	>25	25.7	50.0	36.4	43.9	43.1	45.4	NR	45.3	21.5	42.6	>10	NR
Mean	42.5	44.2		>25	**25.0**	**47.3**	36.2	42.7	43.5	45.9		44.7	**21.6**	42.7	>10	
Median	42.5	44.5		>25	25.0	50.2	36.2	43.0	43.6	45.8		45.1	21.6	42.6	>10	
Std.Dev.	0.4	0.8		-	0.5	7.1	0.2	1.7	0.3	0.8		0.8	0.2	0.3	-	
Rel.Std.Dev.	1.02%	1.87%		-	1.91%	14.9%	0.55%	4.04%	0.64%	1.84%		1.76%	0.89%	0.66%	-	
PDM[3]	-0.75%	3.33%		-	-41.5%	10.6%	-15.4%	-0.19%	1.59%	7.20%		4.48%	-49.5%	-0.24%	-	

Table A13. Analytical results for aqua regia bismuth in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	95	92	NR	96	96	102	73	97	90	97	NR	89	119	98	114	NR
2	96	92	NR	101	99	101	75	95	90	97	NR	90	121	98	121	NR
3	98	90	NR	103	95	103	75	92	91	93	NR	90	123	98	113	NR
4	96	93	NR	101	98	101	76	87	90	94	NR	92	127	96	111	NR
5	99	94	NR	99	94	103	76	100	90	94	NR	92	125	99	113	NR
Mean	97	92		100	96	102	**75**	94	90	95		91	**123**	98	**114**	
Median	96	92		101	96	102	75	95	90	94		90	123	98	113	
Std.Dev.	2	1		2	2	1	1	5	0	2		1	3	1	4	
Rel.Std.Dev.	1.87%	1.35%		2.47%	1.94%	1.08%	1.37%	5.44%	0.49%	1.94%		1.62%	2.57%	1.12%	3.36%	
PDM[3]	4.55%	-0.50%		7.78%	3.68%	9.85%	-19.1%	1.39%	-3.01%	2.32%		-2.46%	32.5%	5.39%	23.3%	

Table A14. Analytical results for aqua regia cobalt in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	122	120	NR	91	63	124	111	126	110	132	NR	96	101	108	107	NR
2	126	113	NR	90	64	115	112	131	105	132	NR	96	**113**	108	107	NR
3	127	114	NR	85	62	120	113	126	110	128	NR	95	101	106	104	NR
4	121	115	NR	84	61	121	115	125	105	130	NR	94	102	109	104	NR
5	126	115	NR	82	64	117	114	**141**	105	129	NR	93	**109**	107	106	NR
Mean	124	115		86	**63**	120	113	129	107	130		94	105	108	106	
Median	126	115		85	63	120	113	126	105	130		95	102	108	106	
Std.Dev.	3	3		4	1	3	2	7	3	2		1	5	1	2	
Rel.Std.Dev.	2.17%	2.22%		4.35%	2.00%	2.89%	1.40%	5.13%	2.56%	1.52%		1.28%	5.22%	1.06%	1.44%	
PDM[3]	12.1%	3.92%		-22.2%	-43.5%	7.72%	1.86%	16.7%	-3.55%	17.3%		-14.9%	-5.17%	-3.01%	-4.81%	

Table A15. Analytical results for aqua regia copper in OREAS 98 (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	14.3	16.7	14.7	14.1	>1	14.9	14.1	14.4	15.1	14.8	NR	14.6	15.1	14.4	NR	NR
2	14.9	16.5	14.3	14.0	>1	15.0	15.2	14.9	15.3	14.7	NR	14.7	15.3	14.3	NR	NR
3	15.1	16.3	14.5	14.4	>1	15.0	14.7	14.3	15.5	14.6	NR	14.7	15.1	14.3	NR	NR
4	14.5	**15.7**	14.4	14.3	>1	15.2	14.5	13.4	15.6	14.7	NR	14.4	15.3	14.4	NR	NR
5	15.2	16.5	14.5	14.0	>1	15.2	14.7	13.7	15.4	14.7	NR	14.8	15.5	14.4	NR	NR
Mean	14.8	**16.3**	14.5	14.1	>1	15.1	14.6	14.1	15.4	14.7		14.6	15.2	14.4		
Median	14.9	16.5	14.5	14.1	>1	15.0	14.7	14.3	15.4	14.7		14.7	15.3	14.4		
Std.Dev.	0.4	0.4	0.1	0.2	-	0.1	0.4	0.6	0.2	0.1		0.1	0.2	0.0		
Rel.Std.Dev.	2.62%	2.35%	0.90%	1.29%	-	0.99%	2.72%	4.09%	1.25%	0.47%		0.85%	1.23%	0.20%		
PDM[3]	0.77%	11.1%	-1.55%	-3.79%	-	2.55%	-0.32%	-3.72%	4.72%	0.11%		-0.29%	3.75%	-2.22%		

Table A16. Analytical results for aqua regia lead in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	293	362	NR	>250	320	322	235	402	335	369	NR	312	381	347	328	NR
2	302	354	NR	>250	313	316	240	392	340	371	NR	309	388	358	330	NR
3	307	339	NR	>250	327	321	241	389	345	354	NR	**305**	393	365	321	NR
4	299	348	NR	>250	307	316	243	**347**	330	359	NR	310	403	360	318	NR
5	310	358	NR	>250	317	319	243	395	345	358	NR	310	399	355	327	NR
Mean	302	352		>250	317	319	**240**	385	339	362		309	393	357	325	
Median	302	354		>250	317	319	241	392	340	359		310	393	358	327	
Std.Dev.	7	9		-	7	3	3	22	7	7		3	9	7	5	
Rel.Std.Dev.	2.21%	2.56%		-	2.37%	0.87%	1.37%	5.66%	1.92%	2.04%		0.84%	2.22%	1.87%	1.56%	
PDM[3]	-11.8%	2.74%		-	-7.58%	-6.98%	-29.9%	12.4%	-1.11%	5.65%		-9.80%	14.59%	4.14%	-5.25%	

Table A17. Analytical results for aqua regia sulphur in OREAS 98 (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	NR	NR	NR	NR	2.56	NR	NR	NR	NR	16.1	NR	NR	NR	NR	>5	NR
2	NR	NR	NR	NR	2.68	NR	NR	NR	NR	16.2	NR	NR	NR	NR	>5	NR
3	NR	NR	NR	NR	2.52	NR	NR	NR	NR	15.7	NR	NR	NR	NR	>5	NR
4	NR	NR	NR	NR	2.47	NR	NR	NR	NR	16.0	NR	NR	NR	NR	>5	NR
5	NR	NR	NR	NR	2.57	NR	NR	NR	NR	15.9	NR	NR	NR	NR	>5	NR
Mean					**2.56**					16.0					>5	
Median					2.56					16.0					>5	
Std.Dev.					0.08					0.17					-	
Rel.Std.Dev.					3.04%					1.07%					-	
PDM[3]					-84.0%					0.00%					-	

Table A18. Analytical results for aqua regia antimony in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	13.0	14.3	NR	20.1	7.5	21.0	16.9	21.7	NR	19.3	NR	11.1	6.8	NR	11.3	NR
2	14.6	13.7	NR	19.4	8.0	19.9	17.2	21.1	NR	19.4	NR	11.3	6.8	NR	**8.6**	NR
3	14.8	13.5	NR	18.4	7.9	20.5	17.4	20.3	NR	18.3	NR	11.4	6.9	NR	12.1	NR
4	14.7	14.2	NR	17.7	7.9	20.8	16.9	19.2	NR	18.6	NR	11.5	6.7	NR	11.5	NR
5	13.5	14.0	NR	17.3	8.4	20.9	17.1	20.7	NR	18.5	NR	11.5	6.9	NR	11.7	NR
Mean	14.1	14.0		18.6	7.9	20.6	17.1	20.6		18.8		11.4	6.8		11.0	
Median	14.6	14.0		18.4	7.9	20.8	17.1	20.7		18.6		11.4	6.8		11.5	
Std.Dev.	0.8	0.3		1.2	0.3	0.4	0.2	1.0		0.5		0.2	0.1		1.4	
Rel.Std.Dev.	5.78%	2.39%		6.23%	4.04%	2.15%	1.24%	4.65%		2.75%		1.47%	1.23%		12.7%	
PDM[3]	-3.84%	-4.93%		26.5%	-46.0%	40.4%	16.4%	40.2%		28.1%		-22.6%	-53.6%		-24.8%	

Table A19. Analytical results for aqua regia selenium in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	**110**	**172**	NR	125	77	191	116	152	142	151	NR	141	130	NR	164	NR
2	122	150	NR	119	81	177	116	153	137	**154**	NR	145	127	NR	173	NR
3	124	151	NR	111	77	193	120	161	141	149	NR	144	128	NR	166	NR
4	122	148	NR	108	78	182	120	142	140	150	NR	145	128	NR	168	NR
5	125	156	NR	103	**83**	183	116	164	138	150	NR	143	**137**	NR	171	NR
Mean	121	155		113	**79**	185	118	154	140	151		144	130		168	
Median	122	151		111	78	183	116	153	140	150		144	128		168	
Std.Dev.	6	10		9	3	7	2	9	2	2		2	4		4	
Rel.Std.Dev.	5.03%	6.27%		7.80%	3.28%	3.59%	1.86%	5.56%	1.49%	1.32%		1.17%	3.12%		2.17%	
PDM[3]	-15.7%	8.59%		-21.2%	-44.8%	29.4%	-17.8%	7.92%	-2.45%	5.28%		0.35%	-9.16%		17.7%	

Table A20. Analytical results for aqua regia tin in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	172	186	NR	218	98	206	156	152	185	207	NR	161	127	NR	166	NR
2	183	192	NR	215	100	202	157	155	195	**210**	NR	166	133	NR	167	NR
3	183	183	NR	215	98	193	157	151	190	201	NR	169	132	NR	170	NR
4	180	190	NR	208	98	205	158	141	185	202	NR	172	129	NR	166	NR
5	188	188	NR	**203**	102	200	158	**166**	190	203	NR	170	130	NR	169	NR
Mean	181	188		212	99	201	157	153	189	205		168	130		168	
Median	183	188		215	98	202	157	152	190	203		169	130		167	
Std.Dev.	6	3		6	2	5	1	9	4	4		4	2		2	
Rel.Std.Dev.	3.25%	1.85%		2.90%	1.72%	2.57%	0.53%	5.75%	2.21%	1.87%		2.55%	1.83%		1.08%	
PDM[3]	6.19%	9.94%		24.1%	-41.8%	17.9%	-7.88%	-10.5%	10.8%	19.9%		-1.78%	-23.7%		-1.78%	

Table A21. Analytical results for aqua regia zinc in OREAS 98 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	1240	1284	1300	1300	1135	1500	1110	1257	1370	1444	NR	1370	1650	1318	1270	NR
2	1300	1285	1300	1300	1125	1500	1110	1225	1350	1448	NR	1380	1550	1328	1330	NR
3	1270	1260	1400	1300	1125	1500	1120	1243	1340	1432	NR	1380	1450	1315	1300	NR
4	1260	1257	1400	1300	1095	1500	1140	1196	1360	1423	NR	1350	1550	1310	1270	NR
5	1310	1257	1400	1200	1140	1500	1140	1228	1340	1420	NR	1380	1500	1329	1290	NR
Mean	1276	1269	1360	1280	1124	1500	1124	1230	1352	1433		1372	**1540**	1320	1292	
Median	1270	1260	1400	1300	1125	1500	1120	1228	1350	1432		1380	1550	1318	1290	
Std.Dev.	29	15	55	45	17	0	15	23	13	12		13	74	8	25	
Rel.Std.Dev.	2.26%	1.15%	4.03%	3.49%	1.55%	0.00%	1.35%	1.84%	0.96%	0.86%		0.95%	4.82%	0.63%	1.93%	
PDM[3]	-2.03%	-2.60%	4.42%	-1.72%	-13.7%	15.2%	-13.7%	-5.58%	3.80%	10.1%		5.34%	18.2%	1.35%	-0.80%	

Table A22. Analytical results for sulphur by LECO in OREAS 98 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab M	Lab N	Lab O	Lab P
1	NR	16.9	16.0	15.2	15.9	16.2	16.1	14.3	NR	NR	NR	16.0	15.4	NR	14.4	16.6
2	NR	16.9	16.0	15.4	15.7	16.3	15.5	15.4	NR	NR	NR	16.2	15.9	NR	14.5	16.4
3	NR	17.0	15.4	15.1	15.7	16.5	15.6	15.0	NR	NR	NR	16.3	16.0	NR	14.9	16.4
4	NR	16.9	16.0	15.4	15.8	15.9	15.4	16.0	NR	NR	NR	16.3	16.4	NR	15.1	16.4
5	NR	16.9	16.5	15.0	15.7	16.0	16.0	15.9	NR	NR	NR	16.3	16.1	NR	14.9	16.5
Mean		16.9	15.9	15.2	15.8	16.2	15.7	15.3				16.2	15.9		**14.8**	16.5
Median		16.9	16.0	15.2	15.7	16.2	15.6	15.4				16.3	16.0		14.9	16.4
Std.Dev.		0.0	0.4	0.2	0.1	0.2	0.3	0.7				0.1	0.4		0.3	0.1
Rel.Std.Dev.		0.26%	2.45%	1.08%	0.45%	1.49%	1.98%	4.56%				0.80%	2.35%		2.01%	0.54%
PDM[3]		6.00%	-0.14%	-4.90%	-1.33%	1.32%	-1.51%	-4.02%				1.67%	-0.21%		-7.53%	3.12%