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CERTIFICATE OF ANALYSIS FOR

NICKEL SULPHIDE ORE REFERENCE MATERIAL OREAS 73a

SUMMARY STATISTICS

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High	Low	High
Lead fire assay					
Gold, Au (ppb)	14	12	15	11	17
Palladium, Pd (ppb)	78	75	81	74	82
Platinum, Pt (ppb)	64	60	68	62	67
4 Acid digest					
Aluminium oxide, Al_2O_3 (wt.%)	2.42	2.36	2.47	2.37	2.47
Arsenic, As (ppm)	24.8	20.9	28.6	22.2	27.3
Chromium, Cr (ppm)	1668	1494	1843	1582	1755
Cobalt, Co (ppm)	286	282	291	279	293
Copper, Cu (ppm)	877	864	890	864	890
Iron, Fe (wt.%)	9.20	9.03	9.38	9.12	9.28
Magnesium oxide, MgO (wt.%)	32.6	31.7	33.6	32.0	33.3
Nickel, Ni (wt.%)	1.41	1.40	1.42	1.39	1.43
Sulphur, S (wt.%)	3.31	3.13	3.50	3.25	3.38
Fusion					
Aluminium oxide, Al_2O_3 (wt.%)	2.38	2.32	2.44	2.34	2.42
Arsenic, As (ppm)	26.3	19.7	32.9	20.6	32.0
Chromium, Cr (ppm)	1987	1948	2026	1944	2029
Cobalt, Co (ppm)	302	292	313	288	317
Copper, Cu (ppm)	915	861	970	885	945
Iron, Fe (wt.%)	9.24	9.18	9.30	9.16	9.32
Magnesium oxide, MgO (wt.%)	32.5	32.0	33.0	32.2	32.8
Nickel, Ni (wt.%)	1.44	1.39	1.48	1.40	1.48
Silicon dioxide, SiO_2 (wt.%)	36.4	35.8	36.9	36.0	36.7
Sulphur, S (wt.%)	3.02	2.91	3.13	2.95	3.10
IR Combustion					
Sulphur, S (wt.%)	3.16	3.09	3.24	3.11	3.22

*IND = Indeterminate; values may appear asymmetric due to rounding

Prepared by:
Ore Research & Exploration Pty Ltd
November 2006

REPORT 05/562B

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 73a is one of a suite of six nickel sulphide CRMs (OREAS 72a to OREAS 77a) prepared from high grade massive nickel sulphide ore and barren ultramafic material from the Cosmos Nickel mine located in the Kathleen Valley area approximately 30km north of Leinster in Western Australia. Cosmos is situated within the Agnew-Wiluna portion of the Norseman-Wiluna greenstone belt. This portion of the belt is strongly attenuated and characterised by large scale faults, complex folding and typically steep dips. It is a typical Kambalda-style, komatiite associated, massive sulphide deposit representing an essentially in-situ accumulation of primary magmatic Ni-Fe sulphides with minor by-products including Cu, Co and platinum group elements (PGE's). The Cosmos deposit comprises one discrete zone of massive and semi-massive sulphides extending over a strike length of 240m. Mineralisation is strata bound between the ovelying ultramafic unit and the underlying dolerite and felsic volcanic rocks. Continuity of grade and width of mineralisation are strong both along strike and down dip.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 73a was prepared in the following manner:

a) drying to constant mass at 65°C (Ni ore) and 105°C (barren ultramafic);
b) crushing;
c) milling of the nickel ore to 100% minus 25 microns;
d) milling of the barren ultramafic to 98% minus 75 microns;
e) combining in appropriate proportions to achieve the desired grade;
f) homogenisation;
g) packaging in 10g units sealed under nitrogen, in laminated foil pouches.

ANALYTICAL PROGRAM FOR OREAS 73a

Fifteen commercial laboratories participated in the analytical program to certify Au, Pt, Pd, Al_2O_3, As, Cr, Co, Cu, Fe, MgO, Ni, SiO_2 and S 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 – A24). 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.

Table 1. Approximate major and trace element composition of nickel sulphide reference material OREAS 73a; wt.% - weight percent; ppm - parts per million.

Constituent	wt.%	Constituent	ppm	Constituent	ppm	Constituent	ppm
TiO_2	0.13	Ag	<1	Ho	0.11	Sm	0.55
MnO	0.13	Ba	17	In	0.06	Sn	1
CaO	2.10	Be	0.55	La	2.9	Sr	17
K_2O	0.12	Bi	1.1	Li	10.8	Ta	<1
P_2O_5	0.03	Cd	<1	Lu	0.06	Tb	0.1
Na_2O	0.14	Ce	5.6	Mo	<1	Te	0.2
C	0.21	Cs	1.9	Nb	1	Th	1.1
		Dy	0.48	Nd	1.5	U	0.35
		Er	0.38	Pb	5	W	4.5
		Eu	0.13	Pr	0.43	Y	3.2
		Ga	1.8	Rb	8.8	Yb	0.38
		Gd	0.5	Sb	0.8	Zn	78
		Hf	<1	Sc	8	Zr	8

The intent of the certification program was to characterise the analytes by a) fire assay ICP-MS, b) total acid digest methods (mainly HF-HCl-HNO_3-$HClO_4$) with ICP-OES, ICP-MS and AAS finish, and b) sodium peroxide or lithium borate fusion with ICP-OES, ICP-MS, AAS or XRF finish. S was also analysed by Leco IR combustion furnace. 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 110g 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 73a

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 distributions 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

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

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

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 73a

Constituent	Recommended value	95% Confidence Interval	
		Low	High
Lead fire assay			
Gold, Au (ppb)	14	12	15
Palladium, Pd (ppb)	78	75	81
Platinum, Pt (ppb)	64	60	68
4 Acid digest			
Aluminium oxide, Al_2O_3 (wt.%)	2.42	2.36	2.47
Arsenic, As (ppm)	24.8	20.9	28.6
Chromium, Cr (ppm)	1668	1494	1843
Cobalt, Co (ppm)	286	282	291
Copper, Cu (ppm)	877	864	890
Iron, Fe (wt.%)	9.20	9.03	9.38
Magnesium oxide, MgO (wt.%)	32.6	31.7	33.6
Nickel, Ni (wt.%)	1.41	1.40	1.42
Sulphur, S (wt.%)	3.31	3.13	3.50
Fusion			
Aluminium oxide, Al_2O_3 (wt.%)	2.38	2.32	2.44
Arsenic, As (ppm)	26.3	19.7	32.9
Chromium, Cr (ppm)	1987	1948	2026
Cobalt, Co (ppm)	302	292	313
Copper, Cu (ppm)	915	861	970
Iron, Fe (wt.%)	9.24	9.18	9.30
Magnesium oxide, MgO (wt.%)	32.5	32.0	33.0
Nickel, Ni (wt.%)	1.44	1.39	1.48
Silicon dioxide, SiO_2 (wt.%)	36.4	35.8	36.9
Sulphur, S (wt.%)	3.02	2.91	3.13
IR Combustion			
Sulphur, S (wt.%)	3.16	3.09	3.24

*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* j*th raw result reported by laboratory* i;

x'_{ij} *is the* j*th 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

$$Lower\ limit\ is\ \ddot{x} - k_2'(n,p,1-\alpha)s_g''$$
$$Upper\ limit\ is\ \ddot{x} + k_2'(n,p,1-\alpha)s_g''$$

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 nickel by 4 acid digest, where 99% of the time at least 95% of subsamples will have concentrations lying between 1.39 and 1.43 percent (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*

according to the formula:

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

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 $1- s_l / 2s_g' < 0$).

Table 3. Recommended values and tolerance limits for OREAS 73a

Constituent	Recommended value	Tolerance limits 1-α =0.99, ρ =0.95	
		Low	High
Lead fire assay			
Gold, Au (ppb)	14	11	17
Palladium, Pd (ppb)	78	74	82
Platinum, Pt (ppb)	64	62	67
4 Acid digest			
Aluminium oxide, Al_2O_3 (wt.%)	2.42	2.37	2.47
Arsenic, As (ppm)	24.8	22.2	27.3
Chromium, Cr (ppm)	1668	1582	1755
Cobalt, Co (ppm)	286	279	293
Copper, Cu (ppm)	877	864	890
Iron, Fe (wt.%)	9.20	9.12	9.28
Magnesium oxide, MgO (wt.%)	32.6	32.0	33.3
Nickel, Ni (wt.%)	1.41	1.39	1.43
Sulphur, S (wt.%)	3.31	3.25	3.38
Fusion			
Aluminium oxide, Al_2O_3 (wt.%)	2.38	2.34	2.42
Arsenic, As (ppm)	26.3	20.6	32.0
Chromium, Cr (ppm)	1987	1944	2029
Cobalt, Co (ppm)	302	288	317
Copper, Cu (ppm)	915	885	945
Iron, Fe (wt.%)	9.24	9.16	9.32
Magnesium oxide, MgO (wt.%)	32.5	32.2	32.8
Nickel, Ni (wt.%)	1.44	1.40	1.48
Silicon dioxide, SiO_2 (wt.%)	36.4	36.0	36.7
Sulphur, S (wt.%)	3.02	2.95	3.10
IR Combustion			
Sulphur, S (wt.%)	3.16	3.11	3.22

*IND - indeterminate; values may appear asymmetric due to rounding

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.

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 (SDs) of the accepted pool of certification data and are presented in Table 4. As a guide these intervals may be regarded as informational (1SD), warning or rejection for multiple outliers (2SD), or rejection for individual outliers (3SD) 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.

Table 4. Proposed performance gates for OREAS 73a

Constituent	Recommended value	Performance Gates							
		1SD		2SD		3SD		5%	
		Low	High	Low	High	Low	High	Low	High
Lead fire assay									
Gold, Au (ppb)	14	11	16	9	19	6	21	13	14
Palladium, Pd (ppb)	78	73	83	68	88	63	92	74	82
Platinum, Pt (ppb)	64	58	71	51	78	44	85	61	68
4 Acid digest									
Aluminium oxide, Al_2O_3 (wt.%)	2.42	2.33	2.50	2.25	2.58	2.17	2.67	2.30	2.54
Arsenic, As (ppm)	24.8	18.9	30.6	13.1	36.4	7.3	42.2	23.5	26.0
Chromium, Cr (ppm)	1668	1422	1915	1176	2161	929	2408	1585	1752
Cobalt, Co (ppm)	286	277	295	268	304	259	313	272	301
Copper, Cu (ppm)	877	852	902	828	926	803	951	833	921
Iron, Fe (wt.%)	9.20	8.92	9.49	8.63	9.78	8.34	10.1	8.74	9.66
Magnesium oxide, MgO (wt.%)	32.6	31.2	34.0	29.8	35.4	28.5	36.8	31.0	34.3
Nickel, Ni (wt.%)	1.41	1.39	1.43	1.36	1.46	1.34	1.48	1.34	1.48
Sulphur, S (wt.%)	3.31	3.07	3.55	2.83	3.79	2.59	4.04	3.15	3.48
Fusion									
Aluminium oxide, Al_2O_3 (wt.%)	2.38	2.29	2.48	2.19	2.57	2.09	2.67	2.26	2.50
Arsenic, As (ppm)	26.3	17.3	35.3	8.3	44.3	IND	53.2	25.0	27.6
Chromium, Cr (ppm)	1987	1911	2062	1835	2138	1760	2214	1887	2086
Cobalt, Co (ppm)	302	285	319	268	336	251	353	287	317
Copper, Cu (ppm)	915	834	996	753	1077	672	1158	870	961
Iron, Fe (wt.%)	9.24	9.09	9.39	8.94	9.54	8.79	9.69	8.78	9.70
Magnesium oxide, MgO (wt.%)	32.5	31.6	33.4	30.6	34.4	29.7	35.3	30.9	34.1
Nickel, Ni (wt.%)	1.44	1.38	1.50	1.32	1.56	1.26	1.62	1.37	1.51
Silicon dioxide, SiO_2 (wt.%)	36.4	35.5	37.3	34.6	38.1	33.7	39.0	34.6	38.2
Sulphur, S (wt.%)	3.02	2.95	3.10	2.88	3.17	2.81	3.24	2.87	3.18
IR Combustion									
Sulphur, S (wt.%)	3.16	3.03	3.30	2.89	3.43	2.76	3.57	3.00	3.32

*IND - indeterminate; values may appear asymmetric due to rounding

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
SGS, Welshpool, WA, Australia
SGS Geosol, Brazil, Sth America
Ultra Trace Laboratories, Canning Vale, WA, Australia

PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

The nickel sulphide ore reference material OREAS 73a has been prepared and certified and is supplied by:

Ore Research & Exploration Pty Ltd
37A Hosie Street
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AUSTRALIA

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Email	info @ore.com.au	Web	www.ore.com.au

It is available in unit sizes of 10g in laminated foil packets.

INTENDED USE

OREAS 73a is a reference material intended for the following:

i) for the calibration of instruments used in the determination of the concentration of Ni, Au, Pt, Pd, Fe, Cu, Cr, Co, MgO, Al_2O_3, As, SiO_2 and S;
ii) for the verification of analytical methods for Ni, Au, Pt, Pd, Fe, Cu, Cr, Co, MgO, Al_2O_3, As, SiO_2 and S;
iii) for the preparation of secondary reference materials of similar composition;

STABILITY AND STORAGE INSTRUCTIONS

OREAS 73a has been prepared from high grade nickel sulphide ore and barren ultramafic. Because of its low sulphide content and packaging under nitrogen in robust foil laminate 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 73a refer to the concentration levels of Ni, Au, Pt, Pd, Fe, Cu, Cr, Co, MgO, Al_2O_3, As, SiO_2 and S after removal of hygroscopic moisture (~0.60 wt.%) by drying in air to constant mass at 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

November 22, 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 73a

Table A1. Explanation of abbreviations used in Tables A2 – A24.

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
4A	four acid (HF-HNO3 -HClO4 -HCl) digestion
AAS	atomic absorption spectrometry
OES	inductively coupled plasma optical emission spectrometry
MS	inductively coupled plasma mass spectrometry
PPP	inductively coupled plasma optical emission spectrometry
XRF	x-ray fluorescence
BF	lithium metaborate fusion
PF	sodium peroxide fusion
LECO	Leco infrared furnace
HG	Hydride generation

Table A2. Analytical results for gold in OREAS 73a (abbreviations as in Table A1; values in ppb).

Replicate No.	Lab A FA*MS	Lab B FA*MS	Lab C FA*MS	Lab D -	Lab E FA*MS	Lab F FA*MS	Lab G FA*MS	Lab H FA*MS	Lab I -	Lab J FA*MS	Lab K FA*MS	Lab L FA*OES	Lab M FA*MS	Lab N FA*MS	Lab O FA*MS
1	17	15	15	NR	14	9	16	13	NR	37	14	19	**30**	11	11
2	16	11	12	NR	18	9	14	11	NR	49	13	15	16	12	13
3	16	16	12	NR	17	12	13	13	NR	43	14	12	22	11	15
4	15	14	13	NR	15	9	13	11	NR	40	11	21	25	12	18
5	15	14	13	NR	14	11	14	14	NR	32	**7**	18	18	11	17
Mean	16	14	13		16	10	14	12		**40**	12	17	**22**	11	15
Median	16	14	13		15	9	14	13		40	13	18	22	11	15
Std.Dev.	1	2	1		2	1	1	1		6	3	3	6	1	3
Rel.Std.Dev.	5.30%	13.4%	9.42%		11.6%	14.1%	8.75%	10.8%		15.9%	25.0%	19.6%	25.2%	4.80%	19.3%
PDM[3]	15.3%	2.12%	-5.17%		13.8%	-27.1%	2.12%	-9.55%		193%	-13.9%	22.5%	61.9%	-16.8%	7.96%

Table A3. Analytical results for palladium in OREAS 73a (abbreviations as in Table A1; values in ppb).

Replicate No.	Lab A FA*MS	Lab B FA*MS	Lab C FA*MS	Lab D -	Lab E FA*MS	Lab F FA*MS	Lab G FA*MS	Lab H FA*MS	Lab I -	Lab J FA*MS	Lab K FA*MS	Lab L FA*OES	Lab M FA*MS	Lab N FA*MS	Lab O FA*MS
1	77	76	78	NR	81	70.3	78.9	**76**	NR	**78**	64	78	82	73	78
2	79	80	80	NR	80	69.8	80.1	71	NR	88	57	75	84	74	80
3	73	79	84	NR	77	72.3	78.3	72	NR	90	46	76	81	72	80
4	71	75	80	NR	86	75.3	79.9	71	NR	88	49	76	79	73	77
5	76	74	76	NR	87	72.5	78.9	73	NR	85	33	75	84	74	73
Mean	75	77	80		82	72	79	73		86	**50**	76	82	73	78
Median	76	76	80		81	72	79	72		88	49	76	82	73	78
Std.Dev.	3	3	3		4	2	1	2		5	12	1	2	1	3
Rel.Std.Dev.	4.17%	3.37%	3.73%		5.12%	3.02%	0.95%	2.86%		5.49%	23.6%	1.74%	2.59%	1.14%	3.71%
PDM[3]	-3.45%	-1.26%	2.34%		5.68%	-7.38%	1.85%	-6.66%		10.3%	-36.0%	-2.14%	5.42%	-5.89%	-0.23%

Table A4. Analytical results for platinum in OREAS 73a (abbreviations as in Table A1; values in ppb).

Replicate No.	Lab A FA*MS	Lab B FA*MS	Lab C FA*MS	Lab D -	Lab E FA*MS	Lab F FA*MS	Lab G FA*MS	Lab H FA*MS	Lab I -	Lab J FA*MS	Lab K FA*MS	Lab L FA*OES	Lab M FA*MS	Lab N FA*MS	Lab O FA*MS
1	70	67	67	NR	69	61	61	**67**	NR	NR	**73**	68	72	73	53
2	70	73	64	NR	69	59	62	62	NR	NR	58	66	71	74	53
3	68	72	**69**	NR	66	**39**	61	63	NR	59	50	64	**76**	74	56
4	72	69	65	NR	71	66	**59**	62	NR	60	53	61	71	78	53
5	72	69	64	NR	71	63	60	62	NR	**42**	**40**	63	72	78	50
Mean	70	70	66		69	58	61	63		54	55	64	72	75	53
Median	70	69	65		69	61	61	62		59	53	64	72	74	53
Std.Dev.	2	2	2		2	11	1	2		10	12	3	2	2	2
Rel.Std.Dev.	2.44%	3.50%	3.28%		3.24%	18.5%	1.99%	3.43%		18.8%	22.1%	4.05%	2.86%	3.19%	4.00%
PDM[3]	9.17%	8.70%	1.84%		7.00%	-10.4%	-6.02%	-1.86%		-16.7%	-14.9%	0.04%	12.4%	17.1%	-17.7%

Table A5. Analytical results for 4 acid aluminium oxide in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J -	Lab K -	Lab L -	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	2.48	2.34	2.27	2.42	2.49	2.17	2.36	1.06	2.33	NR	NR	NR	**2.51**	2.61	2.49
2	2.38	2.38	2.27	2.46	2.43	2.17	2.40	1.06	2.32	NR	NR	NR	2.44	2.57	2.49
3	2.44	2.34	2.27	2.49	2.43	2.21	2.44	1.11	2.34	NR	NR	NR	2.46	2.57	2.46
4	2.38	2.32	2.34	2.46	2.46	2.23	2.36	1.10	2.41	NR	NR	NR	2.44	2.55	2.51
5	2.38	2.34	2.27	2.38	2.46	2.19	2.39	1.04	2.36	NR	NR	NR	2.44	2.54	2.48
Mean	2.41	2.34	2.28	2.44	2.45	**2.20**	2.39	**1.07**	2.35				2.46	2.57	2.49
Median	2.38	2.34	2.27	2.46	2.46	2.19	2.39	1.06	2.34				2.44	2.57	2.49
Std.Dev.	0.04	0.02	0.03	0.04	0.03	0.02	0.03	0.03	0.04				0.03	0.03	0.02
Rel.Std.Dev.	1.83%	0.88%	1.48%	1.75%	1.02%	1.12%	1.39%	2.76%	1.52%				1.33%	1.04%	0.87%
PDM[3]	-0.26%	-3.03%	-5.57%	1.02%	1.52%	-9.17%	-1.13%	-55.6%	-2.70%				1.62%	6.24%	2.87%

Table A6. Analytical results for 4 acid arsenic in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J HG*AAS	Lab K -	Lab L -	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	40	23	60	20	20	<200	27	28.2	25	22	NR	NR	<50	29	29
2	35	22	70	20	10	<200	27	26.7	25	20	NR	NR	<50	31	28
3	25	21	60	10	20	<200	27	25.7	25	22	NR	NR	<50	31	29
4	30	22	50	10	20	<200	26	27.8	30	21	NR	NR	<50	30	24
5	35	22	**<50**	20	20	<200	27	27.1	25	22	NR	NR	<50	30	25
Mean	33	22	**60**	16	18	<200	27	27	26	21			<50	30	27
Median	35	22	60	20	20	<200	27	27	25	22			<50	30	28
Std.Dev.	6	1	8	5	4	-	0	1	2	1			-	1	2
Rel.Std.Dev.	17.3%	3.21%	13.6%	34.2%	24.8%	-	1.67%	3.61%	8.60%	4.18%			-	2.77%	8.69%
PDM[3]	33.3%	-11.1%	142%	-35.4%	-27.3%	-	8.28%	9.49%	5.05%	-13.5%			-	22.0%	9.09%

Table A7. Analytical results for 4 acid chromium in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H -	Lab I 4A*OES	Lab J -	Lab K -	Lab L -	Lab M 4A*OES	Lab N 4A*OES	Lab O -
1	**1655**	1838	1740	990	1830	1050	**2110**	NR	1540	NR	NR	NR	1870	1755	NR
2	1530	1964	1760	900	1880	1000	1680	NR	1510	NR	NR	NR	1640	1772	NR
3	1490	1940	**1410**	1310	1860	1060	1640	NR	1520	NR	NR	NR	1800	1738	NR
4	1490	1901	1700	1530	1880	1040	1740	NR	1570	NR	NR	NR	1940	1767	NR
5	1440	1933	1560	1230	1830	1020	1960	NR	1550	NR	NR	NR	1870	**1829**	NR
Mean	1521	1915	1634	1192	1856	**1034**	1826		1538				1824	1772	
Median	1490	1933	1700	1230	1860	1040	1740		1540				1870	1767	
Std.Dev.	81	49	148	253	25	24	201		24				114	34	
Rel.Std.Dev.	5.35%	2.54%	9.03%	21.2%	1.35%	2.33%	11.0%		1.55%				6.26%	1.94%	
PDM[3]	-8.84%	14.8%	-2.06%	-28.6%	11.2%	-38.0%	9.45%		-7.82%				9.33%	6.22%	

Table A8. Analytical results for 4 acid cobalt in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*AAS	Lab K -	Lab L AR*OES	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	285	278	280	270	280	290	288	299	285	290	NR	294	280	299	310
2	270	284	280	280	270	290	285	306	290	279	NR	291	280	302	320
3	280	280	280	280	280	290	289	304	280	295	NR	292	280	291	320
4	280	275	290	280	290	290	284	305	285	296	NR	**297**	300	299	310
5	280	281	280	260	280	290	286	**286**	290	287	NR	292	280	288	310
Mean	279	280	282	274	280	290	286	300	286	289		293	284	296	**314**
Median	280	280	280	280	280	290	286	304	285	290		292	280	299	310
Std.Dev.	5	3	4	9	7	0	2	8	4	7		2	9	6	5
Rel.Std.Dev.	1.96%	1.20%	1.59%	3.26%	2.53%	0.00%	0.72%	2.76%	1.46%	2.38%		0.81%	3.15%	2.02%	1.74%
PDM[3]	-2.55%	-2.34%	-1.50%	-4.30%	-2.20%	1.29%	0.03%	4.78%	-0.11%	1.08%		2.41%	-0.80%	3.32%	9.67%

Table A9. Analytical results for 4 acid copper in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*AAS	Lab K -	Lab L AR*OES	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	902	876	850	850	920	840	826	777	530	872	NR	**893**	910	879	876
2	864	**926**	870	870	880	850	854	813	520	828	NR	**946**	925	879	878
3	894	882	880	890	880	900	827	807	525	871	NR	910	885	870	879
4	862	879	890	890	900	890	826	798	520	858	NR	913	925	888	872
5	888	879	860	850	880	860	845	761	520	844	NR	907	905	859	**864**
Mean	882	888	870	870	892	868	836	**791**	**523**			914	910	875	874
Median	888	879	870	870	880	860	827	798	520			910	910	879	876
Std.Dev.	18	21	16	20	18	26	13	22	4			20	17	11	6
Rel.Std.Dev.	2.05%	2.38%	1.82%	2.30%	2.01%	2.98%	1.57%	2.74%	0.86%			2.14%	1.82%	1.25%	0.70%
PDM[3]	0.58%	1.31%	-0.78%	-0.78%	1.73%	-1.01%	-4.71%	-9.77%	-40.4%			4.21%	3.78%	-0.21%	-0.35%

Table A10. Analytical results for 4 acid iron in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J -	Lab K -	Lab L -	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	**9.48**	9.65	8.72	8.90	9.30	**9.26**	9.17	8.73	9.34	NR	NR	NR	9.00	9.34	9.55
2	9.06	9.84	8.75	9.01	9.03	9.36	9.22	8.86	9.41	NR	NR	NR	8.98	9.56	9.44
3	9.26	9.56	8.73	9.14	9.04	9.38	**9.33**	9.09	9.36	NR	NR	NR	9.00	9.33	9.57
4	9.17	9.73	**8.93**	9.09	9.15	**9.44**	9.17	9.07	9.34	NR	NR	NR	8.96	9.39	9.49
5	9.19	9.61	8.74	8.73	9.33	9.34	9.15	8.68	9.42	NR	NR	NR	**8.88**	9.49	9.50
Mean	9.23	9.68	8.77	8.97	9.17	9.36	9.21	8.89	9.37				8.96	9.42	9.51
Median	9.19	9.65	8.74	9.01	9.15	9.36	9.17	8.86	9.36				8.98	9.39	9.50
Std.Dev.	0.15	0.11	0.09	0.16	0.14	0.07	0.07	0.19	0.04				0.05	0.10	0.05
Rel.Std.Dev.	1.67%	1.14%	1.00%	1.83%	1.54%	0.70%	0.79%	2.13%	0.41%				0.56%	1.06%	0.54%
PDM[3]	0.30%	5.16%	-4.67%	-2.49%	-0.36%	1.66%	0.05%	-3.45%	1.85%				-2.60%	2.37%	3.33%

Table A11. Analytical results for 4 acid magnesium oxide in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J -	Lab K -	Lab L -	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	**32.8**	31.4	30.3	**26.9**	31.6	32.4	34.5	32.0	32.6	NR	NR	NR	34.5	32.2	34.0
2	31.3	31.9	30.3	28.2	31.0	32.6	35.0	32.7	32.6	NR	NR	NR	34.5	32.2	33.5
3	32.0	31.1	30.5	28.0	30.9	33.4	35.2	34.7	32.0	NR	NR	NR	34.7	32.0	33.8
4	31.8	31.7	**31.3**	27.7	31.2	33.6	34.5	34.8	32.6	NR	NR	NR	35.0	32.1	33.5
5	31.8	31.2	30.6	28.7	31.4	32.7	34.9	33.1	32.8	NR	NR	NR	33.9	32.4	33.3
Mean	31.9	31.5	30.6	**27.9**	31.2	32.9	34.8	33.5	32.5				34.5	32.2	33.6
Median	31.8	31.4	30.5	28.0	31.2	32.7	34.9	33.1	32.6				34.5	32.2	33.5
Std.Dev.	0.53	0.33	0.38	0.67	0.29	0.53	0.31	1.24	0.30				0.39	0.14	0.27
Rel.Std.Dev.	1.65%	1.05%	1.23%	2.39%	0.92%	1.60%	0.89%	3.69%	0.93%				1.13%	0.43%	0.81%
PDM[3]	-2.14%	-3.56%	-6.19%	-14.5%	-4.32%	0.89%	6.72%	2.54%	-0.33%				5.77%	-1.31%	3.06%

Table A12. Analytical results for 4 acid nickel in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G 4A*OES	Lab H 4A*OES	Lab I 4A*OES	Lab J 4A*AAS	Lab K -	Lab L AR*OES	Lab M 4A*OES	Lab N 4A*OES	Lab O 4A*OES
1	**1.44**	1.45	1.40	1.31	1.38	1.36	1.39	1.58	1.42	**1.41**	NR	1.44	1.31	1.42	1.48
2	1.40	1.46	1.41	1.33	1.36	1.36	1.40	1.58	1.43	1.45	NR	1.42	1.32	1.42	**1.55**
3	1.39	1.41	1.40	1.33	1.41	1.39	1.43	1.56	1.42	1.45	NR	1.41	1.33	1.44	1.52
4	1.39	1.39	1.43	1.35	1.41	1.41	1.41	1.57	1.41	1.44	NR	1.42	1.34	1.40	1.51
5	1.38	1.40	1.41	1.29	1.39	1.38	1.43	1.57	1.39	1.44	NR	1.41	1.30	1.40	1.51
Mean	1.40	1.42	1.41	**1.32**	1.39	1.38	1.41	**1.57**	1.41	1.44		1.42	**1.32**	1.42	**1.51**
Median	1.39	1.41	1.41	1.33	1.39	1.38	1.41	1.57	1.42	1.44		1.42	1.32	1.42	1.51
Std.Dev.	0.02	0.03	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.02		0.01	0.01	0.02	0.03
Rel.Std.Dev.	1.52%	2.15%	0.74%	1.72%	1.53%	1.52%	1.27%	0.53%	1.07%	1.11%		0.76%	1.09%	1.18%	1.66%
PDM[3]	-0.75%	0.83%	-0.11%	-6.21%	-1.39%	-2.15%	0.17%	11.5%	0.32%	2.16%		0.64%	-6.42%	0.46%	7.41%

Table A13. Analytical results for 4 acid sulphur in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A 4A*OES	Lab B 4A*OES	Lab C 4A*OES	Lab D 4A*MS	Lab E 4A*AAS	Lab F 4A*OES	Lab G -	Lab H 4A*OES	Lab I 4A*OES	Lab J -	Lab K -	Lab L AR*OES	Lab M 4A*OES	Lab N -	Lab O -
1	3.22	3.00	3.30	3.09	3.46	3.13	NR	**2.91**	3.72	NR	NR	3.36	3.64	NR	NR
2	**3.10**	3.12	3.30	3.15	3.35	3.18	NR	2.99	3.76	NR	NR	3.35	3.79	NR	NR
3	3.24	3.06	3.30	3.21	3.41	3.20	NR	3.01	3.78	NR	NR	3.32	3.73	NR	NR
4	3.19	3.03	3.30	3.21	3.46	3.23	NR	2.99	3.71	NR	NR	3.34	**3.37**	NR	NR
5	3.20	3.11	3.30	3.08	3.41	3.18	NR	**2.83**	3.76	NR	NR	3.31	3.75	NR	NR
Mean	3.19	3.06	3.30	3.15	3.42	3.18		2.95	3.75			3.33	3.66		
Median	3.20	3.06	3.30	3.15	3.41	3.18		2.99	3.76			3.34	3.73		
Std.Dev.	0.05	0.05	0.00	0.06	0.05	0.04		0.08	0.03			0.02	0.17		
Rel.Std.Dev.	1.69%	1.72%	0.00%	1.99%	1.33%	1.19%		2.56%	0.79%			0.58%	4.62%		
PDM[3]	-3.71%	-7.49%	-0.39%	-4.98%	3.17%	-3.92%		-11.1%	13.1%			0.60%	10.4%		

Table A14. Analytical results for fusion aluminium oxide in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I BF*OES	Lab J BF*XRF	Lab K BF*OES	Lab L PF*OES	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	2.40	2.34	2.34	2.54	2.29	2.49	2.60	2.38	2.35	2.40	2.19	2.37	2.41	2.72	**2.36**
2	2.41	2.36	2.39	2.56	2.26	2.44	2.70	2.39	2.36	2.40	**2.14**	2.38	2.41	2.76	2.60
3	2.40	**2.27**	2.34	2.48	2.23	2.42	2.70	2.36	2.32	2.20	2.23	2.38	2.47	2.65	2.55
4	2.41	2.34	2.34	2.46	2.21	2.45	2.70	2.35	2.34	2.40	2.25	2.37	2.48	2.60	2.56
5	2.40	2.32	2.34	2.48	2.23	2.40	2.60	2.36	2.31	2.40	2.21	2.37	2.40	2.59	2.62
Mean	2.40	2.33	2.35	2.50	2.24	2.44	**2.66**	2.37	2.34	2.36	2.20	2.37	2.43	**2.66**	2.54
Median	2.40	2.34	2.34	2.48	2.23	2.44	2.70	2.36	2.34	2.40	2.21	2.37	2.41	2.65	2.56
Std.Dev.	0.01	0.04	0.02	0.04	0.03	0.03	0.05	0.02	0.02	0.09	0.04	0.00	0.04	0.07	0.10
Rel.Std.Dev.	0.23%	1.56%	0.95%	1.73%	1.40%	1.39%	2.06%	0.69%	0.89%	3.79%	1.97%	0.21%	1.55%	2.79%	4.08%
PDM[3]	0.94%	-2.25%	-1.32%	5.14%	-5.77%	2.46%	11.7%	-0.57%	-1.91%	-0.90%	-7.49%	-0.32%	2.20%	11.9%	6.57%

Table A15. Analytical results for fusion arsenic in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I -	Lab J -	Lab K BF*OES	Lab L PF*MS	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	**70**	<100	100	<100	30	20	30	NR	NR	NR	28	21	NR	27	20
2	20	**100**	**<100**	<100	30	20	40	NR	NR	NR	26	21.5	NR	27	15
3	20	<100	100	100	30	20	50	NR	NR	NR	27	21.1	NR	27	27
4	20	<100	200	<100	30	20	60	NR	NR	NR	27	22.1	NR	27	17
5	20	<100	100	100	20	38	40	NR	NR	NR	24	21.3	NR	28	20
Mean	30	<100	**125**	<100	28	24	44				26	21		27	20
Median	20	<100	100	<100	30	20	40				27	21		27	20
Std.Dev.	22	-	50	-	4	8	11				2	0		0	5
Rel.Std.Dev.	74.5%	-	40.0%	-	16.0%	34.1%	25.9%				5.74%	2.04%		1.64%	23.0%
PDM[3]	14.1%	-	375%	-	6.46%	-10.3%	67.3%				0.38%	-18.6%		3.42%	-24.7%

Table A16. Analytical results for fusion chromium in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I BF*OES	Lab J -	Lab K BF*OES	Lab L PF*OES	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	2010	2052	2000	2000	1995	2018	2380	2000	1980	NR	1800	1964	2060	1873	2000
2	2020	2071	2000	1900	2050	2005	2490	2000	1940	NR	1700	**1984**	2040	1887	2100
3	2030	1958	2000	1900	2020	2011	2570	2000	1970	NR	1800	1965	1760	1859	2200
4	2020	2032	2000	1900	2000	1991	2380	2000	1980	NR	1800	1963	1940	1894	2100
5	1990	1975	2000	2000	2040	1977	2220	2000	1960	NR	1700	1968	1820	1851	2200
Mean	2014	2018	2000	1940	2021	2001	**2408**	2000	1966		**1760**	1969	1924	1873	2120
Median	2020	2032	2000	1900	2020	2005	2380	2000	1970		1800	1965	1940	1873	2100
Std.Dev.	15	49	0	55	24	16	132	0	17		55	9	132	18	84
Rel.Std.Dev.	0.75%	2.43%	0.00%	2.82%	1.19%	0.82%	5.49%	0.00%	0.85%		3.11%	0.44%	6.87%	0.97%	3.95%
PDM[3]	1.37%	1.55%	0.67%	-2.35%	1.72%	0.69%	21.2%	0.67%	-1.04%		-11.4%	-0.90%	-3.16%	-5.74%	6.71%

Table A17. Analytical results for fusion cobalt in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I -	Lab J -	Lab K BF*OES	Lab L -	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	310	300	290	300	280	301	320	300	NR	NR	294	NR	320	299	300
2	320	288	310	300	280	306	340	300	NR	NR	277	NR	320	**308**	400
3	310	278	300	300	300	304	360	300	NR	NR	291	NR	320	294	400
4	310	281	300	300	280	305	340	300	NR	NR	286	NR	330	296	400
5	320	296	290	300	280	299	310	300	NR	NR	277	NR	320	290	400
Mean	314	289	298	300	284	303	334	300			285		322	297	**380**
Median	310	288	300	300	280	304	340	300			286		320	296	400
Std.Dev.	5	9	8	0	9	3	19	0			8		4	7	45
Rel.Std.Dev.	1.74%	3.27%	2.81%	0.00%	3.15%	0.96%	5.84%	0.00%			2.75%		1.39%	2.28%	11.8%
PDM[3]	3.93%	-4.48%	-1.36%	-0.70%	-6.00%	0.29%	10.6%	-0.70%			-5.67%		6.58%	-1.56%	25.8%

Table A18. Analytical results for fusion copper in OREAS 73a (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I -	Lab J -	Lab K BF*OES	Lab L -	Lab M BF*OES	Lab N BF*OES	Lab O -
1	990	895	**890**	1000	**960**	762	1050	900	NR	NR	1019	NR	780	872	NR
2	960	894	930	900	900	867	1080	900	NR	NR	926	NR	770	872	NR
3	960	**858**	910	1000	930	782	**1280**	900	NR	NR	993	NR	810	876	NR
4	990	890	930	1000	910	852	1100	900	NR	NR	966	NR	810	862	NR
5	980	898	940	900	900	735	1070	900	NR	NR	924	NR	**1050**	861	NR
Mean	976	887	920	960	920	800	1116	900			966		844	869	
Median	980	894	930	1000	910	782	1080	900			966		810	872	
Std.Dev.	15	16	20	55	25	57	93	0			42		117	7	
Rel.Std.Dev.	1.55%	1.86%	2.17%	5.71%	2.77%	7.18%	8.37%	0.00%			4.30%		13.8%	0.77%	
PDM[3]	6.62%	-3.10%	0.51%	4.88%	0.51%	-12.6%	21.9%	-1.68%			5.49%		-7.80%	-5.11%	

Table A19. Analytical results for fusion iron in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I BF*OES	Lab J BF*XRF	Lab K BF*OES	Lab L PF*OES	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	9.36	9.19	9.00	9.94	9.08	**9.53**	8.93	**9.22**	9.25	9.23	9.22	9.29	9.05	**9.16**	**8.86**
2	9.30	9.34	9.07	9.73	**9.01**	9.37	8.98	9.32	9.31	9.30	8.98	9.29	9.11	9.34	9.96
3	9.28	8.94	9.14	9.58	9.07	9.27	8.94	9.30	9.28	9.23	9.52	9.28	9.09	**9.01**	9.79
4	9.31	9.12	8.98	9.39	9.06	9.28	9.63	9.31	9.35	9.30	9.52	9.22	9.16	9.35	9.86
5	9.34	9.09	9.03	9.57	9.07	9.31	9.45	9.31	9.26	9.30	9.19	9.21	9.05	9.35	10.00
Mean	9.32	9.14	**9.04**	**9.64**	9.06	9.35	9.19	9.29	9.29	9.27	9.29	9.26	9.09	9.24	**9.69**
Median	9.31	9.12	9.03	9.58	9.07	9.31	8.98	9.31	9.28	9.30	9.22	9.28	9.09	9.34	9.86
Std.Dev.	0.03	0.15	0.06	0.21	0.03	0.11	0.33	0.04	0.04	0.04	0.23	0.04	0.05	0.15	0.47
Rel.Std.Dev.	0.34%	1.60%	0.70%	2.13%	0.31%	1.15%	3.59%	0.44%	0.44%	0.41%	2.51%	0.39%	0.51%	1.65%	4.88%
PDM[3]	0.85%	-1.12%	-2.12%	4.35%	-1.97%	1.24%	-0.58%	0.57%	0.54%	0.38%	0.50%	0.19%	-1.60%	0.02%	4.92%

Table A20. Analytical results for fusion magnesium oxide in OREAS 73a (abbreviations as in Table A1; values wt %).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I BF*OES	Lab J BF*XRF	Lab K BF*OES	Lab L PF*OES	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	32.3	32.4	31.6	34.7	31.2	32.5	35.7	**32.2**	31.4	33.9	33.0	32.2	33.1	32.4	34.9
2	32.4	32.6	31.2	34.3	30.6	32.5	36.9	32.4	32.6	33.8	32.1	32.4	33.3	32.7	35.6
3	32.3	**31.7**	31.6	33.7	31.0	33.1	36.2	32.4	31.8	33.5	33.9	32.3	33.0	32.3	35.0
4	32.4	32.6	30.2	33.0	30.4	32.8	37.6	32.4	31.9	33.7	33.8	32.4	33.1	32.2	35.6
5	32.3	32.2	31.2	33.9	31.2	32.8	36.5	**32.6**	32.4	34.0	32.4	32.4	33.0	32.4	36.1
Mean	32.3	32.3	31.2	33.9	30.9	32.7	**36.6**	32.4	32.0	33.8	33.0	32.3	33.1	32.4	**35.4**
Median	32.3	32.4	31.2	33.9	31.0	32.8	36.5	32.4	31.9	33.8	33.0	32.4	33.1	32.4	35.6
Std.Dev.	0.05	0.39	0.57	0.64	0.36	0.26	0.72	0.11	0.48	0.19	0.81	0.08	0.13	0.20	0.49
Rel.Std.Dev.	0.17%	1.22%	1.84%	1.89%	1.18%	0.79%	1.97%	0.35%	1.50%	0.57%	2.46%	0.25%	0.39%	0.61%	1.39%
PDM[3]	-0.50%	-0.63%	-4.13%	4.36%	-5.00%	0.69%	12.5%	-0.31%	-1.49%	3.93%	1.59%	-0.50%	1.78%	-0.28%	9.03%

Table A21. Analytical results for fusion nickel in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I -	Lab J -	Lab K BF*OES	Lab L -	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	1.46	1.43	1.42	1.31	1.46	1.08	NR	1.50	NR	NR	1.42	NR	1.65	1.39	**1.35**
2	1.46	1.47	1.43	1.33	1.49	1.36	NR	1.52	NR	NR	1.36	NR	1.65	1.43	1.54
3	1.46	1.37	1.45	1.33	1.50	1.17	NR	1.49	NR	NR	1.47	NR	1.63	1.40	1.50
4	1.46	1.40	1.44	1.35	1.49	1.35	NR	1.51	NR	NR	1.47	NR	1.70	1.40	1.51
5	1.48	1.40	1.43	1.29	1.45	1.06	NR	1.48	NR	NR	1.42	NR	1.65	1.39	1.53
Mean	1.46	1.42	1.43	1.32	1.48	**1.21**		1.50			1.43		**1.66**	1.40	1.49
Median	1.46	1.40	1.43	1.33	1.49	1.17		1.50			1.42		1.65	1.40	1.51
Std.Dev.	0.01	0.04	0.01	0.02	0.02	0.14		0.02			0.05		0.03	0.02	0.08
Rel.Std.Dev.	0.61%	2.63%	0.80%	1.72%	1.29%	12.0%		1.05%			3.19%		1.57%	1.17%	5.23%
PDM[3]	1.70%	-1.67%	-0.73%	-8.16%	2.47%	-16.3%		4.20%			-0.80%		15.0%	-2.60%	3.23%

Table A22. Analytical results for silicon dioxide in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F BF*OES	Lab G BF*OES	Lab H BF*OES	Lab I BF*OES	Lab J BF*XRF	Lab K -	Lab L PF*OES	Lab M BF*OES	Lab N BF*OES	Lab O BF*OES
1	36.5	37.0	37.5	**38.6**	34.7	36.7	38.5	36.3	36.0	37.3	NR	36.3	36.1	35.4	39.0
2	36.6	37.2	37.6	37.8	34.1	36.5	40.1	36.3	35.6	37.1	NR	36.6	36.4	35.4	39.5
3	36.4	**35.9**	37.5	37.2	34.4	36.2	39.3	36.3	35.6	37.2	NR	36.5	36.4	35.9	38.9
4	36.6	36.8	37.1	**36.3**	33.9	36.4	40.5	36.4	35.6	37.2	NR	36.3	36.5	34.9	39.4
5	36.4	36.6	37.0	37.5	34.4	36.6	39.4	36.6	35.8	37.3	NR	36.4	36.0	35.9	40.0
Mean	36.5	36.7	37.3	37.5	34.3	36.5	**39.6**	36.4	35.7	37.2		36.4	36.3	35.5	**39.4**
Median	36.5	36.8	37.5	37.5	34.4	36.5	39.4	36.3	35.6	37.2		36.4	36.4	35.4	39.4
Std.Dev.	0.10	0.49	0.27	0.84	0.31	0.17	0.77	0.11	0.18	0.08		0.11	0.21	0.42	0.44
Rel.Std.Dev.	0.27%	1.34%	0.72%	2.24%	0.90%	0.46%	1.95%	0.31%	0.50%	0.22%		0.29%	0.58%	1.18%	1.12%
PDM[3]	0.34%	0.92%	2.65%	3.03%	-5.71%	0.31%	8.75%	0.02%	-1.80%	2.32%		0.11%	-0.28%	-2.50%	8.20%

Table A23. Analytical results for fusion sulphur in OREAS 73a (abbreviations as in Table A1; values in wt %)..

Replicate No.	Lab A BF*XRF	Lab B PF*OES	Lab C BF*OES	Lab D BF*OES	Lab E BF*XRF	Lab F -	Lab G -	Lab H -	Lab I -	Lab J -	Lab K -	Lab L -	Lab M -	Lab N -	Lab O -
1	3.10	3.06	2.94	3.53	3.04	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2	3.10	**3.19**	2.99	3.49	2.91	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
3	3.07	3.04	2.93	3.42	3.01	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4	3.10	3.07	2.97	3.46	3.01	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
5	3.16	3.05	2.93	3.35	2.95	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mean	3.11	3.08	2.95	**3.45**	2.98										
Median	3.10	3.06	2.94	3.46	3.01										
Std.Dev.	0.03	0.06	0.03	0.07	0.05										
Rel.Std.Dev.	1.06%	1.99%	0.91%	2.00%	1.77%										
PDM[3]	2.70%	1.91%	-2.39%	14.1%	-1.33%										

Table A24. Analytical results for sulphur by LECO in OREAS 73a (abbreviations as in Table A1; values in wt %).

Replicate No.	Lab A LECO	Lab B LECO	Lab C LECO	Lab D LECO	Lab E LECO	Lab F LECO	Lab G LECO	Lab H LECO	Lab I LECO	Lab J LECO	Lab K LECO	Lab L LECO	Lab M LECO	Lab N LECO	Lab O LECO
1	3.22	3.19	**2.95**	3.03	3.22	2.94	3.29	3.27	NR	**3.01**	3.07	**3.26**	3.31	2.89	**3.26**
2	3.27	3.20	3.25	2.99	3.26	2.97	3.18	3.29	NR	3.10	3.07	3.30	**3.47**	2.93	3.19
3	3.21	3.20	3.19	3.00	3.37	2.93	3.09	3.27	NR	3.16	3.13	3.33	3.34	2.92	3.16
4	3.31	3.27	3.24	3.02	3.38	**2.86**	2.97	**3.11**	NR	3.18	3.13	3.30	3.30	2.90	3.14
5	3.24	3.28	3.11	3.06	3.31	2.92	3.13	3.25	NR	3.16	3.13	3.31	3.21	2.91	3.17
Mean	3.25	3.23	3.15	3.02	3.31	2.92	3.13	3.24		3.12	3.11	3.30	3.33	2.91	3.18
Median	3.24	3.20	3.19	3.02	3.31	2.93	3.13	3.27		3.16	3.13	3.30	3.31	2.91	3.17
Std.Dev.	0.04	0.04	0.12	0.03	0.07	0.04	0.12	0.07		0.07	0.03	0.03	0.09	0.02	0.05
Rel.Std.Dev.	1.28%	1.34%	3.93%	0.91%	2.09%	1.38%	3.75%	2.25%		2.22%	1.06%	0.77%	2.83%	0.54%	1.45%
PDM[3]	2.73%	2.07%	-0.46%	-4.51%	4.60%	-7.54%	-0.96%	2.39%		-1.28%	-1.79%	4.34%	5.17%	-7.98%	0.68%