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**CERTIFICATE OF ANALYSIS FOR**  
**ALTERED ULTRAMAFIC SECONDARY**  
**REFERENCE MATERIAL OREAS 70P**

*Prepared by:*  
*Ore Research & Exploration Pty Ltd*  
*December 2004*

REPORT 02/468

## Summary Statistics

Table 1. Precious and base metals by fire assay and 4 acid digest ICPOES/MS

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High	Low	High
Antimony, Sb (ppm)	0.58	0.47	0.69	0.50	0.66
Arsenic, As (ppm)	2.5	1.2	3.9	2.2	2.8
Bismuth, Bi (ppm)	< 0.01	IND	IND	IND	IND
Cadmium, Cd (ppm)	< 0.2	IND	IND	IND	IND
Chromium, Cr (ppm)	747	675	819	721	772
Cobalt, Co (ppm)	91	88	94	88	95
Copper, Cu (ppm)	2.6	1.0	4.2	2.3	2.8
Gold, Au (ppb)	13	9	16	11	15
Lead, Pb (ppm)	< 2	IND	IND	IND	IND
Nickel, Ni (ppm)	2730	2620	2841	2650	2811
Palladium, Pd (ppb)	< 2	IND	IND	IND	IND
Phosphorous, P (ppm)	15	8	23	13	18
Platinum, Pt (ppb)	0.5	0.2	0.9	0.4	0.7
Silver, Ag (ppm)	< 0.5	IND	IND	IND	IND
Sodium, Na (ppm)	575	236	913	492	657
Zinc, Zn (ppm)	35	33	37	32	37

IND - indeterminate

Table 2. Precious and base metals by aqua regia ICPOES/MS

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High	Low	High
Antimony, Sb (ppm)	0.17	0.13	0.20	0.14	0.20
Arsenic, As (ppm)	1.8	1.6	1.9	1.4	2.1
Bismuth, Bi (ppm)	< 0.01	IND	IND	IND	IND
Cadmium, Cd (ppm)	< 0.02	IND	IND	IND	IND
Chromium, Cr (ppm)	705	676	733	683	727
Cobalt, Co (ppm)	83	76	89	80	85
Copper, Cu (ppm)	2.6	1.4	3.8	2.1	3.1
Gold, Au (ppb)	13	9	16	10	15
Lead, Pb (ppm)	< 1	IND	IND	IND	IND
Nickel, Ni (ppm)	2438	2222	2655	2352	2525
Palladium, Pd (ppb)	< 1	IND	IND	IND	IND
Platinum, Pt (ppb)	< 2	IND	IND	IND	IND
Silver, Ag (ppm)	0.02	0.02	0.03	0.02	0.02
Zinc, Zn (ppm)	34	31	37	32	37

IND - indeterminate

Table 3. Major elements, LOI, C &amp; S by fusion XRF/ICPOES &amp; Leco

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High	Low	High
Aluminium, Al (% wt.)	0.33	0.30	0.36	0.31	0.35
Calcium, Ca (% wt.)	0.25	0.25	0.26	0.25	0.25
Carbon, C (% wt.)	0.39	0.35	0.43	0.35	0.43
Chromium, Cr (% wt.)	0.098	0.089	0.108	0.096	0.101
Iron, Fe (% wt.)	3.98	3.83	4.12	3.96	4.00
Loss on Ignition, LOI (% wt.)	15.74	15.56	15.92	15.64	15.85
Magnesium, Mg (% wt.)	25.20	24.86	25.55	25.13	25.27
Manganese, Mn (% wt.)	0.063	0.061	0.064	0.062	0.063
Phosphorous, P (% wt.)	~0.005	IND	IND	IND	IND
Potassium, K (% wt.)	< 0.03	IND	IND	IND	IND
Silicon, Si (% wt.)	16.31	15.90	16.72	16.23	16.39
Sodium, Na (% wt.)	0.079	0.044	0.113	0.063	0.095
Sulphur, S (% wt.)	0.064	0.054	0.074	0.060	0.068
Titanium, Ti (% wt.)	0.019	0.014	0.025	0.019	0.020

IND - indeterminate

Table 4. Lithophile trace elements by fusion ICPMS

Constituent	Recommended value	95% Confidence Interval		Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High	Low	High
Barium, Ba (ppm)	6.5	3.0	9.9	5.9	7.0
Cerium, Ce (ppm)	0.9	0.7	1.2	0.8	1.1
Dysprosium, Dy (ppm)	0.1	0.1	0.1	0.1	0.1
Erbium, Er (ppm)	~ 0.1	IND	IND	IND	IND
Europium, Eu (ppm)	< 0.1	IND	IND	IND	IND
Gadolinium, Gd (ppm)	~ 0.1	IND	IND	IND	IND
Holmium, Ho (ppm)	< 0.1	IND	IND	IND	IND
Lanthanum, La (ppm)	0.6	0.5	0.7	0.5	0.7
Lutetium, Lu (ppm)	< 0.05	IND	IND	IND	IND
Neodymium, Nd (ppm)	~ 0.5	IND	IND	IND	IND
Niobium, Nb (ppm)	< 1	IND	IND	IND	IND
Praseodymium, Pr (ppm)	0.11	0.09	0.12	0.11	0.11
Rubidium, Rb (ppm)	~ 0.7	IND	IND	IND	IND
Samarium, Sm (ppm)	~ 0.1	IND	IND	IND	IND
Strontium, Sr (ppm)	3.9	3.5	4.3	3.1	4.6
Terbium, Tb (ppm)	< 2	IND	IND	IND	IND
Thorium, Th (ppm)	< 1	IND	IND	IND	IND
Thulium, Tm (ppm)	< 0.05	IND	IND	IND	IND
Tin, Sn (ppm)	< 1	IND	IND	IND	IND
Uranium, U (ppm)	< 0.5	IND	IND	IND	IND
Ytterbium, Yb (ppm)	~ 0.1	IND	IND	IND	IND
Yttrium, Y (ppm)	0.8	0.7	0.9	0.6	1.0
Zirconium, Zr (ppm)	6.3	3.8	8.8	4.5	8.1

IND – indeterminate

## SOURCE MATERIALS

The material used to produce the multi-element secondary reference material OREAS 70P was sourced from poorly mineralised komatiite-associated altered dunite from WMC's Mount Keith Nickel Operations in the Archaean Agnew-Wiluna greenstone belt, northern Yilgarn area, Western Australia.

## COMMINUTION AND HOMOGENISATION PROCEDURES

The material was prepared in the following manner:

- a) *drying to constant mass at 105° C;*
- b) *crushing and screening;*
- c) *preliminary homogenisation;*
- d) *milling to 100% minus 25 microns;*
- e) *final homogenisation;*
- f) *packaging into 50g lots sealed in laminated foil pouches.*

## ANALYSIS OF OREAS 70P

Six commercial laboratories participated in the analytical program to characterise elements listed in Tables 1 - 4. 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<sup>3</sup>) are presented in Appendix A, B, C and D. The parameter PDM<sup>3</sup> (percent deviation of lab mean from the corrected mean of means) is a measure of laboratory accuracy while RSD (the relative standard deviation) is an effective measure of analytical precision where homogeneity of the test material has been confirmed. The analytical methods employed by each laboratory are given in column headings and explained in Table 1 of each appendix.

Five 100g samples were submitted to each laboratory for analysis and were taken at spaced intervals during packaging of the standard in order to maximise their representation. Each laboratory was instructed to determine: Au, Pt and Pd by fire assay ICPMS; total concentration Ag, As, Bi, Cd, Co, Cr, Cu, Na, Ni, P, Pb, Sb, Zn by four-acid digest ICPOES or ICPMS; Ag, As, Au, Bi, Cd, Co, Cr, Cu, Ni, Pb, Pd, Pt, Sb, Zn by aqua regia digest ICPOES or ICPMS; major elements by fusion XRF or ICPOES; loss on ignition by thermo-gravimetry; C and S by Leco furnace; and lithophile trace elements by fusion ICPMS.

## STATISTICAL EVALUATION OF ANALYTICAL DATA FOR OREAS 70P

### 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

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

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

where

$x_{ij}$  is the  $j$ th 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  $i$ ;

$\bar{x}$  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  $(p-1)$ .

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

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

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

$$S = 1.483 \frac{\text{median} / x_j - \text{median} (x_i)}{j=1 \dots n \quad i=1 \dots n}$$

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

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.

In certain instances statistician's prerogative has been employed in discriminating outliers. Individual outliers and, more rarely, laboratory means deemed to be outlying are shown in bold (red in bar charts) 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 5. Recommended values and 95% confidence intervals for precious and base metals by fire assay and 4 acid digest ICPOES/MS.

Constituent	Recommended value	95% Confidence Interval	
		Low	High
Antimony, Sb (ppm)	0.58	0.47	0.69
Arsenic, As (ppm)	2.5	1.2	3.9
Bismuth, Bi (ppm)	< 0.01	IND	IND
Cadmium, Cd (ppm)	< 0.2	IND	IND
Chromium, Cr (ppm)	747	675	819
Cobalt, Co (ppm)	91	88	94
Copper, Cu (ppm)	2.6	1.0	4.2
Gold, Au (ppb)	13	9	16
Lead, Pb (ppm)	< 2	IND	IND
Nickel, Ni (ppm)	2730	2620	2841
Palladium, Pd (ppb)	< 2	IND	IND
Phosphorous, P (ppm)	15	8	23
Platinum, Pt (ppb)	0.5	0.2	0.9
Silver, Ag (ppm)	< 0.5	IND	IND
Sodium, Na (ppm)	575	236	913
Zinc, Zn (ppm)	35	33	37

IND – indeterminate

Table 6. Recommended values and 95% confidence intervals for precious and base metals by aqua regia ICPOES/MS.

Constituent	Recommended value	95% Confidence Interval	
		Low	High
Antimony, Sb (ppm)	0.17	0.13	0.20
Arsenic, As (ppm)	1.8	1.6	1.9
Bismuth, Bi (ppm)	< 0.01	IND	IND
Cadmium, Cd (ppm)	< 0.02	IND	IND
Chromium, Cr (ppm)	705	676	733
Cobalt, Co (ppm)	83	76	89
Copper, Cu (ppm)	2.6	1.4	3.8
Gold, Au (ppb)	13	9	16
Lead, Pb (ppm)	< 1	IND	IND
Nickel, Ni (ppm)	2438	2222	2655
Palladium, Pd (ppb)	< 1	IND	IND
Platinum, Pt (ppb)	< 2	IND	IND
Silver, Ag (ppm)	0.02	0.02	0.03
Zinc, Zn (ppm)	34	31	37

IND - indeterminate

Table 7. Recommended values and 95% confidence intervals for major elements, LOI, C & S by fusion XRF/ICPOES & Leco.

Constituent	Recommended value	95% Confidence Interval	
		Low	High
Aluminium, Al (% wt.)	0.33	0.30	0.36
Calcium, Ca (% wt.)	0.25	0.25	0.26
Carbon, C (% wt.)	0.39	0.35	0.43
Chromium, Cr (% wt.)	0.098	0.089	0.108
Iron, Fe (% wt.)	3.98	3.83	4.12
Loss on Ignition, LOI (% wt.)	15.74	15.56	15.92
Magnesium, Mg (% wt.)	25.20	24.86	25.55
Manganese, Mn (% wt.)	0.063	0.061	0.064
Phosphorous, P (% wt.)	~0.005	IND	IND
Potassium, K (% wt.)	< 0.03	IND	IND
Silicon, Si (% wt.)	16.31	15.90	16.72
Sodium, Na (% wt.)	0.079	0.044	0.113
Sulphur, S (% wt.)	0.064	0.054	0.074
Titanium, Ti (% wt.)	0.019	0.014	0.025

IND – indeterminate

Table 8. Recommended values and 95% confidence intervals for lithophile trace elements by fusion ICPMS.

Constituent	Recommended value	95% Confidence Interval	
		Low	High
Barium, Ba (ppm)	6.5	3.0	9.9
Cerium, Ce (ppm)	0.9	0.7	1.2
Dysprosium, Dy (ppm)	0.1	0.1	0.1
Erbium, Er (ppm)	~ 0.1	IND	IND
Europium, Eu (ppm)	< 0.1	IND	IND
Gadolinium, Gd (ppm)	~ 0.1	IND	IND
Holmium, Ho (ppm)	< 0.1	IND	IND
Lanthanium, La (ppm)	0.6	0.5	0.7
Lutetium, Lu (ppm)	< 0.05	IND	IND
Neodymium, Nd (ppm)	~ 0.5	IND	IND
Niobium, Nb (ppm)	< 1	IND	IND
Praseodymium, Pr (ppm)	0.11	0.09	0.12
Rubidium, Rb (ppm)	~ 0.7	IND	IND
Samarium, Sm (ppm)	~ 0.1	IND	IND
Strontium, Sr (ppm)	3.9	3.5	4.3
Terbium, Tb (ppm)	< 2	IND	IND
Thorium, Th (ppm)	< 1	IND	IND
Thulium, Tm (ppm)	< 0.05	IND	IND
Tin, Sn (ppm)	< 1	IND	IND
Uranium, U (ppm)	< 0.5	IND	IND
Ytterbium, Yb (ppm)	~ 0.1	IND	IND
Yttrium, Y (ppm)	0.8	0.7	0.9
Zirconium, Zr (ppm)	6.3	3.8	8.8

IND - indeterminate

### 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 for elements other than gold that 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

$$\text{Lower limit is } \bar{x} - k'_2(n, p, 1 - \alpha) s_g''$$

$$\text{Upper limit is } \bar{x} + k'_2(n, p, 1 - \alpha) s_g''$$

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 ( $m, \alpha$  unknown);

$s_g''$  is the corrected grand standard deviation.

The meaning of these tolerance limits may be illustrated for fire assay gold, where 99% of the time at least 95% of subsamples will have concentrations lying between 11 and 15 ppb. 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).

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



$$s_g'' = \frac{\sum_{i=1}^p (s_i (1 - \frac{s_i}{s_g'}))}{\sum_{i=1}^p (1 - \frac{s_i}{s_g'})}$$

where

$1 - (\frac{s_i}{s_g'})$  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

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

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

Table 9. Recommended values and tolerance limits for precious and base metals by fire assay and four-acid digest ICPOES/MS.

Constituent	Recommended value	Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High
Antimony, Sb (ppm)	0.58	0.50	0.66
Arsenic, As (ppm)	2.5	2.2	2.8
Bismuth, Bi (ppm)	< 0.01	IND	IND
Cadmium, Cd (ppm)	< 0.2	IND	IND
Chromium, Cr (ppm)	747	721	772
Cobalt, Co (ppm)	91	88	95
Copper, Cu (ppm)	2.6	2.3	2.8
Gold, Au (ppb)	13	11	15
Lead, Pb (ppm)	< 2	IND	IND
Nickel, Ni (ppm)	2730	2650	2811
Palladium, Pd (ppb)	< 2	IND	IND
Phosphorous, P (ppm)	15	13	18
Platinum, Pt (ppb)	0.5	0.4	0.7
Silver, Ag (ppm)	< 0.5	IND	IND

IND - indeterminate

Table 10. Recommended values and tolerance limits for precious and base metals by aqua regia digest ICPOES/MS.

Constituent	Recommended value	Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High
Antimony, Sb (ppm)	0.17	0.14	0.20
Arsenic, As (ppm)	1.8	1.4	2.1
Bismuth, Bi (ppm)	< 0.01	IND	IND
Cadmium, Cd (ppm)	< 0.02	IND	IND
Chromium, Cr (ppm)	705	683	727
Cobalt, Co (ppm)	83	80	85
Copper, Cu (ppm)	2.6	2.1	3.1
Gold, Au (ppb)	13	10	15
Lead, Pb (ppm)	< 1	IND	IND
Nickel, Ni (ppm)	2438	2352	2525
Palladium, Pd (ppb)	< 1	IND	IND
Platinum, Pt (ppb)	< 2	IND	IND
Silver, Ag (ppm)	0.02	0.02	0.02
Zinc, Zn (ppm)	34	32	37

IND - indeterminate

Table 11. Recommended values and tolerance limits for major elements, LOI, C & S by fusion XRF/ICPOES & Leco.

Constituent	Recommended value	Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High
Aluminium, Al (% wt.)	0.33	0.31	0.35
Calcium, Ca (% wt.)	0.25	0.25	0.25
Carbon, C (% wt.)	0.39	0.35	0.43
Chromium, Cr (% wt.)	0.098	0.096	0.101
Iron, Fe (% wt.)	3.98	3.96	4.00
Loss on Ignition, LOI (% wt.)	15.74	15.64	15.85
Magnesium, Mg (% wt.)	25.20	25.13	25.27
Manganese, Mn (% wt.)	0.063	0.062	0.063
Phosphorous, P (% wt.)	~0.005	IND	IND
Potassium, K (% wt.)	< 0.03	IND	IND
Silicon, Si (% wt.)	16.31	16.23	16.39
Sodium, Na (% wt.)	0.079	0.063	0.095
Sulphur, S (% wt.)	0.064	0.060	0.068
Titanium, Ti (% wt.)	0.019	0.019	0.020

IND - indeterminate

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. Outliers were removed prior to the calculation of  $s_g'$  and a

weighting factor of zero was applied to those data sets where  $s_i / 2s_g' > 1$  (i.e. where the weighting factor  $1 - s_i / 2s_g' < 0$ ).

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.

Table 12. Recommended values and tolerance limits for lithophile trace elements by fusion ICPMS.

Constituent	Recommended value	Tolerance limits 1- $\alpha$ =0.99, $\rho$ =0.95	
		Low	High
Barium, Ba (ppm)	6.5	5.9	7.0
Cerium, Ce (ppm)	0.9	0.8	1.1
Dysprosium, Dy (ppm)	0.1	0.1	0.1
Erbium, Er (ppm)	~ 0.1	IND	IND
Europium, Eu (ppm)	< 0.1	IND	IND
Gadolinium, Gd (ppm)	~ 0.1	IND	IND
Holmium, Ho (ppm)	< 0.1	IND	IND
Lanthanium, La (ppm)	0.6	0.5	0.7
Lutetium, Lu (ppm)	< 0.05	IND	IND
Neodymium, Nd (ppm)	~ 0.5	IND	IND
Niobium, Nb (ppm)	< 1	IND	IND
Praseodymium, Pr (ppm)	0.11	0.11	0.11
Rubidium, Rb (ppm)	~ 0.7	IND	IND
Samarium, Sm (ppm)	~ 0.1	IND	IND
Strontium, Sr (ppm)	3.9	3.1	4.6
Terbium, Tb (ppm)	< 2	IND	IND
Thorium, Th (ppm)	< 1	IND	IND
Thulium, Tm (ppm)	< 0.05	IND	IND
Tin, Sn (ppm)	< 1	IND	IND
Uranium, U (ppm)	< 0.5	IND	IND
Ytterbium, Yb (ppm)	~ 0.1	IND	IND
Yttrium, Y (ppm)	0.8	0.6	1.0
Zirconium, Zr (ppm)	6.3	4.5	8.1

IND - indeterminate

### Performance Gates

Performance gates provide an indication of a level of performance that might reasonably be expected from a laboratory being monitored by this standard in a QA/QC program. They take into account 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.

The performance gates are calculated from 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 SRM.

Table 13. Performance gates for precious & base metals by fire assay / 4-acid digest with ICPOES/MS.

Constituent	Recommended value	1 $\sigma$		2 $\sigma$		3 $\sigma$	
		Low	High	Low	High	Low	High
Antimony, Sb (ppm)	0.58	0.48	0.67	0.39	0.77	0.29	0.87
Arsenic, As (ppm)	2.5	1.6	3.5	0.7	4.4	IND	IND
Bismuth, Bi (ppm)	< 0.01	IND	IND	IND	IND	IND	IND
Cadmium, Cd (ppm)	< 0.2	IND	IND	IND	IND	IND	IND
Chromium, Cr (ppm)	747	703	790	660	833	617	876
Cobalt, Co (ppm)	91	89	94	86	96	84	99
Copper, Cu (ppm)	2.6	1.9	3.2	1.2	3.9	0.6	4.5
Gold, Au (ppb)	13	10	16	6	19	3	22
Lead, Pb (ppm)	< 2	IND	IND	IND	IND	IND	IND
Nickel, Ni (ppm)	2730	2643	2817	2556	2904	2469	2991
Palladium, Pd (ppb)	< 2	IND	IND	IND	IND	IND	IND
Phosphorous, P (ppm)	15	10	21	5	26	0	31
Platinum, Pt (ppb)	0.5	0.3	0.7	0.1	1.0	0	1.2
Silver, Ag (ppm)	< 0.5	IND	IND	IND	IND	IND	IND
Sodium, Na (ppm)	575	287	862	0	1150	0	1437
Zinc, Zn (ppm)	35	32	37	30	39	28	41

IND - indeterminate

Table 14. Performance gates for precious and base metals by aqua regia ICPOES/MS.

Constituent	Recommended value	1 $\sigma$		2 $\sigma$		3 $\sigma$	
		Low	High	Low	High	Low	High
Antimony, Sb (ppm)	0.17	0.13	0.20	0.10	0.24	0.07	0.27
Arsenic, As (ppm)	1.8	1.6	1.9	1.5	2.1	1.3	2.2
Bismuth, Bi (ppm)	< 0.01	IND	IND	IND	IND	IND	IND
Cadmium, Cd (ppm)	< 0.02	IND	IND	IND	IND	IND	IND
Chromium, Cr (ppm)	705	681	729	657	753	633	777
Cobalt, Co (ppm)	83	77	88	72	94	66	99
Copper, Cu (ppm)	2.6	1.9	3.3	1.2	4.0	0.5	4.7
Gold, Au (ppb)	13	10	15	8	17	6	19
Lead, Pb (ppm)	< 1	IND	IND	IND	IND	IND	IND
Nickel, Ni (ppm)	2438	2245	2632	2051	2826	1857	3020
Palladium, Pd (ppb)	< 1	IND	IND	IND	IND	IND	IND
Platinum, Pt (ppb)	< 2	IND	IND	IND	IND	IND	IND
Silver, Ag (ppm)	0.02	0.02	0.03	0.01	0.03	0.01	0.03
Zinc, Zn (ppm)	34	31	37	28	40	25	43

IND - indeterminate

Table 15. Performance gates for major elements, LOI, C & S by fusion XRF/ICPOES & Leco.

Constituent	Recommended value	1 $\sigma$		2 $\sigma$		3 $\sigma$	
		Low	High	Low	High	Low	High
Aluminium, Al (% wt.)	0.33	0.30	0.36	0.27	0.39	0.24	0.42
Carbon, C (% wt.)	0.39	0.35	0.43	0.31	0.47	0.27	0.51
Calcium, Ca (% wt.)	0.25	0.24	0.26	0.24	0.26	0.23	0.27
Chromium, Cr (% wt.)	0.098	0.089	0.108	0.080	0.117	0.071	0.126
Iron, Fe (% wt.)	3.98	3.86	4.09	3.74	4.21	3.63	4.33
Potassium, K (% wt.)	< 0.03	IND	IND	IND	IND	IND	IND
Loss on Ignition, LOI (% wt.)	15.74	15.60	15.89	15.45	16.03	15.31	16.18
Magnesium, Mg (% wt.)	25.20	24.95	25.45	24.71	25.70	24.46	25.94
Manganese, Mn (% wt.)	0.063	0.060	0.066	0.057	0.069	0.054	0.072
Sodium, Na (% wt.)	0.079	0.052	0.105	0.026	0.132	IND	IND
Phosphorous, P (% wt.)	~0.005	IND	IND	IND	IND	IND	IND
Sulphur, S (% wt.)	0.064	0.056	0.072	0.047	0.081	0.039	0.089
Silicon, Si (% wt.)	16.31	16.01	16.61	15.70	16.92	15.40	17.22
Titanium, Ti (% wt.)	0.019	0.016	0.023	0.012	0.027	0.008	0.031

IND - indeterminate

Table 16. Performance gates for lithophile trace elements by fusion ICPMS.

Constituent	Recommended value	1 $\sigma$		2 $\sigma$		3 $\sigma$	
		Low	High	Low	High	Low	High
Barium, Ba (ppm)	6.5	5.1	7.8	3.8	9.1	2.5	10.4
Cerium, Ce (ppm)	0.9	0.7	1.1	0.5	1.3	0.3	1.5
Dysprosium, Dy (ppm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Erbium, Er (ppm)	~ 0.1	IND	IND	IND	IND	IND	IND
Europium, Eu (ppm)	< 0.1	IND	IND	IND	IND	IND	IND
Gadolinium, Gd (ppm)	~ 0.1	IND	IND	IND	IND	IND	IND
Holmium, Ho (ppm)	< 0.1	IND	IND	IND	IND	IND	IND
Lanthanium, La (ppm)	0.6	0.5	0.7	0.4	0.8	0.3	0.9
Lutetium, Lu (ppm)	< 0.05	IND	IND	IND	IND	IND	IND
Neodymium, Nd (ppm)	~ 0.5	IND	IND	IND	IND	IND	IND
Niobium, Nb (ppm)	< 1	IND	IND	IND	IND	IND	IND
Praseodymium, Pr (ppm)	0.11	0.10	0.12	0.09	0.13	0.08	0.14
Rubidium, Rb (ppm)	~ 0.7	IND	IND	IND	IND	IND	IND
Samarium, Sm (ppm)	~ 0.1	IND	IND	IND	IND	IND	IND
Strontium, Sr (ppm)	3.9	3.6	4.2	3.2	4.6	2.9	4.9
Terbium, Tb (ppm)	< 2	IND	IND	IND	IND	IND	IND
Thorium, Th (ppm)	< 1	IND	IND	IND	IND	IND	IND
Thulium, Tm (ppm)	< 0.05	IND	IND	IND	IND	IND	IND
Tin, Sn (ppm)	< 1	IND	IND	IND	IND	IND	IND
Uranium, U (ppm)	< 0.5	IND	IND	IND	IND	IND	IND
Ytterbium, Yb (ppm)	~ 0.1	IND	IND	IND	IND	IND	IND
Yttrium, Y (ppm)	0.8	0.7	0.9	0.6	1.0	0.4	1.1
Zirconium, Zr (ppm)	6.3	4.6	8.0	3.0	9.6	1.3	11.3

IND - indeterminate

Performance gates have been calculated for one, two and three standard deviations of the accepted pool of certification data and are presented in Tables 13-16. As a guide these intervals may be regarded as informational ( $1\sigma$ ), warning or rejection for multiple outliers ( $2\sigma$ ), or rejection for individual outliers ( $3\sigma$ ) in QC monitoring although their precise application should be at the discretion of the QC manager concerned.

## PARTICIPATING LABORATORIES

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 SGS, Welshpool, WA, Australia  
 Ultra Trace, Cannington, WA, Australia

## PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

The reference material OREAS 70P has been prepared and certified and is supplied by:

*Ore Research & Exploration Pty Ltd*  
 6-8 Gatwick Road  
 Bayswater North VIC 3153  
 AUSTRALIA

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It has been packaged in unit sizes of 50g.

## **INTENDED USE**

OREAS 70P is a secondary reference material intended for the QC monitoring of analytical data.

## **STABILITY AND STORAGE INSTRUCTIONS**

OREAS 70P has been prepared from a blend of ferruginous soils. It is therefore considered to have long-term stability under normal storage conditions.

## **INSTRUCTIONS FOR THE CORRECT USE OF THE REFERENCE MATERIAL**

The recommended values OREAS 70P refers to the concentration level of elements after drying at 105°C for a minimum of 6 hours and stored in a desiccator until weighed. If reference material OREAS 70P is not dried prior to weighing, values should be corrected to its hygroscopic moisture content.

## **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

## **REFERENCES**

ISO Guide 35 (1985), Certification of reference material - General and statistical principles.

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

## **APPENDIX A**

### **Analytical Results for fire assay and four-acid digest methods in OREAS 70P**

Table A1. Key to abbreviations used in Tables A2 – A17.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM <sup>3</sup>	percent deviation of lab mean from corrected mean of means
4A	four acid (HF-HNO <sub>3</sub> -HClO <sub>4</sub> -HCl) digestion
FA	fire assay (lead collection with a HCl leach)
OES	inductively coupled plasma optical emission spectrometry
MS	inductively coupled plasma mass spectrometry
XRF	x-ray fluorescence

Table A2. Analytical results for silver in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*MS	Lab E 4A*MS	LAB F 4A*MS
1	< 0.1	0.03	0.35	< 0.1	< 0.5	<0.1
2	< 0.1	0.03	0.40	< 0.1	< 0.5	<0.1
3	< 0.1	0.02	0.45	< 0.1	< 0.5	<0.1
4	< 0.1	0.02	0.30	< 0.1	< 0.5	<0.1
5	< 0.1	0.02	0.30	< 0.1	< 0.5	<0.1
Mean	< 0.1	0.02	0.36	< 0.1	< 0.5	<0.1
Median	< 0.1	0.02	0.35	< 0.1	< 0.5	<0.1
Std.Dev.	-	0.01	0.07	-	-	-
Rel.Std.Dev.	-	22.8%	18.1%	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table A3. Analytical results for arsenic in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*MS	Lab E 4A*MS	LAB F 4A*MS
1	< 1	1.6	2.5	3.0	2.0	1.7
2	2.0	1.6	2.5	3.0	4.0	<0.5
3	2.0	1.1	2.5	3.0	4.0	<0.5
4	< 1	1.2	3.0	3.0	2.0	<0.5
5	< 1	1.0	2.5	3.0	4.0	1.4
Mean	< 2	1.3	2.6	3.0	3.2	< 2
Median	2.0	1.2	2.5	3.0	4.0	1.6
Std.Dev.	0.0	0.3	0.2	0.0	1.1	0.2
Rel.Std.Dev.	-	21.8%	8.60%	0.00%	34.2%	-
PDM <sup>3</sup>	-	-48.5%	2.97%	18.8%	26.7%	-

Table A4. Analytical results for gold in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A FA*MS	LAB B FA*MS	Lab C FA*MS	LAB D FA*MS	Lab E FA*MS	LAB F FA*MS
1	14	13	10	8	12	15
2	14	11	11	9	16	14
3	13	12	10	8	16	15
4	13	12	10	9	20	18
5	13	12	10	8	17	14
Mean	13	12	10	8	16	15
Median	13	12	10	8	16	15
Std.Dev.	0.55	0.71	0.45	0.55	2.86	1.64
Rel.Std.Dev.	4.09%	5.89%	4.38%	6.52%	17.7%	10.8%
PDM <sup>3</sup>	6.63%	-4.51%	-18.8%	-33.2%	28.9%	21.0%



Table A5. Analytical results for bismuth in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*MS	Lab E 4A*MS	LAB F 4A*MS
1	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
2	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
3	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
4	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
5	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
Mean	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
Median	< 0.01	<0.01	< .1	< 0.1	< 0.1	<0.02
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table A6. Analytical results for cadmium in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*MS	Lab E 4A*MS	LAB F 4A*MS
1	< 0.1	<0.02	0.15	< 0.1	< 0.5	<0.1
2	0.20	<0.02	0.20	< 0.1	< 0.5	<0.1
3	< 0.1	<0.02	0.30	< 0.1	< 0.5	<0.1
4	< 0.1	<0.02	0.20	< 0.1	< 0.5	<0.1
5	< 0.1	<0.02	0.20	< 0.1	< 0.5	<0.1
Mean	0.2	<0.02	0.2	< 0.1	< 0.5	<0.1
Median	0.2	<0.02	0.2	< 0.1	< 0.5	<0.1
Std.Dev.	-	-	0.1	-	-	-
Rel.Std.Dev.	-	-	26.1%	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table A7. Analytical results for cobalt in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*OES	Lab E 4A*OES	LAB F 4A*OES
1	93	93	102	92	90	86
2	92	96	102	94	90	89
3	91	95	96	93	90	88
4	91	94	98	91	95	87
5	93	92	97	91	90	87
Mean	92	94	<b>99</b>	92	91	87
Median	92	94	98	92	90	87
Std.Dev.	1.0	1.5	2.9	1.3	2.2	1.1
Rel.Std.Dev.	1.04%	1.59%	2.91%	1.41%	2.46%	1.30%
PDM <sup>3</sup>	0.70%	2.78%	8.37%	1.03%	-0.28%	-4.23%

Table A8. Analytical results for chromium in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*OES	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*OES	Lab E 4A*OES	LAB F 4A*OES
1	<b>644</b>	620	701	725	830	792
2	722	623	686	715	820	810
3	745	614	718	745	860	805
4	768	623	690	720	830	817
5	760	618	<b>642</b>	755	830	810
Mean	728	<b>620</b>	687	732	<b>834</b>	807
Median	745	620	690	725	830	810
Std.Dev.	50.0	3.8	28.1	17.2	15.2	9.3
Rel.Std.Dev.	6.87%	0.61%	4.08%	2.35%	1.82%	1.15%
PDM <sup>3</sup>	-1.45%	-16.1%	-6.92%	-0.88%	12.9%	9.25%

Table A9. Analytical results for copper in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*OES	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*OES	Lab E 4A*OES	LAB F 4A*OES
1	1.0	3.4	2.1	6.0	5.0	3.0
2	< 1	3.3	2.2	8.0	< 5	2.0
3	< 1	2.7	2.2	< 5	< 5	2.0
4	< 1	3.1	2.3	< 5	5.0	2.0
5	1.0	4.0	<b>3.7</b>	5.0	< 5	2.0
Mean	<b>1.0</b>	3.3	2.5	<b>6.3</b>	<b>5.0</b>	2.2
Median	1.0	3.3	2.2	6.0	5.0	2.0
Std.Dev.	0.0	0.5	0.7	1.5	0.0	0.4
Rel.Std.Dev.	0.00%	14.4%	27.6%	24.1%	0.00%	20.3%
PDM <sup>3</sup>	-60.9%	29.0%	-3.06%	147%	95.4%	-14.0%

Table A10. Analytical results for sodium in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*OES	LAB B 4A*MS	Lab C 4A*MS	LAB D BF*XRD	Lab E BF*XRD	LAB F 4A*OES
1	481	500	405	1100	890	< 500
2	505	500	410	1000	890	< 500
3	581	400	415	1000	890	< 500
4	627	400	<b>445</b>	1200	890	< 500
5	674	400	410	1300	816	< 500
Mean	574	440	417	1120	875	< 500
Median	581	400	410	1100	890	< 500
Std.Dev.	81	55	16	130	33	-
Rel.Std.Dev.	14.1%	12.4%	3.85%	11.6%	3.79%	-
PDM <sup>3</sup>	-0.50%	-23.7%	-27.7%	94.3%	51.8%	-

Table A11. Analytical results for nickel in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*OES	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*OES	Lab E 4A*OES	LAB F 4A*OES
1	2663	2880	2891	2710	2680	2600
2	2683	2900	2967	2780	2750	2670
3	2675	2910	3060	2730	2760	2640
4	2657	2870	2983	2680	2780	2680
5	2702	2830	2919	2690	2690	2650
Mean	2676	2878	2964	2718	2732	2648
Median	2675	2880	2967	2710	2750	2650
Std.Dev.	18	31	65	40	44	31
Rel.Std.Dev.	0.66%	1.08%	2.20%	1.46%	1.62%	1.18%
PDM <sup>3</sup>	-1.99%	5.41%	8.56%	-0.45%	0.06%	-3.02%

Table A12. Analytical results for phosphorous in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*OES	LAB B 4A*MS	Lab C 4A*MS	LAB D AF*XRD	Lab E AF*XRD	LAB F 4A*OES
1	56	20	15	< 50	22	<1000
2	55	20	15	< 50	9	<1000
3	55	10	20	< 50	9	<1000
4	52	20	20	< 50	13	<1000
5	<b>56</b>	10	20	< 50	9	<1000
Mean	<b>54.8</b>	16.0	18.0	<b>&lt; 50</b>	12.2	<b>&lt;1000</b>
Median	55.0	20.0	20.0	< 50	8.7	<1000
Std.Dev.	1.6	5.5	2.7	-	5.7	-
Rel.Std.Dev.	3.00%	34.2%	15.2%	-	46.6%	-
PDM <sup>3</sup>	255%	3.85%	16.8%	-	-20.7%	-

Table A13. Analytical results for lead in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*MS	Lab E 4A*OES	LAB F 4A*MS
1	< 2	0.6	< .1	2.0	5.0	0.3
2	< 2	< 0.5	< .1	1.0	3.0	0.2
3	< 2	< 0.5	0.5	< 1	3.0	0.2
4	< 2	< 0.5	2.0	< 1	3.0	0.2
5	< 2	0.6	< .1	1.0	5.0	0.1
Mean	< 2	0.6	1.2	1.3	<b>3.8</b>	0.2
Median	< 2	0.6	1.2	1.0	3.0	0.2
Std.Dev.	-	0.0	1.1	0.6	1.1	0.1
Rel.Std.Dev.	-	0.00%	89.5%	43.30%	28.8%	35.3%
PDM <sup>3</sup>	-	-43.0%	16.4%	26.7%	260%	-81.0%

Table A14. Analytical results for palladium in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A FA*MS	LAB B FA*MS	Lab C FA*MS	LAB D FA*MS	Lab E FA*MS	LAB F FA*MS
1	< 1	1	< .5	1	1	< 1
2	< 1	< 1	< .5	1	2	< 1
3	< 1	< 1	< .5	1	< 1	< 1
4	< 1	< 1	< .5	< 0.5	< 1	< 1
5	< 1	1	< .5	2	2	< 1
Mean	< 1	1.0	< .5	1.1	1.7	< 1
Median	< 1	1.0	< .5	1.0	2.0	< 1
Std.Dev.	-	0.0	-	0.6	0.6	-
Rel.Std.Dev.	-	0.00%	-	55.9%	34.6%	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table A15. Analytical results for platinum in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A FA*MS	LAB B FA*MS	Lab C FA*MS	LAB D FA*MS	Lab E FA*MS	LAB F FA*MS
1	< 1	0.6	0.3	0.5	2.0	0.7
2	< 1	0.8	0.3	0.5	3.0	0.5
3	< 1	0.7	0.3	0.5	1.0	0.6
4	1.0	0.7	0.3	< 0.5	1.0	< 0.5
5	1.0	1.0	0.2	0.5	3.0	<b>1.7</b>
Mean	1.0	0.8	0.3	0.5	<b>2.0</b>	0.9
Median	1.0	0.7	0.3	0.5	2.0	0.7
Std.Dev.	0.0	0.2	0.0	0.0	1.0	0.6
Rel.Std.Dev.	0.00%	20.0%	16.0%	0.00%	50.0%	63.6%
PDM <sup>3</sup>	59.2%	21.0%	-55.4%	-20.4%	218%	39.3%

Table A16. Analytical results for antimony in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*MS	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*MS	Lab E 4A*OES	LAB F 4A*MS
1	<b>0.55</b>	<b>0.33</b>	0.50	0.60	0.80	0.50
2	0.50	0.20	0.55	0.60	0.80	0.60
3	0.49	0.17	0.50	0.60	0.80	0.50
4	0.49	0.18	0.55	0.60	0.60	0.60
5	0.50	0.19	0.50	0.60	0.60	0.60
Mean	0.5	0.2	0.5	0.6	0.7	0.6
Median	0.5	0.2	0.5	0.6	0.8	0.6
Std.Dev.	0.0	0.1	0.0	0.0	0.1	0.1
Rel.Std.Dev.	4.96%	30.8%	5.27%	0.00%	15.2%	9.78%
PDM <sup>3</sup>	-12.6%	-63.0%	-10.2%	3.63%	24.4%	-3.28%

Table A17. Analytical results for zinc in Mt Keith altered ultramafic SRM (refer Table A1 for abbreviations; values in ppm).

Replicate No.	Lab A 4A*OES	LAB B 4A*MS	Lab C 4A*MS	LAB D 4A*OES	Lab E 4A*OES	LAB F 4A*OES
1	37	35	37	31	35	38
2	33	34	36	33	35	37
3	32	34	35	32	35	34
4	35	34	39	31	35	38
5	35	34	36	32	30	38
Mean	34.4	34.2	36.4	31.8	34.0	37.0
Median	35.0	34.0	36.0	32.0	35.0	38.0
Std.Dev.	1.9	0.4	1.4	0.8	2.2	1.7
Rel.Std.Dev.	5.67%	1.31%	3.81%	2.63%	6.58%	4.68%
PDM <sup>3</sup>	-0.67%	-1.25%	5.10%	-8.18%	-1.83%	6.83%

## **APPENDIX B**

### **Analytical Results for aqua regia digest methods in OREAS 70P**

Table B1. Key to abbreviations used in Tables B2 – B11.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM <sup>3</sup>	percent deviation of lab mean from corrected mean of means
AR	aqua regia digestion
OES	inductively coupled plasma optical emission spectrometry
MS	inductively coupled plasma mass spectrometry

Table B2. Analytical results for silver in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*MS	LAB F AR*MS
1	<b>0.06</b>	<b>0.05</b>	0.02	< 0.2	< 0.05	<b>0.04</b>
2	0.02	0.02	0.02	< 0.2	< 0.05	0.02
3	0.02	0.03	0.02	< 0.2	< 0.05	0.02
4	0.03	0.02	0.02	< 0.2	< 0.05	0.02
5	0.03	0.02	0.02	< 0.2	< 0.05	0.02
Mean	0.03	0.03	0.02	< 0.2	< 0.05	0.02
Median	0.03	0.0	0.0	< 0.2	< 0.05	0.0
Std.Dev.	0.02	0.01	0.00	-	-	0.01
Rel.Std.Dev.	51.3%	46.6%	10.6%	-	-	37.3%
PDM <sup>3</sup>	49.7%	31.0%	-15.8%	-	-	12.3%

Table B3. Analytical results for arsenic in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*MS	LAB F AR*MS
1	1.4	<b>5.2</b>	<b>1.5</b>	13.0	1.6	2.0
2	1.6	2.0	1.6	12.0	1.8	1.9
3	<b>0.6</b>	1.8	1.7	12.0	2.0	1.9
4	1.3	1.6	1.7	14.0	1.8	1.8
5	1.1	1.7	1.7	13.0	1.8	1.7
Mean	1.2	2.5	1.6	<b>12.8</b>	1.8	1.9
Median	1.3	1.8	1.7	13.0	1.8	1.9
Std.Dev.	0.4	1.5	0.1	0.8	0.1	0.1
Rel.Std.Dev.	31.7%	62.6%	6.25%	6.54%	7.86%	6.13%
PDM <sup>3</sup>	-32.1%	39.1%	-9.5%	624%	1.80%	5.20%

Table B4. Analytical results for gold in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B -	Lab C AR*MS	LAB D -	Lab E AR*MS	LAB F AR*MS
1	10.0	N/A	10.5	N/A	15.0	16.0
2	12.0	N/A	10.5	N/A	15.0	13.0
3	9.0	N/A	11.8	N/A	16.0	14.0
4	9.0	N/A	11.9	N/A	14.0	13.0
5	11.0	N/A	10.9	N/A	15.0	14.0
Mean	10.2	-	11.1	-	15.0	14.0
Median	10.0	-	10.9	-	15.0	14.0
Std.Dev.	1.3	-	0.7	-	0.7	1.2
Rel.Std.Dev.	12.8%	-	6.3%	-	4.71%	8.75%
PDM <sup>3</sup>	-18.9%	-	-11.9%	-	19.3%	11.4%

Table B5. Analytical results for bismuth in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*MS	LAB F AR*MS
1	< 0.01	<b>0.01</b>	< 0.02	< 20	< 0.02	< 0.02
2	< 0.01	< 0.01	< 0.02	< 20	< 0.02	< 0.02
3	< 0.01	< 0.01	< 0.02	< 20	< 0.02	< 0.02
4	< 0.01	< 0.01	< 0.02	< 20	< 0.02	< 0.02
5	< 0.01	< 0.01	< 0.02	< 20	< 0.02	< 0.02
Mean	< 0.01	< 0.01	< 0.02	< 20	< 0.02	< 0.02
Median	< 0.01	< 0.01	< 0.02	< 20	< 0.02	< 0.02
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table B6. Analytical results for cadmium in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*MS	LAB F AR*MS
1	< 0.05	0.07	< 0.01	< 0.1	< 0.05	< 0.02
2	< 0.05	0.01	< 0.01	< 0.1	< 0.05	< 0.02
3	< 0.05	0.01	0.01	< 0.1	< 0.05	< 0.02
4	< 0.05	0.01	< 0.01	< 0.1	< 0.05	< 0.02
5	< 0.05	0.01	< 0.01	< 0.1	< 0.05	< 0.02
Mean	< 0.05	0.02	< 0.01	< 0.1	< 0.05	< 0.02
Median	< 0.05	0.01	< 0.01	< 0.1	< 0.05	< 0.02
Std.Dev.	-	0.03	-	-	-	-
Rel.Std.Dev.	-	122%	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table B7. Analytical results for cobalt in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*OES	LAB F AR*MS
1	82.4	85.6	90.8	78.0	84.0	76.0
2	84.3	86.8	89.0	77.0	85.0	75.0
3	81.3	86.0	91.5	78.0	85.0	74.0
4	84.6	85.2	92.8	77.0	83.0	73.0
5	82.2	84.8	89.9	78.0	85.0	74.0
Mean	83.0	85.7	90.8	77.6	84.4	74.4
Median	82.4	85.6	90.8	78.0	85.0	74.0
Std.Dev.	1.4	0.8	1.5	0.5	0.9	1.1
Rel.Std.Dev.	1.72%	0.90%	1.62%	0.71%	1.06%	1.53%
PDM <sup>3</sup>	0.39%	3.68%	9.84%	-6.09%	2.14%	-9.97%

Table B8. Analytical results for chromium in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*OES	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*OES	LAB F AR*MS
1	687	715	823	710	720	709
2	685	711	807	680	760	698
3	674	716	834	670	735	688
4	686	705	<b>869</b>	710	740	674
5	690	705	813	710	755	688
Mean	684	710	<b>829</b>	696	742	691
Median	686	711	823	710	740	688
Std.Dev.	6.1	5.3	24.6	19.5	16.0	13.0
Rel.Std.Dev.	0.89%	0.74%	2.97%	2.80%	2.16%	1.88%
PDM <sup>3</sup>	-2.90%	0.79%	17.68%	-1.25%	5.27%	-1.91%

Table B9. Analytical results for copper in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*OES	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*OES	LAB F AR*MS
1	< 1	<b>6.2</b>	1.9	9.0	3.0	2.0
2	< 1	3.5	<b>1.8</b>	11.0	3.5	2.0
3	< 1	3.2	1.9	13.0	3.5	2.0
4	< 1	3.2	1.9	12.0	3.0	2.0
5	< 1	3.5	1.9	<b>7.0</b>	3.0	2.0
Mean	< 1	3.9	1.9	<b>10.4</b>	3.2	2.0
Median	< 1	3.5	1.9	11.0	3.0	2.0
Std.Dev.	-	1.3	0.1	2.4	0.3	0.0
Rel.Std.Dev.	-	32.7%	3.44%	23.2%	8.56%	0.00%
PDM <sup>3</sup>	-	50.4%	-28.9%	299%	22.7%	-23.3%

Table B10. Analytical results for nickel in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*OES	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*OES	LAB F AR*MS
1	2372	2590	2716	2200	2480	2270
2	2364	2570	2687	2150	2550	2300
3	2328	2620	2780	2200	2550	2250
4	2368	2560	2693	2150	2560	2200
5	2377	2540	2738	2200	2510	2280
Mean	2362	2576	2723	2180	2530	2260
Median	2368	2570	2716	2200	2550	2270
Std.Dev.	19	30	38	27	34	38
Rel.Std.Dev.	0.83%	1.18%	1.39%	1.26%	1.34%	1.68%
PDM <sup>3</sup>	-3.14%	5.64%	11.7%	-10.6%	3.75%	-7.32%

Table B11. Analytical results for lead in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*MS	LAB F AR*MS
1	< 1	<b>5.40</b>	0.09	< 20	< 1	< 1
2	< 1	0.50	0.09	< 20	< 1	< 1
3	< 1	0.20	0.09	< 20	< 1	< 1
4	< 1	0.20	0.11	< 20	< 1	< 1
5	< 1	0.50	0.08	< 20	< 1	< 1
Mean	< 1	1.36	0.09	< 20	< 1	< 1
Median	< 1	0.50	0.09	< 20	< 1	< 1
Std.Dev.	-	2.3	0.0	-	-	-
Rel.Std.Dev.	-	166%	10.4%	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table B12. Analytical results for palladium in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B -	Lab C AR*MS	LAB D -	Lab E AR*MS	LAB F AR*MS
1	< 10	N/A	< 10	N/A	< 10	< 1
2	< 10	N/A	< 10	N/A	< 10	< 1
3	< 10	N/A	< 10	N/A	< 10	< 1
4	< 10	N/A	< 10	N/A	< 10	< 1
5	< 10	N/A	< 10	N/A	< 10	< 1
Mean	< 10	-	< 10	N/A	< 10	< 1
Median	< 10	-	< 10	N/A	< 10	< 1
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-



Table B13. Analytical results for platinum in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B -	Lab C AR*MS	LAB D -	Lab E AR*MS	LAB F AR*MS
1	< 5	N/A	< 2	N/A	<5	0.7
2	< 5	N/A	< 2	N/A	<5	0.5
3	< 5	N/A	< 2	N/A	<5	0.6
4	< 5	N/A	< 2	N/A	<5	< 0.5
5	< 5	N/A	< 2	N/A	<5	1.7
Mean	< 5	-	< 2	-	<5	0.9
Median	< 5	-	< 2	-	<5	0.7
Std.Dev.	-	-	-	-	-	0.6
Rel.Std.Dev.	-	-	-	-	-	63.5%
PDM <sup>3</sup>	-	-	-	-	-	-

Table B14. Analytical results for antimony in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*MS	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*MS	LAB F AR*MS
1	<b>0.23</b>	<b>0.33</b>	0.16	0.20	0.06	<0.1
2	0.20	0.20	0.17	0.20	0.04	<0.1
3	0.17	0.17	0.17	0.10	0.04	<0.1
4	0.18	0.18	0.16	0.10	0.04	<0.1
5	0.19	0.19	0.16	0.10	0.04	<0.1
Mean	0.19	0.21	0.16	0.14	<b>0.04</b>	<0.1
Median	0.19	0.19	0.16	0.10	0.04	<0.1
Std.Dev.	0.02	0.07	0.00	0.05	0.01	-
Rel.Std.Dev.	11.9%	30.7%	1.69%	39.1%	20.3%	-
PDM <sup>3</sup>	15.5%	27.4%	-3.57%	-16.7%	-73.8%	-

Table B15. Analytical results for zinc in Mt Keith altered ultramafic SRM (refer Table B1 for abbreviations; values in ppm).

Replicate No.	Lab A AR*OES	LAB B AR*MS	Lab C AR*MS	LAB D AR*OES	Lab E AR*OES	LAB F AR*MS
1	23	40	33	36	38	32
2	23	34	32	33	39	31
3	25	35	33	31	38	31
4	24	34	34	36	37	30
5	24	34	32	31	38	31
Mean	<b>23.8</b>	35.4	32.9	33.4	38.0	31.0
Median	24.0	34.0	33.2	33.0	38.0	31.0
Std.Dev.	0.8	2.6	0.8	2.5	0.7	0.7
Rel.Std.Dev.	3.52%	7.37%	2.47%	7.51%	1.86%	2.28%
PDM <sup>3</sup>	-30.3%	3.71%	-3.73%	-2.14%	11.3%	-9.18%

## **APPENDIX C**

### **Analytical Results for major elements by fusion methods in OREAS 70P**

Table C1. Key to abbreviations used in Tables C2 – C11.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM <sup>3</sup>	percent deviation of lab mean from corrected mean of means
AF	alkali fusion
BF	Lithium metaborate fusion
Leco	Leco furnace method
LOI	Grav method after heating to 1000°C
OES	inductively coupled plasma optical emission spectrometry
MS	inductively coupled plasma mass spectrometry
XRF	x-ray fluorescence

Table C2. Analytical results for aluminium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	0.32	0.28	0.32	0.32	0.37	0.37
2	<b>0.41</b>	0.29	0.33	0.31	0.37	0.37
3	0.31	0.29	0.33	0.31	0.36	0.34
4	0.36	0.30	0.34	0.31	0.37	0.36
5	0.32	0.28	0.33	0.31	0.38	0.34
Mean	0.34	0.29	0.33	0.31	0.37	0.36
Median	0.32	0.29	0.33	0.31	0.37	0.36
Std.Dev.	0.04	0.01	0.01	0.00	0.01	0.02
Rel.Std.Dev.	12.1%	2.41%	1.55%	1.43%	1.64%	4.26%
PDM <sup>3</sup>	4.26%	-13.0%	-0.36%	-5.44%	11.7%	7.90%

Table C3. Analytical results for carbon in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A Leco	LAB B Leco	Lab C BF*OES	LAB D Leco	Lab E Leco	LAB F Leco
1	0.38	0.41	0.40	0.31	0.40	0.40
2	0.36	0.41	0.41	0.33	0.44	0.37
3	0.33	0.43	0.41	0.34	0.43	0.40
4	0.38	0.43	0.41	0.34	0.38	0.42
5	0.34	0.45	0.39	0.31	0.41	0.41
Mean	0.36	0.43	0.40	0.32	0.41	0.40
Median	0.36	0.43	0.41	0.33	0.41	0.40
Std.Dev.	0.02	0.02	0.01	0.02	0.02	0.02
Rel.Std.Dev.	6.37%	3.93%	2.08%	5.11%	5.79%	4.68%
PDM <sup>3</sup>	-7.53%	10.0%	4.09%	-16.3%	6.41%	3.31%

Table C4. Analytical results for calcium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	0.30	0.24	0.25	0.25	0.21	0.25
2	0.30	0.25	0.24	0.25	0.21	<b>0.31</b>
3	0.30	0.26	0.25	0.25	0.21	0.27
4	0.30	0.26	0.25	0.25	0.21	0.25
5	0.30	0.24	0.25	0.25	0.21	0.25
Mean	<b>0.30</b>	0.25	0.25	0.25	<b>0.21</b>	0.27
Median	0.30	0.25	0.25	0.25	0.21	0.25
Std.Dev.	0.00	0.01	0.00	0.00	0.00	0.03
Rel.Std.Dev.	0.00%	2.86%	1.21%	0.00%	1.53%	9.80%
PDM <sup>3</sup>	19.7%	-0.18%	-1.32%	-0.25%	-16.7%	6.13%

Table C5. Analytical results for chromium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	0.108	0.089	0.087	0.100	0.104	0.100
2	0.105	0.082	0.086	0.110	0.104	0.100
3	0.105	0.089	0.088	0.110	0.104	0.100
4	0.104	0.089	0.086	0.100	0.104	0.110
5	0.105	0.082	0.089	0.110	0.104	0.100
Mean	0.105	0.086	0.087	0.106	0.104	0.102
Median	0.105	0.089	0.087	0.110	0.104	0.100
Std.Dev.	0.001	0.004	0.001	0.005	0.000	0.004
Rel.Std.Dev.	1.29%	4.35%	1.49%	5.17%	0.00%	4.38%
PDM <sup>3</sup>	7.14%	-12.5%	-11.6%	7.67%	5.60%	3.61%

Table C6. Analytical results for iron in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	3.78	4.80	3.90	4.00	4.06	4.23
2	3.78	4.79	3.91	4.00	4.06	4.03
3	3.95	4.83	3.91	4.00	4.05	4.04
4	3.72	4.80	3.89	4.00	4.06	4.11
5	3.89	4.80	3.89	4.00	4.07	4.12
Mean	3.82	<b>4.81</b>	3.90	4.00	4.06	4.11
Median	3.78	4.80	3.90	4.00	4.06	4.11
Std.Dev.	0.09	0.01	0.01	0.00	0.01	0.08
Rel.Std.Dev.	2.44%	0.26%	0.25%	0.00%	0.20%	1.95%
PDM <sup>3</sup>	-3.87%	20.8%	-1.94%	0.56%	2.03%	3.22%

Table C7. Analytical results for potassium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	< 0.02	0.025	< 0.02	< 0.01	0.008	<0.05
2	< 0.02	0.025	< 0.02	< 0.01	0.008	<0.05
3	< 0.02	0.025	< 0.02	< 0.01	< 0.01	<0.05
4	0.02	0.025	< 0.02	< 0.01	0.008	<0.05
5	< 0.02	0.033	< 0.02	< 0.01	0.008	<0.05
Mean	< 0.02	0.027	< 0.02	< 0.01	0.008	<0.05
Median	< 0.02	0.025	< 0.02	< 0.01	0.008	<0.05
Std.Dev.	-	0.0	-	-	0.0	-
Rel.Std.Dev.	-	14.0%	-	-	0.00%	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table C8. Analytical results for loss on ignition volatiles in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A LOI	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E LOI	LAB F BF*OES
1	15.96	15.70	16.80	15.87	15.58	15.53
2	15.81	15.70	16.60	15.87	15.63	15.50
3	15.91	15.80	16.60	15.84	15.73	15.55
4	15.97	15.85	16.80	15.84	15.63	15.62
5	15.79	15.85	16.80	<b>15.70</b>	15.68	15.50
Mean	15.89	15.78	<b>16.72</b>	15.82	15.65	15.54
Median	15.91	15.80	16.80	15.84	15.63	15.53
Std.Dev.	0.1	0.1	0.1	0.1	0.1	0.0
Rel.Std.Dev.	0.53%	0.48%	0.66%	0.45%	0.36%	0.32%
PDM <sup>3</sup>	0.92%	0.24%	6.21%	0.52%	-0.59%	-1.29%

Table C9. Analytical results for magnesium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	25.69	25.26	24.95	25.21	25.09	27.38
2	25.57	25.24	24.89	25.22	25.09	27.34
3	25.62	25.25	24.98	25.19	25.03	<b>27.58</b>
4	25.62	25.22	24.80	25.28	25.03	27.34
5	<b>25.41</b>	25.22	24.76	25.16	25.03	27.38
Mean	25.58	25.24	24.88	25.21	25.05	<b>27.40</b>
Median	25.62	25.24	24.89	25.21	25.03	27.38
Std.Dev.	0.105	0.018	0.092	0.044	0.033	0.100
Rel.Std.Dev.	0.41%	0.07%	0.37%	0.18%	0.13%	0.37%
PDM <sup>3</sup>	1.51%	0.15%	-1.29%	0.04%	-0.58%	8.74%

Table C10. Analytical results for manganese in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	0.065	0.093	0.062	0.070	0.062	0.070
2	0.064	0.093	0.062	0.060	0.062	0.060
3	0.064	0.093	0.062	0.060	0.062	0.060
4	0.063	0.093	0.062	0.060	0.062	0.070
5	0.063	0.093	0.062	0.060	0.062	0.060
Mean	0.064	0.093	0.062	0.062	0.062	0.064
Median	0.064	0.093	0.062	0.060	0.062	0.060
Std.Dev.	0.001	0.000	0.000	0.004	0.000	0.005
Rel.Std.Dev.	0.92%	0.00%	0.00%	7.21%	0.00%	8.56%
PDM <sup>3</sup>	1.68%	48.1%	-1.24%	-1.19%	-1.24%	2.00%

Table C11. Analytical results for sodium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E BF*XRF	LAB F BF*OES
1	0.048	0.089	0.041	0.110	0.089	<0.05
2	0.051	0.104	0.033	0.100	0.089	<0.05
3	0.058	0.096	0.052	0.100	0.089	<0.05
4	0.063	0.089	0.048	0.120	0.089	<0.05
5	0.067	0.089	0.045	0.130	0.082	<0.05
Mean	0.057	0.093	0.044	0.112	0.088	<0.05
Median	0.058	0.089	0.045	0.110	0.089	<0.05
Std.Dev.	0.008	0.007	0.007	0.013	0.003	-
Rel.Std.Dev.	14.1%	7.1%	16.3%	11.6%	3.79%	-
PDM <sup>3</sup>	-27.2%	18.6%	-44.5%	42.1%	11.0%	-

Table C12. Analytical results for phosphorous in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in wt. %).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	0.0056	0.0044	< 0.005	< 0.005	0.0022	<0.1
2	0.0055	0.0044	0.0044	< 0.005	0.0009	<0.1
3	0.0055	0.0044	< 0.005	< 0.005	0.0009	<0.1
4	0.0052	<b>0.00873</b>	< 0.005	< 0.005	0.0013	<0.1
5	0.0056	0.0044	< 0.005	< 0.005	0.0009	<0.1
Mean	0.0055	0.0052	0.0044	<b>&lt; 0.005</b>	<b>0.0012</b>	<b>&lt;0.1</b>
Median	0.0055	0.0044	0.0044	< 0.005	0.0009	<0.1
Std.Dev.	0.000	0.002	-	-	0.001	-
Rel.Std.Dev.	3.00%	37.3%	-	-	46.6%	-
PDM <sup>3</sup>	15.7%	10.6%	-7.85%	-	-74.2%	-

Table C13. Analytical results for sulphur in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in ppm).

Replicate No.	Lab A Leco	LAB B Leco	Lab C BF*OES	LAB D Leco	Lab E Leco	LAB F Leco
1	0.055	0.020	0.070	0.047	0.070	0.070
2	0.055	0.010	0.065	0.056	0.070	0.080
3	0.054	0.010	0.070	0.059	0.070	0.070
4	<b>0.061</b>	0.010	0.065	0.060	0.070	0.070
5	0.058	0.010	0.070	0.050	0.070	0.070
Mean	0.06	<b>0.01</b>	0.07	0.05	0.07	0.07
Median	0.06	0.01	0.07	0.06	0.07	0.07
Std.Dev.	0.00	0.00	0.00	0.01	0.00	0.00
Rel.Std.Dev.	5.09%	37.3%	4.03%	10.4%	0.00%	6.21%
PDM <sup>3</sup>	-11.5%	-81.2%	6.28%	-15.0%	9.41%	12.5%

Table C14. Analytical results for silicon in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	16.50	15.77	16.19	16.47	16.69	17.24
2	16.20	15.80	16.27	16.44	16.69	17.28
3	16.30	15.80	16.23	16.45	16.69	17.35
4	16.40	15.80	16.27	16.42	16.64	17.23
5	16.40	15.83	16.30	16.51	16.69	17.27
Mean	16.36	15.80	16.25	16.46	16.68	<b>17.27</b>
Median	16.40	15.80	16.27	16.45	16.69	17.27
Std.Dev.	0.11	0.02	0.04	0.03	0.02	0.05
Rel.Std.Dev.	0.70%	0.12%	0.25%	0.21%	0.13%	0.27%
PDM <sup>3</sup>	0.31%	-3.13%	-0.36%	0.91%	2.27%	5.91%

Table C15. Analytical results for titanium in Mt Keith altered ultramafic SRM (refer Table C1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*OES	LAB B BF*XRF	Lab C BF*OES	LAB D BF*XRF	Lab E AF*XRF	LAB F BF*OES
1	< 0.01	0.048	0.018	0.020	0.024	0.020
2	< 0.01	0.042	0.018	0.020	0.024	0.020
3	< 0.01	0.048	0.018	0.020	0.024	0.020
4	< 0.01	0.042	0.018	0.010	0.024	0.020
5	< 0.01	0.042	0.018	0.010	0.024	0.020
Mean	< 0.01	<b>0.044</b>	0.018	0.016	0.024	0.020
Median	< 0.01	0.042	0.018	0.020	0.024	0.020
Std.Dev.	-	0.003	0.000	0.005	0.000	0.000
Rel.Std.Dev.	-	7.40%	0.00%	34.2%	0.00%	0.00%
PDM <sup>3</sup>	-	128%	-7.73%	-17.9%	23.0%	2.61%

## **APPENDIX D**

### **Analytical Results for lithophile trace elements by fusion methods in OREAS 70P**

Table D1. Key to abbreviations used in Tables D2 – D11.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM <sup>3</sup>	percent deviation of lab mean from corrected mean of means
AF	alkali fusion
BF	Lithium metaborate fusion
MS	inductively coupled plasma mass spectrometry

Table D2. Analytical results for barium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	7.0	6.1	< 5	< 10	< 10	7.6
2	5.0	5.9	6.5	< 10	10.0	8.0
3	5.0	5.8	8.0	< 10	< 10	7.7
4	5.0	<b>5.2</b>	< 5	< 10	< 10	8.5
5	5.0	6.0	< 5	11.0	10.0	8.2
Mean	5.4	5.8	7.3	<b>&lt; 10</b>	<b>&lt; 10</b>	8.0
Median	5.0	5.9	7.3	11.0	10.0	8.0
Std.Dev.	0.9	0.4	1.1	-	0.0	0.4
Rel.Std.Dev.	16.6%	6.10%	14.6%	-	0.00%	4.59%
PDM <sup>3</sup>	-18.8%	-12.8%	9.02%	65.4%	50.4%	20.3%

Table D3. Analytical results for cerium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E -	LAB F AF*MS
1	0.9	1.3	1.1	0.6	N/A	1.1
2	0.8	1.1	1.0	0.7	N/A	1.1
3	0.8	1.1	1.0	0.6	N/A	1.0
4	0.8	1.0	1.0	0.5	N/A	1.1
5	0.8	1.1	1.0	0.6	N/A	1.0
Mean	0.8	1.1	1.0	0.6	-	1.1
Median	0.8	1.1	1.0	0.6	-	1.1
Std.Dev.	0.0	0.1	0.0	0.1	-	0.1
Rel.Std.Dev.	5.45%	9.78%	4.56%	11.8%	-	5.17%
PDM <sup>3</sup>	-10.5%	22.3%	6.99%	-34.5%	-	15.7%

Table D4. Analytical results for dysprosium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.1	0.10	0.13	N/A	N/A	0.10
2	< 0.1	0.10	0.13	N/A	N/A	0.10
3	< 0.1	0.10	0.14	N/A	N/A	0.10
4	0.10	0.10	0.13	N/A	N/A	0.10
5	< 0.1	0.10	0.12	N/A	N/A	0.10
Mean	<b>0.10</b>	0.10	0.13	-	-	0.10
Median	0.10	0.10	0.13	-	-	0.10
Std.Dev.	-	0.00	0.01	-	-	0.00
Rel.Std.Dev.	-	0.00%	4.49%	-	-	0.00%
PDM <sup>3</sup>	-8.26%	-8.26%	16.5%	-	-	-8.26%



Table D5. Analytical results for erbium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.1	0.10	0.08	N/A	N/A	<0.1
2	< 0.1	0.10	0.09	N/A	N/A	<0.1
3	< 0.1	0.10	0.11	N/A	N/A	<0.1
4	< 0.1	0.10	0.09	N/A	N/A	<0.1
5	< 0.1	0.10	0.11	N/A	N/A	<0.1
Mean	-	0.10	0.09	-	-	-
Median	-	0.10	0.09	-	-	-
Std.Dev.	-	0.00	0.01	-	-	-
Rel.Std.Dev.	-	0.00%	13.77%	-	-	-
PDM <sup>3</sup>	-	3.09%	-3.09%	-	-	-

Table D6. Analytical results for europium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.1	<0.1	< .05	N/A	N/A	<0.1
2	< 0.1	0.10	< .05	N/A	N/A	<0.1
3	< 0.1	<0.1	< .05	N/A	N/A	<0.1
4	< 0.1	<0.1	< .05	N/A	N/A	<0.1
5	< 0.1	<0.1	< .05	N/A	N/A	<0.1
Mean	-	0.1	< .05	-	-	<0.1
Median	-	0.1	< .05	-	-	<0.1
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D7. Analytical results for gadolinium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	0.10	0.30	0.13	N/A	N/A	0.10
2	< 0.1	0.20	0.13	N/A	N/A	0.10
3	< 0.1	0.20	0.13	N/A	N/A	0.10
4	< 0.1	0.20	0.13	N/A	N/A	0.10
5	< 0.1	0.20	0.18	N/A	N/A	0.10
Mean	<b>0.1</b>	0.2	0.1	-	-	0.1
Median	0.1	0.2	0.1	-	-	0.1
Std.Dev.	-	0.0	0.0	-	-	0.0
Rel.Std.Dev.	-	20.3%	17.1%	-	-	0.00%
PDM <sup>3</sup>	-16.0%	84.9%	16.0%	-	-	-16.0%

Table D8. Analytical results for holmium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
2	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
3	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
4	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
5	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
Mean	< 0.1	<0.1	< 0.05	-	-	<0.1
Median	< 0.1	<0.1	< 0.05	-	-	<0.1
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D9. Analytical results for lanthanum in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E -	LAB F AF*MS
1	0.6	0.8	0.6	0.7	N/A	0.5
2	0.5	0.7	0.6	0.7	N/A	0.5
3	0.5	0.7	0.5	0.6	N/A	0.5
4	0.5	0.7	0.6	0.6	N/A	0.5
5	0.5	0.7	< 0.5	1.4	N/A	0.5
Mean	0.5	0.7	0.6	0.8	-	0.5
Median	0.5	0.7	0.6	0.7	-	0.5
Std.Dev.	0.0	0.0	0.0	0.3	-	0.0
Rel.Std.Dev.	8.60%	6.21%	8.51%	42.4%	-	0.00%
PDM <sup>3</sup>	-11.9%	21.9%	-4.74%	35.5%	-	-15.3%

Table D10. Analytical results for lutetium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.05	<0.1	0.020	N/A	N/A	<0.1
2	< 0.05	<0.1	0.015	N/A	N/A	<0.1
3	< 0.05	<0.1	0.020	N/A	N/A	<0.1
4	< 0.05	<0.1	< 0.01	N/A	N/A	<0.1
5	< 0.05	<0.1	< 0.01	N/A	N/A	<0.1
Mean	< 0.05	<0.1	0.018	-	-	<0.1
Median	< 0.05	<0.1	0.020	-	-	<0.1
Std.Dev.	-	-	0.003	-	-	-
Rel.Std.Dev.	-	-	15.7%	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D11. Analytical results for niobium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	< 10	<1	< 0.5	2	< 1	<1
2	< 10	<1	< 0.5	3	< 1	<1
3	< 10	<1	< 0.5	3	< 1	<1
4	< 10	<1	< 0.5	1	< 1	<1
5	< 10	<1	< 0.5	2	< 1	<1
Mean	< 10	<1	< 0.5	2.2	< 1	<1
Median	< 10	<1	< 0.5	2.0	< 1	<1
Std.Dev.	-	-	-	0.8	-	-
Rel.Std.Dev.	-	-	-	38.0%	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D12. Analytical results for neodymium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	0.50	0.50	0.60	N/A	N/A	<0.5
2	0.60	0.50	< 0.4	N/A	N/A	<0.5
3	0.40	<0.5	< 0.4	N/A	N/A	<0.5
4	0.40	0.50	< 0.4	N/A	N/A	<0.5
5	0.30	0.50	< 0.4	N/A	N/A	<0.5
Mean	0.4	0.5	0.6	-	-	<0.5
Median	0.4	0.5	0.6	-	-	<0.5
Std.Dev.	0.1	0.0	-	-	-	-
Rel.Std.Dev.	25.9%	0.00%	-	-	-	-
PDM <sup>3</sup>	-6.38%	6.38%	27.7%	-	-	-

Table D13. Analytical results for praseodymium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	0.11	0.10	0.12	N/A	N/A	0.10
2	0.12	0.10	0.11	N/A	N/A	0.10
3	0.12	0.10	0.11	N/A	N/A	0.10
4	0.12	0.10	0.14	N/A	N/A	0.10
5	0.11	0.10	0.11	N/A	N/A	0.10
Mean	0.12	0.10	0.12	-	-	0.10
Median	0.12	0.10	0.11	-	-	0.10
Std.Dev.	0.01	0.00	0.01	-	-	0.00
Rel.Std.Dev.	4.72%	0.00%	9.36%	-	-	0.00%
PDM <sup>3</sup>	7.16%	-7.62%	8.08%	-	-	-7.62%

Table D14. Analytical results for rubidium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	1.30	0.50	< 0.5	0.40	< 2	0.70
2	0.80	0.60	0.70	0.40	< 2	0.80
3	< 0.5	0.50	0.65	0.80	< 2	0.70
4	< 0.5	0.50	1.20	0.40	< 2	0.70
5	< 0.5	0.50	< 0.5	0.30	< 2	0.90
Mean	1.05	0.52	0.85	0.46	< 2	0.76
Median	1.05	0.50	0.70	0.40	< 2	0.70
Std.Dev.	0.35	0.04	0.30	0.19	-	0.09
Rel.Std.Dev.	-	8.60%	35.8%	42.4%	-	11.8%
PDM <sup>3</sup>	-100%	-28.6%	16.8%	-36.8%	-	4.40%

Table D15. Analytical results for samarium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.1	0.10	< 0.1	N/A	N/A	<0.1
2	< 0.1	0.10	< 0.1	N/A	N/A	0.10
3	< 0.1	0.10	0.10	N/A	N/A	0.10
4	< 0.1	0.10	< 0.1	N/A	N/A	<0.1
5	< 0.1	0.10	< 0.1	N/A	N/A	<0.1
Mean	< 0.1	0.10	0.10	-	-	0.10
Median	< 0.1	0.10	0.10	-	-	0.10
Std.Dev.	-	0.00	-	-	-	0.00
Rel.Std.Dev.	-	0.00%	-	-	-	0.00%
PDM <sup>3</sup>	-	-	-	-	-	-

Table D16. Analytical results for tin in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E AF*MS	LAB F AF*MS
1	< 2	<1	< 1	N/A	< 10	<1
2	< 2	<1	< 1	N/A	< 10	<1
3	< 2	<1	< 1	N/A	< 10	<1
4	< 2	<1	< 1	N/A	< 10	<1
5	< 2	<1	< 1	N/A	< 10	<1
Mean	< 2	<1	< 1	-	< 10	<1
Median	< 2	<1	< 1	-	< 10	<1
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D17. Analytical results for strontium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	22.0	<b>5.1</b>	3.6	4.0	4.0	4.0
2	< 20	4.1	<b>3.3</b>	<b>7.7</b>	4.0	4.1
3	< 20	3.7	3.6	5.0	5.0	3.9
4	< 20	3.8	3.6	6.2	4.0	3.9
5	< 20	3.6	3.7	4.9	4.0	3.9
Mean	<b>22.00</b>	4.06	3.54	5.56	4.20	3.96
Median	22.00	3.80	3.55	5.00	4.00	3.90
Std.Dev.	-	0.61	0.15	1.43	0.45	0.09
Rel.Std.Dev.	-	15.0%	4.17%	25.7%	10.6%	2.26%
PDM <sup>3</sup>	465%	4.37%	-9.00%	42.9%	7.97%	1.80%

Table D18. Analytical results for terbium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.05	<0.1	0.02	N/A	N/A	<0.1
2	< 0.05	<0.1	0.03	N/A	N/A	<0.1
3	< 0.05	<0.1	0.04	N/A	N/A	<0.1
4	< 0.05	<0.1	0.02	N/A	N/A	<0.1
5	< 0.05	<0.1	0.03	N/A	N/A	<0.1
Mean	< 0.05	<0.1	0.02	-	-	<0.1
Median	< 0.05	<0.1	0.03	-	-	<0.1
Std.Dev.	-	-	0.01	-	-	-
Rel.Std.Dev.	-	-	30.9%	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D19. Analytical results for thorium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	0.2	<1	< 0.1	< 0.25	< 0.5	<1
2	0.2	<1	0.4	1.8	< 0.5	<1
3	0.2	<1	< 0.1	0.7	< 0.5	<1
4	0.2	<1	< 0.1	< 0.25	< 0.5	<1
5	0.1	<1	< 0.1	7.0	< 0.5	<1
Mean	0.2	<1	0.4	3.2	< 0.5	<1
Median	0.2	<1	0.4	1.8	< 0.5	<1
Std.Dev.	0.0	-	-	3.4	-	-
Rel.Std.Dev.	24.8%	-	-	106%	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D20. Analytical results for thulium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E -	LAB F AF*MS
1	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
2	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
3	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
4	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
5	< 0.1	<0.1	< 0.05	N/A	N/A	<0.1
Mean	< 0.1	<0.1	< 0.05	-	-	<0.1
Median	< 0.1	<0.1	< 0.05	-	-	<0.1
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D21. Analytical results for uranium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	< 0.1	<0.5	< 0.1	< 0.25	< 0.5	<0.5
2	< 0.1	<0.5	< 0.1	< 0.25	< 0.5	<0.5
3	< 0.1	<0.5	< 0.1	< 0.25	< 0.5	<0.5
4	< 0.1	<0.5	< 0.1	< 0.25	< 0.5	<0.5
5	< 0.1	<0.5	< 0.1	0.70	< 0.5	<0.5
Mean	< 0.1	<0.5	< 0.1	< 0.25	< 0.5	<0.5
Median	< 0.1	<0.5	< 0.1	< 0.25	< 0.5	<0.5
Std.Dev.	-	-	-	-	-	-
Rel.Std.Dev.	-	-	-	-	-	-
PDM <sup>3</sup>	-	-	-	-	-	-

Table D22. Analytical results for yttrium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E AF*MS	LAB F AF*MS
1	0.8	1.0	0.8	0.8	< 1	0.8
2	0.7	0.9	0.7	0.8	< 1	0.8
3	0.6	0.8	0.8	0.8	< 1	0.7
4	0.5	0.8	0.9	0.7	< 1	0.7
5	0.7	0.8	0.9	1.0	< 1	0.7
Mean	0.7	0.9	0.8	0.8	< 1	0.7
Median	0.7	0.8	0.8	0.8	< 1	0.7
Std.Dev.	0.11	0.09	0.07	0.11	-	0.05
Rel.Std.Dev.	17.3%	10.4%	8.60%	13.4%	-	7.40%
PDM <sup>3</sup>	-14.5%	11.4%	1.04%	6.22%	-	-4.15%

Table D23. Analytical results for ytterbium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D AF*MS	Lab E -	LAB F AF*MS
1	< 0.1	0.20	0.08	< 0.5	N/A	<0.1
2	< 0.1	0.10	0.12	< 0.5	N/A	<0.1
3	0.10	0.10	0.10	< 0.5	N/A	<0.1
4	< 0.1	0.10	0.10	< 0.5	N/A	<0.1
5	< 0.1	0.10	0.11	< 0.5	N/A	<0.1
Mean	< 0.1	0.12	0.10	< 0.5	-	<0.1
Median	< 0.1	0.10	0.10	< 0.5	-	<0.1
Std.Dev.	-	0.04	0.01	-	-	-
Rel.Std.Dev.	-	37.3%	14.6%	-	-	-
PDM <sup>3</sup>	-	12.5%	-6.25%	-	-	-

Table D24. Analytical results for zirconium in Mt Keith altered ultramafic SRM (refer Table D1 for abbreviations; values in ppm).

Replicate No.	Lab A AF*MS	LAB B AF*MS	Lab C BF*MS	LAB D -	Lab E AF*MS	LAB F AF*MS
1	7.0	<b>18.0</b>	4.1	N/A	<b>20.0</b>	<b>11.1</b>
2	5.0	<b>2.7</b>	4.2	N/A	< 10	8.4
3	6.0	8.8	4.2	N/A	< 10	6.2
4	8.0	8.2	4.4	N/A	< 10	6.2
5	7.0	6.9	3.9	N/A	< 10	5.3
Mean	6.6	8.9	<b>4.1</b>	-	< 10	7.4
Median	7.0	8.2	4.2	-	< 10	6.2
Std.Dev.	1.1	5.6	0.2	-	-	2.3
Rel.Std.Dev.	17.3%	62.9%	4.42%	-	-	31.5%
PDM <sup>3</sup>	4.67%	41.5%	-34.5%	-	-	18.0%