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GeoPT 38a, England - HARZ01, Harzburgite

Veranstalter: International Association of Geoanalysts and Geostandards Newsletter - GeoPT38a

Ringversuchsmaterial: HARZ01, Harzburgite

RV geschlossen: 2016 - 06

Literatur: Report - GeoPT38 Proficiency Testing Round 38a (Laborcode CRB = T19)

Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
MgO	45,960	45,840	0,516	0,120
Al_2O_3	0,380	0,380	0,008	0,000
SiO_2	43,860	43,210	0,490	0,660
CaO	0,500	0,478	0,011	1,020
Fe_2O_3-tot.	9,020	8,952	0,129	0,260

Spurenelemente [µg/g]

	CRB	RV	1sRV	Z-Score
Co	131,00	116,20	4,50	1,63
Cr	2970,00	2911,00	70,10	0,42
Ni	2719,00	2436,00	60,30	2,35
Pb	255,00	234,00	8,20	1,28
V	40,00	35,10	1,60	1,50

Legende

CRB: Ergebnisse CRB – **RV:** Ergebnisse Ringversuch -- **1s-RV:** Standardabweichung Ringversuch
Z-Score: Differenz des Messwertes vom Mittelwert des Ringversuchs -- * Wert nicht zertifiziert

Geo*PT*38A — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES

SPECIAL REPORT

ON ROUND 38A (Modified harzburgite, HARZ01) / June 2016 (delayed)

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*Keywords: proficiency testing, quality assurance, Geo*PT*, Geo*PT*38A, round 38, HARZ01, harzburgite*

Abstract

Results are presented for Geo*PT*38A, the supplementary test material supplied in round thirty-eight of the International Association of Geoanalysts' proficiency testing programme for analytical geochemistry laboratories. The test material was a modified harzburgite, HARZ01, supplied by Thomas Meisel, of the Montanuniversität Leoben, Austria. This material originated from the Earth's mantle and is highly depleted in many constituents, which has led to challenges for many laboratories in deriving satisfactory data and unprecedented difficulties in processing the data submitted. Consequently, this special report differs in format from that which is the norm. It is also relevant to note is that the test material had been contaminated during processing leading to enhanced levels of Pb, Pr and Er, but in no way does this diminishes its value as a test material for assessing analytical performance. In this special report, the data contributed from 95 laboratories are listed, together with an assessment of consensus values, consequent *z*-scores and charts to show the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This thirty-eighth round of the international proficiency testing programme, Geo*PT*, was conducted in a similar manner to earlier rounds. The programme is designed to be part of the routine quality assurance procedures employed by analytical geochemistry laboratories. The programme is organised by the International Association of Geoanalysts and is conducted in accordance with a published protocol available at (http://www.geoanalyst.org/documents/ GeoPT-protocol.pdf). The overall aim of the programme is to provide participating laboratories with *z*-score information for reported analyte determinations from which the laboratory can decide whether the quality of their data is satisfactory in relation to both their chosen fitness-for-purpose criteria and the results submitted by other laboratories contributing to the round and can choose to take corrective action if this appears justified.

Owing to circumstances for which there is no precedent in Geo*PT* it has been necessary to produce a special report that includes additional information. For a high proportion of the analytes reported, mass fractions were very low in comparison with the detection limits obtainable by the most sensitive methods of analysis, including ICP-MS. A consequence of this is that datasets for many of these elements were highly skewed with modes near (and in some cases, indistinguishable from) zero. Special procedures had to be devised to interpret these results. Research into this area is still proceeding, so this report should be regarded in part as provisional.

Steering Committee for Round 38: P.C. Webb (results analyst), M. Thompson (statistical advisor), P.J. Potts and C.J.B. Gowing (analytical advisors), Thomas Meisel (provision of HARZ01).

Timetable for Round 38:
Distribution of sample: September 2015.
Results submission deadline: 11th December 2015.
Release of report: June 2016 (delayed)

Test Material details

Geo*PT*38A: The modified harzburgite test material, HARZ01, was supplied by Thomas Meisel of the Montanuniversität Leoben, Austria. It was produced from 100 kg of largely unserpentinised harzburgite that was collected from the Devolli gorge, Southeast Albania. This material is a rock that originated in the Earth's mantle. It has particular significance because it is highly depleted in many trace elements, some major elements, and has a very low content of clinopyroxene. These low mass fractions make it extremely challenging analytically. In addition, during commercial processing, the sample composition was modified owing to contamination with lead glass that not only contained high levels of Pb, but also elevated mass fractions of Pr and Er. Although this has resulted in an irregular chondrite normalized REE pattern, which cannot therefore be used to assess REE data quality, evaluation of homogeneity by the originator indicated that the material would be suitable for use in this proficiency test.

Submission of results

2409 results were submitted for Geo*PT*38A (HARZ01) by 95 laboratories as listed in Table 1 where results designated as data quality 1 are shown in bold and results of data quality 2 are shown underlined. Results from all laboratories submitting data were used to assess respective assigned values. There were 6 laboratories reporting 21 values of '0' (i.e. zero) for this round. We should once more emphasise that, as stated in the ***Instructions to Analysts*,** such values should not be reported. These 21 values were excluded from further consideration in the data assessment process.

Assigned values

Following procedures described in earlier rounds, robust statistical procedures were used to derive assigned mass fraction values [X_a] for this test sample, these being judged to be the best available estimates of its true composition. Values were assigned on the basis that: i) sufficient laboratories had contributed data for an element, and ii) visual assessment gave confidence that the results distribution, outliers aside, was symmetrically disposed. Part of this assessment involved examining a bar chart of contributed data for each element to judge the distribution of results (presented in Figures 1 and 2).

However, special consideration had to be given to the processing of data on account of the mass fractions of many elements in HARZ01 being extremely depleted compared to test materials provided routinely as part of the Geo*PT* programme. For many methods of analysis employed by participating laboratories mass fractions were well below detection limits, which explains why fewer results were reported for this test sample. It also became apparent that methods of analysis which are generally capable of measuring low mass fractions very effectively, and normally produce a coherent consensus of results, were found wanting at the mass fractions typical of many elements in this material. In these exceptional circumstances, it has been necessary to undertake an extended analysis of the data supplied.

For a much smaller number of analytes than usual, well-behaved distributions of results allowed assigned and provisional values to be set in a similar way to previous rounds using Huber's H15 robust mean (AMC, 2001) or the median of the dataset to obtain a consensus value. In only 5 cases (Fe_2O_3T, MnO, CaO, Er, Zn) did the robust mean provide a suitable consensus value, whereas in 10 cases (SiO_2, Al_2O_3, MgO, Co, Li, Ni, Pb, Pr, Sb, Sc) the median value was preferred. For a significant number of analytes, however, datasets were markedly skewed and neither of these methods provided a suitable estimator of the consensus. For some of these skewed datasets a new procedure involving the kernel density estimate of the mode was used to estimate a consensus for the most coherent part of the data distribution as defined on the basis of values representing the maximum data density for half of the dataset or a minimum of 15 values. This procedure was used where datasets were skewed, sometimes quite markedly, to derive the mode as a consensus values, and in 14 cases the results were judged to be sufficiently convincing to provide provisional values (see Table 2). However, because the derivation of modes in this way involves a degree of data rejection, leaving a reduced number of values to perform the statistical analysis, caution should be applied as the data may be dominated by a single procedure with the potential for method-related bias to come into play. The potential for this situation to occur in individual cases may be assessed in Appendix 2 where data for those elements for which modes are estimated are plotted to show the distribution of results according to analytical procedure.

Table 2 lists assigned and provisional values derived for 6 major components and 23 trace elements in Geo*PT*38A (HARZ01). The number of analytes for which such values could be reported is much smaller than usual. Bar charts for the 29 analytes of Geo*PT*38A that were judged to have satisfactory distributions for consensus values to be designated as assigned or provisional are shown in Figure 1. These are: SiO_2, Al_2O_3, Fe_2O_3T, MnO, MgO, CaO, Cd*, Ce*, Co, Cr*, Cu*, Er, Ga*, Ho*, La*, Li, Lu*, Nd*, Ni, Pb, Pr, Sb*, Sc, Tm*, V*, W*, Y*, Yb*, Zn. Of these, values given to the 15 elements marked '*' are regarded as provisional because either: i) a relatively small number of results contributed to the consensus, or ii) the results were unduly dispersed in relation to the target value, or iii) the distribution of values was notably skewed, or iv) values were obtained by too few methods of analysis. In addition, because the particular procedure for estimating modes is used here for the first time values obtained in this way are for the present deemed provisional. With further investigation, the status of these values may be revised and therefore this aspect of this report should be regarded as provisional.

Bar charts for the 34 elements/components: TiO_2, Fe(II)O, Na_2O, K_2O, P_2O_5, LOI[a], Ag, As, B, Ba[a], Be, Bi, C(tot), Cl, Cs[a], Dy[a], Eu, F, Gd, Ge[a], Hf[a], Mo, Nb, Rb, S, Sm, Sn[a], Sr[a], Ta, Tb, Th, Tl, U[a], and Zr are plotted in Figure 2 for information only, as the data were insufficient, highly skewed or too variable for the reliable determination of a consensus. For elements marked [a], however, there were sufficient coherent data for 'indicative' values to be listed as discussed further below.

For some datasets, especially to TiO_2, Na_2O, K_2O and P_2O_5, the excessive rounding of submitted data alongside a relatively high dispersion of results at low concentrations prohibited the setting of any value.

***Z*-score analysis**

As in previous rounds, laboratories were invited to choose one of two performance standards against which their analytical results would be judged:

Data quality 1 for laboratories working to a 'pure geochemistry' standard of performance, where analytical results are designed for geochemical research and where care is taken to provide data of high precision and accuracy, sometimes at the expense of a reduced sample throughput rate. For Geo*PT*38A, 1010 results of data quality 1 were submitted.

Data quality 2 for laboratories working to an 'applied geochemistry' standard of performance, where, although precision and accuracy are still important, the main objective is to provide results on large numbers of samples collected, for example, as part of geochemical mapping projects or geochemical exploration programmes. For Geo*PT*38A, 1399 results of data quality 2 were submitted.

The target standard deviation (H_a) for each element assessed was calculated from the assigned (or provisional) value using a modified form of the Horwitz function as follows:

$$H_a = k.X_a^{0.8495}$$

where X_a is the mass fraction of the element,
the factor k = 0.01 for pure geochemistry labs and
k = 0.02 for applied geochemistry labs.

Z-scores were calculated for each elemental result submitted by each laboratory from:

$$z = [X - X_a] / H_a$$

where X is the contributed result, X_a is the assigned value and H_a is the target standard deviation (all a mass fractions).

Z-score results for contributors to Geo*PT*38A are listed in Table 3. Results designated as data quality 1 are shown in bold: results of data quality 2 are shown underlined. Where *z*-scores are derived from provisional values, they are shown in italics.

Participating laboratories are invited to assess their performance using the following criterion:– *Z*-score results in the range –2<*z*<2 are considered to be 'satisfactory' (in the sense that no action is called for by the participant). If the *z*-score for any element falls outside this range, especially if it is outside the range –3<*z*<3, it would be advisable for the contributing laboratory to examine its procedures, and if necessary, take action to ensure that determinations are not subject to unsuspected analytical bias.

Overall performance

A summary of the overall performance of individual laboratories for this round is plotted in multiple *z*-score charts in Figure 3. In these charts, the *z*-score performance for each element is distinguished by symbols that make it simple to identify whether the results were satisfactory or gave *z*-scores that exceeded the action limits. This chart is designed to help individual laboratories to judge their overall performance in this proficiency testing round. Participants should always review their *z*-scores in accord with their own fitness-for-purpose criteria.

Participation in future rounds

The benefit from proficiency testing arises through regular participation and laboratories are invited to contribute to the Geo*PT*39 round, the test sample for which was distributed during March 2016.

Addendum — 'Indicative' values

For many datasets for which no assigned or provisional value could be specified there were indications that a consensus might exist, but there were either: i) insufficient coherent results to derive a satisfactory consensus value by any of the usual procedures (robust mean, median or mode), or ii) the consensus was predominantly achieved by a single method of analysis. As a consequence, consideration was given to the distribution of results according to both the analytical procedure employed and the fitness for purpose option (data quality 1 or 2) declared.

A typical set of data is shown in Figure 0.1 for Hf and expanded in Figure 0.2 to reveal greater detail. The 30 values reported for Hf range from 0.01 to 3.2 mg/kg, of which a coherent set of 10 values occupies the range 0.0166 to 0.021 mg/kg and a further 3 values (0.01 to 0.011 mg/kg) are close by. These more coherent results were obtained mainly by ICP-MS using acid digestion (AD) for sample preparation and many of them were

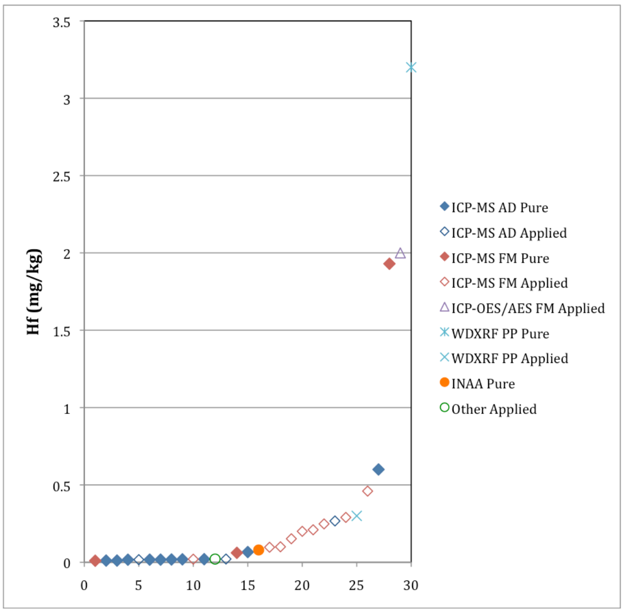

Figure 0.1 Ordered Hf results represented according to analytical procedure. Scale expanded in Figure 0.2. See Appendix 4 for explanation of key.

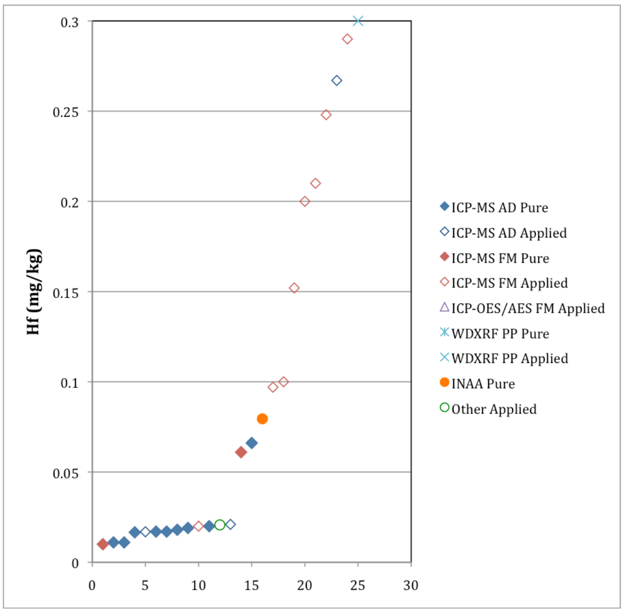

Figure 0.2 Ordered Hf results represented according to analytical procedure. Expanded version of Figure 1. See Appendix 4 for explanation of key.

categorised as fitness-for-purpose Quality 1, 'pure geochemistry' – shown with solid symbols (Figure 0.2). It is also evident from these plots that most of the ICP-MS fusion (FM) determinations span a wide range of values and lack any convincing consensus or coherence. Notably, these data, designated Quality 2, 'applied geochemistry' – shown with open symbols (Figure 0.2), were predominantly reported at much higher mass fractions. Such patterns are common to many trace element datasets presented in this report. We speculate that the contrast in ICP-MS values using different forms of sample preparation may be due to the greater effective dilution necessary for samples prepared by the fusion method, thus raising the detection limit. There is also the possibility that the flux used or the fusion process may introduce contamination. It is also possible that laboratories operating at a level of performance corresponding to Quality 1 may indeed be taking greater precautions than those claiming Quality 2 (where speed and cost of analysis may be issues) with consequent improvement in the quality of results at low concentrations.

The apparent 'consensus' for Hf, visually recognised at around 0.018 mg/kg, does not satisfy our usual criteria for setting an assigned value or even a provisional value. Therefore we do not provide *z*-scores for Hf, nor for a number of other analytes for which similar data distributions are noted in the submitted data. However it is considered that in these cases there are sufficient coherent values (either 10 or more, or representing more than 25% of the dataset and comprising a high proportion of Quality 1 data) that an 'indicative' value can be provided for information purposes, which may be of benefit to laboratories interested in evaluating their performance at low concentrations, particularly those producing data by ICP-MS using acid digestion. These values are listed in Table 0.1 along with the total contributed values and the number of coherent values contributing to the 'indicative' value.

Data distributions for all elements for which 'indicative' values are listed in Table 0.1 are presented in Appendix 3 according to the analytical procedure employed and the fitness for purpose option (data quality 1 or 2) declared. It is notable that the most coherent groups of results, especially for Ba, Cs, Dy, Hf, Sm, Sn, Sr and U, tend to be produced by procedures involving ICP-MS and acid digestion and by laboratories operating to the fitness for purpose Quality 1, 'pure geochemistry'.

Table 0.1 'Indicative' values (estimated) for coherent groups of data produced mainly by laboratories employing ICP-MS using acid digestion and claiming to achieve the fitness for purpose of a 'pure geochemistry', Quality 1 standard of performance.

Analyte	Indicative value ($g\ kg^{-1}$)	Total no. of values	No. of coherent values
LOI ($g\ 100g^{-1}$)	0.42*	70	median
As	0.3	17	8
Ba	0.3	43	11
Cs	0.004	24	8
Dy	0.003	26	15
Ge	0.85	14	5
Hf	0.018	30	10
Sm	0.0013	25	7
Sn	0.085	22	6
Sr	0.14	37	12
U	0.0015	27	7

**Note: The LOI data distribution was not of the kind exhibited by other elements listed. It was a symmetrical, though dispersed, distribution for which the median value is listed for information purposes.*

These 'indicative' values should be regarded with caution and considered in association with the details shown by the plots recorded in Appendix 3. These data are offered for the benefit to laboratories wishing to evaluate their performance at low concentrations, especially in relation to other laboratories using similar procedures.

Acknowledgements
The authors thank Liz Lomas for much-valued assistance in distributing this sample.

Reference

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Geo*PT*36
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*36 - an international proficiency test for analytical geochemistry laboratories - report on round 36 / January 2015 (Gabbro, GSM-1). International Association of Geoanalysts: Unpublished report.

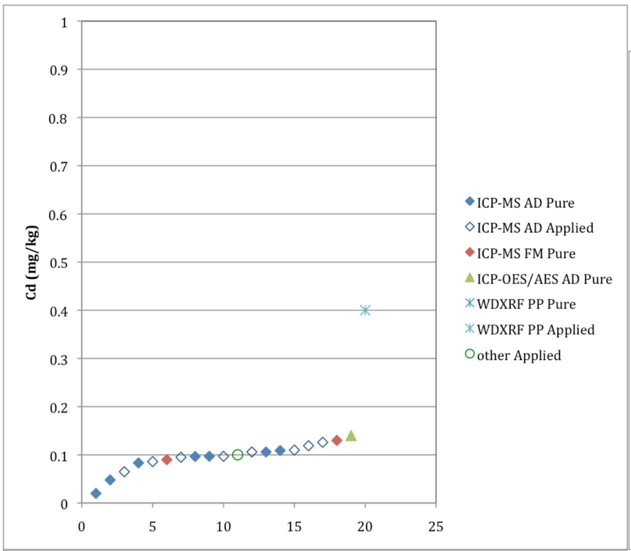
Geo*PT*36A
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*36A - an international proficiency test for analytical geochemistry laboratories - report on round 36A / January 2015 (Metal-rich sediment, SdAR-M2). International Association of Geoanalysts: Unpublished report.

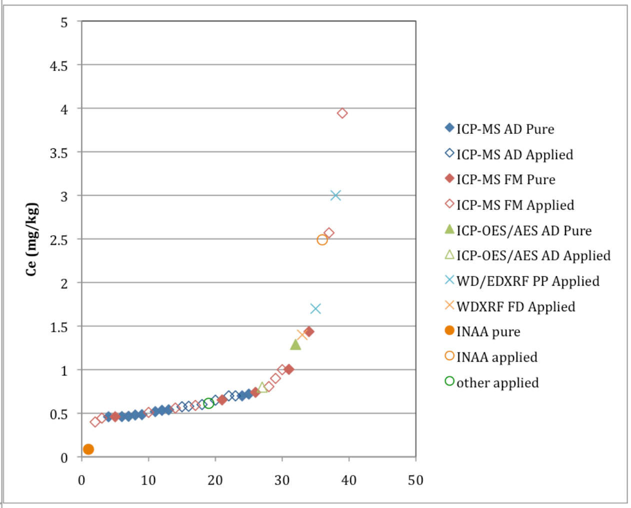
Geo*PT*37
Webb, P.C., Thompson, M., Potts, P.J and Burnham, M. (2015)
Geo*PT*37 - an international proficiency test for analytical geochemistry laboratories - report on round 37 / July 2015 (Rhyolite, ORPT-1). International Association of Geoanalysts: Unpublished report.

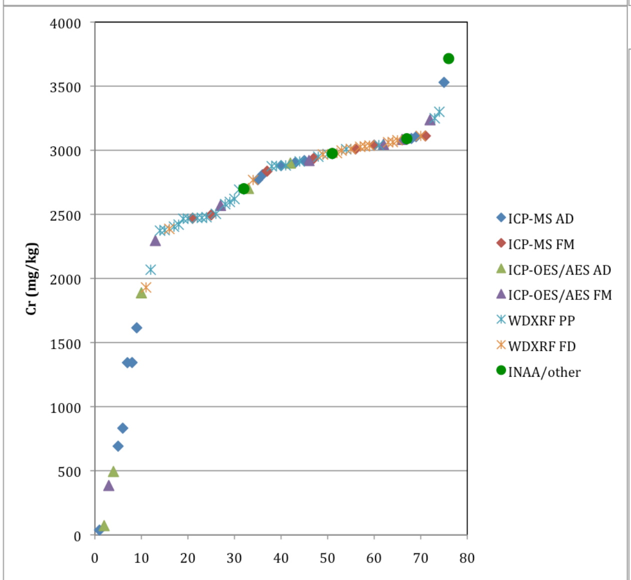
Geo*PT*37A
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*37A - an international proficiency test for analytical geochemistry laboratories - report on round 37A / July 2015 (Blended sediment, SdAR-L2). International Association of Geoanalysts: Unpublished report.

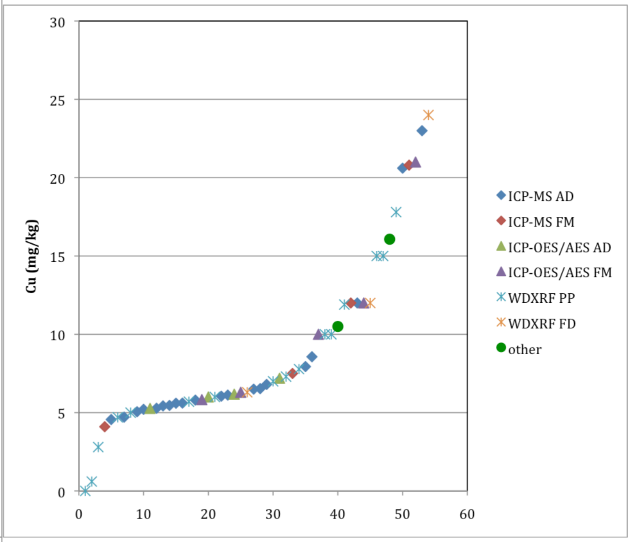
Geo*PT*38
Webb, P.C., Thompson, M., Potts, P.J and Walsh, J.N. (2016)
Geo*PT*38 - an international proficiency test for analytical geochemistry laboratories - report on round 38 / January 2016 (Gabbro, OU-7). International Association of Geoanalysts: Unpublished report.

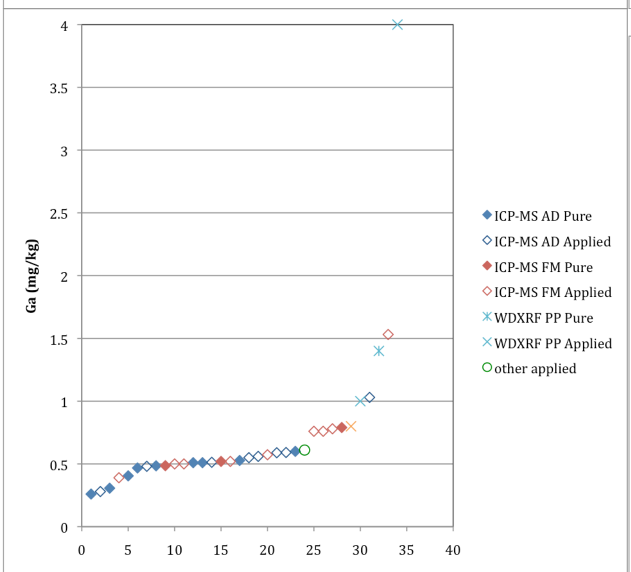
Appendix 2. Sequential plots of contributed data identified by analytical procedure for elements Cd*, Ce*, Cr*, Cu*, Ga*, Ho*, La*, Lu*, Nd*, Tm*, V*, W*, Y*, Yb* for which modes are estimated. See Table 2 for mode values – provisional values for elements marked '*'. See Appendix 4 for explanation of keys.

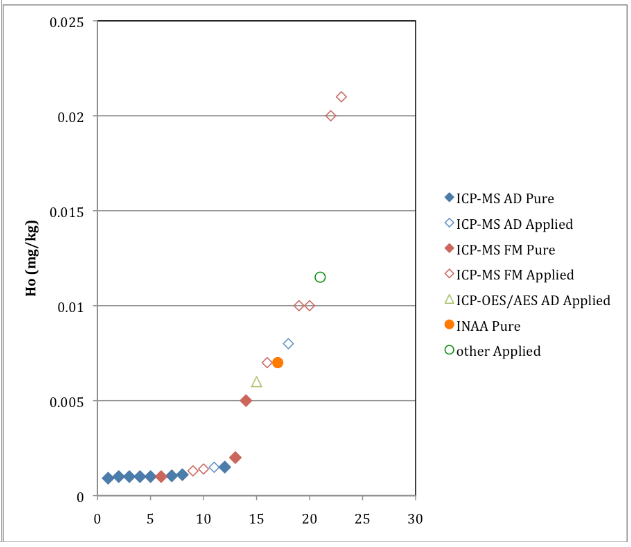




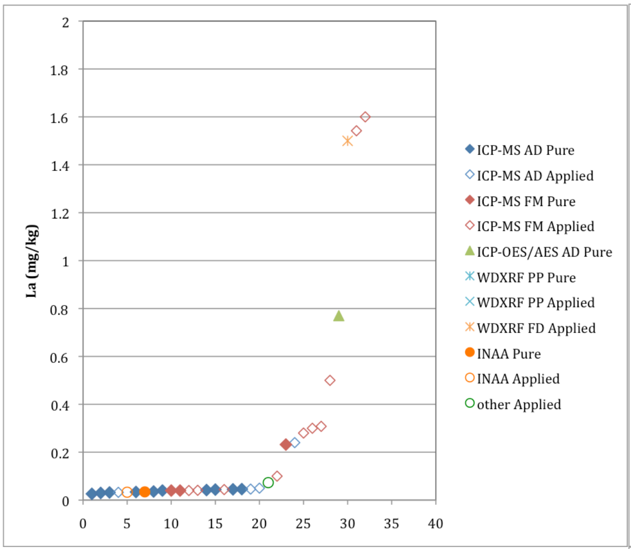


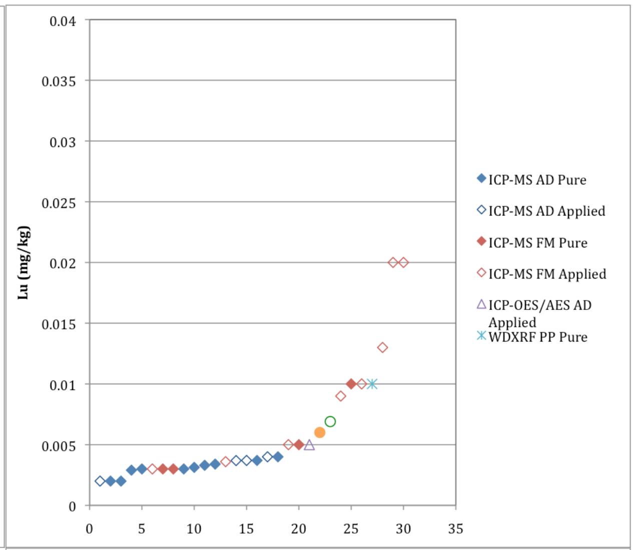


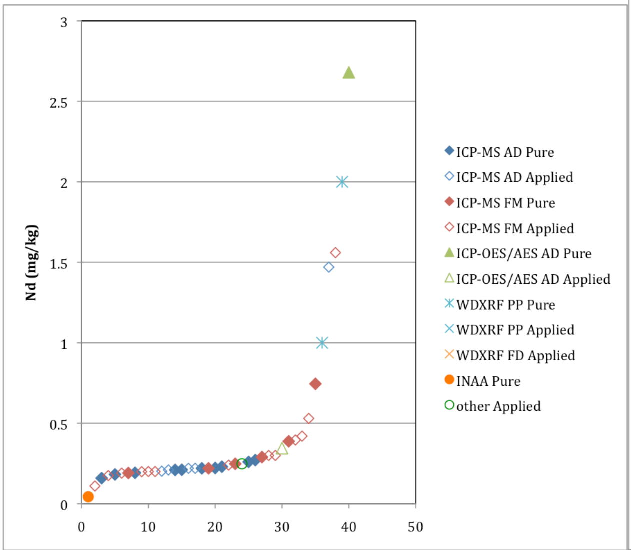


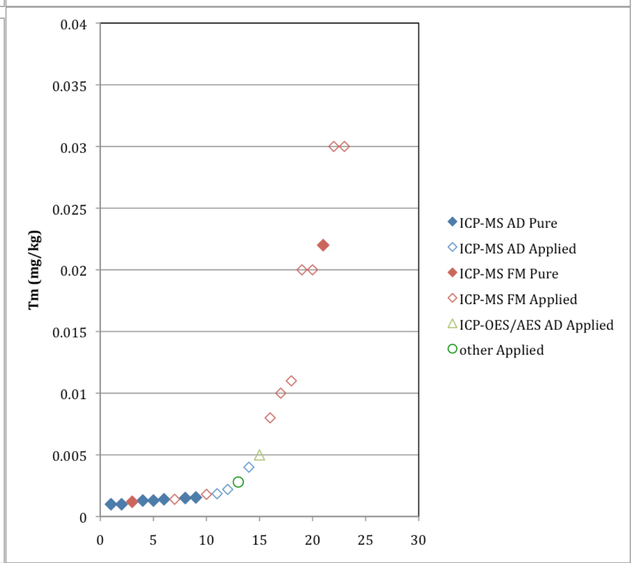


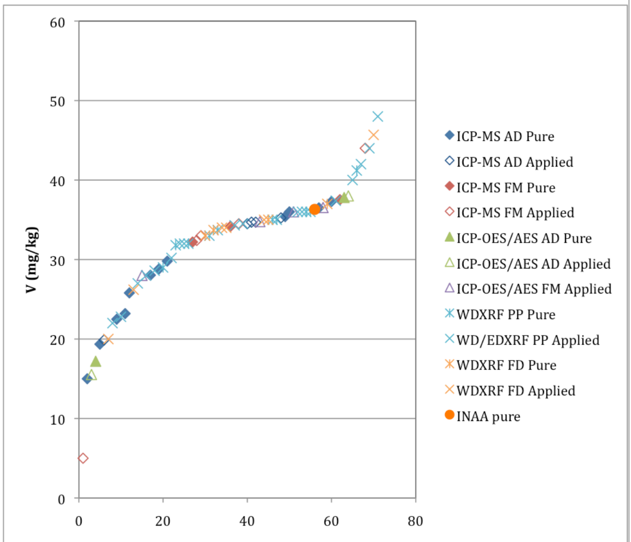
Appendix 2 (cont'd). Sequential plots of contributed data identified by analytical procedure for elements Cd*, Ce*, Cr*, Cu*, Ga*, Ho*, La*, Lu*, Nd*, Tm*, V*, W*, Y*, Yb* for which modes are estimated. See Table 2 for mode values – provisional values for elements marked '*'. See Appendix 4 for explanation of keys.

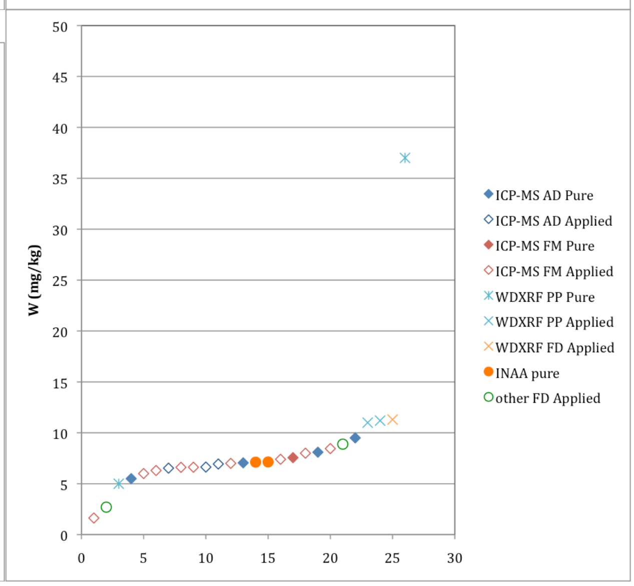




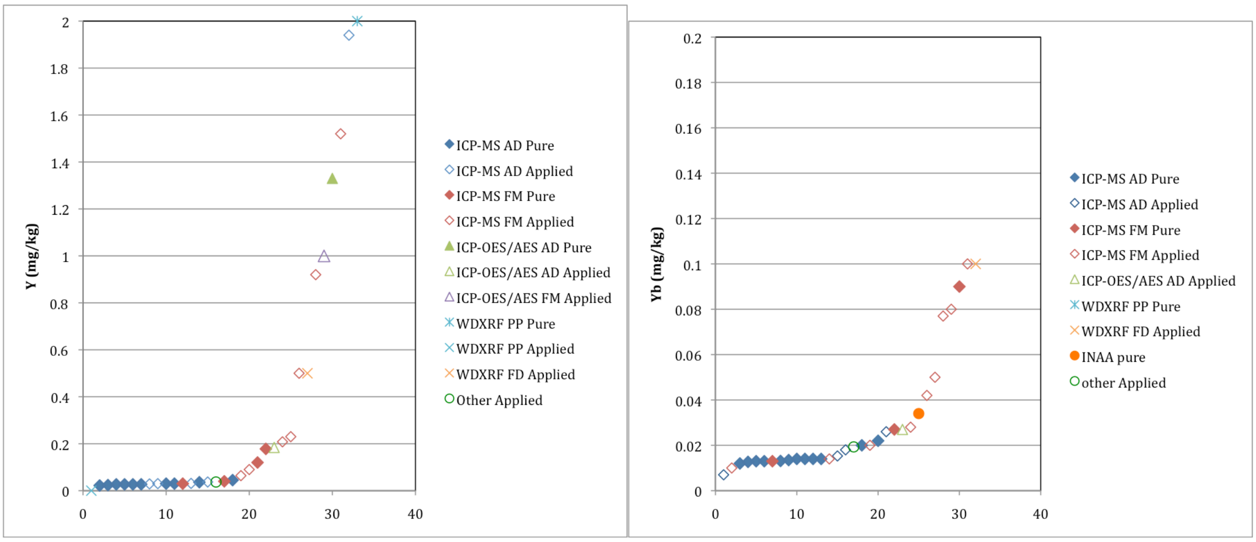




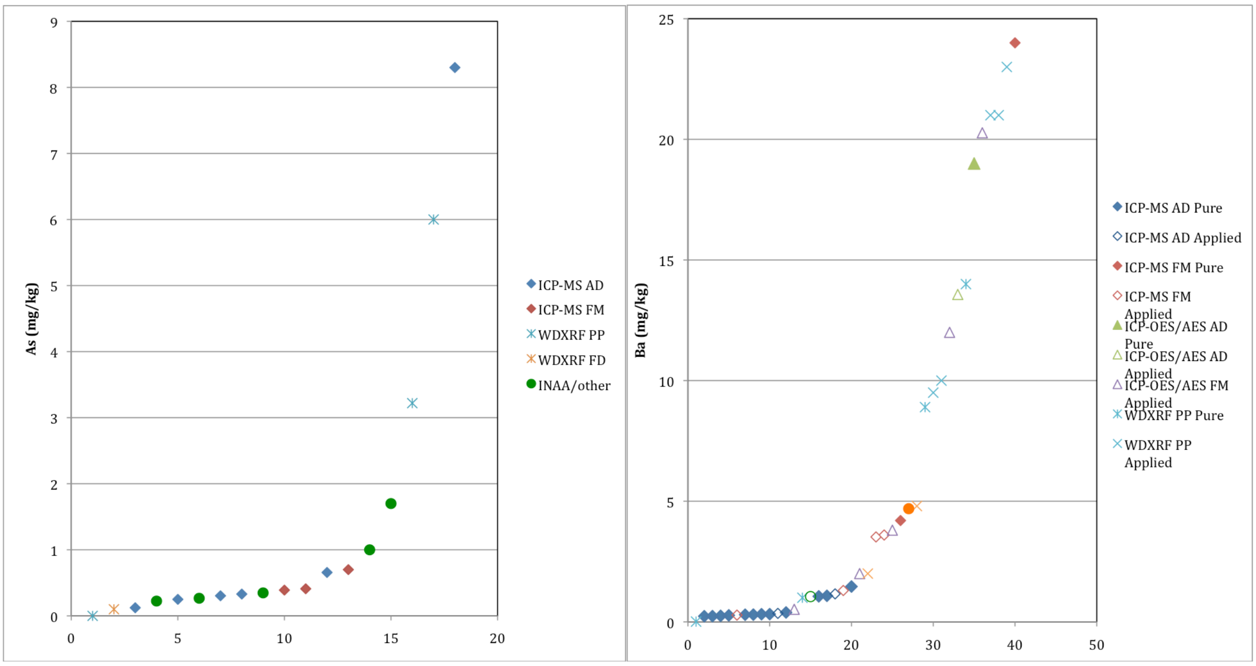




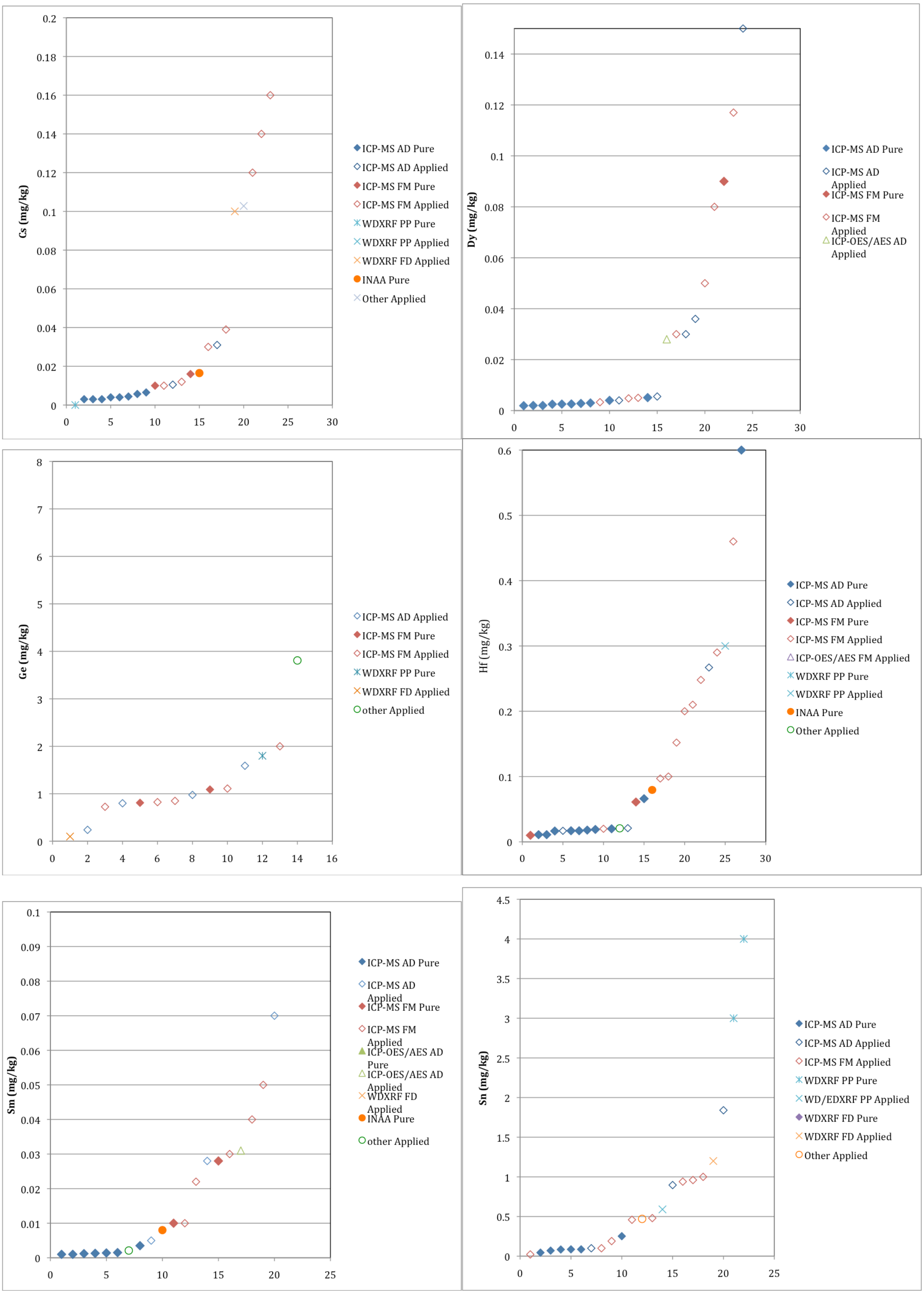
Appendix 2 (cont'd). Sequential plots of contributed data identified by analytical procedure for elements Cd*, Ce*, Cr*, Cu*, Ga*, Ho*, La*, Lu*, Nd*, Tm*, V*, W*, Y*, Yb* for which modes are estimated. See Table 2 for mode values – provisional values for elements marked '*'. See Appendix 4 for explanation of keys.



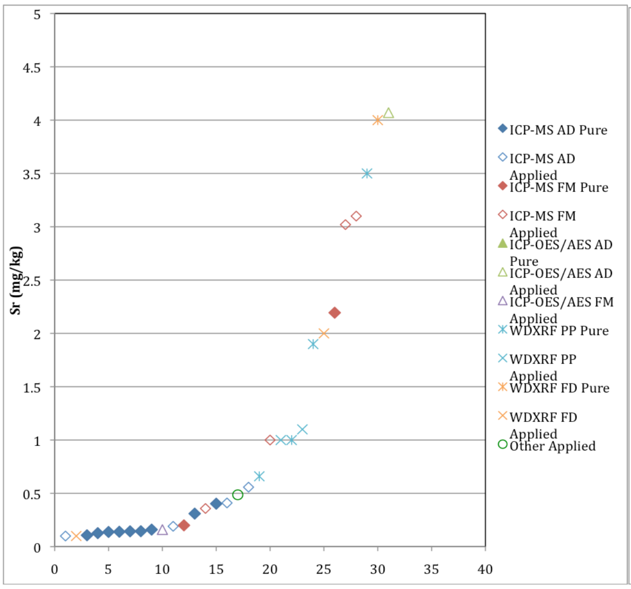
Appendix 3. Sequential plots of contributed data identified by analytical procedure and fitness for purpose criterion for elements listed in Table 0.1 for which 'indicative' values are proposed. See Appendix 4 for explanation of keys.

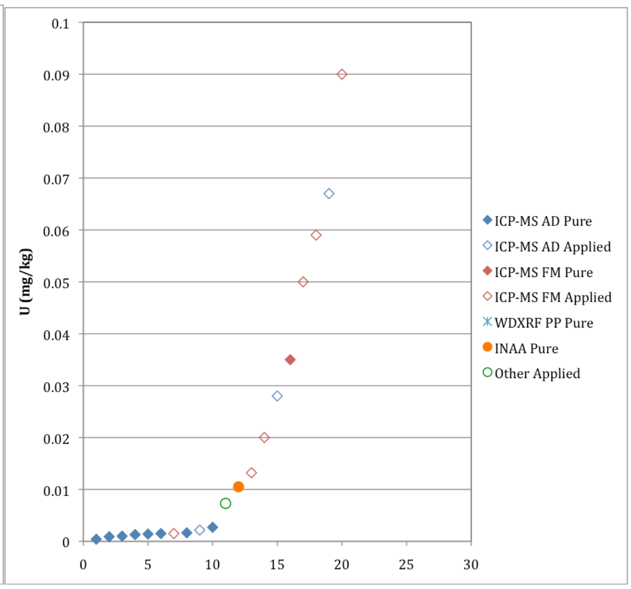


Appendix 3 (cont'd). Sequential plots of contributed data identified by analytical procedure and fitness for purpose criterion for elements listed in Table 0.1 for which 'indicative' values are proposed. See Appendix 4 for explanation of keys.



Appendix 3 (cont'd). Sequential plots of contributed data identified by analytical procedure and fitness for purpose criterion for elements listed in Table 0.1 for which 'indicative' values are proposed. See Appendix 4 for explanation of keys.





Appendix 4. Explanation of keys to plots in Appendices 2 and 3.

Analytical technique
ICP-MS — Inductively coupled plasma – mass spectrometry
ICP-OES/AES — Inductively coupled plasma – optical emission spectrometry
WD(ED)XRF — Wavelength dispersive (energy dispersive) X-ray fluorescence spectrometry
INAA — Instrumental neutron activation analysis
Other — Unspecified

Sample preparation
AD — Acid digestion including special digestion
FM — Fusion of material before digestion or of residual material after digestion in combination and sintering
PP — Powder pellet
FD — Fusion disc

Fitness for purpose
Pure — Quality 1 data
Applied — Quality 2 data

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T1	T2	T3	T4	T8	T9	T10	T11	T12	T14	T15	T17	T19
SiO2	g 100g^{-1}	43.25	**43.41**		**42.86**	44.29	42.67		41.42	43.208	40.32	42.07	43.69	43.86
TiO2	g 100g^{-1}		**0.01**		**0.01**	0.003			0.038	0.003	0.018		0.02	0.009
Al2O3	g 100g^{-1}	0.37	**0.37**		**0.36**	0.589	0.383	0.425	0.29	0.372	0.455	0.38	0.74	0.38
Fe2O3T	g 100g^{-1}	8.92	**9.04**		**8.67**	8.99	8.93	**9.04**	8.09	9.059	10.23	9.01	8.76	9.02
Fe(II)O	g 100g^{-1}		**7.26**							7.239				
MnO	g 100g^{-1}	0.13	**0.126**		**0.12**	0.131	0.127	**0.13**	0.11	0.129	0.139	0.125	0.12	0.133
MgO	g 100g^{-1}	45.68	**45.65**		**47.56**	45.03	45.64	**45.01**	45.78	45.953	51.15	47.34	47.52	45.96
CaO	g 100g^{-1}	0.48	**0.48**		**0.43**	0.465	0.48	**0.475**	0.25	0.511	1.02	0.47	0.47	0.5
Na2O	g 100g^{-1}				**0.01**	0.062	0.13		0.86		0.038	0.14		0.03
K2O	g 100g^{-1}				**0.01**	0.018			1.2			0.02	0.02	0.004
P2O5	g 100g^{-1}								0.02			0.007	0.01	0.006
H2O+	g 100g^{-1}									1.171				
CO2	g 100g^{-1}										0.12			
LOI	g 100g^{-1}	0.26	**0.43**		**0.35**	0.346			0.4	0.366	0.5		0.48	0.3
Ag	mg kg^{-1}										0.017			
As	mg kg^{-1}							**0.348**			0.224			
Au	mg kg^{-1}										0.005			
B	mg kg^{-1}								14					
Ba	mg kg^{-1}			**0.238**	**1.08**	13.57			2		1.047			23
Be	mg kg^{-1}									0.04				
Bi	mg kg^{-1}					9.17								
Br	mg kg^{-1}							**0.22**						
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}									173	321.020			
Cd	mg kg^{-1}				**0.02**					0.086	0.100			
Ce	mg kg^{-1}			**0.519**	**0.48**	0.51		2.49	0.8	0.58	0.614	0.7	13	
Cl	mg kg^{-1}							56.7						
Co	mg kg^{-1}		**114**	**114.070**	**120**	88.32		**121.5**	74	119.350	133.324	81		131
Cr	mg kg^{-1}	3040	**2978**	**1343.200**	**2880**	494.080		**3090**	385.1	2919.600	3715.220	2068	1930	2970
Cs	mg kg^{-1}			**0.003**	**0.007**						0.103			
Cu	mg kg^{-1}		**7**	**7.94**	**6.05**	7.2			10	6.8	16.07		24	10
Dy	mg kg^{-1}			**0.004**	**0.005**				0.028					
Er	mg kg^{-1}			**0.237**	**0.22**	0.27			0.287	0.326	0.293	0.3		
Eu	mg kg^{-1}				**0.001**			0.028	0.01		0.011			
F	mg kg^{-1}													
Ga	mg kg^{-1}			**0.468**	**0.51**	0.39				0.481	0.611			
Gd	mg kg^{-1}			**0.005**	**0.17**	0.23			0.4		0.005			
Ge	mg kg^{-1}										3.808			
Hf	mg kg^{-1}			**0.011**	**0.017**	0.46					0.021			0.3
Hg	mg kg^{-1}													
Ho	mg kg^{-1}				**0.001**				0.006		0.012			
I	mg kg^{-1}													
In	mg kg^{-1}									0.005	0.027			
Ir	mg kg^{-1}										0.003			
La	mg kg^{-1}			**0.034**	**0.042**	0.044		0.033			0.073		1.5	
Li	mg kg^{-1}				**2.01**	7.76			3	1				
Lu	mg kg^{-1}			**0.002**	**0.003**				0.005	0.004	0.007			
Mo	mg kg^{-1}								19.9	0.18	0.351			
Nb	mg kg^{-1}				**0.026**				3		0.019			
Nd	mg kg^{-1}			**0.192**	**0.26**	0.199			0.345	0.22	0.248			
Ni	mg kg^{-1}		**2532**	**2622.600**	**2392**	1669		**2546**	2645	2427.520	2908.270	2459	1521	2719
Os	mg kg^{-1}										0.003			
Pb	mg kg^{-1}		**230**	**241.840**	**244**	174.4			133.4	241.9	194.656	224	126	255
Pd	mg kg^{-1}										0.006			
Pr	mg kg^{-1}	2.4		**2.79**	**2.3**	3.19			2.71	2.4	2.776	2.8		
Pt	mg kg^{-1}										0.008			
Rb	mg kg^{-1}			**0.027**	**0.071**			5.6			0.286		8	
Re	mg kg^{-1}										0.008			
Rh	mg kg^{-1}										0.001			
Ru	mg kg^{-1}										0.008			
S	mg kg^{-1}									47	179			
Sb	mg kg^{-1}					17.46		**1.4**	2.5	1.332	2.542			
Sc	mg kg^{-1}			**10.09**	**10.2**	10.61		**9.08**	9.511	5.6	17.587	10.6		
Se	mg kg^{-1}													
Sm	mg kg^{-1}				**0.004**				0.031		0.002			
Sn	mg kg^{-1}										0.897			
Sr	mg kg^{-1}			**0.403**	**0.31**	4.07					0.487		2	9
Ta	mg kg^{-1}				**0.12**	0.01			0.189		0.007			
Tb	mg kg^{-1}			**0.001**	**0.001**				0.06		0.001			
Te	mg kg^{-1}													
Th	mg kg^{-1}			**0.001**	**0.011**				0.19		0.008			
Tl	mg kg^{-1}									0.002				
Tm	mg kg^{-1}				**0.001**				0.005	0.002	0.003			
U	mg kg^{-1}				**0.003**						0.007			
V	mg kg^{-1}		**35**	**22.49**	**36.5**	15.53		**36.31**		35.24	45.680	22	20	40
W	mg kg^{-1}							**7.12**		6.638	8.885			
Y	mg kg^{-1}			**0.045**	**0.036**	0.92			0.184		0.037			
Yb	mg kg^{-1}			**0.014**	**0.014**				0.027	0.018	0.019			
Zn	mg kg^{-1}		**72**	**51.01**	**65.1**	34.93		**82.2**	67	66.1	66.507	66	103	
Zr	mg kg^{-1}			**0.608**	**0.78**	36.42					0.913		1.7	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T20	T22	T23	T24	T25	T28	T29	T30	T31	T32	T33	T34	T35
SiO2	g 100g^{-1}	**43.17**	**43.485**	42.78	43.1	43.46	43.07	43.32	42.86	45.021	**42.94**	43.22	43.36	**43.52**
TiO2	g 100g^{-1}	**0.01**			0.01			0.003						
Al2O3	g 100g^{-1}	**0.4**	**0.439**	0.39	0.44	0.33	0.37	0.41	0.72		**0.38**	0.5	0.436	**0.48**
Fe2O3T	g 100g^{-1}	**8.69**	**8.99**	9.31	8.66	8.91	8.96	9.01	8.7	9.266	**9.04**	8.98	8.953	**8.823**
Fe(II)O	g 100g^{-1}						7.85							
MnO	g 100g^{-1}	**0.13**	**0.14**	0.11	0.13	0.13	0.13	0.119	0.145	0.133	**0.127**	0.12	0.12	**0.141**
MgO	g 100g^{-1}	**46.16**	**45.88**	45.8	40.15	45.55	45.93	44.51	45.72	47.29	**45.15**	46.2	45.84	**47.46**
CaO	g 100g^{-1}	**0.51**	**0.479**	0.47	0.48	0.46	0.48	0.49	0.46		**0.47**	0.48	0.499	**0.47**
Na2O	g 100g^{-1}	**0.09**			0.03	0.02	0.04					0.03	0.029	**0.09**
K2O	g 100g^{-1}				0.02							0.01		**0.02**
P2O5	g 100g^{-1}				0.002							0.01		**0.01**
H2O+	g 100g^{-1}						1.1							
CO2	g 100g^{-1}						0.08							
LOI	g 100g^{-1}	**0.32**	**0.23**	0.41	0.56	0.52	0.49	0.29	0.37	0.39	**1.03**	0.47	0.336	**0.62**
Ag	mg kg^{-1}													
As	mg kg^{-1}						1					6		
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}	**14**		0.351	47.1		0.52			3.8	**4.2**	10		**8.9**
Be	mg kg^{-1}			0.003	0.09									
Bi	mg kg^{-1}													
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}						290							
Cd	mg kg^{-1}	**3**												
Ce	mg kg^{-1}			0.575	1		0.4	0.59			**1.004**	3		
Cl	mg kg^{-1}							110						
Co	mg kg^{-1}	**116**	**114.8**	119	116.3		122	114.5	135	118.880			246.3	**104.9**
Cr	mg kg^{-1}	**2377**	**2967**	2809	2936	3030	3064	3041	3250	3085	**3010**	2875	2570	**2693**
Cs	mg kg^{-1}			0.011	0.12						**0.016**			
Cu	mg kg^{-1}	**10**		6.53	4.1		5.83		12	6.3		6		
Dy	mg kg^{-1}			0.006	0.03				0.004		**0.03**			
Er	mg kg^{-1}			0.268	0.27		0.22	0.32			**0.327**			
Eu	mg kg^{-1}			0.001	0.01						**0.008**			
F	mg kg^{-1}													
Ga	mg kg^{-1}		**0.486**	0.589	0.78				0.56			1		
Gd	mg kg^{-1}			0.115	0.24						**0.032**			
Ge	mg kg^{-1}			0.976			2							
Hf	mg kg^{-1}			0.017	0.1						**0.061**			
Hg	mg kg^{-1}													
Ho	mg kg^{-1}			0.001	0.007						**0.005**			
I	mg kg^{-1}	**2**												
In	mg kg^{-1}													
Ir	mg kg^{-1}													
La	mg kg^{-1}			0.033	0.28		0.1		0.046		**0.232**			**12.5**
Li	mg kg^{-1}		1.49	2.06					2.1					
Lu	mg kg^{-1}			0.004	0.005				0.004		**0.005**			
Mo	mg kg^{-1}				0.26									
Nb	mg kg^{-1}			0.011	0.48						**0.098**	2		**2**
Nd	mg kg^{-1}	**2**	**0.191**	0.202	0.42		0.2	0.24			**0.388**			
Ni	mg kg^{-1}	**2267**	**2452**	2393	2227	2510	2386	2402	2350	2591	**2540**	2571	2566	**1934**
Os	mg kg^{-1}													
Pb	mg kg^{-1}	**226**	**217**	238	327		242	232	380	236.810	**234.370**	239	217.7	**230.1**
Pd	mg kg^{-1}													
Pr	mg kg^{-1}		**2.626**	2.38	2.6		2.56	2.26		2.39	**2.81**			
Pt	mg kg^{-1}													
Rb	mg kg^{-1}			0.262	1.3						**0.385**	1		**3.7**
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
Ru	mg kg^{-1}													
S	mg kg^{-1}													
Sb	mg kg^{-1}	**2**	**1.254**				1.5	1.31						**3.4**
Sc	mg kg^{-1}	**13**		9.16	8.6		9	8.2	9.2	8.8	**8.91**	6		**6.9**
Se	mg kg^{-1}													
Sm	mg kg^{-1}			0.005	0.04						**0.028**			
Sn	mg kg^{-1}	**4**			0.19									
Sr	mg kg^{-1}			0.191	3.1		0.16				**2.194**	1		**1.9**
Ta	mg kg^{-1}			0.012	0.02						**0.045**			
Tb	mg kg^{-1}			0.001	0.007						**0.005**			
Te	mg kg^{-1}													
Th	mg kg^{-1}			0.003	0.07						**0.118**	1		
Tl	mg kg^{-1}				0.02									
Tm	mg kg^{-1}		**0.168**	0.002	0.008									
U	mg kg^{-1}			0.002	0.02						**0.035**			**4.6**
V	mg kg^{-1}	**35**	**33.7**	34.7	34.5		33	34.77	36	36	**37**	36		**29**
W	mg kg^{-1}	**37**			6.3		6							
Y	mg kg^{-1}			0.029	0.23				0.037		**0.178**			
Yb	mg kg^{-1}			0.015	0.028				0.022		**0.027**			
Zn	mg kg^{-1}	**66**	**74.4**	67.6	81.7		80	61.14	102	79.9	**70**	66	86.3	**62.1**
Zr	mg kg^{-1}			0.657	2.7		0.8				**2.023**	10	66	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T36	T37	T38	T39	T40	T41	T42	T43	T46	T47	T49	T50	T51
SiO2	$g\ 100g^{-1}$		**43.34**	**42.997**	43.61	42.79	43.26		**44.35**	**43.66**		39.768	43.16	43.45
TiO2	$g\ 100g^{-1}$	**0.003**			0.02		0.002	**0.002**	**0.09**	**0.01**	**0.002**			0.018
Al2O3	$g\ 100g^{-1}$		**0.35**	**0.382**	0.38		0.38		**0.4**	**0.38**		0.375	0.37	0.378
Fe2O3T	$g\ 100g^{-1}$		**8.9**	**9.039**	8.89	9.1	8.85		**8.78**	**8.94**		9.069	8.91	8.81
Fe(II)O	$g\ 100g^{-1}$													7.59
MnO	$g\ 100g^{-1}$	**0.128**	**0.12**	**0.126**	0.13	0.13	0.12	**0.124**	**0.13**	**0.13**	**0.12**	0.134	0.13	0.119
MgO	$g\ 100g^{-1}$		**45.68**	**45.722**	46.03	46.33	45.59		**45.37**	**46.42**		49.6	45.66	45.88
CaO	$g\ 100g^{-1}$		**0.47**	**0.477**	0.48	0.47	0.47		**0.48**	**0.48**	**0.52**	0.145	0.493	0.452
Na2O	$g\ 100g^{-1}$				0.02		0.02			**0.05**				
K2O	$g\ 100g^{-1}$				0.01		0.01		**0.01**	**0.01**				
P2O5	$g\ 100g^{-1}$				0.001		0.002			**0.01**				
H2O+	$g\ 100g^{-1}$													
CO2	$g\ 100g^{-1}$													
LOI	$g\ 100g^{-1}$		**0.3**	**0.31**	0.42	0.53	0.4		**0.38**	**0.35**		0.652	0.46	0.26
Ag	$mg\ kg^{-1}$													
As	$mg\ kg^{-1}$								**0.304**					
Au	$mg\ kg^{-1}$						0.001							
B	$mg\ kg^{-1}$													
Ba	$mg\ kg^{-1}$	**0.32**		**1.464**	1.3			**0.25**	**0.296**		**0.234**		2	
Be	$mg\ kg^{-1}$	**0.003**												
Bi	$mg\ kg^{-1}$													
Br	$mg\ kg^{-1}$													
C(org)	$mg\ kg^{-1}$													
C(tot)	$mg\ kg^{-1}$		**475**		0.000		300							
Cd	$mg\ kg^{-1}$			**0.097**			0.11				**0.106**			0.119
Ce	$mg\ kg^{-1}$	**0.72**		**0.534**			0.6	**0.46**	**0.54**		**0.465**			
Cl	$mg\ kg^{-1}$													
Co	$mg\ kg^{-1}$	**118**		**124.240**		111	118	**117**	**116**	**113**	**110**		119	139
Cr	$mg\ kg^{-1}$	**3106**		**2902.300**	3010	2373	3047	**1615**	**2504**	**2998**	**2837**		3027	2404
Cs	$mg\ kg^{-1}$	**0.006**			0.03			**0.004**	**0.004**		**0.003**		2	
Cu	$mg\ kg^{-1}$	**5.8**					6	**6.12**	**5.058**		**5.46**		12	
Dy	$mg\ kg^{-1}$	**0.003**		**0.003**	0.05			**0.002**	**0.003**		**0.003**			
Er	$mg\ kg^{-1}$	**0.59**					0.2	**0.315**	**0.311**		**0.25**			
Eu	$mg\ kg^{-1}$	**0.000**			0.32			**0.000**						
F	$mg\ kg^{-1}$													
Ga	$mg\ kg^{-1}$	**0.6**		**0.528**	0.5		0.5							0.591
Gd	$mg\ kg^{-1}$	**0.006**			0.05			**0.002**			**0.022**			
Ge	$mg\ kg^{-1}$						0.8							
Hf	$mg\ kg^{-1}$	**0.019**		**0.02**	0.2			**0.066**	**0.017**					
Hg	$mg\ kg^{-1}$													
Ho	$mg\ kg^{-1}$	**0.001**		**0.002**	0.01			**0.001**	**0.001**		**0.002**			
I	$mg\ kg^{-1}$													
In	$mg\ kg^{-1}$													
Ir	$mg\ kg^{-1}$													
La	$mg\ kg^{-1}$	**0.045**		**0.046**	0.5			**0.026**	**0.032**		**0.03**			
Li	$mg\ kg^{-1}$	**2**		**2.142**			2	**1.87**	**1.81**					
Lu	$mg\ kg^{-1}$	**0.003**		**0.003**	0.01			**0.003**	**0.004**		**0.003**			
Mo	$mg\ kg^{-1}$						0.2				**0.133**			
Nb	$mg\ kg^{-1}$	**0.006**			0.2			**0.026**	**0.002**					
Nd	$mg\ kg^{-1}$	**0.22**		**0.222**	0.2		0.3	**0.159**	**0.271**		**0.23**			
Ni	$mg\ kg^{-1}$	**2338**		**2408.100**		2360	2488	**2390**	**2430**	**2512**	**2368**		2506	2468
Os	$mg\ kg^{-1}$													
Pb	$mg\ kg^{-1}$	**247**		**244.1**		225	238	**255**	**238.3**	**186**	**222.7**		229	219
Pd	$mg\ kg^{-1}$													
Pr	$mg\ kg^{-1}$	**3.31**			2.52		2.7	**2.51**	**2.729**		**2.44**			
Pt	$mg\ kg^{-1}$													
Rb	$mg\ kg^{-1}$	**0.034**			0.2			**0.029**	**0.029**		**0.023**			
Re	$mg\ kg^{-1}$													
Rh	$mg\ kg^{-1}$													
Ru	$mg\ kg^{-1}$													
S	$mg\ kg^{-1}$													
Sb	$mg\ kg^{-1}$						1.5	**1.38**			**1.137**		1	
Sc	$mg\ kg^{-1}$	**9.49**		**9.311**			9	**8.73**	**7.732**	**8**				9.25
Se	$mg\ kg^{-1}$													
Sm	$mg\ kg^{-1}$	**0.002**			0.03			**0.001**			**0.001**			
Sn	$mg\ kg^{-1}$	**0.086**			1		0.1	**0.252**			**0.084**			
Sr	$mg\ kg^{-1}$	**0.16**						**0.145**	**0.138**		**0.107**			
Ta	$mg\ kg^{-1}$	**0.004**			0.1			**0.031**	**0.002**					
Tb	$mg\ kg^{-1}$	**0.001**			0.01			**0.000**			**0.001**			
Te	$mg\ kg^{-1}$													
Th	$mg\ kg^{-1}$	**0.003**			0.05			**0.022**	**0.002**		**0.002**			
Tl	$mg\ kg^{-1}$										**0.003**			
Tm	$mg\ kg^{-1}$	**0.001**		**0.001**	0.02				**0.002**		**0.002**			
U	$mg\ kg^{-1}$	**0.001**			0.05			**0.000**	**0.001**		**0.002**			
V	$mg\ kg^{-1}$	**37.3**		**37.532**	5	28	38	**23.2**	**36**	**33**	**29.8**		35	22.8
W	$mg\ kg^{-1}$			**8.096**	8		7.4				**9.5**			
Y	$mg\ kg^{-1}$	**0.03**			0.5			**0.027**	**0.024**		**0.027**			
Yb	$mg\ kg^{-1}$	**0.012**		**0.014**	0.05			**0.013**	**0.013**		**0.014**			
Zn	$mg\ kg^{-1}$	**61.3**		**58.8**		65	72	**60.8**	**70**	**64**	**63.4**		75	64
Zr	$mg\ kg^{-1}$	**0.77**		**0.756**	2		1	**1.16**	**0.629**	**12**				

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T53	T55	T56	T57	T58	T59	T61	T62	T64	T65	T67	T68	T70
SiO2	g 100g^{-1}		**41.89**		43.23	41.7	**42.96**	**43.03**	43.33	43.8	**43.61**	43.23	**44.06**	43.3
TiO2	g 100g^{-1}	0.002	**0.03**				**0.039**	**0.007**			**0.005**	0.02	**0.01**	
Al2O3	g 100g^{-1}	0.23	**0.01**	0.32	0.42	0.346	**0.4**	**0.583**	0.382		**0.42**	0.222	**0.57**	0.43
Fe2O3T	g 100g^{-1}	8.811	**9.56**	8.21	9	9.92	**9.01**	**8.881**	9.04	8.9	**8.96**	9.09	**9.09**	8.9
Fe(II)O	g 100g^{-1}				7.52		4.72							
MnO	g 100g^{-1}	0.121	**0.11**	0.13	0.12	0.147	**0.13**	**0.136**	0.129	0.154	**0.13**	0.104	**0.13**	0.125
MgO	g 100g^{-1}	43.965	**47.34**	87.31	45.46	45.5	**45.52**	**45.75**	46.1		**45.88**	46.39	**46.61**	45.6
CaO	g 100g^{-1}	0.491	**0.45**	0.48	0.54	510	**0.49**	**0.504**	0.503	0.4	**0.46**	0.48	**0.49**	0.46
Na2O	g 100g^{-1}	0.012	**0.01**	0.05	0.01		**0.128**	**0.027**	0.106		**0.005**		**0.25**	0.01
K2O	g 100g^{-1}	0.006	**0.01**	0.01			**0.015**	**0.003**			**0.01**			
P2O5	g 100g^{-1}		**0.01**				**0.022**				**0.01**	0.009		0.02
H2O+	g 100g^{-1}				0.88									
CO2	g 100g^{-1}			0.13										
LOI	g 100g^{-1}		**0.32**		0.42	1.6	**0.48**		0.386		**0.48**	0.43	**0.37**	0.51
Ag	mg kg^{-1}				0.025								**0.19**	
As	mg kg^{-1}	0.33	**3.22**					**0.267**					**0.41**	
Au	mg kg^{-1}							**0.005**						
B	mg kg^{-1}				4.44									
Ba	mg kg^{-1}		**0.01**		1.16		**38.1**	**4.69**					**24**	
Be	mg kg^{-1}				0.054									
Bi	mg kg^{-1}													
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}			0.04										
Cd	mg kg^{-1}	0.126		0.106	0.097			**0.083**					**0.13**	
Ce	mg kg^{-1}	0.7	**1.437**		0.65			**0.087**					**0.74**	
Cl	mg kg^{-1}					135							**79**	
Co	mg kg^{-1}	112.205	**33.2**	118.336	117		**103**	**120**				110.5		
Cr	mg kg^{-1}	691.520	**4504**	1344.101	3530	2580	**2702**	**2975**					**2879**	
Cs	mg kg^{-1}		**0.01**		0.031			**0.017**						
Cu	mg kg^{-1}	5.43	**5.7**	20.606	4.56		**6.18**	**8.567**				7.3	**7.5**	
Dy	mg kg^{-1}		**0.09**		0.036									
Er	mg kg^{-1}	0.515	**0.208**		0.025								**0.4**	
Eu	mg kg^{-1}		**0.034**		0.009			**0.002**						
F	mg kg^{-1}													
Ga	mg kg^{-1}	0.28		0.513	1.03			**0.307**					**0.79**	
Gd	mg kg^{-1}		**0.03**		0.019			**0.05**					**0.02**	
Ge	mg kg^{-1}				1.59								**1.09**	
Hf	mg kg^{-1}	0.267	**1.93**		0.021			**0.080**					**0.01**	
Hg	mg kg^{-1}			0.004	0.006			**0.01**						
Ho	mg kg^{-1}		**0.044**		0.008			**0.007**						
I	mg kg^{-1}													
In	mg kg^{-1}													
Ir	mg kg^{-1}													
La	mg kg^{-1}	0.05	**0.04**		0.24			**0.035**						
Li	mg kg^{-1}	1.7			1.91		**6.31**							
Lu	mg kg^{-1}	0.002	**0.01**		0.004			**0.006**						
Mo	mg kg^{-1}	0.141			0.17									
Nb	mg kg^{-1}		**16.9**		0.48									
Nd	mg kg^{-1}	0.21	**0.745**		0.22			**0.044**					**0.29**	
Ni	mg kg^{-1}	2465.960	**2309**	2436.251	2540	2350	**2573**	**2260**				2506	**2462**	
Os	mg kg^{-1}													
Pb	mg kg^{-1}	243.3	**188**	246.546	255	255	**256**	**227.3**				206	**231.590**	
Pd	mg kg^{-1}													
Pr	mg kg^{-1}	2.46	**2.33**		0.087			**2.34**					**4.54**	
Pt	mg kg^{-1}													
Rb	mg kg^{-1}	0.1	**2.4**	0.101	0.41							0.6	**0.76**	
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
Ru	mg kg^{-1}													
S	mg kg^{-1}					47							**80**	
Sb	mg kg^{-1}	1.63						**1.445**					**1.11**	
Sc	mg kg^{-1}		**23.6**		9.42			**8.845**					**29.53**	
Se	mg kg^{-1}	0.049						**0.117**						
Sm	mg kg^{-1}				0.028			**0.008**						
Sn	mg kg^{-1}	0.1			0.47									
Sr	mg kg^{-1}	0.1	**0.66**	0.558	0.41							1.1	**0.2**	
Ta	mg kg^{-1}	0.131	**0.35**		0.036			**0.003**						
Tb	mg kg^{-1}		**0.01**		0.005			**0.004**						
Te	mg kg^{-1}													
Th	mg kg^{-1}	0.49	**0.34**		0.21			**0.083**				0.5	**0.01**	
Tl	mg kg^{-1}	0.028												
Tm	mg kg^{-1}		**0.022**		0.004									
U	mg kg^{-1}		**0.11**	0.028	0.067			**0.011**						
V	mg kg^{-1}	19.88	**41.2**	34.502	34.7		**37.8**	**28.033**				36	**34.17**	
W	mg kg^{-1}	6.937			6.53			**7.14**						
Y	mg kg^{-1}	0.03	**28.5**		0.031								**0.12**	
Yb	mg kg^{-1}	0.007	**0.09**		0.026			**0.034**						
Zn	mg kg^{-1}	54.4	**77.2**	24.884	71.5	59	**69.7**	**67.45**				71.4	**72.73**	
Zr	mg kg^{-1}	2.4	**45.8**		0.94		**126**	**4.49**				6.2	**0.76**	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T71	T74	T75	T76	T78	T80	T82	T83	T84	T85	T86	T87	T88
SiO2	g 100g^{-1}	42.754	42.76	42.2	**43.54**	43.1		42.74	**41.446**	43.74	**42.88**	44.3	42.862	**43.58**
TiO2	g 100g^{-1}		0.02		**0.006**	0.01				0.01		0.02	0.007	**0.002**
Al2O3	g 100g^{-1}	0.405	0.06	0.37	**0.37**	0.384				0.37	**0.29**	0.87	0.607	**0.39**
Fe2O3T	g 100g^{-1}	8.931	9.07	10.7	**8.9**	8.9		8.95		8.91	**8.98**	9.25	8.761	**9.01**
Fe(II)O	g 100g^{-1}							6.66						
MnO	g 100g^{-1}	0.095	0.129	0.14	**0.123**	0.113		0.124		0.13	**0.13**	0.073	0.123	**0.121**
MgO	g 100g^{-1}	46.157	46.6		**45.83**	45.2		45.97		46.1	**45.9**	43.7	41.132	**45.4**
CaO	g 100g^{-1}	0.53	0.49	0.57	**0.464**	0.47		0.46		0.48	**0.49**	0.18	0.457	**0.49**
Na2O	g 100g^{-1}	0.015	0.01		**0.038**							0.17	0.025	
K2O	g 100g^{-1}	0.041	0.01		**0.002**	0.014						0.1	0.017	
P2O5	g 100g^{-1}	0.004	0.01		**0.002**							0.04	0.002	
H2O+	g 100g^{-1}													
CO2	g 100g^{-1}													
LOI	g 100g^{-1}	0.585	0.27		**0.28**	0.415		0.44	**0.37**	0.46	0.45	0.44		**0.37**
Ag	mg kg^{-1}		0.1											
As	mg kg^{-1}		0.1									0.657		
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}		4.8		**0.39**				**0.317**	9.5			20.27	**0.27**
Be	mg kg^{-1}												0.127	
Bi	mg kg^{-1}		0.1											
Br	mg kg^{-1}		0.1											
C(org)	mg kg^{-1}					683								
C(tot)	mg kg^{-1}		100											
Cd	mg kg^{-1}		2.7		**0.109**					0.4		0.065		
Ce	mg kg^{-1}		1.4		**0.462**				**0.484**	36			2.57	**0.7**
Cl	mg kg^{-1}													
Co	mg kg^{-1}		124.3	67.8	**126**	114		105	**108.2**	115	**111.6**	95	90.5	**117**
Cr	mg kg^{-1}		2386.900	2900	**3008**	2420		2478	**832.1**	2473	**2466**	37	2920	**3092**
Cs	mg kg^{-1}		0.1		**0.004**				**0.003**				0.14	
Cu	mg kg^{-1}		6.3	7.78	**5.21**				**4.712**	0.6	**17.8**	23		**5.61**
Dy	mg kg^{-1}				**0.002**				**0.002**				0.31	**0.003**
Er	mg kg^{-1}				**0.243**		0.34		**0.294**				0.33	**0.59**
Eu	mg kg^{-1}								**0.001**				0.02	**0.000**
F	mg kg^{-1}													
Ga	mg kg^{-1}		0.8		**0.485**				**0.26**		**1.4**		0.76	**0.51**
Gd	mg kg^{-1}				**0.01**		0.51		**0.005**					**0.006**
Ge	mg kg^{-1}		0.1								**1.8**			
Hf	mg kg^{-1}		0.6		**0.017**				**0.011**		**3.2**		0.29	**0.018**
Hg	mg kg^{-1}		0.02											
Ho	mg kg^{-1}				**0.001**				**0.001**					**0.001**
I	mg kg^{-1}		1.5											
In	mg kg^{-1}													
Ir	mg kg^{-1}													
La	mg kg^{-1}		9.2		**0.04**				**0.036**	5.2				**0.044**
Li	mg kg^{-1}				**1.71**			1.7	**1.869**					**1.93**
Lu	mg kg^{-1}				**0.003**				**0.002**				0.02	**0.003**
Mo	mg kg^{-1}		0.2		**0.134**				**0.134**				0.24	**0.19**
Nb	mg kg^{-1}		0.1		**0.004**	2.44			**0.006**				0.9	**0.005**
Nd	mg kg^{-1}		3.4		**0.211**		0.11		**0.182**				0.19	**0.21**
Ni	mg kg^{-1}		2314.700	2700	**2403**	2505		2473	**2244**	2435	**2221**	2121	2377	**2355**
Os	mg kg^{-1}													
Pb	mg kg^{-1}		204.7	270	**276**	234		231	**237.2**	219	**214.1**		159	**244**
Pd	mg kg^{-1}													
Pr	mg kg^{-1}				**2.635**		4.15		**2.62**				2.93	**3.19**
Pt	mg kg^{-1}													
Rb	mg kg^{-1}		0.4		**0.024**				**0.009**	1				**0.03**
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
Ru	mg kg^{-1}													
S	mg kg^{-1}		70											
Sb	mg kg^{-1}		3.6		**1.566**							0.511		
Sc	mg kg^{-1}		6.2		**7.69**	7.59		8.5	**8.66**		**9.2**		8.914	**8.9**
Se	mg kg^{-1}		0.1											
Sm	mg kg^{-1}		3.3		**0.001**				**0.001**				0.05	**0.001**
Sn	mg kg^{-1}		1.2		**0.045**									**0.07**
Sr	mg kg^{-1}		0.1		**0.144**				**0.127**	360	**3.5**		3.02	**0.14**
Ta	mg kg^{-1}		0.1						**0.001**				0.14	
Tb	mg kg^{-1}												0.02	**0.000**
Te	mg kg^{-1}		2.7		**0.021**							0.03		
Th	mg kg^{-1}		0.1						**0.001**					**0.002**
Tl	mg kg^{-1}		0.1							0.5		0.239	0.01	
Tm	mg kg^{-1}				**0.001**								0.03	**0.001**
U	mg kg^{-1}		0.3						**0.001**	2.2				**0.001**
V	mg kg^{-1}		26.2		**31.8**	34.5		32	**19.35**	27	**33.7**	15	36.54	**35.4**
W	mg kg^{-1}		11.3		**5.5**								6.62	**7.05**
Y	mg kg^{-1}		0.5		**0.027**		0.09		**0.027**				1.52	**0.03**
Yb	mg kg^{-1}		0.1		**0.014**		0.01		**0.013**		**21.5**		0.1	**0.013**
Zn	mg kg^{-1}		63.9	98.3	**69.5**	68.9		70	**56.82**	67	**62.1**	100	71.9	**60.1**
Zr	mg kg^{-1}		0.4		**0.591**				**0.541**		**0.6**		12.77	**0.74**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T89	T90	T91	T92	T93	T95	T96	T97	T98	T100	T101	T104	T105
SiO2	g 100g^{-1}	**43.6**		**44.29**	**42.582**	43.2	43.7	**43.37**	43.15	43.381	42.78	**42.06**	**41.334**	**43.62**
TiO2	g 100g^{-1}			**0.12**				**0.003**		0.002	0.01		**0.005**	**0.003**
Al2O3	g 100g^{-1}	**0.39**		**0.94**	**0.376**	0.35	0.4	**0.22**	0.37	0.296	0.39	**0.92**	**0.278**	**0.36**
Fe2O3T	g 100g^{-1}	**9.07**		**6.67**	**8.705**	8.92	8.81	**9.3**	8.95	9.097	8.91	**8.8**	**10.204**	**9.01**
Fe(II)O	g 100g^{-1}							**7.3**						
MnO	g 100g^{-1}	**0.13**		**0.11**	**0.122**	0.13	0.119	**0.114**	0.125	0.117	0.13	**0.129**	**0.132**	**0.124**
MgO	g 100g^{-1}	**45.66**		**45.69**	**44.388**	46.7	45.4	**44.93**	47.19	45.704	45.76	**46.24**	**44.797**	**46.29**
CaO	g 100g^{-1}	**0.49**		**0.57**	**0.471**	0.46	0.44	**0.6**	0.4	0.449	0.52	**1.69**	**0.318**	**0.48**
Na2O	g 100g^{-1}	**0.02**		**1.15**				**0.13**		0.009	0.21		**0.02**	**0.13**
K2O	g 100g^{-1}	**0.01**		**0.04**				**0.05**		0.008		**0.01**	**0.005**	**0.005**
P2O5	g 100g^{-1}						0.019	**0.01**		0.004	0.01	**0.016**	**0.022**	**0.002**
H2O+	g 100g^{-1}				**1.131**									
CO2	g 100g^{-1}				**0.097**									
LOI	g 100g^{-1}	**0.21**				0.68	0.48	**0.71**		0.437		**0.25**	**0.294**	**0.51**
Ag	mg kg^{-1}							**0.28**						
As	mg kg^{-1}					0.7								
Au	mg kg^{-1}							**0.006**						
B	mg kg^{-1}													
Ba	mg kg^{-1}				**1.058**	3.6		**19**		12	21			
Be	mg kg^{-1}						0.24				0.33			
Bi	mg kg^{-1}													
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}					400			310					
Cd	mg kg^{-1}				**0.097**			**0.14**						
Ce	mg kg^{-1}	**24**				0.9	27.28	**1.29**			0.56	**11**		
Cl	mg kg^{-1}	**21**												
Co	mg kg^{-1}	**123**	115	**96**	**132.3**	123	126	**109**	122	101	4	**110**		**122**
Cr	mg kg^{-1}	**2768**	3062.500			2470	3037	**1888**	3238	2296	2950	**2467**		**2597**
Cs	mg kg^{-1}					0.16								
Cu	mg kg^{-1}		11.9		**6.499**	12		**5.27**	12	21	15		**5**	
Dy	mg kg^{-1}						0.15				0.08			
Er	mg kg^{-1}					0.32	0.66				0.36			
Eu	mg kg^{-1}							**0.024**			0.03			
F	mg kg^{-1}													
Ga	mg kg^{-1}				**0.405**	0.76	0.55			34	4		**6**	
Gd	mg kg^{-1}						0.81	**0.15**			0.18			
Ge	mg kg^{-1}						0.24				0.85			
Hf	mg kg^{-1}									2	0.21			
Hg	mg kg^{-1}													
Ho	mg kg^{-1}										0.02			
I	mg kg^{-1}													
In	mg kg^{-1}													
Ir	mg kg^{-1}													
La	mg kg^{-1}	**7**				1.6	11.82	**0.77**			0.3			
Li	mg kg^{-1}						4.26			3				
Lu	mg kg^{-1}										0.02			
Mo	mg kg^{-1}						8.82				0.61			
Nb	mg kg^{-1}											**5.2**	**4**	
Nd	mg kg^{-1}	**5**				0.3	1.47	**2.68**			0.53			
Ni	mg kg^{-1}	**2484**	2488.700	**1958**		2217	2408	**2316**	2495	2318	2464	**2450**	**2445**	**2517**
Os	mg kg^{-1}													
Pb	mg kg^{-1}	**257**	254.3		**266.5**	203	207	**242**			465	**219**	**233**	**234**
Pd	mg kg^{-1}							**0.006**						
Pr	mg kg^{-1}					2.28		**3.66**			1.44			
Pt	mg kg^{-1}							**0.003**						
Rb	mg kg^{-1}	**6**				0.4	0.28				3			
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
Ru	mg kg^{-1}													
S	mg kg^{-1}							**48**	30					
Sb	mg kg^{-1}						1.63	**3**						
Sc	mg kg^{-1}	**7**	8		**9.273**		12.83	**8.53**			7	**7.1**		**7**
Se	mg kg^{-1}													
Sm	mg kg^{-1}						0.07	**0.14**			0.42			
Sn	mg kg^{-1}						1.84				0.48			
Sr	mg kg^{-1}	**4**				1		**51**		33				
Ta	mg kg^{-1}										0.1			
Tb	mg kg^{-1}										0.03			
Te	mg kg^{-1}													
Th	mg kg^{-1}				**0.002**						14			
Tl	mg kg^{-1}													
Tm	mg kg^{-1}										0.02			
U	mg kg^{-1}				**0.002**		0.15				0.09			
V	mg kg^{-1}	**33**	34.3		**28.8**	44	34	**17.2**	28		42	**32**		**35**
W	mg kg^{-1}					7					1.63		**5**	
Y	mg kg^{-1}				**0.022**		1.94	**1.33**		1	7			
Yb	mg kg^{-1}						0.53				0.08			**40**
Zn	mg kg^{-1}	**72**	68.97	**64**	**70.37**	69	76	**73**	84	72	65	**60**	**71**	**69**
Zr	mg kg^{-1}			**82**				**25**		20			**1**	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T106	T107	T108	T109	T110	T111	T112	T113	T114	T115	T117	T118	T120
SiO_2	$g\ 100g^{-1}$	42.49	43.499		43.665	**41.81**	42.4	**42.49**	43.18	**42.63**	**43.64**	**43.62**	44.1	**42.6**
TiO_2	$g\ 100g^{-1}$					**0.01**	0.001				**0.01**		0.002	**0.02**
Al_2O_3	$g\ 100g^{-1}$	0.22	0.364			**0.41**	0.344	**0.4**	0.386	**0.31**	**0.49**	**0.47**	0.144	**0.29**
Fe_2O_3T	$g\ 100g^{-1}$	8.76	8.931	**21.321**		**7.47**	8.81	**8.82**	9.042	**8.92**	**9.02**	**9.03**	9.402	**8.61**
Fe(II)O	$g\ 100g^{-1}$							**7.51**		**6.81**			6.17	
MnO	$g\ 100g^{-1}$	0.13	0.13	**0.069**		**0.11**	0.015	**0.127**	0.127	**0.13**	0.126	**0.13**	0.174	**0.14**
MgO	$g\ 100g^{-1}$	46.73	46.29			**47.98**	51.6	**45.7**	45.676	**46.32**	46.69	**45.78**	45.01	**44.27**
CaO	$g\ 100g^{-1}$	0.38	0.476	**0.041**		**0.04**	0.504	**0.46**	0.454	**0.46**	0.5	**0.55**	0.498	**0.49**
Na_2O	$g\ 100g^{-1}$			**0.042**		**0.04**					**0.02**		0.018	**0.04**
K_2O	$g\ 100g^{-1}$					**0.04**	0.014				**0.02**		0.012	
P_2O_5	$g\ 100g^{-1}$					**0.01**					**0.01**		0.021	
H_2O+	$g\ 100g^{-1}$	0.09						**0.99**		**0.94**				
CO_2	$g\ 100g^{-1}$									**0.14**				
LOI	$g\ 100g^{-1}$	0.42	0.34		0.413	**1.11**		**0.38**	0.408		0.42		0.467	**0.42**
Ag	$mg\ kg^{-1}$												0.003	
As	$mg\ kg^{-1}$			**8.3**				**0.39**			1.7		0.123	**0.25**
Au	$mg\ kg^{-1}$													
B	$mg\ kg^{-1}$							**6**			5			
Ba	$mg\ kg^{-1}$									**1**	0.28		107	**0.3**
Be	$mg\ kg^{-1}$										0.002		0.073	
Bi	$mg\ kg^{-1}$										0.013		0.009	2.2
Br	$mg\ kg^{-1}$													
C(org)	$mg\ kg^{-1}$										0.3			
C(tot)	$mg\ kg^{-1}$							**246**					676	
Cd	$mg\ kg^{-1}$			**0.048**				**0.09**		2			0.095	
Ce	$mg\ kg^{-1}$		1.7					**0.653**		**6**			0.444	**0.46**
Cl	$mg\ kg^{-1}$						95.7	**70**		48				
Co	$mg\ kg^{-1}$	130	122.2	**94.8**				**118**		**109**	78	**120**	105	118.8
Cr	$mg\ kg^{-1}$	2620	2472.600	**71.6**			3300	**3112**	3112	**2913**	2700		2496	**2770**
Cs	$mg\ kg^{-1}$		1.1								0.01		0.012	
Cu	$mg\ kg^{-1}$		2.8	**5.6**			52	**20.8**			10.5		5.28	4.7
Dy	$mg\ kg^{-1}$										0.003		0.005	
Er	$mg\ kg^{-1}$							**0.429**			0.002		0.19	**0.24**
Eu	$mg\ kg^{-1}$										0.000		0.001	
F	$mg\ kg^{-1}$										240			
Ga	$mg\ kg^{-1}$							**0.52**			0.52		0.573	
Gd	$mg\ kg^{-1}$							**0.087**			0.003		0.02	**0.04**
Ge	$mg\ kg^{-1}$							**0.81**			1.11		0.824	
Hf	$mg\ kg^{-1}$										0.02		0.152	
Hg	$mg\ kg^{-1}$							**0.004**			0.013			
Ho	$mg\ kg^{-1}$							**0.001**			0.001		0.001	
I	$mg\ kg^{-1}$													
In	$mg\ kg^{-1}$												0.003	
Ir	$mg\ kg^{-1}$													
La	$mg\ kg^{-1}$									**8**	0.04		0.041	**0.04**
Li	$mg\ kg^{-1}$							**1.8**			1.79		2.14	**1.5**
Lu	$mg\ kg^{-1}$							**0.003**			0.004		0.003	**0.01**
Mo	$mg\ kg^{-1}$			**0.28**						**2**	0.9		0.301	
Nb	$mg\ kg^{-1}$									**76**			0.069	
Nd	$mg\ kg^{-1}$		11.8					**0.248**		**1**			0.175	**0.22**
Ni	$mg\ kg^{-1}$	2537	2442.400	**2485**			2540	**2419**	2832.900	**2384**	2448	**2427**	2094	2263
Os	$mg\ kg^{-1}$													
Pb	$mg\ kg^{-1}$	202	224.1	**201.7**			270	**245**		**227**	274.180	**224**	200	
Pd	$mg\ kg^{-1}$													
Pr	$mg\ kg^{-1}$							**3.33**					2.642	**2.16**
Pt	$mg\ kg^{-1}$													
Rb	$mg\ kg^{-1}$							**0.16**			0.03		0.092	
Re	$mg\ kg^{-1}$												0.001	
Rh	$mg\ kg^{-1}$													
Ru	$mg\ kg^{-1}$													
S	$mg\ kg^{-1}$									47				
Sb	$mg\ kg^{-1}$		1.14	**0.15**				**1.41**		13	1.81		1.073	
Sc	$mg\ kg^{-1}$		9.9				73	**9.11**			10.35		7.55	7.7
Se	$mg\ kg^{-1}$							**0.05**					0.048	
Sm	$mg\ kg^{-1}$												0.01	**0.01**
Sn	$mg\ kg^{-1}$		0.59	**0.086**						**3**	0.96		0.94	
Sr	$mg\ kg^{-1}$									**1**	11		0.358	
Ta	$mg\ kg^{-1}$		1.8								0.01		0.008	9.6
Tb	$mg\ kg^{-1}$										0.000		0.002	
Te	$mg\ kg^{-1}$													
Th	$mg\ kg^{-1}$									**2**	0.004		0.014	
Tl	$mg\ kg^{-1}$										0.002		0.017	
Tm	$mg\ kg^{-1}$							**0.001**			0.001		0.002	**0.01**
U	$mg\ kg^{-1}$									**2**	0.002		0.013	
V	$mg\ kg^{-1}$	32	30.2	**25.8**			37.4	**32.2**		**36**	34	44	32.4	28.6
W	$mg\ kg^{-1}$		11.2					**7.56**		11	2.7		6.61	
Y	$mg\ kg^{-1}$							**0.03**		**2**			0.064	**0.04**
Yb	$mg\ kg^{-1}$							**0.013**			0.02		0.014	**0.02**
Zn	$mg\ kg^{-1}$		68	**37.2**			66	**87.7**		**60**	88	69	54.9	**40.8**
Zr	$mg\ kg^{-1}$									**4**	0.79		7.23	

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT38A Contributed data for Modified harzburgite, HARZ01. 11/12/2015

Lab Code		T121	T122	T123	T124	-	-	-	-	-	-	-	-	-
SiO2	g 100g^{-1}	43.656			42.92									
TiO2	g 100g^{-1}				0.01									
Al2O3	g 100g^{-1}	0.363			0.37									
Fe2O3T	g 100g^{-1}	9.117			8.81									
Fe(II)O	g 100g^{-1}													
MnO	g 100g^{-1}	0.131			0.12									
MgO	g 100g^{-1}	45.965			45.86									
CaO	g 100g^{-1}	0.446			0.56									
Na2O	g 100g^{-1}				0.2									
K2O	g 100g^{-1}													
P2O5	g 100g^{-1}				0.01									
H2O+	g 100g^{-1}													
CO2	g 100g^{-1}													
LOI	g 100g^{-1}	0.475			0.51									
Ag	mg kg^{-1}													
As	mg kg^{-1}													
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}			3.52	21									
Be	mg kg^{-1}				0.258									
Bi	mg kg^{-1}													
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}													
Cd	mg kg^{-1}													
Ce	mg kg^{-1}		**41.1**	0.806	3.943									
Cl	mg kg^{-1}													
Co	mg kg^{-1}				144									
Cr	mg kg^{-1}	3078			2882									
Cs	mg kg^{-1}			0.039										
Cu	mg kg^{-1}				15									
Dy	mg kg^{-1}		**4.87**	0.005	0.117									
Er	mg kg^{-1}		**2.75**	0.295	0.364									
Eu	mg kg^{-1}			0.006	0.021									
F	mg kg^{-1}													
Ga	mg kg^{-1}			1.531										
Gd	mg kg^{-1}		**5.29**	0.245	0.233									
Ge	mg kg^{-1}				0.726									
Hf	mg kg^{-1}			0.097	0.248									
Hg	mg kg^{-1}													
Ho	mg kg^{-1}			0.01	0.021									
I	mg kg^{-1}													
In	mg kg^{-1}													
Ir	mg kg^{-1}													
La	mg kg^{-1}		**19.7**	0.308	1.542									
Li	mg kg^{-1}													
Lu	mg kg^{-1}			0.009	0.013									
Mo	mg kg^{-1}													
Nb	mg kg^{-1}			1.661										
Nd	mg kg^{-1}		**22.8**	0.396	1.56									
Ni	mg kg^{-1}	2704			2405									
Os	mg kg^{-1}													
Pb	mg kg^{-1}	235.2			465									
Pd	mg kg^{-1}													
Pr	mg kg^{-1}		**5.31**	2.368	2.708									
Pt	mg kg^{-1}													
Rb	mg kg^{-1}			0.747										
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
Ru	mg kg^{-1}													
S	mg kg^{-1}													
Sb	mg kg^{-1}													
Sc	mg kg^{-1}			15.2	6									
Se	mg kg^{-1}													
Sm	mg kg^{-1}		**4.89**	0.022	0.23									
Sn	mg kg^{-1}			0.022	0.459									
Sr	mg kg^{-1}			17.85										
Ta	mg kg^{-1}			0.159	0.094									
Tb	mg kg^{-1}			0.042	0.026									
Te	mg kg^{-1}													
Th	mg kg^{-1}			0.048	14									
Tl	mg kg^{-1}													
Tm	mg kg^{-1}			0.03	0.011									
U	mg kg^{-1}			0.375	0.059									
V	mg kg^{-1}				48									
W	mg kg^{-1}			8.45										
Y	mg kg^{-1}		**24.4**	0.208	8									
Yb	mg kg^{-1}		**2.22**	0.042	0.077									
Zn	mg kg^{-1}	75.7			65									
Zr	mg kg^{-1}			3.916										

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 2 - GeoPT38A Assigned values and statistical summary for Modified harzburgite, HARZ01.

	Assigned Value	Uncertainty of assigned value	Horwitz Target Value	Uncertainty/ Target	Number of reported results	Robust Mean of results	Robust SD of results	Median of results	Status of consensus value	Type of consensus value
	X_a	sdm	H_a	sdm/H_a	n					
	g 100g^{-1}	g 100g^{-1}	g 100g^{-1}			g 100g^{-1}	g 100g^{-1}	g 100g^{-1}		
SiO2	43.21	0.06705	0.4903	0.1368	83	43.14	0.6179	43.21	Assigned	Median
Al2O3	0.38	0.004973	0.008791	0.5656	80	0.3854	0.07057	0.38	Assigned	Median
Fe2O3T	8.952	0.01895	0.1287	0.1472	85	8.952	0.1747	8.95	Assigned	Robust Mean
MnO	0.1262	0.0008665	0.003446	0.2514	88	0.1262	0.008128	0.1285	Assigned	Robust Mean
MgO	45.84	0.06385	0.5155	0.1239	82	45.91	0.7717	45.84	Assigned	Median
CaO	0.4781	0.003362	0.01069	0.3146	85	0.4781	0.03099	0.48	Assigned	Robust Mean
	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}			mg kg^{-1}	mg kg^{-1}	mg kg^{-1}		
Cd	0.0968	0.01453	0.011	1.321	23	0.1099	0.03761	0.106	Provisional	Mode
Ce	0.5452	0.09423	0.04778	1.972	46	1.155	0.9721	0.7	Provisional	Mode
Co	116.2	1.081	4.542	0.238	70	114.7	12.13	116.2	Assigned	Median
Cr	2911	19.23	70.1	0.2744	77	2736	426.9	2879	Provisional	Mode
Cu	5.671	0.535	0.3493	1.531	54	8.403	4.35	6.665	Provisional	Mode
Er	0.3048	0.01525	0.02915	0.523	36	0.3048	0.09148	0.2975	Assigned	Robust Mean
Ga	0.5121	0.02463	0.0453	0.5437	36	0.6307	0.2551	0.555	Provisional	Mode
Ho	0.001029	0.0000545	0.0002318	0.2352	24	0.004883	0.004956	0.00175	Provisional	Mode
La	0.03713	0.01012	0.004875	2.075	39	0.5045	0.7546	0.05	Provisional	Mode
Li	1.93	0.06227	0.1398	0.4453	25	1.999	0.4081	1.93	Assigned	Median
Lu	0.003135	0.000214	0.0005971	0.3584	30	0.005035	0.003058	0.0037	Provisional	Mode
Nd	0.2185	0.02031	0.02197	0.9246	44	0.3444	0.2312	0.244	Provisional	Mode
Ni	2436	12.72	60.26	0.2111	79	2429	131.7	2436	Assigned	Median
Pb	234	2.446	8.235	0.2971	72	233	25.18	234	Assigned	Median
Pr	2.623	0.05345	0.1815	0.2946	40	2.655	0.401	2.623	Assigned	Median
Sb	1.473	0.09428	0.1111	0.8485	28	1.685	0.8163	1.473	Provisional	Median
Sc	8.914	0.2008	0.513	0.3914	53	8.9	1.602	8.914	Assigned	Median
Tm	0.001445	0.0002376	0.0003092	0.7683	24	0.0077	0.009283	0.0025	Provisional	Mode
V	35.08	1.459	1.642	0.8884	71	32.74	5.976	34.17	Provisional	Mode
W	6.75	0.5054	0.405	1.248	26	7.402	1.904	7.085	Provisional	Mode
Y	0.02944	0.004002	0.004003	0.9999	36	0.4226	0.6098	0.077	Provisional	Mode
Yb	0.0139	0.001364	0.002116	0.6449	36	0.03543	0.03282	0.02	Provisional	Mode
Zn	68.43	1.015	2.898	0.3504	76	68.43	8.851	68.45	Assigned	Robust Mean

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T1	T2	T3	T4	T8	T9	T10	T11	T12	T14	T15	T17	T19
SiO2	0.04	**0.41**	*	**-0.71**	1.10	-0.55	*	-1.82	0.00	-2.95	-1.16	0.49	0.66
Al2O3	-0.57	**-1.14**	*	**-2.27**	11.89	0.17	2.56	-5.12	-0.45	4.28	0.00	20.47	0.00
Fe2O3T	-0.12	**0.68**	*	**-2.19**	0.15	-0.09	**0.68**	-3.35	0.41	4.96	0.23	-0.75	0.26
MnO	0.55	**-0.05**	*	**-1.79**	0.70	0.12	**1.11**	-2.35	0.44	1.83	-0.17	-0.90	0.99
MgO	-0.15	**-0.36**	*	**3.35**	-0.78	-0.19	**-1.60**	-0.05	0.11	5.16	1.46	1.63	0.12
CaO	0.09	**0.18**	*	**-4.50**	-0.61	0.09	**-0.29**	-10.67	1.53	25.36	-0.38	-0.38	1.02
Cd	*	*	*	***-6.98***	*	*	*	*	*-0.49*	*0.15*	*	*	*
Ce	*	*	***-0.55***	***-1.36***	*-0.37*	*	*20.35*	*2.67*	*0.36*	*0.72*	*1.62*	*130.35*	*
Co	*	**-0.47**	**-0.46**	**0.85**	-3.06	*	**1.18**	-4.64	0.35	1.89	-3.87	*	1.63
Cr	*0.92*	***0.96***	***-22.37***	***-0.44***	*-17.24*	*	***2.55***	*-18.02*	*0.06*	*5.74*	*-6.01*	*-7.00*	*0.42*
Cu	*	***3.80***	***6.49***	***1.08***	*2.19*	*	*	*6.20*	*1.62*	*14.88*	*	*26.23*	*6.20*
Er	*	*	**-2.33**	**-2.91**	-0.60	*	*	-0.31	0.37	-0.21	-0.08	*	*
Ga	*	*	***-0.97***	***-0.05***	*-1.35*	*	*	*	*-0.34*	*1.09*	*	*	*
Ho	*	*	*	***0.31***	*	*	*	*10.72*	*	*22.59*	*	*	*
La	*	*	***-0.64***	***1.00***	*0.70*	*	*-0.42*	*	*	*3.68*	*	*150.04*	*
Li	*	*	*	**0.57**	20.85	*	*	3.83	-3.33	*	*	*	*
Lu	*	*	***-1.90***	***-0.39***	*	*	*	*1.56*	*0.47*	*3.15*	*	*	*
Nd	*	*	***-1.20***	***1.89***	*-0.44*	*	*	*2.88*	*0.03*	*0.67*	*	*	*
Ni	*	**1.59**	**3.09**	**-0.73**	-6.37	*	**1.82**	1.73	-0.07	3.92	0.19	-7.59	2.35
Pb	*	**-0.49**	**0.95**	**1.21**	-3.62	*	*	-6.11	0.48	-2.39	-0.61	-6.56	1.28
Pr	-0.61	*	**0.92**	**-1.78**	1.56	*	*	0.24	-0.61	0.42	0.49	*	*
Sb	*	*	*	*	*71.94*	*	***-0.65***	*4.62*	*-0.63*	*4.81*	*	*	*
Sc	*	*	**2.29**	**2.51**	1.65	*	**0.32**	0.58	-3.23	8.45	1.64	*	*
Tm	*	*	*	***-0.15***	*	*	*	*5.75*	*1.22*	*2.19*	*	*	*
V	*	***-0.05***	***-7.66***	***0.87***	*-5.95*	*	***0.75***	*	*0.05*	*3.23*	*-3.98*	*-4.59*	*1.50*
W	*	*	*	*	*	*	***0.91***	*	*-0.14*	*2.64*	*	*	*
Y	*	*	***3.89***	***1.64***	*111.24*	*	*	*19.31*	*	*0.94*	*	*	*
Yb	*	*	***0.05***	***0.05***	*	*	*	*3.10*	*0.97*	*1.28*	*	*	*
Zn	*	**1.23**	**-6.01**	**-1.15**	-5.78	*	**4.75**	-0.25	-0.40	-0.33	-0.42	5.97	*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T20	T22	T23	T24	T25	T28	T29	T30	T31	T32	T33	T34	T35
SiO2	**-0.08**	**0.56**	-0.44	-0.11	0.26	-0.14	0.11	-0.35	1.85	**-0.55**	0.01	0.16	0.64
Al2O3	**2.27**	**6.71**	0.57	3.41	-2.84	-0.57	1.71	19.34	*	**0.00**	6.82	3.18	11.37
Fe2O3T	**-2.04**	**0.29**	1.39	-1.13	-0.16	0.03	0.23	-0.98	1.22	**0.68**	0.11	0.00	-1.00
MnO	**1.11**	**4.01**	-2.35	0.55	0.55	0.55	-1.04	2.73	0.99	**0.24**	-0.90	-0.90	4.30
MgO	**0.63**	**0.09**	-0.03	-5.51	-0.28	0.09	-1.29	-0.11	1.41	**-1.33**	0.35	0.00	3.15
CaO	**2.98**	**0.08**	-0.38	0.09	-0.85	0.09	0.56	-0.85	*	**-0.76**	0.09	0.98	-0.76
Cd	***263.86***	*	*	*	*	*	*	*	*	*	*	*	*
Ce	*	*	*0.31*	*4.76*	*	*-1.52*	*0.47*	*	*	***9.60***	*25.69*	*	*
Co	**-0.03**	**-0.30**	0.31	0.02	*	0.64	-0.18	2.08	0.30	*	*	14.33	-2.48
Cr	***-7.62***	***0.80***	*-0.73*	*0.18*	*0.85*	*1.09*	*0.93*	*2.42*	*1.24*	***1.41***	*-0.26*	*-2.43*	*-3.11*
Cu	***12.39***	*	*1.23*	*-2.25*	*	*0.23*	*	*9.06*	*0.90*	*	*0.47*	*	*
Er	*	*	-0.63	-0.60	*	-1.45	0.26	*	*	**0.76**	*	*	*
Ga	*	***-0.58***	*0.85*	*2.96*	*	*	*	*0.53*	*	*	*5.39*	*	*
Ho	*	*	*0.99*	*12.88*	*	*	*	*	*	***17.13***	*	*	*
La	*	*	*-0.47*	*24.91*	*	*6.45*	*	*0.91*	*	***39.97***	*	*	*2556.45*
Li	*	-1.57	0.46	*	*	*	*	0.61	*	*	*	*	*
Lu	*	*	*0.46*	*1.56*	*	*	*	*0.72*	*	***3.12***	*	*	*
Nd	***81.09***	***-1.25***	*-0.37*	*4.59*	*	*-0.42*	*0.49*	*	*	***7.72***	*	*	*
Ni	**-2.81**	**0.26**	-0.36	-1.74	0.61	-0.42	-0.28	-0.72	1.28	**1.72**	1.12	1.08	-8.33
Pb	**-0.97**	**-2.06**	0.24	5.65	*	0.49	-0.12	8.86	0.17	**0.04**	0.30	-0.99	-0.47
Pr	*	**0.02**	-0.67	-0.06	*	-0.17	-1.00	*	-0.64	**1.03**	*	*	*
Sb	***4.75***	***-1.97***	*	*	*	*0.12*	*-0.73*	*	*	*	*	*	*17.35*
Sc	**7.97**	*	0.24	-0.31	*	0.08	-0.70	0.28	-0.11	**-0.01**	-2.84	*	-3.93
Tm	*	***538.58***	*0.65*	*10.60*	*	*	*	*	*	*	*	*	*
V	***-0.05***	***-0.84***	*-0.11*	*-0.18*	*	*-0.63*	*-0.09*	*0.28*	*0.28*	***1.17***	*0.28*	*	*-3.70*
W	***74.68***	*	*	*-0.56*	*	*-0.93*	*	*	*	*	*	*	*
Y	*	*	*-0.07*	*25.05*	*	*	*	*0.94*	*	***37.11***	*	*	*
Yb	*	*	*0.33*	*3.33*	*	*	*	*1.91*	*	***6.19***	*	*	*
Zn	**-0.84**	**2.06**	-0.14	2.29	*	2.00	-1.26	5.79	1.98	**0.54**	-0.42	3.08	-2.18

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T36	T37	T38	T39	T40	T41	T42	T43	T46	T47	T49	T50	T51
SiO2	*	**0.27**	**-0.43**	0.41	-0.43	0.05	*	**2.33**	**0.92**	*	-3.51	-0.05	0.25
Al2O3	*	**-3.41**	**0.23**	0.00	*	0.00	*	**2.27**	**0.00**	*	-0.28	-0.57	-0.11
Fe2O3T	*	**-0.40**	**0.68**	-0.24	0.57	-0.40	*	**-1.34**	**-0.09**	*	0.45	-0.16	-0.55
MnO	**0.53**	**-1.79**	**0.03**	0.55	0.55	-0.90	**-0.63**	**1.11**	**1.11**	-1.79	1.13	0.55	-1.04
MgO	*	**-0.30**	**-0.22**	0.19	0.48	-0.24	*	**-0.90**	**1.13**	*	3.65	-0.17	0.04
CaO	*	**-0.76**	**-0.10**	0.09	-0.38	-0.38	*	**0.18**	**0.18**	3.92	-15.59	0.70	-1.22
Cd	*	*	***0.02***	*	*	*0.60*	*	*	*	*0.84*	*	*	*1.01*
Ce	***3.66***	*	***-0.23***	*	*	*0.57*	***-1.78***	***-0.11***	*	*-1.68*	*	*	*
Co	**0.41**	*	**1.78**	*	-0.57	0.20	**0.19**	**-0.03**	**-0.69**	-1.35	*	0.31	2.52
Cr	***2.78***	*	***-0.12***	*0.71*	*-3.84*	*0.97*	***-18.49***	***-5.81***	***1.24***	*-1.06*	*	*0.83*	*-3.62*
Cu	***0.37***	*	*	*	*	*0.47*	***1.28***	***-1.76***	*	*-0.61*	*	*9.06*	*
Er	**9.78**	*	*	*	*	-1.80	**0.35**	**0.21**	*	-1.88	*	*	*
Ga	***1.94***	*	***0.34***	*-0.13*	*	*-0.13*	*	*	*	*	*	*	*0.87*
Ho	***-0.13***	*	***2.03***	*19.35*	*	*	***-0.50***	***0.05***	*	*4.19*	*	*	*
La	***1.61***	*	***1.82***	*47.47*	*	*	***-2.24***	***-1.05***	*	*-1.46*	*	*	*
Li	**0.50**	*	**1.52**	*	*	0.25	**-0.43**	**-0.86**	*	*	*	*	*
Lu	***0.28***	*	***-0.23***	*5.75*	*	*	***-0.01***	***0.95***	*	*-0.23*	*	*	*
Nd	***0.07***	*	***0.16***	*-0.42*	*	*1.86*	***-2.71***	***2.39***	*	*0.52*	*	*	*
Ni	**-1.63**	*	**-0.47**	*	-0.63	0.43	**-0.77**	**-0.10**	**1.26**	-1.13	*	0.58	0.26
Pb	**1.58**	*	**1.23**	*	-0.55	0.24	**2.55**	**0.52**	**-5.83**	-1.37	*	-0.30	-0.91
Pr	**3.79**	*	*	-0.28	*	0.21	**-0.62**	**0.58**	*	-1.01	*	*	*
Sb	*	*	*	*	*	*0.12*	***-0.83***	*	*	*-3.02*	*	*-2.13*	*
Sc	**1.12**	*	**0.77**	*	*	0.08	**-0.36**	**-2.30**	**-1.78**	*	*	*	0.33
Tm	***-0.47***	*	***-1.44***	*30.00*	*	*	*	***0.34***	*	*0.18*	*	*	*
V	***1.35***	*	***1.49***	*-9.16*	*-2.15*	*0.89*	***-7.23***	***0.56***	***-1.26***	*-3.21*	*	*-0.02*	*-3.74*
W	*	*	***3.32***	*1.54*	*	*0.80*	*	*	*	*6.79*	*	*	*
Y	***0.14***	*	*	*58.78*	*	*	***-0.53***	***-1.38***	*	*-0.61*	*	*	*
Yb	***-0.90***	*	***-0.19***	*8.53*	*	*	***-0.57***	***-0.38***	*	*0.05*	*	*	*
Zn	**-2.46**	*	**-3.32**	*	-0.59	0.62	**-2.63**	**0.54**	**-1.53**	-1.74	*	1.13	-0.76

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T53	T55	T56	T57	T58	T59	T61	T62	T64	T65	T67	T68	T70
SiO2	*	**-2.69**	*	0.02	-1.54	**-0.51**	**-0.36**	0.12	0.60	**0.82**	0.02	**1.74**	0.09
Al2O3	-8.53	**-42.09**	-3.41	2.27	-1.93	**2.27**	**23.09**	0.11	*	**4.55**	-8.99	**21.61**	2.84
Fe2O3T	-0.55	**4.72**	-2.88	0.19	3.76	**0.45**	**-0.55**	0.34	-0.20	**0.06**	0.54	**1.07**	-0.20
MnO	-0.75	**-4.70**	0.55	-0.90	3.02	**1.11**	**2.70**	0.41	4.04	**1.11**	-3.22	**1.11**	-0.17
MgO	-1.81	**2.92**	40.23	-0.36	-0.32	**-0.61**	**-0.16**	0.26	*	**0.09**	0.54	**1.50**	-0.23
CaO	0.60	**-2.63**	0.09	2.90	23842.10	**1.11**	**2.38**	1.16	-3.65	**-1.69**	0.09	**1.11**	-0.85
Cd	*1.33*	*	*0.42*	*0.01*	*	*	***-1.22***	*	*	*	*	***3.02***	*
Ce	*1.62*	***18.67***	*	*1.10*	*	*	***-9.60***	*	*	*	*	***4.08***	*
Co	-0.43	**-18.26**	0.24	0.09	*	**-2.90**	**0.85**	*	*	*	-0.62	*	*
Cr	*-15.83*	***22.73***	*-11.18*	*4.42*	*-2.36*	***-2.98***	***0.91***	*	*	*	*	***-0.46***	*
Cu	*-0.35*	***0.08***	*21.37*	*-1.59*	*	***1.46***	***8.29***	*	*	*	*2.33*	***5.23***	*
Er	3.61	**-3.32**	*	-4.80	*	*	*	*	*	*	*	**3.27**	*
Ga	*-2.56*	*	*0.01*	*5.72*	*	*	***-4.53***	*	*	*	*	***6.13***	*
Ho	*	***185.41***	*	*15.04*	*	*	***25.76***	*	*	*	*	*	*
La	*1.32*	***0.59***	*	*20.81*	*	*	***-0.54***	*	*	*	*	*	*
Li	-0.82	*	*	-0.07	*	**31.33**	*	*	*	*	*	*	*
Lu	*-0.95*	***11.50***	*	*0.72*	*	*	***4.80***	*	*	*	*	*	*
Nd	*-0.19*	***23.97***	*	*0.03*	*	*	***-7.96***	*	*	*	*	***3.26***	*
Ni	0.25	**-2.11**	0.00	0.86	-0.72	**2.27**	**-2.92**	*	*	*	0.58	**0.43**	*
Pb	0.56	**-5.59**	0.76	1.28	1.28	**2.67**	**-0.81**	*	*	*	-1.70	**-0.29**	*
Pr	-0.45	**-1.61**	*	-6.99	*	*	**-1.56**	*	*	*	*	**10.56**	*
Sb	*0.71*	*	*	*	*	*	***-0.25***	*	*	*	*	***-3.26***	*
Sc	*	**28.63**	*	0.49	*	*	**-0.13**	*	*	*	*	**40.19**	*
Tm	*	***66.47***	*	*4.13*	*	*	*	*	*	*	*	*	*
V	*-4.63*	**3.73**	*-0.18*	*-0.11*	*	***1.66***	***-4.29***	*	*	*	*0.28*	***-0.55***	*
W	*0.23*	*	*	*-0.27*	*	*	***0.96***	*	*	*	*	*	*
Y	*0.07*	***7112.48***	*	*0.19*	*	*	*	*	*	*	*	***22.62***	*
Yb	*-1.63*	***35.97***	*	*2.86*	*	*	***9.50***	*	*	*	*	*	*
Zn	-2.42	**3.03**	-7.51	0.53	-1.63	**0.44**	**-0.34**	*	*	*	0.51	**1.48**	*

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T71	T74	T75	T76	T78	T80	T82	T83	T84	T85	T86	T87	T88
SiO2	-0.46	-0.46	-1.03	0.68	-0.11	*	-0.48	-3.59	0.54	-0.67	1.11	-0.35	0.76
Al2O3	1.42	-18.20	-0.57	-1.14	0.23	*	*	*	-0.57	-10.24	27.87	12.91	1.14
Fe2O3T	-0.08	0.46	6.79	-0.40	-0.20	*	-0.01	*	-0.16	0.22	1.16	-0.74	0.45
MnO	-4.52	0.41	2.00	-0.92	-1.91	*	-0.32	*	0.55	1.11	-7.72	-0.46	-1.50
MgO	0.31	0.74	*	-0.01	-0.62	*	0.13	*	0.26	0.13	-2.07	-4.56	-0.84
CaO	2.43	0.56	4.30	-1.32	-0.38	*	-0.85	*	0.09	1.11	-13.95	-0.99	1.11
Cd	*	118.30	*	1.11	*	*	*	*	13.78	*	-1.45	*	*
Ce	*	8.95	*	-1.74	*	*	*	-1.28	371.06	*	*	21.19	3.24
Co	*	0.90	-5.32	2.17	-0.24	*	-1.23	-1.75	-0.13	-1.00	-2.33	-2.82	0.19
Cr	*	-3.74	-0.08	1.38	-3.50	*	-3.09	-29.66	-3.12	-6.35	-20.50	0.06	2.58
Cu	*	0.90	3.02	-1.32	*	*	*	-2.75	-7.26	34.72	24.80	*	-0.18
Er	*	*	*	-2.12	*	0.60	*	-0.37	*	*	*	0.43	9.78
Ga	*	3.18	*	-0.60	*	*	*	-5.57	*	19.60	*	2.74	-0.05
Ho	*	*	*	-0.13	*	*	*	-0.13	*	*	*	*	-0.13
La	*	939.77	*	0.59	*	*	*	-0.23	529.52	*	*	*	1.41
Li	*	*	*	-1.57	*	*	-0.82	-0.44	*	*	*	*	0.00
Lu	*	*	*	-0.23	*	*	*	-1.90	*	*	*	14.12	0.44
Nd	*	72.41	*	-0.34	*	-2.47	*	-1.66	*	*	*	-0.65	-0.39
Ni	*	-1.01	2.19	-0.55	0.57	*	0.30	-3.19	-0.01	-3.57	-2.62	-0.49	-1.35
Pb	*	-1.78	2.19	5.10	0.00	*	-0.18	0.39	-0.91	-2.42	*	-4.55	1.21
Pr	*	*	*	0.07	*	4.21	*	-0.02	*	*	*	0.85	3.12
Sb	*	9.57	*	0.84	*	*	*	*	*	*	-4.33	*	*
Sc	*	-2.65	*	-2.39	-1.29	*	-0.40	-0.50	*	0.56	*	0.00	-0.03
Tm	*	*	*	-1.44	*	*	*	*	*	*	*	46.17	-0.47
V	*	-2.70	*	-2.00	-0.18	*	-0.94	-9.58	-2.46	-0.84	-6.11	0.45	0.20
W	*	5.62	*	-3.09	*	*	*	*	*	*	*	-0.16	0.74
Y	*	58.78	*	-0.61	*	7.56	*	-0.61	*	*	*	186.18	0.14
Yb	*	20.35	*	0.05	*	-0.92	*	-0.42	*	10155.93	*	20.35	-0.42
Zn	*	-0.78	5.15	0.37	0.08	*	0.27	-4.01	-0.25	-2.18	5.45	0.60	-2.87

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T89	T90	T91	T92	T93	T95	T96	T97	T98	T100	T101	T104	T105
SiO2	**0.80**	*	**2.21**	**-1.28**	-0.01	0.50	**0.33**	-0.06	0.18	-0.44	**-2.34**	**-3.82**	**0.84**
Al2O3	**1.14**	*	**63.70**	**-0.48**	-1.71	1.14	**-18.20**	-0.57	-4.78	0.57	**61.42**	**-11.60**	**-2.27**
Fe2O3T	**0.92**	*	**-17.73**	**-1.92**	-0.12	-0.55	**2.70**	-0.01	0.56	-0.16	**-1.18**	**9.73**	**0.45**
MnO	**1.11**	*	**-4.70**	**-1.21**	0.55	-1.04	**-3.54**	-0.17	-1.33	0.55	**0.82**	**1.69**	**-0.63**
MgO	**-0.34**	*	**-0.28**	**-2.81**	0.84	-0.42	**-1.76**	1.31	-0.13	-0.07	**0.79**	**-2.01**	**0.88**
CaO	**1.11**	*	**8.60**	**-0.65**	-0.85	-1.78	**11.41**	-3.65	-1.36	1.96	**113.42**	**-14.98**	**0.18**
Cd	*	*	*	***-0.01***	*	*	***3.93***	*	*	*	*	*	*
Ce	***490.94***	*	*	*	*3.71*	*279.80*	***15.59***	*	*	*0.15*	***218.83***	*	*
Co	**1.51**	-0.13	**-4.44**	**3.56**	0.75	1.08	**-1.57**	0.64	-1.67	-12.35	**-1.35**	*	**1.29**
Cr	***-2.04***	*1.08*	*	*	*-3.15*	*0.90*	***-14.59***	*2.33*	*-4.39*	*0.28*	***-6.33***	*	***-4.48***
Cu	*	*8.91*	*	***2.37***	*9.06*	*	***-1.15***	*9.06*	*21.94*	*13.35*	*	***-1.92***	*
Er	*	*	*	*	0.26	6.09	*	*	*	0.95	*	*	*
Ga	*	*	*	***-2.36***	*2.74*	*0.42*	*	*	*369.62*	*38.50*	*	***121.15***	*
Ho	*	*	*	*	*	*	*	*	*	*40.93*	*	*	*
La	***1428.26***	*	*	*	*160.29*	*1208.48*	***150.33***	*	*	*26.96*	*	*	*
Li	*	*	*	*	*	8.33	*	*	3.83	*	*	*	*
Lu	*	*	*	*	*	*	*	*	*	*14.12*	*	*	*
Nd	***217.65***	*	*	*	*1.86*	*28.48*	***112.04***	*	*	*7.09*	*	*	*
Ni	**0.79**	0.44	**-7.94**	*	-1.82	-0.23	**-2.00**	0.49	-0.98	0.23	**0.23**	**0.15**	**1.34**
Pb	**2.79**	1.23	*	**3.95**	-1.88	-1.64	**0.97**	*	*	14.03	**-1.82**	**-0.12**	**0.00**
Pr	*	*	*	*	-0.95	*	**5.71**	*	*	-3.26	*	*	*
Sb	*	*	*	*	*	*0.71*	***13.75***	*	*	*	*	*	*
Sc	**-3.73**	-0.89	*	**0.70**	*	3.82	**-0.75**	*	*	-1.87	**-3.54**	*	**-3.73**
Tm	*	*	*	*	*	*	*	*	*	*30.00*	*	*	*
V	***-1.26***	*-0.24*	*	***-3.82***	*2.72*	*-0.33*	***-10.88***	*-2.15*	*	*2.11*	***-1.87***	*	***-0.05***
W	*	*	*	*	*0.31*	*	*	*	*	*-6.32*	*	***-4.32***	*
Y	*	*	*	***-1.83***	*	*238.65*	***324.90***	*	*121.23*	*870.69*	*	*	*
Yb	*	*	*	*	*	*121.97*	*	*	*	*15.62*	*	*	***18900.40***
Zn	**1.23**	0.09	**-1.53**	**0.67**	0.10	1.31	**1.58**	2.69	0.62	-0.59	**-2.91**	**0.89**	**0.20**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

Lab Code	T106	T107	T108	T109	T110	T111	T112	T113	T114	T115	T117	T118	T120
SiO2	-0.73	0.30	*	0.47	**-2.85**	-0.82	**-1.46**	-0.03	**-1.18**	**0.88**	**0.84**	0.91	**-1.24**
Al2O3	-9.10	-0.91	*	*	**3.41**	-2.05	**2.27**	0.34	**-7.96**	**12.51**	**10.24**	-13.42	**-10.24**
Fe2O3T	-0.75	-0.08	**96.08**	*	**-11.51**	-0.55	**-1.03**	0.35	**-0.25**	**0.53**	**0.61**	1.75	**-2.66**
MnO	0.55	0.55	**-16.54**	*	**-4.70**	-16.18	**0.24**	0.12	**1.11**	-0.03	**1.11**	6.94	**4.01**
MgO	0.87	0.44	*	*	**4.16**	5.59	**-0.26**	-0.15	**0.94**	0.83	**-0.11**	-0.80	**-3.04**
CaO	-4.59	-0.10	**-40.89**	*	**-41.00**	1.21	**-1.69**	-1.13	**-1.69**	1.02	**6.73**	0.91	**1.11**
Cd	*	*	***-4.44***	*	*	*	***-0.62***	*	*86.49*	*	*	*-0.08*	*
Ce	*	*12.09*	*	*	*	*	***2.26***	*	***114.18***	*	*	*-1.06*	***-1.78***
Co	1.52	0.67	**-4.70**	*	*	*	**0.41**	*	**-1.57**	-4.20	**0.85**	-1.23	0.29
Cr	*-2.08*	*-3.13*	***-40.51***	*	*	*2.77*	***2.87***	*1.43*	***0.03***	*-1.51*	*	*-2.96*	***-2.01***
Cu	*	*-4.11*	***-0.20***	*	*	*66.31*	***43.31***	*	*	*6.91*	*	*-0.56*	*-1.39*
Er	*	*	*	*	*	*	**4.26**	*	*	-5.19	*	-1.97	**-2.22**
Ga	*	*	*	*	*	*	***0.17***	*	*	*0.09*	*	*0.67*	*
Ho	*	*	*	*	*	*	***-0.13***	*	*	*0.58*	*	*0.80*	*
La	*	*	*	*	*	*	*	*	***1633.38***	*0.29*	*	*0.40*	***0.59***
Li	*	*	*	*	*	*	**-0.93**	*	*	-0.50	*	0.75	**-3.08**
Lu	*	*	*	*	*	*	***-0.23***	*	*	*0.39*	*	*-0.11*	***11.50***
Nd	*	*263.59*	*	*	*	*	***1.34***	*	***35.57***	*	*	*-0.99*	***0.07***
Ni	0.84	0.05	**0.81**	*	*	0.86	**-0.29**	3.29	**-0.87**	0.10	**-0.15**	-2.84	-1.44
Pb	-1.94	-0.60	**-3.92**	*	*	2.19	**1.34**	*	**-0.85**	2.44	**-1.21**	-2.06	*
Pr	*	*	*	*	*	*	**3.90**	*	*	*	*	0.05	**-2.55**
Sb	*	*-1.50*	***-11.90***	*	*	*	***-0.56***	*	*51.87*	*1.52*	*	*-1.80*	*
Sc	*	0.96	*	*	*	62.47	**0.38**	*	*	1.40	*	-1.33	-1.18
Tm	*	*	*	*	*	*	***-0.79***	*	*	*-0.07*	*	*0.57*	***27.66***
V	*-0.94*	*-1.48*	***-5.65***	*	*	*0.71*	***-1.75***	*	***0.56***	*-0.33*	2.72	*-0.81*	*-1.97*
W	*	*5.49*	*	*	*	*	***2.00***	*	*5.25*	*-5.00*	*	*-0.17*	*
Y	*	*	*	*	*	*	***0.14***	*	***492.28***	*	*	*4.32*	***2.64***
Yb	*	*	*	*	*	*	***-0.42***	*	*	*1.44*	*	*0.02*	***2.88***
Zn	*	-0.07	**-10.78**	*	*	-0.42	**6.65**	*	**-2.91**	3.38	0.10	-2.33	**-9.53**

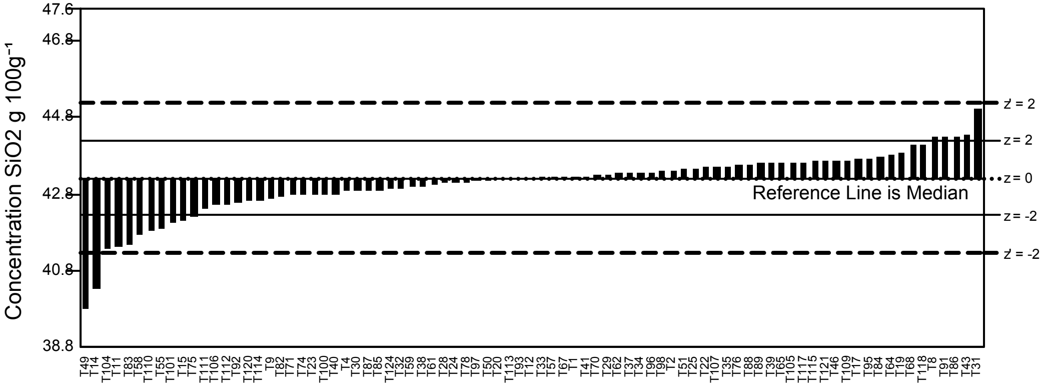
Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT38A Z-scores for Modified harzburgite, HARZ01. 11/12/2015

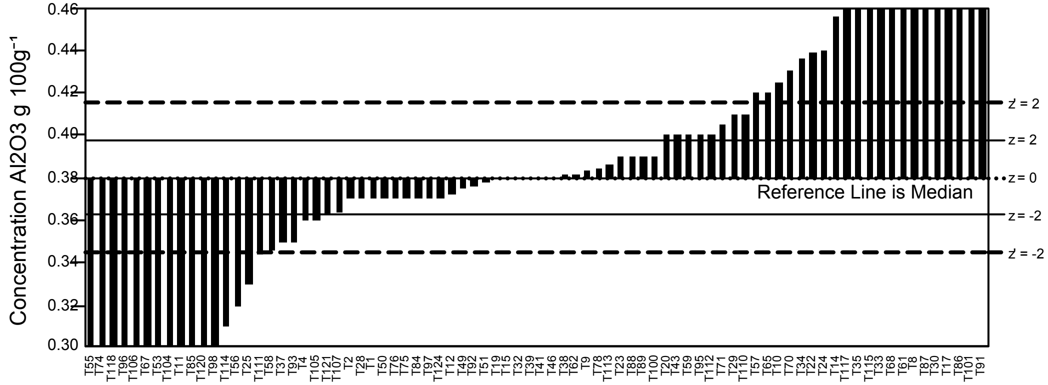
Lab Code	T121	T122	T123	T124
SiO2	0.46	*	*	-0.29
Al2O3	-0.97	*	*	-0.57
Fe2O3T	0.64	*	*	-0.55
MnO	0.70	*	*	-0.90
MgO	0.13	*	*	0.02
CaO	-1.50	*	*	3.83
Cd	*	*	*	*
Ce	*	***848.86***	*2.73*	*35.56*
Co	*	*	*	3.07
Cr	*1.19*	*	*	*-0.21*
Cu	*	*	*	*13.35*
Er	*	**83.88**	-0.17	1.02
Ga	*	*	*11.25*	*
Ho	*	*	*19.35*	*43.08*
La	*	***4033.35***	*27.78*	*154.34*
Li	*	*	*	*
Lu	*	*	*4.91*	*8.26*
Nd	*	***1027.87***	*4.04*	*30.53*
Ni	2.22	*	*	-0.26
Pb	0.07	*	*	14.03
Pr	*	**14.81**	-0.70	0.23
Sb	*	*	*	*
Sc	*	*	6.13	-2.84
Tm	*	*	*46.17*	*15.45*
V	*	*	*	*3.93*
W	*	*	*2.10*	*
Y	*	***6088.22***	*22.30*	*995.60*
Yb	*	***1042.77***	*6.64*	*14.91*
Zn	1.25	*	*	-0.59

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

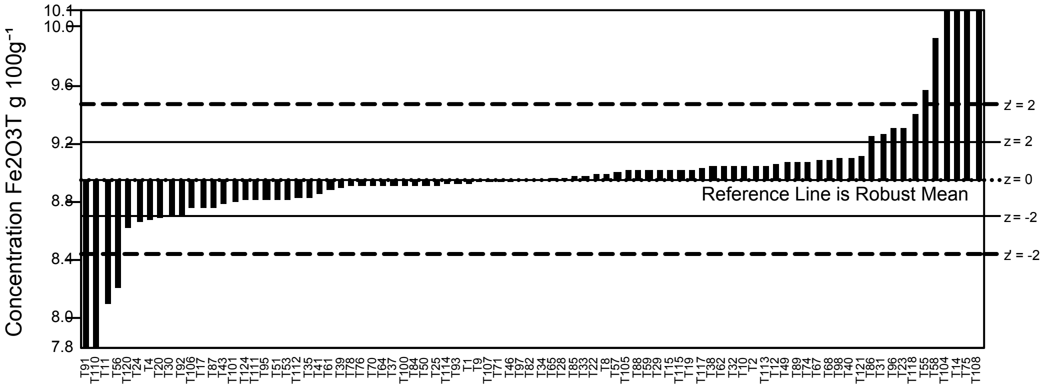
GeoPT38A - Barchart for SiO2



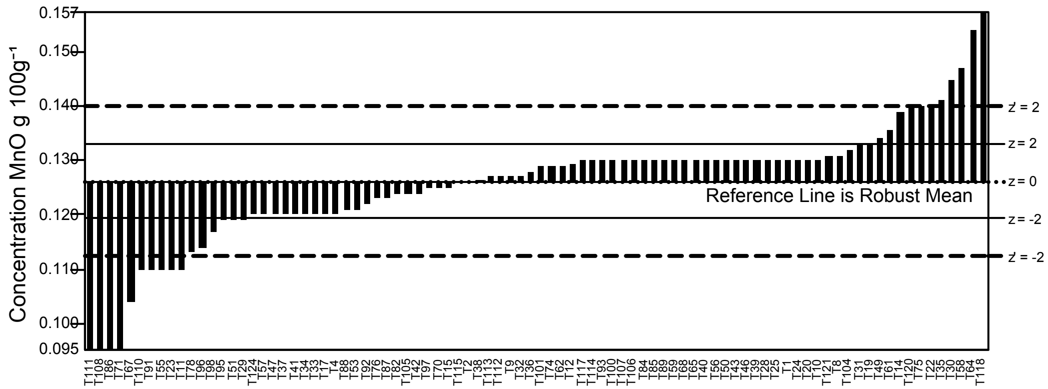
GeoPT38A - Barchart for Al2O3



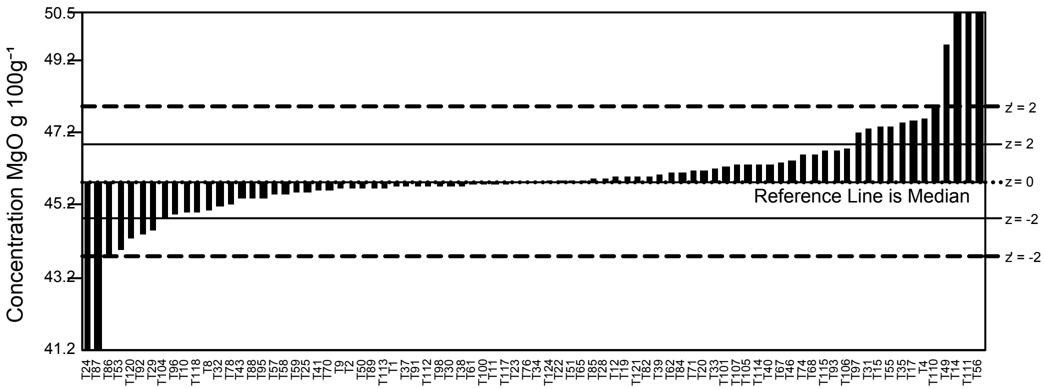
GeoPT38A - Barchart for Fe2O3T



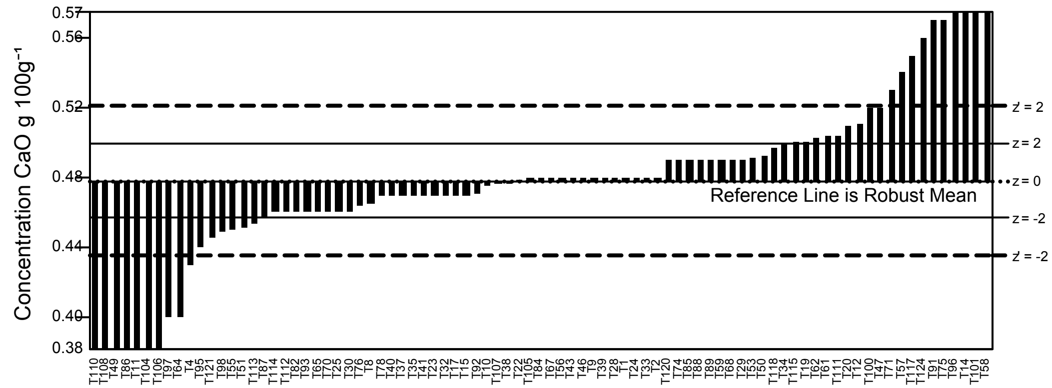
GeoPT38A - Barchart for MnO

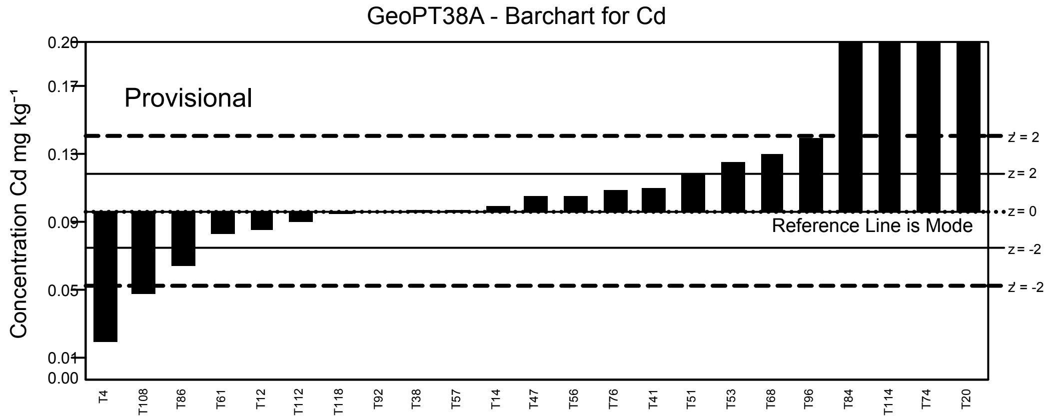


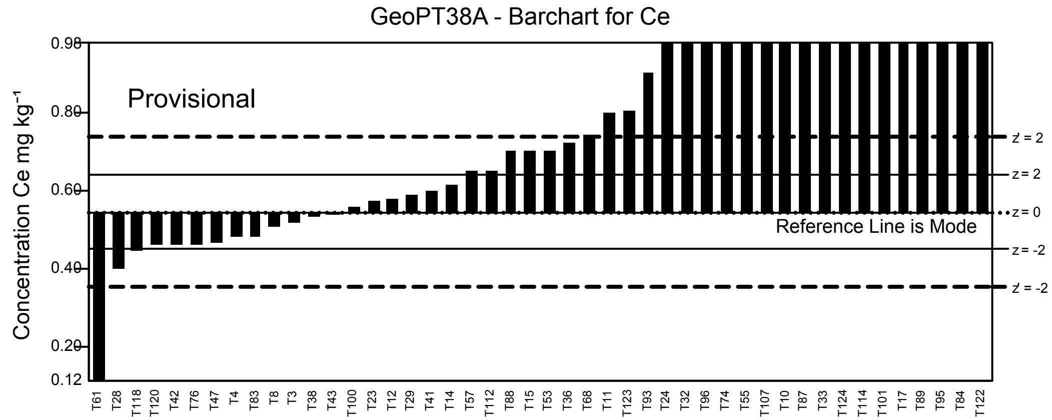
GeoPT38A - Barchart for MgO

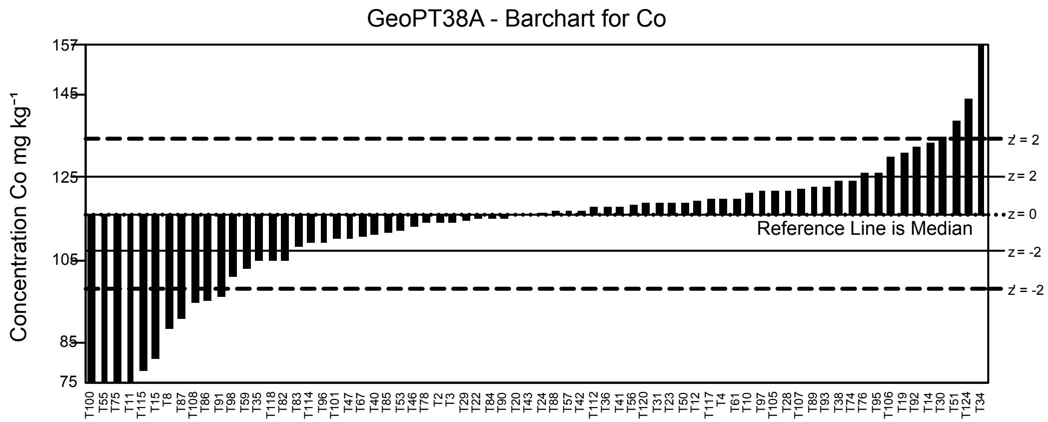


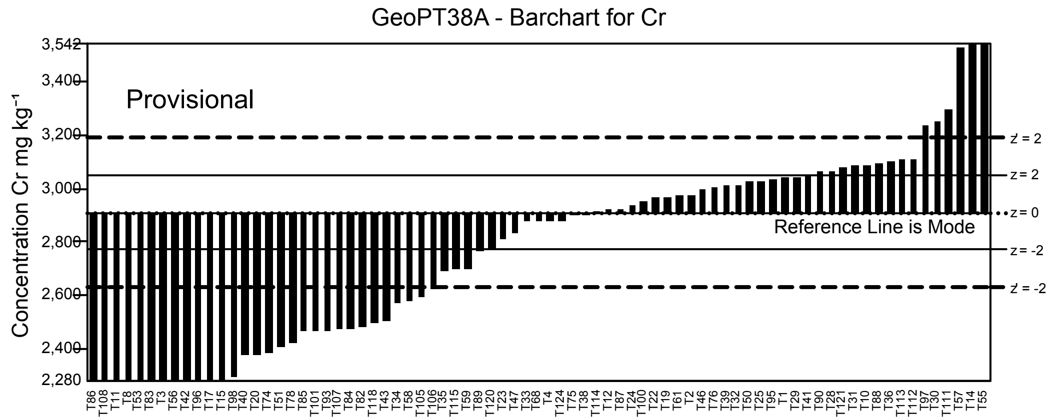
GeoPT38A - Barchart for CaO

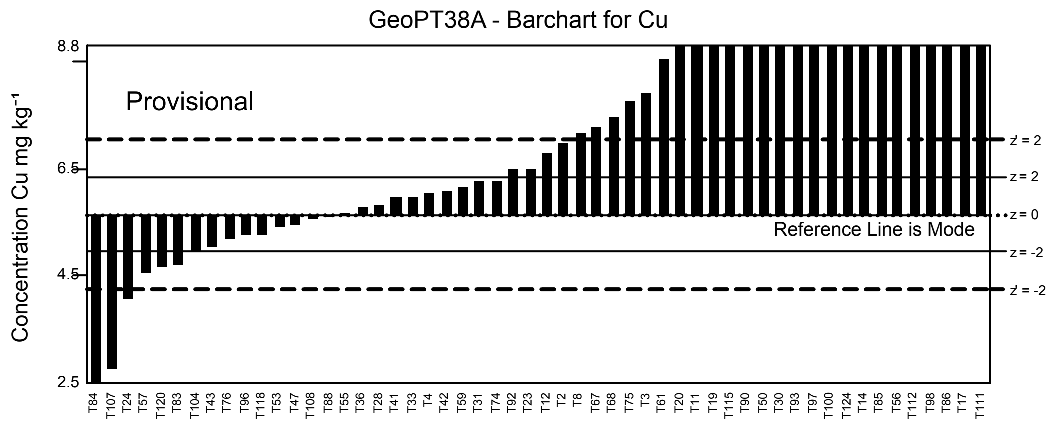


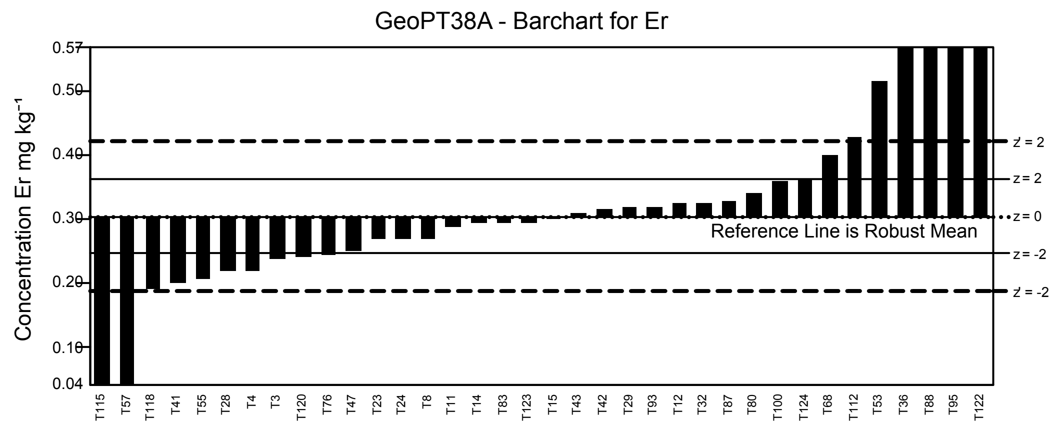

GeoPT38A - Barchart for Cd
Provisional
Concentration Cd mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2
0.20
0.17
0.13
0.09
0.05
0.01
0.00
T4
T108
T86
T61
T12
T112
T118
T92
T38
T57
T14
T47
T56
T76
T41
T51
T53
T68
T96
T84
T114
T74
T20


GeoPT38A - Barchart for Ce
Provisional
Concentration Ce mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2
0.98
0.80
0.60
0.40
0.20
0.12

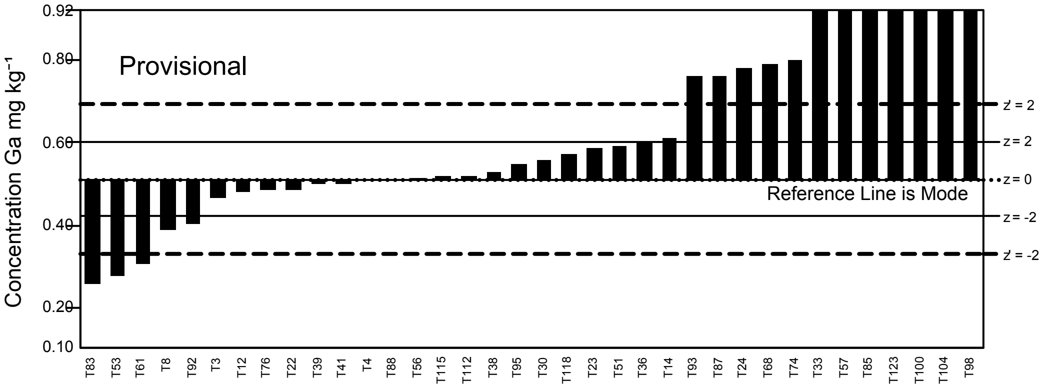

GeoPT38A - Barchart for Co
Concentration Co mg kg⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2
157
145
125
105
85
75


GeoPT38A - Barchart for Cr
Provisional
Concentration Cr mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2
3,542
3,400
3,200
3,000
2,800
2,600
2,400
2,280

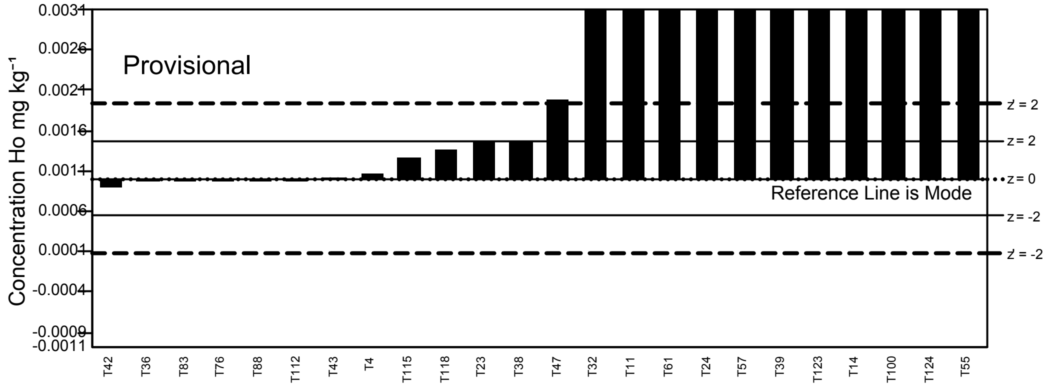

GeoPT38A - Barchart for Cu
Provisional
Concentration Cu mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2
8.8
6.5
4.5
2.5


GeoPT38A - Barchart for Er
Concentration Er mg kg⁻¹
Reference Line is Robust Mean
z' = 2
z = 2
z = 0
z = -2
z' = -2
0.57
0.50
0.40
0.30
0.20
0.10
0.04

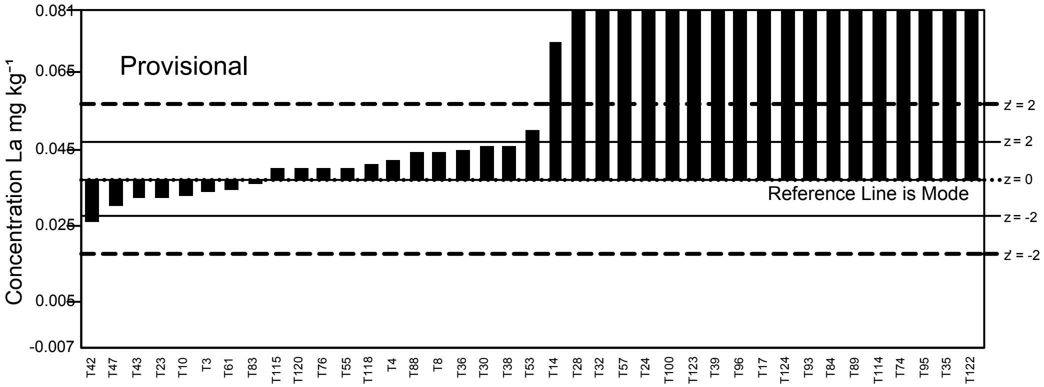
GeoPT38A - Barchart for Ga



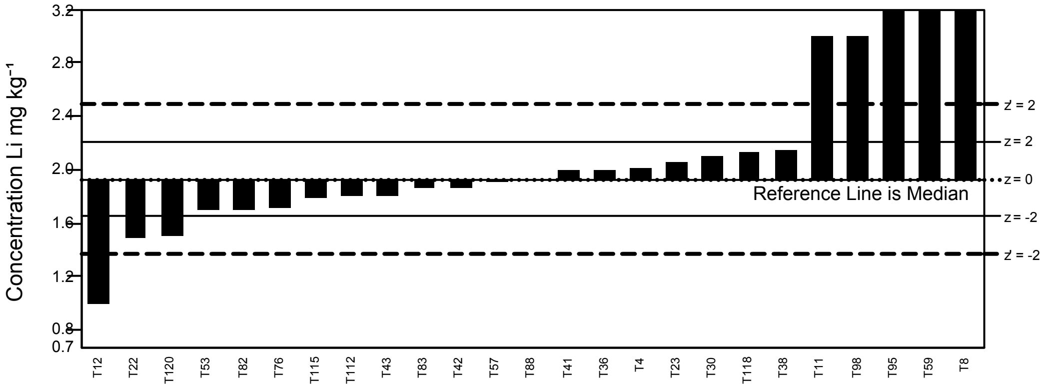
GeoPT38A - Barchart for Ho



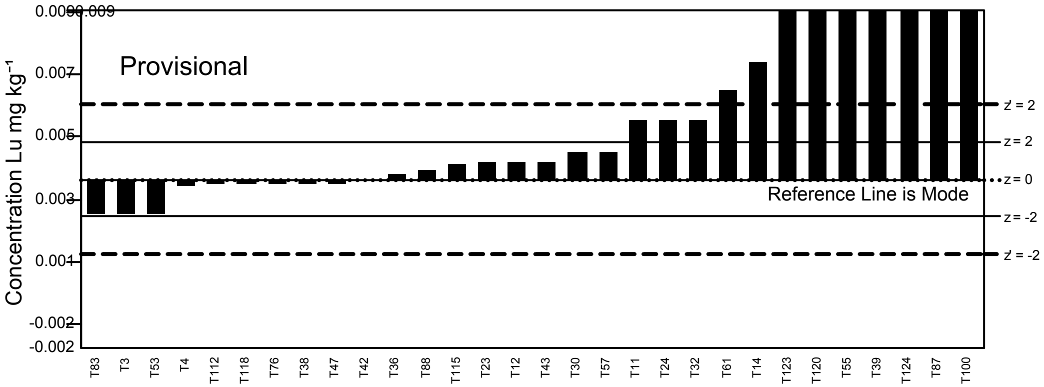
GeoPT38A - Barchart for La



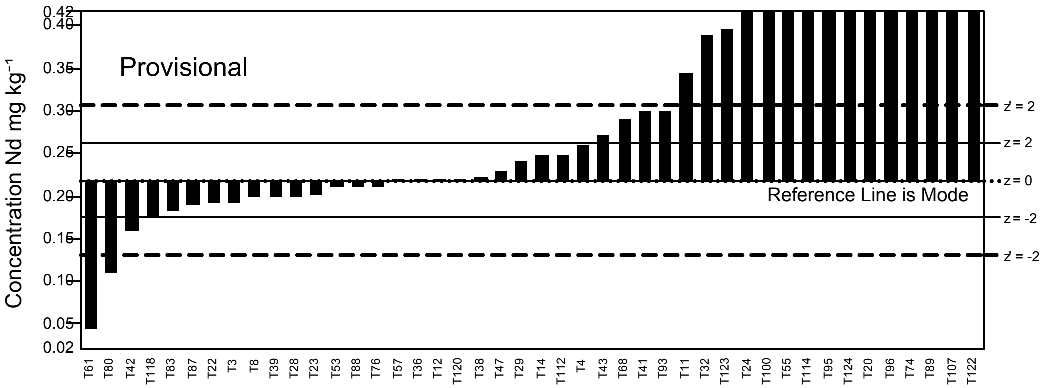
GeoPT38A - Barchart for Li



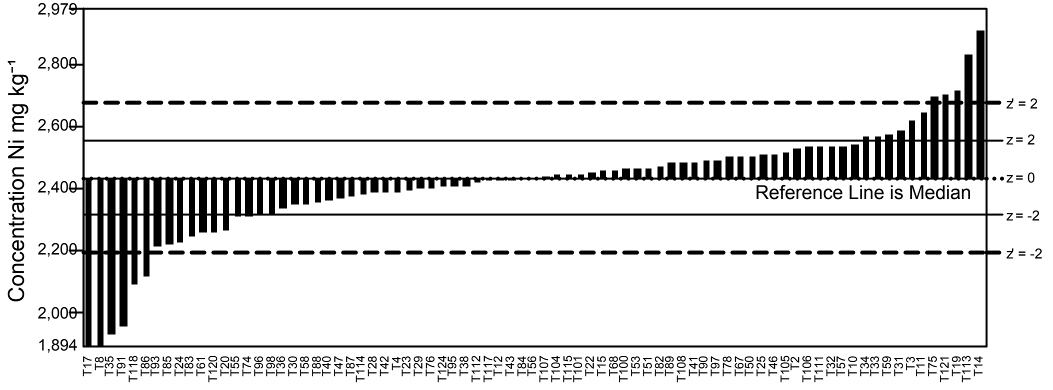
GeoPT38A - Barchart for Lu



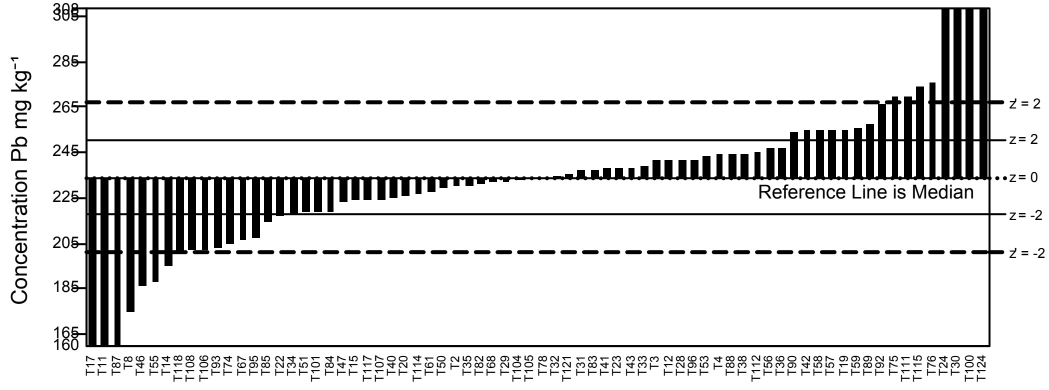
GeoPT38A - Barchart for Nd



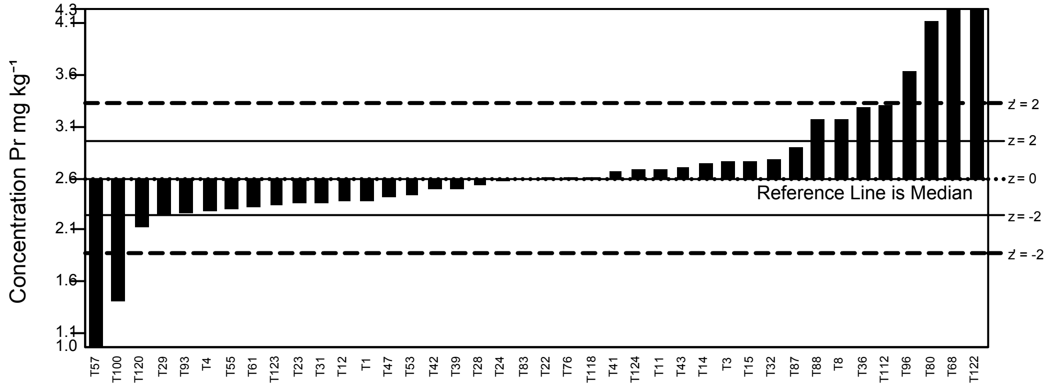
GeoPT38A - Barchart for Ni



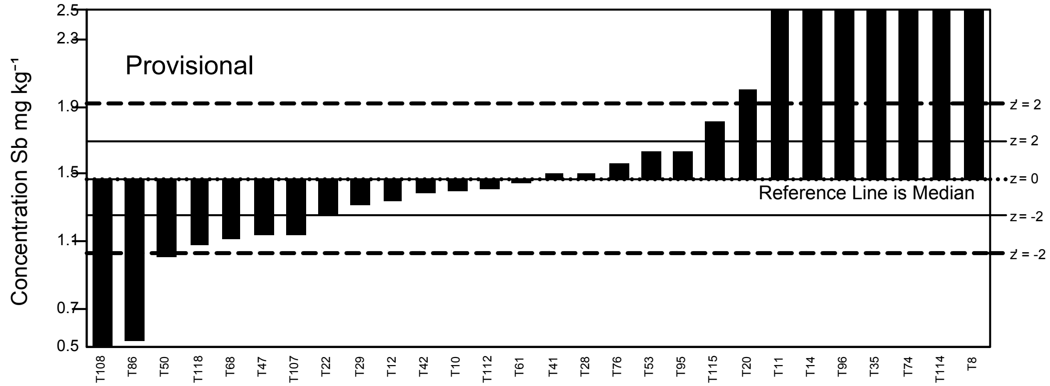
GeoPT38A - Barchart for Pb



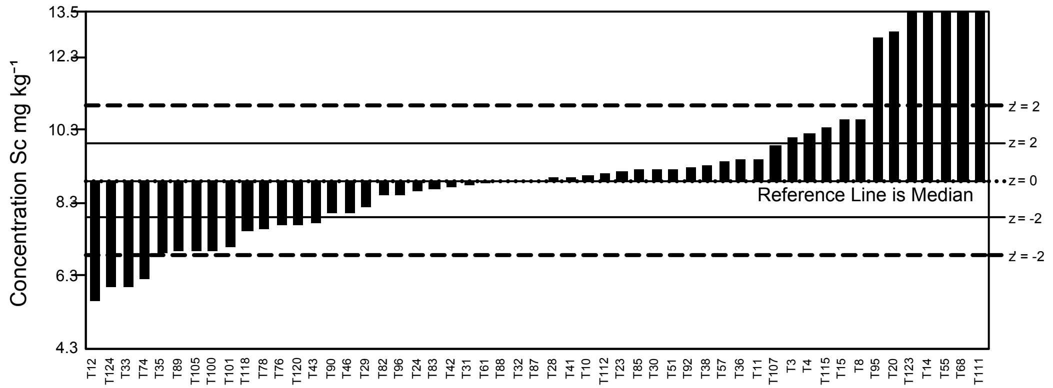
GeoPT38A - Barchart for Pr



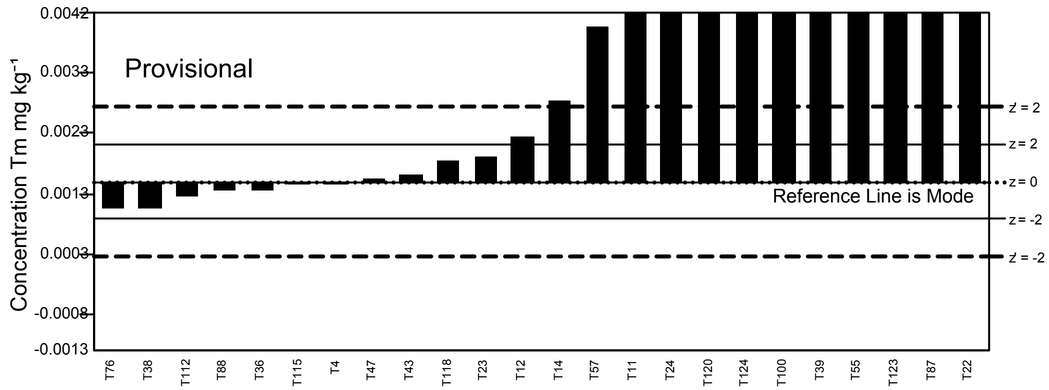
GeoPT38A - Barchart for Sb



GeoPT38A - Barchart for Sc



GeoPT38A - Barchart for Tm



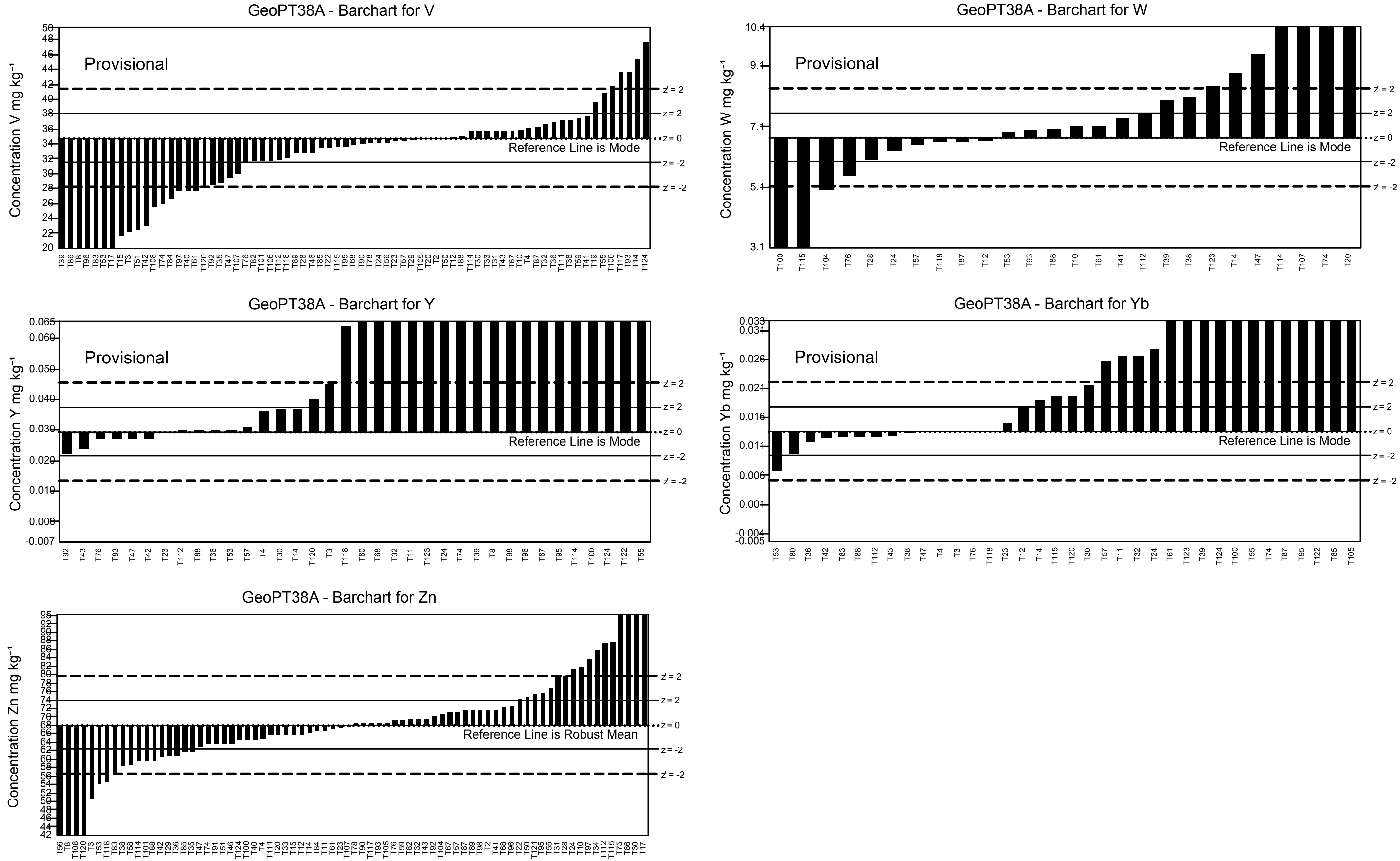
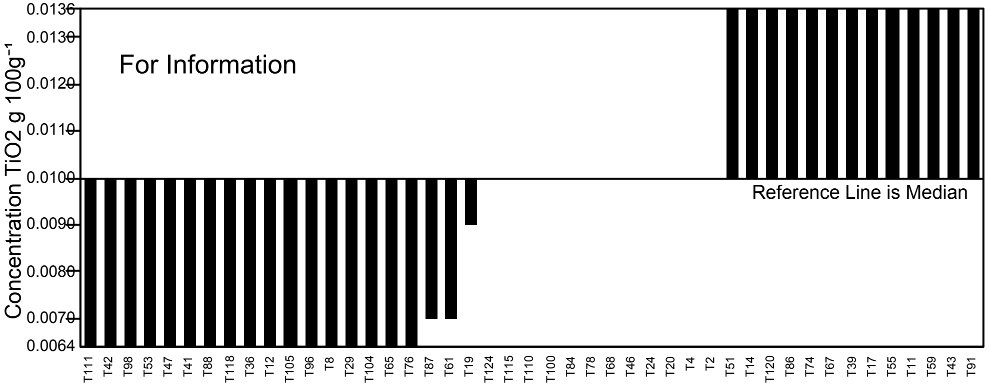
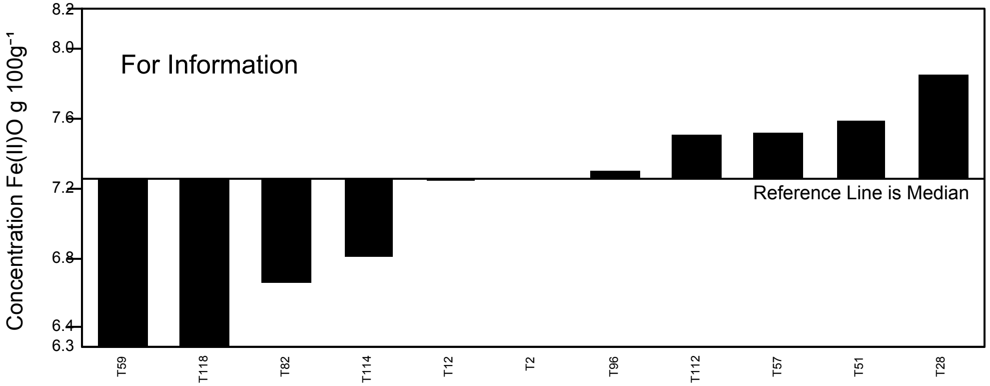


Figure 1: GeoPT38A - Modified harzburgite, HARZ01. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

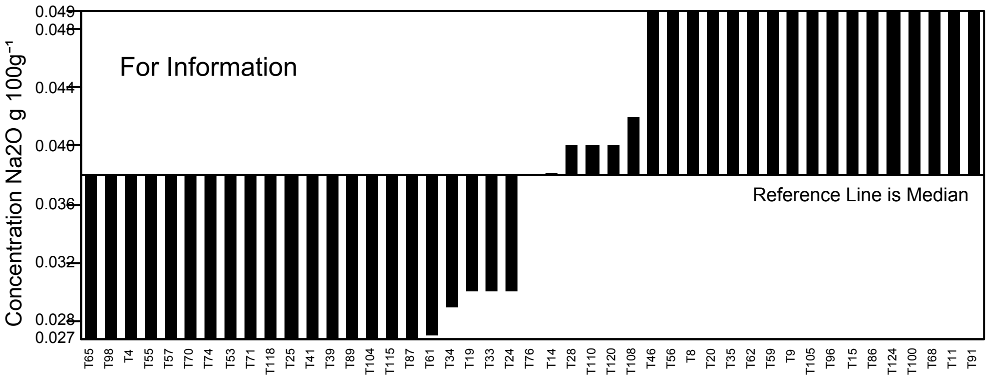
GeoPT38A - Barchart for TiO2



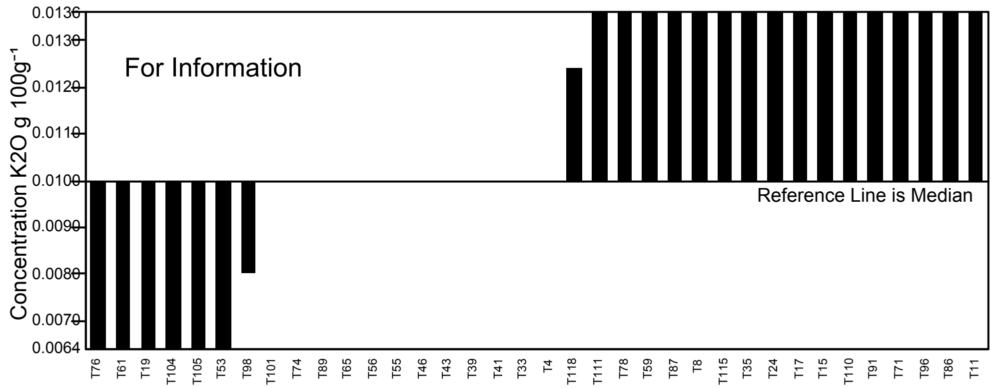
GeoPT38A - Barchart for Fe(II)O



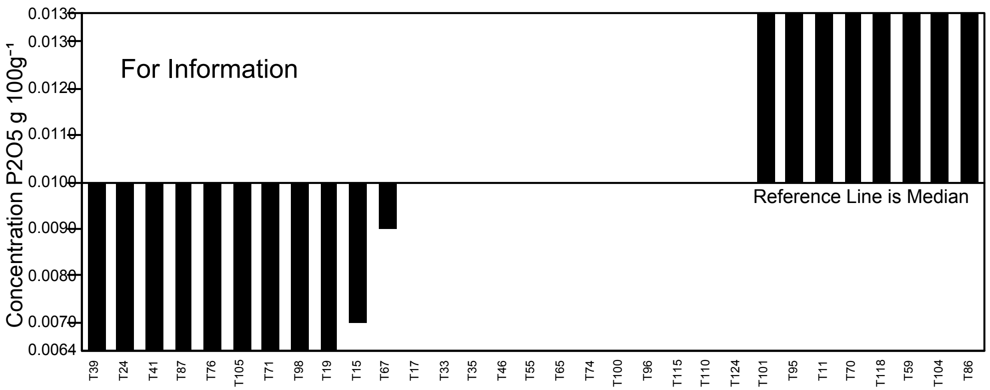
GeoPT38A - Barchart for Na2O



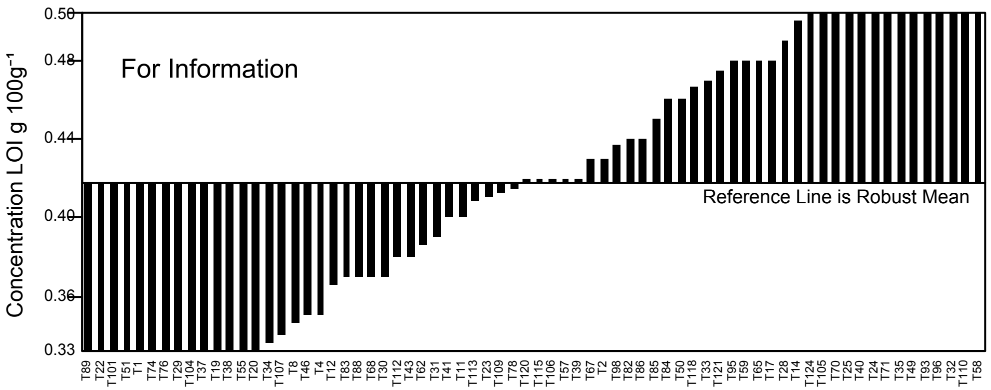
GeoPT38A - Barchart for K2O



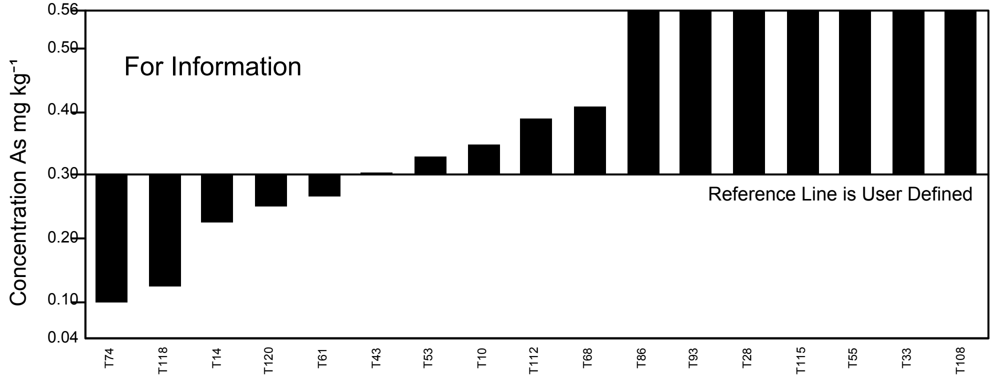
GeoPT38A - Barchart for P2O5



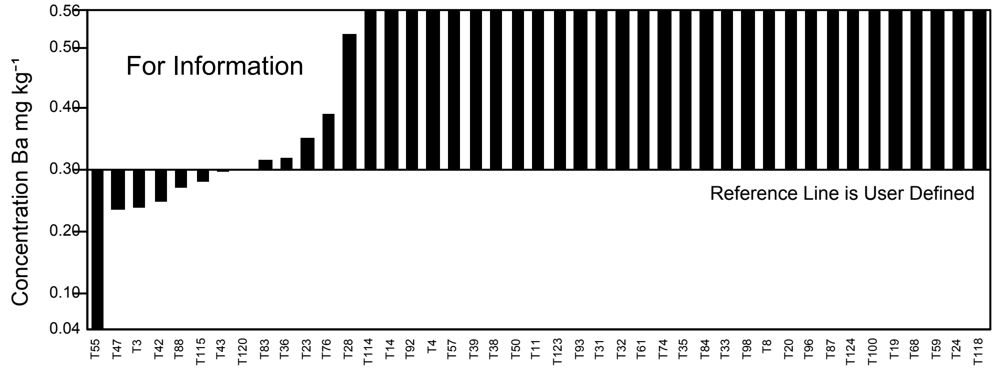
GeoPT38A - Barchart for LOI



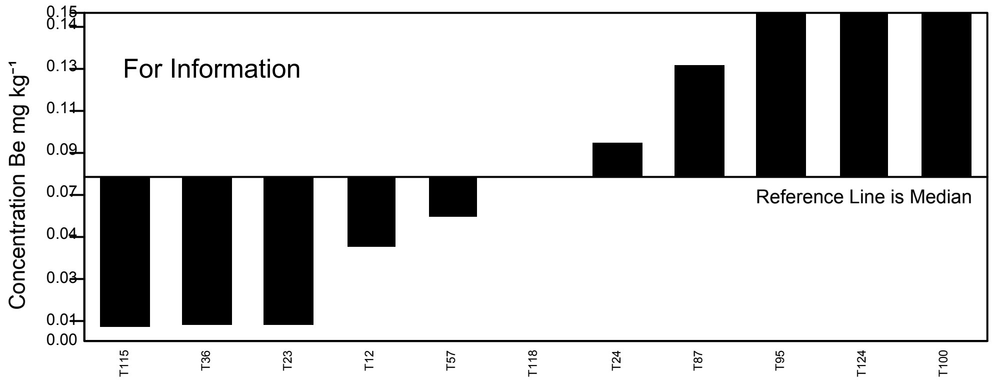
GeoPT38A - Barchart for As



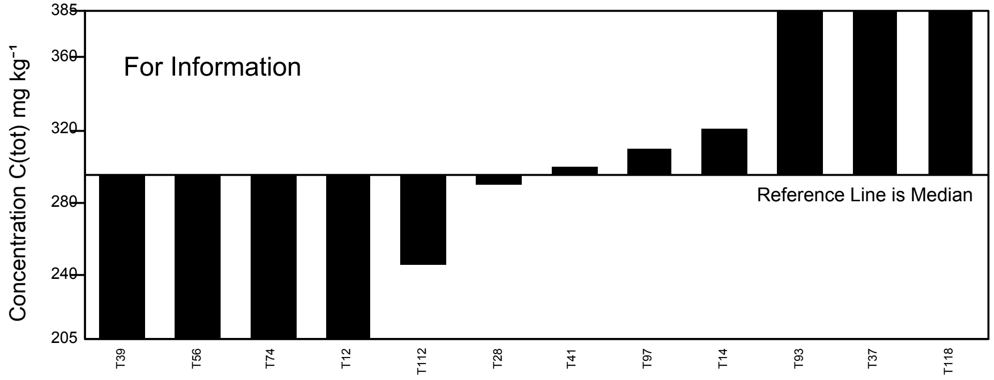
GeoPT38A - Barchart for Ba



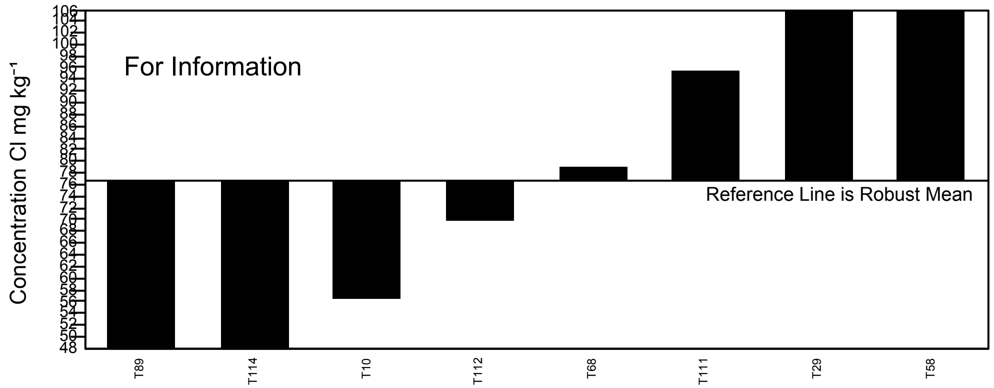
GeoPT38A - Barchart for Be



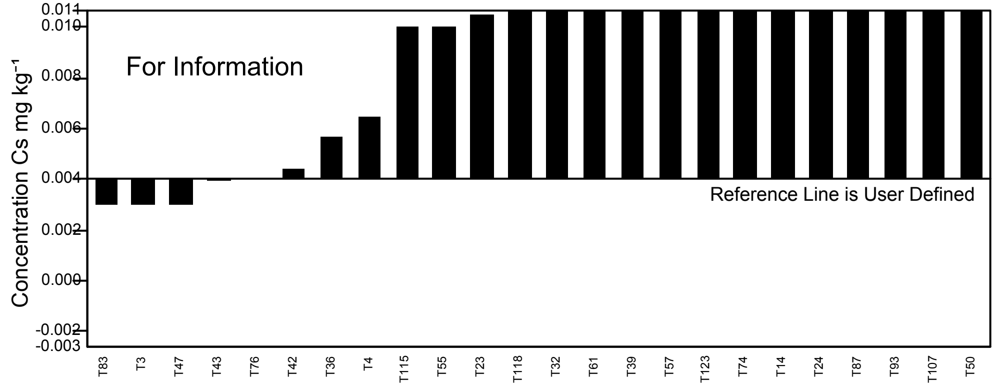
GeoPT38A - Barchart for C(tot)



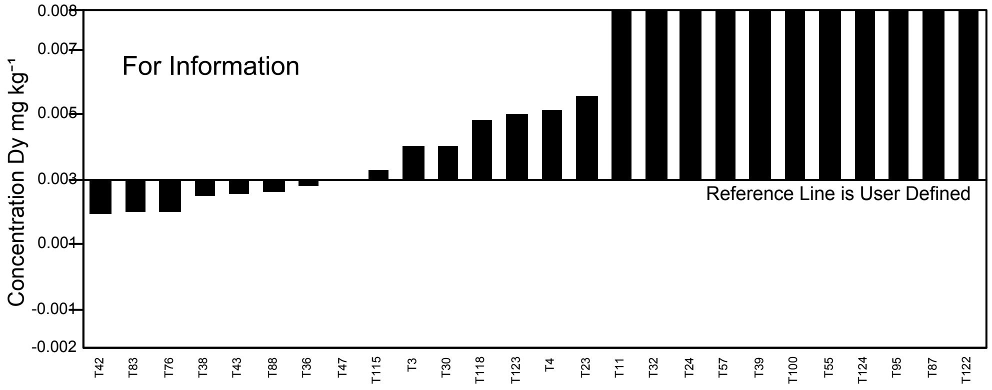
GeoPT38A - Barchart for Cl



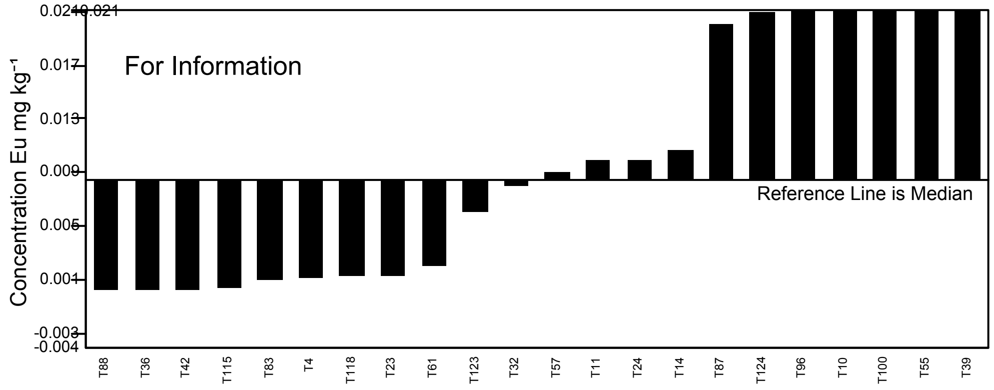
GeoPT38A - Barchart for Cs



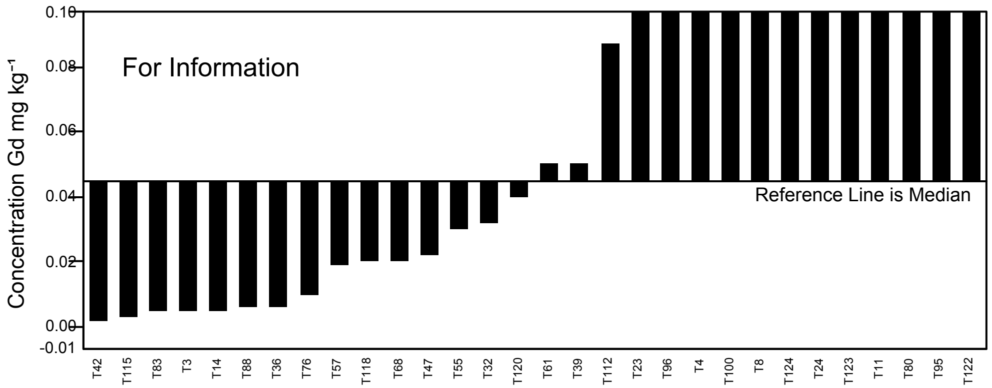
GeoPT38A - Barchart for Dy



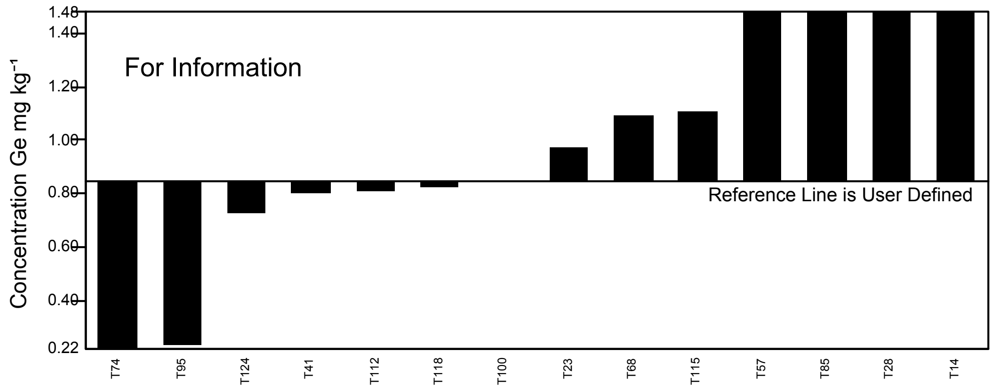
GeoPT38A - Barchart for Eu



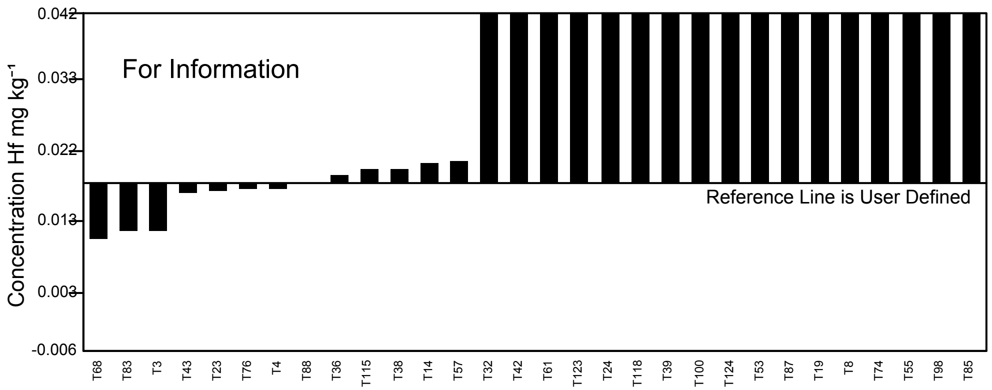
GeoPT38A - Barchart for Gd



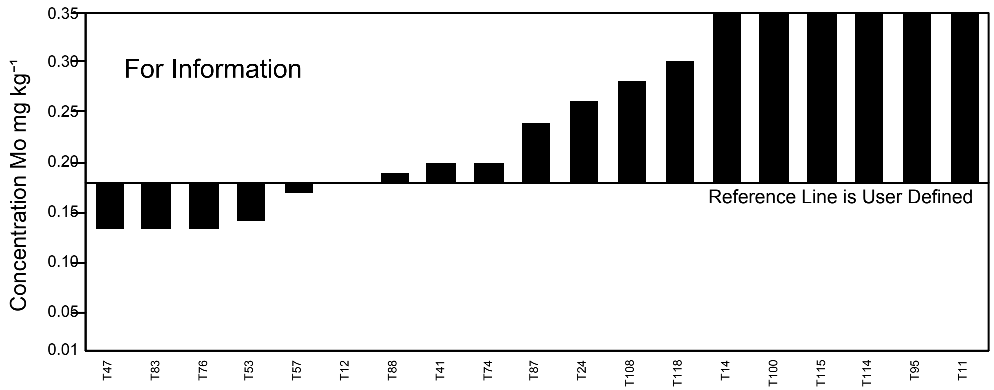
GeoPT38A - Barchart for Ge



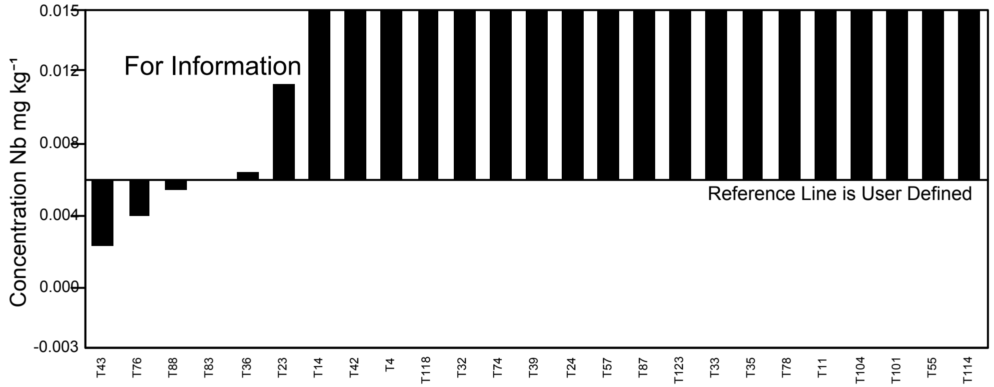
GeoPT38A - Barchart for Hf



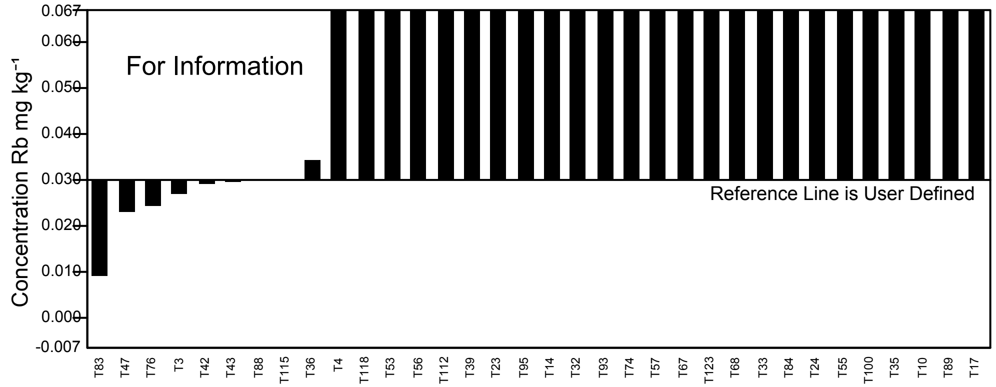
GeoPT38A - Barchart for Mo



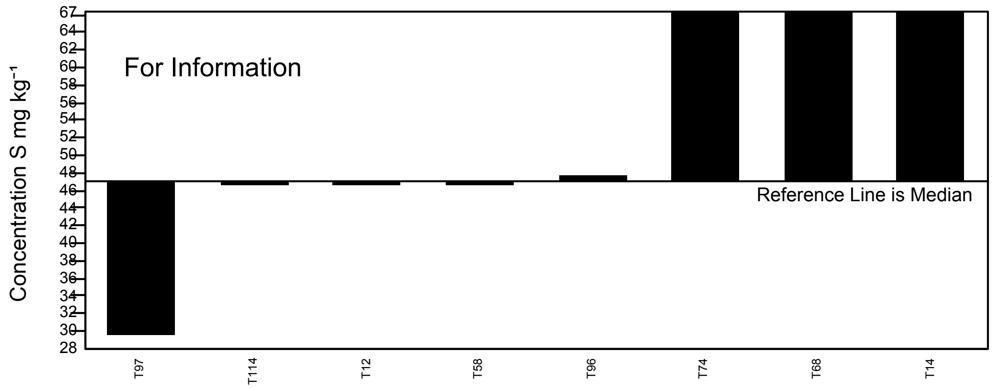
GeoPT38A - Barchart for Nb



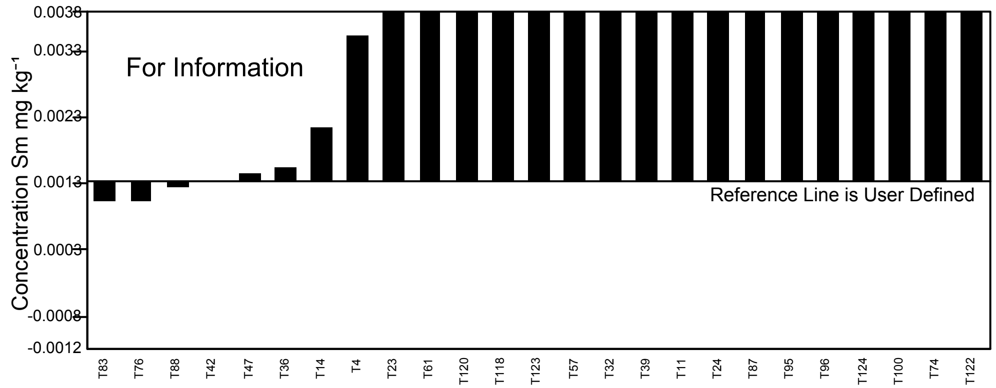
GeoPT38A - Barchart for Rb



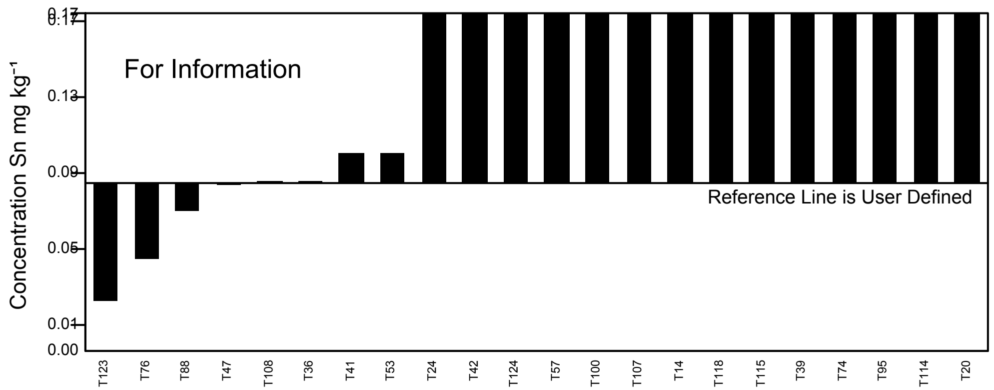
GeoPT38A - Barchart for S



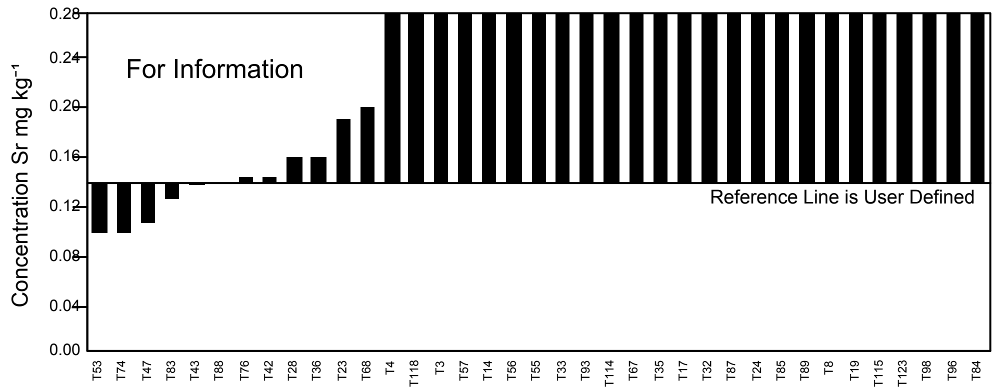
GeoPT38A - Barchart for Sm



GeoPT38A - Barchart for Sn



GeoPT38A - Barchart for Sr



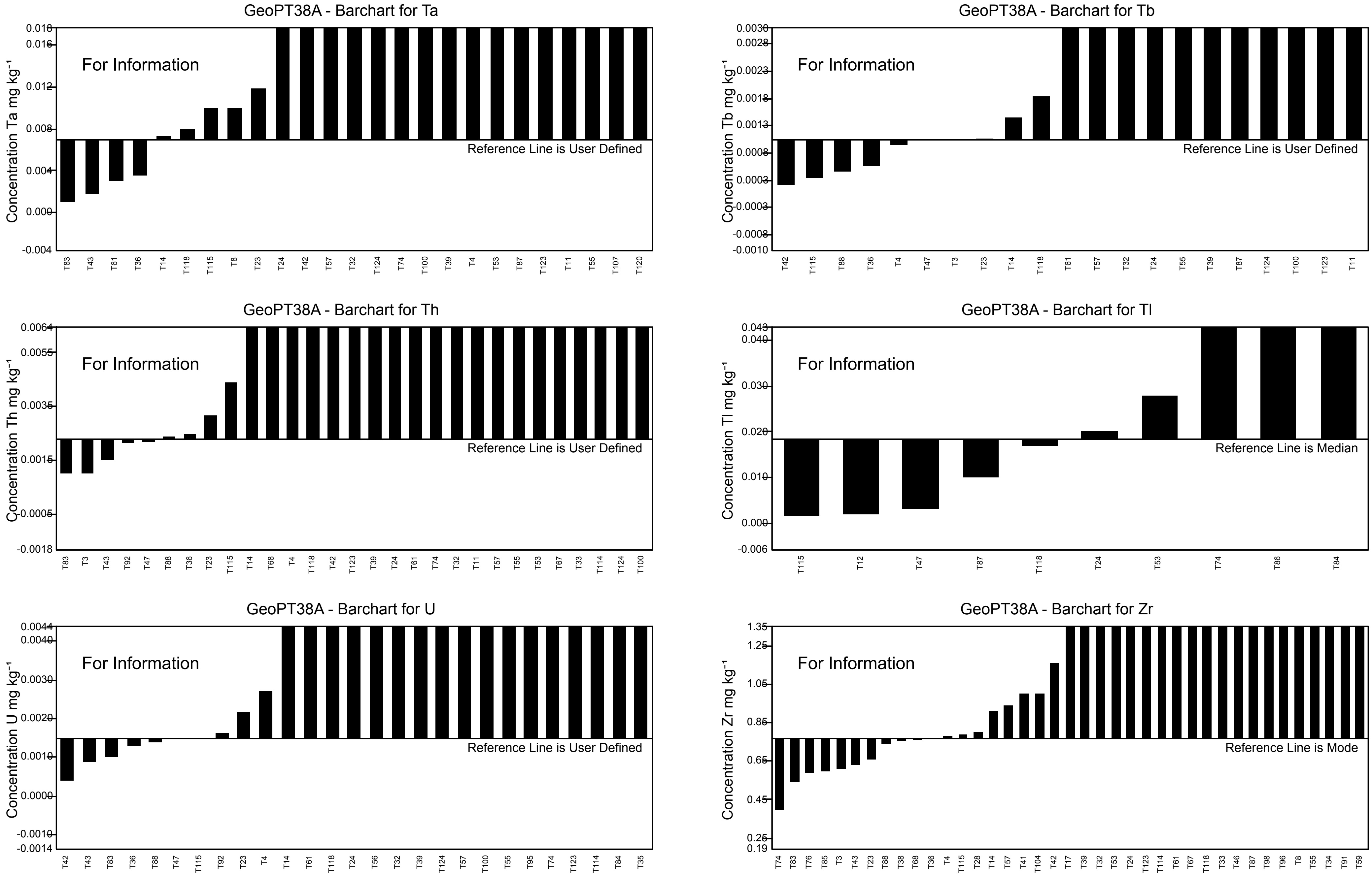


Figure 2: GeoPT38A - Modified harzburgite, HARZ01. Data distribution charts provided for information only for elements for which values could not be assigned.

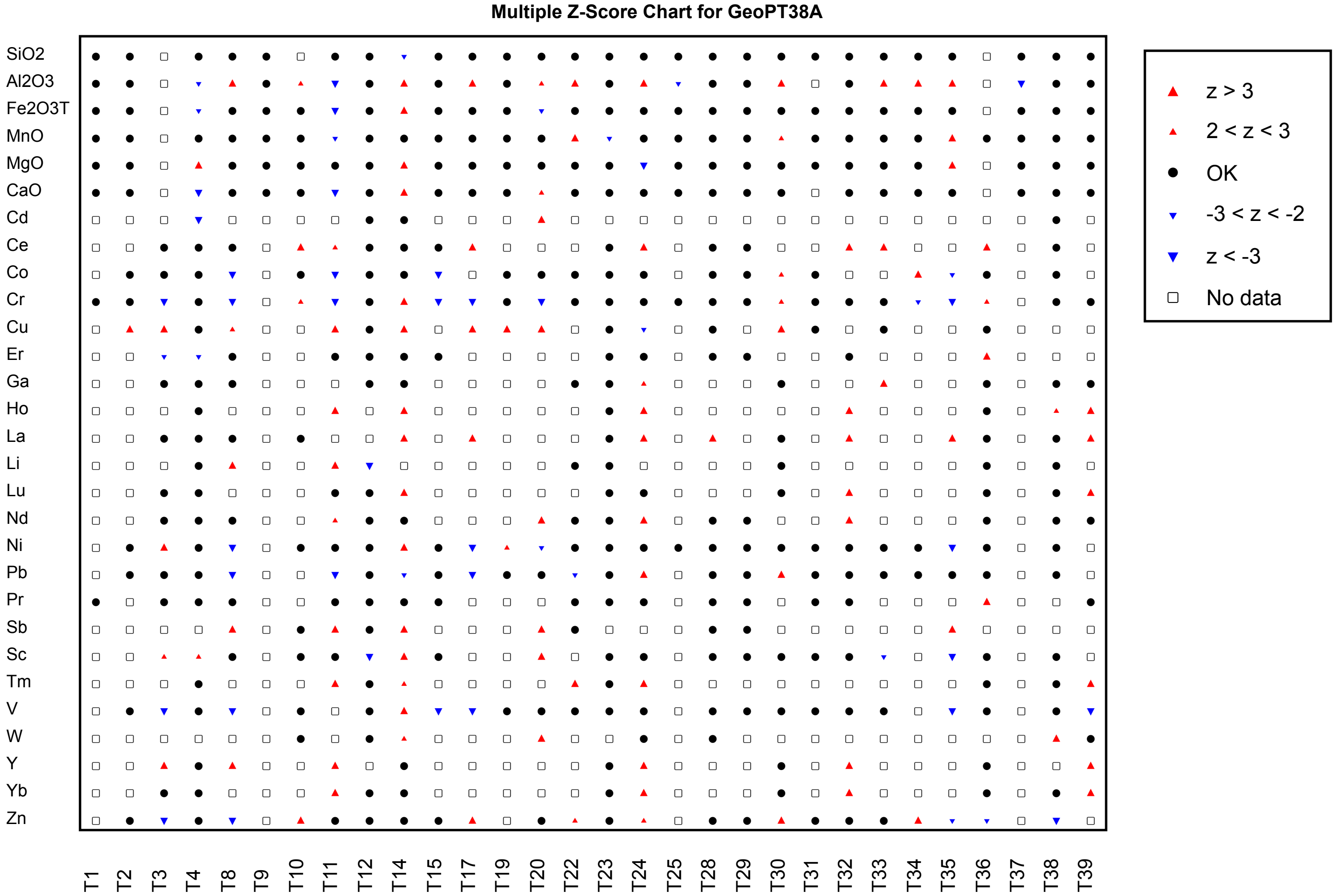


Figure 3: GeoPT38A - Modified harzburgite, HARZ01. Multiple z-score charts for laboratories participating in the GeoPT38 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

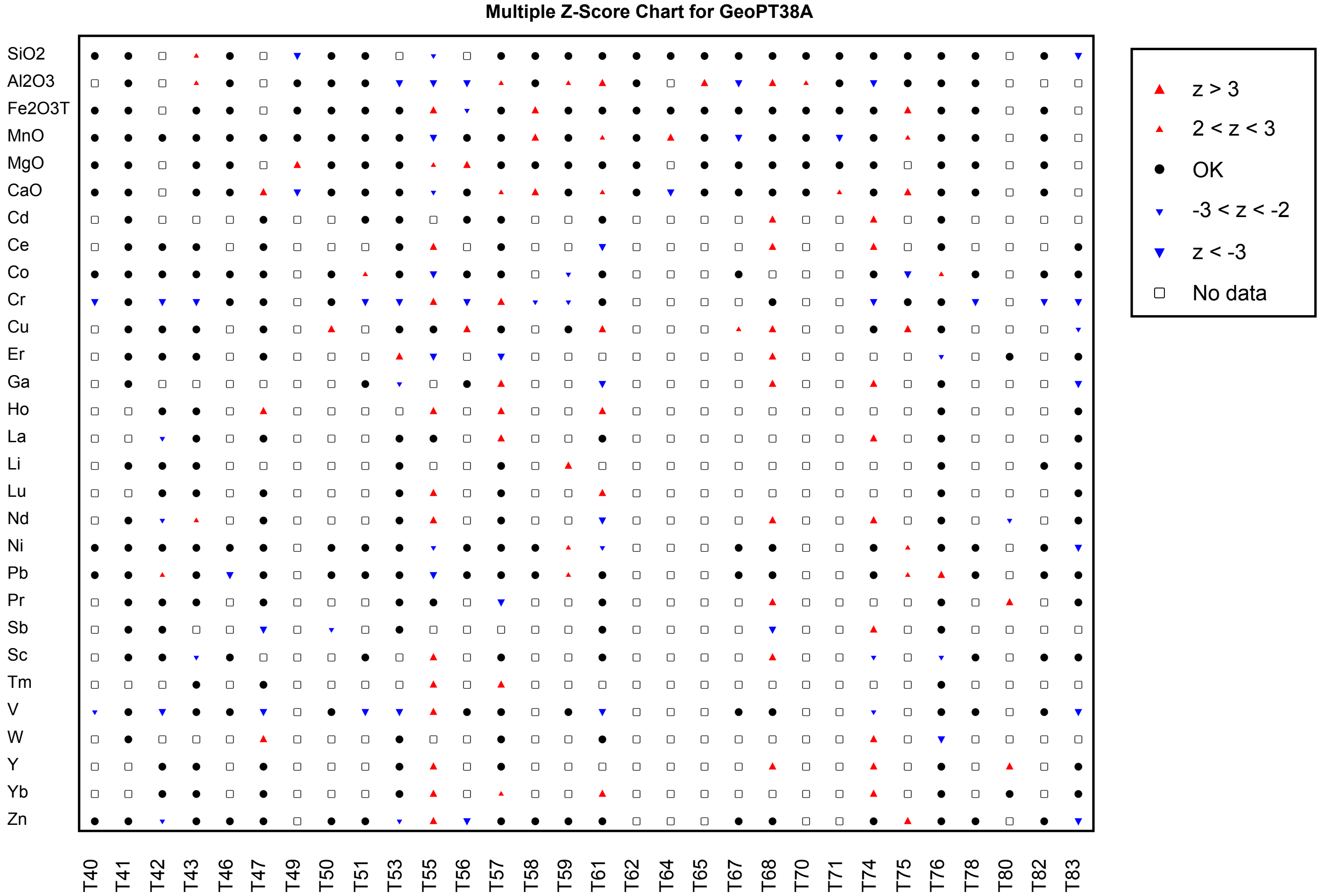


Figure 3: GeoPT38A - Modified harzburgite, HARZ01. Multiple z-score charts for laboratories participating in the GeoPT38 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT38A

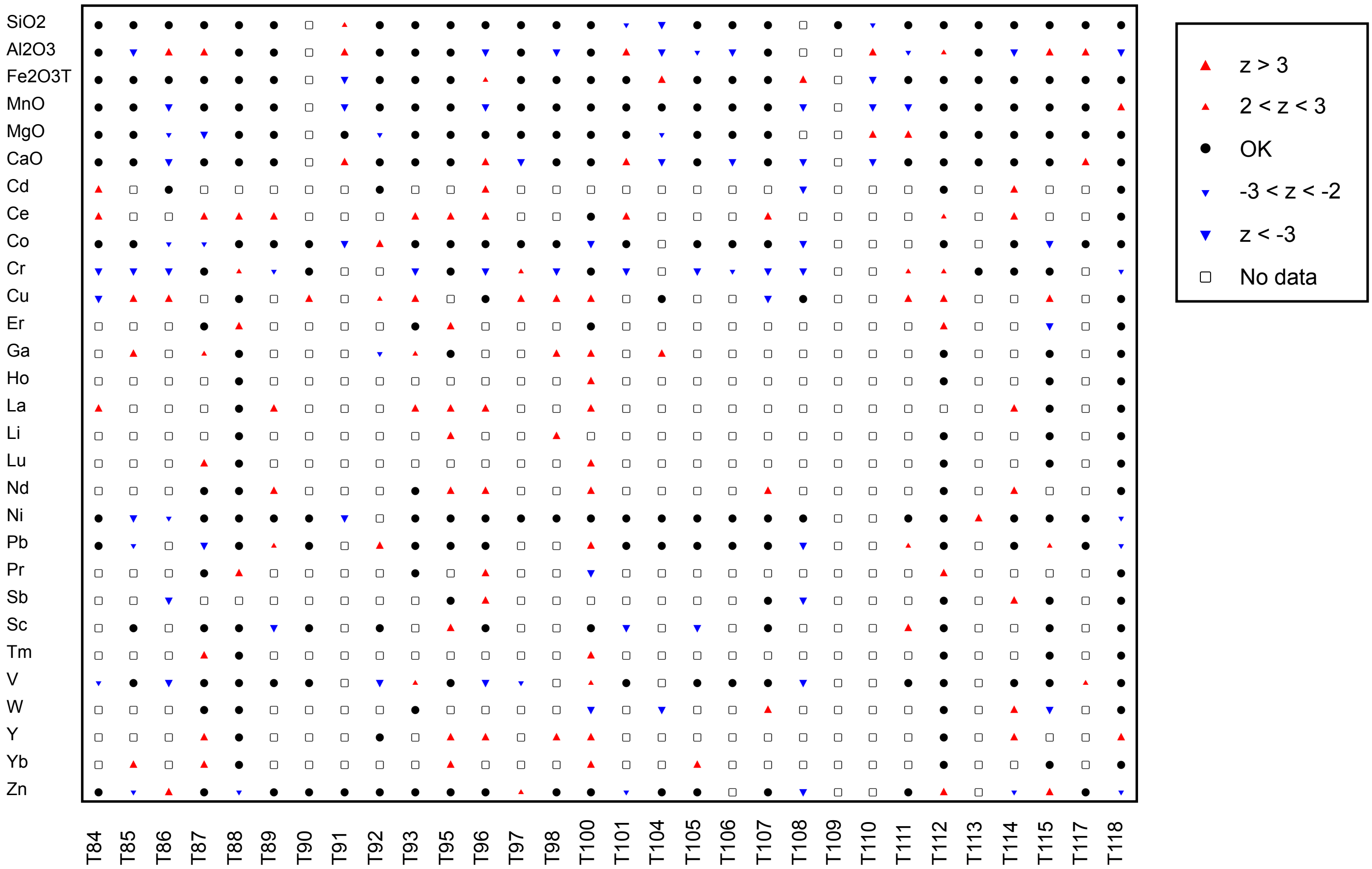


Figure 3: GeoPT38A - Modified harzburgite, HARZ01. Multiple z-score charts for laboratories participating in the GeoPT38 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT38A

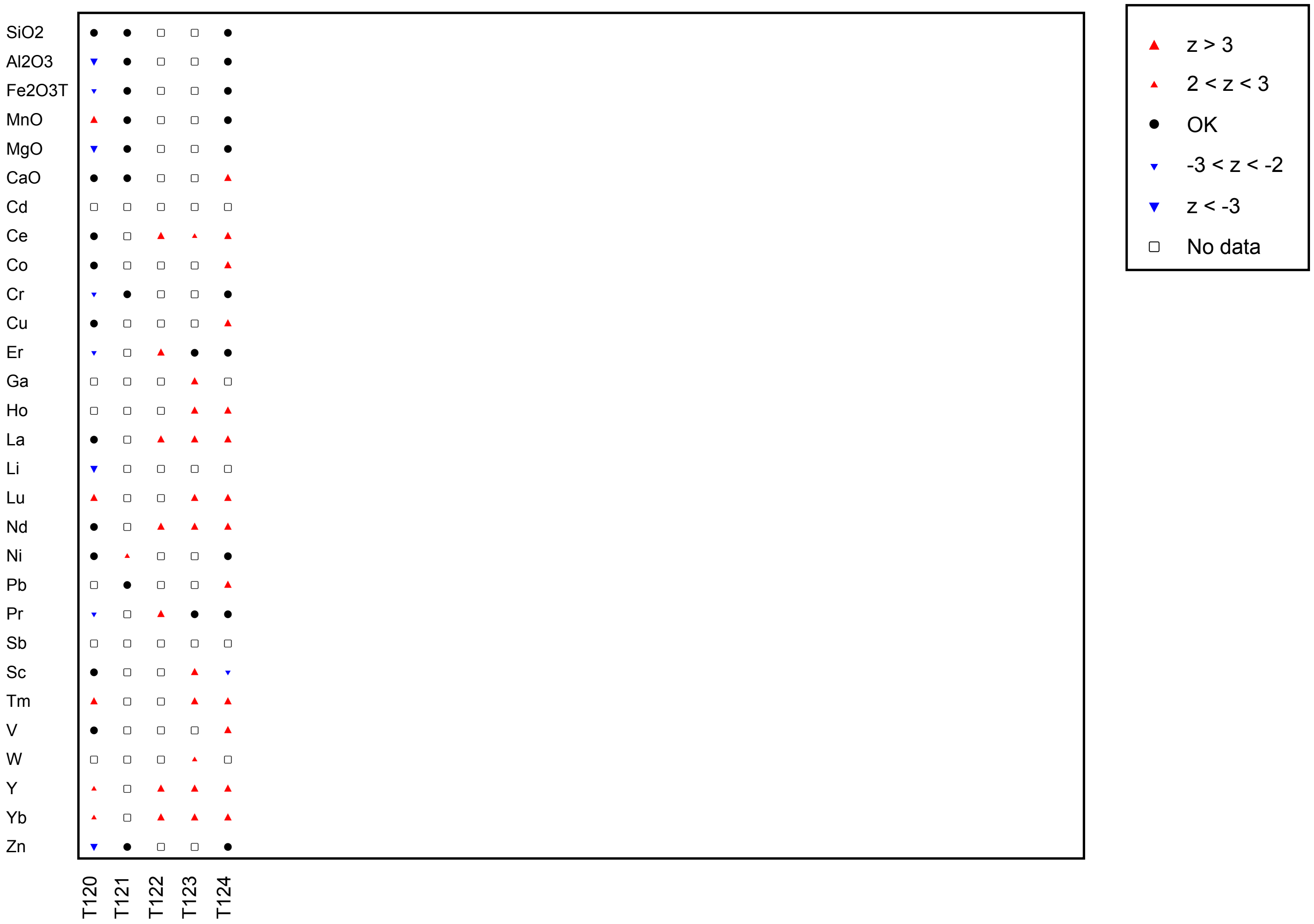


Figure 3: GeoPT38A - Modified harzburgite, HARZ01. Multiple z-score charts for laboratories participating in the GeoPT38 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).