

GeoPT22 – AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES – REPORT ON ROUND 22 / Jan 2008 (Basalt, MBL-1)

**Peter C. Webb^{1*}, Michael Thompson², Philip J. Potts¹
and B. Batjargal³**

¹Department of Earth Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

²Department of Chemistry, Birkbeck College, Gordon House, London, WC1H 0PP, UK.

³Central Geological Laboratory, Ulaanbaatar, Mongolia.

*Corresponding author: e-mail p.c.webb@open.ac.uk

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Abstract

Results are presented for GeoPT22, round twenty-two of the GeoPT international proficiency testing programme for analytical geochemistry laboratories. The sample distributed for this round was MBL-1, basalt, supplied by B. Batjargal of the Central Geological Laboratory, Ulaanbaatar, Mongolia. In this report, contributed data are listed, together with an assessment of assigned values, z-scores and charts showing both the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This twenty-second round of the international proficiency testing programme, GeoPT22, was conducted in a similar manner to earlier rounds. The programme is designed to be part of the routine quality assurance scheme of analytical geochemistry laboratories and the aims of the programme can be reviewed at <http://www.geoanalyst.org/geopt.html>. The programme is organised by the International Association of Geoanalysts and is conducted in accordance with a published protocol (<http://www.geoanalyst.org/GeoPt-protocol.pdf>). The

overall aim of the programme is to provide participating laboratories with z-score information for each reported elemental determination, from which the laboratories can decide whether the quality of their data is satisfactory in relation to both their chosen fitness-for-purpose criterion and results submitted by all the other laboratories contributing to the round and, therefore, choose to take corrective action if this appears justified.

Steering Committee for Round 22: M. Thompson (Chair), P.J. Potts (Secretary) and P.C. Webb (Results coordinator).

Sample GeoPT22: MBL-1, basalt, was supplied ready packaged by B. Batjargal (Central Geological Laboratory, Ulaanbaatar, Mongolia).

The test material was analysed at the Open University for a range of major and trace elements and the data tested for lack of sufficient homogeneity according to the Fearn test. In none of the cases for which valid data were obtained was any significant lack found, therefore the sample was considered suitable for use in the GeoPT proficiency testing programme.

Timetable for GeoPT22:

Distribution of sample: September 2007.

Deadline for submission of analytical results: 14th December 2007.

Distribution of draft report: February 2008

Submission of results

Results submitted by the 79 laboratories that participated in this round are listed in Table 1. All of these data were used for the assessment of assigned values.

Assigned values

Following procedures described in earlier rounds, a robust statistical procedure was used to derive assigned concentration values [X_a], these being judged to be the best estimates of the true composition of this sample. Data in Table 2 lists assigned and provisional values for 11 major components and assigned and provisional values for 41 trace elements. Values were assigned on the basis that: (i) sufficient laboratories had contributed data for an element, (ii) the statistical assessment gave confidence that the results showed a central portion approximating to a normal distribution. Part of this assessment involved examining a bar chart for each element to judge the distribution of results. Bar charts for 52 elements/components shown in Figure 1 were judged to have satisfactory distributions and values were assigned, namely:

SiO₂, TiO₂, Al₂O₃, Fe₂O₃T, Fe(II)O, MnO, MgO, CaO, Na₂O, K₂O, P₂O₅, Ba, Be, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, W, Y, Yb, Zn, and Zr. Of these, the elements Fe(II)O, Sb, and Tl were assigned only provisional values.

Bar charts for the 12 elements/components, CO₂, H₂O⁺, LOI, Ag, As, Bi, Cd, Cl, F, In, S and W are plotted in Figure 2 for information only, where the statistical analysis was sufficiently unsatisfactory to

be able to assign values or insufficient data were reported to allow any assessment to be made.

Some elements required special consideration because the dispersion of results was such that no completely reliable estimate of the assigned value could be ascertained despite, in some cases, a reasonably large number of reported results. Examples in this round are provided by arsenic, bismuth and cadmium for which kernel density plots are shown in Figure 3. In each instance there is a subset of results tightly dispersed around a low concentration and a more loosely dispersed subset around a considerably higher concentration. This is thought to be because of the use among participants of several analytical methods with widely different detection limits. For example, ICP-MS would have a very low detection limit and provide sensible results for arsenic at about 1 ppm, whereas XRF with a much higher detection limit would provide a dispersion of results up to higher concentrations. In such instances the median or robust mean is not a good value for an assigned value. It is, however, tempting to regard the mode of the low subset at 1.3 ppm (as can be ascertained from the kernel density representations of the results – Figure 3) as the putative true value. This may be valuable as a guide to those who wish to investigate further, but is felt to be unsafe for the identification of an assigned value without evidence external to the GeoPT data, such as a confirmatory result from a national reference laboratory.

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. 1196 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. 1669 results of data quality 2 were submitted.

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

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

Where X_a is the concentration of the element expressed as a *fraction*, and 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.

Z-score results are listed in Table 3. 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, it would be advisable for contributing laboratories to examine their 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 in this round is plotted in Figure 4 as a multiple z-score chart. In this chart, 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.

Participation in future rounds

The benefit from proficiency testing arises from regular participation and laboratories are invited to contribute to the GeoPT23 round, the sample for which will be distributed during March 2008.

Acknowledgements

The authors thank Liz Lomas and John Watson (OU) for valued assistance in the distribution of samples and the production of this report. The GeoPT programme is organised on behalf of the International Association of Geoanalysts.

Appendix 1

Publication status of proficiency testing reports

GeoPT1

Thompson M., Potts P.J., Kane J.S. and Webb P.C. (1996)
GeoPT1. International proficiency test for analytical geochemistry laboratories - Report on round 1. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 20, 295-325.

GeoPT2

Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson, J.S. (1998)
GeoPT2. International proficiency test for analytical geochemistry laboratories - Report on round 2. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 22 127-156.

GeoPT3

Thompson M., Potts P.J., Kane J.S. and Chappell B.W. (1999a)
GeoPT3. International proficiency test for analytical geochemistry laboratories - Report on round 3. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis, 23, 87-121.

GeoPT4

Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson J.S. (1999b)
GeoPT4. International proficiency test for analytical geochemistry laboratories - Report on round 4. Published in the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT5

Thompson M., Potts P.J., Kane J.S., and Wilson S. (1999c)
GeoPT5. International proficiency test for analytical geochemistry laboratories - Report on round 5. Published in the electronic version of Geostandards Newsletter: The Journal of Geostandards and Geoanalysis (Summer 2000).

GeoPT6

Potts P.J., Thompson M., Kane J.S., Webb P.C. and Carignan J. (2000)
GEOPT6 - an international proficiency test for analytical geochemistry laboratories - report on round 6 (OU-3: Nanhon microgranite) and 6A (CAL-S: CRPG limestone). International Association of Geoanalysts: Unpublished report.

GeoPT7

Potts P.J., Thompson M., Kane J.S., and Petrov L.L. (2000)
GEOPT7 - an international proficiency test for analytical geochemistry laboratories - report on round 7 (GBPG-1 Garnet-biotite plagiogneiss). International Association of Geoanalysts: Unpublished report.

GeoPT8

Potts P.J., Thompson M., Kane J.S., Webb, P.C. and Watson J.S. (2000)
GEOPT8 - an international proficiency test for analytical geochemistry laboratories - report on round 8 / February 2001 (OU-4 Penmaenmawr microdiorite). International Association of Geoanalysts: Unpublished report.

GeoPT9

Potts P.J., Thompson M., Webb, P.C. and Watson J.S. (2001)
GEOPT9 - an international proficiency test for analytical geochemistry laboratories - report on round 9 / July 2001 (OU-6 Penrhyn slate). International Association of Geoanalysts: Unpublished report.

GeoPT10

Potts P.J., Thompson M., Webb, P.C., Watson J.S. and Wang Yimin (2001)
GEOPT10 - an international proficiency test for analytical geochemistry laboratories - report on round 10 / December 2001 (CH-1 Marine sediment). International Association of Geoanalysts: Unpublished report.

GeoPT11

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Watson J.S. (2002)

GEOPT11 - an international proficiency test for analytical geochemistry laboratories - report on round 11 / July 2002 (OU-5 Leaton dolerite). International Association of Geoanalysts: Unpublished report.

GeoPT12

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Batjargal B. (2003)
GEOPT12 - an international proficiency test for analytical geochemistry laboratories - report on round 12 / January 2003 (GAS Serpentine). International Association of Geoanalysts: Unpublished report.

GeoPT13

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Kaspar H.U. (2003)
GEOPT13 - an international proficiency test for analytical geochemistry laboratories - report on round 13 / July 2003 (Köln Loess). International Association of Geoanalysts: Unpublished report.

GeoPT14

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and B. Batjargal (2004)
GeoPT14 - an international proficiency test for analytical geochemistry laboratories - report on round 14 / January 2004 (OShBO - alkaline granite). International Association of Geoanalysts: Unpublished report.

GeoPT15

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and WANG Yimin (2004)
GeoPT15 - an international proficiency test for analytical geochemistry laboratories - report on round 15 / June 2004 (Ocean floor sediment MSAN). International Association of Geoanalysts: Unpublished report.

GeoPT16

Potts P.J., Thompson M., Webb, P.C. and S.Wilson (2005)
GeoPT16 - an international proficiency test for analytical geochemistry laboratories - report on round 16 / February 2005 (Nevada basalt, BNV-1). International Association of Geoanalysts: Unpublished report.

GeoPT17

Potts P.J., Thompson M., Webb, P.C. and J. Nicholas Walsh (2005)
GeoPT17 - an international proficiency test for analytical geochemistry laboratories - report on round 17 / July 2005 (Calcareous sandstone, OU-8). International Association of Geoanalysts: Unpublished report.

GeoPT18

Webb, P.C., Thompson M., Potts P.J. and L. Paul Bedard (2006)
GeoPT18 - an international proficiency test for analytical geochemistry laboratories - report on round 18 / Jan 2006 (Quartz Diorite, KPT-1). International Association of Geoanalysts: Unpublished report.

GeoPT19

Webb, P.C., Thompson M., Potts P.J. and B. Batjargal (2006)
GeoPT19 - an international proficiency test for analytical geochemistry laboratories - report on round 19 / July 2006 (Gabbro, MGR-N). International Association of Geoanalysts: Unpublished report.

GeoPT20

Webb, P.C., Thompson M., Potts P.J. and M. Burnham (2007)
GeoPT20 - an international proficiency test for analytical geochemistry laboratories - report on round 20 / Jan 2007 (Ultramafic rock, OPY-1). International Association of Geoanalysts: Unpublished report.

GeoPT21

Webb, P.C., Thompson M., Potts P.J. and B. Batjargal (2007)
GeoPT21 - an international proficiency test for analytical geochemistry laboratories - report on round 21 / July 2007 (Granite, MGT-1). International Association of Geoanalysts: Unpublished report.

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W01	W02	W03	W04	W05	W06	W07	W08	W09	W10
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	1	2	1	2	2	2	2	2	2
SiO2	% m/m	51.42	51.72	47.2	51.9	52.07	46.2	51.84	51.69	51.97	51.74
TiO2	% m/m	2.04	2.08	1.92	2.03	2.12	1.86	2.12	2.08	2.133	2.105
Al2O3	% m/m	14.33	14.53	13.6	14.55	14.56	7.45	14.54	14.51	14.73	14.44
Fe2O3	% m/m	9.67	9.94	9.11	9.78	9.79	8.84	9.82	9.87	9.861	9.78
Fe(II)O	% m/m							6.07			
MnO	% m/m	0.13	0.14	0.117	0.125	0.13	0.126	0.126	0.138	0.1315	0.142
MgO	% m/m	6.28	6.41	5.11	6.33	6.37		6.38	6.35	6.382	6.22
CaO	% m/m	5.35	5.57	5.87	5.48	5.49	4.97	5.49	5.475	5.437	5.37
Na2O	% m/m	4.3	4.39	4.22	4.45	4.32		4.43	4.24	4.388	4.53
K2O	% m/m	3.77	3.94	3.71	4.01	4.09	4.1	4.08	3.945	4.006	4.05
P2O5	% m/m	0.81	0.86	0.772	0.86	0.86		0.85	0.846	0.8521	0.857
H2O+	% m/m							0.13			
CO2	% m/m					0.18					
LOI	% m/m	0.37	0.49		0.35	0.1		0.13	0.3	0.308	0.347
Ag	mg kg-1	0									
As	mg kg-1	0	1.8	1.32							
Au	mg kg-1										
B	mg kg-1										
Ba	mg kg-1	732	745	723		642	822	689	791	772	636
Be	mg kg-1		2.75	2.73							
Bi	mg kg-1	0		0.024				3.7			
Br	mg kg-1	0									
Cd	mg kg-1	0	0.36	0.18			3	0.1			
Ce	mg kg-1	101	98.4	95.1			107	92	98	116	
Cl	mg kg-1	269									
Co	mg kg-1	29	35.4	40		32		35	37	35.6	35
Cr	mg kg-1	224	238	230		152	288	213	238	202.6	187
Cs	mg kg-1	0	1.12	1.1					9		
Cu	mg kg-1	40	31.8	36			96	34	37	26.3	30
Dy	mg kg-1		4.46	3.91							
Er	mg kg-1		1.77	1.62							
Eu	mg kg-1		2.66	2.4							
F	mg kg-1	473									
Ga	mg kg-1	21	23.3	24.4		83	21	20	22	21.3	
Gd	mg kg-1		6.79	7.23							
Ge	mg kg-1	0	1.28	1.15							
Hf	mg kg-1	6	6.6	5.04						6	
Hg	mg kg-1								0.0032		
Ho	mg kg-1		0.737	0.676							
I	mg kg-1	0									
In	mg kg-1		0.07								
Ir	mg kg-1										
La	mg kg-1	56	55.2	51.2			54	59	56	54.2	
Li	mg kg-1			11.4							
Lu	mg kg-1		0.192	0.154							
Mo	mg kg-1	5	5.25	6.01			2			4.2	
N	mg kg-1										
Nb	mg kg-1	48	47.8	56.9			44	39	50	49.3	
Nd	mg kg-1	42	45.4	41.2			44	29	49	53.7	
Ni	mg kg-1	151	165	162		64	144	176	172	150.3	161
Os	mg kg-1										
Pb	mg kg-1	10	8.5	3.12			18	10	6	14.3	11
Pd	mg kg-1										
Pr	mg kg-1		11.8	10.7			9				
Pt	mg kg-1										
Rb	mg kg-1	61	62.1	63.7			59	59	63	65	
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1	40		554						118	281
Sb	mg kg-1	0	0.29								
Sc	mg kg-1	10		9.53					11	7.8	
Se	mg kg-1	0									
Sm	mg kg-1	9	8.53	7.72							
Sn	mg kg-1	3	2.41	1.96							
Sr	mg kg-1	858	915	859			871	906	911	882	879
Ta	mg kg-1	2	3.35	3.42				2			
Tb	mg kg-1		0.912	0.866							
Te	mg kg-1	0					1				
Th	mg kg-1	8	6.66	5.43			4	7	14	7.9	10
Tl	mg kg-1	0		0.086				2			
Tm	mg kg-1		0.222								
U	mg kg-1	3	1.67	1.26			3			2.26	
V	mg kg-1	96	105	105		90	340	107	98	102.1	
W	mg kg-1	0	1.18	1.99				2			
Y	mg kg-1	19	20.6	22.2			17		22	20.52	
Yb	mg kg-1	1	1.35	1.08				18			
Zn	mg kg-1	108	125	92.8		80	110	117	112	110.2	104
Zr	mg kg-1	282	292	296			267	267	290	290.6	

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W11	W12	W13	W14	W15	W16	W17	W17	W18	W19
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	1	1	1	2	2	1	2	1	2
SiO2	% m/m		51.42	51.86	52.11	53.67	51.2	52.17		51.853	51.26
TiO2	% m/m		2.03	2.07	1.98	1.16	2.22	2.048		2.116	2.15
Al2O3	% m/m		14.15	14.56	14.42	17.8	14.1	14.43		14.39	14.49
Fe2O3	% m/m		10.06	9.88	9.75	4.72	9.82	9.767		9.79	10.03
Fe(II)O	% m/m		4.80		5.99						
MnO	% m/m		0.13	0.13	0.129	0.059	0.130	0.124		0.131	0.134
MgO	% m/m		6.24	6.51	6.09	8.67	5.64	6.276		6.157	6.41
CaO	% m/m		5.40	5.59	5.86	3.54	5.35	5.479		5.438	5.55
Na2O	% m/m		4.47	4.3	4.38	6.51	4.06	4.543		4.432	4.46
K2O	% m/m		3.95	4.07	3.85	2.92	4.06	3.96		4.01	4.06
P2O5	% m/m		0.78	0.76	0.761	0.653	0.79	0.856		0.832	0.837
H2O+	% m/m				0.90						
CO2	% m/m				0.18						
LOI	% m/m		0.19	0.25	0.31	0.3	0.09	0.35		0.16	0.22
Ag	mg kg-1										
As	mg kg-1				0.41				0.25		
Au	mg kg-1										
B	mg kg-1										
Ba	mg kg-1	972.3					667		909		780
Be	mg kg-1				4.2				2.5		
Bi	mg kg-1				0.06				1.6		
Br	mg kg-1										
Cd	mg kg-1										
Ce	mg kg-1	105.6							122		100
Cl	mg kg-1						322				270
Co	mg kg-1				41				50		42
Cr	mg kg-1						201		255		241
Cs	mg kg-1										
Cu	mg kg-1				33				35		24
Dy	mg kg-1	4.843						4.76			
Er	mg kg-1	1.872						1.95			
Eu	mg kg-1	2.737						2.71			
F	mg kg-1				720			657			
Ga	mg kg-1						23		23		24
Gd	mg kg-1	7.181						7.22			
Ge	mg kg-1										
Hf	mg kg-1	4.79							8		
Hg	mg kg-1										
Ho	mg kg-1	0.795						0.8			
I	mg kg-1										
In	mg kg-1										
Ir	mg kg-1										
La	mg kg-1	56.57							63.5		58
Li	mg kg-1				14			9.97			
Lu	mg kg-1	0.188						0.2			
Mo	mg kg-1				5.5				5		13
N	mg kg-1										
Nb	mg kg-1	69.64		53	49.6		46		52		54
Nd	mg kg-1	48.24						47.3			49
Ni	mg kg-1				154		165		188		171
Os	mg kg-1										
Pb	mg kg-1				7.5				5.7		17
Pd	mg kg-1										
Pr	mg kg-1	12.19						11.6			12
Pt	mg kg-1										
Rb	mg kg-1			133	58.6		68		67		63
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1						248				
Sb	mg kg-1				0.13						1.2
Sc	mg kg-1								17		6
Se	mg kg-1										
Sm	mg kg-1	9.27						9.06			7
Sn	mg kg-1										
Sr	mg kg-1			930	891		910		948		970
Ta	mg kg-1	2.877							5		
Tb	mg kg-1	0.947						0.92			
Te	mg kg-1										
Th	mg kg-1	7.088			8				13		5
Tl	mg kg-1										
Tm	mg kg-1	0.233						0.25			
U	mg kg-1								5.4		0.7
V	mg kg-1				109		153		107		108
W	mg kg-1										
Y	mg kg-1	18.709		8	27.5		20		22		20
Yb	mg kg-1	1.336						1.32			
Zn	mg kg-1				118		125		109		117
Zr	mg kg-1	262.8		311	300		315		304		307

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W20	W21	W22	W23	W24	W25	W26	W27	W28	W28
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	2	1	2	2	1	2	1	1	2
SiO2	% m/m	51.763	51.973	51.69	52.134	51.44		52.16	51.46	51.55	
TiO2	% m/m	2.096	2.117	2.034	2.174	1.80		2.155	2.18	2.149	
Al2O3	% m/m	14.466	14.609	14.65	14.475	14.40		14.37	14.92	14.56	
Fe2O3	% m/m	9.784	9.867	9.80	9.928	9.60		9.90	4.44	10.02	
Fe(II)O	% m/m	5.86	6.22		6.739				5.72		
MnO	% m/m	0.129	0.118	0.131	0.126	0.125		0.13	0.136		0.13
MgO	% m/m	6.281	6.271	6.30	6.384	6.67		6.53	6.09	6.784	
CaO	% m/m	5.384	5.441	5.50	5.298	5.52		5.53	5.38	5.456	
Na2O	% m/m	4.43	4.37	4.39	4.530	4.63		4.32	4.32		4.37
K2O	% m/m	4.041	4.037	3.99	3.939	4.25		4.08	4.05		3.95
P2O5	% m/m	0.822	0.841	0.869	0.796	1.0		0.89	0.789		0.816
H2O+	% m/m										
CO2	% m/m										
LOI	% m/m	0.25	0.16	0.19	0.844	0.26		0.27			0.38
Ag	mg kg-1							0.35			0.15
As	mg kg-1				9.42				10		10.4
Au	mg kg-1										
B	mg kg-1										7.7
Ba	mg kg-1	787.3	754	712.6	771.9		773	801	764		645
Be	mg kg-1		3.6		4.2		2.75	2.20	3.2		3.2
Bi	mg kg-1						0.027	0.04			
Br	mg kg-1										
Cd	mg kg-1					0.07		0.20			0.08
Ce	mg kg-1	104.35	126.9	105.1	100		106	109	94	102.3	
Cl	mg kg-1				254						
Co	mg kg-1	34.45	36	34.7	40	28.2	38.9	38.8	44		41
Cr	mg kg-1	211.89	253	228.9	224	203	204	173.5	227		193
Cs	mg kg-1	1.143	1.68		2.34		1.16	1.22			
Cu	mg kg-1	33.62	30	34.6	33.4	27.2	29.9	29	38		31
Dy	mg kg-1	4.833	5.38	4.68	4.62		4.71	4.36		4.3	
Er	mg kg-1	1.888	2.34	1.88	1.64		2.06	1.87		1.77	
Eu	mg kg-1	2.627	2.93	2.66	2.29		2.75	2.75		2.4	
F	mg kg-1										800
Ga	mg kg-1	23.44		20.2	21		24.4	23.3			26
Gd	mg kg-1	7.479	8.33	7.14	5.52		7.85	6.9			6.57
Ge	mg kg-1				1.31		0.63	1.10			1.31
Hf	mg kg-1	6.094	5.5		6.93		6.38	6.85			6.57
Hg	mg kg-1					0.0024					0.015
Ho	mg kg-1	0.791	0.98	0.81	0.72		0.73	0.77		0.75	
I	mg kg-1										
In	mg kg-1						0.058	0.07			
Ir	mg kg-1										
La	mg kg-1	56.583	66.45	56.9	57		57.3	58.6	59	50.9	
Li	mg kg-1		15.61				12.1	10.6	10	10	
Lu	mg kg-1	0.183	0.22	0.18	0.23		0.18	0.18			
Mo	mg kg-1		4.9		3.73		4.97	5.25			6.7
N	mg kg-1										
Nb	mg kg-1	57.095	54	45.5	56.6		54.5	56.6	42		56
Nd	mg kg-1	48.202	53.6	46.2	47		44.4	46.2			40.03
Ni	mg kg-1	160.92	152	165.7	198	152	168	170.5	156		167
Os	mg kg-1										11
Pb	mg kg-1	7.884	7.5	7.9	9		6.35	14.0			
Pd	mg kg-1									10.22	
Pr	mg kg-1	12.539	13.9	11.9	11.9		12.1	12.6			
Pt	mg kg-1									58	
Rb	mg kg-1	64.721	61	66.6	60		66.4	70.4			
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1				286			314			
Sb	mg kg-1		0.36		0.25			0.29	18		
Sc	mg kg-1	10.419	11.51		10		15.8	9.0	4.9		9.4
Se	mg kg-1										
Sm	mg kg-1	8.982	7.86	8.73	9.36		8.65	8.48		7.83	
Sn	mg kg-1		2.48		2.78			3.15			3.3
Sr	mg kg-1	892.5	953	919.3	901		1014	1001	883		940
Ta	mg kg-1	3.22	2.87		1.90		3.16	3.22			
Tb	mg kg-1	1.019	1.19	0.95	0.82		1.03	0.92		0.97	
Te	mg kg-1										
Th	mg kg-1	7	5	5.6	7.81		6.81	6.82			8.26
Tl	mg kg-1				0.11		0.088	0.15			0.11
Tm	mg kg-1	0.231	0.295	0.23	0.22		0.23	0.23		0.22	
U	mg kg-1	1.544	1.9		1.64		1.65	1.69		1.91	
V	mg kg-1	103.92	70	109.4	97.2		118	97	100		120
W	mg kg-1				1.12		1.51	1.20			
Y	mg kg-1	22.618	25	21.0	20		21.1	20.5	19		22
Yb	mg kg-1	1.323	1.74	1.34	1.37		1.35	1.26		1.39	
Zn	mg kg-1	108.2	119	118.1	120	117	129	110	111		120
Zr	mg kg-1	267.51	263	291.1	282.2		291	318			289

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W29	W30	W31	W32	W33	W34	W35	W36	W37	W38
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		2	1	2	2	1	2	2	1	2	2
SiO2	% m/m	51.599	49.94	52.5	52.02	51.38		51.56		51.84	51.9
TiO2	% m/m	2.121	2.14	2.08	2.09	2.03		2.11	2.1	2.10	2.13
Al2O3	% m/m	14.259	12.89	14.4	14.53	14.53		14.43	14.2	15.15	14.9
Fe2O3	% m/m	9.657	9.72	9.8	9.80	9.7		9.76	9.76	9.61	9.98
Fe(II)O	% m/m			7.8	6.45	6.05					
MnO	% m/m	0.13	0.127	0.14	0.13	0.13		0.13	0.132	0.122	
MgO	% m/m	6.764	4.48	6.6	6.38	5.74		6.58	6.1	5.97	6.54
CaO	% m/m	5.86	5.25	5.6	5.41	5.23		5.48		5.24	5.50
Na2O	% m/m	4.283	2.99	4.3	4.45	4.5		4.43	4.3	4.68	4.44
K2O	% m/m	3.78	4.08	3.81	3.96	4.19		4.08	3.8	3.92	3.94
P2O5	% m/m	0.928	0.6985	0.91	0.83	0.85		0.85		0.858	0.817
H2O+	% m/m					0.57					
CO2	% m/m			0.15		0.15			0.214		
LOI	% m/m			0.22	0.24	0.35				0.46	
Ag	mg kg-1			0.3						1.43	
As	mg kg-1		1.0	6.8		11	1.75		1.8	1	
Au	mg kg-1								0.93		
B	mg kg-1										
Ba	mg kg-1	751.5	792.3	684	789	726			789	790	723.8
Be	mg kg-1	2.8		3.1	2.86		2.8			3.46	
Bi	mg kg-1					0					
Br	mg kg-1										2.1
Cd	mg kg-1		1.3			12				0.15	
Ce	mg kg-1	103.74	95.3	101	106	155	103		115	110	112.8
Cl	mg kg-1			680		281				549	
Co	mg kg-1	36.23		35	37.0	33	34		37	36.7	32.9
Cr	mg kg-1	229.3	190.3	195	194	205			221	224	204.2
Cs	mg kg-1	1.16	8.6	1.1	1.25	0	1.2		1.3	1.21	
Cu	mg kg-1	28.8	31.4	31	31.3	32				32.2	22.1
Dy	mg kg-1	4.78		4.4	4.77	4	4.44		4.3	5.18	
Er	mg kg-1	1.95		3.2	1.91	3	1.67			2.13	
Eu	mg kg-1	2.67		2.3	2.73	2	2.73		2.59	2.82	
F	mg kg-1			490		248					
Ga	mg kg-1	23.41	21.0	25	23.7	24	21.49			24	21.9
Gd	mg kg-1	7.03		8.8	7.31	13	6.74			8.74	
Ge	mg kg-1			3.6			1.5			1.13	
Hf	mg kg-1	6.57		5.5	6.72	11	6.69		6.9	5.82	
Hg	mg kg-1										
Ho	mg kg-1	0.81		0.7	0.79	3	0.75			0.82	
I	mg kg-1										
In	mg kg-1				0.059					0.05	
Ir	mg kg-1								0.0015		
La	mg kg-1	55.17	52.7	58	57.1	44	55.45		53.9	57.7	64.6
Li	mg kg-1			13	11.5						
Lu	mg kg-1	0.19		0.2	0.18		0.18		0.184	0.22	
Mo	mg kg-1	4.61	1.0	5.2	4.97	4				4.55	5.66
N	mg kg-1										
Nb	mg kg-1	48.83	47.2	79	53.1	59	49.1			54	50.2
Nd	mg kg-1	46.35	39.5	48	49.5	50	45.8		46.7	51	47.7
Ni	mg kg-1	187.9	162.5	154	162	148			141	170	156.7
Os	mg kg-1										
Pb	mg kg-1	13.77	8.5	8.2	8.60	10				6.84	4.4
Pd	mg kg-1										
Pr	mg kg-1	11.83		13	12.8	9	12.06			12.8	
Pt	mg kg-1										
Rb	mg kg-1	64.49	59.5	62	63.8	60			64	66	63.2
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1		229.0	280		129			357	281	
Sb	mg kg-1			0.3		0			0.3		
Sc	mg kg-1	9.9		14	10.4	13			10.2	11.5	4.01
Se	mg kg-1								0.07		
Sm	mg kg-1	8.65	10.7	8.3	9.05	8	8.65		8.6	9.2	
Sn	mg kg-1	4.79	3.8	2.4	2.54	5				2.63	
Sr	mg kg-1	898.02	851.5	890	933	901				979	877.2
Ta	mg kg-1	3		3	3.23	0	3.06		3.1	3.37	
Tb	mg kg-1	0.95		0.6	1.00	1	0.95		0.94	1.15	
Te	mg kg-1										
Th	mg kg-1	6.78	8.0	7.3	6.38	4	7.12		7.2	6.35	8.53
Tl	mg kg-1			0.2	0.12					0.16	
Tm	mg kg-1	0.24		0.2	0.25		0.24				
U	mg kg-1	1.66	2.8	2	1.60	0	1.54		1.7	1.8	4.34
V	mg kg-1	107.8	153.0	92	104	103			105	100	87.7
W	mg kg-1	3.14		1.7	1.14	0			1.3	1.35	34.8
Y	mg kg-1	19.96	19.5	18	20.6	17	21.03			23.2	20.9
Yb	mg kg-1	1.41		1.4	1.30	5	1.32		1.35	1.45	
Zn	mg kg-1	128.2	108.9	113	114	92			124	133	111.3
Zr	mg kg-1	272.2	286.4	229	270	302	276			256	295.9

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W39	W39	W40	W41	W41	W42	W43	W44	W45	W46
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	2	1	1	2	2	1	2	2	1
SiO2	% m/m	51.21		53.39		57.76	52.29		51.8	52.518	51.68
TiO2	% m/m	2.114		2.25	2.05		2.24		2.10	2.386	2.07
Al2O3	% m/m	14.50		14.19	13.96		14.14		14.74	14.645	14.41
Fe2O3	% m/m	9.80		11.42	9.69		9.53	8.46	10.21	9.533	9.68
Fe(II)O	% m/m	6.31		5.95							
MnO	% m/m	0.130		0.136	0.13		0.123	0.123	0.12	0.134	0.14
MgO	% m/m	6.27		4.62	5.97		6.27		6.26	6.357	6.35
CaO	% m/m	5.48		5.35	5.16		5.31		5.39	4.893	5.38
Na2O	% m/m	4.39		2.9	4.41		4.48		4.32	4.315	4.45
K2O	% m/m	4.00		4.23	4.14		4.06		4.07	4.149	4.16
P2O5	% m/m	0.828		0.6			0.889		0.86	0.837	0.84
H2O+	% m/m										
CO2	% m/m										
LOI	% m/m	0.22		0.28			0.399		0.3	0.425	
Ag	mg kg-1			1.095							
As	mg kg-1				1.7				1.1		2
Au	mg kg-1				0.71						
B	mg kg-1										
Ba	mg kg-1	766		690	780.0		741	670.45	778	732.00	720
Be	mg kg-1		2.4	1.9					2.6		
Bi	mg kg-1			0.032							
Br	mg kg-1				0.9						
Cd	mg kg-1			0.15					0.08		
Ce	mg kg-1	109		95.39	101.8		95	104.55	103		103
Cl	mg kg-1		294		530.0				314		
Co	mg kg-1	35		31.66	35.8		30	36.3	37.8		22
Cr	mg kg-1	226		190	236.0		210	210.8	168	205.00	220
Cs	mg kg-1	1.19		0.99	1.15			1.23	1.4		
Cu	mg kg-1	32		33.93			25	29.17	35.7	30.20	33
Dy	mg kg-1	4.82		3.42	4.9			4.99	4.5		
Er	mg kg-1	1.93		1.27				1.95	1.7		
Eu	mg kg-1	2.81		2.02	2.83			2.6	2.7		
F	mg kg-1						535		435		
Ga	mg kg-1	23		20.84		28	28		23.9	22.50	24
Gd	mg kg-1	7.42		6.11				6.82	8		
Ge	mg kg-1			1.05							
Hf	mg kg-1	6.70		4.1	7.15		5	5.04	6		
Hg	mg kg-1										
Ho	mg kg-1	0.80		0.56				0.78	0.74		
I	mg kg-1										
In	mg kg-1										
Ir	mg kg-1										
La	mg kg-1	58.9		46.73	56.0		50	53.38	54.2	67.50	52
Li	mg kg-1			8.1			10	11.56	10.2		
Lu	mg kg-1	0.19		0.12	0.163			0.19	0.16		
Mo	mg kg-1			4.61			7		5.3		
N	mg kg-1										
Nb	mg kg-1	53.1		53.17			4	50.35	46	51.50	53
Nd	mg kg-1	48.0		36.95	47.0		45	45.73	46.7		
Ni	mg kg-1	163		133.76		150.0	86	161.84	167	158.00	124
Os	mg kg-1										
Pb	mg kg-1	8.82		4.8			4	8.9	7.8	10.00	10
Pd	mg kg-1										
Pr	mg kg-1	12.4		9.48				11.44	11.7		
Pt	mg kg-1										
Rb	mg kg-1	63.0		60.79	61.0			61.36	60.4	63.00	64
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1						334		445	389	40
Sb	mg kg-1			0.28		0.250			0.4		
Sc	mg kg-1		13	8.58	10.25				10.5		
Se	mg kg-1										
Sm	mg kg-1	8.88		6.68	8.6			8.29	8.4		
Sn	mg kg-1			2.01					2.4		
Sr	mg kg-1	918		940.22	940.0		895	954.97	979	945	915
Ta	mg kg-1	3.13		2.64	2.89			2.2			
Tb	mg kg-1	0.96		0.64	0.84			1.07	1.0		
Te	mg kg-1			0.004							
Th	mg kg-1	7.31		4.75	6.56			6.66	7.3	2.2	5
Tl	mg kg-1			0.087					0.10		
Tm	mg kg-1	0.24		0.155				0.22	0.21		
U	mg kg-1	1.77		1.19		1.1		1.67	1.4	0.5	
V	mg kg-1	110		107.8	108.0		105	108.52	123		85
W	mg kg-1			0.91		1.6			1.0		
Y	mg kg-1	21		17.45			21	21.61	19	22.00	25
Yb	mg kg-1	1.36		0.903	1.20			1.2	1.3		
Zn	mg kg-1	112		88.53	120.0		105	118.17	128	117.50	120
Zr	mg kg-1	278		241.1	240.0		296	280.0	288	287.50	310

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W47	W47	W48	W49	W50	W51	W52	W53	W54	W55
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	2	2	1	2	2	1	2	2	2
SiO2	% m/m	58.65			52	52.0	52.1	51.51	51.5	52.03	51.130
TiO2	% m/m	2.54		2.21	2.1	2.20	2.08	2.08	2.08	2.185	2.124
Al2O3	% m/m	16.23		15.03	14.57	14.1	14.46	14.61	14.3	14.85	14.296
Fe2O3	% m/m	11.57		10.18	9.79	9.81	9.98	9.76	10.0	9.666	9.480
Fe(II)O	% m/m	6.2									
MnO	% m/m	0.16		0.134	0.13	0.136	0.13	0.136	0.137	0.1205	0.126
MgO	% m/m	7.22		6.59	6.34	6.13	6.49	6.42	6.54	6.745	6.180
CaO	% m/m	6.27		5.72	5.51	5.41	5.33	5.49	5.30	5.5	5.380
Na2O	% m/m	5.15		4.57	4.47	4.33	4.32	4.5	4.39	4.27	4.448
K2O	% m/m	4.64		4.30	4.03	4.00	4.03	4.04	4.05	3.872	4.035
P2O5	% m/m	0.99		0.91	1.13		0.79	0.86	0.854	0.8107	0.845
H2O+	% m/m										
CO2	% m/m										
LOI	% m/m					0.350	0.25	0.192	0.206		1.025
Ag	mg kg-1	0.25						0.16		0.483	
As	mg kg-1	3.52			1.7						
Au	mg kg-1										
B	mg kg-1			5.74							
Ba	mg kg-1	763.1		769	765.7	734.0	775	780	740	633	750
Be	mg kg-1			2.85	2.867		2.99	3.11		2.613	
Bi	mg kg-1							0.035			
Br	mg kg-1										
Cd	mg kg-1	0.178			0.1			0.1		0.34	4.28
Ce	mg kg-1	100.1		105	106.57		105	104	103	95.85	
Cl	mg kg-1										
Co	mg kg-1	37.36		36.2	36.47	41.20	36.8	34.9	34.4	33.07	42.0
Cr	mg kg-1	238		219	226	187.6	220	237.7	172	633	186
Cs	mg kg-1	1.17		1.15	1.15		1.14	1.14	1.08	1.078	
Cu	mg kg-1	31.5		31.7		30.4	32.6	34.4	32.2	26.83	30.8
Dy	mg kg-1	4.78		4.82	4.888		4.84	4.75	4.60	4.406	
Er	mg kg-1	1.98		1.92	1.98		1.95	1.85	1.84	1.71	
Eu	mg kg-1	2.77		2.66	2.65		2.66	2.7	2.58	2.439	
F	mg kg-1	350									
Ga	mg kg-1	20.87		23	25.47		23.3	23		20.9	
Gd	mg kg-1	7.55		7.4	7.096		7.47	7.2	6.89	6.842	
Ge	mg kg-1	1.59		1.45			1.36				
Hf	mg kg-1	6.81		6.25	6.643		6.46	6		7.217	
Hg	mg kg-1										
Ho	mg kg-1	0.73		0.84	0.8		0.84	0.77	0.760	0.74	
I	mg kg-1										
In	mg kg-1										
Ir	mg kg-1										
La	mg kg-1	53.37		56.4	55.347		56.5	59	54.8	50.43	
Li	mg kg-1			12.5	11.5	11.42	12.5	11.86	10.2	33.233	
Lu	mg kg-1	0.18		0.19	0.206		0.19	0.179	0.170	0.179	
Mo	mg kg-1	4.77		5.06	5.5			5.12	4.27	4.807	
N	mg kg-1										
Nb	mg kg-1	54.85		54.5	44.33		54.6	54.2		59.66	
Nd	mg kg-1	45.66		47.1	46.93	49.00	46.9	47.2	45.5	41.17	
Ni	mg kg-1	193.5		168	158.33	158.3	167	162	158	141.33	112
Os	mg kg-1										
Pb	mg kg-1	8.02		8.73	8.38	10.2	9.2	8.99	8.40	5.554	
Pd	mg kg-1										
Pr	mg kg-1	12		12.2	12.227	11.2	11.7	12.13	11.6	11.01	
Pt	mg kg-1										
Rb	mg kg-1	64.7		63.2	69.73	72.5	65.7	63.3	64.2	60.84	
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1	604									
Sb	mg kg-1				0.257			0.22	0.20	0.372	
Sc	mg kg-1		11	10.6	9.99		10.6	10.1	9.83	8.753	
Se	mg kg-1										
Sm	mg kg-1	9.27		8.94	8.82		8.92	8.91	8.51	8.085	
Sn	mg kg-1	2.88		2.79				2.93		2.114	
Sr	mg kg-1	952.3		935	1096.7	898.6	937	924	912	933.2	975
Ta	mg kg-1			3.11	3.42		3.16	3.34		3.223	
Tb	mg kg-1	0.97		0.95	0.953		0.97	0.98	0.890	0.927	
Te	mg kg-1										
Th	mg kg-1	4.73		6.85	7.11		6.79	8.67	6.38	4.923	
Tl	mg kg-1			0.13	0.12			0.119			
Tm	mg kg-1			0.24	0.261		0.25	0.242	0.220	0.225	
U	mg kg-1	1.66		1.65	1.733		1.66	2.2	1.66	1.349	
V	mg kg-1	107		109	104.68	104.00	110	107	101	97.57	104
W	mg kg-1	5						1.13		0.645	
Y	mg kg-1	21		22.4	21.3	17.7	22.1	21.5	19.8	18.63	
Yb	mg kg-1	1.36		1.42	1.412		1.43	1.36	1.26	1.326	
Zn	mg kg-1	122.5		111	126.33	176.5	114	115.1	114	106.33	114
Zr	mg kg-1	296		282	294		286	294	197	306.1	

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W56	W57	W58	W59	W60	W60	W61	W62	W63	W64
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		2	2	1	1	1	2	2	1	2	2
SiO2	% m/m	51.39	51.83	52.3	51.96		50.6	51.97		50.6	51.32
TiO2	% m/m	2.105	2.149	2.16	2.10		1.86	2.11	2.24	1.97	2.08
Al2O3	% m/m	14.62	14.54	14.4	14.49		13.9	14.80		14.05	14.37
Fe2O3	% m/m	9.81	9.9	10.1	9.66		8.4	9.87		8.84	9.84
Fe(II)O	% m/m	9.5	6.37							5.9	6.14
MnO	% m/m	0.128	0.129	0.13	0.130		0.13	0.13	0.13	0.12	0.13
MgO	% m/m	6.25	5.75	6.29	6.39		6.0	6.19		5.9	6.26
CaO	% m/m	5.35	5.46	5.66	5.49		5.7	5.29	5.51	5.27	5.58
Na2O	% m/m	4.42	4.48	3.69	4.22		4.17	4.31		4.43	4.38
K2O	% m/m	3.93	4.11	4.06	4.01		4.04	4.00		3.77	4.07
P2O5	% m/m	0.847	0.84	0.87	0.80		0.69	0.81		0.8	0.88
H2O+	% m/m									0.7	1.05
CO2	% m/m			0.14						0.11	0.16
LOI	% m/m		0.29	0.4	0.30			0.35			0.44
Ag	mg kg-1									0.22	
As	mg kg-1	7				3.56					
Au	mg kg-1										
B	mg kg-1										
Ba	mg kg-1	761	758		788	781		794	769.8	750	773
Be	mg kg-1		2.36							2.9	2.84
Bi	mg kg-1	3				0.069					0.14
Br	mg kg-1										
Cd	mg kg-1	4				0.22				0.19	0.1
Ce	mg kg-1	107.8	103		101	108			104.1	106	105
Cl	mg kg-1	0.244								530	
Co	mg kg-1	25	34	26	32.0	31.08		39	37	32.7	34.3
Cr	mg kg-1	208	194		212	212		217	229	170	223
Cs	mg kg-1					1.13			1.13	1.2	1.22
Cu	mg kg-1	61	33	23	62.2	56.3		36	31	27	31.6
Dy	mg kg-1	5.04	5.8			5.2			4.89	4.75	4.56
Er	mg kg-1	1.94	2.3			2.19				2.11	1.75
Eu	mg kg-1	2.94	3			2.95			2.70	2.45	2.62
F	mg kg-1									590	
Ga	mg kg-1	21	23		21.4	36.7		22	23.0	21	21.2
Gd	mg kg-1	7.41	8.4			9.0				7.27	7.13
Ge	mg kg-1					1.18					
Hf	mg kg-1	7	5.9			8.0				7	6.38
Hg	mg kg-1										
Ho	mg kg-1	0.83	0.87			0.87			0.78	0.77	0.779
I	mg kg-1										
In	mg kg-1									0.06	
Ir	mg kg-1										
La	mg kg-1	57.2	58			65.3			55.75	58	55.01
Li	mg kg-1		10	10				11.3		10	12.1
Lu	mg kg-1	0.17	0.23			0.21			0.17	0.2	0.187
Mo	mg kg-1	8				5.4			5.04	6	5.83
N	mg kg-1										
Nb	mg kg-1	50	53	28	52.6	50.3		47	51.58	56	51.1
Nd	mg kg-1	50.1	55.7			49.9		43	46.19	48.8	47.2
Ni	mg kg-1	160	151		177	138		160	166	150	165.1
Os	mg kg-1										
Pb	mg kg-1	7	11			9.5			8.4		9.19
Pd	mg kg-1			0.04							
Pr	mg kg-1	12.7	14.8			12.4			11.97	12.7	11.8
Pt	mg kg-1			0.11							
Rb	mg kg-1	60	63		50.5	64.4		62	61.38	65.5	61.2
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1			0.02						0.02	
Sb	mg kg-1					1.46			0.36		0.281
Sc	mg kg-1	9.3	8.5					11	10	8	10.1
Se	mg kg-1										
Sm	mg kg-1	9.17	9.9			9.4			8.60	8.9	8.64
Sn	mg kg-1	4	2.6						2.74		
Sr	mg kg-1	906	909		933	993		881	965	945	934
Ta	mg kg-1					3.64			3.31	3.5	3.04
Tb	mg kg-1	0.99	1.21			1.04			0.95	1.04	0.948
Te	mg kg-1										
Th	mg kg-1	6.38				1.17				7.4	6.53
Tl	mg kg-1					0.05			0.110	0.14	0.135
Tm	mg kg-1	0.22	0.21			0.27				0.21	0.239
U	mg kg-1	3				0.34			1.58	1.7	1.64
V	mg kg-1	105		130	94	103		103	112	105	99.3
W	mg kg-1					1.49			1.13		1.07
Y	mg kg-1	19.5	20	13	17.3	19.9		21		20.3	22.1
Yb	mg kg-1	1.21	1.76			1.59			1.32	1.4	1.36
Zn	mg kg-1	115	119	180	116	58.3		120	124	108	106
Zr	mg kg-1	312	292		284	279		296	261	281	288

Table 1		GeoPT22 Analytical results submitted (Dec 2007)									
		Basalt, MBL-1									
Lab. identifier		W65	W66	W67	W68	W69	W70	W70	W71	W72	W73
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	2	2	2	1	1	2	1	2	2
SiO2	% m/m		51.1	51.5311	51.44		52.249		52.99	46.74	51.60
TiO2	% m/m		2.11	2.1108	2.11		2.064		2.29	2.12	2.117
Al2O3	% m/m		13.85	14.3680	14.52		14.645		13.22	13.32	14.49
Fe2O3	% m/m		9.65	9.9093	9.73		10.035		10.16	8.62	9.79
Fe(II)O	% m/m										6.09
MnO	% m/m			0.1351	0.13		0.131		0.13	0.141	0.13
MgO	% m/m		6.11	6.2882			6.31		6.12		6.32
CaO	% m/m		5.33	5.4672	5.36		5.573		5.01	5.22	5.41
Na2O	% m/m		4.4	4.4129	4.31		4.4		3.94		4.31
K2O	% m/m		3.82	3.9565	3.96		4.144		4.24	4.06	3.981
P2O5	% m/m			0.8501	0.77		0.886		0.76		0.865
H2O+	% m/m										
CO2	% m/m										
LOI	% m/m	0.13	0.43	0.25	0.64		0.25		0.65		0.35
Ag	mg kg-1										
As	mg kg-1		6.4								
Au	mg kg-1										
B	mg kg-1										
Ba	mg kg-1	743	773			7.28		771.1			743
Be	mg kg-1		2.56								
Bi	mg kg-1										
Br	mg kg-1										
Cd	mg kg-1										
Ce	mg kg-1	106	98.6			1.04					109
Cl	mg kg-1										
Co	mg kg-1	29	36.3			34.1		37.4			32
Cr	mg kg-1	228	230			217		246.7			221
Cs	mg kg-1		1.21			1.26					
Cu	mg kg-1	33	27.7			32.6	32.7			70	35
Dy	mg kg-1		4.44			4.92					
Er	mg kg-1		1.83			2.03					
Eu	mg kg-1		2.47			2.85					
F	mg kg-1										
Ga	mg kg-1	23	22.5			21.2		21.6		24	22
Gd	mg kg-1		7.32			7.76					
Ge	mg kg-1										
Hf	mg kg-1		7.2								
Hg	mg kg-1										
Ho	mg kg-1		0.69			0.968					
I	mg kg-1										
In	mg kg-1		0.184								
Ir	mg kg-1										
La	mg kg-1	59	54.3			53.8					63
Li	mg kg-1										
Lu	mg kg-1										
Mo	mg kg-1		4.78					5.5			
N	mg kg-1										
Nb	mg kg-1	51	53.7			44	50.8				54
Nd	mg kg-1		45.6			45.6					
Ni	mg kg-1	158	148.5			157	153.2			195	160
Os	mg kg-1										
Pb	mg kg-1	6.7						8.3			
Pd	mg kg-1										
Pr	mg kg-1		11.25			11.6					
Pt	mg kg-1										
Rb	mg kg-1	62	59.3			55.5	65.1			80	56
Re	mg kg-1										
Rh	mg kg-1										
Ru	mg kg-1										
S	mg kg-1										
Sb	mg kg-1										
Sc	mg kg-1	9.6	10.2					10.5			
Se	mg kg-1										
Sm	mg kg-1		8.28			8.53					
Sn	mg kg-1										
Sr	mg kg-1	954	931		0.082	893	922.4			925	888
Ta	mg kg-1		3.1			3.2					
Tb	mg kg-1		0.87			1.15					
Te	mg kg-1										
Th	mg kg-1		6.81			6.99		8.5			
Tl	mg kg-1										
Tm	mg kg-1										
U	mg kg-1	2.2	1.63			1.7					
V	mg kg-1	117	97			107		111.8			101
W	mg kg-1										
Y	mg kg-1	20	19.8			19.1	23.2			16	20
Yb	mg kg-1		1.34								
Zn	mg kg-1	117	113			120	107.4			135	121
Zr	mg kg-1	297	279		0.029		290.3			296	284

Table 1		GeoPT22 Analytical results submitted (Dec 2007)						Revisions	
		Basalt, MBL-1							
Lab. identifier		W74	W75	W75	W76	W77	W78	W79	W28
Sample		MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality		1	1	2	1	2	2	2	1
SiO2	% m/m	52.140			51.07	52.184		52.2	51.55
TiO2	% m/m	2.1308		2.046	2.07	2.106		2.18	2.149
Al2O3	% m/m	14.697		15.06	14.43	14.684		14.9	14.56
Fe2O3	% m/m	9.772		9.254	9.74	9.879	9.63	10.1	10.02
Fe(II)O	% m/m				6.61				
MnO	% m/m	0.1333		0.1297	0.13	0.132		0.13	0.13
MgO	% m/m	6.400		6.30	6.33	6.343		6.45	6.784
CaO	% m/m	5.545		5.222	5.46	5.567		5.46	5.456
Na2O	% m/m	4.481			4.38	4.518	4.07	4.43	4.37
K2O	% m/m	4.053			3.96	4.068	3.63	4.11	3.95
P2O5	% m/m	0.8485			0.81	0.87		0.89	0.816
H2O+	% m/m				0.52				
CO2	% m/m				0.24				
LOI	% m/m	0.279			-0.01	0.317		0.24	0.38
Ag	mg kg-1								0.15
As	mg kg-1						1.76		10.4
Au	mg kg-1								
B	mg kg-1								7.7
Ba	mg kg-1	776.1	736.1		742	833.7	896	740	645
Be	mg kg-1					3.1		2.2	3.2
Bi	mg kg-1					1.1		1.2	
Br	mg kg-1					1.1			
Cd	mg kg-1								0.08
Ce	mg kg-1	105.768	106.1			102.9	111	97	102.3
Cl	mg kg-1								
Co	mg kg-1			36.12	35	37	37.7	53	41
Cr	mg kg-1	225.1			201	223.4	204		193
Cs	mg kg-1	1.147	1.137			1.11	1.49		
Cu	mg kg-1	31.8		35.6	33	30.9		31	31
Dy	mg kg-1	5.221	4.728			4.66		4.4	4.3
Er	mg kg-1	1.953	1.880			1.8		1.7	1.77
Eu	mg kg-1	2.841	2.573			2.66	2.44	2.4	2.4
F	mg kg-1								800
Ga	mg kg-1	19.8			16	22.3			26
Gd	mg kg-1	7.519	6.975			6.97		6.9	6.57
Ge	mg kg-1					1.4			1.31
Hf	mg kg-1	6.783	6.471		9	6.95	6.4		6.57
Hg	mg kg-1								0.015
Ho	mg kg-1	0.877	0.793			0.805			0.75
I	mg kg-1								
In	mg kg-1								
Ir	mg kg-1								
La	mg kg-1	56.764	56.06			53.1	52.1	50	50.9
Li	mg kg-1			11.47		11.1			10
Lu	mg kg-1	0.194	0.1853			0.185	0.206		
Mo	mg kg-1			4.79		4.87		5.7	6.7
N	mg kg-1								
Nb	mg kg-1	49.993	50.92		48	50.3			56
Nd	mg kg-1	46.939	46.03			45.7	51.8	42	40.03
Ni	mg kg-1	164.2		163.5	172	163.8		140	167
Os	mg kg-1								
Pb	mg kg-1	8.676	8.89		9	9.6		9	11
Pd	mg kg-1								
Pr	mg kg-1	12.188	12.05			11.56		11	10.22
Pt	mg kg-1								
Rb	mg kg-1	62.61	62.05		62	62.4	62.4		58
Re	mg kg-1								
Rh	mg kg-1								
Ru	mg kg-1								
S	mg kg-1				180				
Sb	mg kg-1					0.33			
Sc	mg kg-1	10.70			10	9.8	10.4		9.4
Se	mg kg-1								
Sm	mg kg-1	9.133	8.659			8.33	8.25	8	7.83
Sn	mg kg-1					2.6		2	3.3
Sr	mg kg-1	962.5	923.8		841	941.4		840	940
Ta	mg kg-1	3.114	2.968			2.9	2.98		
Tb	mg kg-1	1.025	0.892			0.856	0.88	0.9	0.97
Te	mg kg-1								
Th	mg kg-1	7.031	7.15			6.47	6.72	7	8.26
Tl	mg kg-1								0.11
Tm	mg kg-1	0.238	0.224			0.22			0.22
U	mg kg-1	1.708	1.687			1.67		1.3	1.91
V	mg kg-1	109.9			98	103.2		110	120
W	mg kg-1					1.23			
Y	mg kg-1	21.830	19.75		22	21.8		19	22
Yb	mg kg-1	1.321	1.295			1.32	1.61	1.1	1.39
Zn	mg kg-1	114.9		133.7	112	115.5		99	120
Zr	mg kg-1	301.0	279.0		294	300.9			289

Table 1		Revisions	Data omitted
		(cont'd)	in error
Lab. identifier		W69	WXX
Sample		MBL-1	MBL-1
Data quality		1	2
SiO2	% m/m		51.814
TiO2	% m/m		2.135
Al2O3	% m/m		14.171
Fe2O3	% m/m		9.91
Fe(II)O	% m/m		
MnO	% m/m		0.117
MgO	% m/m		6.401
CaO	% m/m		5.549
Na2O	% m/m		4.503
K2O	% m/m		4.088
P2O5	% m/m		0.86
H2O+	% m/m		
CO2	% m/m		
LOI	% m/m		0.117
Ag	mg kg-1		
As	mg kg-1		2.5
Au	mg kg-1		
B	mg kg-1		
Ba	mg kg-1	728	814.5
Be	mg kg-1		
Bi	mg kg-1		
Br	mg kg-1		
Cd	mg kg-1		
Ce	mg kg-1	104	107.7
Cl	mg kg-1		
Co	mg kg-1	34.1	
Cr	mg kg-1	217	240.7
Cs	mg kg-1	1.26	
Cu	mg kg-1	32.6	26.5
Dy	mg kg-1	4.92	
Er	mg kg-1	2.03	
Eu	mg kg-1	2.85	
F	mg kg-1		
Ga	mg kg-1	21.2	23
Gd	mg kg-1	7.76	
Ge	mg kg-1		
Hf	mg kg-1		
Hg	mg kg-1		
Ho	mg kg-1	0.968	
I	mg kg-1		
In	mg kg-1		
Ir	mg kg-1		
La	mg kg-1	53.8	67.8
Li	mg kg-1		
Lu	mg kg-1		
Mo	mg kg-1		
N	mg kg-1		
Nb	mg kg-1	44	49
Nd	mg kg-1	45.6	
Ni	mg kg-1	157	164
Os	mg kg-1		
Pb	mg kg-1		11.3
Pd	mg kg-1		
Pr	mg kg-1	11.6	
Pt	mg kg-1		
Rb	mg kg-1	55.5	65.7
Re	mg kg-1		
Rh	mg kg-1		
Ru	mg kg-1		
S	mg kg-1		
Sb	mg kg-1		
Sc	mg kg-1		10.2
Se	mg kg-1		
Sm	mg kg-1	8.53	
Sn	mg kg-1		
Sr	mg kg-1	893	963.7
Ta	mg kg-1	3.2	
Tb	mg kg-1	1.15	
Te	mg kg-1		
Th	mg kg-1	6.99	7.7
Tl	mg kg-1		
Tm	mg kg-1		
U	mg kg-1	1.7	1.5
V	mg kg-1	107	103.5
W	mg kg-1		
Y	mg kg-1	19.1	22.5
Yb	mg kg-1		
Zn	mg kg-1	120	111
Zr	mg kg-1		303.7

Table 2 GeoPT22 Assigned values and robust statistical analysis of contributed data (Basalt, MBL-1)

	X _a	sd	H _a	n	sdm	sdm/H _a	status		X _a	sd	H _a	n	sdm	sdm/H _a	status
	% m/m	% m/m	% m/m		% m/m				% m/m	% m/m	% m/m		% m/m		
SiO ₂	51.763	0.515	0.572	68	0.063	0.109	Assigned	La	55.88	3.39	2.44	57	0.45	0.18	Assigned
TiO ₂	2.107	0.066	0.038	72	0.008	0.207	Assigned	Li	11.26	1.36	0.63	28	0.26	0.41	Assigned
Al ₂ O ₃	14.464	0.302	0.194	71	0.036	0.185	Assigned	Lu	0.19	0.02	0.02	38	0.00	0.14	Assigned
Fe ₂ O ₃	9.782	0.216	0.139	73	0.025	0.183	Assigned	Mo	5.11	0.74	0.32	39	0.12	0.37	Assigned
Fe(II)O	6.140	0.401	0.093	19	0.078	0.837	Provisional	Nb	51.30	4.66	2.27	60	0.60	0.27	Assigned
MnO	0.130	0.005	0.004	71	0.001	0.165	Assigned	Nd	46.61	3.05	2.09	54	0.42	0.20	Assigned
MgO	6.302	0.231	0.096	68	0.028	0.294	Assigned	Ni	159.30	12.50	5.94	66	1.54	0.26	Assigned
CaO	5.433	0.148	0.084	71	0.018	0.208	Assigned	Pb	8.59	1.94	0.50	51	0.27	0.55	Assigned
Na ₂ O	4.384	0.119	0.070	69	0.014	0.205	Assigned	Pr	11.94	0.70	0.66	42	0.11	0.16	Assigned
K ₂ O	4.016	0.112	0.065	71	0.013	0.204	Assigned	Rb	62.89	3.00	2.70	60	0.39	0.14	Assigned
P ₂ O ₅	0.846	0.05	0.017	64	0.005	0.310	Assigned	Sb	0.29	0.12	0.03	22	0.02	0.79	Provisional
	mg/kg	mg/kg	mg/kg		mg/kg			Sc	10.09	1.27	0.57	44	0.19	0.34	Assigned
Ba	755.01	41.44	22.28	65	5.14	0.23	Assigned	Sm	8.66	0.53	0.50	46	0.08	0.16	Assigned
Be	2.84	0.44	0.19	29	0.08	0.42	Assigned	Sn	2.69	0.62	0.19	24	0.09	0.47	Assigned
Ce	103.76	5.97	4.13	57	0.79	0.19	Assigned	Sr	920.52	39.92	26.36	65	4.95	0.19	Assigned
Co	35.65	3.81	1.67	63	0.48	0.29	Assigned	Ta	3.08	0.31	0.21	37	0.05	0.24	Assigned
Cr	214.81	21.72	7.66	63	2.74	0.36	Assigned	Tb	0.96	0.08	0.08	43	0.01	0.16	Assigned
Cs	1.16	0.10	0.09	39	0.01	0.13	Assigned	Th	6.84	1.34	0.41	54	0.09	0.23	Assigned
Cu	32.19	3.71	1.53	62	0.47	0.31	Assigned	Tl	0.12	0.04	0.01	19	0.01	0.67	Provisional
Dy	4.70	0.32	0.30	42	0.05	0.17	Assigned	Tm	0.23	0.02	0.02	32	0.00	0.13	Assigned
Er	1.91	0.19	0.14	39	0.03	0.22	Assigned	U	1.67	0.42	0.12	47	0.03	0.23	Assigned
Eu	2.65	0.20	0.18	43	0.03	0.17	Assigned	V	105.03	7.57	4.17	61	0.97	0.23	Assigned
Ga	22.66	1.80	1.13	55	0.24	0.21	Assigned	Y	20.41	1.89	1.04	62	0.24	0.23	Assigned
Gd	7.32	0.57	0.43	39	0.09	0.21	Assigned	Yb	1.35	0.11	0.10	44	0.02	0.16	Assigned
Ge	1.26	0.26	0.10	16	0.07	0.67	Assigned	Zn	115.47	8.97	4.52	67	1.10	0.24	Assigned
Hf	6.46	0.78	0.39	42	0.12	0.31	Assigned	Zr	288.00	17.38	9.82	61	1.71	0.17	Assigned
Ho	0.79	0.06	0.07	39	0.01	0.15	Assigned								

where: X_a = Robust Mean

sd = Robust standard deviation

H_a = Target value

n = no. of contributed data

sdm = Uncertainty = $sd/\sqrt{n}$

sdm/H_a = Uncertainty/Target value

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	1	2	1	2	2	2	2	2	2
SiO2	-0.60	-0.07	-3.99	0.24	0.27	-4.87	0.07	-0.06	0.18	-0.02
TiO2	-1.77	-0.71	-2.48	-2.04	0.18	-3.27	0.18	-0.35	0.35	-0.02
Al2O3	-0.69	0.34	-2.23	0.45	0.25	-18.12	0.20	0.12	0.69	-0.06
Fe2O3	-0.81	1.14	-2.42	-0.01	0.03	-3.39	0.14	0.32	0.29	-0.01
Fe(II)O	*	*	*	*	*	*	-0.37	*	*	*
MnO	-0.03	2.80	-1.85	-1.44	-0.01	-0.58	-0.58	1.12	0.20	1.68
MgO	-0.23	1.13	-6.24	0.29	0.36	*	0.41	0.25	0.42	-0.43
CaO	-0.98	1.63	2.60	0.56	0.34	-2.75	0.34	0.25	0.03	-0.37
Na2O	-1.20	0.08	-1.17	0.94	-0.46	*	0.33	-1.03	0.03	1.04
K2O	-3.77	-1.17	-2.35	-0.09	0.57	0.65	0.49	-0.54	-0.08	0.26
P2O5	-2.05	0.84	-2.12	0.84	0.42	*	0.13	0.01	0.19	0.33
Ba	-1.03	-0.45	-0.72	*	-2.54	1.50	-1.48	0.81	0.38	-2.67
Be	*	-0.47	-0.29	*	*	*	*	*	*	*
Ce	-0.67	-1.30	-1.05	*	*	0.39	-1.42	-0.70	1.48	*
Co	-3.99	-0.15	1.31	*	-1.10	*	-0.19	0.41	-0.01	-0.19
Cr	1.20	3.03	0.99	*	-4.10	4.78	-0.12	1.51	-0.80	-1.82
Cs	-12.79	-0.44	-0.33	*	*	*	*	43.20	*	*
Cu	5.11	-0.26	1.25	*	*	20.89	0.59	1.57	-1.93	-0.72
Dy	*	-0.82	-1.33	*	*	*	*	*	*	*
Er	*	-0.99	-1.04	*	*	*	*	*	*	*
Eu	*	0.08	-0.67	*	*	*	*	*	*	*
Ga	-1.47	0.56	0.77	*	26.62	-0.73	-1.18	-0.29	-0.60	*
Gd	*	-1.21	-0.10	*	*	*	*	*	*	*
Ge	-12.95	0.18	-0.58	*	*	*	*	*	*	*
Hf	-1.19	0.35	-1.82	*	*	*	*	*	-0.59	*
Hg	*									
Ho	*	-0.76	-0.85	*	*	*	*	*	*	*
La	0.05	-0.28	-0.96	*	*	-0.39	0.64	0.02	-0.34	*
Li	*	*	0.11	*	*	*	*	*	*	*
Lu	*	0.24	-0.86	*	*	*	*	*	*	*
Mo	-0.34	0.44	1.41	*	*	-4.86	*	*	-1.42	*
Nb	-1.46	-1.54	1.23	*	*	-1.61	-2.71	-0.29	-0.44	*
Nd	-2.20	-0.58	-1.29	*	*	-0.62	-4.21	0.57	1.70	*
Ni	-1.40	0.96	0.23	*	-8.02	-1.29	1.41	1.07	-0.76	0.14
Pb	2.84	-0.18	-5.50	*	*	9.47	1.42	-2.60	5.74	2.42
Pr	*	-0.21	-0.94	*	*	-2.24	*	*	*	*
Rb	-0.70	-0.29	0.15	*	*	-0.72	-0.72	0.02	0.39	*
Sb	-10.38	0.00	*	*	*	*	*	*	*	*
Sc	-0.16	*	-0.49	*	*	*	*	0.80	-2.01	*
Sm	0.69	-0.25	-0.94	*	*	*	*	*	*	*
Sn	1.70	-1.49	-1.96	*	*	*	*	*	*	*
Sr	-2.37	-0.21	-1.17	*	*	-0.94	-0.28	-0.18	-0.73	-0.79
Ta	-5.21	1.28	0.81	*	*	*	-2.60	*	*	*
Tb	*	-0.56	-0.58	*	*	*	*	*	*	*
Th	2.85	-0.43	-1.72	*	*	-3.46	0.20	8.75	1.30	3.87
Tl	-9.06	*	-1.22	*	*	*	72.47	*	*	*
Tm	*	-0.38	*	*	*	*	*	*	*	*
U	10.76	0.00	-1.66	*	*	5.38	*	*	2.39	*
V	-2.17	-0.01	0.00	*	-1.80	28.18	0.24	-0.84	-0.35	*
Y	-1.36	0.18	0.86	*	*	-1.65	*	0.77	0.05	*
Yb	-3.37	0.03	-1.29	*	*	*	80.84	*	*	*
Zn	-1.65	2.11	-2.51	*	-3.92	-0.61	0.17	-0.38	-0.58	-1.27
Zr	-0.61	0.41	0.41	*	*	-1.07	-1.07	0.10	0.13	*

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W11	W12	W13	W14	W15	W16	W17	W17	W18	W19
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	1	1	1	2	2	1	2	1	2
SiO2	*	-0.60	0.17	0.61	1.67	-0.49	0.71	*	0.16	-0.44
TiO2	*	-2.04	-0.97	-3.36	-12.57	1.50	-1.56	*	0.25	0.58
Al2O3	*	-1.62	0.50	-0.22	8.62	-0.94	-0.17	*	-0.38	0.07
Fe2O3	*	2.00	0.71	-0.23	-18.24	0.14	-0.11	*	0.06	0.89
Fe(II)O	*	-14.34	*	-1.61	*	*	*	*	*	*
MnO	*	-0.03	-0.03	-0.31	-10.05	-0.01	-1.72	*	0.26	0.55
MgO	*	-0.65	2.18	-2.22	12.39	-3.46	-0.27	*	-1.52	0.57
CaO	*	-0.39	1.87	5.07	-11.24	-0.49	0.55	*	0.06	0.70
Na2O	*	1.22	-1.20	-0.06	15.14	-2.31	2.26	*	0.68	0.54
K2O	*	-1.01	0.83	-2.55	-8.41	0.34	-0.86	*	-0.09	0.34
P2O5	*	-3.78	-4.93	-4.87	-5.55	-1.60	0.61	*	-0.78	-0.25
Ba	9.76	*	*	*	*	-1.98	*	3.46	*	0.56
Be	*	*	*	6.99	*	*	*	-0.88	*	*
Ce	0.45	*	*	*	*	*	*	2.21	*	-0.46
Co	*	*	*	3.22	*	*	*	4.31	*	1.91
Cr	*	*	*	*	*	-0.90	*	2.62	*	1.71
Cs	*	*	*	*	*	*	*	*	*	*
Cu	*	*	*	0.53	*	*	*	0.92	*	-2.68
Dy	0.47	*	*	*	*	*	0.19	*	*	*
Er	-0.25	*	*	*	*	*	0.31	*	*	*
Eu	0.50	*	*	*	*	*	0.35	*	*	*
Ga	*	*	*	*	*	0.15	*	0.15	*	0.59
Gd	-0.31	*	*	*	*	*	-0.22	*	*	*
Ge	*	*	*	*	*	*	*	*	*	*
Hf	-4.29	*	*	*	*	*	*	1.97	*	*
Hg										
Ho	0.13	*	*	*	*	*	0.21	*	*	*
La	0.28	*	*	*	*	*	*	1.56	*	0.43
Li	*	*	*	4.37	*	*	-2.07	*	*	*
Lu	0.04	*	*	*	*	*	0.66	*	*	*
Mo	*	*	*	1.22	*	*	*	-0.17	*	12.34
Nb	8.08	*	0.75	-0.75	*	-1.17	*	0.15	*	0.59
Nd	0.78	*	*	*	*	*	0.33	*	*	0.57
Ni	*	*	*	-0.89	*	0.48	*	2.42	*	0.99
Pb	*	*	*	-2.19	*	*	*	-2.91	*	8.46
Pr	0.38	*	*	*	*	*	-0.52	*	*	0.05
Rb	*	*	25.99	-1.59	*	0.95	*	0.76	*	0.02
Sb	*	*	*	-5.73	*	*	*	*	*	16.28
Sc	*	*	*	*	*	*	*	6.06	*	-3.59
Sm	1.22	*	*	*	*	*	0.81	*	*	-1.66
Sn	*	*	*	*	*	*	*	*	*	*
Sr	*	*	0.36	-1.12	*	-0.20	*	0.52	*	0.94
Ta	-0.99	*	*	*	*	*	*	4.60	*	*
Tb	-0.11	*	*	*	*	*	-0.46	*	*	*
Th	0.62	*	*	2.85	*	*	*	7.53	*	-2.24
Tl	*	*	*	*	*	*	*	*	*	*
Tm	0.10	*	*	*	*	*	0.84	*	*	*
U	*	*	*	*	*	*	*	15.08	*	-3.92
V	*	*	*	0.95	*	5.75	*	0.24	*	0.36
Y	-1.64	*	-11.97	6.84	*	-0.20	*	0.77	*	-0.20
Yb	-0.10	*	*	*	*	*	-0.26	*	*	*
Zn	*	*	*	0.56	*	1.06	*	-0.72	*	0.17
Zr	-2.57	*	2.34	1.22	*	1.37	*	0.81	*	0.97

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W20	W21	W22	W23	W24	W25	W26	W27	W28	W28
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	2	1	2	2	1	2	1	1	2
SiO2	0.00	0.18	-0.13	0.32	-0.28	*	0.35	-0.53	-0.37	*
TiO2	-0.28	0.14	-1.93	0.89	-4.07	*	0.64	1.95	1.12	*
Al2O3	0.01	0.38	0.96	0.03	-0.16	*	-0.24	2.36	0.50	*
Fe2O3	0.02	0.31	0.13	0.53	-0.66	*	0.43	-38.49	1.72	*
Fe(II)O	-3.00	0.43	*	3.21	*	*	*	-4.49	*	*
MnO	-0.31	-1.71	0.26	-0.58	-0.72	*	-0.01	1.67	*	-0.01
MgO	-0.22	-0.16	-0.02	0.43	1.93	*	1.19	-2.22	5.05	*
CaO	-0.58	0.05	0.80	-0.80	0.52	*	0.58	-0.63	0.28	*
Na2O	0.65	-0.10	0.08	1.04	1.75	*	-0.46	-0.92	*	-0.10
K2O	0.38	0.16	-0.40	-0.59	1.80	*	0.49	0.52	*	-0.51
P2O5	-1.36	-0.13	1.36	-1.43	4.45	*	1.28	-3.26	*	-0.85
Ba	1.45	-0.02	-1.90	0.38	*	0.81	1.03	0.40	*	-2.47
Be	*	1.95	*	3.49	*	-0.47	-1.65	1.84	*	0.92
Ce	0.14	2.80	0.33	-0.46	*	0.54	0.64	-2.36	-0.35	*
Co	-0.72	0.11	-0.57	1.31	-2.24	1.95	0.95	5.02	*	1.61
Cr	-0.38	2.49	1.84	0.60	-0.77	-1.41	-2.70	1.59	*	-1.42
Cs	-0.19	2.87	*	6.50	*	0.00	0.33	*	*	*
Cu	0.93	-0.72	1.58	0.40	-1.64	-1.50	-1.05	3.80	*	-0.39
Dy	0.44	1.14	-0.08	-0.14	*	0.02	-0.58	*	-1.35	*
Er	-0.13	1.57	-0.19	-0.96	*	1.11	-0.13	*	-0.99	*
Eu	-0.10	0.78	0.08	-0.97	*	0.57	0.28	*	-1.35	*
Ga	0.69	*	-2.17	-0.73	*	1.53	0.28	*	*	1.47
Gd	0.37	1.17	-0.41	-2.07	*	1.23	-0.48	*	*	-0.86
Ge	*	*	*	0.24	*	-6.49	-0.83	*	*	0.24
Hf	-0.94	-1.23	*	0.60	*	-0.21	0.50	*	*	0.14
Hg										
Ho	0.07	1.49	0.36	-0.51	*	-0.86	-0.12	*	-0.56	*
La	0.29	2.17	0.42	0.23	*	0.58	0.56	1.28	-2.04	*
Li	*	3.47	*	*	*	1.33	-0.53	-2.02	-2.02	*
Lu	-0.22	0.85	-0.38	1.11	*	-0.38	-0.19	*	*	*
Mo	*	-0.33	*	-2.16	*	-0.44	0.22	*	*	2.49
Nb	2.55	0.59	-2.56	1.17	*	1.41	1.17	-4.10	*	1.03
Nd	0.76	1.67	-0.19	0.09	*	-1.06	-0.10	*	*	-1.57
Ni	0.27	-0.62	1.08	3.26	-0.62	1.47	0.94	-0.56	*	0.65
Pb	-1.42	-1.10	-1.39	0.41	*	-4.51	5.44	*	*	*
Pr	0.91	1.49	-0.06	-0.03	*	0.24	0.50	*	*	*
Rb	0.68	-0.35	1.38	-0.54	*	1.30	1.39	*	*	*
Sb	*	1.25	*	-0.72	*	*	0.00	633.74	*	*
Sc	0.57	1.24	*	-0.08	*	10.01	-0.96	-9.11	*	-0.61
Sm	0.65	-0.80	0.15	0.70	*	-0.01	-0.18	*	-1.65	*
Sn	*	-0.55	*	0.26	*	*	1.26	*	*	1.66
Sr	-1.06	0.62	-0.05	-0.37	*	3.55	1.53	-1.42	*	0.37
Ta	0.65	-0.51	*	-2.84	*	0.37	0.33	*	*	*
Tb	0.83	1.52	-0.07	-0.88	*	0.97	-0.23	*	0.19	*
Th	0.40	-2.24	-3.02	1.19	*	-0.06	-0.02	*	*	1.74
Tl	*	*	*	-0.30	*	-2.28	1.24	*	*	-0.30
Tm	0.01	1.40	-0.03	-0.23	*	-0.03	-0.02	*	-0.47	*
U	-1.02	0.93	*	-0.12	*	-0.16	0.08	*	1.94	*
V	-0.27	-4.20	1.05	-0.94	*	3.11	-0.96	-1.21	*	1.80
Y	2.13	2.21	0.57	-0.20	*	0.66	0.04	-1.36	*	0.77
Yb	-0.23	1.91	-0.07	0.11	*	0.03	-0.42	*	0.42	*
Zn	-1.61	0.39	0.58	0.50	0.17	3.00	-0.61	-0.99	*	0.50
Zr	-2.09	-1.27	0.32	-0.30	*	0.31	1.53	*	*	0.05

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	2	1	2	2	1	2	2	1	2	2
SiO2	-0.14	-3.19	0.65	0.23	-0.67	*	-0.18	*	0.07	0.12
TiO2	0.19	0.89	-0.35	-0.22	-2.04	*	0.04	-0.18	-0.09	0.31
Al2O3	-0.53	-8.13	-0.16	0.17	0.34	*	-0.09	-1.36	1.77	1.13
Fe2O3	-0.45	-0.45	0.07	0.07	-0.59	*	-0.08	-0.16	-0.62	0.71
Fe(II)O	*	*	8.88	1.66	-0.96	*	*	*	*	*
MnO	-0.01	-0.88	1.40	-0.01	-0.03	*	-0.01	0.54	-1.15	*
MgO	2.42	-19.07	1.56	0.41	-5.88	*	1.46	-2.11	-1.74	1.25
CaO	2.54	-2.17	0.99	-0.13	-2.41	*	0.28	*	-1.14	0.40
Na2O	-0.72	-19.86	-0.60	0.47	1.65	*	0.33	-1.20	2.11	0.40
K2O	-1.81	0.98	-1.58	-0.43	2.67	*	0.49	-3.31	-0.74	-0.58
P2O5	2.38	-8.48	1.86	-0.45	0.26	*	0.13	*	0.36	-0.82
Ba	-0.08	1.67	-1.59	0.76	-1.30	*	*	1.53	0.79	-0.70
Be	-0.11	*	0.66	0.05	*	-0.11	*	*	1.59	*
Ce	0.00	-2.05	-0.33	0.27	12.42	-0.09	*	2.73	0.76	1.10
Co	0.18	*	-0.19	0.41	-1.59	-0.49	*	0.81	0.32	-0.82
Cr	0.95	-3.20	-1.29	-1.36	-1.28	*	*	0.81	0.60	-0.69
Cs	0.00	82.00	-0.33	0.50	-12.79	0.22	*	1.54	0.28	*
Cu	-1.11	-0.52	-0.39	-0.29	-0.13	*	*	*	0.00	-3.31
Dy	0.13	*	-0.51	0.11	-2.36	-0.44	*	-1.35	0.80	*
Er	0.16	*	4.67	0.01	7.90	-0.86	*	*	0.81	*
Eu	0.07	*	-0.95	0.23	-3.53	0.23	*	-0.31	0.48	*
Ga	0.33	-1.47	1.03	0.46	1.18	-0.52	*	*	0.59	-0.34
Gd	-0.33	*	1.71	-0.01	13.10	-0.66	*	*	1.64	*
Ge	*	*	11.98	*	*	1.22	*	*	-0.68	*
Hf	0.14	*	-1.23	0.33	11.62	0.29	*	1.12	-0.82	*
Hg										
Ho	0.18	*	-0.66	0.03	33.95	-0.28	*	*	0.26	*
La	-0.15	-1.30	0.43	0.25	-4.87	-0.09	*	-0.81	0.37	1.79
Li	*	*	1.39	0.19	*	*	*	*	*	*
Lu	0.07	*	0.33	-0.19	*	-0.19	*	-0.17	0.85	*
Mo	-0.78	-12.85	0.14	-0.22	-3.47	*	*	*	-0.88	0.86
Nb	-0.55	-1.81	6.10	0.40	3.39	-0.49	*	*	0.59	-0.24
Nd	-0.06	-3.40	0.33	0.69	1.62	-0.19	*	0.04	1.05	0.26
Ni	2.41	0.54	-0.45	0.23	-1.90	*	*	-3.08	0.90	-0.22
Pb	5.21	-0.18	-0.39	0.01	2.84	*	*	*	-1.76	-4.21
Pr	-0.08	*	0.81	0.65	-4.47	0.09	*	*	0.65	*
Rb	0.30	-1.26	-0.17	0.17	-1.07	*	*	0.41	0.58	0.06
Sb	*	*	0.18	*	-10.38	*	*	0.36	*	*
Sc	-0.17	*	3.43	0.27	5.10	*	*	0.19	1.23	-5.34
Sm	-0.01	4.08	-0.36	0.39	-1.31	-0.01	*	-0.11	0.54	*
Sn	5.69	6.02	-0.77	-0.39	12.51	*	*	*	-0.15	*
Sr	-0.43	-2.62	-0.58	0.24	-0.74	*	*	*	1.11	-0.82
Ta	-0.20	*	-0.20	0.35	-14.81	-0.06	*	0.08	0.69	*
Tb	-0.04	*	-2.31	0.29	0.58	-0.04	*	-0.20	1.26	*
Th	-0.07	2.85	0.57	-0.56	-6.93	0.35	*	0.89	-0.59	2.07
Tl	*	*	3.17	0.09	*	*	*	*	1.63	*
Tm	0.20	*	-0.67	0.42	*	0.20	*	*	*	*
U	-0.04	9.14	1.33	-0.28	-13.51	-0.53	*	0.24	0.53	10.80
V	0.33	11.51	-1.56	-0.12	-0.49	*	*	-0.01	-0.60	-2.08
Y	-0.22	-0.88	-1.16	0.09	-3.29	0.30	*	*	1.34	0.24
Yb	0.31	*	0.26	-0.23	35.47	-0.13	*	0.03	0.50	*
Zn	1.41	-1.45	-0.27	-0.16	-5.19	*	*	1.89	1.94	-0.46
Zr	-0.80	-0.16	-3.00	-0.92	1.43	-0.61	*	*	-1.63	0.40

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W39	W39	W40	W41	W41	W42	W43	W44	W45	W46
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	2	1	1	2	2	1	2	2	1
SiO2	-0.97	*	2.85	*	5.25	0.46	*	0.03	0.66	-0.14
TiO2	0.20	*	3.81	-1.50	*	1.77	*	-0.09	3.71	-0.97
Al2O3	0.19	*	-1.41	-2.60	*	-0.84	*	0.71	0.47	-0.28
Fe2O3	0.13	*	11.80	-0.66	*	-0.91	-9.52	1.54	-0.90	-0.73
Fe(II)O	1.82	*	-2.03	*	*	*	*	*	*	*
MnO	-0.03	*	1.67	-0.03	*	-1.00	-2.01	-1.43	0.55	2.80
MgO	-0.33	*	-17.61	-3.47	*	-0.17	*	-0.22	0.29	0.50
CaO	0.56	*	-0.98	-3.24	*	-0.73	*	-0.25	-3.20	-0.63
Na2O	0.08	*	-21.15	0.37	*	0.68	*	-0.46	-0.49	0.94
K2O	-0.24	*	3.29	1.90	*	0.34	*	0.42	1.02	2.21
P2O5	-1.01	*	-14.16	*	*	1.25	*	0.42	-0.25	-0.32
Ba	0.49	*	-2.92	1.12	*	-0.32	-3.80	0.52	-0.52	-1.57
Be	*	-1.14	-4.85	*	*	*	*	-0.62	*	*
Ce	1.27	*	-2.03	-0.47	*	-1.06	0.19	-0.09	*	-0.18
Co	-0.39	*	-2.39	0.09	*	-1.70	0.39	0.65	*	-8.20
Cr	1.46	*	-3.24	2.77	*	-0.31	-0.52	-3.06	-0.64	0.68
Cs	0.33	*	-1.87	-0.11	*	*	0.77	1.32	*	*
Cu	-0.13	*	1.14	*	*	-2.36	-1.98	1.15	-0.65	0.53
Dy	0.39	*	-4.31	0.66	*	*	0.96	-0.34	*	*
Er	0.17	*	-4.60	*	*	*	0.31	-0.75	*	*
Eu	0.90	*	-3.43	1.01	*	*	-0.25	0.15	*	*
Ga	0.30	*	-1.61	*	2.35	2.35	*	0.55	-0.07	1.18
Gd	0.24	*	-2.78	*	*	*	-1.14	0.79	*	*
Ge	*	*	-2.18	*	*	*	*	*	*	*
Hf	0.61	*	-6.05	1.76	*	-1.87	-3.64	-0.59	*	*
Hg										
Ho	0.21	*	-3.47	*	*	*	-0.10	-0.35	*	*
La	1.24	*	-3.75	0.05	*	-1.21	-1.03	-0.34	2.38	-1.59
Li	*	*	-5.06	*	*	-1.01	0.47	-0.85	*	*
Lu	0.14	*	-3.49	-1.26	*	*	0.14	-0.71	*	*
Mo	*	*	-1.56	*	*	2.96	*	0.30	*	*
Nb	0.79	*	0.82	*	*	-10.43	-0.42	-1.17	0.04	0.75
Nd	0.67	*	-4.62	0.19	*	-0.38	-0.42	0.02	*	*
Ni	0.62	*	-4.30	*	-0.78	-6.17	0.43	0.65	-0.11	-5.94
Pb	0.46	*	-7.62	*	*	-4.62	0.62	-0.79	1.42	2.84
Pr	0.70	*	-3.74	*	*	*	-0.76	-0.18	*	*
Rb	0.04	*	-0.78	-0.70	*	*	-0.57	-0.46	0.02	0.41
Sb	*	*	-0.36	*	-0.72	*	*	1.97	*	*
Sc	*	2.55	-2.65	0.28	*	*	*	0.36	*	*
Sm	0.45	*	-3.95	-0.11	*	*	-0.73	-0.26	*	*
Sn	*	*	-3.65	*	*	*	*	-0.77	*	*
Sr	-0.10	*	0.75	0.74	*	-0.48	1.31	1.11	0.46	-0.21
Ta	0.22	*	-2.13	-0.93	*	*	-4.24	*	*	*
Tb	0.06	*	-4.10	-1.50	*	*	1.49	0.29	*	*
Th	1.16	*	-5.09	-0.67	*	*	-0.43	0.57	-5.66	-4.48
Tl	*	*	-2.36	*	*	*	*	-0.68	*	*
Tm	0.40	*	-3.29	*	*	*	-0.47	-0.45	*	*
U	0.81	*	-3.88	*	-2.30	*	0.00	-1.09	-4.73	*
V	1.19	*	0.67	0.71	*	0.00	0.84	2.16	*	-4.80
Y	0.57	*	-2.86	*	*	0.28	1.16	-0.68	0.77	4.43
Yb	0.13	*	-4.31	-1.42	*	*	-1.42	-0.23	*	*
Zn	-0.77	*	-5.96	1.00	*	-1.16	0.60	1.39	0.23	1.00
Zr	-1.02	*	-4.77	-4.89	*	0.41	-0.81	0.00	-0.03	2.24

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W47	W47	W48	W49	W50	W51	W52	W53	W54	W55
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	2	2	1	2	2	1	2	2	2
SiO2	12.05	*	*	0.42	0.21	0.30	-0.44	-0.23	0.23	-0.55
TiO2	11.51	*	1.37	-0.18	1.24	-0.35	-0.71	-0.35	1.04	0.23
Al2O3	9.13	*	1.46	0.55	-0.94	-0.01	0.76	-0.42	1.00	-0.43
Fe2O3	12.88	*	1.43	0.06	0.10	0.71	-0.16	0.79	-0.42	-1.09
Fe(II)O	0.64	*	*	*	*	*	*	*	*	*
MnO	8.46	*	0.55	-0.03	0.83	-0.01	1.67	0.98	-1.36	-0.58
MgO	9.61	*	1.51	0.40	-0.90	0.98	1.24	1.25	2.32	-0.64
CaO	9.94	*	1.71	0.92	-0.13	-0.61	0.68	-0.79	0.40	-0.31
Na2O	10.91	*	1.32	1.22	-0.39	-0.46	1.65	0.04	-0.81	0.45
K2O	9.58	*	2.18	0.22	-0.12	0.11	0.37	0.26	-1.10	0.15
P2O5	8.33	*	1.86	16.41	*	-1.60	0.84	0.25	-1.00	-0.01
Ba	0.36	*	0.31	0.48	-0.47	0.45	1.12	-0.34	-2.74	-0.11
Be	*	*	0.02	0.13	*	0.38	1.38	*	-0.59	*
Ce	-0.89	*	0.15	0.68	*	0.15	0.06	-0.09	-0.96	*
Co	1.03	*	0.17	0.49	1.67	0.35	-0.45	-0.37	-0.77	1.91
Cr	3.03	*	0.27	1.46	-1.78	0.34	2.99	-2.80	27.31	-1.88
Cs	0.11	*	-0.06	-0.11	*	-0.11	-0.22	-0.44	-0.45	*
Cu	-0.45	*	-0.16	*	-0.59	0.13	1.44	0.00	-1.76	-0.46
Dy	0.26	*	0.20	0.62	*	0.23	0.16	-0.17	-0.50	*
Er	0.53	*	0.05	0.53	*	0.16	-0.41	-0.24	-0.71	*
Eu	0.68	*	0.04	0.02	*	0.04	0.29	-0.18	-0.57	*
Ga	-1.58	*	0.15	2.48	*	0.28	0.30	*	-0.78	*
Gd	0.54	*	0.10	-0.51	*	0.18	-0.27	-0.49	-0.55	*
Ge	3.36	*	0.96	*	*	0.50	*	*	*	*
Hf	0.89	*	-0.27	0.46	*	0.00	-1.19	*	0.97	*
Hg										
Ho	-0.86	*	0.41	0.21	*	0.41	-0.25	-0.20	-0.35	*
La	-1.03	*	0.11	-0.22	*	0.13	1.28	-0.22	-1.12	*
Li	*	*	0.99	0.38	0.12	0.99	0.95	-0.85	17.55	*
Lu	-0.38	*	0.07	0.97	*	0.07	-0.43	-0.45	-0.22	*
Mo	-1.06	*	-0.08	1.22	*	*	0.03	-1.31	-0.47	*
Nb	1.56	*	0.70	-3.07	*	0.73	1.28	*	1.84	*
Nd	-0.45	*	0.12	0.15	0.57	0.07	0.28	-0.26	-1.30	*
Ni	5.76	*	0.73	-0.16	-0.08	0.65	0.46	-0.11	-1.51	-3.98
Pb	-1.15	*	0.14	-0.42	1.62	0.61	0.81	-0.19	-3.05	*
Pr	0.09	*	0.20	0.44	-0.56	-0.18	0.29	-0.26	-0.71	*
Rb	0.67	*	0.06	2.54	1.78	0.52	0.15	0.24	-0.38	*
Sb	*	*	*	-1.18	*	*	-2.51	-1.61	1.47	*
Sc	*	0.80	0.44	-0.18	*	0.44	0.01	-0.23	-1.18	*
Sm	1.22	*	0.28	0.33	*	0.26	0.51	-0.15	-0.57	*
Sn	1.05	*	0.28	*	*	*	1.32	*	-1.54	*
Sr	1.21	*	0.28	6.68	-0.42	0.31	0.13	-0.16	0.24	1.03
Ta	*	*	0.06	1.62	*	0.18	1.23	*	0.33	*
Tb	0.19	*	-0.04	-0.03	*	0.09	0.32	-0.43	-0.18	*
Th	-5.14	*	0.02	0.67	*	-0.06	4.48	-0.56	-2.34	*
Tl	*	*	0.47	0.18	*	*	0.10	*	*	*
Tm	*	*	0.20	1.31	*	0.42	0.49	-0.23	-0.12	*
U	-0.08	*	-0.08	0.51	*	-0.04	4.29	-0.04	-1.30	*
V	0.47	*	0.48	-0.08	-0.12	0.60	0.47	-0.48	-0.89	-0.12
Y	0.57	*	0.96	0.86	-1.31	0.81	1.05	-0.29	-0.86	*
Yb	0.13	*	0.36	0.63	*	0.40	0.13	-0.42	-0.10	*
Zn	1.56	*	-0.49	2.40	6.75	-0.16	-0.08	-0.16	-1.01	-0.16
Zr	0.81	*	-0.31	0.61	*	-0.10	0.61	-4.63	0.92	*

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W56	W57	W58	W59	W60	W60	W61	W62	W63	W64
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	2	2	1	1	1	2	2	1	2	2
SiO2	-0.33	0.06	0.94	0.35	*	-1.02	0.18	*	-1.02	-0.39
TiO2	-0.02	0.56	1.42	-0.18	*	-3.27	0.04	3.54	-1.81	-0.35
Al2O3	0.40	0.20	-0.33	0.14	*	-1.46	0.87	*	-1.07	-0.24
Fe2O3	0.10	0.43	2.29	-0.88	*	-4.98	0.32	*	-3.39	0.21
Fe(II)O	17.98	1.23	*	*	*	*	*	*	-1.28	0.00
MnO	-0.30	-0.16	-0.03	-0.03	*	-0.01	-0.01	-0.03	-1.43	-0.01
MgO	-0.27	-2.89	-0.12	0.92	*	-1.58	-0.59	*	-2.10	-0.22
CaO	-0.49	0.16	2.70	0.68	*	1.59	-0.85	0.92	-0.97	0.87
Na2O	0.25	0.68	-9.89	-2.34	*	-1.53	-0.53	*	0.33	-0.03
K2O	-0.66	0.72	0.68	-0.09	*	0.18	-0.12	*	-1.89	0.42
P2O5	0.04	-0.16	1.41	-2.62	*	-4.48	-1.02	*	-1.31	0.99
Ba	0.13	0.07	*	1.48	1.17	*	0.88	0.66	-0.11	0.40
Be	*	-1.24	*	*	*	*	*	*	0.15	-0.01
Ce	0.49	-0.09	*	-0.67	1.03	*	*	0.08	0.27	0.15
Co	-3.20	-0.49	-5.79	-2.19	-2.74	*	1.01	0.81	-0.88	-0.40
Cr	-0.45	-1.36	*	-0.37	-0.37	*	0.14	1.85	-2.93	0.54
Cs	*	*	*	*	-0.33	*	*	-0.33	0.22	0.33
Cu	9.43	0.26	-6.02	19.65	15.79	*	1.25	-0.78	-1.70	-0.19
Dy	0.57	1.84	*	*	1.67	*	*	0.63	0.08	-0.24
Er	0.12	1.42	*	*	2.05	*	*	*	0.73	-0.57
Eu	0.80	0.97	*	*	1.66	*	*	0.29	-0.54	-0.07
Ga	-0.73	0.15	*	-1.11	12.39	*	-0.29	0.30	-0.73	-0.65
Gd	0.11	1.25	*	*	3.88	*	*	*	-0.05	-0.21
Ge	*	*	*	*	-0.85	*	*	*	*	*
Hf	0.69	-0.72	*	*	3.94	*	*	*	0.69	-0.11
Hg										
Ho	0.34	0.64	*	*	1.28	*	*	-0.10	-0.12	-0.06
La	0.27	0.43	*	*	3.86	*	*	-0.05	0.43	-0.18
Li	*	-1.01	-2.02	*	*	*	0.03	*	-1.01	0.67
Lu	-0.45	1.11	*	*	1.18	*	*	-0.90	0.33	-0.01
Mo	4.52	*	*	*	0.91	*	*	-0.22	1.39	1.13
Nb	-0.29	0.37	-10.27	0.57	-0.44	*	-0.95	0.12	1.03	-0.05
Nd	0.84	2.17	*	*	1.58	*	-0.86	-0.20	0.52	0.14
Ni	0.06	-0.70	*	2.98	-3.59	*	0.06	1.13	-0.78	0.49
Pb	-1.60	2.42	*	*	1.83	*	*	-0.38	*	0.60
Pr	0.58	2.17	*	*	0.70	*	*	0.05	0.58	-0.11
Rb	-0.54	0.02	*	-4.59	0.56	*	-0.17	-0.56	0.48	-0.31
Sb	*	*	*	*	41.87	*	*	2.51	*	-0.16
Sc	-0.70	-1.40	*	*	*	*	0.80	-0.16	-1.84	0.01
Sm	0.51	1.24	*	*	1.48	*	*	-0.11	0.24	-0.02
Sn	3.55	-0.23	*	*	*	*	*	0.30	*	*
Sr	-0.28	-0.22	*	0.47	2.75	*	-0.75	1.69	0.46	0.26
Ta	*	*	*	*	2.67	*	*	1.09	1.00	-0.10
Tb	0.22	1.65	*	*	1.10	*	*	-0.07	0.55	-0.05
Th	-0.56	*	*	*	-13.84	*	*	*	0.69	-0.37
Tl	*	*	*	*	-5.21	*	*	-0.59	0.86	0.67
Tm	-0.23	-0.45	*	*	1.71	*	*	*	-0.45	0.18
U	5.38	*	*	*	-10.76	*	*	-0.73	0.12	-0.12
V	0.00	*	5.99	-2.64	-0.49	*	-0.24	1.67	0.00	-0.69
Y	-0.44	-0.20	-7.15	-3.00	-0.49	*	0.28	*	-0.05	0.81
Yb	-0.66	2.01	*	*	2.36	*	*	-0.26	0.26	0.06
Zn	-0.05	0.39	14.28	0.12	-12.65	*	0.50	1.89	-0.83	-1.05
Zr	1.22	0.20	*	-0.41	-0.92	*	0.41	-2.75	-0.36	0.00

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W65	W66	W67	W68	W69	W70	W70	W71	W72	W73
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	2	2	2	1	1	2	1	2	2
SiO2	*	-0.58	-0.20	-0.28	*	0.85	*	2.15	-4.39	-0.14
TiO2	*	0.04	0.06	0.04	*	-1.13	*	4.87	0.18	0.14
Al2O3	*	-1.59	-0.25	0.15	*	0.94	*	-6.43	-2.95	0.07
Fe2O3	*	-0.48	0.46	-0.19	*	1.82	*	2.72	-4.19	0.03
Fe(II)O	*	*	*	*	*	*	*	*	*	-0.27
MnO	*	*	0.71	-0.01	*	0.26	*	-0.03	1.54	-0.01
MgO	*	-1.00	-0.07	*	*	0.09	*	-1.90	*	0.09
CaO	*	-0.61	0.21	-0.43	*	1.67	*	-5.02	-1.26	-0.13
Na2O	*	0.11	0.20	-0.53	*	0.22	*	-6.33	*	-0.53
K2O	*	-1.50	-0.46	-0.43	*	1.97	*	3.44	0.34	-0.27
P2O5	*	*	0.13	-2.18	*	2.34	*	-4.93	*	0.56
Ba	-0.54	0.40	*	*	-33.57	*	0.36	*	*	-0.27
Be	*	-0.73	*	*	*	*	*	*	*	*
Ce	0.54	-0.63	*	*	-24.89	*	*	*	*	0.64
Co	-3.99	0.20	*	*	-0.93	*	0.53	*	*	-1.10
Cr	1.72	0.99	*	*	0.29	*	2.08	*	*	0.40
Cs	*	0.28	*	*	1.10	*	*	*	*	*
Cu	0.53	-1.47	*	*	0.27	0.33	*	*	12.38	0.92
Dy	*	-0.44	*	*	0.73	*	*	*	*	*
Er	*	-0.28	*	*	0.89	*	*	*	*	*
Eu	*	-0.48	*	*	1.11	*	*	*	*	*
Ga	0.30	-0.07	*	*	-1.29	*	-0.47	*	0.59	-0.29
Gd	*	0.00	*	*	1.02	*	*	*	*	*
Ge	*	*	*	*	*	*	*	*	*	*
Hf	*	0.94	*	*	*	*	*	*	*	*
Hg										
Ho	*	-0.74	*	*	2.79	*	*	*	*	*
La	1.28	-0.32	*	*	-0.85	*	*	*	*	1.46
Li	*	*	*	*	*	*	*	*	*	*
Lu	*	*	*	*	*	*	*	*	*	*
Mo	*	-0.52	*	*	*	*	0.61	*	*	*
Nb	-0.13	0.53	*	*	-3.22	-0.22	*	*	*	0.59
Nd	*	-0.24	*	*	-0.48	*	*	*	*	*
Ni	-0.22	-0.91	*	*	-0.39	-1.03	*	*	3.01	0.06
Pb	-3.80	*	*	*	*	*	-0.29	*	*	*
Pr	*	-0.52	*	*	-0.52	*	*	*	*	*
Rb	-0.33	-0.67	*	*	-2.74	0.82	*	*	3.17	-1.28
Sb	*	*	*	*	*	*	*	*	*	*
Sc	-0.86	0.09	*	*	*	*	0.36	*	*	*
Sm	*	-0.38	*	*	-0.25	*	*	*	*	*
Sn	*	*	*	*	*	*	*	*	*	*
Sr	1.27	0.20	*	-17.46	-1.04	0.07	*	*	0.09	-0.62
Ta	*	0.04	*	*	0.56	*	*	*	*	*
Tb	*	-0.56	*	*	2.53	*	*	*	*	*
Th	*	-0.03	*	*	0.38	*	2.03	*	*	*
Tl	*	*	*	*	*	*	*	*	*	*
Tm	*	*	*	*	*	*	*	*	*	*
U	4.29	-0.16	*	*	0.24	*	*	*	*	*
V	2.87	-0.96	*	*	0.47	*	0.81	*	*	-0.48
Y	-0.40	-0.29	*	*	-1.26	2.69	*	*	-2.13	-0.20
Yb	*	-0.03	*	*	*	*	*	*	*	*
Zn	0.34	-0.27	*	*	1.00	-1.79	*	*	2.16	0.61
Zr	0.92	-0.46	*	-14.66	*	0.23	*	*	0.41	-0.20

Table 3 GeoPT22 Z-scores for analytical results submitted (Dec 2007)
MGT-1, Basalt

Lab. identifier	W74	W75	W75	W76	W77	W78	W79
Sample	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1	MBL-1
Data quality	1	1	2	1	2	2	2
SiO2	0.66	*	*	-1.21	0.37	*	0.38
TiO2	0.64	*	-0.81	-0.97	-0.01	*	0.97
Al2O3	1.21	*	1.54	-0.17	0.57	*	1.13
Fe2O3	-0.07	*	-1.90	-0.30	0.35	-0.55	1.15
Fe(II)O	*	*	*	5.03	*	*	*
MnO	0.91	*	-0.06	-0.03	0.27	*	-0.01
MgO	1.03	*	-0.01	0.29	0.22	*	0.78
CaO	1.33	*	-1.25	0.32	0.80	*	0.16
Na2O	1.38	*	*	-0.06	0.95	-2.24	0.33
K2O	0.57	*	*	-0.86	0.40	-2.96	0.72
P2O5	0.17	*	*	-2.05	0.71	*	1.28
Ba	0.95	-0.85	*	-0.58	1.77	3.17	-0.34
Be	*	*	*	*	0.66	*	-1.65
Ce	0.49	0.57	*	*	-0.10	0.88	-0.82
Co	*	*	0.14	-0.39	0.41	0.62	5.21
Cr	1.34	*	*	-1.80	0.56	-0.71	*
Cs	-0.14	-0.25	*	*	-0.28	1.82	*
Cu	-0.26	*	1.12	0.53	-0.42	*	-0.39
Dy	1.74	0.08	*	*	-0.07	*	-0.51
Er	0.33	-0.19	*	*	-0.39	*	-0.75
Eu	1.07	-0.40	*	*	0.04	-0.56	-0.67
Ga	-2.53	*	*	-5.88	-0.16	*	*
Gd	0.47	-0.79	*	*	-0.40	*	-0.48
Ge	*	*	*	*	0.70	*	*
Hf	0.82	0.02	*	6.50	0.62	-0.08	*
Hg							
Ho	1.39	0.10	*	*	0.14	*	*
La	0.36	0.07	*	*	-0.57	-0.78	-1.21
Li	*	*	0.16	*	-0.13	*	*
Lu	0.35	-0.10	*	*	-0.06	0.48	*
Mo	*	*	-0.50	*	-0.38	*	0.92
Nb	-0.58	-0.17	*	-1.46	-0.22	*	*
Nd	0.16	-0.28	*	*	-0.22	1.24	-1.10
Ni	0.83	*	0.35	2.14	0.38	*	-1.63
Pb	0.17	0.60	*	0.83	1.02	*	0.41
Pr	0.38	0.17	*	*	-0.29	*	-0.71
Rb	-0.10	-0.31	*	-0.33	-0.09	-0.09	*
Sb	*	*	*	*	0.72	*	*
Sc	1.06	*	*	-0.16	-0.26	0.27	*
Sm	0.95	0.00	*	*	-0.33	-0.41	-0.66
Sn	*	*	*	*	-0.23	*	-1.85
Sr	1.59	0.12	*	-3.02	0.40	*	-1.53
Ta	0.15	-0.56	*	*	-0.44	-0.25	*
Tb	0.90	-0.82	*	*	-0.65	-0.49	-0.36
Th	0.48	0.77	*	*	-0.45	-0.14	0.20
Tl	*	*	*	*	*	*	*
Tm	0.32	-0.29	*	*	-0.23	*	*
U	0.31	0.14	*	*	0.00	*	-1.50
V	1.17	*	*	-1.69	-0.22	*	0.60
Y	1.37	-0.64	*	1.53	0.67	*	-0.68
Yb	-0.25	-0.50	*	*	-0.13	1.28	-1.20
Zn	-0.13	*	2.02	-0.77	0.00	*	-1.82
Zr	1.32	-0.92	*	0.61	0.66	*	*

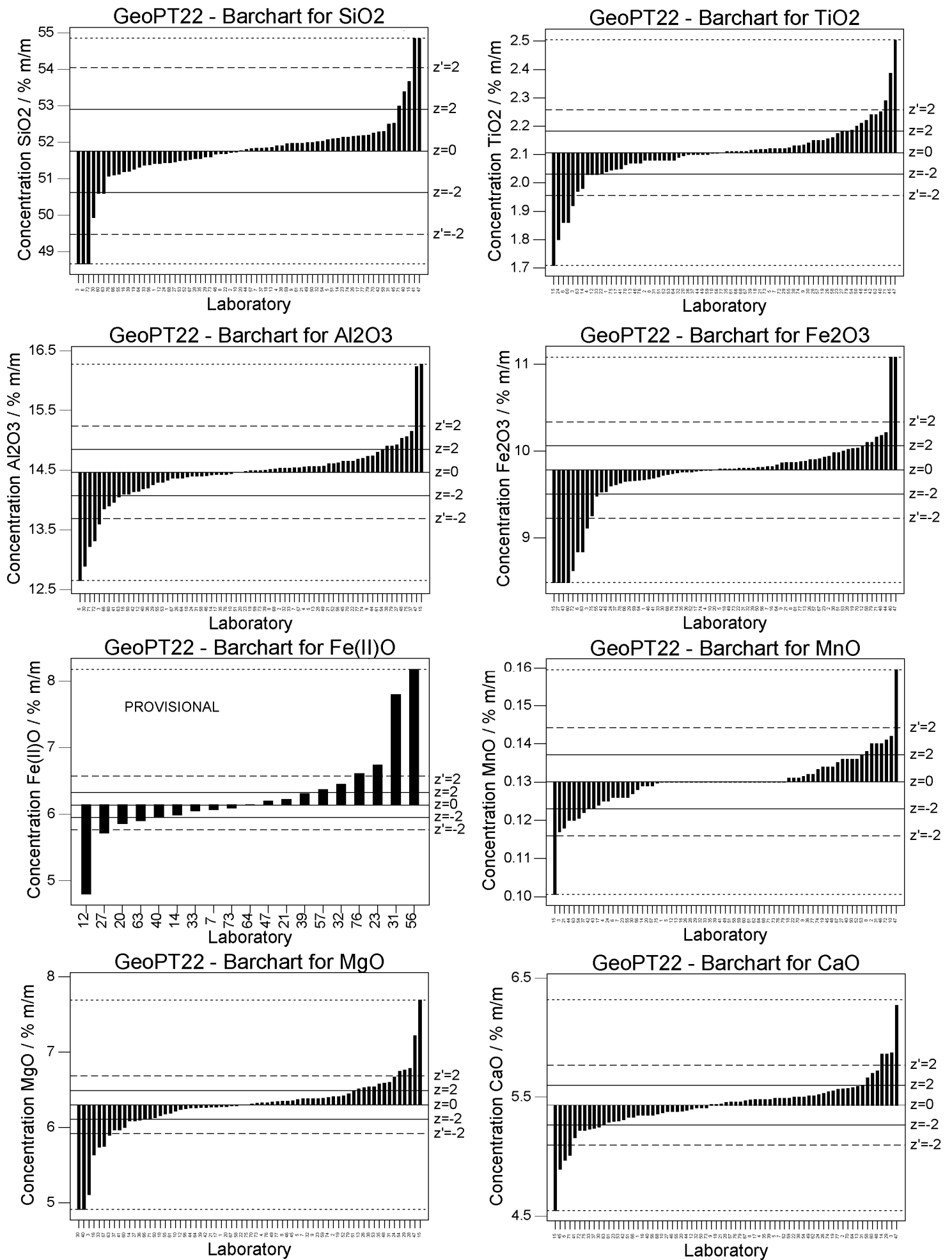


Figure 1: GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

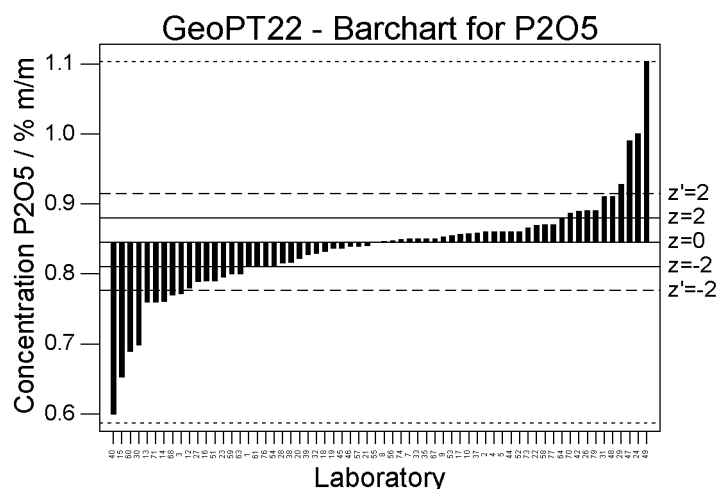
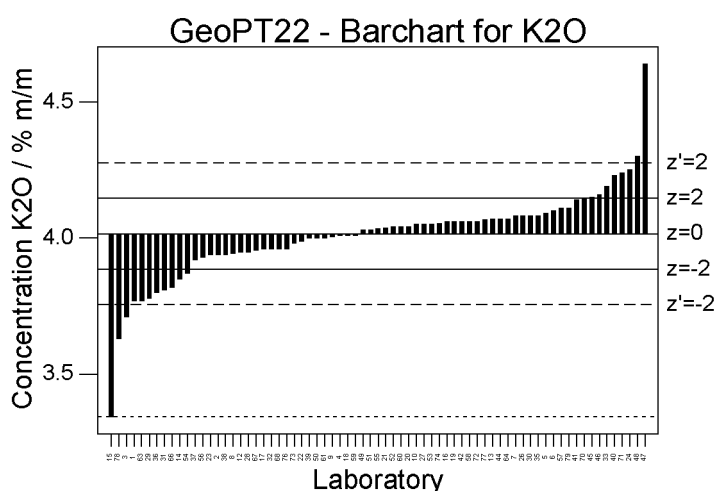
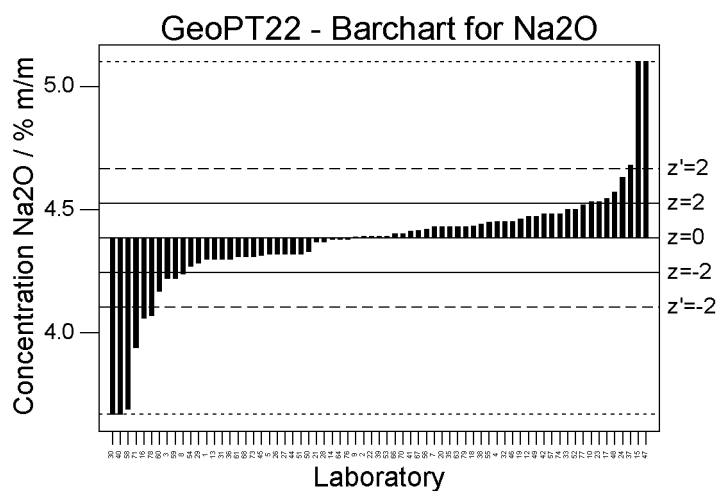


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

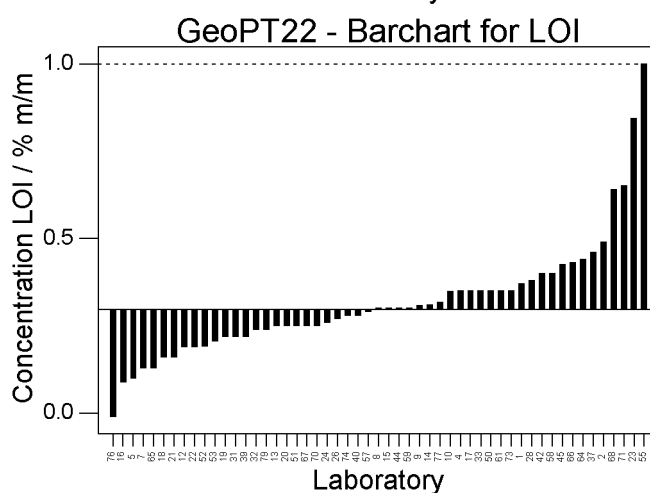
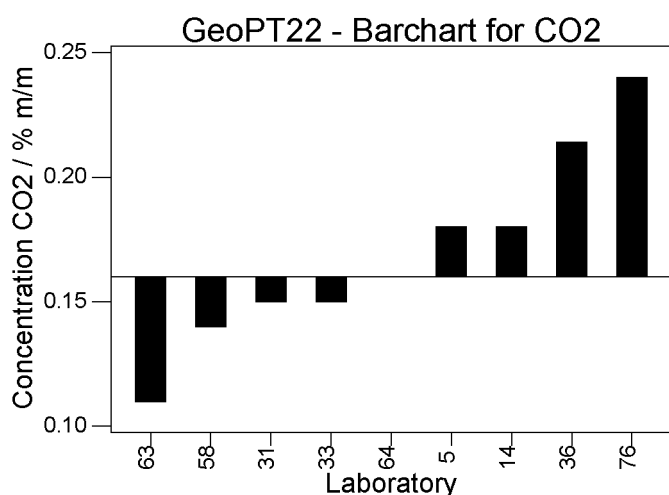
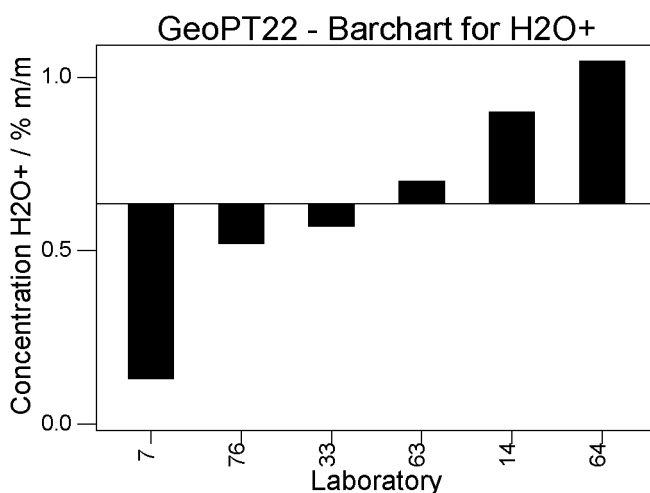


Figure 2: GeoPT22 – Basalt MBL-1. Data distribution charts for information only for elements for which values could not be assigned.

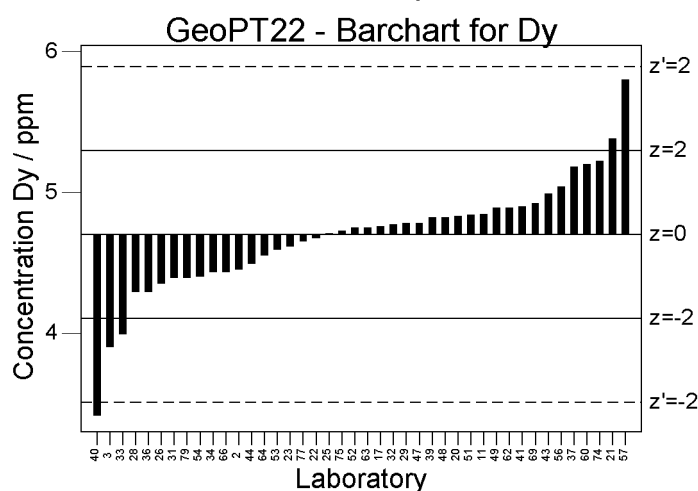
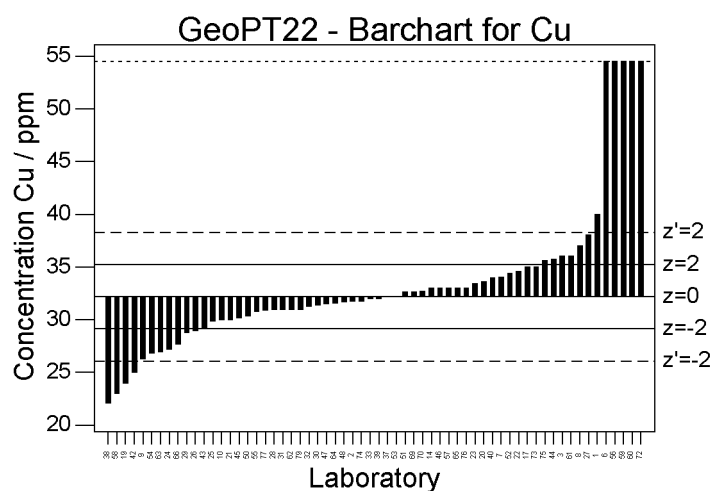
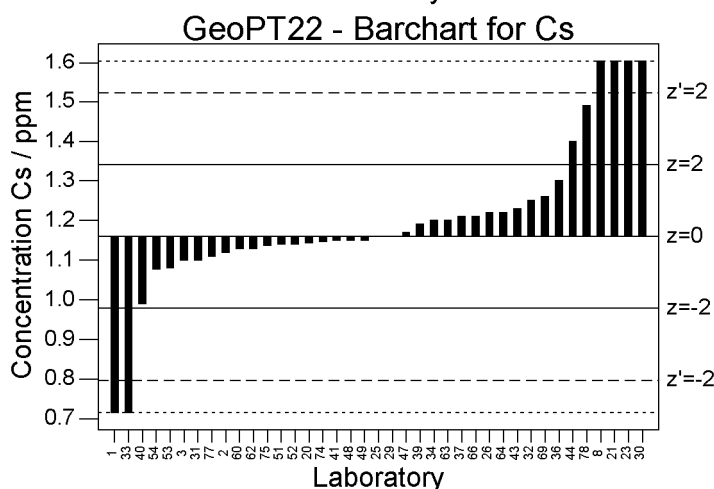
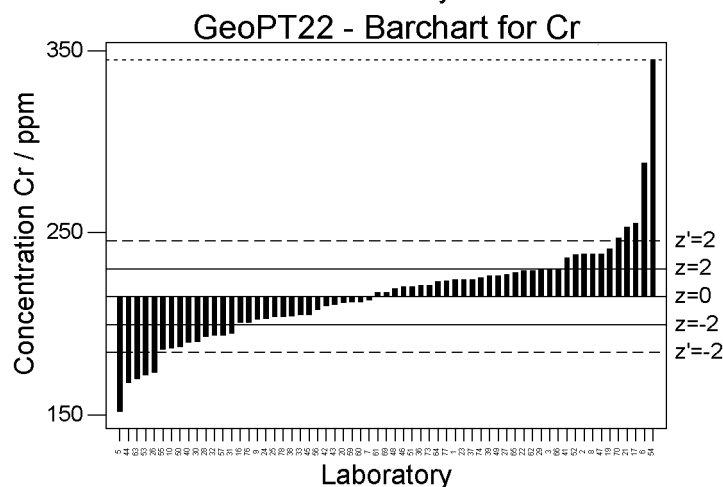
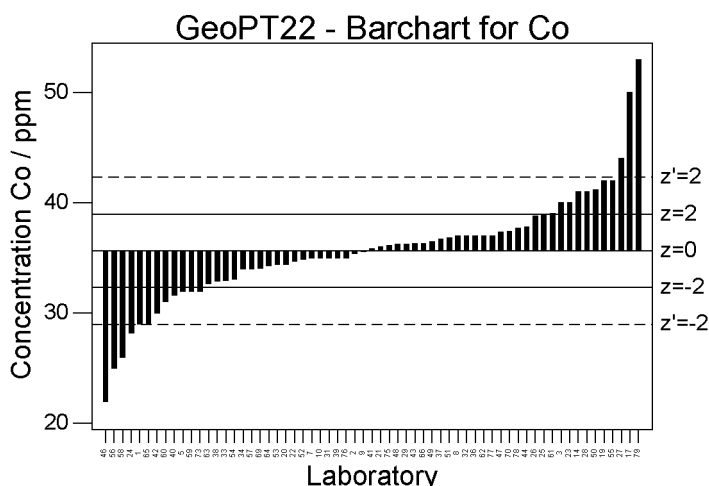
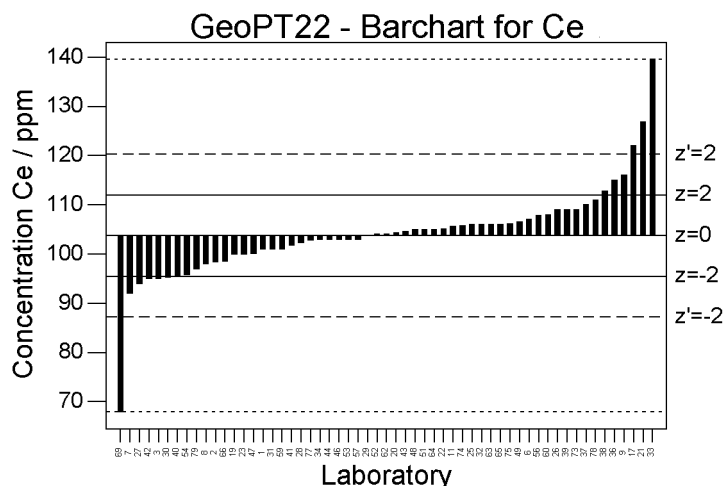
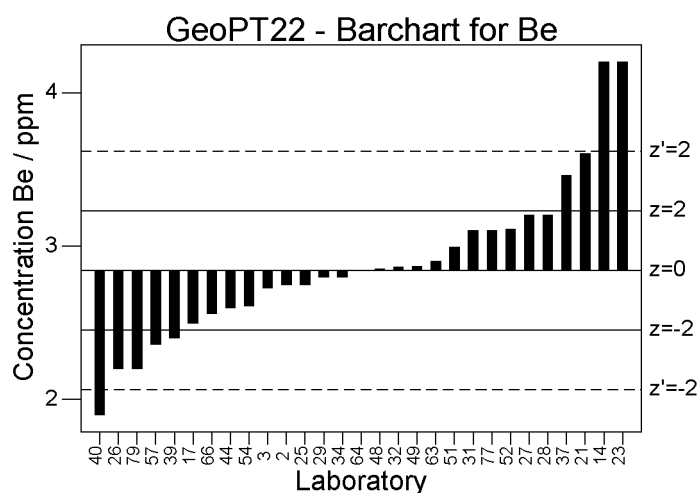
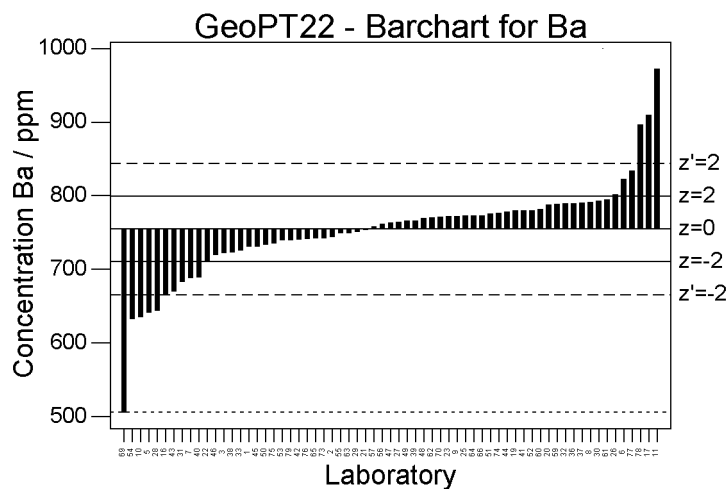


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

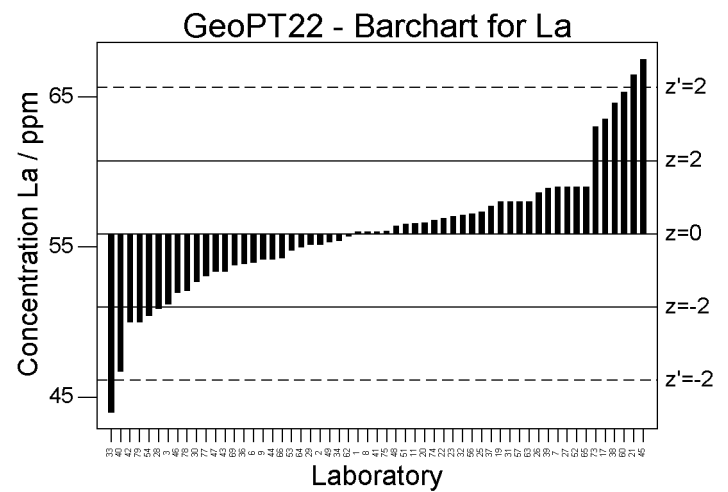
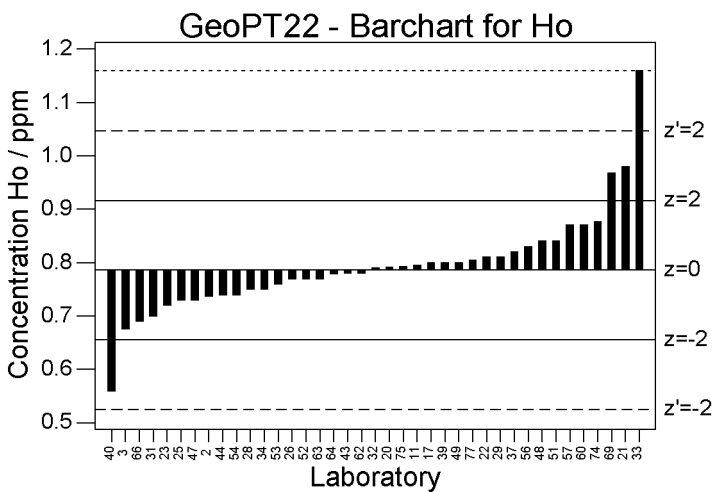
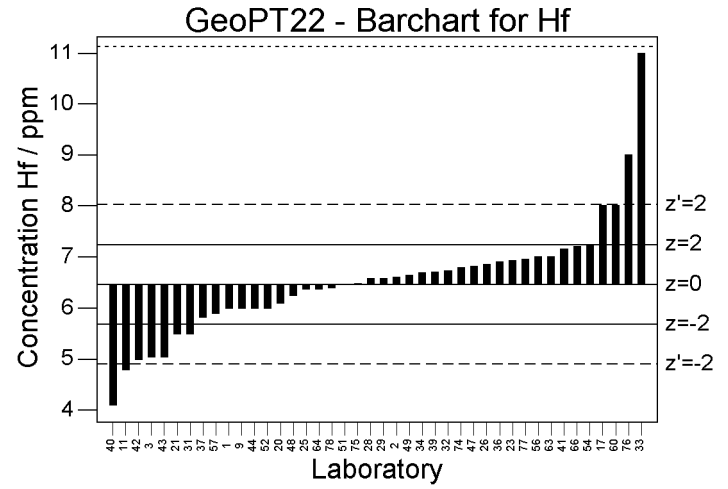
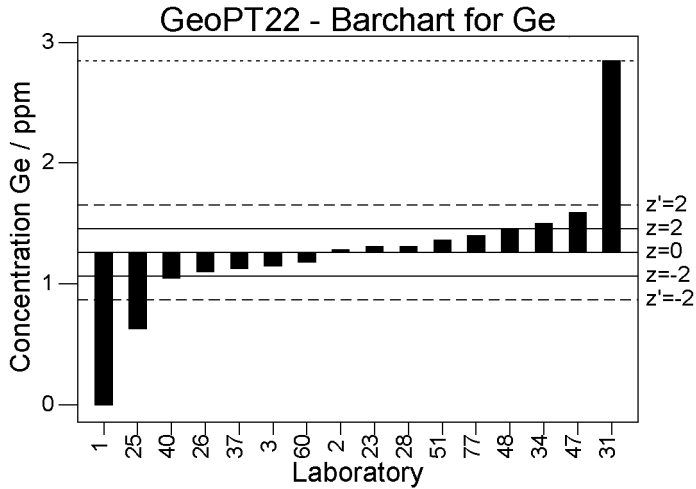
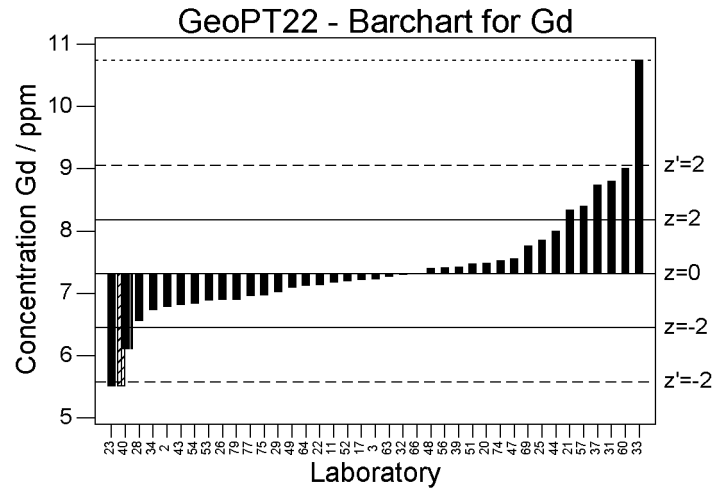
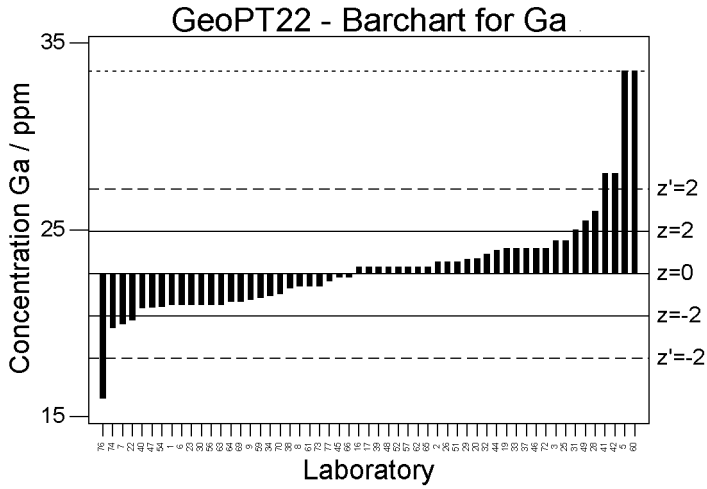
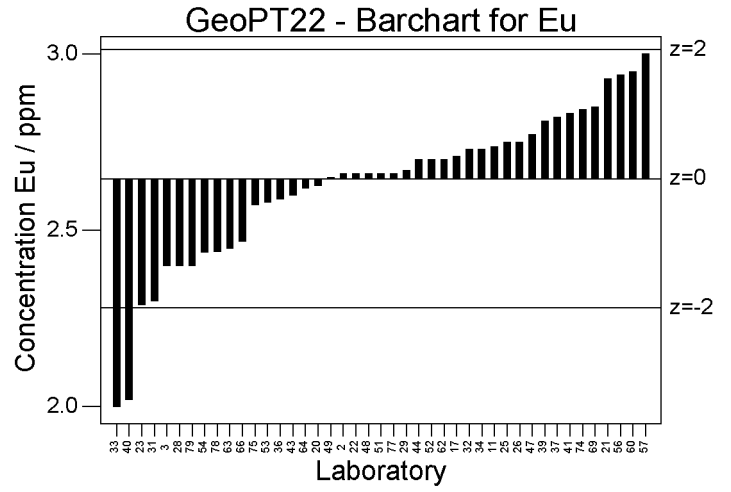
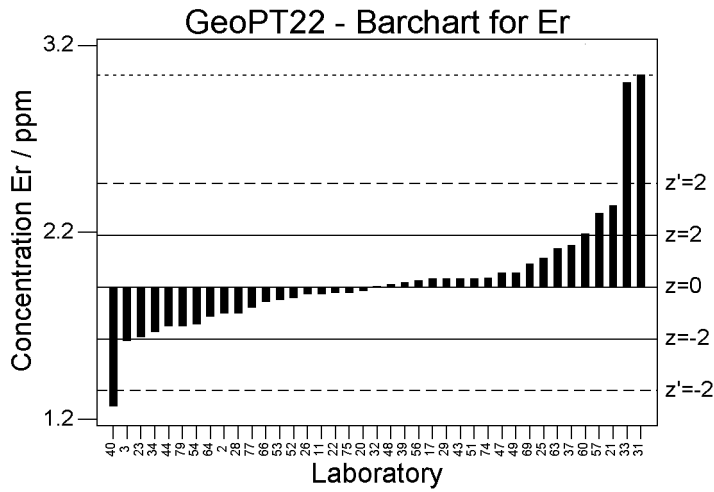


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

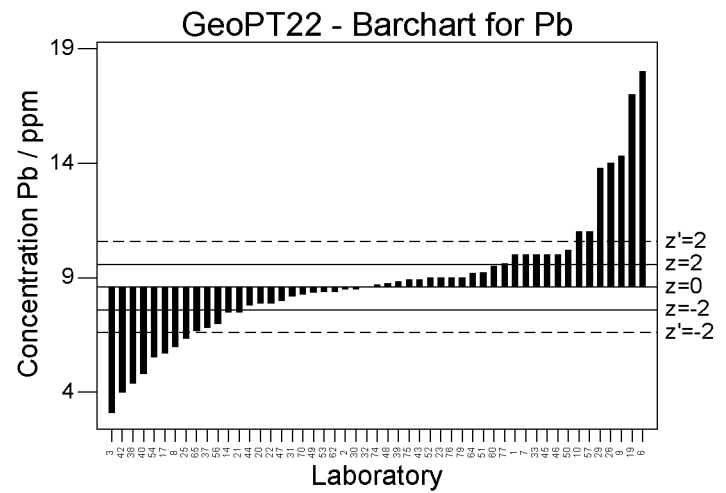
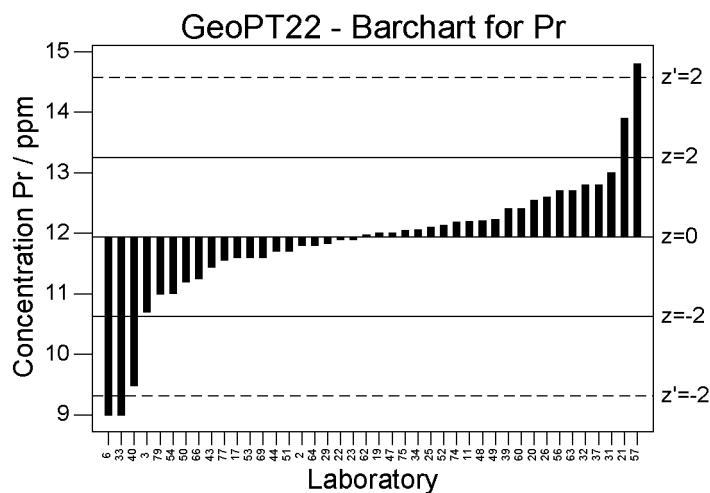
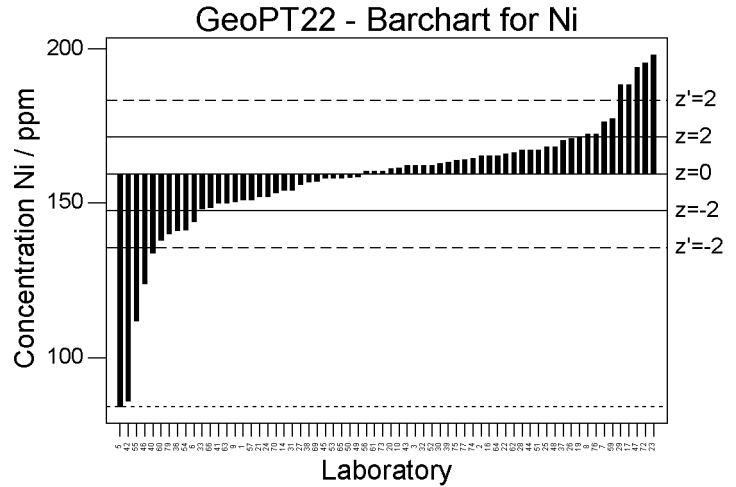
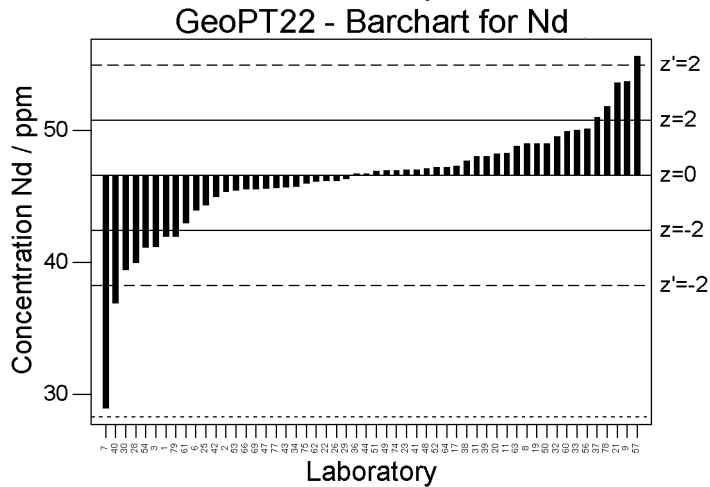
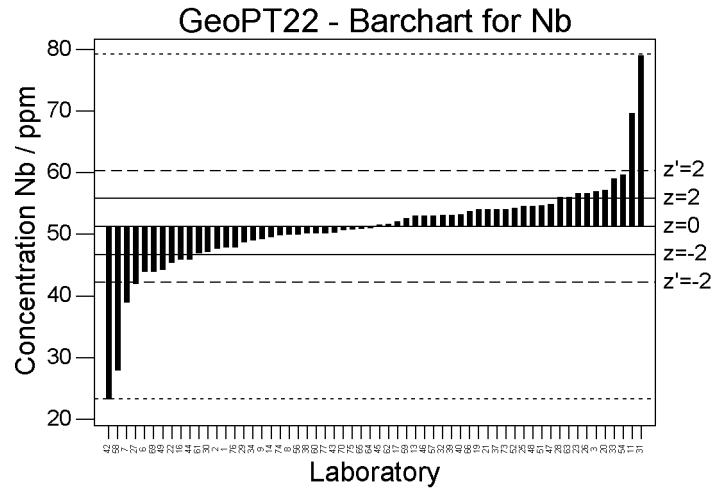
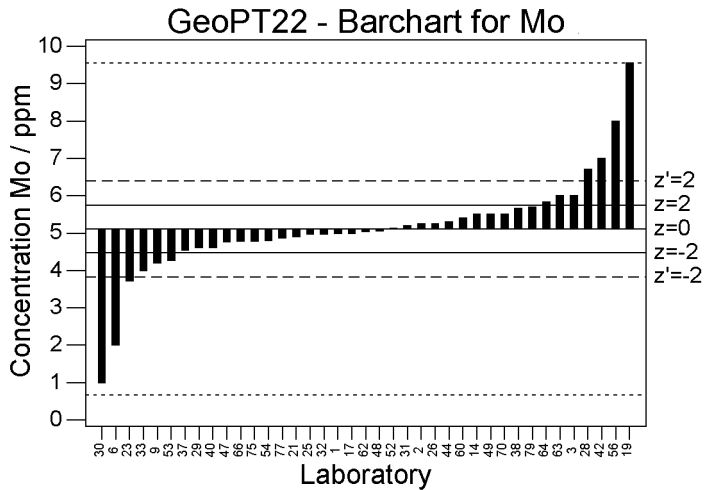
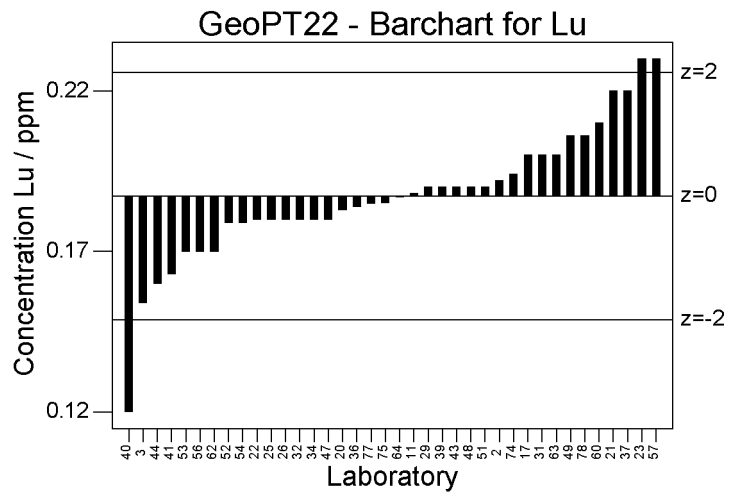
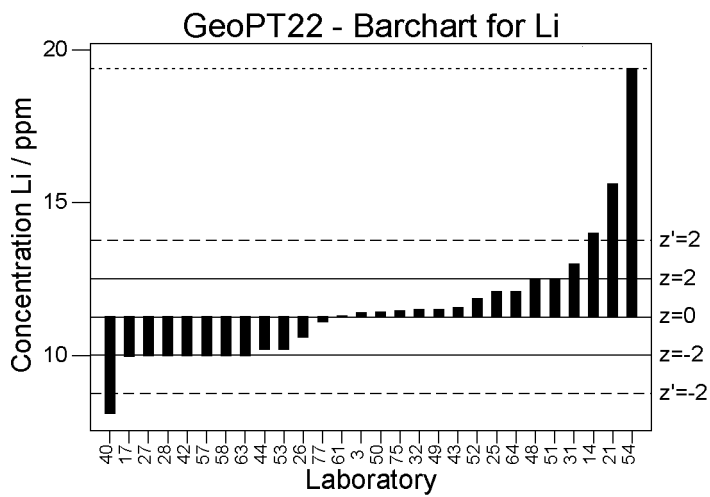


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

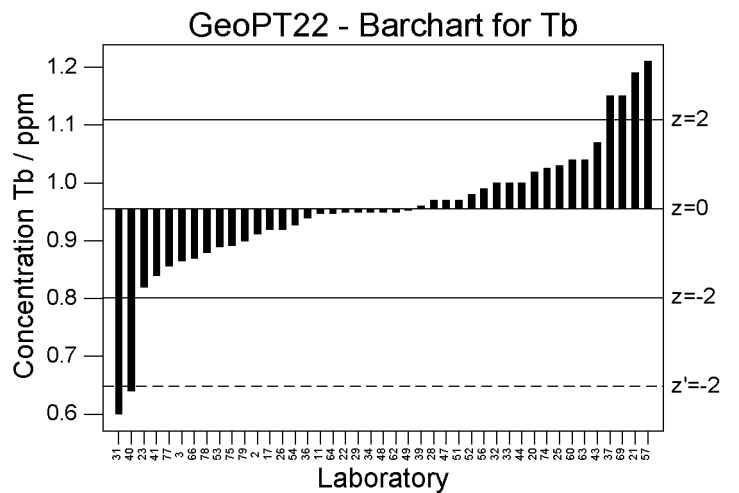
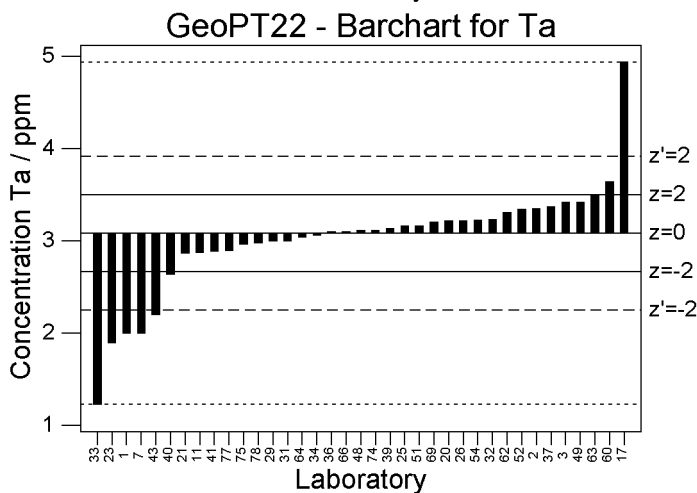
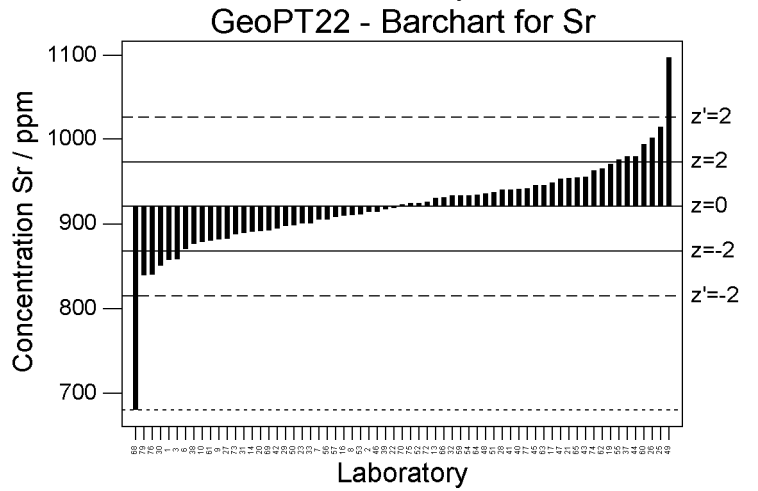
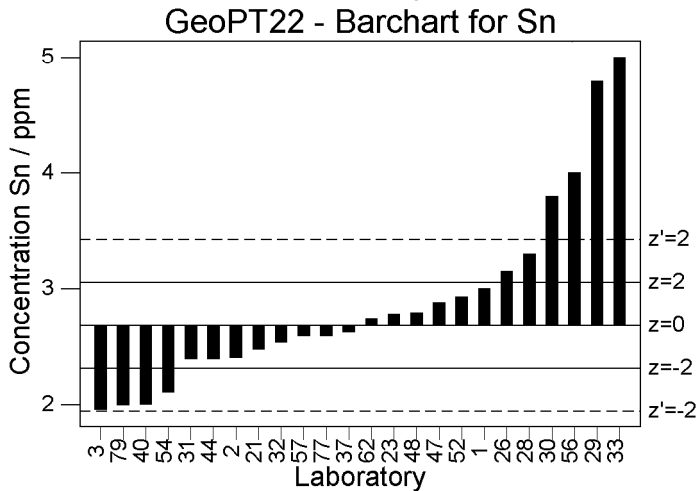
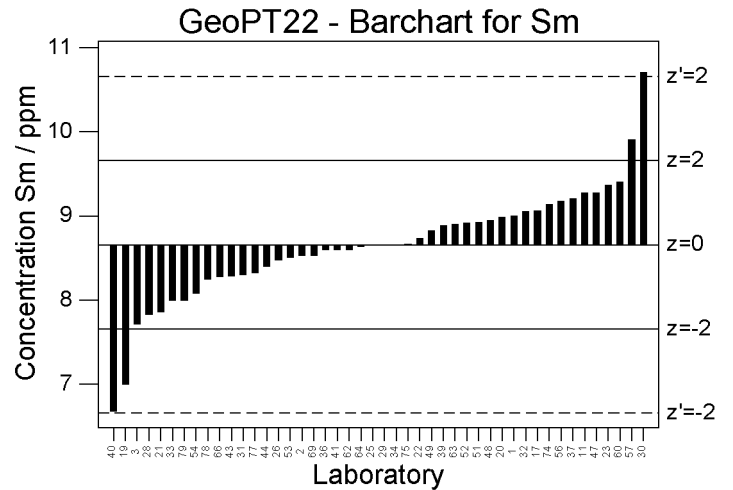
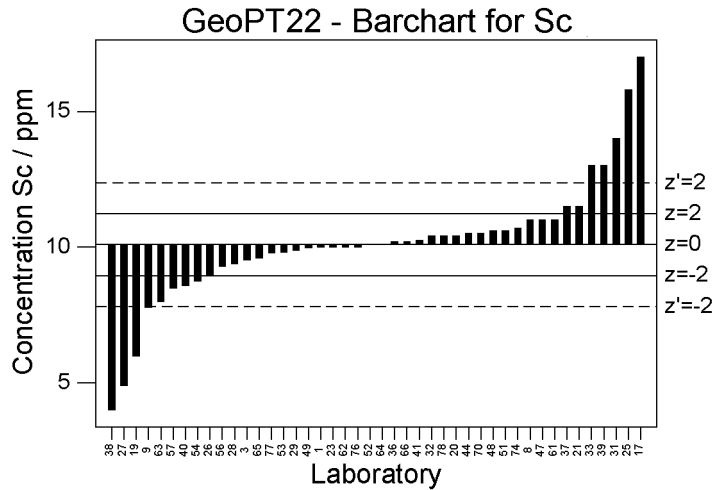
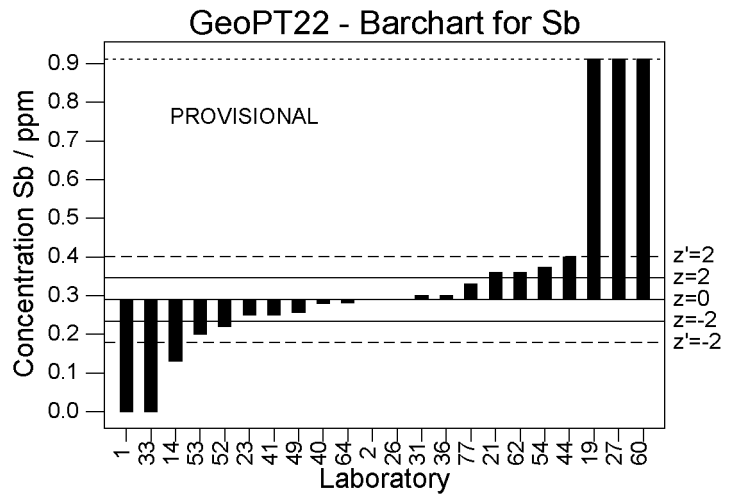
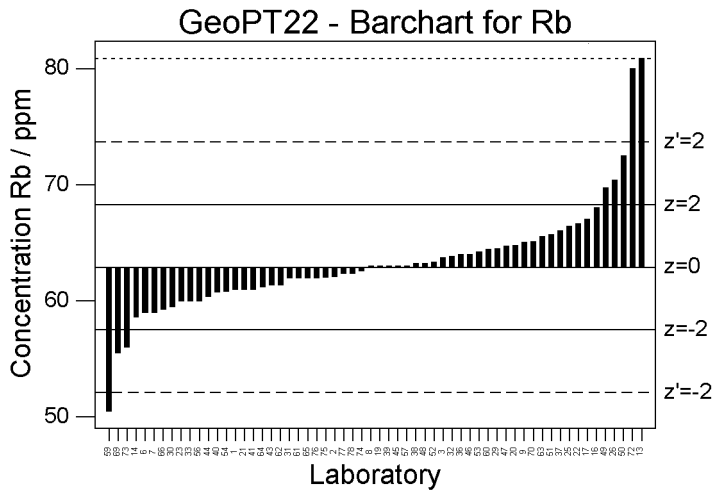


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

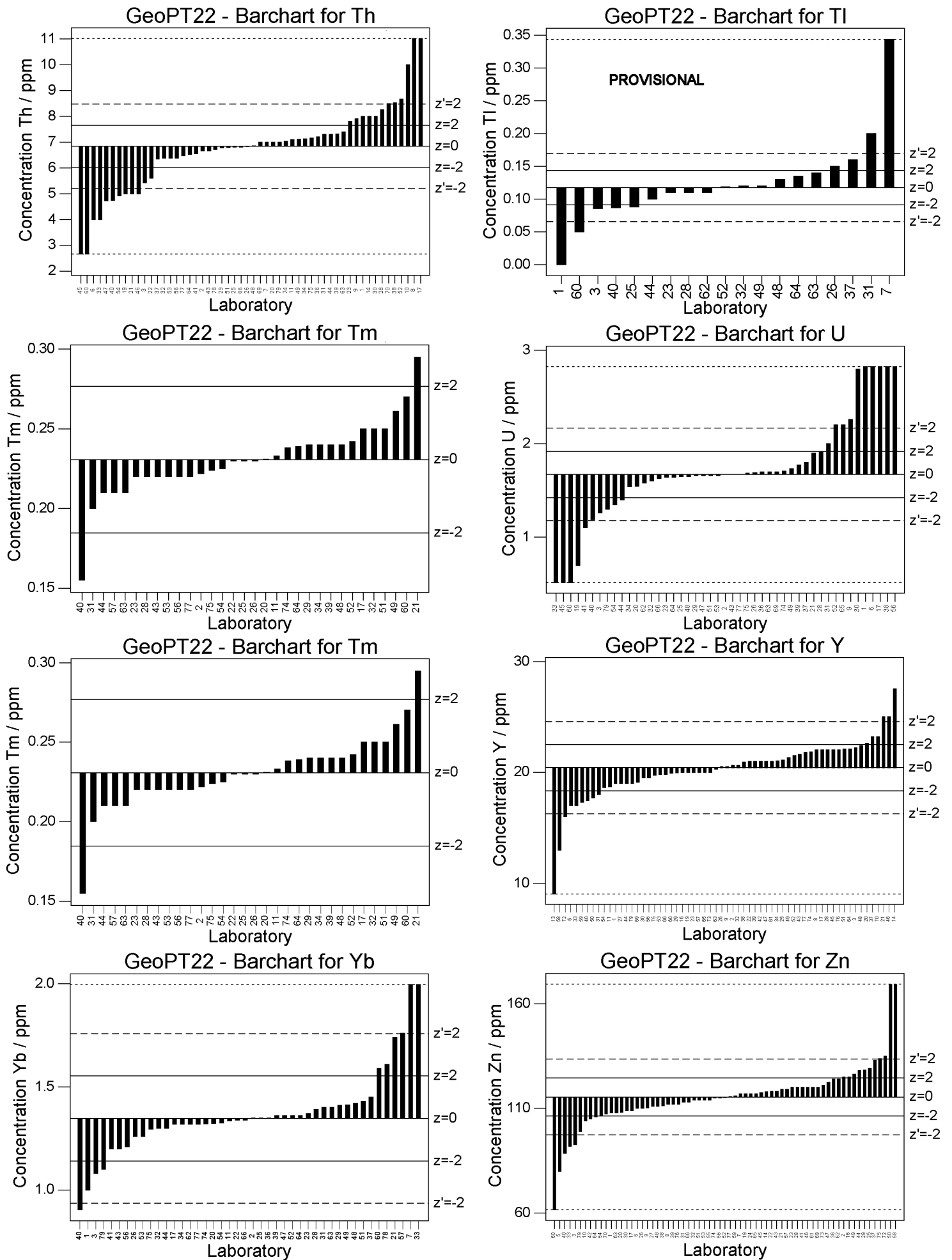


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

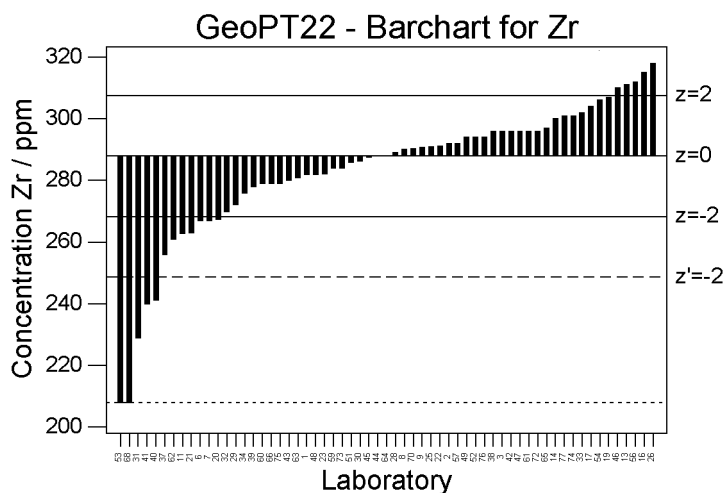


Figure 1 (cont'd): GeoPT22 – Basalt MBL-1. Data distribution charts for elements for which values were assigned. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

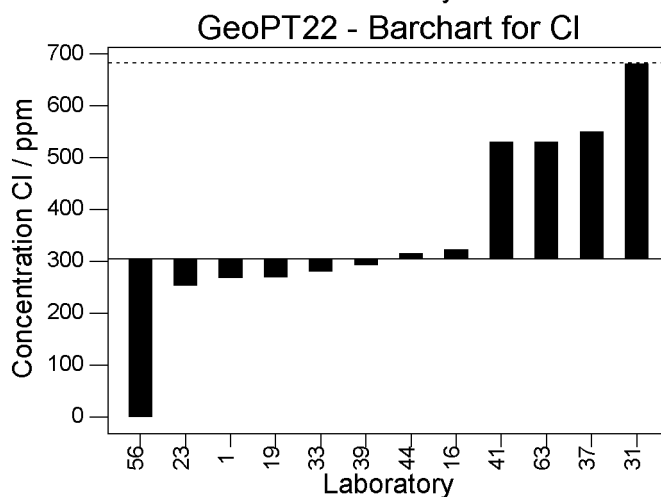
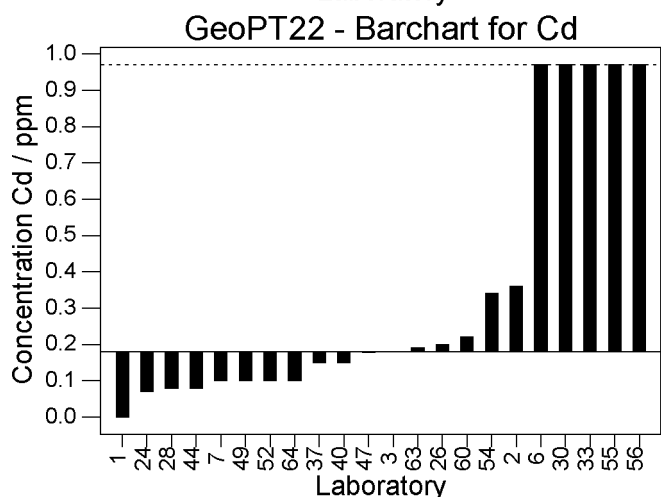
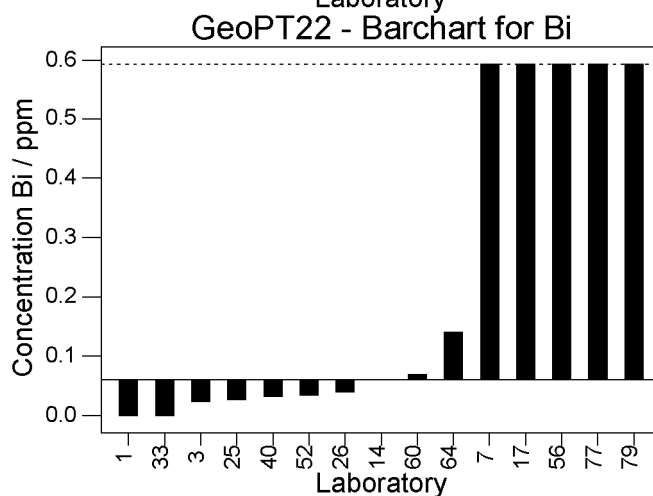
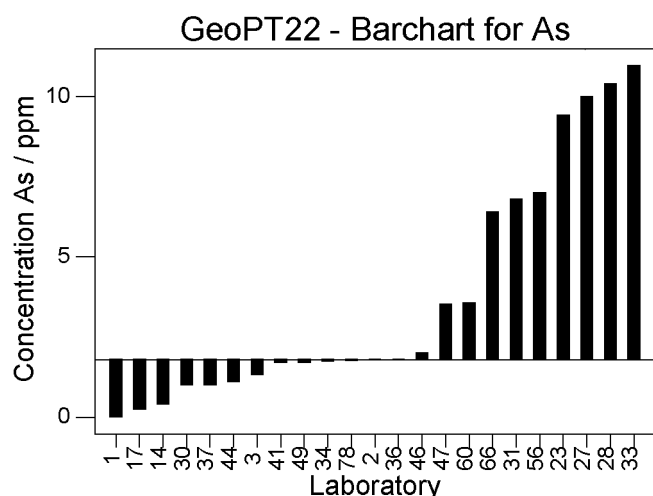
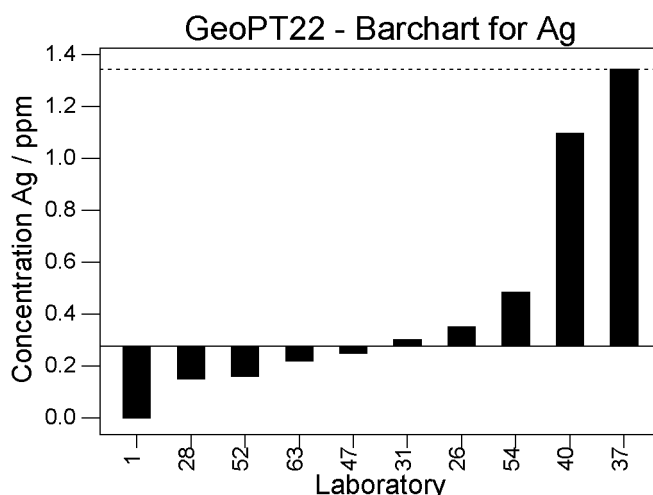


Figure 2: GeoPT22 – Basalt MBL-1. Data distribution charts for information only for elements for which values could not be assigned.

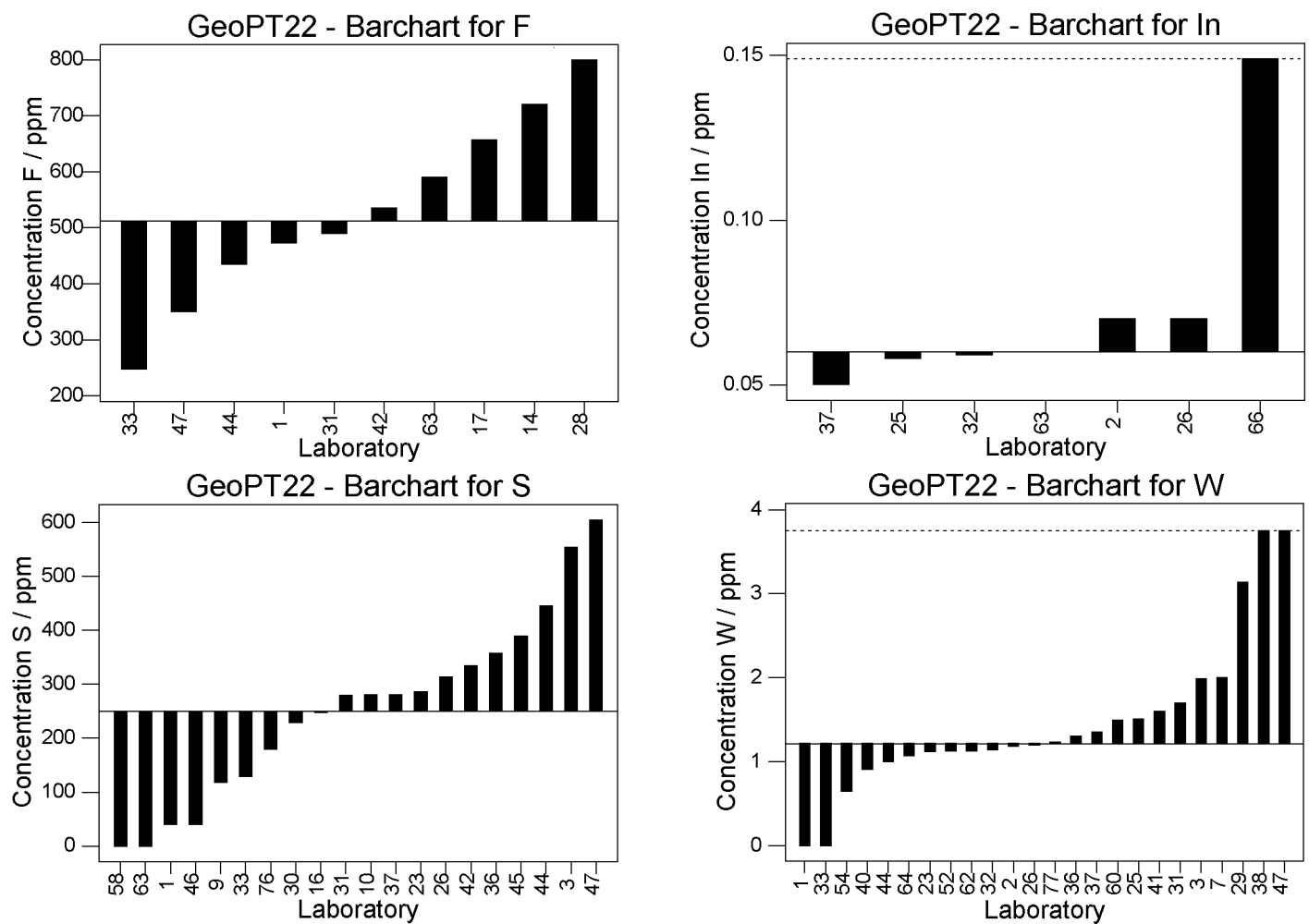


Figure 2: GeoPT22 – Basalt MBL-1. Data distribution charts for information only for elements for which values could not be assigned.

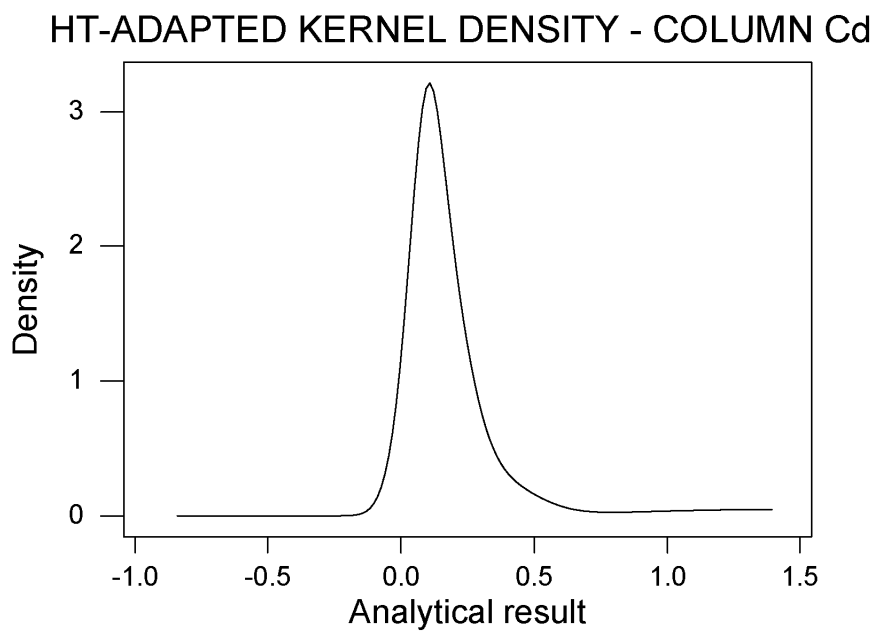
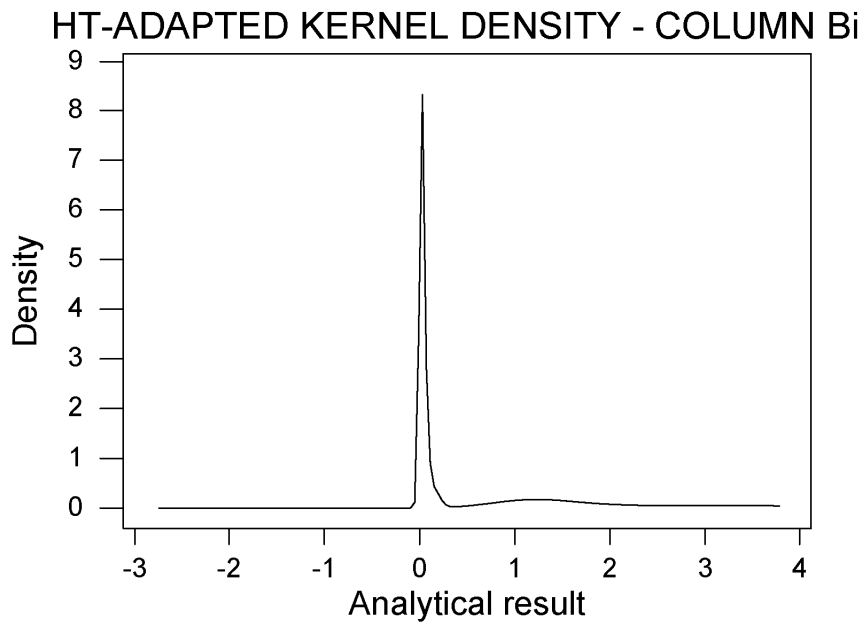
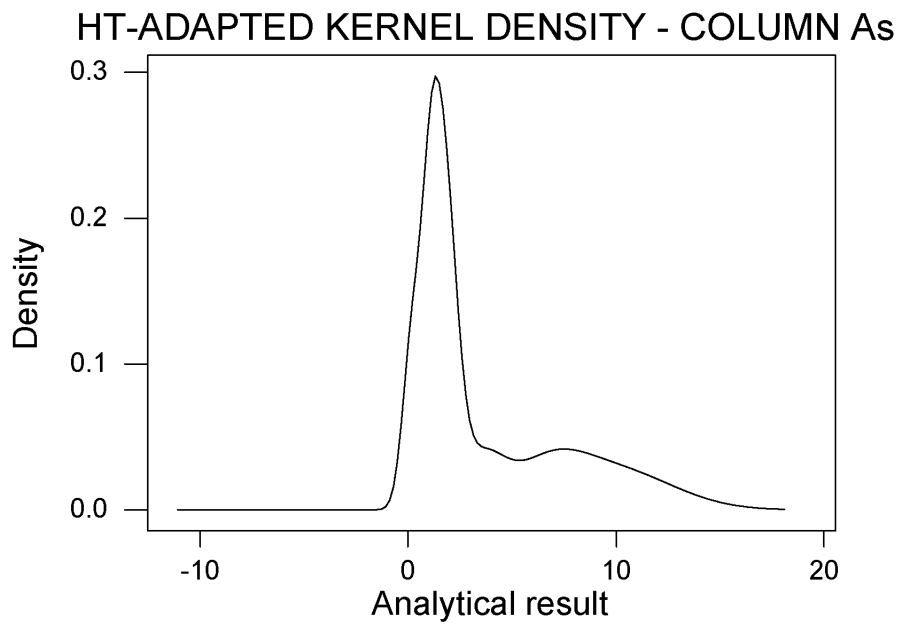


Figure 3: GeoPT22 – Basalt MBL-1. HT-adapted kernel density charts for elements As, Bi, and Cd for which the data distribution was not adequate to permit a consensus value to be assigned.

Multiple z-score chart

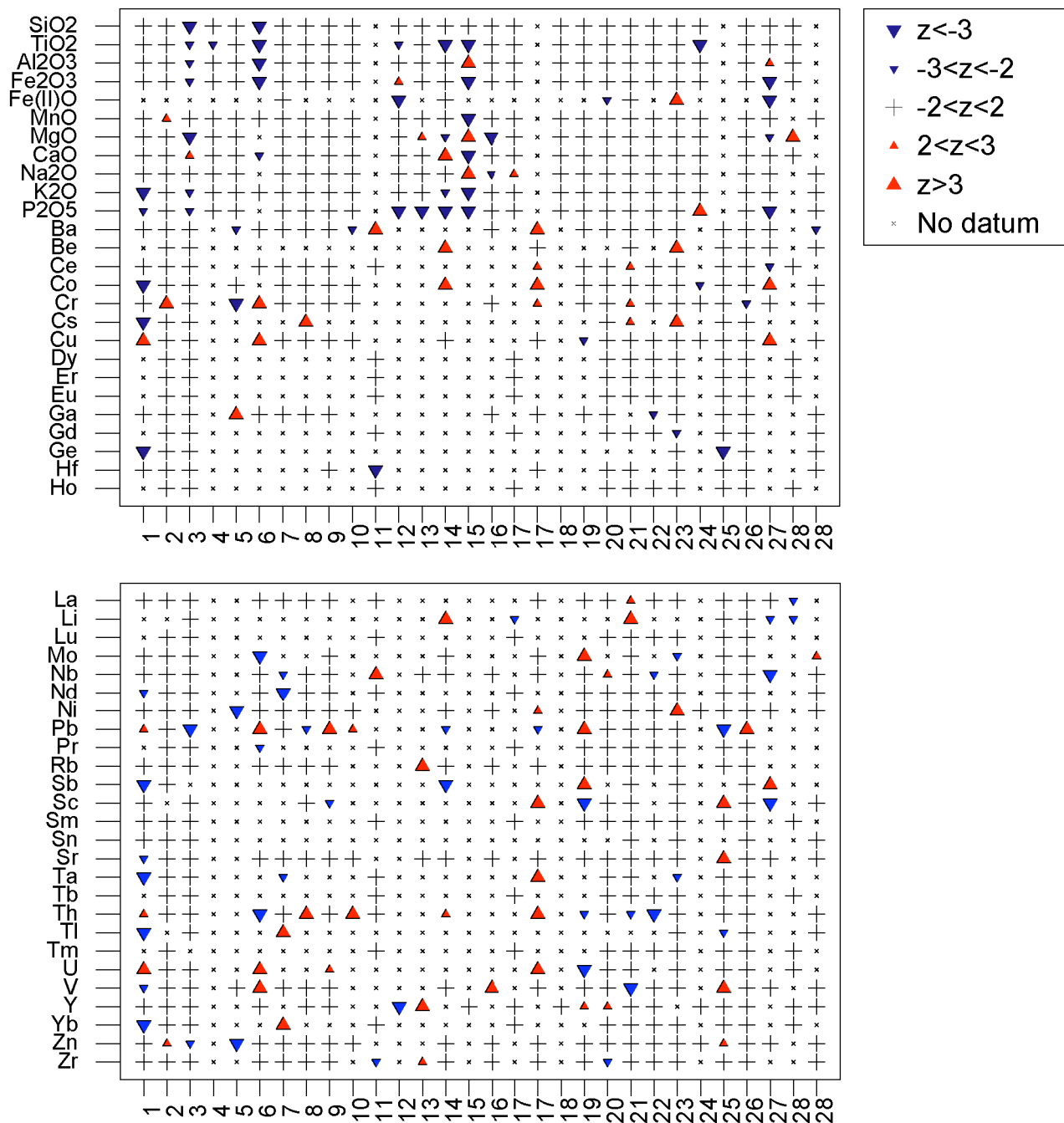


Figure 4: GeoPT22 – Basalt MBL-1. Multiple z-score charts for laboratories participating in the GeoPT22 round. Symbols indicate whether or not an elemental result complies with the $-2 < z < +2$ criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: $z < -3$ ($\blacktriangledown$), $-3 < z < -2$ ($\blacktriangleup$), $+2 < z < +3$ ($\blacktriangleup$), $Z > +3$ ($\blacktriangledown$).

Multiple z-score chart

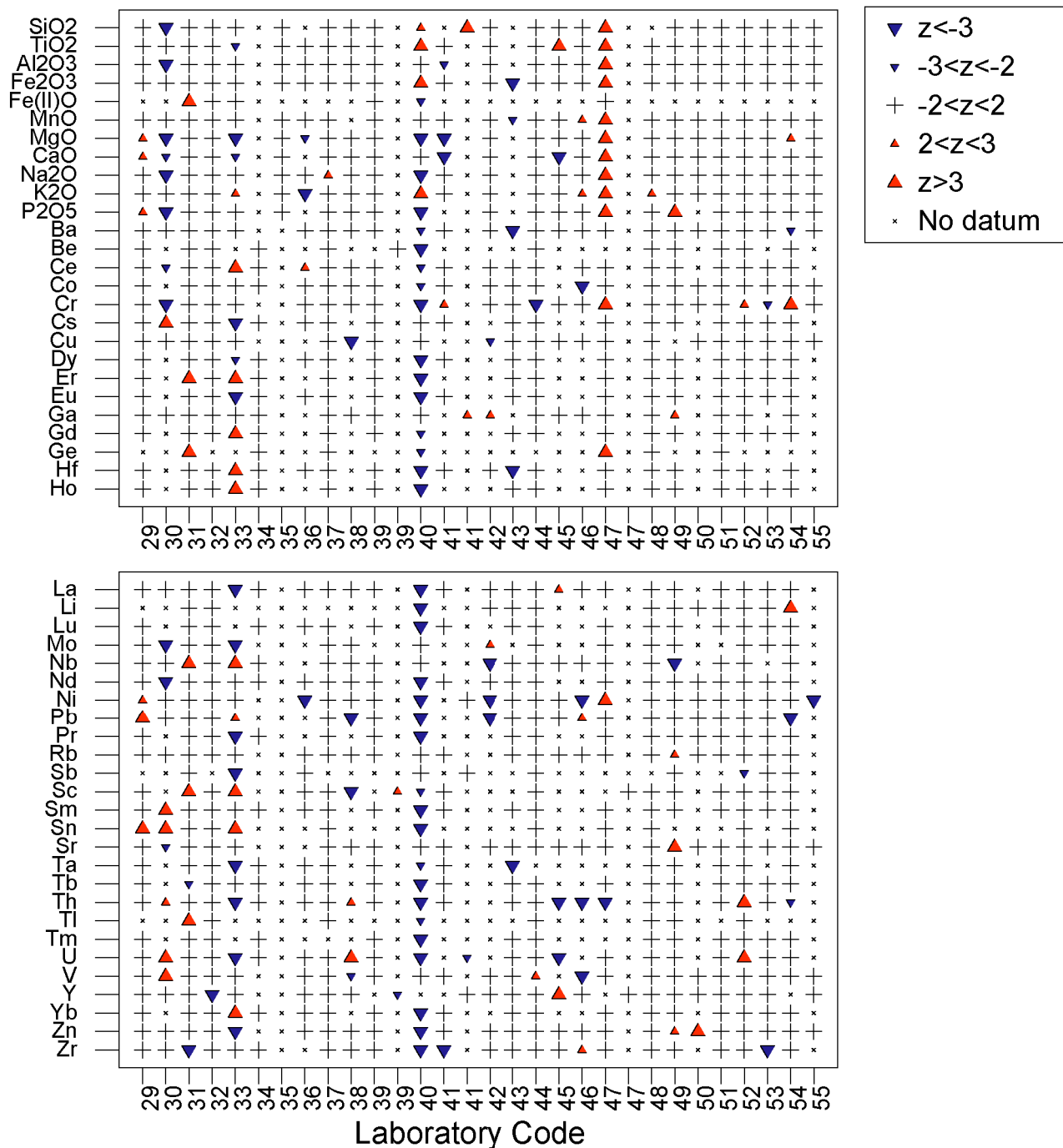


Figure 4 (cont'd): GeoPT22 – Basalt MBL-1. Multiple z-score charts for laboratories participating in the GeoPT22 round. Symbols indicate whether or not an elemental result complies with the $-2 < z < +2$ criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: $z < -3$ (▼), $-3 < z < -2$ (▼), $+2 < z < +3$ (▲), $Z > +3$ (▲).

Multiple z-score chart

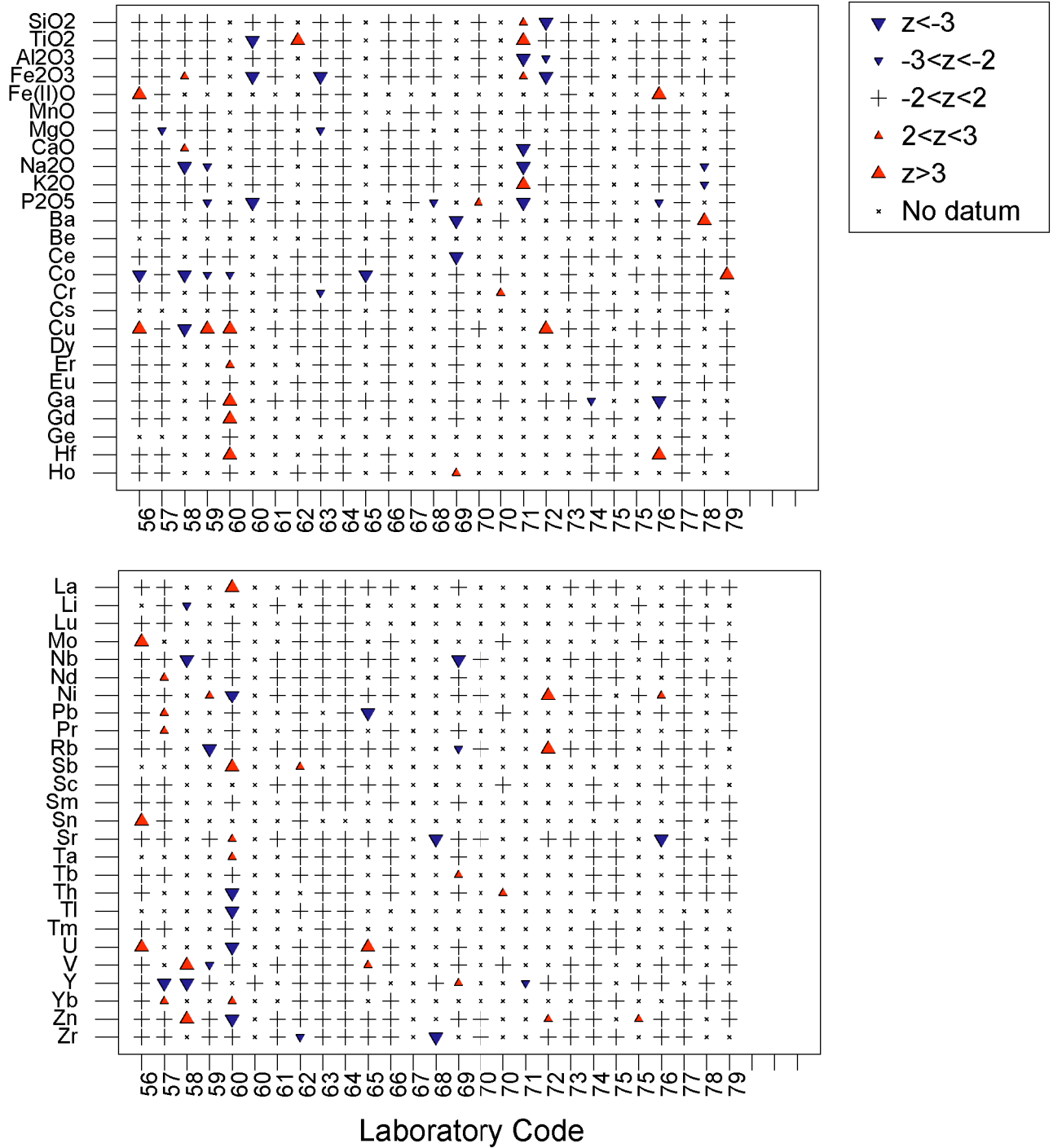


Figure 4 (cont'd): GeoPT22 – Basalt MBL-1. Multiple z-score charts for laboratories participating in the GeoPT22 round. Symbols indicate whether or not an elemental result complies with the $-2 < z < +2$ criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: $z < -3$ (∇), $-3 < z < -2$ (∇), $+2 < z < +3$ ($\blacktriangle$), $Z > +3$ ($\blacktriangle$).