

GEOPT11 - AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES - REPORT ON ROUND 11 / July 2001 (OU-5 Leaton dolerite)

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Abstract

Results are presented for round eleven, GeoPT11, of the international proficiency testing programme for analytical geochemistry laboratories. The sample distributed for this round was OU-5 Leaton dolerite, a sample collected and prepared as a proficiency testing sample at The Open University. 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 eleventh round of the international proficiency testing programme, GeoPT10, 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. The trial involves distributing a sample of established homogeneity to participating laboratories, which are required to analyse the sample using a well-characterised technique or techniques operated under routine analytical conditions. Results are then tabulated by the organisers and z-scores calculated by comparing each analysed result submitted with the value assigned to be the best estimate of the true composition. These

assigned values were estimated by robust statistical analysis of all the contributed data. By examining the magnitude of the z-score, participating laboratories can decide whether the quality of their data is satisfactory in relation to both their chosen fitness-for-purpose criteria and results submitted by all the other laboratories contributing to the round, and choose to take corrective action if this appears justified.

Full details of the programme have been included in reports of previous rounds, the current publication status of which is listed in Appendix 1. In this report, therefore, only the features of the present round are included and readers interested in further details are invited to review the previously published reports.

Steering Committee for Round 10: M. Thompson (Chair), P.J. Potts (Secretary), S.R.N. Chenery, P.C. Webb and J.S. Watson.

Sample: OU-5 is an olivine dolerite which was collected from Leaton Quarry, near Wellington, Telford, Shropshire, TF6 5HA, England, by courtesy of Johnstone Roadstone Ltd., the quarry operator. Several broken blocks were collected from the secondary crusher

and prepared at the Open University using procedures described in previous reports.

The sample was tested for homogeneity by selecting at random twelve packets of the sample prepared for distribution. Duplicate test portions from each packet were analysed by WD-XRF at the OU. For the elements that could be given assigned values, homogeneity was considered to be satisfactory for use in the GeoPT11 round. An analysis of the results is listed in Appendix 2.

Timetable for GeoPT11:

Distribution of sample: March 2002.

Deadline for submission of analytical results: 15th May 2002.

Distribution of preliminary report: July 2002

Submission of results

Results submitted by the eighty-three laboratories that participated in this round are listed in Table 1. All results listed in this Table except data in columns L80 to L83 contributed to the assessment of assigned values.

Assigned values

Following procedures described in earlier rounds, a robust statistical procedure was used to derive assigned value concentrations [X_a], these being judged to be the best estimates of the true composition of this sample. Data in Table 2 lists assigned values for 12 major and 43 trace elements (of which 6 are provisional values). 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 tendency 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 elements shown in Figure 1 were judged to have satisfactory distributions, namely:

SiO_2 , TiO_2 , Al_2O_3 , $\text{Fe}_2\text{O}_3\text{T}$, FeO , MnO , MgO , CaO , Na_2O , K_2O , P_2O_5 , LOI, As*, Ba, Be, Cd*, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge*, Hf, Ho, La, Li, Lu, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Ta*, Tb, Th, Tl*, Tm, U, V, W*, Y, Yb, Zn, Zr. Note that As, Cd, Ge, Ta, Tl and W were assigned provisional values.

Charts in Figure 2 show distribution data for elements that were not judged to be satisfactory in the statistical analysis to assign values. In the present round, values could not be assigned to the following elements:

CO_2 , H_2O^+ , Bi, Cl, F, Mo, S.

The most common reasons for elements failing the assessment of assigned values were as follows:

- (i) Insufficient number of contributed results.
- (ii) Results showing a strong positive skew in the frequency distribution diagram, sometimes with hints of multi-modality.
- (iii) A robust mean clearly different from the mode, which makes the determination of a consensus impracticable.
- (iv) A very wide distribution of results as judged by the sigma value, so that no matter where the consensus was placed most of the participants would receive an ‘unsatisfactory’ classification if z-scores were calculated.

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 pure geochemistry laboratories, 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.

Data quality 2 for applied geochemistry laboratories, where, although precision and accuracy are still important, the main objective is to provide results on large numbers of samples collected as part of

geochemical mapping projects or geochemical exploration programmes.

The target precision [H_a] for each element assessed was calculated from a modified version of the Horwitz function as follows:

$$[H_a] = k \cdot [X_a]^{0.8495}$$

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 precision.

Z-score results are listed in Table 3 and 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. If the z-score for any element falls outside this range, contributing laboratories are advised to examine their procedures to ensure that determinations are not subject to unsuspected analytical bias.

Participating laboratories

Laboratories that contributed data to this proficiency testing round are listed in Table 4

Overall performance

A summary of the overall performance of individual laboratories in this round is plotted in Figure 3 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-score values that were greater or lower than the acceptable z-score limits. These data are 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 GeoPT12 round, the sample for which will be distributed during September 2002.

Acknowledgments

The authors are very grateful to Liz Lomas (OU) for valued assistance with this work, and to Adrian Hadley (Johnstone Roadstone Ltd.) for assistance with sample collection. This program was 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. Submitted for publication to 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. Submitted for publication to 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: Nanhron 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.

Appendix 2 - GeoPT11 Homogeneity Report

Homogeneity testing was based on analysis of duplicate test portions taken from each of 12 packets, which had been selected at random. These samples were analysed in duplicate by WD-XRF at the Open University for the major and minor elements (SiO_2 , TiO_2 , Al_2O_3 , Fe_2O_3 , MnO , MgO , CaO , Na_2O , K_2O , P_2O_5 , LOI) on glass discs and the trace elements (As, Ba, Co, Cr, Cu, Ga, Mo, Nb, Ni, Pb, Rb, S, Sc, Sr, Th, U, V, Y, Zn, Zr) on powder pellets, following the procedures described in the GeoPT1 report.

Statistical analysis of homogeneity data was carried out using a new sequence of tests developed by Fearn and Thompson (Analyst, 2001, 126, 1414-1417) as follows:

DATATEST is the outcome of a range of tests designed to identify analytical problems and discrepancies that could mask differences in analytical results related to inhomogeneity effects, particularly the identification of outliers. All elements listed in the Tables below, passed these tests.

CONC is the average concentration derived from the XRF results.

SIGMA is the target value for the standard deviation derived using the same modified form of the Horwitz function that was used to calculate the target precision for pure geochemistry laboratories (data quality = 1), described above. **F** is the well-known F-statistic for one way analysis of variance. When compared to the relevant critical value of 4.94 (majors) or 2.78 (traces) all elements passed the F-test.

VARSAM is the estimated between-sample variance, which is used to calculate:

SAMRATIO, which is the ratio of the square root (VARSAM) / SIGMAP. Where this ratio has a value of less than 0.3, the element data is considered to have passed the harmonised protocol (**HP-TEST**). Results for LOI, As, Co, Ga, Mo, Ni, S, Th and U were, however, significant (**SAMRATIO>0.3**). Careful re-evaluation of the source data for these elements indicated that inadequate analytical precision had been achieved in the determination of most of these elements and that interpretation of homogeneity may not be reliable.

In the typical interpretation of homogeneity data, the principal criterion is normally that elemental results 'pass' the classical F-test. However, this is not the ultimate arbiter of homogeneity, since the Harmonised Protocol requires that homogeneity should have an insignificant effect on the interpretation of proficiency testing results. If the within-packet variance is particularly small, the F-test may detect a significant level of between-packet variance (indicating inhomogeneity effects), that is, in fact, unimportant in relation to the target precision against which the results from participating laboratories are evaluated. In order to test the significance of data that 'fails' the F-test, the ratio of sampling precision to target precision is calculated. If this ratio is less than 0.3, elemental results are considered to be compatible with those of a homogeneous sample, in the context of this proficiency testing programme. Although data for LOI, As, Co, Ga, Mo, Ni, S, Th and U all passed the F-test, these elements gave a SAMRATIO of >0.3 indicating results for these elements failed the harmonised protocol test. It is considered that the most likely explanation for this is that the precision of the XRF data for these elements was not adequate for homogeneity testing, noting that several approach the detection limit range of the technique. Participating laboratories are, therefore, advised to take these considerations into account when interpreting the z-score values for these elements. Tables H1 and H2 presenting these statistical parameters for both major and trace elements are listed below.

Table H1 showing the results of homogeneity testing on the WD-XRF major element data and LOI.

ANALYTE	DATA TEST	CONC	SIGMA	VAR-SAM	F	F-TEST	SAMRATIO	HP-TEST
SiO ₂	OK	48.8575	0.54419	0.004135	1.46081	OK	0.11817	OK
TiO ₂	OK	2.6416	0.04564	1.09E-05	1.45415	OK	0.07249	OK
Al ₂ O ₃	OK	13.5761	0.18336	0	0.78997	OK	0	OK
Fe ₂ O ₃	OK	14.5524	0.1945	0.000349	2.37679	OK	0.09603	OK
MnO	OK	0.3027	0.00725	2E-07	1.18182	OK	0.06578	OK
MgO	OK	5.0846	0.07961	0.000127	2.16011	OK	0.14142	OK
CaO	OK	6.5945	0.09929	1.05E-05	1.07319	OK	0.03266	OK
Na ₂ O	OK	4.2957	0.06899	2.01E-05	1.10803	OK	0.06493	OK
K ₂ O	OK	0.8305	0.01708	1.7E-06	1.16566	OK	0.07652	OK
P ₂ O ₅	OK	0.4198	0.00957	2.9E-06	1.40564	OK	0.17769	OK
LOI	OK	2.0262	0.03644	0.000256	4.14685	SIG	0.43885	SIG

Table H2 showing the results of homogeneity testing on the WD-XRF trace element data.

ANALYTE	DATA TEST	CONC	SIGMA	VAR-SAM	F	F-TEST	SAMRATIO	HP-TEST
Rb	OK	20.021	1.02	0	0.54441	OK	0	OK
Sr	OK	230.129	8.1189	0	0.89554	OK	0	OK
Y	OK	57.2	2.4883	0.04621	1.46995	OK	0.08639	OK
Zr	OK	225.408	7.9772	0	0.35188	OK	0	OK
Nb	OK	9.804	0.5562	0	0.57216	OK	0	OK
Ba	OK	323.688	10.8481	0	0.48506	OK	0	OK
Pb	OK	3.733	0.2449	0	0.58832	OK	0	OK
Th	OK	2.746	0.1886	0.24379	1.94905	OK	2.61729	SIG
U	OK	0.733	0.0615	0.04758	1.15024	OK	3.54911	SIG
Sc	OK	47.904	2.1403	0	0.63686	OK	0	OK
V	OK	487.529	15.3623	0	0.53163	OK	0	OK
Cr	OK	40.304	1.8482	0.06004	1.12757	OK	0.13258	OK
Co	OK	26.671	1.3014	0.35261	1.69281	OK	0.45628	SIG
Ni	OK	15.108	0.8031	0.08481	1.51793	OK	0.36264	SIG
Cu	OK	26.496	1.2942	0	0.96748	OK	0	OK
Zn	OK	127.792	4.9258	0	0.55116	OK	0	OK
Ga	OK	20.479	1.0398	0.1853	2.13306	OK	0.41398	SIG
Mo	OK	-1.792	*	0.01852	1.19584	OK	*	SIG
As	OK	3.446	0.2288	0.05398	1.02935	OK	1.01549	SIG
S	OK	51.379	2.2715	3.3572	1.72285	OK	0.80663	SIG

		Table 1: GeoPT11																				
		OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																				
Round identifier	L1	L2	L3	L3	L4	L5	L6	L7	L7	L8	L9	L10	L10	L11	L12	L12	L13	L14	L15	L16	L17	
Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5		
Technique codes	X	X	X	X	X	X	AA,C,	M	M	AA,M,	IR,T,	M	M	T,X	M	M	IR,X	X	M,T,	X	A,X	
							T			T,X	X								X			
Test portion (g)	0.7-5	1	0.7-10	10	0.02-0.7	0.5	0.05-0.5	0.1	0.1	0.1-0.75	0.1-0.8	0.1	0.1	0.6-5.4	0.1	0.1	0.1-0.7	5	0.05-0.7	0.8-8	1-1.5	
Data quality	2	2	1	2	2	1	1	1	2	1	2	1	2	2	1	2	2	2	2	2		
SiO ₂	% m/m	49.48	51.18	49.068		48.86	49.5	49.81			49.456	49.08			49.7			48.25	42.21	49.45	49.22	49.53
TiO ₂	% m/m	2.76	2.89	2.63		2.6	2.72	2.76			2.71	2.71			2.726			2.91	2.58	2.73	2.75	2.69
Al ₂ O ₃	% m/m	13.65	13.09	13.646		16.11	13.4	14.17			13.718	13.48			13.76			13.88	11.44	13.7	13.55	13.65
Fe ₂ O ₃	% m/m	14.65	15.4	14.608		14.8	14.5	5.08			14.496	14.44			14.41			14.67	16.29	14.79	14.4	14.51
Fe(II)O	% m/m										8.74				8.55	8.69						
MnO	% m/m	0.32	0.18	0.302		0.271	0.34	0.31			0.308	0.309			0.299			0.30	0.26	0.29	0.309	0.32
MgO	% m/m	5.09	5.43	5.137		3.43	5.13	5.08			5.249	5.16			5.13			4.73	6.13	5.13	5.22	5.13
CaO	% m/m	6.62	5.32	6.633		6.8	6.54	6.7			6.58	6.65			6.765			7.40	6.73	6.6	6.76	6.62
Na ₂ O	% m/m	4.38	4.11	4.335			4.46	5.35			4.4	4.35			4.242			4.37	3.54	4.04	3.46	4.36
K ₂ O	% m/m	0.84	0.87	0.827		0.7	0.84	0.9			0.855	0.83			0.835			0.95	0.54	0.85	0.85	0.84
P ₂ O ₅	% m/m	0.45	0.5	0.432			0.46	0.57			0.462	0.43			0.43			0.59		0.44	0.462	0.44
H ₂ O+	% m/m	0.33													3.29							
CO ₂	% m/m													0.21				0.43				
LOI	% m/m	2.14	2.37	2.1		2.11	2.15			1.72	2.02			1.96			2.29		2.02	1.9	1.92	
Ag	mg kg ⁻¹																					
As	mg kg ⁻¹			7.1																4.2	1.9	
Au	mg kg ⁻¹																					
B	mg kg ⁻¹																					
Ba	mg kg ⁻¹	360		326	298			308		327.63	325	314.5		325	284.67			270	332		210	
Be	mg kg ⁻¹																		1.48			
Bi	mg kg ⁻¹																			3.5		
Br	mg kg ⁻¹																					
Cd	mg kg ⁻¹																					
Ce	mg kg ⁻¹				40			45.3		46.28	52	46.04		26.5	41.599				47.4			
Cl	mg kg ⁻¹																					
Co	mg kg ⁻¹	33		26.5						38.22	37			48.4	37.981				41.8		40	
Cr	mg kg ⁻¹	43		40	116					33.4	29			27.6	27.763				38.4	51	15	
Cs	mg kg ⁻¹							0.536		0.59		0.557							0.54			
Cu	mg kg ⁻¹	27		24.6	31					30.95	23			27.7	24.944				43			
Dy	mg kg ⁻¹							9.42		8.69		9.95			8.5237				9.2			
Er	mg kg ⁻¹							5.63		5.21		5.61			5.1071				5.11			
Eu	mg kg ⁻¹							2.43		2.28		2.42			2.4227				2.4			
F	mg kg ⁻¹																					
Ga	mg kg ⁻¹			20.5	21.5					21.8	22			21.7	20.995				21.4	17		
Gd	mg kg ⁻¹							9.14		8.39		9.02			8.2388				8.54			
Ge	mg kg ⁻¹														2.0322				2.16			
Hf	mg kg ⁻¹							5.66		5.18		5.85			4.7308				5.59			
Hg	mg kg ⁻¹																					
Ho	mg kg ⁻¹							1.92		1.79		2.01			1.7789				1.99			
I	mg kg ⁻¹																					
In	mg kg ⁻¹																					
Ir	mg kg ⁻¹																					

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Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	
Technique codes	X	X	X	X	X	X	AA,C, T	M	M	AA,M, T,X	IR,T, X	M	M	T,X	M	M	IR,X	X	M,T, X	A,X	
Test portion (g)	0.7-5	1	0.7-10	10	0.02-0.7	0.5	0.05-0.5	0.1	0.1	0.1-0.75	0.1-0.8	0.1	0.1	0.6-5.4	0.1	0.1	0.1-0.7	5	0.05-0.7	0.8-8	1-1.5
Data quality	2	2	1	2	1	1	1	2	1	2	1	2	2	1	2	2	2	2	2	2	
La	mg kg ⁻¹				16			18.2		18.7	27	18.06		22.1	17.02				19.4		
Li	mg kg ⁻¹																		24.5		
Lu	mg kg ⁻¹							0.777		0.71		0.829			0.6873				0.81		
Mo	mg kg ⁻¹																				
N	mg kg ⁻¹																				
Nb	mg kg ⁻¹			10	7				11.9	9.59	11	9.6		6.2	8.1877			8.83	11.2		
Nd	mg kg ⁻¹				27			29.4		28.66	21	30.08		18.1	27.144			31.8			
Ni	mg kg ⁻¹	15	15.6							14.39	20			13.3	11.393			15.5	24	0.6	
Os	mg kg ⁻¹																				
Pb	mg kg ⁻¹	4	4.6	0.7			4.42		4.73		4.66			3.8098				4.68	5.1		
Pd	mg kg ⁻¹																				
Pr	mg kg ⁻¹				6		6.36		6.27		6.38			5.9191				6.57			
Pt	mg kg ⁻¹																				
Rb	mg kg ⁻¹		20.1	19			19.5		20.11	16	18.6		17.4	18.731				20.7	15		
Re	mg kg ⁻¹																				
Rh	mg kg ⁻¹																				
Ru	mg kg ⁻¹																				
S	mg kg ⁻¹		35.9													340					
Sb	mg kg ⁻¹													0.4172							
Sc	mg kg ⁻¹		46.6						34.98				43.8				52.5		35		
Se	mg kg ⁻¹																1.5				
Sm	mg kg ⁻¹						7.77		7.53		7.78			6.939			8.18				
Sn	mg kg ⁻¹													5.5925							
Sr	mg kg ⁻¹	254	227.9	233			225		240.87	228	211.38		218	220.72			150	222	237	150	
Ta	mg kg ⁻¹							1.04	0.47		0.549			0.3332			0.57				
Tb	mg kg ⁻¹						1.49		1.4		1.48			1.3467			1.58				
Te	mg kg ⁻¹																				
Th	mg kg ⁻¹	5		0.6	1.9			2.27		2.45		2.38			1.9785			2.25	2.9		
Tl	mg kg ⁻¹																				
Tm	mg kg ⁻¹							0.794		0.73		0.828			0.7001			0.8			
U	mg kg ⁻¹			0.8			0.451		0.51		0.47			0.4014			0.44				
V	mg kg ⁻¹			483.5					414.09	445			337		466		454	417	415		
W	mg kg ⁻¹													0.84							
Y	mg kg ⁻¹		55.9	51			49.5		52.64	61		57.53	53.8	48.495			48.8	50.4	35		
Yb	mg kg ⁻¹							5.13		4.74		5.17			4.7953			5.34			
Zn	mg kg ⁻¹	133	123.4	138					147.64	130			127	142.95			138	123	75		
Zr	mg kg ⁻¹		222.2	217				226	243.26	212		246.43	221	232.67			200	206	208		
		Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;																			
		I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;																			
		T=titrimetry; W=wet chemistry; X=X-ray fluorescence.																			
		Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.																			

		Table 1: GeoPT11 OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																					
		L18	L19	L20	L21	L22	L23	L24	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36	L37	
Round identifier	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	
Sample																							
Technique codes	M,T, X	X	X	A,M,X comb,	M	I	I	A,M F,M,X	AA,X IR,T	AA, IR,T	AA, G,O	AA, M,X											
Test portion (g)	0.1-10	0.75-11.3	1.0-5	0.1-3	0.025-0.5	0.3	0.195	0.195	0.25	0.25-5	0.1-0.5	0.003-5	0.03-0.06	0.004-2	0.2-7	0.174	4	1	1.0-5.0	1.5	10		
Data quality	1	2	2	2	1	2	1	2	2	2	1	2	2	1	2	1	2	2	1	2	1		
SiO ₂	% m/m	48.746	48.71	48.96	48.68	49.59			50.44	45.63		49.47		49.50	48.68	50.24		48.6	49.04	49.19			
TiO ₂	% m/m	2.602	2.67	2.67	2.8	2.681			5.55	2.761	3.01		2.741		2.60	2.79	2.79		2.76	2.39	2.69		
Al ₂ O ₃	% m/m	13.592	13.58	13.65	13.63	13.58			13.44	13.41	13.76	13.73		13.80	13.72	14.06		14.9	13.5	13.62			
Fe ₂ O ₃	% m/m	14.471	14.16	14.84	14.63	14.63		14.07		14.64	15.08	15.45	14.77	13.26	5.20	14.67	14.16		14.7	14.54	14.59		
Fe(II)O	% m/m	9.191				8.8	8.68					XXX	8.96	8.84	8.49								
MnO	% m/m	0.31	0.31	0.31	0.31	0.311				0.317	0.36	0.29	0.29		0.31	0.302	0.313		0.34	0.28	0.317		
MgO	% m/m	5.192	5.11	5.05	5.29	5.19				5.159	5.4	5.03	4.74		5.20	4.91	5.40		8.25	5.1	5.2		
CaO	% m/m	6.61	6.58	6.53	6.91	6.57			4.52	6.569	6.71	6.35	7.05		7.27	6.38	7.16		4.51	6.7	6.65		
Na ₂ O	% m/m	4.198	4.09	4	4.3	4.35		4.34		4.335	3.37	4.34	3.73	3.99	4.27	4.65	3.82		4.82	4.35	4.39		
K ₂ O	% m/m	0.824	0.81	0.84	0.82	0.784			0.783		0.799	0.68	0.77	0.84		0.82	0.815	0.87		0.8	0.85	0.828	
P ₂ O ₅	% m/m	0.474	0.44	0.43	0.46	0.435				0.43	0.56		0.427		0.41	0.449	0.426		0.52	0.44	0.448		
H ₂ O+	% m/m	0.25			2.8	2.64						2.69											
CO ₂	% m/m				0.11	0.24						0.16	0.26				0.19						
LOI	% m/m		2.11	2.34	2	1.99					2.24	1.99	1.95		2.01	2.09	2.04		2.02		2.09		
Ag	mg kg ⁻¹	0.01			0.57																		
As	mg kg ⁻¹	2.5			2.8	2.01	2.908		2.4		6		3	1.8									
Au	mg kg ⁻¹																						
B	mg kg ⁻¹				36							15											
Ba	mg kg ⁻¹	310	473	284	341	290	350	250		299.1	268	354	308	251		311				303			
Be	mg kg ⁻¹	1.2			1.2	1.4	0.911			2.2			1.45										
Bi	mg kg ⁻¹	0.3	89			0.014																	
Br	mg kg ⁻¹					1.6	0.86																
Cd	mg kg ⁻¹	0.2	96		0.31	0.15	0.1528				0.7												
Ce	mg kg ⁻¹	43.57	70		46	44.8		48.1		47.37			51	41.3		39.3			48		43.55		
Cl	mg kg ⁻¹				260	167										151							
Co	mg kg ⁻¹		40		39.1	42.5	53.309	38.6		38.25		48	34	37.3		37.2	65						
Cr	mg kg ⁻¹	32	53		40	53.3	43.891	36		35.04	43	36	35	28.8		26.6	56						
Cs	mg kg ⁻¹	0.55			0.4	0.81	0.6407			0.66	1												
Cu	mg kg ⁻¹	30			26	24.3	23.993			29.75	29	24	34		26.6			24					
Dy	mg kg ⁻¹	9.4			9.17	9.5				9.06			8.7		8.04								
Er	mg kg ⁻¹	5.71			5.53	5.7				5.42			5.3		4.47								
Eu	mg kg ⁻¹	2.41			2.62	2.48		2.53		2.44			2.3	1.93		2.03				2.33			
F	mg kg ⁻¹	730	984		639	0.11																	
Ga	mg kg ⁻¹	21.3	27		19.5	21.9			23.1	20.32	21.9		22		19.4								
Gd	mg kg ⁻¹	9.7			9.22	8.5				8.11			9		8.3								
Ge	mg kg ⁻¹	2	3		2.1	2.24																	
Hf	mg kg ⁻¹	5.6	43		6	5.91		5.67		5.66				4.4		4.43							
Hg	mg kg ⁻¹				0.004	0.0075																	
Ho	mg kg ⁻¹	1.9			1.93	2.01				2.18			1.7		1.64					2.06			
I	mg kg ⁻¹					0.009																	
In	mg kg ⁻¹					0.1	0.11																
Ir	mg kg ⁻¹																						

		Table 1: GeoPT11 OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																			
Round identifier	L18	L19	L20	L21	L22	L23	L24	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36	L37
Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5
Technique codes	M,T, X	X	X	A,M,X comb,	M	I	I	A,M	AA,X	AA,	A,O,X	I	AA,	IR,	X	X	X	X	X	I	
				F,M,X						IR,T			G,O	M,X							
Test portion (g)	0.1-10	0.75-11.3	1.0-5	0.1-3	0.025-0.5	0.3	0.195	0.195	0.25	0.25-5	0.1-0.5	0.003-5	0.03-0.06	0.004-2	0.2-7	0.174	4	1	1.0-5.0	1.5	10
Data quality	1	2	2	2	1	2	1	2	2	2	1	2	2	1	2	1	2	2	1	2	1
La	mg kg ⁻¹	17.68			18.4	18.9	18.008	17.8		18.53			18	16.3		15.9					18.54
Li	mg kg ⁻¹				21	21.2	26.21					24	22								
Lu	mg kg ⁻¹	0.76			0.78	0.95	3.7835	0.834		0.8			0.75	0.74		0.65					0.67
Mo	mg kg ⁻¹	1.9			0.84	0.43	0.5854				1										2.23
N	mg kg ⁻¹																				
Nb	mg kg ⁻¹	9.1	12	14	11	8.7				7.89	9		9.5		7.68		10.6		9		
Nd	mg kg ⁻¹	29.85			31.1	32.2			29.9	30.58			29	24.5		27.2				26	26.85
Ni	mg kg ⁻¹	15	24		15.1	12.5	9.4621			14.82	20	14	16			12	167			20	
Os	mg kg ⁻¹																				
Pb	mg kg ⁻¹	4	61		4.4	5.8	3.7222				7	6	5			3.8		6.3			
Pd	mg kg ⁻¹																				
Pr	mg kg ⁻¹	6.34			6.79	6.9				6.47			7.6		5.34						
Pt	mg kg ⁻¹																				
Rb	mg kg ⁻¹	18.8	618	18	19.7	18.9			27.3	18.96	5	10	18	18.1		17.2		18.1		20	
Re	mg kg ⁻¹																				
Rh	mg kg ⁻¹																				
Ru	mg kg ⁻¹																				
S	mg kg ⁻¹	110	1147							90											
Sb	mg kg ⁻¹	0.2			0.47	0.39	0.3438		0.45												
Sc	mg kg ⁻¹	46			41.2	39	46.017	43.6		44.4			41	42.2		39.7				45	
Se	mg kg ⁻¹				0.03	2.42															
Sm	mg kg ⁻¹	8.05			8.2	8.1		8.21		7.98			6.9	6.75		6.34				7.36	
Sn	mg kg ⁻¹	2.7			2	2.02	1.9012				2		1.7								
Sr	mg kg ⁻¹	220.3	1419	209	229	221	243.9		244	227.5	218	209	218			227		233		228	
Ta	mg kg ⁻¹	0.5	5		0.81	0.67			0.42	0.55				0.41		0.51					1.46
Tb	mg kg ⁻¹	1.65			1.52	1.5		1.34		1.47				1.25		1.31					
Te	mg kg ⁻¹				0.01																
Th	mg kg ⁻¹	2.4			2.5	2.06	1.1715	2.23		2.32	4			1.85		1.6		4.37		1	
Tl	mg kg ⁻¹				0.12	0.22															
Tm	mg kg ⁻¹				0.81	0.88							0.77			0.65					
U	mg kg ⁻¹	0.49	177		0.53	0.45	0.3984			3						0.51				0.01	
V	mg kg ⁻¹	459	401		427	408	541.9		486.4	333		442			429	629					
W	mg kg ⁻¹				1.3	0.8	0.5899			3.5											
Y	mg kg ⁻¹	51.9	1032	53	53.3	49.2	50.563		57.7	43.4		51			49.1	19	53.8		56		
Yb	mg kg ⁻¹	5.26			5.7	5.9		5.26		5.26			5.1	4.49		4.19					4.95
Zn	mg kg ⁻¹	131	116		112	134	144.5				110	140	135			140				136	
Zr	mg kg ⁻¹	231	183	199	195	234	132.8		276	207.2	290		219			169	86	233		232	
Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;																					
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;																					
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.																					
Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.																					

		Table 1: GeoPT11 OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																				
Round identifier	L37	L38	L38	L39	L40	L41	L41	L42	L43	L44	L45	L46	L47	L47	L48	L49	L50	L51	L52	L53	L54	
Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	
Technique codes	I	T,X	T,X	AA,	AA,A	X	X	M,X	A,X	A,M	AA,	X	X	AA,	X	A,IR,	A,M	A,I,	AA,	M,X		
				W,X							A,G,T				A,O,X		M,X		M,X	I,O		
Test portion (g)	1	0.17-6	6	0.1-15	0.5	0.6-6	0.6-6	8.0-10.0	1-1.2	1.0-6.0	0.1	0.5-1.0	1-4.5	4.5	0.2-3	0.4	1.0-2.0	0.2-0.25	0.1-0.8	0.5-5	0.125-3.5	
Data quality	2	1	2	2	1	1	2	2	2	2	2	2	1	2	1	2	2	2	1	1		
SiO ₂	% m/m	49.37		48.9		49.63			47.97	48.9	48.2	50.45	48.89		49.63	49.21	49.6	49.45	49.15		48.913	
TiO ₂	% m/m	2.685		2.74	2.86	2.74		2.79	2.54	2.71	2.71	2.60	2.71		2.63	2.73	2.75	2.67	2.7		2.7334	
Al ₂ O ₃	% m/m	13.66		13.8	12.95	13.53			13.42	13.4	14.5	13.43	13.92		13.54	13.6	13.4	13.25	13.63	13.95	13.427	
Fe ₂ O ₃	% m/m	14.73	14.678		14.4	13.92	14.64		14.7	15.18	14.61	14.7	15.60	14.65		14.69	14.58	14.95	14.03	14.53	14.2	14.8
Fe(II)O	% m/m	8.89		8.32												8.5		9.05				6.28
MnO	% m/m	0.336		0.31	0.35	0.31		0.3	0.297	0.304	0.306	0.33	0.35		0.323	0.31	0.3	0.27	0.305	0.33	0.3132	
MgO	% m/m	5.263		5.13	5.26	5.23			5	5.18	5.16	5.50	5.37		5.1	5.25	5.2	4.99	5.11		5.197	
CaO	% m/m	6.35	6.662		6.26	6.6	6.65		7.16	6.51	6.64	6.5	5.56	6.65		6.8	6.55	6.7	6.45	6.62		6.714
Na ₂ O	% m/m	4.39	4.586		4.13	4.2	4.33			4.55	4.58	4.65	4.11	4.37		4.23	4.25	4.1	4.31	4.3	4.18	4.277
K ₂ O	% m/m	0.74	0.825		0.86	0.8	0.83		0.82	0.778	0.85	0.86	0.82	0.85		0.862	0.86	0.8	0.81	0.818		0.832
P ₂ O ₅	% m/m	0.445		0.46		0.51			0.56	0.464	0.46	0.467	0.45		0.184	0.44	0.44	0.43	0.387		0.4443	
H ₂ O+	% m/m			0.44												2.83						
CO ₂	% m/m															0.175		0.3		0.107		
LOI	% m/m	2.95		1.52		2.21			2.9	2.26	1.92	2.37	2.31		1.99		2		2.093		2.187	
Ag	mg kg ⁻¹																					
As	mg kg ⁻¹	2.5							2	3					6				2.29	2.4		
Au	mg kg ⁻¹																					
B	mg kg ⁻¹																					
Ba	mg kg ⁻¹	322	323.8		296.9	280	340		294	319	323	315	287	277.4		287		260	301	311.1	306	310.3
Be	mg kg ⁻¹					0.15				1.2											1.12	
Bi	mg kg ⁻¹														0.56							
Br	mg kg ⁻¹	1.23																			1.15	
Cd	mg kg ⁻¹				0.12				0.3													
Ce	mg kg ⁻¹		29		45		44	39	41	41.9	48.75		45.5	43.1		46	41	44.1	42.4	42.177		
Cl	mg kg ⁻¹															340						
Co	mg kg ⁻¹	39.9		37	57.8	62			36	30	36	55	27.3			43	35	41.97	34.9			
Cr	mg kg ⁻¹	38.2	36.9		6.2	36			30	22	37	35	32.5		40		64	32	39.23	36.9	59.7	
Cs	mg kg ⁻¹				0.7				0.4	0.52						<1	0.55	0.546	0.17	0.514		
Cu	mg kg ⁻¹	27.3		19.33	32.5			25	19.9	22	35	28	18.6		27	28	33.6	28.97	20	30.3		
Dy	mg kg ⁻¹								6.7	9.4	8.2	9.48			8.68		9.5	8.1		8.2	10.239	
Er	mg kg ⁻¹								4	5.7	4.8	5.52			3.16		5.6	4.8			5.732	
Eu	mg kg ⁻¹								2	2.24	2.27	2.45			2.08		2.8	2	2.48	2.8	2.527	
F	mg kg ⁻¹		523		1060										710	640						
Ga	mg kg ⁻¹				20		22	18.6	20			20.9			20	20.5	20.5			19.6		
Gd	mg kg ⁻¹							7.8	8.4	7.5	8.76			8.89		9.3	8.7	9.18		9.108		
Ge	mg kg ⁻¹							8.3							1			1.63				
Hf	mg kg ⁻¹	5.6			7			3.4	6	5			8.2			5.2		5.63	5.4	5.468		
Hg	mg kg ⁻¹							1.7														
Ho	mg kg ⁻¹							1.4	1.7	1.9	1.68			1.75		2	1.9	2.22		2.1		
I	mg kg ⁻¹																					
In	mg kg ⁻¹																					
Ir	mg kg ⁻¹																					

		Table 1: GeoPT11 OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																			
Round identifier	L37	L38	L38	L39	L40	L41	L41	L42	L43	L44	L45	L46	L47	L47	L48	L49	L50	L51	L52	L53	L54
Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5
Technique codes	I	T,X	T,X	AA,	AA,A	X	X	M,X	A,X	A,M	AA,	X	X	AA,	X	A,IR,	A,M	A,I,	AA,	M,X	
				W,X							A,G,T				A,O,X		M,X		M,X	I,O	
Test portion (g)	1	0.17-6	6	0.1-15	0.5	0.6-6	0.6-6	8.0-10.0	1-1.2	1.0-6.0	0.1	0.5-1.0	1-4.5	4.5	0.2-3	0.4	1.0-2.0	0.2-0.25	0.1-0.8	0.5-5	0.125-3.5
Data quality	2	1	2	2	1	1	2	2	2	2	2	2	1	2	1	2	2	2	1	1	
La	mg kg ⁻¹		3		75		16	16.9	16.9	17.2	21.94		35	12.9		19	19.5	18.17	17.86	18.482	
Li	mg kg ⁻¹			21.07	16.5						24					21	19.6	23.5			
Lu	mg kg ⁻¹								0.5	0.72	0.74	0.72			0.69		0.8		0.803	0.79	
Mo	mg kg ⁻¹				3.7				0.4		0.8	5							0.43		
N	mg kg ⁻¹																				
Nb	mg kg ⁻¹		11.5				13		9.1	12	7.5		8.5		8		12		9.77		8.703
Nd	mg kg ⁻¹						27	31	25	28	26.9	30.07		27.3		31	27	29.47	27.2	27.312	
Ni	mg kg ⁻¹		15.9		9.7		15	17	14	18	20	13.8		8		13	14.6	19.23		13.7	
Os	mg kg ⁻¹																				
Pb	mg kg ⁻¹		5.2		3.4		10	4.2			2	4.4		6			4.5	5.42		4.658	
Pd	mg kg ⁻¹							2.1													
Pr	mg kg ⁻¹								6	6.3	6.1	6.08		7.1		6.2	5.6	6.57		5.743	
Pt	mg kg ⁻¹																				
Rb	mg kg ⁻¹	24.9	20.3		22.73	16		19	21.5	25	19	20	19.2		33		19	18	20.03	3.1	19.19
Re	mg kg ⁻¹																				
Rh	mg kg ⁻¹																				
Ru	mg kg ⁻¹																				
S	mg kg ⁻¹															140			110		
Sb	mg kg ⁻¹	0.41							0.9		0.3					26		0.35	0.42		
Sc	mg kg ⁻¹	44.1					40		41	44.9		42.2				37		42.7	44.06	47.58	
Se	mg kg ⁻¹																				
Sm	mg kg ⁻¹								6.6	7.4	7.5	8.95		7.35		8.1	6.7	8.12	7.8	8.011	
Sn	mg kg ⁻¹								27		2								1.85		
Sr	mg kg ⁻¹	227		225	220	250		229	232	215	222	227	223		214		209	226	231.3		227.5
Ta	mg kg ⁻¹								0.3		0.54						0.6		0.55	0.48	0.553
Tb	mg kg ⁻¹								1.1	1.56	1.42	1.53			1		1.5		1.56	1.62	1.605
Te	mg kg ⁻¹								0.3												
Th	mg kg ⁻¹	2.08							1.1	7	2.2						2.1		2.24	2.43	2.329
Tl	mg kg ⁻¹								0.1									0.1			
Tm	mg kg ⁻¹								0.6		0.8	0.74		0.74		0.9		0.94		0.818	
U	mg kg ⁻¹								0.2		0.4						0.4		0.472	0.41	0.445
V	mg kg ⁻¹	455.5		319	505	505		624	403	364	455	399	453.3				468	395	438.3	520	441.4
W	mg kg ⁻¹									0.5		0.7	12						1.87		
Y	mg kg ⁻¹	49.6		41.5			55	53	62	53	50.5	57.84	53.9		46.3		51	43.5	62.73		54.613
Yb	mg kg ⁻¹									3.9	4.67	4.6	5.30		4.97		5	4.6	5.75	5.21	5.007
Zn	mg kg ⁻¹	152	134.5		112.4	132	140		134	139	119	132	131	201.7		125		117	125	137.2	125.3
Zr	mg kg ⁻¹		217.9		218.1	310	240		211	259	226	215		216.2		220		226	207	226.5	204.7
Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;																					
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;																					
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.																					
Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.																					

		Table 1: GeoPT11 OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																						
Round identifier	L55	L55	L56	L57	L57	L58	L59	L60	L61	L62	L63	L64	L65	L66	L67	L68	L68	L69	L69	L70	L71			
Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5			
Technique codes	AA,A,E	AA,A,E	A,W	X	X	A	AA,	X	M,X	X	X	M	E,O,X	O,X	X	A,IR,	A,IR,	M,X	M	X	X			
	M,O,X	M,O,X					A,M,O									T,X	T,X							
Test portion (g)	0.1-1.2	0.1-1.2	0.5-1	1.6	1.6	0.05-0.5	0.25-0.5	6.3	0.04-1.2	1	0.7	0.1	0.06-8	0.01-0.7	0.28-6	0.1-7.5	0.1-7.5	0.1-0.3	0.1	1.0-10.0	1.2-9			
Data quality	1	2	1	1	2	2	2	2	1	1	1	1	2	1	1	1	2	1	2	1	1			
SiO ₂	% m/m	39.2		47.64	49.185			49.5	51.71	49.02	48.98	49.17		48.553	48.23	50.02	49.36		48.97		48.93	48.637		
TiO ₂	% m/m	2.8		2.89	2.665			2.667	2.68	2.805	2.75	2.83	2.7131	2.69	2.824	2.73	2.7	2.61		2.701		2.66	2.6887	
Al ₂ O ₃	% m/m	13.66		13.33	13.535			13.66	13.5	13.52	13.41	13.58	13.57		13.971	13.32	13.95	13.67		13.51		13.7	13.608	
Fe ₂ O ₃	% m/m	14.42		16.50	14.27			14.64	14.7	15.243	14.77	14.46	14.65		14.612	14.3	14.95	14.59		14.53		14.47	14.424	
Fe(II)O	% m/m														9.014	8.77		8.63						
MnO	% m/m			0.3	0.27	0.323			0.314	0.31	0.3327	0.32	0.31	0.3112	0.3	0.273	0.3	0.31	0.317		0.309		0.306	0.3087
MgO	% m/m			5.27	5.37	5.1			5.223	5.05	6.75	5.18	4.7	5.163		5.078	4.83	5.37	5.18		5.066		5.12	5.549
CaO	% m/m	6.614		6.77	6.605			6.687	6.5	6.899	6.63	6.73	6.676		6.69	6.56	6.48	6.63		6.582		6.63	6.747	
Na ₂ O	% m/m	4.1		4.21	4.305			4.341	4.25		4.13	3.28	4.37		4.016	4.19	3.49	4.29		4.321		4.38	4.209	
K ₂ O	% m/m	0.79		0.75	0.81			0.789	0.85	0.8244	0.85	0.85	0.831		0.801	0.82	0.83	0.87		0.822		0.85	0.832	
P ₂ O ₅	% m/m			0.426		0.427			0.44	0.5919	0.43	0.47	0.4392		0.431	0.43	0.43	0.429		0.437		0.46	0.4252	
H ₂ O+	% m/m																2.22		2.64					
CO ₂	% m/m																0.22	0.18						
LOI	% m/m			2.05	2.18	2.06			2.05		2.12	4.25			3.235	2.19	2	2.1				2.1	1.99	
Ag	mg kg ⁻¹	0.03																						
As	mg kg ⁻¹	4							2								2							
Au	mg kg ⁻¹																							
B	mg kg ⁻¹	11.2													428									
Ba	mg kg ⁻¹	357		288		324.5	315	330.8	308.2	410	314.3	317	3.5	285	314	321				296.1	307	233		
Be	mg kg ⁻¹	3.75							1.3		1.4							1.06						
Bi	mg kg ⁻¹								0.02		0.02					0								
Br	mg kg ⁻¹																							
Cd	mg kg ⁻¹	0.2							0.15					0.186		0								
Ce	mg kg ⁻¹	44.79		38		42.3	54.8	47.4					50.2	41.3	107		44.4		42.49		43			
Cl	mg kg ⁻¹				160											93			138					
Co	mg kg ⁻¹	45		31																		46		
Cr	mg kg ⁻¹	68		41					39		32.5	79	43.1	46.3	32	50	55	42					37	
Cs	mg kg ⁻¹	0.56							34		0.59			0.53		0							0.498	
Cu	mg kg ⁻¹	31		23		0.55	28.9	30.6			24.5	35.5	57	29	30	25								
Dy	mg kg ⁻¹	8.01							25		9.73			10.4	7.75	7			10.7	8.995				
Er	mg kg ⁻¹	4.55							9.7		5.85			5.84	4.32	3			5.59	5.452				
Eu	mg kg ⁻¹	1.67							5.35		2.32			2.26	1.99	2			2.6				2.333	
F	mg kg ⁻¹	500							2.3					1100	1125				666					
Ga	mg kg ⁻¹	29.3		22		600	21.7	20.7			20.4	21.5	21	22		22						21		
Gd	mg kg ⁻¹	8.67							21		8.69			8.56	8.18	5			9.31	8.625				
Ge	mg kg ⁻¹			1.7					8.95					3.02	2									
Hf	mg kg ⁻¹	5.09							1.6		5.76			5.88	3.6	8			6.11	5.719				
Hg	mg kg ⁻¹	0.011							5.2															
Ho	mg kg ⁻¹	1.59									2.01			2.03	1.52	1			2.02		1.906			
I	mg kg ⁻¹								1.7															
In	mg kg ⁻¹													0.079										
Ir	mg kg ⁻¹								0.11															

		Table 1: GeoPT11 OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.																					
		L55	L55	L56	L57	L57	L58	L59	L60	L61	L62	L63	L64	L65	L66	L67	L68	L68	L69	L69	L70	L71	
Round identifier	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	
Sample	AA,A,E	AA,A,E	A,W	X	X	A	AA,	X	M,X	X	X	M	E,O,X	O,X	X	A,IR,	A,IR,	M,X	M	X	X		
Technique codes	M,O,X	M,O,X					A,M,O									T,X	T,X						
Test portion (g)	0.1-1.2	0.1-1.2	0.5-1	1.6	1.6	0.05-0.5	0.25-0.5	6.3	0.04-1.2	1	0.7	0.1	0.06-8	0.01-0.7	0.28-6	0.1-7.5	0.1-7.5	0.1-0.3	0.1	1.0-10.0	1.2-9		
Data quality	1	2	1	1	2	2	2	2	1	1	1	1	2	1	1	1	2	1	2	1	1		
La	mg kg ⁻¹	18.37			19					18.9			18.9	17.4	2		18.8		17.11				
Li	mg kg ⁻¹	21					23.9	16.9		22.4				20.9	0								
Lu	mg kg ⁻¹	0.55						22.5		0.97			0.86	0.48				0.69		0.757			
Mo	mg kg ⁻¹		0.72					0.69		0.4			0.47	1.26	3								
N	mg kg ⁻¹							0.4															
Nb	mg kg ⁻¹	10			8				10.56		14.3	8.88	4.2	8	10			10	8.51		9		
Nd	mg kg ⁻¹	27.77						7.9	31.6		30.3	26.5	29			31.3			28.13				
Ni	mg kg ⁻¹	16.8		11			28.1	18.6	24.7	10	11.2	19.6	15	7	2	16				16			
Os	mg kg ⁻¹						13																
Pb	mg kg ⁻¹	3.89			17				4.61			6.95	3.4	7			12	5.32		6			
Pd	mg kg ⁻¹						4																
Pr	mg kg ⁻¹	6.23							6.78			6.3	5.94	8			6.26	5.985					
Pt	mg kg ⁻¹							5.8									20						
Rb	mg kg ⁻¹	16			15			18.2	19.07	18.2	18.4	21.9	19.3	16	20	30			21.13		21		
Re	mg kg ⁻¹																						
Rh	mg kg ⁻¹																						
Ru	mg kg ⁻¹																	11					
S	mg kg ⁻¹			110										6									
Sb	mg kg ⁻¹						0.39							8		41.9							
Sc	mg kg ⁻¹	40					43		41.8		41.1	46.1	35	43				43.8		36			
Se	mg kg ⁻¹						0.8									7.75							
Sm	mg kg ⁻¹	7.33					7.4		8.14			7.65	6.9	9				7.465					
Sn	mg kg ⁻¹	2.3					1.9		2.04			2.46	2	2		231							
Sr	mg kg ⁻¹	227			229		234.7	225	227.6	217.7	266.5	232	240	247	227	225			196.4		227	215	
Ta	mg kg ⁻¹		1.03					0.55		0.56			0.54	0.27	0			1.65	0.526				
Tb	mg kg ⁻¹	1.31						1.5		1.55			1.53	1.28	2				1.429				
Te	mg kg ⁻¹																4						
Th	mg kg ⁻¹	1.6						2.1		2.41			2.32	1.39	0				2.113		2.3		
Tl	mg kg ⁻¹							0.11		0.15			0.13			0.73							
Tm	mg kg ⁻¹	0.64						0.7		0.96			0.85	0.59			2	0.763					
U	mg kg ⁻¹	0.35						0.45		0.55			0.47	0.31	1		451		0.424				
V	mg kg ⁻¹		450		435			450	523	451.9		452.1	473	350	460	967				478	475		
W	mg kg ⁻¹	0.84						0.6		0.89			1.14		1			49					
Y	mg kg ⁻¹		51		53			48	54.57	54.7	48.8	54.8	56.9	44.4	42	56	4.68		49.5		52		
Yb	mg kg ⁻¹	4.19						4.9		6.13			5.77	3.76	7			157		4.98			
Zn	mg kg ⁻¹		128.4		131		128.3	128	136.5	147.8		130.2	154	91.4	141	138		217			144		
Zr	mg kg ⁻¹		225		219		212	215	229	216.5	197.5	220.8	207	201	221	225			221.2		220		
Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;																							
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;																							
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.																							
Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.																							

		Table 1: GeoPT11													
		OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.													
		L72	L72	L73	L74	L75	L76	L77	L78	L79	L80	L81	L82	L82	L83
Round identifier		OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5
Sample		X	X	M	M,X	X	M,V,X	X	M,X	M	A	X	ir,M,T	AA	
Technique codes															
Test portion (g)	1.0-20.0	20	0.1	0.1-12	8	0.2-7.0	0.02-0.4	1.2	0.1-10	0.25	0.1-1	4	0.2-0.45	0.1	
Data quality	1	2	1	2	2	1	1	1	1	1	2	1	2	1	
SiO ₂	% m/m	48.56			49.1		48.916	48.44	49.16	49.33		47.3	49.11		48.46
TiO ₂	% m/m	2.71			2.7		2.705	2.87	2.65	2.67		2.74	2.74		
Al ₂ O ₃	% m/m	13.41			13.51	13.83	13.969	13.34	13.70	13.62		13.6	13.96		6.61
Fe ₂ O ₃	% m/m	14.5			14.57		14.675	14.84	14.50	14.43		15.7	14.62		8.79
Fe(II)O	% m/m						8.657							30.37	
MnO	% m/m	0.31			0.3162	0.31	0.296	0.31	0.31	0.31		0.32	0.31		0.32
MgO	% m/m	4.98			5.05		4.968	5.16	5.23	5.16		5.3	5.21		7.06
CaO	% m/m	6.55			6.63	6.17	6.634	6.78	6.68	6.62		7.03	6.69		6.75
Na ₂ O	% m/m	4.17			4.29	3.89	4.446	3.95	4.44	4.32		4.5	4.58		3.96
K ₂ O	% m/m	0.85			0.83	0.71	0.836	0.81	0.85	0.83		0.97	0.88		0.79
P ₂ O ₅	% m/m	0.46			0.45		0.471	0.43	0.44	0.46		0.46	0.41		
H ₂ O+	% m/m													2.70	
CO ₂	% m/m													0.2	
LOI	% m/m	1.82			2.05	2.28	1.94		1.99	1.93		2.18	2.3		
Ag	mg kg ⁻¹						0.07		0.06						
As	mg kg ⁻¹				1		1.87					20			
Au	mg kg ⁻¹														
B	mg kg ⁻¹											26			
Ba	mg kg ⁻¹	368	312.55	312		303	337	338	304.4	324	361		307.04		
Be	mg kg ⁻¹		1.46	1.2439						1.51		3			
Bi	mg kg ⁻¹			2					0.067						
Br	mg kg ⁻¹														
Cd	mg kg ⁻¹		0.22	0.1516					0.21		10				
Ce	mg kg ⁻¹	40	42.2	42.9		45.32	45.4	21	45	45.6			45.12		
Cl	mg kg ⁻¹														
Co	mg kg ⁻¹	78	37.8	36.542		42	39.2	36		37.5	66		39.52		
Cr	mg kg ⁻¹	26	40.9	79		53	34.5	59	40.6		38		42.34		
Cs	mg kg ⁻¹		0.61	0.45			0.51		0.58				0.61		
Cu	mg kg ⁻¹	19	61.2	30		21	28.6		27.4		48		30.07		
Dy	mg kg ⁻¹		9.16	9.61		7.72	9.55		9.9	9.35			9.64		
Er	mg kg ⁻¹		5.24	5.75		4.22	5.74		5.69	6.06			5.81		
Eu	mg kg ⁻¹		2.38	2.4		2.32	2.37		2.57				2.68		
F	mg kg ⁻¹														
Ga	mg kg ⁻¹	21	22.2	22			21.2	21	21.7	22.7			20.29		
Gd	mg kg ⁻¹		6.83	8.99		6.84	8.7		8.71				9.36		
Ge	mg kg ⁻¹			2			1.9								
Hf	mg kg ⁻¹		6.28	6.4			5.65		5.56	5.58			5.89		
Hg	mg kg ⁻¹														
Ho	mg kg ⁻¹			2.06	2		1.77	2.06		2.06	2.04		2.16		
I	mg kg ⁻¹														
In	mg kg ⁻¹														
Ir	mg kg ⁻¹														

Table 1: GeoPT11												
OU-5 Leiton dolerite: Results submitted by laboratories to the GeoPT11 round.												
								Late	Late	Late	Late	Late
Round identifier	L72	L72	L73	L74	L75	L76	L77	L78	L79	L80	L81	L82
Sample	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5	OU-5
Technique codes	X	X	M	M,X	X	M,V,X	X	M,X	M	A	X	ir,M,T
												AA
Test portion (g)	1.0-20.0	20	0.1	0.1-12	8	0.2-7.0	0.02-0.4	1.2	0.1-10	0.25	0.1-1	4
Data quality	1	2	1	2	2	1	1	1	1	2	1	2
La	mg kg ⁻¹		82	17.8	16.8		16.56	18.5		18.9	17.9	
Li	mg kg ⁻¹				22.418				22.8		19	25.34
Lu	mg kg ⁻¹			0.87	0.8		0.75	0.81		0.74	0.74	
Mo	mg kg ⁻¹				0.52				0.56		52	
N	mg kg ⁻¹											
Nb	mg kg ⁻¹	10		10.8	8.34		8	9.22	20	8.48	8.40	45
Nd	mg kg ⁻¹			31.1	29		26.14	30.2		29.9	29.0	
Ni	mg kg ⁻¹		34	20.6	14		19	13.2	12	15		7.8
Os	mg kg ⁻¹											
Pb	mg kg ⁻¹	4		4.94	4		5	4.41		4.29		121
Pd	mg kg ⁻¹											
Pr	mg kg ⁻¹			6.39	6		5.63	6.37		6.53	6.40	
												6.73
Pt	mg kg ⁻¹											
Rb	mg kg ⁻¹	21		21.8	19		19	19.5	27	19.4	19.2	
Re	mg kg ⁻¹											
Rh	mg kg ⁻¹											
Ru	mg kg ⁻¹											
S	mg kg ⁻¹		56									
Sb	mg kg ⁻¹						0.39	0.46				
Sc	mg kg ⁻¹	43		41.6	40		42.4		44.9			44.00
Se	mg kg ⁻¹											
Sm	mg kg ⁻¹			7.91	7.66		7.01	8.05		8.24	7.15	
Sn	mg kg ⁻¹				1.85			2		2.34		
Sr	mg kg ⁻¹	232		218	235		239	228	240	228	232	214
Ta	mg kg ⁻¹			0.68	0.2			0.56		0.58	0.303	
Tb	mg kg ⁻¹			1.5	1.47		1.22	1.59		1.54	1.47	
Te	mg kg ⁻¹											
Th	mg kg ⁻¹			2.59	2.5		2	2.25		2.31	2.33	
Tl	mg kg ⁻¹			0.17	0.0926			0.13		0.12		
Tm	mg kg ⁻¹			0.91	0.82		0.66	0.83		0.86	0.847	
U	mg kg ⁻¹			0.42	0.49			0.46		0.45	0.528	
V	mg kg ⁻¹		425	448	422		446	443		468		541
W	mg kg ⁻¹			0.66								0.67
Y	mg kg ⁻¹	54		55.3	48.2		45	54.6	70	52.4	48.5	43
Yb	mg kg ⁻¹				5.92	5.27		4.4		5.36		5.18
Zn	mg kg ⁻¹			140	150	143		139	131	128	140.2	
Zr	mg kg ⁻¹			226	221	224		233	223	242	223.5	210
												218
Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;												
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;												
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.												
Results L80 to L83 were submitted too late to contribute to the assessment of assigned values.												

Table 2 GeoPT 11 (OU-5 Leiton dolerite)
Assigned values and robust statistical analysis of contributed data

Element	X _a % m/m	H _a % m/m	sdm % m/m	H _a /s	Status	Element	X _a mg kg ⁻¹	H _a mg kg ⁻¹	sdm mg kg ⁻¹	H _a /s	Status
SiO ₂	49.10	0.547	0.075	0.136	Full	Hf	5.59	0.35	0.13	0.381	Full
TiO ₂	2.718	0.047	0.010	0.206	Full	Ho	1.92	0.14	0.04	0.260	Full
Al ₂ O ₃	13.62	0.184	0.027	0.148	Full	La	18.10	0.94	0.23	0.250	Full
Fe ₂ O ₃	14.60	0.195	0.032	0.164	Full	Li	21.74	1.09	0.55	0.505	Full
Fe(II)O	8.74	0.126	0.055	0.440	Full	Lu	0.767	0.064	0.015	0.241	Full
MnO	0.310	0.007	0.001	0.180	Full	Nb	9.58	0.55	0.26	0.469	Full
MgO	5.17	0.081	0.019	0.236	Full	Nd	28.47	1.38	0.37	0.271	Full
CaO	6.63	0.100	0.017	0.173	Full	Ni	15.00	0.80	0.61	0.758	Full
Na ₂ O	4.29	0.069	0.018	0.259	Full	Pb	4.66	0.30	0.15	0.499	Full
K ₂ O	0.826	0.017	0.004	0.219	Full	Pr	6.29	0.38	0.08	0.198	Full
P ₂ O ₅	0.440	0.010	0.002	0.231	Full	Rb	19.29	0.99	0.31	0.315	Full
LOI	2.08	0.037	0.017	0.461	Full	Sb	0.420	0.040	0.020	0.500	Full
	mg kg ⁻¹	mg kg ⁻¹	mg kg ⁻¹			Sc	42.4	1.9	0.5	0.274	Full
As	2.45	0.17	0.16	0.930	Provisional	Sm	7.64	0.45	0.10	0.229	Full
Ba	309.2	10.4	3.4	0.329	Full	Sn	2.00	0.14	0.04	0.290	Full
Be	1.31	0.10	0.07	0.659	Full	Sr	226.8	8.0	1.4	0.173	Full
Cd	0.20	0.02	0.02	0.940	Provisional	Ta	0.546	0.048	0.033	0.696	Provisional
Ce	44.17	2.00	0.56	0.280	Full	Tb	1.46	0.11	0.02	0.215	Full
Co	38.60	1.78	0.71	0.401	Full	Th	2.25	0.159	0.046	0.291	Full
Cr	38.40	1.77	1.16	0.653	Full	Tl	0.125	0.014	0.011	0.783	Provisional
Cs	0.555	0.048	0.022	0.447	Full	Tm	0.789	0.065	0.022	0.329	Full
Cu	27.32	1.33	0.75	0.562	Full	U	0.500	0.044	0.000	0.400	Full
Dy	9.04	0.52	0.17	0.330	Full	V	447.8	14.3	6.4	0.449	Full
Er	5.49	0.34	0.07	0.200	Full	W	0.865	0.071	0.100	1.415	Provisional
Eu	2.35	0.17	0.04	0.247	Full	Y	51.8	2.3	0.7	0.298	Full
Ga	21.2	1.1	0.2	0.158	Full	Yb	5.10	0.32	0.10	0.318	Full
Gd	8.64	0.50	0.10	0.209	Full	Zn	133.6	5.1	1.5	0.297	Full
Ge	2.03	0.15	0.08	0.545	Provisional	Zr	219.9	7.8	2.0	0.261	Full

X_a=assigned value calculated as the robust mean of submitted data.

H_a=target precision calculated using a modified version of the Horwitz equation for Data quality 1 (H_a=0.01X_a^{0.8495}).

sdm=standard deviation of the mean calculated from submitted data using robust statistics.

Full=full assigned value, provisional = provisional assigned value (additional uncertainty).

		Table 3 GeoPT11 OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round												
Labs		L1	L2	L3	L3	L4	L5	L6	L7	L7	L8	L9	L10	L10
Technique codes		X	X	X	X	X	AA,C,T	M	M	AA,M,	IR,T,X	M	M	T,X
Test portion (g)		0.7-5	1	0.7-10	10	0.02-0.7	0.5	0.05-0.5	0.1	0.1	0.1-0.75	0.1-0.8	0.1	0.1
Data quality		2	2	1	2	2	1	1	1	2	1	2	1	2
SiO ₂	% m/m	0.34	1.90	-0.06	*	-0.22	0.73	1.29	*	*	0.65	-0.02	*	*
TiO ₂	% m/m	0.45	1.84	-1.89	*	-1.27	0.04	0.89	*	*	-0.18	-0.09	*	*
Al ₂ O ₃	% m/m	0.09	-1.43	0.17	*	6.79	-1.17	3.02	*	*	0.56	-0.37	*	*
Fe ₂ O ₃	% m/m	0.13	2.06	0.05	*	0.52	-0.50	-48.81	*	*	-0.53	-0.41	*	*
Fe(II)O	% m/m	*	*	*	*	*	*	0.03	*	*	-1.48	-0.18	*	*
MnO	% m/m	0.68	-8.79	-1.08	*	-2.64	4.06	0.00	*	*	-0.27	-0.07	*	*
MgO	% m/m	-0.47	1.64	-0.35	*	-10.75	-0.44	-1.06	*	*	1.04	-0.03	*	*
CaO	% m/m	-0.04	-6.56	0.04	*	0.86	-0.89	0.71	*	*	-0.49	0.11	*	*
Na ₂ O	% m/m	0.65	-1.31	0.65	*	*	2.47	15.38	*	*	1.60	0.44	*	*
K ₂ O	% m/m	0.41	1.29	0.06	*	-3.71	0.82	4.35	*	*	1.70	0.12	*	*
P ₂ O ₅	% m/m	0.50	3.01	-0.80	*	*	2.01	13.06	*	*	2.21	-0.50	*	*
LOI	% m/m	0.87	3.97	0.67	*	*	0.94	2.02	*	*	-9.55	-0.74	*	*
As	mg/kg	*	*	*	13.58	*	*	*	*	*	*	*	*	*
Ba	mg/kg	2.44	*	*	0.81	-0.54	*	*	-0.11	*	1.77	0.76	0.51	*
Be	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Cd	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Ce	mg/kg	*	*	*	*	-1.04	*	*	0.57	*	1.06	1.96	0.94	*
Co	mg/kg	-1.57	*	*	-3.40	*	*	*	*	*	-0.21	-0.45	*	*
Cr	mg/kg	1.30	*	*	0.45	21.87	*	*	*	*	-2.82	-2.65	*	*
Cs	mg/kg	*	*	*	*	*	*	*	-0.38	*	0.73	*	0.05	*
Cu	mg/kg	-0.12	*	-2.05	*	1.39	*	*	*	*	2.73	-1.63	*	*
Dy	mg/kg	*	*	*	*	*	*	*	0.72	*	-0.68	*	1.74	*
Er	mg/kg	*	*	*	*	*	*	*	0.42	*	-0.81	*	0.37	*
Eu	mg/kg	*	*	*	*	*	*	*	0.51	*	-0.40	*	0.45	*
Ga	mg/kg	*	*	*	-0.33	0.14	*	*	*	*	0.55	0.37	*	*
Gd	mg/kg	*	*	*	*	*	*	*	1.00	*	-0.50	*	0.76	*
Ge	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Hf	mg/kg	*	*	*	*	*	*	*	*	0.10	-1.20	*	0.74	*
Ho	mg/kg	*	*	*	*	*	*	*	0.00	*	-0.93	*	0.65	*
La	mg/kg	*	*	*	*	-1.12	*	*	0.11	*	0.64	4.75	-0.04	*
Li	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Lu	mg/kg	*	*	*	*	*	*	*	0.16	*	-0.89	*	0.97	*
Nb	mg/kg	*	*	0.77	*	-2.37	*	*	*	2.13	0.02	1.30	0.03	*
Nd	mg/kg	*	*	*	*	-0.53	*	*	0.68	*	0.14	-2.71	1.17	*
Ni	mg/kg	0.00	*	0.75	*	*	*	*	*	*	-0.76	3.13	*	*
Pb	mg/kg	-1.11	*	-0.20	*	-6.70	*	*	-0.81	*	0.24	*	0.00	*
Pr	mg/kg	*	*	*	*	-0.38	*	*	0.19	*	-0.05	*	0.24	*
Rb	mg/kg	*	*	0.82	*	-0.15	*	*	0.21	*	0.83	-1.67	-0.70	*
Sb	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Sc	mg/kg	*	*	*	1.10	*	*	*	*	*	-3.83	*	*	*
Sm	mg/kg	*	*	*	*	*	*	*	0.29	*	-0.25	*	0.31	*
Sn	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Sr	mg/kg	1.69	*	0.13	*	0.39	*	*	-0.23	*	1.75	0.07	-1.93	*
Ta	mg/kg	*	*	*	*	*	*	*	*	5.17	-1.58	*	0.07	*
Tb	mg/kg	*	*	*	*	*	*	*	0.25	*	-0.57	*	0.16	*
Th	mg/kg	8.63	*	-5.18	-1.10	*	*	*	0.13	*	1.26	*	0.82	*
Tl	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Tm	mg/kg	*	*	*	*	*	*	*	0.08	*	-0.90	*	0.60	*
U	mg/kg	*	*	4.00	*	*	*	*	-0.30	*	1.10	*	0.20	*
V	mg/kg	*	*	1.25	*	*	*	*	*	*	-2.36	-0.10	*	*
W	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Y	mg/kg	*	*	1.78	*	-0.18	*	*	-1.02	*	0.36	2.00	*	1.25
Yb	mg/kg	*	*	*	*	*	*	*	0.09	*	-1.14	*	0.21	*
Zn	mg/kg	-0.06	*	-1.99	*	0.43	*	*	*	*	2.75	-0.35	*	*
Zr	mg/kg	*	*	0.30	*	-0.19	*	*	*	0.39	2.99	-0.51	*	1.70

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

*=no data reported

		Table 3 GeoPT11 OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round												
Labs		L11	L12	L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22
Technique codes		T,X	M	M	IR,X	X	M,T,X	X	A,X	M,T,X	X	X	A,M,X	comb, F,M,X
Test portion (g)		0.6-5.4	0.1	0.1	0.1-0.7	5	0.05-0.7	0.8-8	1-1.5	0.1-10	0.75-11.3	1.0-5	0.1-3	0.025-0.5
Data quality		2	1	2	2	2	2	2	2	1	2	2	2	1
SiO ₂	% m/m	0.55	*	*	-0.78	-6.31	0.32	0.11	0.39	-0.65	-0.36	-0.13	-0.39	0.89
TiO ₂	% m/m	0.08	*	*	2.05	-1.48	0.12	0.34	-0.30	-2.49	-0.52	-0.52	0.87	-0.80
Al ₂ O ₃	% m/m	0.39	*	*	0.72	-5.92	0.23	-0.18	0.09	-0.13	-0.10	0.09	0.04	-0.19
Fe ₂ O ₃	% m/m	-0.48	*	*	0.18	4.34	0.49	-0.51	-0.23	-0.65	-1.12	0.62	0.08	0.16
Fe(II)O	% m/m	-0.26	*	*	*	*	*	*	*	3.61	*	*	0.25	-0.45
MnO	% m/m	-0.74	*	*	-0.68	-3.38	-1.35	-0.07	0.68	0.00	0.00	0.00	0.00	0.14
MgO	% m/m	-0.22	*	*	-2.70	5.98	-0.22	0.34	-0.22	0.33	-0.34	-0.71	0.77	0.31
CaO	% m/m	0.68	*	*	3.87	0.51	-0.14	0.66	-0.04	-0.19	-0.24	-0.50	1.41	-0.59
Na ₂ O	% m/m	-0.35	*	*	0.58	-5.44	-1.81	-6.02	0.51	-1.34	-1.45	-2.10	0.07	0.87
K ₂ O	% m/m	0.26	*	*	3.65	-8.41	0.70	0.70	0.41	-0.12	-0.47	0.41	-0.18	-2.47
P ₂ O ₅	% m/m	-0.50	*	*	7.53	*	0.00	1.10	0.00	3.41	0.00	-0.50	1.00	-0.50
LOI	% m/m	-1.55	*	*	2.89	*	-0.74	-2.35	-2.08	*	0.47	3.56	-1.01	-2.29
As	mg/kg	*	*	*	*	*	*	5.11	-1.61	0.29	*	*	1.02	-2.57
Ba	mg/kg	0.76	-2.35	*	*	-1.88	1.09	*	-4.75	0.08	7.85	-1.21	1.52	-1.84
Be	mg/kg	*	*	*	*	*	0.84	*	*	-1.10	*	*	-0.55	0.89
Cd	mg/kg	*	*	*	*	*	*	*	*	0.00	2350.23	*	2.70	-2.45
Ce	mg/kg	-4.42	-1.29	*	*	*	0.81	*	*	-0.30	6.46	*	0.46	0.32
Co	mg/kg	2.75	-0.35	*	*	*	0.90	*	0.39	*	0.39	*	0.14	2.19
Cr	mg/kg	-3.04	-6.00	*	*	*	0.00	3.55	-6.60	-3.61	4.12	*	0.45	8.40
Cs	mg/kg	*	*	*	*	*	-0.15	*	*	-0.09	*	*	-1.59	5.27
Cu	mg/kg	0.14	*	-0.89	*	*	5.90	*	*	2.02	*	*	-0.50	-2.27
Dy	mg/kg	*	-1.00	*	*	*	0.15	*	*	0.69	*	*	0.12	0.88
Er	mg/kg	*	-1.12	*	*	*	-0.55	*	*	0.66	*	*	0.06	0.63
Eu	mg/kg	*	0.47	*	*	*	0.17	*	*	0.39	*	*	0.83	0.82
Ga	mg/kg	0.23	-0.20	*	*	*	0.09	-1.96	*	0.09	2.71	*	-0.80	0.65
Gd	mg/kg	*	-0.80	*	*	*	-0.10	*	*	2.13	*	*	0.58	-0.28
Ge	mg/kg	*	0.00	*	*	*	0.44	*	*	-0.22	3.31	*	0.23	1.42
Hf	mg/kg	*	-2.50	*	*	*	-0.01	*	*	0.02	54.17	*	0.59	0.92
Ho	mg/kg	*	-1.01	*	*	*	0.25	*	*	-0.14	*	*	0.04	0.65
La	mg/kg	2.14	-1.15	*	*	*	0.70	*	*	-0.45	*	*	0.16	0.86
Li	mg/kg	*	*	*	*	*	1.26	*	*	*	*	*	-0.34	-0.50
Lu	mg/kg	*	-1.25	*	*	*	0.34	*	*	-0.11	*	*	0.10	2.87
Nb	mg/kg	-3.10	-2.56	*	*	*	-0.69	1.48	*	-0.88	2.22	4.05	1.30	-1.62
Nd	mg/kg	-3.77	-0.96	*	*	*	1.21	*	*	1.01	*	*	0.96	2.71
Ni	mg/kg	-1.07	-4.52	*	*	*	0.31	5.64	-9.02	0.00	5.64	*	0.06	-3.13
Pb	mg/kg	*	-2.87	*	*	*	0.04	0.75	*	-2.23	95.30	*	-0.44	3.86
Pr	mg/kg	*	-0.97	*	*	*	0.37	*	*	0.14	*	*	0.66	1.60
Rb	mg/kg	-0.96	-0.57	*	*	*	0.71	-2.17	*	-0.50	302.88	-0.65	0.21	-0.40
Sb	mg/kg	*	0.00	*	*	*	*	*	*	-5.71	*	*	0.69	-0.71
Sc	mg/kg	0.37	*	*	*	*	2.63	*	-1.91	1.88	*	*	-0.30	-1.75
Sm	mg/kg	*	-1.56	*	*	*	0.60	*	*	0.91	*	*	0.62	1.02
Sn	mg/kg	*	24.93	*	*	*	*	*	*	4.86	*	*	0.00	0.14
Sr	mg/kg	-0.55	-0.76	*	*	-4.79	-0.30	0.63	-4.79	-0.81	74.33	-1.11	0.14	-0.73
Ta	mg/kg	*	-4.44	*	*	*	0.26	*	*	-0.95	46.60	*	2.77	2.61
Tb	mg/kg	*	-1.05	*	*	*	0.53	*	*	1.70	*	*	0.26	0.34
Th	mg/kg	*	-1.70	*	*	*	0.00	2.04	*	0.94	*	*	0.78	-1.19
Tl	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-0.18	6.95
Tm	mg/kg	*	-1.36	*	*	*	0.09	*	*	*	*	*	0.16	1.39
U	mg/kg	*	-1.50	*	*	*	-0.30	*	*	0.60	2120.50	*	0.80	-0.30
V	mg/kg	-3.88	*	0.64	*	*	0.22	-1.08	-1.15	0.79	-1.64	*	-0.73	-2.78
W	mg/kg	*	-0.35	*	*	*	*	*	*	*	*	*	3.08	-0.92
Y	mg/kg	0.43	-1.46	*	*	*	-0.66	-0.31	-3.68	0.03	214.17	0.26	0.32	-1.15
Yb	mg/kg	*	-0.96	*	*	*	0.37	*	*	0.49	*	*	0.94	2.50
Zn	mg/kg	-0.64	1.83	*	*	*	0.43	-1.04	-5.73	-0.51	-1.72	*	-2.11	0.08
Zr	mg/kg	0.07	1.64	*	*	-1.27	-0.89	-0.76	*	1.42	-2.36	-1.34	-1.59	1.81
Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;														
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;														
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.														
*=no data reported														

		Table 3 GeoPT11												
		OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round												
Labs		L23	L24	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33	L34
Technique codes		M	I	I	A,M	AA,X	AA,	A,O,X	I	AA,G,O	IR,M,X	X	X	X
						IR,T								
Test portion (g)		0.3	0.195	0.195	0.25	0.25-5	0.1-0.5	0.003-5	0.03-0.06	0.004-2	0.2-7	0.174	4	1
Data quality		2	1	2	2	2	1	2	2	1	2	1	2	2
SiO ₂	% m/m	*	*	*	1.22	-3.18	*	0.34	*	0.73	-0.39	2.08	*	-0.46
TiO ₂	% m/m	*	*	30.27	0.46	3.12	*	0.24	*	-2.53	0.77	1.53	*	0.45
Al ₂ O ₃	% m/m	*	*	*	-0.48	-0.56	0.79	0.31	*	1.00	0.28	2.42	*	3.49
Fe ₂ O ₃	% m/m	*	-2.71	*	0.11	1.23	4.37	0.44	-3.43	-48.19	0.18	-2.25	*	0.26
Fe(II)O	% m/m	*	*	*	*	*	1.77	0.41	*	-1.95	*	*	*	*
MnO	% m/m	*	*	*	0.47	3.38	-2.70	-1.35	*	0.00	-0.54	0.41	*	2.03
MgO	% m/m	*	*	*	-0.04	1.45	-1.68	-2.64	*	0.43	-1.58	2.91	*	19.12
CaO	% m/m	*	*	-10.57	-0.30	0.41	-2.80	2.11	*	6.43	-1.25	5.33	*	-10.62
Na ₂ O	% m/m	*	0.73	*	0.33	-6.68	0.73	-4.06	-2.18	-0.29	2.61	-6.82	*	3.85
K ₂ O	% m/m	*	-2.53	*	-0.80	-4.29	-3.30	0.41	*	-0.36	-0.32	2.59	*	-0.77
P ₂ O ₅	% m/m	*	*	*	-0.50	6.03	*	-0.65	*	-3.01	0.45	-1.41	*	4.02
LOI	% m/m	*	*	*	*	2.22	-2.29	-1.68	*	-1.75	0.20	-0.94	*	-0.74
As	mg/kg	1.34	*	-0.15	*	10.37	*	1.61	-1.90	*	*	*	*	*
Ba	mg/kg	1.96	-5.67	*	-0.48	-1.97	4.30	-0.06	-2.79	*	0.09	*	*	*
Be	mg/kg	-1.98	*	*	4.42	*	*	0.69	*	*	*	*	*	*
Cd	mg/kg	-1.16	*	*	*	12.27	*	*	*	*	*	*	*	*
Ce	mg/kg	*	1.97	*	0.80	*	*	1.71	-0.72	*	-1.22	*	*	*
Co	mg/kg	4.13	0.00	*	-0.10	*	5.28	-1.29	-0.36	*	-0.39	14.82	*	*
Cr	mg/kg	1.55	-1.35	*	-0.95	1.30	-1.35	-0.96	-2.71	*	-3.33	9.92	*	*
Cs	mg/kg	0.89	*	*	1.09	4.60	*	*	*	*	*	*	*	*
Cu	mg/kg	-1.25	*	*	0.92	0.63	-2.50	2.51	*	*	-0.27	*	*	*
Dy	mg/kg	*	*	*	0.02	*	*	-0.33	*	*	-0.97	*	*	*
Er	mg/kg	*	*	*	-0.10	*	*	-0.27	*	*	-1.50	*	*	*
Eu	mg/kg	*	1.12	*	0.29	*	*	-0.14	-1.26	*	-0.96	*	*	*
Ga	mg/kg	*	*	0.88	-0.41	0.32	*	0.37	*	*	-0.84	*	*	*
Gd	mg/kg	*	*	*	-0.53	*	*	0.36	*	*	-0.34	*	*	*
Ge	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Hf	mg/kg	*	0.22	*	0.10	*	*	*	-1.73	*	-1.69	*	*	*
Ho	mg/kg	*	*	*	0.93	*	*	-0.79	*	*	-1.01	*	*	*
La	mg/kg	-0.05	-0.32	*	0.23	*	*	-0.05	-0.96	*	-1.17	*	*	*
Li	mg/kg	2.04	*	*	*	*	2.06	0.12	*	*	*	*	*	*
Lu	mg/kg	23.63	1.05	*	0.26	*	*	-0.13	-0.21	*	-0.92	*	*	*
Nb	mg/kg	*	*	*	-1.55	-0.53	*	-0.07	*	*	-1.74	*	0.93	*
Nd	mg/kg	*	*	0.52	0.77	*	*	0.19	-1.44	*	-0.46	*	*	*
Ni	mg/kg	-3.47	*	*	-0.11	3.13	-1.25	0.63	*	*	-1.88	190.44	*	*
Pb	mg/kg	-1.58	*	*	*	3.96	4.54	0.58	*	*	-1.45	*	2.78	*
Pr	mg/kg	*	*	*	0.24	*	*	1.72	*	*	-1.24	*	*	*
Rb	mg/kg	*	*	4.05	-0.17	-7.23	-9.40	-0.65	-0.60	*	-1.06	*	-0.60	*
Sb	mg/kg	-0.96	*	0.43	*	*	*	*	*	*	*	*	*	*
Sc	mg/kg	0.94	0.64	*	0.53	*	*	-0.36	-0.04	*	-0.69	*	*	*
Sm	mg/kg	*	1.27	*	0.38	*	*	-0.82	-0.99	*	-1.45	*	*	*
Sn	mg/kg	-0.34	*	*	*	0.00	*	-1.04	*	*	*	*	*	*
Sr	mg/kg	1.07	*	1.07	0.04	-0.55	-2.22	-0.55	*	*	0.01	*	0.39	*
Ta	mg/kg	*	*	-1.31	0.05	*	*	*	-1.42	*	-0.37	*	*	*
Tb	mg/kg	*	-1.11	*	0.03	*	*	*	-0.96	*	-0.69	*	*	*
Th	mg/kg	-3.39	-0.13	*	0.22	5.49	*	*	-1.26	*	-2.04	*	6.65	*
Tl	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	*
Tm	mg/kg	*	*	*	*	*	*	-0.14	*	*	-1.06	*	*	*
U	mg/kg	-0.80	*	*	*	30.50	*	*	*	*	0.60	*	*	*
V	mg/kg	3.29	*	*	1.35	-4.02	*	-0.20	*	*	-0.66	12.68	*	*
W	mg/kg	-1.95	*	*	*	18.63	*	*	*	*	*	*	*	*
Y	mg/kg	-0.28	*	*	1.28	-1.84	*	-0.18	*	*	-0.60	-14.35	0.43	*
Yb	mg/kg	*	0.49	*	0.25	*	*	0.00	-0.96	*	-1.43	*	*	*
Zn	mg/kg	1.07	*	*	*	-2.31	1.26	0.14	*	*	0.63	*	*	*
Zr	mg/kg	-5.58	*	3.59	-0.81	4.49	*	-0.06	*	*	-3.26	-17.14	0.84	*

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;
 I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
 T=titrimetry; W=wet chemistry; X=X-ray fluorescence.
 * = no data reported

		Table 3 GeoPT11												
		OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round												
Labs		L35	L36	L37	L37	L38	L38	L39	L40	L41	L41	L42	L43	L44
Technique codes		X	X	I	I	T,X	T,X	AA,	AA,A	X	X	X	M,X	A,X
								W,X						
Test portion (g)		1.0-5.0	1.5	10	1	0.17-6	6	0.1-15	0.5	0.6-6	0.6-6	8.0-10.0	1-1.2	1.0-6.0
Data quality		1	2	1	2	1	2	2	1	1	2	2	2	2
SiO ₂	% m/m	-0.12	0.08	*	*	0.49	*	-0.19	*	0.96	*	*	-1.04	-0.19
TiO ₂	% m/m	-7.02	-0.30	*	*	-0.71	*	0.23	3.03	0.46	*	0.77	-1.91	-0.09
Al ₂ O ₃	% m/m	-0.63	0.01	*	*	0.24	*	0.50	-3.62	-0.47	*	*	-0.53	-0.59
Fe ₂ O ₃	% m/m	-0.30	-0.02	*	0.34	0.41	*	-0.51	-3.48	0.21	*	0.26	1.49	0.03
Fe(II)O	% m/m	*	*	*	*	1.22	*	-1.65	*	*	*	*	*	*
MnO	% m/m	-4.06	0.47	*	*	3.52	*	0.00	5.41	0.00	*	-0.68	-0.88	-0.41
MgO	% m/m	-0.81	0.21	*	*	1.21	*	-0.22	1.17	0.80	*	*	-1.02	0.09
CaO	% m/m	0.71	0.11	*	-1.40	0.33	*	-1.85	-0.29	0.21	*	2.66	-0.60	0.06
Na ₂ O	% m/m	0.87	0.73	*	0.73	4.30	*	-1.16	-1.31	0.58	*	*	1.89	2.10
K ₂ O	% m/m	1.41	0.06	*	-2.53	-0.06	*	1.00	-1.53	0.23	*	-0.18	-1.41	0.70
P ₂ O ₅	% m/m	0.00	0.40	*	*	0.50	*	1.00	*	7.03	*	*	6.03	1.21
LOI	% m/m	*	0.20	*	*	23.53	*	-7.46	*	3.63	*	*	11.09	2.49
As	mg/kg	*	*	*	0.15	*	*	*	*	*	*	*	-1.31	1.61
Ba	mg/kg	-0.59	*	*	0.61	1.40	*	-0.59	-2.80	2.95	*	-0.73	0.47	0.66
Be	mg/kg	*	*	*	*	*	*	*	-11.53	*	*	*	-0.55	*
Cd	mg/kg	*	*	*	*	*	*	*	-3.93	*	*	*	2.45	*
Ce	mg/kg	1.92	*	-0.31	*	*	-3.80	*	*	0.42	*	-0.04	-1.29	-0.79
Co	mg/kg	*	*	*	0.36	*	*	-0.45	10.78	13.13	*	*	-0.73	-2.41
Cr	mg/kg	*	*	*	-0.06	-0.85	*	*	-18.15	-1.35	*	*	-2.37	-4.62
Cs	mg/kg	*	*	*	*	*	*	*	3.00	*	*	*	-1.59	*
Cu	mg/kg	-2.50	*	*	*	-0.01	*	-3.01	3.90	*	*	-0.87	-2.79	-2.00
Dy	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-2.26	0.34
Er	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-2.19	0.32
Eu	mg/kg	*	*	-0.09	*	*	*	*	*	*	*	*	-1.05	-0.32
Ga	mg/kg	*	*	*	*	*	*	*	*	-1.13	*	0.37	-1.22	-0.56
Gd	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-0.84	-0.24
Ge	mg/kg	*	*	*	*	*	*	*	*	*	*	*	21.45	*
Hf	mg/kg	*	*	*	0.01	*	*	*	*	4.07	*	*	-3.18	0.59
Ho	mg/kg	*	*	1.01	*	*	*	*	*	*	*	*	-1.87	-0.79
La	mg/kg	*	*	0.47	*	*	-8.06	*	*	60.78	*	-1.12	-0.64	-0.64
Li	mg/kg	*	*	*	*	*	*	-0.31	-4.79	*	*	*	*	*
Lu	mg/kg	*	*	-1.52	*	*	*	*	*	*	*	*	-2.09	-0.37
Nb	mg/kg	-1.07	*	*	*	3.52	*	*	*	*	3.13	*	-0.44	2.22
Nd	mg/kg	-1.79	*	-1.18	*	*	*	*	*	*	-0.53	0.92	-1.26	-0.17
Ni	mg/kg	6.26	*	*	*	1.13	*	*	-6.64	*	*	0.00	1.25	-0.63
Pb	mg/kg	*	*	*	*	1.83	*	*	-4.26	*	*	9.03	-0.78	*
Pr	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-0.38	0.02
Rb	mg/kg	0.72	*	*	2.84	1.02	*	1.74	-3.33	*	*	-0.15	1.12	2.89
Sb	mg/kg	*	*	*	-0.09	*	*	*	*	*	*	*	6.34	*
Sc	mg/kg	1.36	*	*	0.45	*	*	*	*	-0.62	*	*	-0.36	
Sm	mg/kg	*	*	-0.62	*	*	*	*	*	*	*	*	-1.16	-0.27
Sn	mg/kg	*	*	*	*	*	*	*	*	*	*	*	86.73	*
Sr	mg/kg	0.15	*	*	*	0.02	*	-0.11	-0.85	2.89	*	0.14	0.32	-0.74
Ta	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-2.57	*
Tb	mg/kg	*	*	-0.02	*	*	*	*	*	*	*	*	-1.64	0.44
Th	mg/kg	-7.85	*	*	-0.53	*	*	*	*	*	*	*	-3.61	14.91
Tl	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-0.91	*
Tm	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-1.44	*
U	mg/kg	-10.90	*	*	*	*	*	*	*	*	*	*	-3.20	*
V	mg/kg	*	*	*	*	0.54	*	-4.51	4.00	4.00	*	6.17	-1.57	-2.93
W	mg/kg	*	*	*	*	*	*	*	*	*	*	*	-2.58	*
Y	mg/kg	1.82	*	*	*	-0.97	*	-2.26	*	*	0.69	0.26	2.22	0.26
Yb	mg/kg	*	*	-0.48	*	*	*	*	*	*	*	*	-1.88	-0.68
Zn	mg/kg	0.47	*	*	1.80	0.18	*	-2.07	-0.31	1.26	*	0.04	0.53	-1.43
Zr	mg/kg	1.55	*	*	*	-0.25	*	-0.11	11.54	2.58	*	-0.57	2.50	0.39

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;

I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;

T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

*=no data reported

		Table 3 GeoPT11												
		OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round												
Labs		L45	L46	L47	L47	L48	L49	L50	L51	L52	L53	L54	L55	L55
Technique codes		A,M	AA,A, G,T	X	X	AA,A, O,X	X	A,IR, M,X	A,M	A,I,M,X	AA,I,O	M,X	AA,A,E, M,O,X	AA,A,E, M,O,X
Test portion (g)		0.1	0.5-1.0	1-4.5	4.5	0.2-3	0.4	1.0-2.0	0.2-0.25	0.1-0.8	0.5-5	0.125-3.5	0.1-1.2	0.1-1.2
Data quality		2	2	1	2	1	2	2	2	1	1	1	1	2
SiO ₂	% m/m	-0.83	1.23	-0.39	*	0.96	0.10	0.45	0.32	0.09	*	-0.35	-18.12	*
TiO ₂	% m/m	-0.09	-1.27	-0.18	*	-1.89	0.12	0.34	-0.52	-0.39	*	0.32	1.75	*
Al ₂ O ₃	% m/m	2.41	-0.51	1.66	*	-0.41	-0.04	-0.59	-0.99	0.08	1.82	-1.03	0.24	*
Fe ₂ O ₃	% m/m	0.26	2.57	0.26	*	0.47	-0.05	0.90	-1.46	-0.35	-2.04	1.03	-0.92	*
Fe(II)O	% m/m	*	*	*	*	-1.88	*	1.24	*	*	-19.48	*	*	*
MnO	% m/m	-0.27	1.35	5.41	*	1.76	0.00	-0.68	-2.70	-0.68	2.70	0.43	*	-0.68
MgO	% m/m	-0.03	2.07	2.54	*	-0.81	0.52	0.21	-1.09	-0.69	*	0.39	*	0.65
CaO	% m/m	-0.65	-5.36	0.21	*	1.72	-0.40	0.36	-0.90	-0.09	*	0.85	-0.15	*
Na ₂ O	% m/m	2.61	-1.31	1.16	*	-0.87	-0.29	-1.38	0.15	0.15	-1.60	-0.19	-2.76	*
K ₂ O	% m/m	1.00	-0.18	1.41	*	2.11	1.00	-0.77	-0.47	-0.47	*	0.35	-2.12	*
P ₂ O ₅	% m/m	1.00	1.36	1.00	*	-25.71	0.00	0.00	-0.50	-5.32	*	0.43	*	-0.70
LOI	% m/m	-2.08	3.97	6.32	*	-2.29	*	-1.01	*	0.48	*	3.01	*	-0.34
As	mg/kg	*	*	*	*	20.73	*	*	*	-0.93	-0.29	*	*	4.53
Ba	mg/kg	0.28	-1.06	-3.05	*	-2.13	*	-2.36	-0.39	0.18	-0.31	0.11	*	2.29
Be	mg/kg	*	*	*	*	*	*	*	*	-1.89	*	*	*	12.12
Cd	mg/kg	*	*	*	*	*	*	*	*	*	*	*	*	0.00
Ce	mg/kg	-0.57	1.15	*	0.33	-0.54	*	0.46	-0.79	-0.04	-0.89	-1.00	0.31	*
Co	mg/kg	-0.73	4.60	-6.34	*	*	*	1.23	-1.01	1.89	-2.08	*	*	1.80
Cr	mg/kg	-0.39	-0.96	-3.33	*	0.90	*	7.22	-1.80	0.47	-0.85	12.01	*	8.34
Cs	mg/kg	-0.36	*	*	*	*	*	*	-0.05	-0.18	-7.93	-0.84	0.11	*
Cu	mg/kg	2.89	0.26	-6.56	*	-0.24	*	0.26	2.36	1.24	-5.51	2.24	*	1.39
Dy	mg/kg	-0.81	0.42	*	*	-0.70	*	0.44	-0.91	*	-1.63	2.30	-1.99	*
Er	mg/kg	-1.01	0.05	*	*	-6.85	*	0.17	-1.01	*	*	0.72	-2.76	*
Eu	mg/kg	-0.23	0.32	*	*	-1.61	*	1.38	-1.05	0.82	2.75	1.10	-4.09	*
Ga	mg/kg	*	*	-0.29	*	*	*	-0.56	-0.33	-0.66	*	-1.50	*	3.78
Gd	mg/kg	-1.14	0.12	*	*	0.50	*	0.66	0.06	1.08	*	0.94	0.06	*
Ge	mg/kg	*	*	*	*	*	*	-3.53	*	-2.75	*	*	*	-1.14
Hf	mg/kg	-0.86	*	*	3.77	*	*	-0.57	*	0.11	-0.56	-0.36	-1.46	*
Ho	mg/kg	-0.07	-0.86	*	*	-1.22	*	0.29	-0.07	2.16	*	1.29	-2.37	*
La	mg/kg	-0.48	2.05	*	9.03	-5.55	*	0.48	0.75	0.08	-0.25	0.41	0.29	*
Li	mg/kg	*	1.03	*	*	*	*	-0.34	-0.98	1.61	*	*	-0.68	*
Lu	mg/kg	-0.21	-0.37	*	*	-1.21	*	0.26	*	*	0.57	0.36	-3.40	*
Nb	mg/kg	-1.91	*	-1.98	*	-2.90	*	2.22	*	0.35	*	-1.61	0.77	*
Nd	mg/kg	-0.57	0.58	*	*	-0.85	*	0.92	-0.53	0.73	-0.92	-0.84	-0.51	*
Ni	mg/kg	1.88	3.13	-1.50	*	-8.77	*	-1.25	-0.25	5.30	*	-1.63	*	1.13
Pb	mg/kg	*	-4.50	-0.88	*	4.54	*	*	-0.27	2.57	*	0.00	-2.60	*
Pr	mg/kg	-0.25	-0.27	*	*	2.13	*	-0.12	-0.90	0.74	*	-1.43	-0.15	*
Rb	mg/kg	-0.15	0.36	-0.09	*	13.87	*	-0.15	-0.65	0.75	-16.38	-0.10	-3.33	*
Sb	mg/kg	-1.54	*	*	*	*	*	336.09	*	-1.77	0.07	*	*	*
Sc	mg/kg	0.66	*	-0.09	*	*	*	-1.39	*	0.17	0.88	2.70	*	-0.62
Sm	mg/kg	-0.16	1.45	*	*	-0.65	*	0.51	-1.05	1.07	0.35	0.82	-0.69	*
Sn	mg/kg	0.00	*	*	*	*	*	*	*	-1.04	*	*	*	1.04
Sr	mg/kg	-0.30	0.01	-0.48	*	-1.60	*	-1.11	-0.05	0.56	*	0.08	0.02	*
Ta	mg/kg	-0.06	*	*	*	*	*	0.57	*	0.09	-1.37	0.16	*	5.07
Tb	mg/kg	-0.19	0.30	*	*	-4.19	*	0.17	*	0.88	1.42	1.29	-1.38	*
Th	mg/kg	-0.16	*	*	*	*	*	-0.47	*	-0.06	1.13	0.50	-4.08	*
Tl	mg/kg	*	*	*	*	*	*	*	*	-1.83	*	*	*	*
Tm	mg/kg	0.09	-0.37	*	*	-0.75	*	0.85	*	2.31	*	0.45	-2.28	*
U	mg/kg	-0.80	*	*	*	*	*	-0.80	*	0.20	-1.30	-0.40	-2.70	*
V	mg/kg	0.25	-1.71	0.39	*	*	*	0.71	-1.85	-0.66	5.05	-0.45	*	0.08
W	mg/kg	-1.17	78.73	*	*	*	*	*	*	14.21	*	*	-0.35	*
Y	mg/kg	-0.29	1.31	0.91	*	-2.42	*	-0.18	-1.82	4.77	*	1.22	*	-0.18
Yb	mg/kg	-0.79	0.31	*	*	-0.42	*	-0.16	-0.79	2.03	0.34	-0.30	-2.86	*
Zn	mg/kg	-0.16	-0.25	13.32	*	-1.68	*	-1.62	-0.84	0.71	*	-1.62	*	-0.51
Zr	mg/kg	-0.31	*	-0.47	*	0.02	*	0.39	-0.83	0.85	*	-1.94	*	0.33

		Table 3 GeoPT11												
		OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round												
Labs		L56	L57	L57	L58	L59	L60	L61	L62	L63	L64	L65	L66	L67
Technique codes		A,W	X	X	A	AA,A, M,O	X	M,X	X	X	M	E,O,X	O,X	X
Test portion (g)		0.5-1	1.6	1.6	0.05-0.5	0.25-0.5	6.3	0.04-1.2	1	0.7	0.1	0.06-8	0.01-0.7	0.28-6
Data quality		1	1	2	2	2	2	1	1	1	1	2	1	1
SiO ₂	% m/m	-2.68	0.15	*	*	0.36	2.39	-0.15	-0.23	0.12	*	-0.50	-1.60	1.68
TiO ₂	% m/m	3.67	-1.14	*	-0.55	-0.41	0.93	0.68	2.39	-0.11	-0.61	1.13	0.25	-0.39
Al ₂ O ₃	% m/m	-1.55	-0.44	*	0.12	-0.31	-0.26	-1.12	-0.19	-0.25	*	0.97	-1.61	1.82
Fe ₂ O ₃	% m/m	9.75	-1.68	*	0.11	0.26	1.65	0.88	-0.71	0.26	*	0.03	-1.53	1.80
Fe(II)O	% m/m	*	*	*	*	0.89	*	*	*	*	*	1.10	0.27	*
MnO	% m/m	-5.41	1.76	*	0.27	0.00	1.53	1.35	0.00	0.16	-1.35	-2.50	-1.35	0.00
MgO	% m/m	2.54	-0.81	*	0.36	-0.71	9.82	0.18	-5.77	-0.03	*	-0.54	-4.16	2.54
CaO	% m/m	1.42	-0.24	*	0.29	-0.65	1.35	0.01	1.01	0.47	*	0.31	-0.69	-1.49
Na ₂ O	% m/m	-1.16	0.22	*	0.37	-0.29	*	-2.32	-14.66	1.16	*	-1.99	-1.45	-11.61
K ₂ O	% m/m	-4.47	-0.94	*	-1.09	0.70	-0.05	1.41	1.41	0.29	*	-0.74	-0.36	0.23
P ₂ O ₅	% m/m	*	-1.31	*	*	0.00	7.63	-1.00	3.01	-0.08	*	-0.45	-1.00	-1.00
LOI	% m/m	2.82	-0.40	*	*	-0.34	*	1.21	58.50	*	*	15.60	3.09	-2.02
As	mg/kg	*	*	*	*	-1.31	*	*	*	*	*	*	*	-2.63
Ba	mg/kg	*	-2.03	*	0.73	0.28	1.04	-0.10	9.66	0.49	0.75	-14.65	-2.32	0.46
Be	mg/kg	*	*	*	*	-0.05	*	0.89	*	*	*	*	*	*
Cd	mg/kg	*	*	*	*	-1.23	*	*	*	*	-0.69	*	-9.81	*
Ce	mg/kg	*	-3.09	*	*	-0.47	2.66	1.62	*	*	3.02	-0.72	31.45	*
Co	mg/kg	*	-4.27	*	*	*	*	0.00	-2.47	1.96	1.46	-0.45	4.71	-0.34
Cr	mg/kg	*	1.47	*	*	0.17	*	-3.33	22.89	2.65	4.45	-1.80	6.54	9.36
Cs	mg/kg	*	*	*	*	344.99	*	0.73	*	*	-0.51	*	-11.44	*
Cu	mg/kg	*	-3.25	*	*	-10.08	0.60	2.47	*	-2.12	6.16	11.17	1.27	2.02
Dy	mg/kg	*	*	*	*	15.36	*	1.32	*	*	2.61	-1.25	-3.94	*
Er	mg/kg	*	*	*	*	6.20	*	1.07	*	*	1.04	-1.72	-7.32	*
Eu	mg/kg	*	*	*	*	9.10	*	-0.15	*	*	-0.52	-1.08	-2.09	*
Ga	mg/kg	*	0.74	*	*	270.19	0.23	-0.47	*	-0.75	0.27	-0.10	0.74	*
Gd	mg/kg	*	*	*	*	12.38	*	0.10	*	*	-0.16	-0.46	-7.28	*
Ge	mg/kg	*	*	*	*	23.68	*	*	*	*	6.76	-0.11	*	*
Hf	mg/kg	*	*	*	*	-5.78	*	0.48	*	*	0.83	-2.89	6.97	*
Ho	mg/kg	*	*	*	*	*	*	0.65	*	*	0.79	-1.44	-6.61	*
La	mg/kg	*	0.96	*	*	*	*	0.86	*	*	0.86	-0.37	-17.20	*
Li	mg/kg	*	*	*	0.99	-2.21	*	0.60	*	*	*	-0.38	-19.87	*
Lu	mg/kg	*	*	*	*	170.22	*	3.18	*	*	1.46	-2.25	*	*
Nb	mg/kg	*	-2.90	*	*	*	*	1.79	*	8.65	-1.29	-4.93	-2.90	0.77
Nd	mg/kg	*	*	*	*	-7.48	*	2.28	*	*	1.33	-0.72	0.39	*
Ni	mg/kg	*	-5.01	*	*	8.21	2.26	12.15	-6.26	-4.76	5.76	0.00	-10.02	-16.29
Pb	mg/kg	*	41.75	*	*	*	*	-0.17	*	*	7.75	-2.13	7.92	*
Pr	mg/kg	*	*	*	*	*	*	1.29	*	*	0.03	-0.46	4.49	*
Rb	mg/kg	*	-4.34	*	*	-0.55	-0.11	-1.10	-0.90	2.64	0.01	-1.67	0.72	10.84
Sb	mg/kg	*	*	*	*	-0.36	*	*	*	*	*	*	*	199.24
Sc	mg/kg	*	*	*	*	0.16	*	-0.30	*	-0.66	1.93	-1.91	0.33	*
Sm	mg/kg	*	*	*	*	-0.27	*	1.11	*	*	0.02	-0.82	3.02	*
Sn	mg/kg	*	*	*	*	-0.35	*	0.28	*	*	3.19	0.00	0.00	*
Sr	mg/kg	*	0.27	*	0.49	-0.11	0.05	-1.14	4.95	0.65	1.64	1.26	0.02	-0.23
Ta	mg/kg	*	*	*	*	0.05	*	0.30	*	*	-0.11	-2.88	-11.41	*
Tb	mg/kg	*	*	*	*	0.17	*	0.79	*	*	0.61	-0.83	4.86	*
Th	mg/kg	*	*	*	*	-0.47	*	1.00	*	*	0.44	-2.70	-14.13	*
Tl	mg/kg	*	*	*	*	-0.55	*	1.83	*	*	0.37	*	*	*
Tm	mg/kg	*	*	*	*	-0.68	*	2.62	*	*	0.93	-1.52	*	*
U	mg/kg	*	*	*	*	-0.20	*	2.10	*	*	0.20	-1.80	12.90	*
V	mg/kg	*	-0.89	*	*	0.08	2.63	0.29	*	0.30	1.77	-3.42	0.86	36.33
W	mg/kg	*	*	*	*	-1.87	*	0.35	*	*	3.89	*	1.91	*
Y	mg/kg	*	0.51	*	*	-0.84	0.60	1.26	-1.32	1.30	2.22	-1.62	-4.29	1.82
Yb	mg/kg	*	*	*	*	-0.32	*	3.22	*	*	2.09	-2.10	5.94	*
Zn	mg/kg	*	-0.51	*	-0.52	-0.55	0.29	2.78	*	-0.66	3.99	-4.12	1.45	0.86
Zr	mg/kg	*	-0.11	*	-0.51	-0.31	0.58	-0.43	-2.87	0.12	-1.65	-1.21	0.14	0.66
Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;														
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;														
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.														
*=no data reported														

Labs	L68	L68	L69	L69	L70	L71	L72	L72	L73	L74	L75	L76	L77		
Technique codes	A,IR,	A,IR,	M,X	M	X	X	X	M	M,X	X	M,V,X	M,X			
	T,X	T,X													
Test portion (g)	0.1-7.5	0.1-7.5	0.1-0.3	0.1	1.0-10.0	1.2-9	1.0-20.0	20	0.1	0.1-12	8	0.2-7.0	0.02-0.4		
Data quality	1	2	1	2	1	1	1	2	1	2	2	1	1		
SiO ₂	% m/m	0.47	*	-0.24	*	-0.32	-0.85	-0.99	*	*	0.00	*	-0.34	-1.21	
TiO ₂	% m/m	-2.32	*	-0.37	*	-1.25	-0.63	-0.18	*	*	-0.20	*	-0.29	3.24	
Al ₂ O ₃	% m/m	0.30	*	-0.57	*	0.46	-0.04	-1.12	*	*	-0.29	0.58	1.92	-1.50	
Fe ₂ O ₃	% m/m	-0.04	*	-0.35	*	-0.66	-0.89	-0.50	*	*	-0.07	*	0.39	1.24	
Fe(II)O	% m/m	-0.84	*	*	*	*	*	*	*	*	*	*	-0.63	*	
MnO	% m/m	0.95	*	-0.14	*	-0.54	-0.18	0.00	*	*	0.42	0.00	-1.89	0.00	
MgO	% m/m	0.18	*	-1.23	*	-0.56	4.76	-2.30	*	*	-0.71	*	-2.45	-0.07	
CaO	% m/m	0.01	*	-0.47	*	0.01	1.19	-0.79	*	*	0.01	-2.30	0.05	1.52	
Na ₂ O	% m/m	0.00	*	0.45	*	1.31	-1.18	-1.74	*	*	0.00	-2.90	2.26	-4.93	
K ₂ O	% m/m	2.59	*	-0.24	*	1.41	0.35	1.41	*	*	0.12	-3.41	0.59	-0.94	
P ₂ O ₅	% m/m	-1.10	*	-0.30	*	2.01	-1.49	2.01	*	*	0.50	*	3.11	-1.00	
LOI	% m/m	0.67	*	*	*	0.67	-2.29	-6.86	*	*	-0.34	2.76	-3.63	*	
As	mg/kg	*	*	*	*	*	*	*	*	*	-4.23	*	*	-3.39	
Ba	mg/kg	1.13	*	*	-0.63	-0.21	-7.30	*	2.82	0.32	0.14	*	-0.59	2.67	
Be	mg/kg	-2.49	*	*	*	*	*	*	*	1.49	-0.33	*	*	*	
Cd	mg/kg	*	*	*	*	*	*	*	*	0.98	-1.19	*	*	*	
Ce	mg/kg	0.11	*	-0.84	*	-0.59	*	*	-1.04	-0.99	-0.32	*	0.58	0.62	
Co	mg/kg	-0.90	*	*	*	4.15	*	*	11.06	-0.45	-0.58	*	1.91	0.34	
Cr	mg/kg	2.03	*	*	*	-0.79	*	*	-3.50	1.41	11.44	*	8.23	-2.20	
Cs	mg/kg	*	*	-1.17	*	*	*	*	*	1.14	-1.08	*	*	-0.92	
Cu	mg/kg	-1.75	*	*	*	*	*	-6.26	*	25.51	1.01	*	-4.76	0.96	
Dy	mg/kg	*	1.59	-0.09	*	*	*	*	*	0.22	0.54	*	-2.55	0.97	
Er	mg/kg	*	0.15	-0.10	*	*	*	*	*	-0.72	0.39	*	-3.73	0.75	
Eu	mg/kg	1.54	*	-0.08	*	*	*	*	*	0.21	0.17	*	-0.15	0.15	
Ga	mg/kg	0.74	*	*	*	-0.19	*	-0.19	*	0.93	0.37	*	*	-0.01	
Gd	mg/kg	*	0.67	-0.03	*	*	*	*	*	-3.62	0.35	*	-3.60	0.12	
Ge	mg/kg	*	*	*	*	*	*	*	*	-0.11	*	*	-0.90		
Hf	mg/kg	*	0.75	0.36	*	*	*	*	*	1.99	1.17	*	*	0.16	
Ho	mg/kg	0.72	*	-0.10	*	*	*	*	*	1.01	0.29	*	-1.08	1.01	
La	mg/kg	0.75	*	-1.06	*	*	*	*	34.13	-0.32	-0.69	*	-1.64	0.43	
Li	mg/kg	*	*	*	*	*	*	*	*	*	0.31	*	*	*	
Lu	mg/kg	-1.21	*	-0.16	*	*	*	*	*	1.62	0.26	*	-0.27	0.68	
Nb	mg/kg	*	0.38	-1.96	*	-1.07	*	0.77	*	2.23	-1.14	*	-2.90	-0.66	
Nd	mg/kg	2.06	*	-0.25	*	*	*	*	*	1.91	0.19	*	-1.69	1.26	
Ni	mg/kg	1.25	*	*	*	1.25	*	*	11.90	7.02	-0.63	*	5.01	-2.26	
Pb	mg/kg	*	12.42	2.24	*	4.54	*	-2.23	*	0.95	-1.11	*	1.15	-0.84	
Pr	mg/kg	*	-0.04	-0.79	*	*	*	*	*	0.27	-0.38	*	-1.73	0.21	
Rb	mg/kg	*	*	1.86	*	1.73	*	1.73	*	2.54	-0.15	*	-0.30	0.21	
Sb	mg/kg	1089.95	*	*	*	*	*	*	*	*	*	*	*	-0.71	
Sc	mg/kg	*	*	0.74	*	-3.30	*	0.33	*	-0.40	-0.62	*	*	0.01	
Sm	mg/kg	*	*	-0.39	*	*	*	*	*	0.60	0.02	*	-1.40	0.91	
Sn	mg/kg	1588.95	*	*	*	*	*	*	*	-1.04	*	*	*	0.00	
Sr	mg/kg	*	*	-3.79	*	0.02	-1.48	0.65	*	-1.10	0.51	*	1.52	0.15	
Ta	mg/kg	*	11.55	-0.41	*	*	*	*	*	2.81	-3.61	*	*	0.30	
Tb	mg/kg	*	*	-0.30	*	*	*	*	*	0.34	0.03	*	-2.20	1.15	
Th	mg/kg	*	*	-0.86	*	0.31	*	*	*	2.13	0.78	*	-1.57	0.00	
Tl	mg/kg	44.25	*	*	*	*	*	*	*	3.29	-1.19	*	*	0.37	
Tm	mg/kg	*	9.26	-0.40	*	*	*	*	*	1.85	0.24	*	-1.97	0.63	
U	mg/kg	10823.40	*	-1.00	*	*	*	*	*	-1.00	0.30	*	*	-0.10	
V	mg/kg	*	*	*	*	2.12	1.91	*	-0.80	0.02	-0.90	*	-0.13	-0.33	
W	mg/kg	680.72	*	*	*	*	*	*	*	-2.90	*	*	*	*	
Y	mg/kg	-20.60	*	-1.02	*	0.08	*	0.95	*	1.52	-0.79	*	-2.98	1.21	
Yb	mg/kg	475.63	*	-0.38	*	*	*	*	*	2.56	0.26	*	-2.20	0.81	
Zn	mg/kg	16.31	*	*	*	2.04	*	*	0.63	3.21	0.92	*	1.06	-0.51	
Zr	mg/kg	*	*	0.17	*	0.02	*	*	0.39	0.14	0.26	*	1.68	0.40	

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry; G=gravimetric;

I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;

T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

*=no data reported

		Table 3 GeoPT11						
		OU-5 Leiton dolerite: Z-scores calculated for the GeoPT11 round						
Labs		L78	L79	L80	L81	L82	L82	L83
Technique codes		X	M,X	M	A	X	ir,M,T	AA
Test portion (g)		1.2	0.1-10	0.25	0.1-1	4	0.2-0.45	0.1
Data quality		1	1	1	2	1	2	1
SiO ₂	% m/m	0.10	0.42	*	-1.65	0.01	*	-1.18
TiO ₂	% m/m	-1.46	-1.03	*	0.23	0.46	*	*
Al ₂ O ₃	% m/m	0.46	0.02	*	-0.04	1.87	*	-38.12
Fe ₂ O ₃	% m/m	-0.50	-0.86	*	2.82	0.11	*	-29.79
Fe(II)O	% m/m	*	*	*	*	*	85.78	*
MnO	% m/m	0.00	0.00	*	0.68	0.00	*	1.35
MgO	% m/m	0.80	-0.07	*	0.83	0.55	*	23.48
CaO	% m/m	0.51	-0.09	*	2.01	0.61	*	1.22
Na ₂ O	% m/m	2.18	0.44	*	1.52	4.21	*	-4.79
K ₂ O	% m/m	1.41	0.23	*	4.23	3.17	*	-2.12
P ₂ O ₅	% m/m	0.00	2.01	*	1.00	-3.00	*	*
LOI	% m/m	-2.29	-3.90	*	1.41	6.05	*	*
As	mg/kg	*	*	*	51.26	*	*	*
Ba	mg/kg	2.76	-0.46	1.42	2.48	*	-0.10	*
Be	mg/kg	*	1.98	*	8.40	*	*	*
Cd	mg/kg	*	0.49	*	245.00	*	*	*
Ce	mg/kg	-11.60	0.42	0.72	*	*	0.24	*
Co	mg/kg	-1.46	*	-0.62	7.69	*	0.26	*
Cr	mg/kg	11.61	1.24	*	-0.11	*	1.11	*
Cs	mg/kg	*	0.52	*	*	*	0.57	*
Cu	mg/kg	*	0.06	*	7.79	*	1.04	*
Dy	mg/kg	*	1.65	0.59	*	*	0.57	*
Er	mg/kg	*	0.60	1.69	*	*	0.48	*
Eu	mg/kg	*	1.36	*	*	*	1.01	*
Ga	mg/kg	-0.19	0.46	1.39	*	*	-0.43	*
Gd	mg/kg	*	0.14	*	*	*	0.72	*
Ge	mg/kg	*	*	*	*	*	*	*
Hf	mg/kg	*	-0.10	-0.04	*	*	0.43	*
Ho	mg/kg	*	1.01	0.86	*	*	0.86	*
La	mg/kg	*	0.86	-0.21	*	*	0.30	*
Li	mg/kg	*	0.97	*	-1.25	*	1.64	*
Lu	mg/kg	*	-0.42	-0.42	*	*	0.77	*
Nb	mg/kg	19.10	-2.02	-2.17	32.47	*	-0.02	*
Nd	mg/kg	*	1.04	0.39	*	*	0.52	*
Ni	mg/kg	-3.76	0.00	*	-4.51	*	-0.41	*
Pb	mg/kg	*	-1.25	*	196.79	*	-0.54	*
Pr	mg/kg	*	0.63	0.29	*	*	0.58	*
Rb	mg/kg	7.80	0.11	-0.09	*	*	1.07	*
Sb	mg/kg	*	1.13	*	*	*	*	*
Sc	mg/kg	*	1.31	*	*	*	0.42	*
Sm	mg/kg	*	1.33	-1.09	*	*	0.43	*
Sn	mg/kg	*	2.36	*	*	*	-0.71	*
Sr	mg/kg	1.64	0.15	0.65	-0.80	*	1.40	*
Ta	mg/kg	*	0.72	-5.07	*	*	-0.37	*
Tb	mg/kg	*	0.70	0.07	*	*	0.62	*
Th	mg/kg	*	0.38	0.50	*	*	0.50	*
Tl	mg/kg	*	-0.37	*	*	*	*	*
Tm	mg/kg	*	1.09	0.89	*	*	0.70	*
U	mg/kg	*	-0.30	0.63	*	*	-0.11	*
V	mg/kg	*	1.42	*	3.26	*	*	*
W	mg/kg	*	*	*	*	*	-1.37	*
Y	mg/kg	7.94	0.25	-1.45	-1.93	*	0.45	*
Yb	mg/kg	*	0.24	1.59	*	*	0.48	*
Zn	mg/kg	-1.09	1.29	*	-5.24	*	0.17	*
Zr	mg/kg	2.83	0.46	-1.27	-0.12	*	0.48	*

Technique codes: A=ICP-AES; AA=AAS; C=colorimetry; E=(atomic) emission spectrometry
I=INAA; IR= infra red detection; ISE=ion selective electrodes; M=ICP-MS; O=other;
T=titrimetry; W=wet chemistry; X=X-ray fluorescence.

*=no data reported

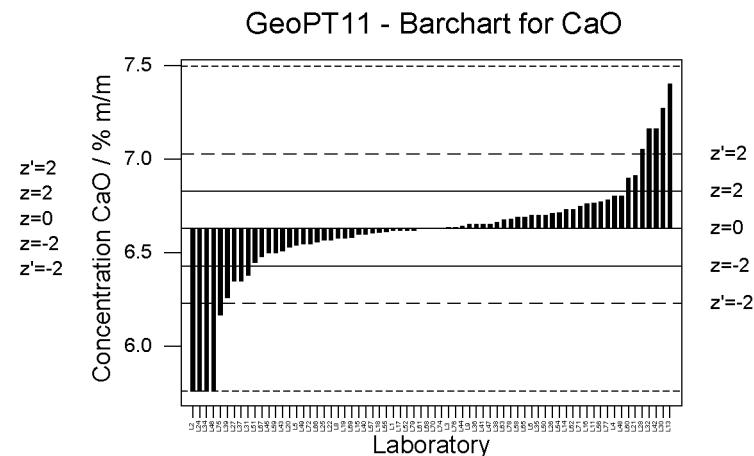
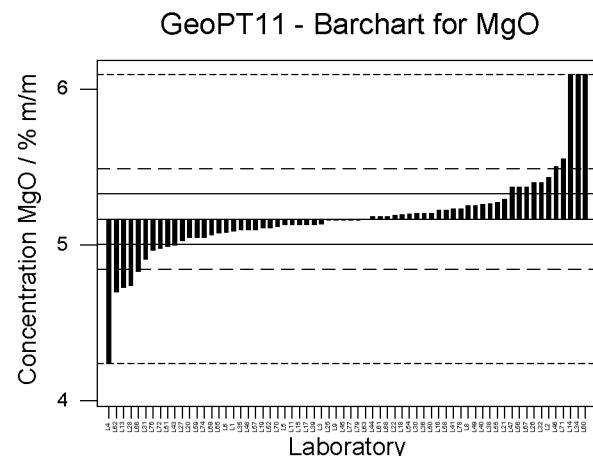
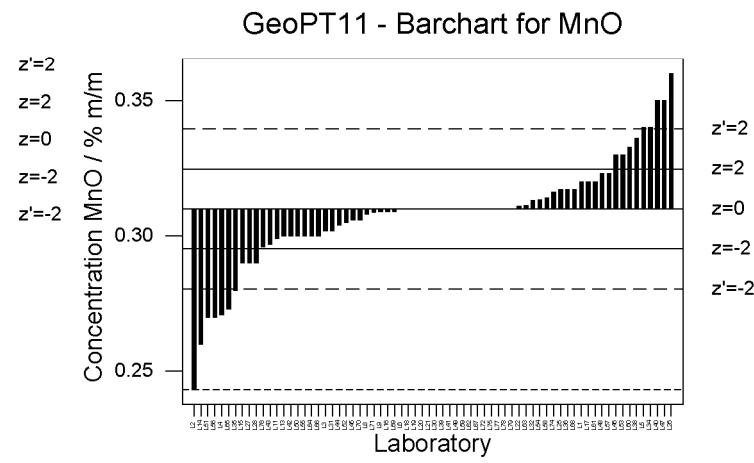
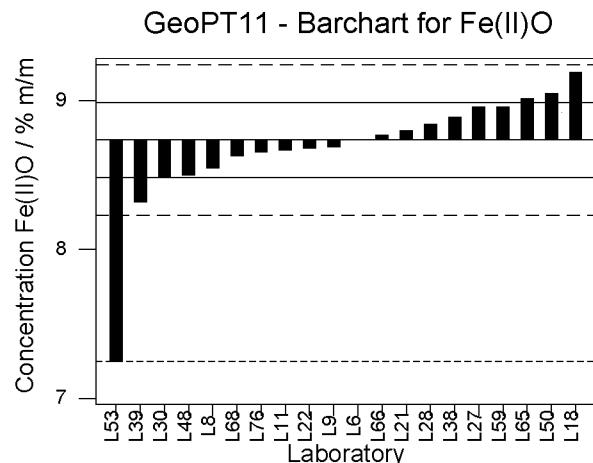
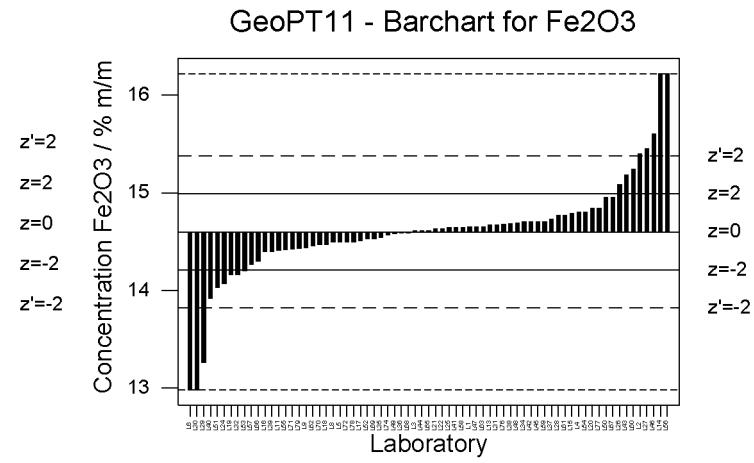
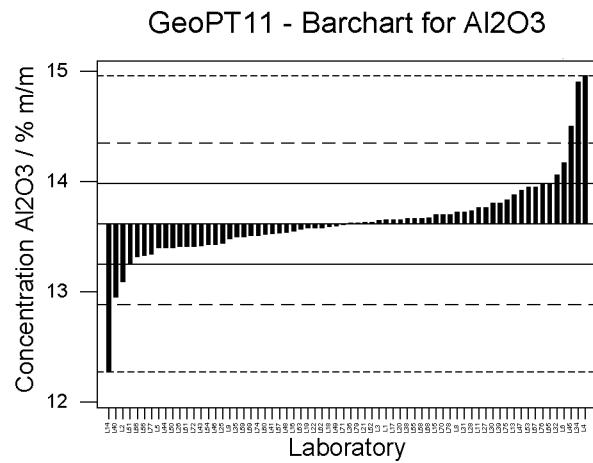
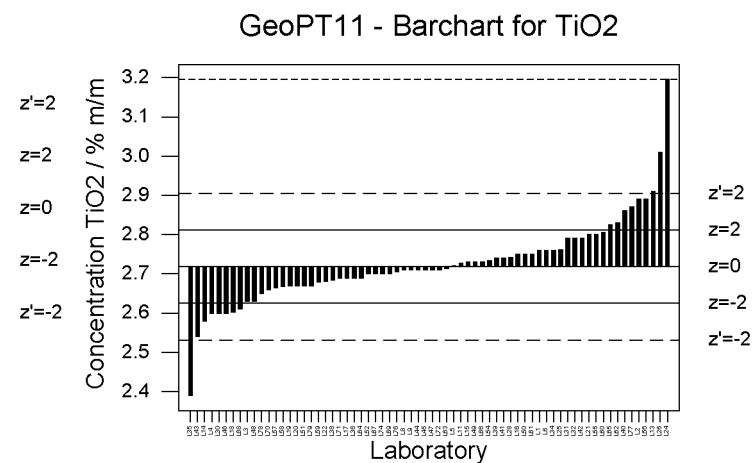
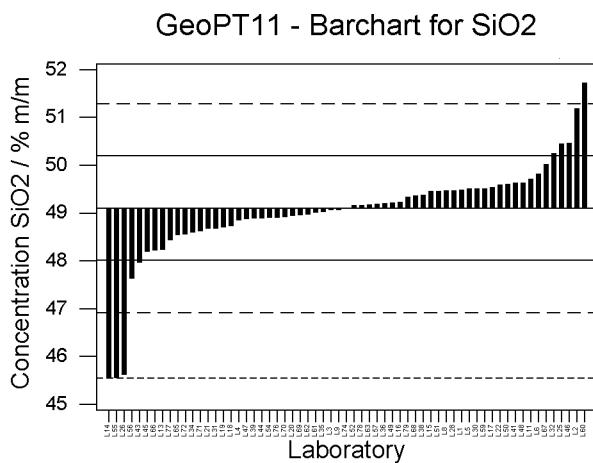


Figure 1

GeoPT11 – OU-5 Leatton dolerite: 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).

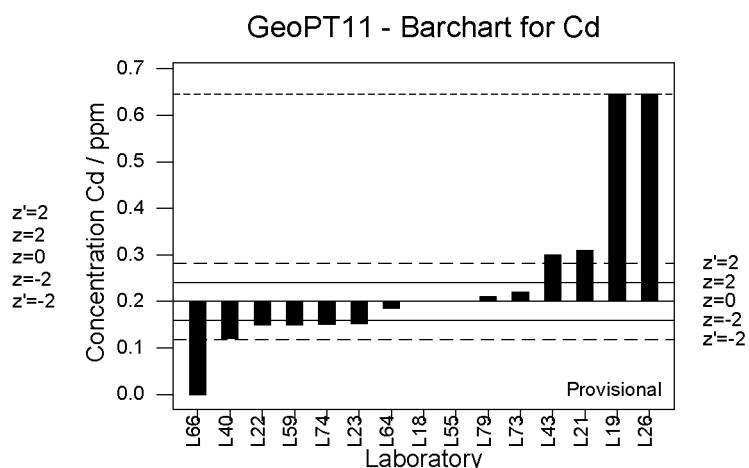
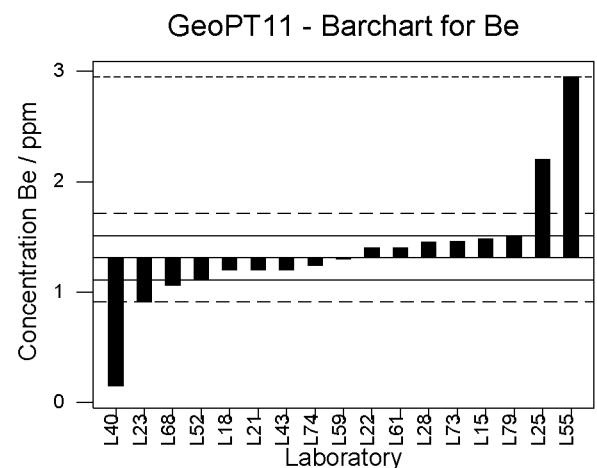
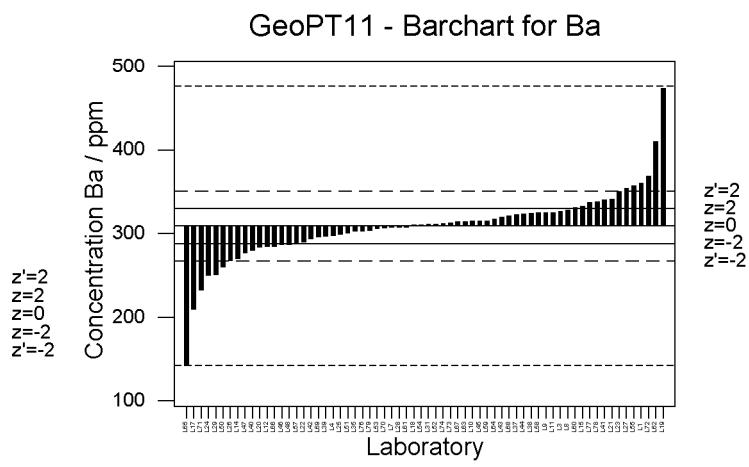
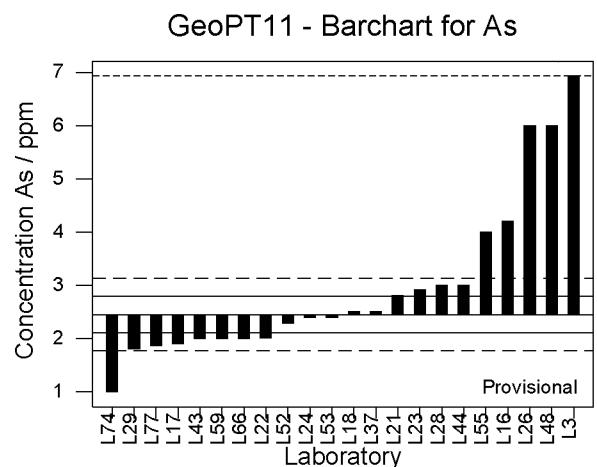
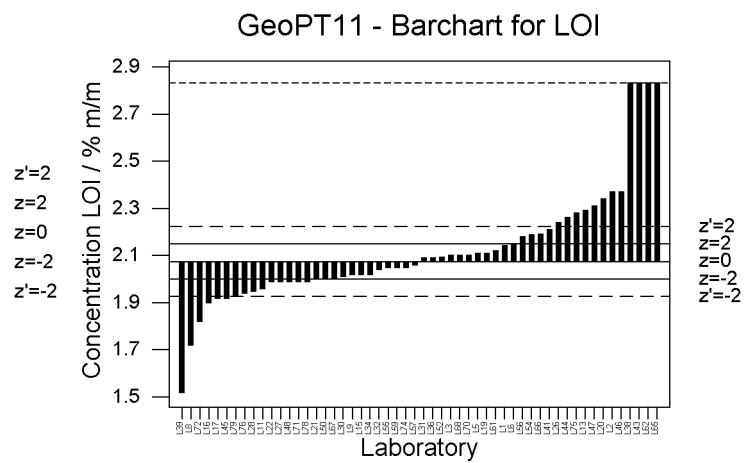
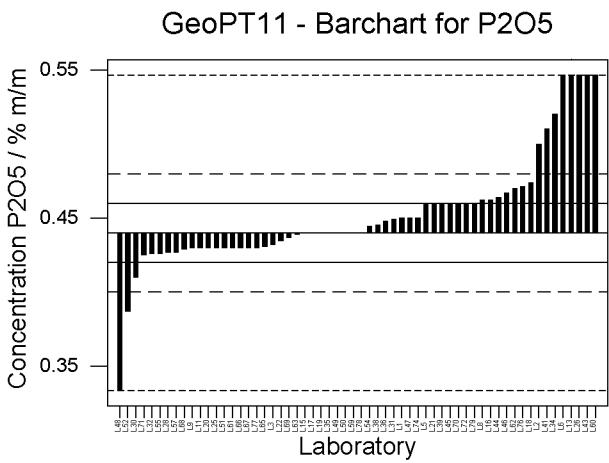
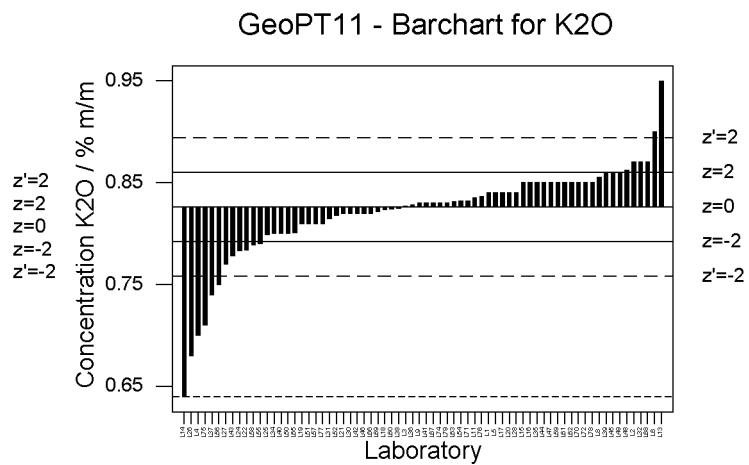
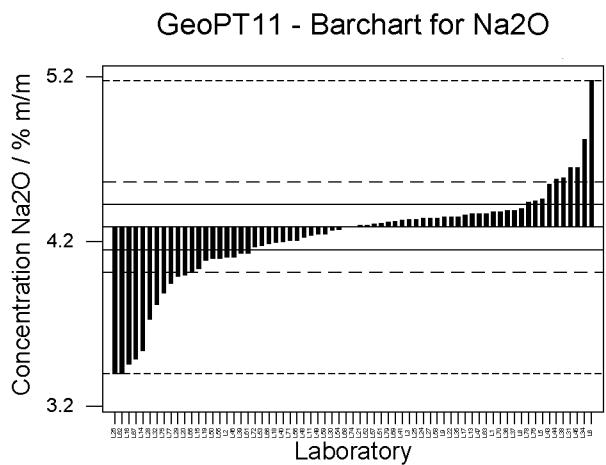


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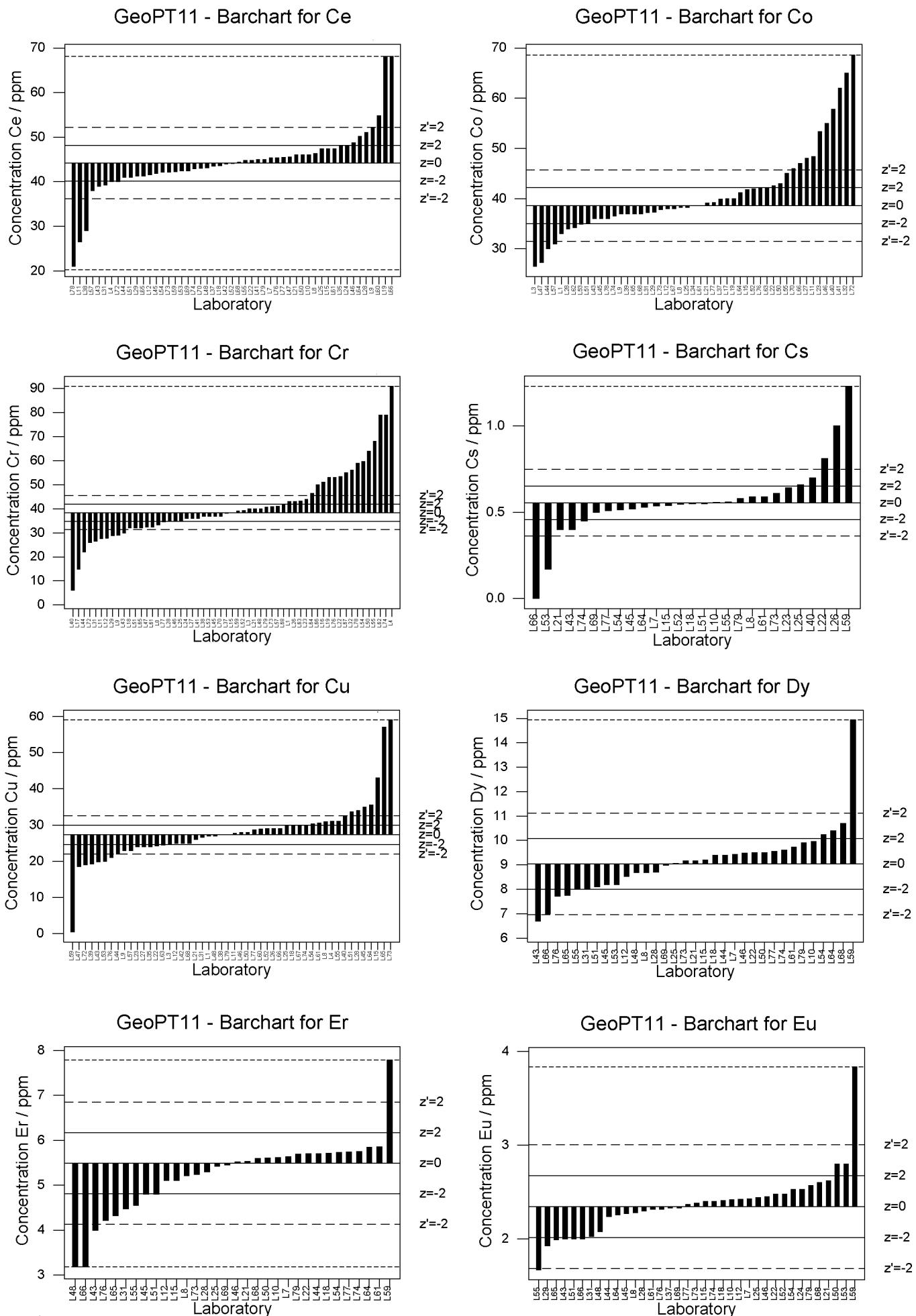


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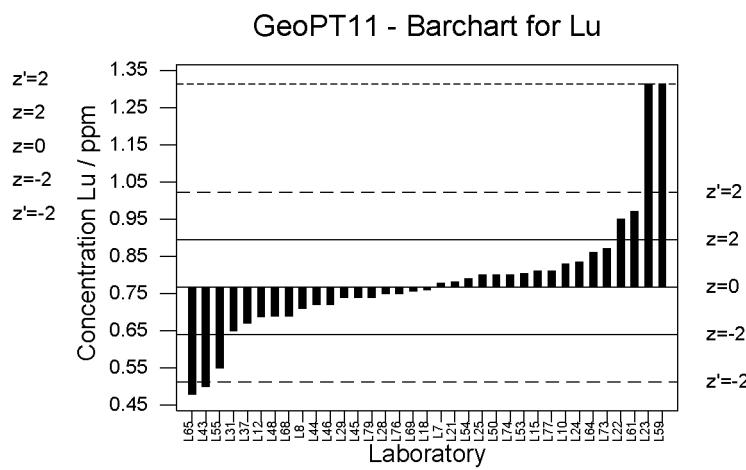
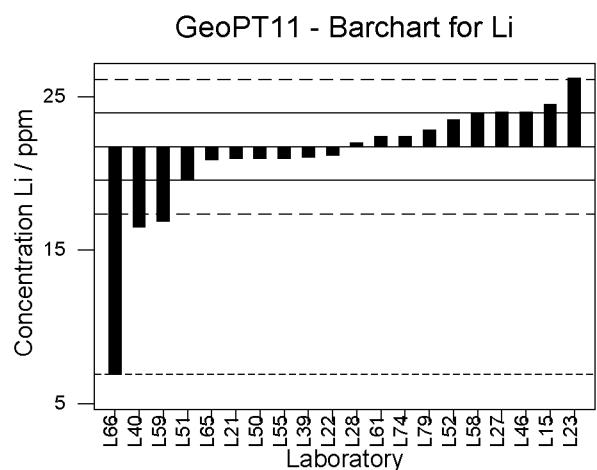
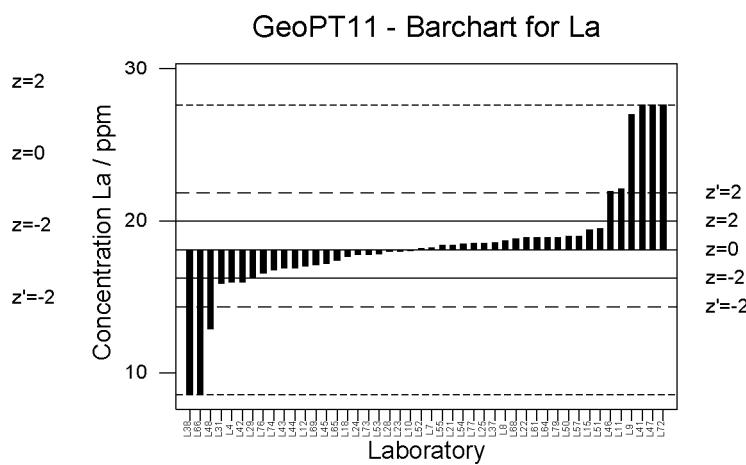
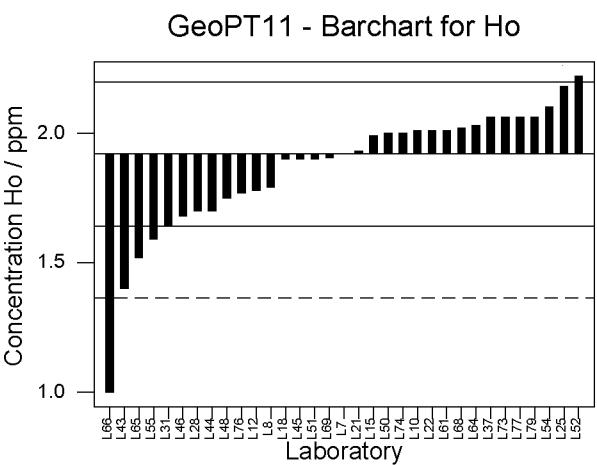
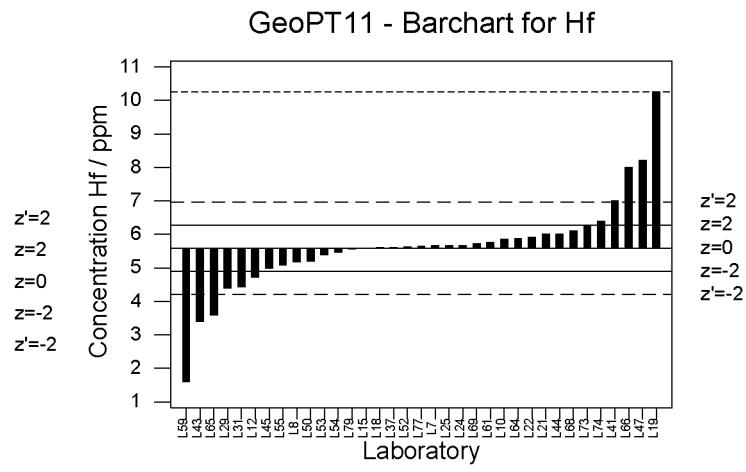
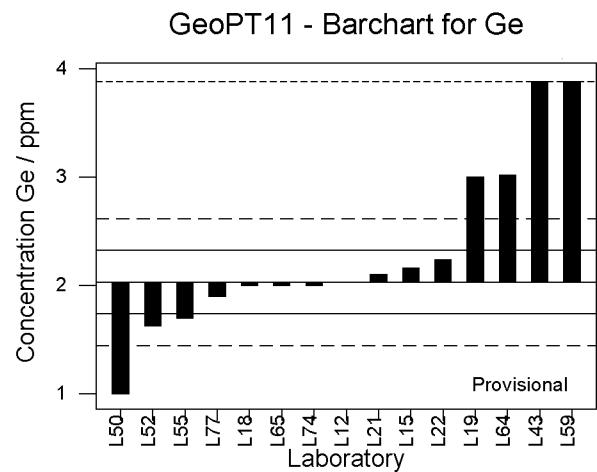
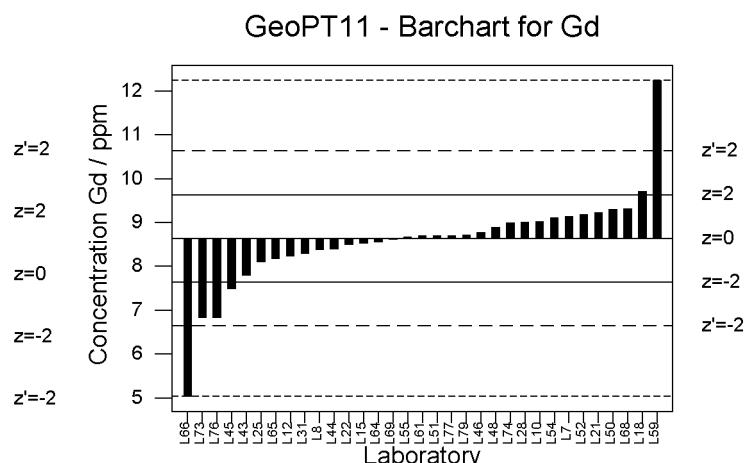
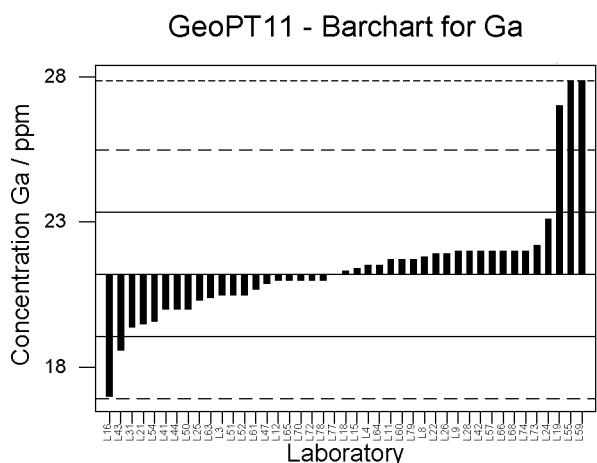


Figure 1

GeoPT11 – OU-5 Leatton dolerite: 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).

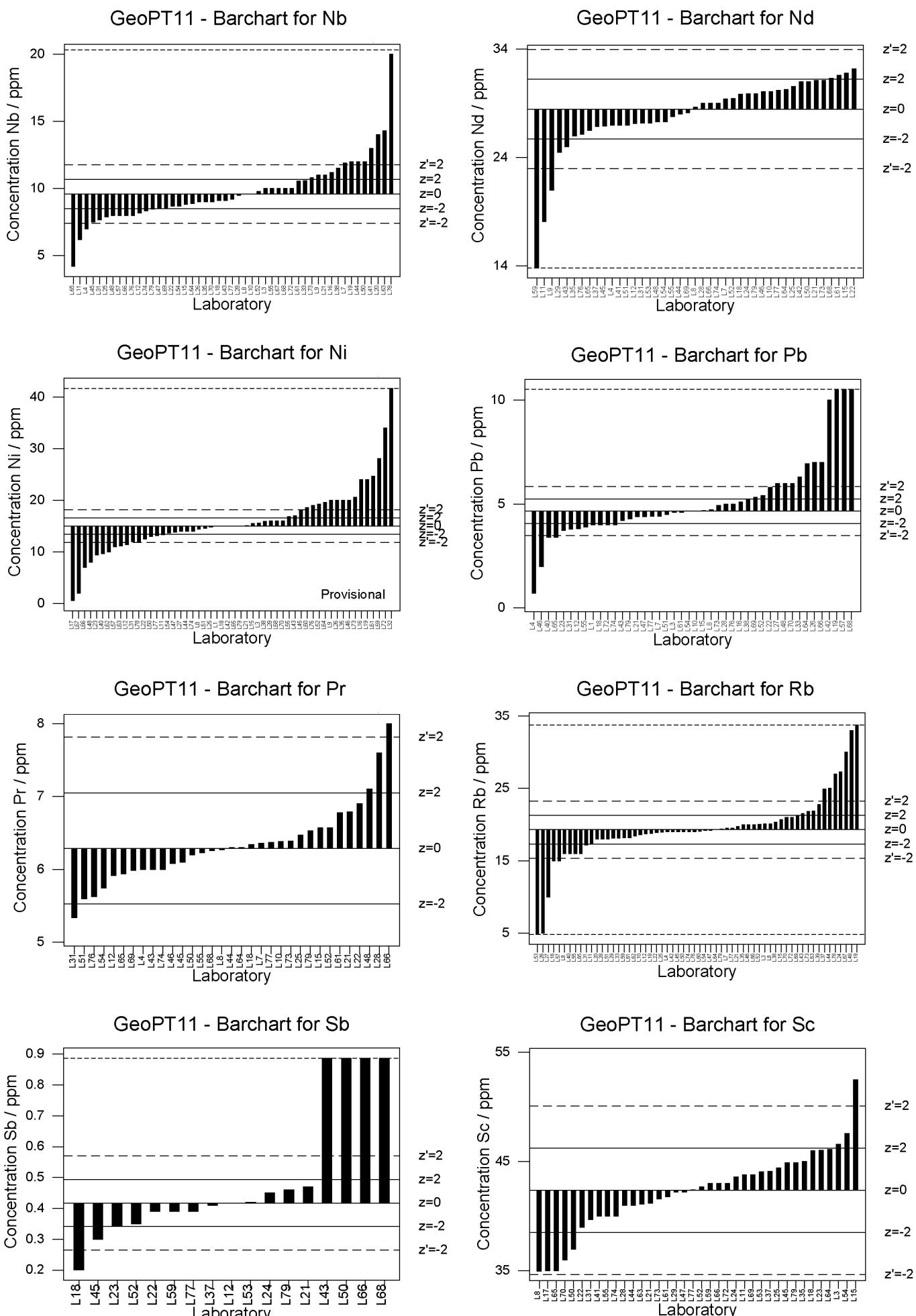


Figure 1

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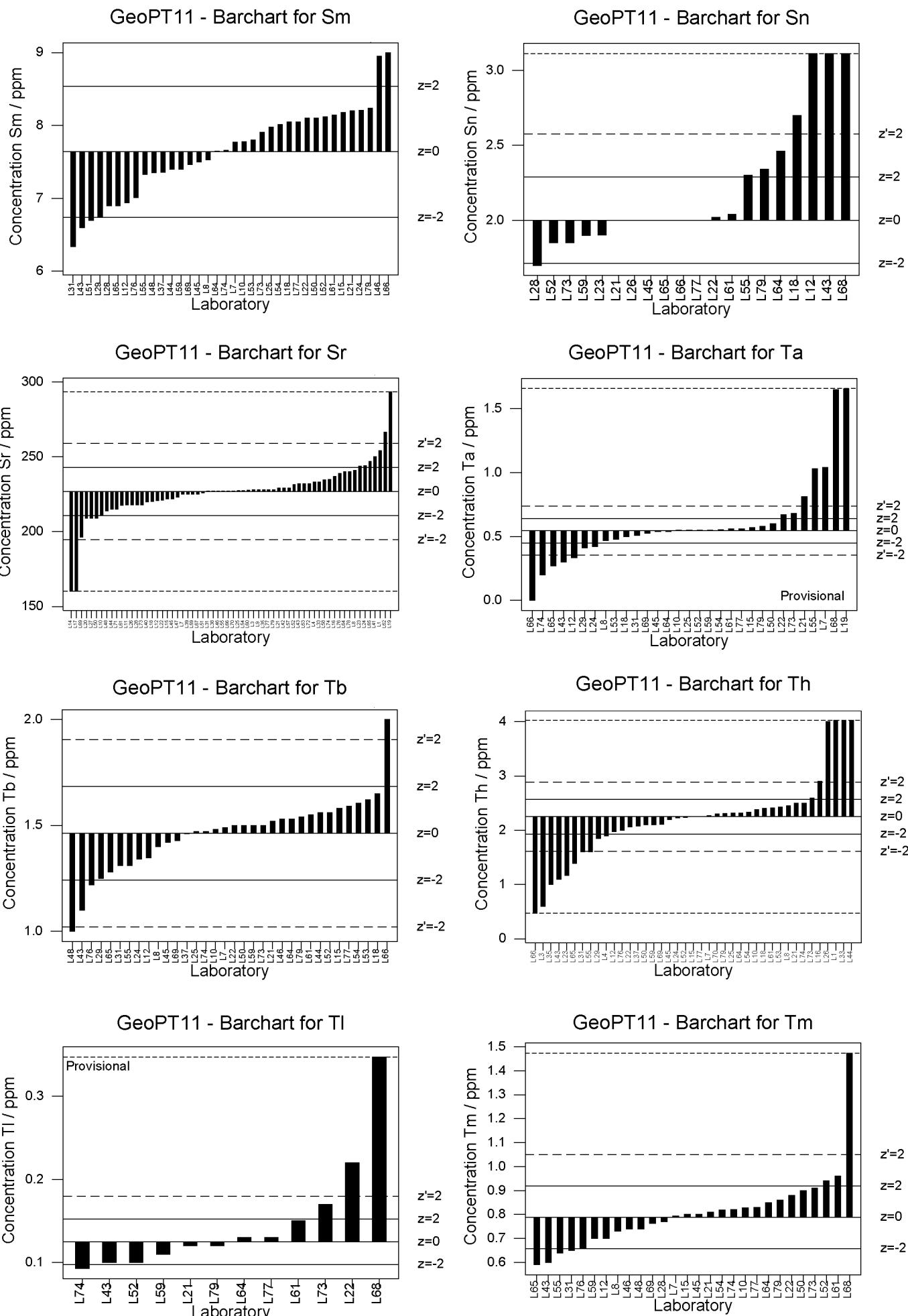


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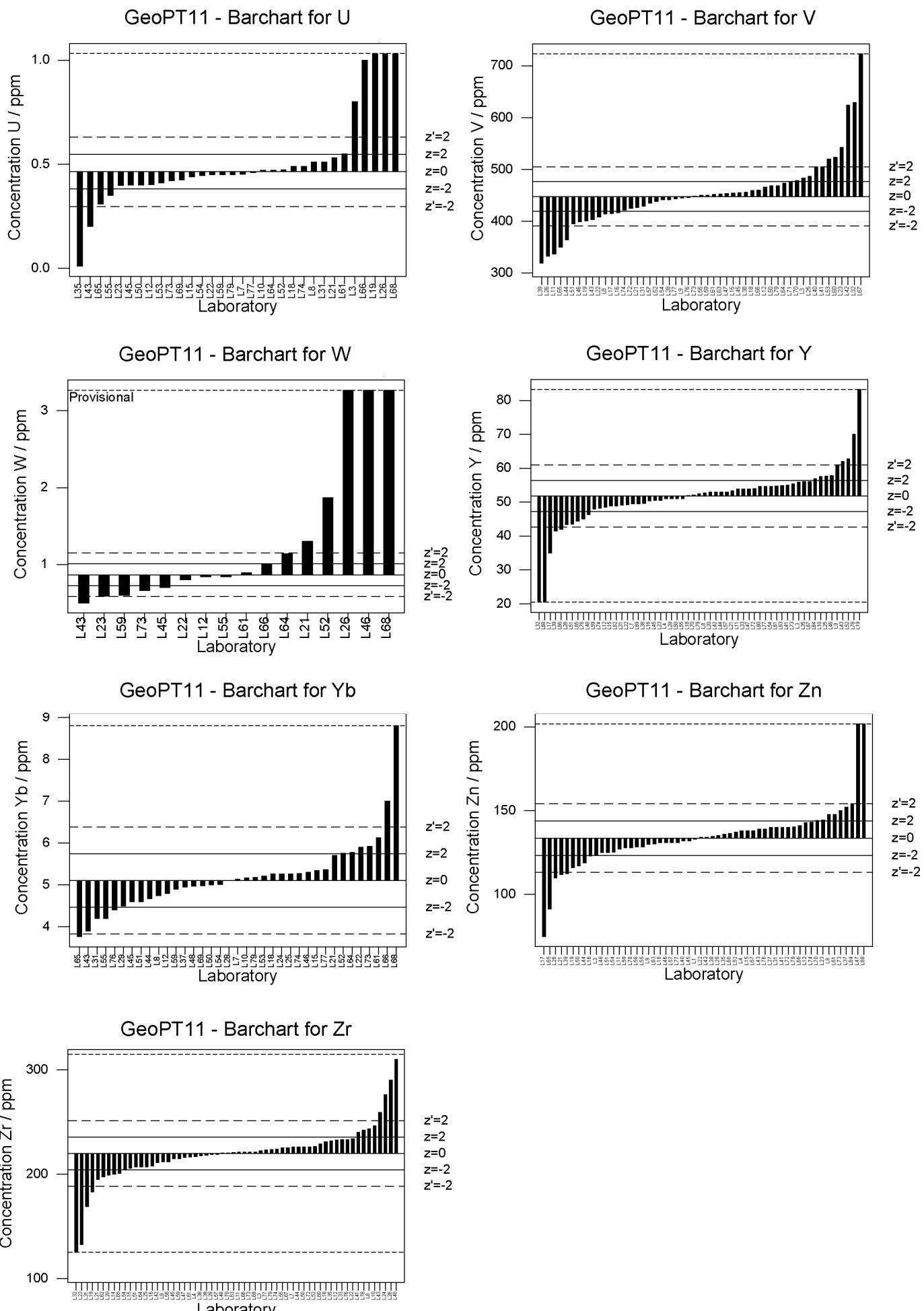


Figure 1

GeoPT11 – OU-5 Leaton dolerite: 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).

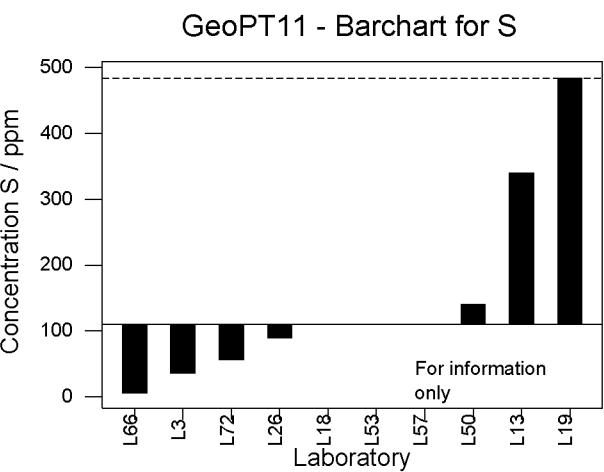
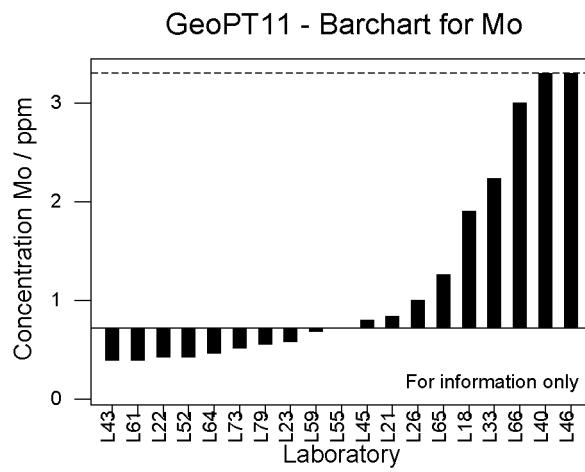
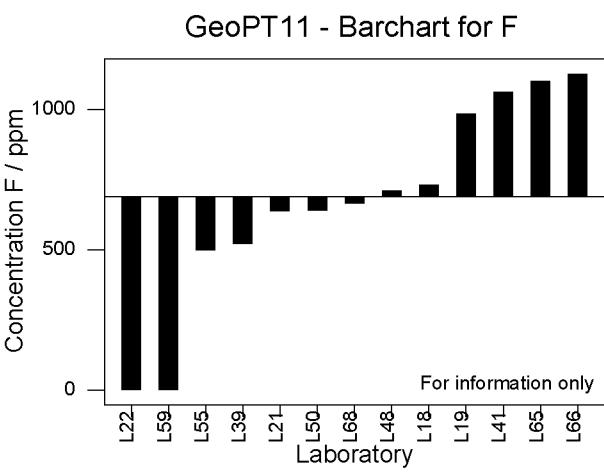
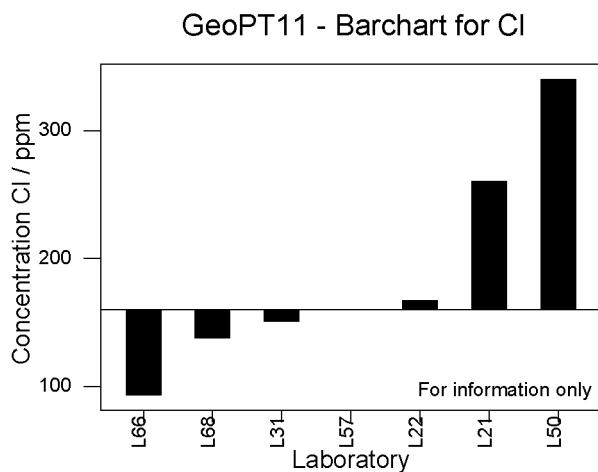
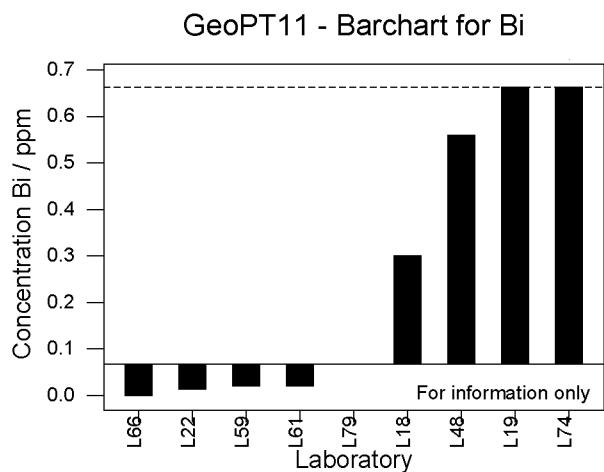
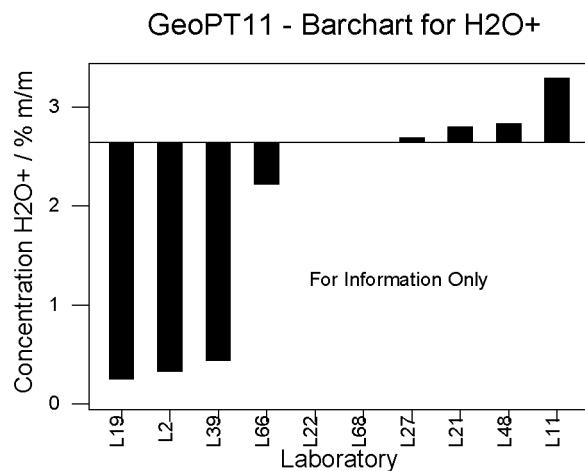
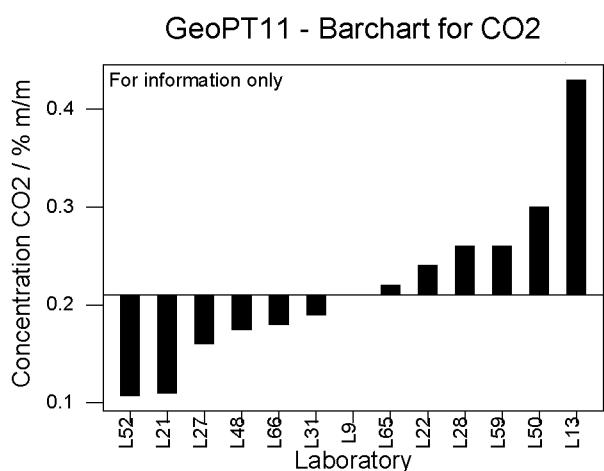


Figure 2

GeoPT11 – OU-5 Leatton dolerite: Data distribution charts for elements for which values were not assigned.

GeoPT11 - Multiple z-score Chart

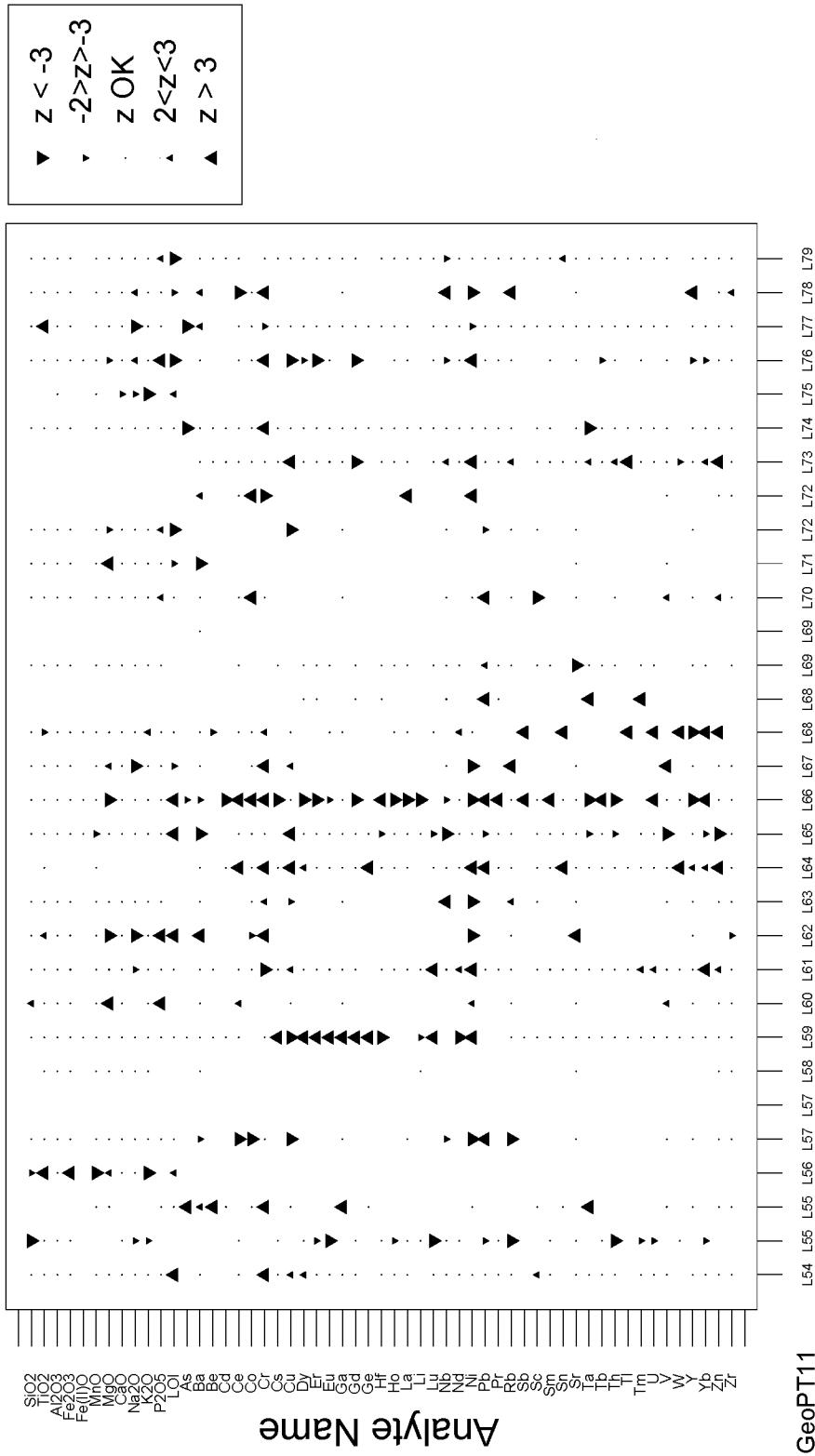


Figure 3
GeoPT11 – OU-5 Leatton dolerite: Multiple z-score charts for laboratories participating in the GeoPT11 round.
Symbols indicate whether or not an elemental result complies with the $-2 < Z < +2$ criteria. Satisfactory data are plotted as (•). Data for other categories are plotted as follows: $Z < -3$ (▼), $-3 < Z < -2$ (►), $+2 < Z < +3$ (▲), $Z > +3$ (▲).

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GeoPT11 - Multiple z-score Chart

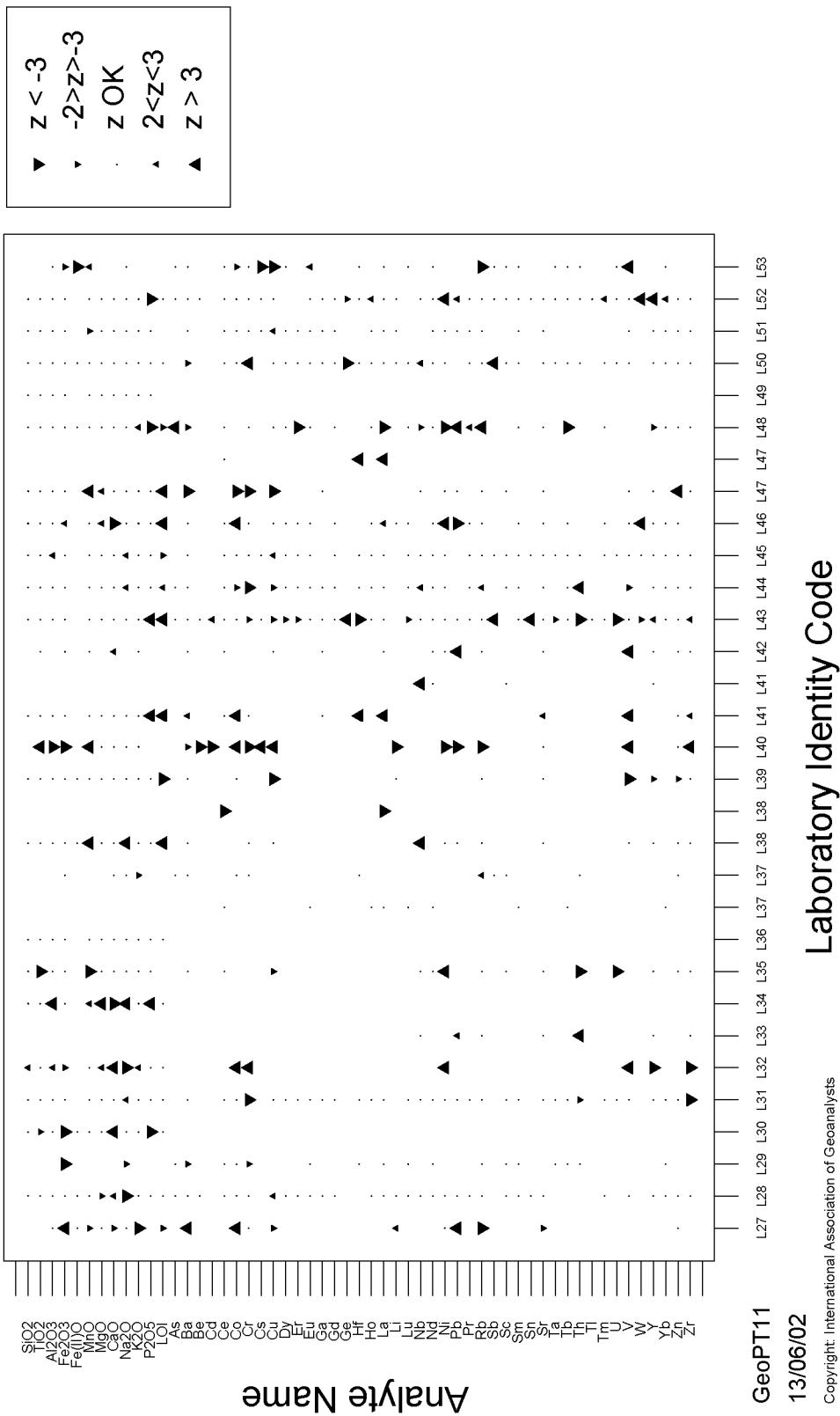


Figure 3

GeoPT11 – OU-5 Leatton dolerite: Multiple z-score charts for laboratories participating in the GeoPT11 round. Symbols indicate whether or not an elemental result complies with the $-2 < Z < +2$ criteria. Satisfactory data are plotted as (\square). Data for other categories are plotted as follows: $Z < -3$ (\blacktriangledown), $-3 < Z < +3$ (\blacktriangleright), $+2 < Z < +3$ (\cdot), $Z > +3$ (\blacktriangleup).

GeoPT11 - Multiple z-score Chart

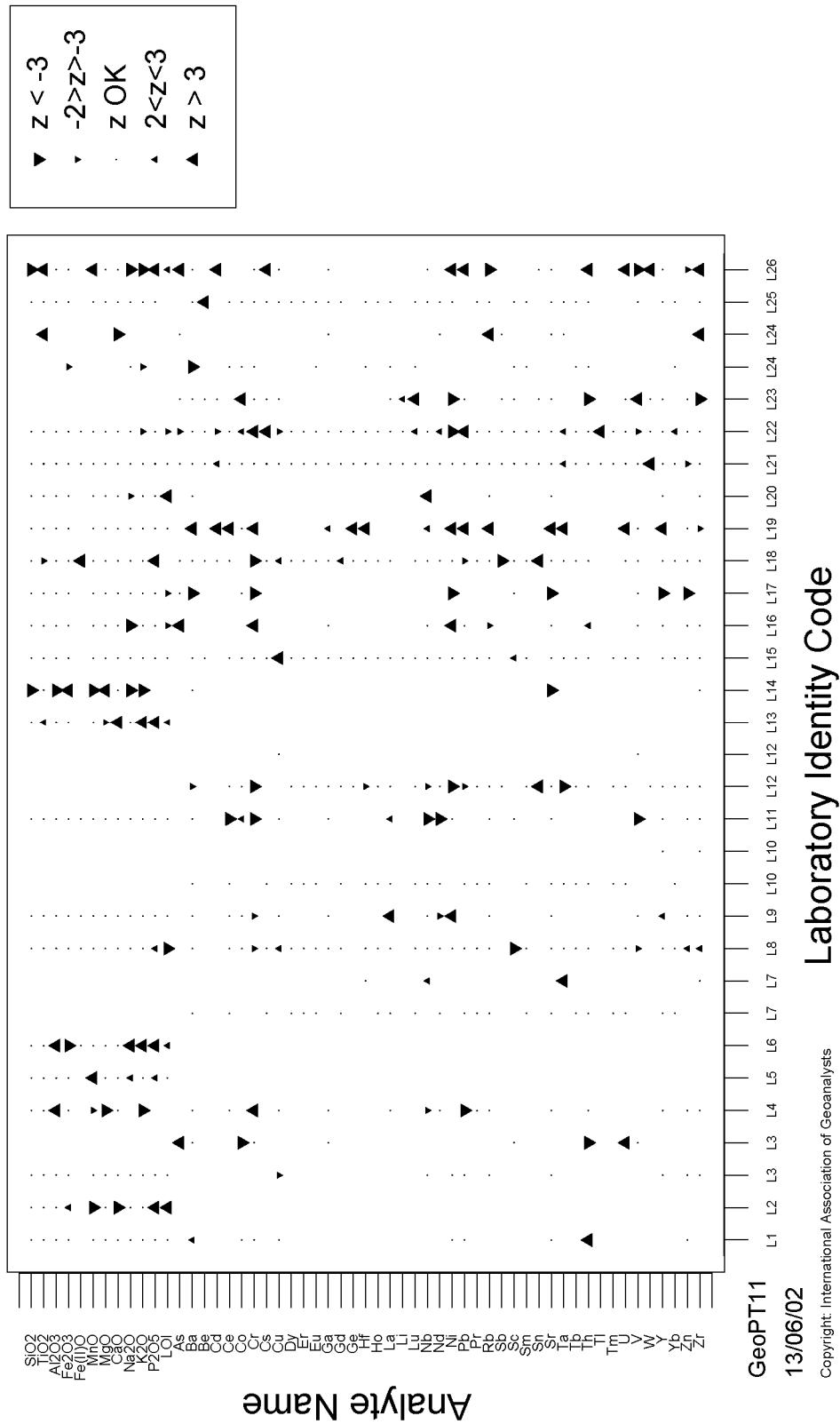


Figure 3

GeoPT11 – OU-5 Leatton dolerite: Multiple z-score charts for laboratories participating in the GeoPT11 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: $z < -3$ (▼), $-3 < z < -2$ (▲), $+2 < z < +3$ (●), $z > +3$ (▲).