

GeoPT24 - OU-10, Longmydian Greywacke

Veranstalter: International Association of Geoanalysts and Geostandards Newsletter - GeoPT24

Ringversuchsmaterial: OU-10, Longmydian Greywacke

RV geschlossen: 2009 – 2

Literatur: Proficiency Testing Report GeoPT24 (Laboride CRB = Y20)

Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
Na ₂ O	2,43	2,31	0,043	
MgO	1,74	1,77	0,033	
Al ₂ O ₃	11,02	10,97	0,153	
SiO ₂	73,44	73,12	0,764	
P ₂ O ₅	0,089	0,09	0,003	
K ₂ O	1,26	1,28	0,025	
CaO	2,33	2,34	0,041	
TiO ₂	0,52	0,534	0,012	
Fe ₂ O ₃ tot	4,9	4,92	0,077	
MnO	0,121	0,12	0,003	
L.O.I.	2,11	2,2	0,039	

Spurenelemente [µg/g]

	CRB	RV	1sRV	Z-Score
As	2,7	2,8		
Ba	331	311	10,5	
Ce	22	38	1,8	
Co	13	12	0,7	
Cr	36	34	1,6	
Cs	1,6	1,7	0,12	
Cu	21	22,3	1,1	
Ga	10	12	0,7	
Ge	0,8	1,4		
Hf	3,3	3,3	0,2	
Hg	0,3	0,35		
In	0,03	0,04		
La	11	18,8	1	
Mo	4	0,98	0,08	
Nb	7	7,7	0,4	
Nd	15	18,7	1	
Ni	15	17,7	0,9	
Pb	24	26,9	1,3	
Pr	3	4,7	0,3	
Rb	33	36	1,7	

Sb	3,7	1,2	
Sm	2,9	3,9	0,3
Sr	166	174	6,4
Ta	135	124	4,8
Te	0,05	0,06	
Th	4,7	5	0,3
Tl	0,25	0,23	
V	77	77	3,2
W	2,9	2,2	
Y	18	20,5	1
Zn	52	54	2,4
Zr	124	123	4,8

Legende

CRB: Ergebnisse CRB – **RV:** Ergebnisse Ringversuch -- **1s-RV:** Standardabweichung Ringversuch

Z-Score: Differenz des Messwertes vom Mittelwert des Ringversuchs -- * Wert nicht zertifiziert

GeoPT24 – AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES – REPORT ON ROUND 24 (Longmyndian greywacke, OU-10) / Jan 2009

Peter C. Webb^{1*}, Michael Thompson², Philip J. Potts¹
and John S. Watson¹

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.

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

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Abstract

Results are presented for GeoPT24, round twenty-four of the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. The sample distributed for this round was OU-10, a Longmyndian greywacke from Bayston Hill quarry, Shrewsbury, Shropshire, England, and prepared at the Open University. In this report, contributed data are listed, together with an assessment of consensus values, z-scores and charts showing both the distribution of contributed results and the overall performance of participating laboratories.

Introduction

This twenty-fourth round of the international proficiency testing programme, GeoPT, 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 24: M. Thompson (Statistician), P.C. Webb (Results coordinator), P.J. Potts and J.S. Watson.

Sample GeoPT24: OU-10, Longmyndian greywacke, was prepared and packeted at the Open University. The test material was analysed by WDXRF at the Open University for a range of major and trace elements and the data tested for consequential degree of homogeneity according to the Fearn test. In none of the cases for which valid data were obtained was any significant lack of homogeneity found, therefore the sample was considered suitable for use in the GeoPT proficiency testing programme.

Timetable for Round 24:

Distribution of sample: September 2008.

Deadline for submission of analytical results: 12th December 2008.

Distribution of draft report: February 2009

Submission of results

Results were submitted by 76 laboratories and are listed in Table 1. All of these data were used for the assessment of assigned values. Data are also listed for one laboratory (Y77) that submitted results too late for inclusion in the results.

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 39 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 50 elements/components that were judged to have satisfactory distributions for assigned or provisional values to be given, as listed in Table 2, are shown in Figure 1, namely: SiO₂, TiO₂, Al₂O₃, Fe₂O₃T, MnO, MgO, CaO, Na₂O, K₂O, P₂O₅, LOI, Ba, Be, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Hf, Ho, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sc, Sm, Sr, Ta, Tb, Th, Tl, Tm, U, V, Y, Yb, Zn, and Zr. Of these, only provisional values could be given to the elements/components: LOI, Be, Cd, Ce, Li, Mo, Ni, Sb, Sm and Tl.

Bar charts for the 12 elements/components, Fe(II)O, CO₂, H₂O⁺, As, Bi, Cl, F, Ge, S, Sb, Sn, and W are plotted in Figure 2 for information only, where the

data were not amenable to a reliable determination of the consensus.

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. 1273 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. 1389 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, to 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.

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).

Participation in future rounds

The benefit from proficiency testing arises from regular participation and laboratories are invited to contribute to the GeoPT25 round, the sample for which will be distributed during March 2008.

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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: Nanharon 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 Serpentinite). 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.

GeoPT22

Webb, P.C., Thompson, M., Potts, P.J. and Batjargal, B. (2008)
GeoPT22 - an international proficiency test for analytical geochemistry laboratories - report on round 22 / January 2008 (Basalt, MBL-1). International Association of Geoanalysts: Unpublished report.

GeoPT23

Webb, P.C., Thompson, M., Potts, P.J., Watson, J.S. and Kriete, C. (2008)
GeoPT23 - an international proficiency test for analytical geochemistry laboratories - report on round 23 / September 2008 (Separation Lake pegmatite, OU-9) and 23A (Manganese nodule, FeMn-1). International Association of Geoanalysts: Unpublished report.

Table 1		GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)										
Lab identifier		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		2	1	2	1	1	2	1	1	1	1	1
SiO2	% m/m	73.559	74.33	73.17	72.49	65.4	73.12	63.5	73.55	73.4	72.81	73.10
TiO2	% m/m	0.544	0.51	0.54	0.52	0.56	0.54	0.503	0.527	0.51	0.53	0.537
Al2O3	% m/m	10.926	10.86	10.97	10.86	13.4	11.06	9.95	10.88	10.99	10.78	11.01
Fe2O3	% m/m	4.972	5.08	4.89	4.87	6.74	4.93	4.83	4.875	4.88	5	4.96
Fe(II)O	% m/m		3.27	3.47	3.34					3.56	0	
MnO	% m/m	0.127	0.12	0.118	0.119	0.2	0.137	0.117	0.119	0.12	0.12	0.120
MgO	% m/m	1.745	1.73	1.78	1.74	2.49	1.77	2.27	1.728	1.74	1.68	1.80
CaO	% m/m	2.334	2.29	2.33	2.32	2.85	2.34	2.4	2.297	2.29	2.25	2.35
Na2O	% m/m	2.255	2.33	2.42	2.4	3.72	2.45	0.96	2.412	2.54	2.46	2.45
K2O	% m/m	1.252	1.22	1.3	1.26	1.87	1.31	1.55	1.288	1.36	1.28	1.28
P2O5	% m/m	0.0895	0.02	0.1	0.09	0.02	0.094	0.077	0.087	0.09	0.08	0.900
H2O+	% m/m									2.15		
CO2	% m/m					0.166				0.62		
LOI	% m/m	2.05	2.17	2.3	3.14	2.17	2.25		2.23	2.27	2.07	2.42
Ag	ma ka ⁻¹											
As	ma ka ⁻¹			7.5	2.65			1.4		9	3	
Au	ma ka ⁻¹											
B	ma ka ⁻¹											
Ba	ma ka ⁻¹			323.2	302.7			315.9		294		314.9
Be	ma ka ⁻¹				1.2							
Bi	ma ka ⁻¹			11.2	0.26			0.8		4		
Br	ma ka ⁻¹											
Cd	ma ka ⁻¹			0.076	2.45			7.1		13		2.800
Ce	ma ka ⁻¹				37.52			44.5		42		38.80
Cl	ma ka ⁻¹									23		
Co	ma ka ⁻¹				12.7					14	12	10.78
Cr	ma ka ⁻¹			19.7	33.5			41		32	12	31.76
Cs	ma ka ⁻¹			2.4	1.63			6.7		2		1.753
Cu	ma ka ⁻¹			19.1	19			19.9		22	21	22.97
Dy	ma ka ⁻¹				3.65					2		3.758
Er	ma ka ⁻¹				2.18					3		2.187
Eu	ma ka ⁻¹				0.99					1		1.014
F	ma ka ⁻¹				250					98		
Ga	ma ka ⁻¹			31.1	11.9			11		12	10	10.99
Gd	ma ka ⁻¹				3.73					4		3.794
Ge	ma ka ⁻¹				1.2							
Hf	ma ka ⁻¹				3.08					4		3.149
Hg	ma ka ⁻¹											
Ho	ma ka ⁻¹				0.75					1		0.7741
I	ma ka ⁻¹											
In	ma ka ⁻¹											
Ir	ma ka ⁻¹											
La	ma ka ⁻¹			18.2	19.16			24.1		18		18.45
Li	ma ka ⁻¹											28.83
Lu	ma ka ⁻¹				0.36							0.3420
Mo	ma ka ⁻¹				0.9					3	1	1.030
N	ma ka ⁻¹											
Nb	ma ka ⁻¹			10.9	7.6			6.5		9	6	7.252
Nd	ma ka ⁻¹			23	18.1			11.9		23		18.00
Ni	ma ka ⁻¹			14.7	18			17.6		19	21	16.40
Os	ma ka ⁻¹											
Pb	ma ka ⁻¹			13.8	29.16			23		25	30	29.42
Pd	ma ka ⁻¹											
Pr	ma ka ⁻¹				4.64					4		4.798
Pt	ma ka ⁻¹											
Rb	ma ka ⁻¹			39.5	34.5			32.7		35	36	34.08
Re	ma ka ⁻¹											
Rh	ma ka ⁻¹											
Ru	ma ka ⁻¹											
S	ma ka ⁻¹				399			329.7		137		
Sb	ma ka ⁻¹			1.7	1.2					12		0.3000
Sc	ma ka ⁻¹				10					13	13	10.10
Se	ma ka ⁻¹											
Sm	ma ka ⁻¹				4.050					3		3.999
Sn	ma ka ⁻¹			1.7	0.85			1.9		2		1.166
Sr	ma ka ⁻¹			175.3	173.7			153.1		174	166	169.8
Ta	ma ka ⁻¹				0.47					0		0.5689
Tb	ma ka ⁻¹				0.59					1		0.6124
Te	ma ka ⁻¹											
Th	ma ka ⁻¹				5.31			4.9		4		5.109
Tl	ma ka ⁻¹											0.2520
Tm	ma ka ⁻¹											0.3385
U	ma ka ⁻¹			7.2	1.05			1.6		2		1.162
V	ma ka ⁻¹			79.9	78.5			84.2		76	77	69.32
W	ma ka ⁻¹			5.3	5.8					0		0.7860
Y	ma ka ⁻¹			21.5	25.2			19.1		19	22	20.17
Yb	ma ka ⁻¹				2.2					3		2.284
Zn	ma ka ⁻¹			55.3	56			53.1		46	54	57.58
Zr	ma ka ⁻¹			121.1	128			112.5		124	132	108.8

Table 1		GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)										
Lab identifier		Y12	Y13	Y13	Y14	Y14	Y15	Y16	Y17	Y18	Y19	Y20
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		1	1	2	1	2	1	1	1	1	2	2
SiO2	% m/m	73.003	73.6		72.61		73.53	73.09		18.93	73.26	73.44
TiO2	% m/m	0.522	0.549		0.541		0.52	0.54		0.4687	0.517	0.52
Al2O3	% m/m	10.871	10.88		11.23		10.97	11.09			10.94	11.02
Fe2O3	% m/m	4.945	4.969		4.85		4.82	4.92		5.204	4.89	4.9
Fe(II)O	% m/m	3.89										
MnO	% m/m	0.116	0.121				0.115	0.1193	0.120		0.123	0.12575
MgO	% m/m	1.741					1.80	1.83	1.93		1.35	1.75
CaO	% m/m	2.278	2.345		2.39		2.29	2.32		2.323	2.306	2.33
Na2O	% m/m	2.52	2.548		2.46		2.41	1.93		2.534	2.3725	2.31
K2O	% m/m	1.253	1.233		1.29		1.25	1.32		1.183	1.24075	1.26
P2O5	% m/m	0.102	0.066			0.088	0.09	0.09		0.0753	0.09575	0.089
H2O+	% m/m							0.16				
CO2	% m/m											
LOI	% m/m	2.11	2.11				2.50	2.08	2.17		2.2	2.11
Ag	ma ka ⁻¹						0.041	0.06			0.052	
As	ma ka ⁻¹			1.58			4.3			1.86	2.17	2.7
Au	ma ka ⁻¹											
B	ma ka ⁻¹						18.0					
Ba	ma ka ⁻¹	305.8		338			320	338		311	314	311
Be	ma ka ⁻¹			1			1.3	1.18		1.1	0.765	1.00
Bi	ma ka ⁻¹							0.092			0.098	1.3
Br	ma ka ⁻¹											0.4
Cd	ma ka ⁻¹			2.89			2.51	3.38		1.39	2.98	2.61
Ce	ma ka ⁻¹	36.56		30.5	40.6			38.3		39.6	23	35.4
Cl	ma ka ⁻¹											30
Co	ma ka ⁻¹	11.577		11.8			12.4	13.2		12.1	8.97	11.0
Cr	ma ka ⁻¹	30.92		72.5			34.4	39		33.8	22.5	30.2
Cs	ma ka ⁻¹	1.522						1.66		1.66	1.56	1.50
Cu	ma ka ⁻¹	21.55		22.5			27	20		24.7	18.3	26
Dy	ma ka ⁻¹	3.41	3.17		3.67			3.75		3.8	3.28	3.21
Er	ma ka ⁻¹	2.126	1.98		2.23			2.24		2.32	1.94	1.93
Eu	ma ka ⁻¹	0.942	0.88		1.09			1.01		1.01		0.84
F	ma ka ⁻¹						700					440
Ga	ma ka ⁻¹	12.06		12			11.7	12.5		13		13
Gd	ma ka ⁻¹	3.731	3.43		3.85			3.89		3.88	2.73	3.32
Ge	ma ka ⁻¹						1.20				3.12	0.8
Hf	ma ka ⁻¹	2.532		4.2			3.62	3.24		3.31	2.39	2.90
Hg	ma ka ⁻¹						0.0053					0.3
Ho	ma ka ⁻¹	0.757	0.66		0.76			0.76		0.82	0.65	0.67
I	ma ka ⁻¹											1.9
In	ma ka ⁻¹											0.03
Ir	ma ka ⁻¹											
La	ma ka ⁻¹	18.075		17.6	21.0			19.5		19.3	8.26	14.6
Li	ma ka ⁻¹			15	26			27.4			8.02	25.5
Lu	ma ka ⁻¹	0.324	0.3		0.36			0.339		0.35	0.26	0.31
Mo	ma ka ⁻¹						1.67	0.89		0.98	0.98	0.87
N	ma ka ⁻¹											4.4
Nb	ma ka ⁻¹	7.542		7.4			7.74	7.58		7.9	6.65	6.66
Nd	ma ka ⁻¹	18.267	16.2		19.5			20.3		19.2	13.5	15.2
Ni	ma ka ⁻¹	17.753		16.6			17.4	16.9		17.8	14.4	17
Os	ma ka ⁻¹						27.5					15
Pb	ma ka ⁻¹	28.65		24.4				23.8		31.3	26.8	30
Pd	ma ka ⁻¹											24
Pr	ma ka ⁻¹	4.844	4.2					5.12		4.95	3.13	3.85
Pt	ma ka ⁻¹											2.8
Rb	ma ka ⁻¹	35.82		35.7	33			35.5		37.3		40
Re	ma ka ⁻¹											33
Rh	ma ka ⁻¹											
Ru	ma ka ⁻¹											
S	ma ka ⁻¹										600	300
Sb	ma ka ⁻¹							0.23			0.62	0.28
Sc	ma ka ⁻¹	10.94		10.8			14.4	12.95		12.2	6.95	11
Se	ma ka ⁻¹											0.066
Sm	ma ka ⁻¹	3.787	3.38					4.13		4.08	3.03	3.42
Sn	ma ka ⁻¹							1.08		1.35	1.21	1.07
Sr	ma ka ⁻¹	176.81		165			168	179		184	169	173
Ta	ma ka ⁻¹	0.562		3.4			0.60	0.6		0.56		0.51
Tb	ma ka ⁻¹	0.597	0.54		0.63			0.63		0.61	495	0.52
Te	ma ka ⁻¹											0.094
Th	ma ka ⁻¹	4.772		5.1			4.89	4.94		5.14	1.54	5.37
Tl	ma ka ⁻¹						0.29	0.21			0.315	0.17
Tm	ma ka ⁻¹	0.344		0.36				0.329		0.35		0.30
U	ma ka ⁻¹	0.981		1			1.04	1.01		1.11	1.19	1.04
V	ma ka ⁻¹	72.72		83.5			83.3	81		79.1	56.2	73
W	ma ka ⁻¹						0.38	0.21		0.39	0.55	0.45
Y	ma ka ⁻¹	21.921		20.6			22.2	20.3		23	10.9	22
Yb	ma ka ⁻¹	2.102	1.97		2.39			2.15		2.41	1.78	2.02
Zn	ma ka ⁻¹	48.53		53.1			55	52		55.2	44.8	56
Zr	ma ka ⁻¹	100.99		121			134	128		128	69.1	125

Table 1		GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)										
Lab identifier		Y21	Y22	Y23	Y24	Y25	Y26	Y27	Y28	Y29	Y30	Y31
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		2	1	2	2	2	1	2	2	2	2	2
SiO2	% m/m	72.54	69.88	73.15	72.91	72.85		73.6	73.51	73.213	73.36	79.49
TiO2	% m/m	0.548	0.525	0.55	0.55	0.541		0.54	0.66	0.528	0.56	0.47
Al2O3	% m/m	11.30	10.15	11.18	11.03	10.91		10.94	11.14	10.944	10.9	9.99
Fe2O3	% m/m	5.08	4.656	5.03	5.01	4.94		4.87	5.49	4.923	4.96	4.56
Fe(II)O	% m/m				3.46							
MnO	% m/m	0.120	0.125	0.13	0.13	0.118		0.12	0.13	0.126	0.12	0.14
MgO	% m/m	2.17	1.601	1.81	1.91	1.79		1.74	1.84	1.778	1.75	2.21
CaO	% m/m	2.30	2.277	2.36	2.42	2.39		2.34	2.46	2.329	2.34	3.11
Na2O	% m/m	2.27	2.300	2.51	2.52	2.42		2.49	2.63	2.486	2.46	0
K2O	% m/m	1.51	1.142	1.31	1.35	1.26		1.26	1.36	1.290	1.3	0.56
P2O5	% m/m	0.083	0.090	0.091	0.09	0.127		0.09	0.086	0.094	0.09	0.1
H2O+	% m/m				1.95							
CO2	% m/m											
LOI	% m/m	2.23		2.296	2.04	2.3		2.09		2.250	2.11	
Ag	ma ka ⁻¹						0.155					
As	ma ka ⁻¹	1.1					1.902			3.0		0.97
Au	ma ka ⁻¹											
B	ma ka ⁻¹						13.475					
Ba	ma ka ⁻¹	304	253.4	295	313	311	622.194	322	328.7	363.7	299	
Be	ma ka ⁻¹	1.15	1.283	1.2	1.18		0.960				1.19	
Bi	ma ka ⁻¹						0.083					
Br	ma ka ⁻¹											
Cd	ma ka ⁻¹	2.91	2.85		2.60		3.269					
Ce	ma ka ⁻¹	35.5	28.23	39.2	35.4	17	38.638		40.16	37.3	38	
Cl	ma ka ⁻¹											
Co	ma ka ⁻¹	12.4	12.88	12.5	12.6	10	10.422	17	10.62		12	20.5
Cr	ma ka ⁻¹	40	31.38	35.5	36.7	39	27.716	41	31.32	36.7	31.5	52.03
Cs	ma ka ⁻¹	1.68	1.250	1.8	1.73		1.624		1.64		1.62	
Cu	ma ka ⁻¹	27.5	23.79	23.5	24.6	30	19.789		20.38	18.7	22.4	27.7
Dy	ma ka ⁻¹	3.50	3.039	3.66	3.35		3.780		3.95		3.65	
Er	ma ka ⁻¹	2.06	1.908	2.2	2.17		2.214		2.43		2.22	
Eu	ma ka ⁻¹	0.98	0.720	1.02	1.10		0.973		1.04		0.96	
F	ma ka ⁻¹	1053				230						
Ga	ma ka ⁻¹	13.4	11.06	11.9	12.2	11	11.283		25.18	11.7	12.2	
Gd	ma ka ⁻¹	3.97	3.206	3.62	3.70		3.462		3.95		3.69	
Ge	ma ka ⁻¹						1.078				1.32	
Hf	ma ka ⁻¹			3.12	3.59	6	2.796				3.2	
Hg	ma ka ⁻¹						0.809					
Ho	ma ka ⁻¹	0.73	0.6509		0.71		0.778		0.78		0.79	
I	ma ka ⁻¹											
In	ma ka ⁻¹											
Ir	ma ka ⁻¹						0.005					
La	ma ka ⁻¹	17.8	12.826	18.9	20.2	20	17.735		18.82	20.0	18.4	
Li	ma ka ⁻¹	27.7	29.79		22.2	26	25.505		48.38		27.5	
Lu	ma ka ⁻¹	0.31	0.2832	0.33	0.34		0.337		0.36		0.34	
Mo	ma ka ⁻¹		0.745	1.03	0.83		0.854					
N	ma ka ⁻¹											
Nb	ma ka ⁻¹	10	6.836	6.4	8.05	5	6.977			8.3	7.73	
Nd	ma ka ⁻¹	17.8	14.338	18.8	20.3	19	18.932		18.85		18.6	
Ni	ma ka ⁻¹	17.7	19.2	13.1	18.3	23	15.435		14.96	17.0	17.4	22.8
Os	ma ka ⁻¹											
Pb	ma ka ⁻¹	29.5	25.36		28.5		28.262		28.51	26.7	31.4	28.45
Pd	ma ka ⁻¹						1.709					
Pr	ma ka ⁻¹	4.53	3.602	4.8	4.71		4.759		4.87		4.57	
Pt	ma ka ⁻¹						0.008					
Rb	ma ka ⁻¹	34.3	22.42	36.8	36.6		31.887		34.12	38.3	36.2	
Re	ma ka ⁻¹											
Rh	ma ka ⁻¹						0.006					
Ru	ma ka ⁻¹											
S	ma ka ⁻¹	580	711.8	583		735			677.36			
Sb	ma ka ⁻¹		0.246				0.268		0.30			
Sc	ma ka ⁻¹	11.3	10.315	11.6	11.9		10.086	10	14.63	11.7	11.3	4.26
Se	ma ka ⁻¹						0.410					
Sm	ma ka ⁻¹	3.63	3.149	3.8	4.04		3.937		4.00		3.81	
Sn	ma ka ⁻¹	1.15	1.070		1.21		1.094					
Sr	ma ka ⁻¹	164.7	174.7	181.5	184	184	219.573	182	176.98	177.3	176	93.49
Ta	ma ka ⁻¹			0.58	0.64		0.529				0.54	
Tb	ma ka ⁻¹	0.63	0.5017		0.61		0.556		0.61		0.59	
Te	ma ka ⁻¹						0.034					
Th	ma ka ⁻¹	6.19	3.543	5.1	4.78		4.863		5.41	5.7	5.1	
Tl	ma ka ⁻¹	0.25					0.216					
Tm	ma ka ⁻¹	0.31	0.2762		0.33		0.331		0.36		0.34	
U	ma ka ⁻¹	1.10	0.8559	1.1	1.06		1.043		1.12	0	1.08	
V	ma ka ⁻¹	80.7	79.39	79.5	87.5	75	67.107		66.99	86.0	74.9	40.25
W	ma ka ⁻¹	0.43			0.31		0.358					
Y	ma ka ⁻¹	20	15.03	23.2	19.7	20	18.117		19.44	21.7	22	
Yb	ma ka ⁻¹	2.00	1.883	2.18	2.03		2.164		2.39		2.25	
Zn	ma ka ⁻¹	58.0	49.37	55.3	56.1	63	49.672	47	58.36	55.0	52.6	480
Zr	ma ka ⁻¹	132	124.5	115.5	129	135	90.561	133	123.31	132.3	123	82.22

Table 1		GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)										
Lab identifier		Y32	Y33	Y34	Y35	Y36	Y37	Y38	Y39	Y40	Y41	Y42
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		2	2	2	2	2	1	1	2	2	1	1
SiO2	% m/m		73.903	73.3	73.5			70.64	72.85	72.98	72.8	70.68
TiO2	% m/m	0.530	0.528	0.539	0.54	0.477		0.59	0.57	0.544	0.52	0.59
Al2O3	% m/m	10.5	11.085	10.7	11.06	10.99		11.54	10.983	10.959	10.60	12.08
Fe2O3	% m/m	5.16	4.868	4.85	4.94	4.94	4.6	4.45	4.998	4.887	4.80	5.42
Fe(II)O	% m/m								3.394			
MnO	% m/m	0.124	0.121	0.119	0.12	0.127		0.140	0.13	0.13	0.11	0.128
MgO	% m/m	1.90	1.740	1.64	1.67	1.96		2.93	1.876	1.805	1.71	2.52
CaO	% m/m	2.37	2.357	2.34	2.25	2.4	2.3	2.59	2.272	2.327	2.31	2.36
Na2O	% m/m	2.40	2.397	2.48	2.35	1.89		2	2.436	2.437	2.10	2.34
K2O	% m/m		1.286	1.26	1.25	1.66		1.57	1.295	1.294	1.13	1.46
P2O5	% m/m		0.086	0.089	0.09	0.104		0.09	0.106	0.091	0.095	0.099
H2O+	% m/m											
CO2	% m/m			0.579								
LOI	% m/m		2.300	2.16	2.23	2.3		2.26	2.074	2.095	2.25	2.28
Ag	ma ka ⁻¹										0.05	
As	ma ka ⁻¹		1.1				1.8				0.63	8
Au	ma ka ⁻¹											
B	ma ka ⁻¹		7.433									
Ba	ma ka ⁻¹	311	310.1		341	350			394		400	180
Be	ma ka ⁻¹								0.9			
Bi	ma ka ⁻¹											
Br	ma ka ⁻¹											
Cd	ma ka ⁻¹	2.64	3.155				3.7				0.47	
Ce	ma ka ⁻¹	34.4	38.24		32.4	32			35		41.05	
Cl	ma ka ⁻¹					110			92			
Co	ma ka ⁻¹	11.2	9.5		13				13		13.3	19
Cr	ma ka ⁻¹	31.4	33.3		37	29	36.8		37		31.7	25
Cs	ma ka ⁻¹	1.70	2.374						1.94			
Cu	ma ka ⁻¹	25.5	20.6		24	20	20.6		24.6		17.6	30
Dy	ma ka ⁻¹		3.617		3.4				4.11		4.05	
Er	ma ka ⁻¹		2.35		2.1				2.55		1.7	
Eu	ma ka ⁻¹		1.012		0.8				1.11		0.93	
F	ma ka ⁻¹											
Ga	ma ka ⁻¹		10.9		11	11			15			
Gd	ma ka ⁻¹		3.626		3.4				4.39		3.6	
Ge	ma ka ⁻¹		1.8						1.87			
Hf	ma ka ⁻¹		2.811		3.9				3.21			
Hg	ma ka ⁻¹											
Ho	ma ka ⁻¹		0.741		0.67				0.87		0.74	
I	ma ka ⁻¹											
In	ma ka ⁻¹											
Ir	ma ka ⁻¹											
La	ma ka ⁻¹	21.5	19.42		16.4	16			20		19.78	
Li	ma ka ⁻¹	24.9	32.38		29				25.1			
Lu	ma ka ⁻¹		0.335		0.26				0.42		0.19	
Mo	ma ka ⁻¹	0.870	1.440			2			0.94			
N	ma ka ⁻¹											
Nb	ma ka ⁻¹		7.8		5.7	9			8			8
Nd	ma ka ⁻¹		19.57		16.7				17		24.22	
Ni	ma ka ⁻¹	15.6	16.6		18	21	16		24.6		16.5	36
Os	ma ka ⁻¹											
Pb	ma ka ⁻¹	26.4	26.1		27	19	21		27.5			12
Pd	ma ka ⁻¹											
Pr	ma ka ⁻¹		4.852		4.1				5.32		6.86	
Pt	ma ka ⁻¹											
Rb	ma ka ⁻¹	34.8	35.1		36	35.5			42			37
Re	ma ka ⁻¹											
Rh	ma ka ⁻¹											
Ru	ma ka ⁻¹											
S	ma ka ⁻¹			500		390			350		630	460
Sb	ma ka ⁻¹		0.31									
Sc	ma ka ⁻¹		10.5		12				14		11.1	
Se	ma ka ⁻¹											
Sm	ma ka ⁻¹		3.992		3.4				4.58		3.69	
Sn	ma ka ⁻¹		1.6									
Sr	ma ka ⁻¹	183	171.9		162	170.5			190		187	211
Ta	ma ka ⁻¹				0.47				0.17			
Tb	ma ka ⁻¹		0.638		0.49				0.69		0.71	
Te	ma ka ⁻¹											
Th	ma ka ⁻¹	5.59	4.488		5.2	6			6.8			
Tl	ma ka ⁻¹	0.185	2.262						0.18			
Tm	ma ka ⁻¹		0.357		0.28				0.39		0.2	
U	ma ka ⁻¹	1.13	1.098		1.1	2.5			1.12			
V	ma ka ⁻¹	74.7	76.1		79	80.5			80		75	68
W	ma ka ⁻¹		0.487						0.13		20.5	
Y	ma ka ⁻¹	19.7	21.2		19	23			23		20.9	23
Yb	ma ka ⁻¹		2.178		2.1				2.31		1.41	
Zn	ma ka ⁻¹	50.8	52.1		51	46	50.9		63.7		55	62
Zr	ma ka ⁻¹		122.3		112	126.5			120			144

Table 1		GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)										
Lab identifier		Y43	Y43	Y44	Y45	Y46	Y47	Y48	Y49	Y50	Y51	Y52
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		1	2	1	1	1	1	2	1	2	1	2
SiO2	% m/m	73.04			73.02			72.62	72.9	72.2	73.334959	74.565
TiO2	% m/m	0.520			0.53		0.54	0.54	0.52	0.53	0.5399853	0.534
Al2O3	% m/m	10.89			10.85		11.22	10.95	11.1	10.6	10.970461	10.733
Fe2O3	% m/m	4.87		9.1	4.83		4.89	4.86	4.84	4.85	4.9418473	4.802
Fe(II)O	% m/m	3.99			3.32					2.9		
MnO	% m/m	0.120			0.113		0.12	0.12	0.12	0.12	0.1078991	0.123
MgO	% m/m	1.74			1.77		1.59	1.76	1.81	1.67	1.7560452	1.712
CaO	% m/m	2.32			2.62		2.29	2.36	2.35	2.31	2.3239285	2.338
Na2O	% m/m	2.47			2.46		2.41	2.33	2.46	2.4	2.3212632	2.317
K2O	% m/m	1.27			1.34		1.33	1.28	1.25	1.29	1.2761347	1.21
P2O5	% m/m	0.096			0.083			0.1	0.08	0.11	0.0964809	0.088
H2O+	% m/m				2.06					2		
CO2	% m/m				0.64		0.66		0.7			
LOI	% m/m	2.30			2.29			2.04	2.28	1.52	2.2	1.97
Ag	ma ka ⁻¹						0.32					
As	ma ka ⁻¹			2.54	0.53		1.9		3.5	1.8		
Au	ma ka ⁻¹											
B	ma ka ⁻¹									40		
Ba	ma ka ⁻¹	308		328.5		377.6	299	141	273	310		288
Be	ma ka ⁻¹	0.84			2.05				1.3			1.1
Bi	ma ka ⁻¹									0.1		
Br	ma ka ⁻¹											
Cd	ma ka ⁻¹			3.81	1.5		0.27		3.5	3.07		
Ce	ma ka ⁻¹	40.2		41.1		37.91	39	27	45	38		35.99
Cl	ma ka ⁻¹									135		
Co	ma ka ⁻¹	11		12	12.5		11.5	5	12	11.8	11.5	11.53
Cr	ma ka ⁻¹	34			37.5		34	23	36	30	35.5	30.9
Cs	ma ka ⁻¹	1.6		1.75			1.73		2.3	1.7		1.57
Cu	ma ka ⁻¹	22		24	26.5			20	21.1	23	18	22.2
Dy	ma ka ⁻¹	3.44		4.07		3.67	3.7		3.1	3.72	3.2771667	3.5
Er	ma ka ⁻¹	2.25		2.45		2.232			1.9	2.39	2.0376667	2.13
Eu	ma ka ⁻¹	1.09		1.07		0.964	1.01		0.91	1.01	0.8627667	0.95
F	ma ka ⁻¹	381			370					220		
Ga	ma ka ⁻¹	12		13.0				14	13	12	11	12.1
Gd	ma ka ⁻¹	3.88		4.4		3.538			3.3	3.88	3.3596667	3.41
Ge	ma ka ⁻¹			1.38								
Hf	ma ka ⁻¹	3.25				3.31	3.36		2.4	4		2.81
Hg	ma ka ⁻¹											
Ho	ma ka ⁻¹	0.79		0.82		0.757	0.6		0.62	0.78	0.6814333	0.73
I	ma ka ⁻¹											
In	ma ka ⁻¹								0.05			
Ir	ma ka ⁻¹						0.004					
La	ma ka ⁻¹	18.9		19.91		18.814	18.8	6	21	18.2	17.163333	17.22
Li	ma ka ⁻¹				23				30	27		
Lu	ma ka ⁻¹	0.34		0.36		0.337	0.34		0.36	0.36	0.2960333	0.32
Mo	ma ka ⁻¹			0.983					1.2			
N	ma ka ⁻¹											
Nb	ma ka ⁻¹	12.4			8	6.611			7.9	7		5.82
Nd	ma ka ⁻¹	18.8		19.89		18.985	17.7		16	19	17.09	17.58
Ni	ma ka ⁻¹	18			17			23	19	17.3	15	18.1
Os	ma ka ⁻¹											
Pb	ma ka ⁻¹	31.9		32.3	25.5			26	29	28.1	21.596667	26.34
Pd	ma ka ⁻¹											
Pr	ma ka ⁻¹	4.72		5.04		4.707			4.1	4.87	4.3813333	4.44
Pt	ma ka ⁻¹											
Rb	ma ka ⁻¹	38.2		36.96	31.5		37	14	43	36.5	35	34.23
Re	ma ka ⁻¹											
Rh	ma ka ⁻¹											
Ru	ma ka ⁻¹											
S	ma ka ⁻¹		192		740		654		0.07	0.07		
Sb	ma ka ⁻¹				0.07		0.26					
Sc	ma ka ⁻¹	10.6					11.67		12	10	10.5	10.8
Se	ma ka ⁻¹						0.019					
Sm	ma ka ⁻¹	3.84		4.16		3.977	3.91		4	4.1	3.5395	3.72
Sn	ma ka ⁻¹			1.31					1.5			
Sr	ma ka ⁻¹	183		177	169			81	179	170	155.5	168.97
Ta	ma ka ⁻¹	0.60		0.84		0.391	0.57		1.6			0.49
Tb	ma ka ⁻¹	0.62		0.65		0.58	0.59		0.71	0.63	0.5330667	0.57
Te	ma ka ⁻¹											
Th	ma ka ⁻¹	6.76			6.5	4.827	5.09		5.9	4.9	4.272	4.4
Tl	ma ka ⁻¹									0.22		
Tm	ma ka ⁻¹	0.34		0.36		0.349			0.27	0.35	0.2994	0.31
U	ma ka ⁻¹	1.06		1.16			1.08		1.2	1.18	0.9909333	0.99
V	ma ka ⁻¹	73		78.20	77.6		85	42	75	88	78	69.2
W	ma ka ⁻¹			0.79			0.53					
Y	ma ka ⁻¹	21.5		20.7		18.956		16	24	20.8	19.763333	18.85
Yb	ma ka ⁻¹	2.26		2.42		2.274	2.37		2.4	2.2	1.9563333	2.13
Zn	ma ka ⁻¹	54			54.6		37	23	51	51	51	53.5
Zr	ma ka ⁻¹	125		102	123	130.01		101	83.2	120	132.03161	101.46

Table 1		GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)									
Lab identifier		Y53	Y53	Y54	Y55	Y56	Y57	Y58	Y58	Y59	Y60
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		1	2	2	2	2	2	1	2	1	2
SiO2	% m/m	73.09		73.2	73.8835	66.64	73.48	73.168			72.9
TiO2	% m/m	0.5		0.52	0.5612	0.52	0.57	0.53		0.5103	0.55
Al2O3	% m/m	10.85		11.18	10.9123	12.8	10.74	10.943		11.81	11.1
Fe2O3	% m/m	4.74		4.79	4.9538	4.82	4.935	4.904		4.61	5.01
Fe(II)O	% m/m										
MnO	% m/m	0.12		0.12	0.121	0.121	0.119	0.113		0.1164	0.12
MgO	% m/m	1.71		1.81	1.8028		1.973	1.67		1.615	1.75
CaO	% m/m	2.29		2.31	2.3365	2.55	2.317	2.356		2.19	2.35
Na2O	% m/m	2.43		2.42	2.4931		2.578	2.422			2.44
K2O	% m/m	1.24		1.26	1.2847	1.72	1.312	1.264			1.26
P2O5	% m/m	0.1		0.091	0.0971		0.128	0.089			0.08
H2O+	% m/m										
CO2	% m/m				0.629						
LOI	% m/m		2.36	2.03	2.7494			2.18			2.3
Ag	ma ka ⁻¹	0									
As	ma ka ⁻¹	2			1.8466151		2.152				
Au	ma ka ⁻¹										
B	ma ka ⁻¹										
Ba	ma ka ⁻¹	324		296	303	320	359.7		351.7	289.8	
Be	ma ka ⁻¹			0.98	0.7052421		1.141				
Bi	ma ka ⁻¹	1			0.00755						
Br	ma ka ⁻¹	0									
Cd	ma ka ⁻¹	0		2.58	2.6501221	5.6					
Ce	ma ka ⁻¹	30			37.66	35	39.61			38.71	
Cl	ma ka ⁻¹	36			118						
Co	ma ka ⁻¹	7		11.7	11.53		12.03			11.71	
Cr	ma ka ⁻¹	33			25.31	109	41.85		31		
Cs	ma ka ⁻¹	0		1.68	1.6058436		1.662			1.641	
Cu	ma ka ⁻¹	23		24.3	20.12	65	19.46	18.6		25.6	
Dy	ma ka ⁻¹			3.71	3.9190437		3.517			3.61	
Er	ma ka ⁻¹			2.38	2.3097334		2.239			2.239	
Eu	ma ka ⁻¹				0.88273		0.949			0.942	
F	ma ka ⁻¹										
Ga	ma ka ⁻¹	13		12.6	12.15	11.8	12.72		10.4		
Gd	ma ka ⁻¹				4.4215591		3.843			3.6	
Ge	ma ka ⁻¹	0			1.7293268		1.395				
Hf	ma ka ⁻¹	2		3.5	2.713073		2.935			3.35	
Hg	ma ka ⁻¹										
Ho	ma ka ⁻¹			0.78	0.7530119		0.696			0.776	
I	ma ka ⁻¹	0									
In	ma ka ⁻¹			0.37	0.036773						
Ir	ma ka ⁻¹										
La	ma ka ⁻¹	14		19.6	18.1	15	19.17			19.38	
Li	ma ka ⁻¹									25.08	
Lu	ma ka ⁻¹			0.37	0.3309944		0.347			0.338	
Mo	ma ka ⁻¹	2			0.9548455		1.6			0.925	
N	ma ka ⁻¹										
Nb	ma ka ⁻¹	7		7.5	7.3352983	6.3	9.665	7			7.13
Nd	ma ka ⁻¹	19		19.2	17.63	15	19.28			18.42	
Ni	ma ka ⁻¹	16		17.3	17.19	14.4	22.18	18.2			
Os	ma ka ⁻¹										
Pb	ma ka ⁻¹	25		29	28.36	31	23.5	25.2		27.89	
Pd	ma ka ⁻¹										
Pr	ma ka ⁻¹			5.04	4.4		4.779			4.68	
Pt	ma ka ⁻¹										
Rb	ma ka ⁻¹	35		35.8	35.16	37.2	37.3	36.3		34.91	
Re	ma ka ⁻¹										
Rh	ma ka ⁻¹										
Ru	ma ka ⁻¹										
S	ma ka ⁻¹	40			595						
Sb	ma ka ⁻¹	3					0.226				
Sc	ma ka ⁻¹	10			11.82		10.55				
Se	ma ka ⁻¹	0									
Sm	ma ka ⁻¹	4		3.85	3.8613225		3.722			3.722	
Sn	ma ka ⁻¹	3			1.0381573		1.633				
Sr	ma ka ⁻¹	167		178.5	174.3	184	175.5	170.4		173	
Ta	ma ka ⁻¹	0		0.6	0.5177831		0.602				0.483
Tb	ma ka ⁻¹			0.64	0.6901646		0.602			0.564	
Te	ma ka ⁻¹	0									
Th	ma ka ⁻¹	6		5.34	4.0345073	4.9	6.175		4.5	4.775	
Tl	ma ka ⁻¹	0									
Tm	ma ka ⁻¹			0.36	0.3254854		0.302			0.335	
U	ma ka ⁻¹	1		1.15	0.9197167		0.956			1.078	
V	ma ka ⁻¹	71		76	77.4		77.17				
W	ma ka ⁻¹	0			0.343157		0.483				
Y	ma ka ⁻¹	19		20.8	21.09	20.4	20.4	22.2		19.67	
Yb	ma ka ⁻¹	1		2.27	2.2646016		2.05			2.125	
Zn	ma ka ⁻¹	53		57	48.15	58.4	58.41	50.1			61.2
Zr	ma ka ⁻¹	120		123	127	133	126.5	122.3		123.4	

Table 1 GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)												
Lab identifier		Y61	Y62	Y63	Y63	Y64	Y65	Y66	Y67	Y68	Y69	Y70
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality		2	1	1	2	2	2	2	1	2	1	2
SiO2	% m/m	72.9	73.41328		68.45	73.39	73	73.57	73.09	73.7	73.49	73.12
TiO2	% m/m	0.538	0.53723	0.48		0.54	0.55	0.53	0.53	0.52	0.532	0.533
Al2O3	% m/m	11	10.92405	10.75		10.82	11.1	10.94	11.01	10.88	10.93	11.03
Fe2O3	% m/m	4.94	5.0116877	4.82		4.97	4.93	4.94	4.93	4.94	4.99	4.96
Fe(II)O	% m/m							3.46				3.42
MnO	% m/m		0.12368	0.12		0.12	0.122	0.12	0.13	0.12	0.118	0.133
MgO	% m/m	1.75	1.75158	1.87		1.71	1.84	1.77	1.79	1.8	1.79	1.64
CaO	% m/m	2.31	2.34898	2.39		2.35	2.32	2.4	2.37	2.29	2.37	2.29
Na2O	% m/m	2.44	2.44904	2.45		2.22	2.4	2.59	2.44	2.46	2.42	2.51
K2O	% m/m	1.26	1.29297	1.36		1.28	1.28	1.31	1.29	1.26	1.29	1.26
P2O5	% m/m		0.0919			0.09	0.09	0.09	0.09	0.088	0.094	0.09
H2O+	% m/m							1.64				
CO2	% m/m							0.66				
LOI	% m/m	2.11	2.09569			2.25	2.16	2.15	2.3	2.28	2.12	2.16
Ag	ma ka ⁻¹											
As	ma ka ⁻¹			2.1								
Au	ma ka ⁻¹				0.022							
B	ma ka ⁻¹											
Ba	ma ka ⁻¹	324.4	309.16061	330		307	350	263	297	306	370.1	335
Be	ma ka ⁻¹							1.43		1		1.22
Bi	ma ka ⁻¹							0.104		0.08		
Br	ma ka ⁻¹											
Cd	ma ka ⁻¹							3.13		2.7		2.9
Ce	ma ka ⁻¹		39.475623	38.4		41		39.8		35.7		39
Cl	ma ka ⁻¹											
Co	ma ka ⁻¹			11.6		11		14.7	12	11.6		11
Cr	ma ka ⁻¹		33.3	34.8		31		41	67	47	40.8	37
Cs	ma ka ⁻¹		1.7101447	1.71				1.888		1.64		
Cu	ma ka ⁻¹		22.4		110	10		30	18	24	21.3	20
Dy	ma ka ⁻¹		4.1218886	4.1				4.1		3.2		
Er	ma ka ⁻¹		2.3543081					2.56		2.1		
Eu	ma ka ⁻¹		1.075001	1.13				1.102		0.95		
F	ma ka ⁻¹											
Ga	ma ka ⁻¹		13.1		12	15		13.88	12	11.3	12.9	12
Gd	ma ka ⁻¹		3.9526528					4.09		3.3		
Ge	ma ka ⁻¹											
Hf	ma ka ⁻¹		3.3570441	3.67				3.73	5	2.8		
Hg	ma ka ⁻¹											
Ho	ma ka ⁻¹		0.8615759					0.878		0.69		
I	ma ka ⁻¹											
In	ma ka ⁻¹									0.04		
Ir	ma ka ⁻¹											
La	ma ka ⁻¹		19.392214	19.2		16		18.55		17.2		21
Li	ma ka ⁻¹							30.8		21.9		24
Lu	ma ka ⁻¹		0.3566255	0.318				0.381		0.29		
Mo	ma ka ⁻¹							1.17		0.9		
N	ma ka ⁻¹											
Nb	ma ka ⁻¹		7.1937818			8		8.8	9	6.5	8.3	8.2
Nd	ma ka ⁻¹		19.359246	24				19.69		16.8		23.1
Ni	ma ka ⁻¹	17.7	16.3			18		22	18	21	17.2	20
Os	ma ka ⁻¹											
Pb	ma ka ⁻¹	21.8	28.343444			28		32.4	25	26	29.9	25.6
Pd	ma ka ⁻¹											
Pr	ma ka ⁻¹		4.9128167					5.1		4.2		
Pt	ma ka ⁻¹											
Rb	ma ka ⁻¹	34.7	36.399259	37		37	40	40.2	36	36	36.2	36
Re	ma ka ⁻¹											
Rh	ma ka ⁻¹											
Ru	ma ka ⁻¹											
S	ma ka ⁻¹						1060	700		650		
Sb	ma ka ⁻¹							0.32		0.23		
Sc	ma ka ⁻¹		12.022942	11.88				12	12	11		10.8
Se	ma ka ⁻¹											
Sm	ma ka ⁻¹		4.1583122	4.14				4.28		3.5		
Sn	ma ka ⁻¹							1.04		1		
Sr	ma ka ⁻¹	162.5	183.12733		170	164	170	197	170	179	164.1	171
Ta	ma ka ⁻¹		0.5557339	0.47				0.6		0.54		
Tb	ma ka ⁻¹		0.659339	0.56				0.657		0.54		
Te	ma ka ⁻¹											
Th	ma ka ⁻¹		5.2032027	5.1				4.38	6	4.3		
Tl	ma ka ⁻¹							0.239		0.2		
Tm	ma ka ⁻¹		0.3459524					0.387		0.3		
U	ma ka ⁻¹		1.0982364					1.31		1.03		
V	ma ka ⁻¹		80.4	83		74		91	83	77	79.7	74
W	ma ka ⁻¹									0.3		
Y	ma ka ⁻¹		21.928595			20		23.6	20	16.8	20.5	21.6
Yb	ma ka ⁻¹		2.2439582	2.02				2.499		2.1		
Zn	ma ka ⁻¹	53.7	56.4	51		55		66	54	61	57.7	56
Zr	ma ka ⁻¹	122.2	118.24553		110	116	120	139	132	105	120.5	124

Table 1 GeoPT24 Analytical results for Longmyndian greywacke, OU-10, as submitted (Dec. 2008)

Lab identifier		Y71	Y72	Y73	Y74	Y75	Y76	Y77*	*submitted		
Sample		OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	too late for		
Data quality		1	1	2	2	1	2	1	inclusion		
SiO2	% m/m	72.59	73.24	73.555	73.4	67.23	73.82				
TiO2	% m/m	0.547	0.55	0.526	0.53	0.562	0.52				
Al2O3	% m/m	11.03	11.09	10.995	10.9	11.208	10.85				
Fe2O3	% m/m	5.34	5.09	4.8585	4.87	4.914	4.88				
Fe(II)O	% m/m		3.32								
MnO	% m/m	0.121	0.12	0.1195	0.11	0.13	0.12				
MgO	% m/m	1.755	1.78	1.765	1.72	1.818	1.77				
CaO	% m/m	2.4	2.41	2.3185	2.32	2.467	2.32				
Na2O	% m/m	2.46	2.43	2.525	2.37	2.417	2.53				
K2O	% m/m	1.3	1.26	1.279	1.27	1.265	1.32				
P2O5	% m/m	0.097	0.096	0.091	0.09	0.092	0.08				
H2O+	% m/m		1.99								
CO2	% m/m		0.63								
LOI	% m/m	2.1	2.34	2.11	2.29						
Ag	ma ka ⁻¹										
As	ma ka ⁻¹		2.04	8		1.8					
Au	ma ka ⁻¹										
B	ma ka ⁻¹		10								
Ba	ma ka ⁻¹	337	295	278	310	311.67		317			
Be	ma ka ⁻¹	1.29			0.88	1.333		1.58			
Bi	ma ka ⁻¹					0.063		0.062			
Br	ma ka ⁻¹					0.39					
Cd	ma ka ⁻¹	0.57	2.74		3	2.8		3.48			
Ce	ma ka ⁻¹	37.83	38		40	39.567		37.4			
Cl	ma ka ⁻¹		65								
Co	ma ka ⁻¹	15	12	12.2	12	11.633		12.9			
Cr	ma ka ⁻¹	52	39	30.9	16	33.2		34.6			
Cs	ma ka ⁻¹	1.7	1.6			1.63		1.73			
Cu	ma ka ⁻¹	26	24.3	19.5	29	26.63		23.9			
Dy	ma ka ⁻¹	3.63	3.48		3.8	3.953		3.48			
Er	ma ka ⁻¹	2.19	2.07		2.2	2.21		2.1			
Eu	ma ka ⁻¹	1.02	0.988		1	0.991		1.03			
F	ma ka ⁻¹		2300								
Ga	ma ka ⁻¹		12.9			11.9		13			
Gd	ma ka ⁻¹	4.32	3.46		3.7	4.13		3.75			
Ge	ma ka ⁻¹		1.33					1.22			
Hf	ma ka ⁻¹	2.97	3.28			3.327		2.98			
Hg	ma ka ⁻¹										
Ho	ma ka ⁻¹	0.74	0.716			0.836		0.74			
I	ma ka ⁻¹										
In	ma ka ⁻¹							0.065			
Ir	ma ka ⁻¹										
La	ma ka ⁻¹	18.97	18		18	18.8		18.9			
Li	ma ka ⁻¹	27.24	27.1		23	26.5		37			
Lu	ma ka ⁻¹	0.35	0.347			0.346		0.31			
Mo	ma ka ⁻¹	0.8	1			0.873		1.47			
N	ma ka ⁻¹										
Nb	ma ka ⁻¹	8	6.58			10.53		7.62			
Nd	ma ka ⁻¹	18.77	18.3		18	19.03		18.9			
Ni	ma ka ⁻¹	21	20.1	27	18	17.03		20.2			
Os	ma ka ⁻¹										
Pb	ma ka ⁻¹	25	25.5	23	30	30.33		31.2			
Pd	ma ka ⁻¹										
Pr	ma ka ⁻¹	4.86	4.46		5	4.417		4.71			
Pt	ma ka ⁻¹										
Rb	ma ka ⁻¹	40	35			35.5		46.5			
Re	ma ka ⁻¹										
Rh	ma ka ⁻¹										
Ru	ma ka ⁻¹										
S	ma ka ⁻¹		600	620							
Sb	ma ka ⁻¹	0.25	0.28			0.287					
Sc	ma ka ⁻¹	12.95				11.167		14.4			
Se	ma ka ⁻¹										
Sm	ma ka ⁻¹	4	3.83		4	3.95		4.06			
Sn	ma ka ⁻¹	1.17	1.12								
Sr	ma ka ⁻¹	183	166		180	185.3		199			
Ta	ma ka ⁻¹	0.58	0.6			0.603		0.53			
Tb	ma ka ⁻¹	0.65	0.564		0.6	0.617		0.59			
Te	ma ka ⁻¹										
Th	ma ka ⁻¹	4	4.69		5	5.06		4.19			
Tl	ma ka ⁻¹					0.223		0.19			
Tm	ma ka ⁻¹	0.32	0.315			0.367		0.31			
U	ma ka ⁻¹	1.09	1.11		1.1	1.067		0.97			
V	ma ka ⁻¹	85	71.5			80.67		81.2			
W	ma ka ⁻¹		0.36			0.053		5.98			
Y	ma ka ⁻¹	22	19.1		20	22.4		22.8			
Yb	ma ka ⁻¹	2.28	2.18		2	2.25		2.06			
Zn	ma ka ⁻¹	63	58.6	54.1	54	55.77		59.6			
Zr	ma ka ⁻¹	136	114			102.97		119			

Table 2 GeoPT24 Assigned values and statistical summary for contributed data (Longmyndian greywacke, OU-10)

	X_a % m/m	H_a % m/m	n	sdm % m/m	sdm/ H_a	Status	Assigned value is:
SiO ₂	73.12	0.767	67	0.0580	0.0756	Assigned	Median
TiO ₂	0.534	0.012	71	0.0022	0.1846	Assigned	Rob. Mean
Al ₂ O ₃	10.97	0.153	70	0.0214	0.1399	Assigned	Rob. Mean
Fe ₂ O ₃	4.92	0.077	73	0.0121	0.1559	Assigned	Rob. Mean
MnO	0.120	0.003	70	0.0003	0.0805	Assigned	Median
MgO	1.77	0.033	69	0.0071	0.2198	Assigned	Median
CaO	2.34	0.041	72	0.0048	0.1158	Assigned	Median
Na ₂ O	2.43	0.043	69	0.0100	0.2351	Assigned	Median
K ₂ O	1.28	0.025	69	0.0036	0.1447	Assigned	Median
P ₂ O ₅	0.090	0.003	65	-	0.2840	Assigned	Median
LOI	2.20	0.039	58	0.0157	0.4013	Provisional	Rob. Mean
	mg/kg	mg/kg		mg/kg			
Ba	311	10.486	60	3.0620	0.2920	Assigned	Median
Be	1.1	0.090	27	0.0405	0.4529	Provisional	Median
Cd	2.8	0.190	35	0.1850	0.9730	Provisional	Rob. Mean
Ce	38.0	1.758	49	0.4575	0.2602	Provisional	Median
Co	12.0	0.661	53	0.1712	0.2591	Assigned	Rob. Mean
Cr	34.0	1.600	59	0.5983	0.3741	Assigned	Median
Cs	1.68	0.124	39	0.0170	0.1390	Assigned	Median
Cu	22.3	1.118	60	0.4402	0.3938	Assigned	Median
Dy	3.65	0.240	41	0.0486	0.2024	Assigned	Median
Er	2.2	0.156	39	0.0317	0.2036	Assigned	Rob. Mean
Eu	1.00	0.080	38	0.0109	0.1374	Assigned	Median
Ga	12.0	0.660	49	0.1991	0.3015	Assigned	Median
Gd	3.7	0.244	37	0.0553	0.2271	Assigned	Rob. Mean
Hf	3.3	0.218	37	0.0853	0.3919	Assigned	Median
Ho	0.75	0.063	37	0.0090	0.1434	Assigned	Median
La	18.8	0.967	53	0.2036	0.2106	Assigned	Median
Li	26.0	1.275	28	0.7092	0.5561	Provisional	Rob. Mean
Lu	0.34	0.032	39	0.0047	0.1484	Assigned	Median
Mo	0.98	0.079	28	0.0312	0.3968	Provisional	Median
Nb	7.6	0.446	50	0.1562	0.3503	Assigned	Rob. Mean
Nd	18.7	0.962	48	0.2129	0.2214	Assigned	Median
Ni	17.7	0.919	57	0.2553	0.2779	Provisional	Median
Pb	26.9	1.309	55	0.4455	0.3402	Assigned	Rob. Mean
Pr	4.7	0.299	38	0.0637	0.2134	Assigned	Median
Rb	35.9	1.676	55	0.2789	0.1664	Assigned	Rob. Mean
Sc	11.3	0.628	42	0.1685	0.2685	Assigned	Median
Sm	3.9	0.252	41	0.0397	0.1574	Provisional	Median
Sr	174	6.394	61	1.1980	0.1870	Assigned	Rob. Mean
Ta	0.56	0.049	33	0.0103	0.2106	Assigned	Median
Tb	0.61	0.050	39	0.0100	0.1900	Assigned	Rob. Mean
Th	5.0	0.316	49	0.1081	0.3424	Assigned	Rob. Mean
Tl	0.23	0.023	16	0.0137	0.5987	Provisional	Median
Tm	0.34	0.032	33	0.0065	0.2043	Assigned	Median
U	1.09	0.086	44	0.0150	0.1790	Assigned	Rob. Mean
V	77	3.209	55	0.6657	0.2074	Assigned	Median
Y	20.5	1.039	56	0.2774	0.2671	Assigned	Median
Yb	2.2	0.155	42	0.0310	0.1970	Assigned	Rob. Mean
Zn	54	2.382	62	0.6385	0.2680	Assigned	Rob. Mean
Zr	123	4.768	58	1.2650	0.2650	Assigned	Median

where: X_a = Consensus value

H_a = Horwitz Target value

n = no. of contributed data

sdm = Uncertainty of assigned value

sdm/ H_a = Uncertainty/Horwitz Target value

Table 3 GeoPT24 Z-scores for analytical results submitted for Longmyndian greywacke, OU-10 (Dec. 2008)

Lab identifier	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y13	Y14	Y14
Sample	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality	2	1	2	1	1	2	1	1	1	1	1	1	1	2	1	2
SiO2	0.29	1.58	0.03	-0.82	-10.07	0.00	-12.55	0.56	0.37	-0.40	-0.03	-0.15	0.63	*	-0.67	*
TiO2	0.43	-2.03	0.26	-1.18	2.23	0.26	-2.63	-0.59	-2.03	-0.33	0.27	-1.01	1.29	*	0.61	*
Al2O3	-0.13	-0.70	0.01	-0.70	15.91	0.31	-6.65	-0.57	0.15	-1.22	0.28	-0.62	-0.57	*	1.72	*
Fe2O3	0.34	2.08	-0.19	-0.63	23.53	0.07	-1.15	-0.57	-0.50	1.05	0.53	0.34	0.65	*	-0.89	*
MnO	1.06	0.00	-0.30	-0.30	24.23	2.57	-0.91	-0.30	0.00	0.00	0.00	-1.21	0.30	*	*	-0.76
MgO	-0.38	-1.23	0.15	-0.92	22.17	0.00	15.39	-1.29	-0.92	-2.77	0.92	-0.89	*	*	*	0.46
CaO	-0.02	-1.10	-0.06	-0.37	12.52	0.06	1.58	-0.93	-1.10	-2.07	0.36	-1.39	0.24	*	1.33	*
Na2O	-2.06	-2.35	-0.12	-0.71	30.34	0.24	-34.57	-0.42	2.59	0.71	0.47	2.12	2.78	*	0.71	*
K2O	-0.57	-2.43	0.41	-0.81	23.92	0.61	10.95	0.32	3.24	0.00	0.00	-1.09	-1.91	*	0.41	*
P2O5	-0.10	-27.07	1.93	0.00	-27.07	0.77	-5.03	-1.16	0.00	-3.87	313.23	4.64	-9.28	*	*	-0.39
LOI	-1.91	-0.75	1.29	24.08	-0.75	0.65	*	0.79	1.81	-3.31	5.65	-2.28	-2.28	*	*	3.85
Ba	*	*	0.58	-0.79	*	*	0.47	*	-1.62	*	0.37	-0.50	*	1.29	*	0.43
Be	*	*	*	0.66	*	*	*	*	*	*	*	*	*	-0.79	*	0.89
Cd	*	*	-7.09	-1.69	*	*	22.76	*	53.78	*	0.15	*	*	0.31	*	-0.69
Ce	*	*	*	-0.27	*	*	3.70	*	2.28	*	0.46	-0.82	*	-2.13	1.48	*
Co	*	*	*	1.04	*	*	*	*	3.01	-0.02	-1.86	-0.66	*	-0.16	*	0.29
Cr	*	*	-4.47	-0.31	*	*	4.38	*	-1.25	-13.75	-1.40	-1.93	*	12.03	*	0.13
Cs	*	*	2.90	-0.40	*	*	40.39	*	2.58	*	0.59	-1.27	*	*	*	*
Cu	*	*	-1.43	-2.95	*	*	-2.15	*	-0.27	-1.16	0.60	-0.67	*	0.09	*	2.10
Dy	*	*	*	0.00	*	*	*	*	-6.87	*	0.45	-1.00	-2.00	*	0.08	*
Er	*	*	*	-0.08	*	*	*	*	5.18	*	-0.04	-0.43	-1.37	*	0.24	*
Eu	*	*	*	-0.06	*	*	*	*	0.06	*	0.24	-0.67	-1.44	*	1.19	*
Ga	*	*	14.46	-0.15	*	*	-1.51	*	0.00	-3.03	-1.53	0.09	*	0.00	*	-0.23
Gd	*	*	*	0.09	*	*	*	*	1.20	*	0.35	0.09	-1.14	*	0.58	*
Hf	*	*	*	-0.78	*	*	*	*	3.45	*	-0.46	-3.30	*	2.18	*	0.85
Ho	*	*	*	-0.05	*	*	*	*	3.93	*	0.34	0.06	-1.48	*	0.11	*
La	*	*	-0.31	0.37	*	*	5.48	*	-0.83	*	-0.36	-0.75	*	-0.62	2.28	*
Li	*	*	*	*	*	*	*	*	*	*	2.19	*	*	-4.33	-0.03	*
Lu	*	*	*	0.63	*	*	*	*	*	*	0.06	-0.50	-1.25	*	0.63	*
Mo	*	*	*	-1.04	*	*	*	*	25.64	0.24	0.62	*	*	*	*	4.37
Nb	*	*	3.74	0.09	*	*	-2.38	*	3.23	-3.50	-0.69	-0.04	*	-0.18	*	0.20
Nd	*	*	2.24	-0.61	*	*	-7.05	*	4.49	*	-0.71	-0.43	-2.58	*	0.85	*
Ni	*	*	-1.63	0.33	*	*	-0.11	*	1.42	3.59	-1.42	0.06	*	-0.60	*	-0.16
Pb	*	*	-4.99	1.76	*	*	-2.95	*	-1.42	2.40	1.95	1.37	*	-0.94	*	*
Pr	*	*	*	-0.25	*	*	*	*	-2.39	*	0.28	0.43	-1.72	*	*	*
Rb	*	*	1.07	-0.85	*	*	-1.92	*	-0.55	0.05	-1.10	-0.06	*	-0.07	-1.74	*
Sc	*	*	*	-2.07	*	*	*	*	2.71	2.71	-1.91	-0.57	*	-0.40	*	2.47
Sm	*	*	*	0.75	*	*	*	*	-3.42	*	0.55	-0.29	-1.91	*	*	*
Sr	*	*	0.12	0.00	*	*	-3.23	*	0.04	-1.21	-0.61	0.48	*	-0.68	*	-0.45
Ta	*	*	*	-1.88	*	*	*	*	-11.46	*	0.14	0.00	*	28.95	*	0.39
Tb	*	*	*	-0.39	*	*	*	*	7.41	*	0.04	-0.25	-1.34	*	0.38	*
Th	*	*	*	0.88	*	*	-0.42	*	-3.27	*	0.24	-0.83	*	0.11	*	-0.23
Tl	*	*	*	*	*	*	*	*	*	*	0.98	*	*	*	*	1.32
Tm	*	*	*	*	*	*	*	*	*	*	0.11	0.28	*	*	0.79	*
U	*	*	35.39	-0.50	*	*	5.87	*	10.51	*	0.80	-1.30	*	-0.54	*	-0.31
V	*	*	0.43	0.41	*	*	2.19	*	-0.36	-0.05	-2.45	-1.39	*	0.99	*	0.96
Y	*	*	0.51	4.57	*	*	-1.30	*	-1.40	1.49	-0.27	1.42	*	0.07	*	0.84
Yb	*	*	*	0.12	*	*	*	*	5.27	*	0.66	-0.52	-1.37	*	1.34	*
Zn	*	*	0.20	0.70	*	*	-0.52	*	-3.50	-0.14	1.36	-2.44	*	-0.26	*	0.14
Zr	*	*	-0.20	1.05	*	*	-2.20	*	0.21	1.89	-2.98	-4.62	*	-0.21	*	1.15

Table 3 GeoPT24 Z-scores for analytical results submitted for Longmyndian greywacke, OU-10 (Dec. 2008)

Lab identifier	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y27	Y28	Y29	Y30
Sample	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality	1	1	1	1	2	2	2	1	2	2	2	1	2	2	2	2
SiO2	0.53	-0.04	*	-70.70	0.09	0.21	-0.38	-4.23	0.02	-0.14	-0.18	*	0.31	0.25	0.06	0.16
TiO2	-1.18	0.52	*	-5.55	-0.72	-0.59	0.60	-0.76	0.69	0.69	0.30	*	0.26	5.37	-0.25	1.11
Al2O3	0.02	0.81	*	*	-0.09	0.18	1.09	-5.34	0.21	-0.18	*	*	-0.09	0.57	-0.07	-0.22
Fe2O3	-1.28	0.01	*	3.68	-0.19	-0.12	1.04	-3.40	0.72	0.59	0.14	*	-0.32	3.69	0.03	0.26
MnO	-0.21	0.00	*	0.91	0.87	0.15	0.00	1.51	1.51	1.51	-0.30	*	0.00	1.51	0.91	0.00
MgO	1.85	4.93	*	-12.93	-0.31	-0.46	6.16	-5.20	0.62	2.16	0.31	*	-0.46	1.08	0.12	-0.31
CaO	-1.10	-0.37	*	-0.30	-0.36	-0.06	-0.43	-1.42	0.30	1.03	0.67	*	0.06	1.52	-0.08	0.06
Na2O	-0.47	-11.76	*	2.45	-0.68	-1.41	-1.88	-3.06	0.94	1.06	-0.12	*	0.71	2.35	0.66	0.35
K2O	-1.22	1.62	*	-3.93	-0.80	-0.41	4.66	-5.60	0.61	1.42	-0.41	*	-0.41	1.62	0.20	0.41
P2O5	0.00	0.00	*	-5.68	1.11	-0.19	-1.35	0.00	0.19	0.00	7.15	*	0.00	-0.77	0.77	0.00
LOI	-3.05	-0.75	*	*	0.01	-1.14	0.39	*	1.24	-2.04	1.29	*	-1.40	*	0.65	-1.14
Ba	2.58	*	0.00	0.29	0.00	0.95	-0.33	-5.49	-0.76	0.10	0.00	29.68	0.53	0.84	2.51	-0.57
Be	0.44	*	-0.46	-4.20	-0.79	*	0.05	1.59	0.33	0.22	*	-2.02	*	*	*	0.27
Cd	3.20	*	-7.27	1.09	-0.43	*	0.36	0.41	*	-0.45	*	2.61	*	*	*	*
Ce	0.17	*	0.91	-8.53	-0.74	-4.55	-0.71	-5.56	0.34	-0.74	-5.97	0.36	*	0.61	-0.20	0.00
Co	1.80	*	0.14	-4.60	-0.76	0.75	0.29	1.32	0.37	0.45	-1.52	-2.40	3.78	-1.05	*	-0.01
Cr	3.13	*	-0.13	-7.19	-1.19	0.63	1.88	-1.64	0.47	0.84	1.56	-3.93	2.19	-0.84	0.84	-0.78
Cs	-0.16	*	-0.16	-0.97	-0.72	-0.32	0.00	-3.46	0.48	0.20	*	-0.45	*	-0.16	*	-0.24
Cu	-2.06	*	2.15	-3.58	1.66	-0.58	2.33	1.33	0.54	1.03	3.44	-2.25	*	-0.86	-1.61	0.04
Dy	0.42	*	0.62	-1.54	-0.92	*	-0.31	-2.54	0.02	-0.62	*	0.54	*	0.62	*	0.00
Er	0.30	*	0.82	-1.62	-0.84	*	-0.43	-1.83	0.02	-0.07	*	0.14	*	0.76	*	0.09
Eu	0.19	*	0.19	*	-0.97	*	-0.09	-3.45	0.16	0.66	*	-0.28	*	0.28	*	-0.22
Ga	0.76	*	1.51	*	0.76	-1.21	1.06	-1.42	-0.08	0.15	-0.76	-1.09	*	9.98	-0.23	0.15
Gd	0.74	*	0.70	-4.02	-0.80	*	0.54	-2.06	-0.18	-0.02	*	-1.01	*	0.50	*	-0.04
Hf	-0.05	*	0.28	-3.95	-0.80	0.11	*	*	-0.30	0.78	6.32	-2.09	*	*	*	-0.11
Ho	0.11	*	1.07	-1.64	-0.66	*	-0.18	-1.62	*	-0.34	*	0.40	*	0.21	*	0.29
La	0.72	*	0.52	-10.90	-2.17	-4.03	-0.52	-6.18	0.05	0.72	0.62	-1.10	*	0.01	0.62	-0.21
Li	1.07	*	*	-14.13	-0.21	*	0.65	2.94	*	-1.51	-0.02	-0.42	*	8.76	*	0.57
Lu	-0.03	*	0.31	-2.50	-0.47	*	-0.47	-1.78	-0.16	0.00	*	-0.09	*	0.31	*	0.00
Mo	-1.16	*	-0.02	-0.02	-0.71	21.71	*	-3.00	0.31	-0.96	*	-1.62	*	*	*	*
Nb	0.04	*	0.76	-2.04	-1.01	-0.63	2.73	-1.63	-1.30	0.55	-2.87	-1.31	*	*	0.83	0.19
Nd	1.68	*	0.54	-5.39	-1.81	-1.92	-0.46	-4.52	0.06	0.84	0.16	0.26	*	0.09	*	-0.04
Ni	-0.87	*	0.11	-3.59	-0.38	-1.47	0.00	1.63	-2.50	0.33	2.88	-2.47	*	-1.49	-0.38	-0.16
Pb	-2.34	*	3.39	-0.05	1.20	-1.09	1.01	-1.15	*	0.63	*	1.07	*	0.63	-0.06	1.73
Pr	1.36	*	0.79	-5.31	-1.45	-3.21	-0.31	-3.73	0.14	-0.01	*	0.15	*	0.26	*	-0.24
Rb	-0.25	*	0.82	*	1.22	-0.87	-0.48	-8.06	0.26	0.20	*	-2.41	*	-0.54	0.71	0.08
Sc	2.63	*	1.43	-6.93	-0.24	2.95	0.00	-1.57	0.24	0.48	*	-1.93	-1.04	2.65	0.32	0.00
Sm	1.07	*	0.87	-3.30	-0.88	-1.91	-0.46	-2.83	-0.12	0.35	*	0.30	*	0.28	*	-0.10
Sr	0.83	*	1.61	-0.74	-0.06	-0.60	-0.71	0.15	0.61	0.80	0.80	7.17	0.65	0.26	0.28	0.18
Ta	0.78	*	-0.04	*	-0.53	*	*	*	0.18	0.80	*	-0.67	*	*	*	-0.22
Tb	0.38	*	-0.01	9403.08	-0.86	*	0.19	-2.06	*	0.00	*	-1.03	*	0.00	*	-0.19
Th	-0.29	*	0.34	-11.07	0.53	-0.53	1.83	-4.72	0.11	-0.40	*	-0.54	*	0.60	1.06	0.11
Tl	-0.85	*	*	3.73	-1.30	0.45	0.45	*	*	*	*	-0.59	*	*	*	*
Tm	-0.19	*	0.47	*	-0.55	*	-0.40	-1.86	*	-0.08	*	-0.13	*	0.40	*	0.08
U	-0.97	*	0.19	1.12	-0.31	*	0.04	-2.75	0.04	-0.19	*	-0.58	*	0.15	-6.34	-0.08
V	1.19	*	0.60	-6.53	-0.65	-0.03	0.55	0.69	0.36	1.61	-0.34	-3.14	*	-1.59	1.38	-0.35
Y	-0.14	*	2.46	-9.20	0.75	-1.18	-0.22	-5.22	1.32	-0.36	-0.22	-2.25	*	-0.49	0.60	0.75
Yb	-0.21	*	1.47	-2.59	-0.52	*	-0.59	-1.93	-0.01	-0.49	*	-0.12	*	0.67	*	0.22
Zn	-0.98	*	0.36	-4.00	0.35	-0.49	0.77	-2.09	0.20	0.37	1.82	-1.96	-1.54	0.84	0.14	-0.37
Zr	1.05	*	1.05	-11.30	0.21	0.11	0.94	0.32	-0.79	0.63	1.26	-6.80	1.05	0.03	0.98	0.00

Table 3 GeoPT24 Z-scores for analytical results submitted for Longmyndian greywacke, OU-10 (Dec. 2008)

Lab identifier	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y38	Y39	Y40	Y41	Y42	Y43	Y43	Y44	Y45
Sample	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality	2	2	2	2	2	2	1	1	2	2	1	1	1	2	1	1
SiO2	4.16	*	0.51	0.12	0.25	*	*	-3.24	-0.18	-0.09	-0.42	-3.18	-0.10	*	*	-0.13
TiO2	-2.72	-0.17	-0.25	0.22	0.26	-2.42	*	4.78	1.54	0.43	-1.18	4.78	-1.18	*	*	-0.33
Al2O3	-3.19	-1.52	0.39	-0.87	0.31	0.08	*	3.75	0.05	-0.02	-2.40	7.28	-0.50	*	*	-0.76
Fe2O3	-2.32	1.56	-0.33	-0.45	0.14	0.14	-4.12	-6.06	0.51	-0.21	-1.54	6.47	-0.63	*	54.02	-1.15
MnO	3.03	0.61	0.15	-0.15	0.00	1.06	*	6.06	1.51	1.51	-3.03	2.42	0.00	*	*	-2.12
MgO	6.77	2.00	-0.46	-2.00	-1.54	2.92	*	35.71	1.63	0.54	-1.85	23.09	-0.92	*	*	0.00
CaO	9.42	0.42	0.26	0.06	-1.04	0.79	-0.86	6.20	-0.77	-0.10	-0.61	0.60	-0.37	*	*	6.93
Na2O	-28.58	-0.35	-0.39	0.59	-0.94	-6.35	*	-10.11	0.07	0.08	-7.76	-2.12	0.94	*	*	0.71
K2O	-14.60	*	0.12	-0.41	-0.61	7.70	*	11.76	0.30	0.28	-6.08	7.30	-0.41	*	*	2.43
P2O5	1.93	*	-0.77	-0.19	0.00	2.71	*	0.00	3.09	0.19	1.93	3.48	2.32	*	*	-2.71
LOI	*	*	1.29	-0.50	0.39	1.29	*	1.56	-1.60	-1.33	1.30	2.07	2.58	*	*	2.32
Ba	*	0.00	-0.04	*	1.43	1.86	*	*	3.96	*	8.49	-12.49	-0.29	*	1.67	*
Be	*	*	*	*	*	*	*	*	-1.35	*	*	*	-3.36	*	*	10.16
Cd	*	-0.35	1.01	*	*	*	4.88	*	*	*	-12.11	*	*	*	5.46	-6.69
Ce	*	-1.02	0.07	*	-1.59	-1.71	*	*	-0.85	*	1.73	*	1.25	*	1.76	*
Co	6.42	-0.61	-1.90	*	0.75	*	*	*	0.75	*	1.95	10.58	-1.53	*	-0.02	0.74
Cr	5.64	-0.81	-0.22	*	0.94	-1.56	1.75	*	0.94	*	-1.44	-5.63	0.00	*	*	2.19
Cs	*	0.08	2.79	*	*	*	*	*	1.05	*	*	*	-0.64	*	0.56	*
Cu	2.42	1.43	-0.76	*	0.76	-1.03	-1.52	*	1.03	*	-4.20	6.89	-0.27	*	1.52	3.76
Dy	*	*	-0.07	*	-0.52	*	*	*	0.96	*	1.66	*	-0.87	*	1.75	*
Er	*	*	0.50	*	-0.30	*	*	*	1.15	*	-3.16	*	0.37	*	1.65	*
Eu	*	*	0.11	*	-1.22	*	*	*	0.72	*	-0.82	*	1.19	*	0.94	*
Ga	*	*	-0.83	*	-0.76	-0.76	*	*	2.27	*	*	*	0.00	*	1.51	*
Gd	*	*	-0.17	*	-0.63	*	*	*	1.40	*	-0.45	*	0.70	*	2.84	*
Hf	*	*	-1.01	*	1.49	*	*	*	-0.09	*	*	*	0.00	*	*	*
Ho	*	*	-0.10	*	-0.66	*	*	*	0.93	*	-0.21	*	0.59	*	1.07	*
La	*	1.40	0.32	*	-1.24	-1.45	*	*	0.62	*	1.01	*	0.10	*	1.15	*
Li	*	-0.45	2.49	*	1.16	*	*	*	-0.37	*	*	*	*	*	*	-2.38
Lu	*	*	-0.08	*	-1.25	*	*	*	1.25	*	-4.69	*	0.00	*	0.63	*
Mo	*	-0.71	2.91	*	*	6.47	*	*	-0.26	*	*	*	*	*	0.02	*
Nb	*	*	0.27	*	-2.09	1.61	*	*	0.49	*	*	0.98	10.85	*	*	0.98
Nd	*	*	0.46	*	-1.03	*	*	*	-0.88	*	5.75	*	0.12	*	1.25	*
Ni	2.78	-1.14	-0.60	*	0.16	1.80	-1.85	*	3.76	*	-1.31	19.92	0.33	*	*	-0.76
Pb	0.61	-0.18	-0.29	*	0.05	-3.00	-4.48	*	0.24	*	*	-11.35	3.85	*	4.15	-1.04
Pr	*	*	0.23	*	-1.03	*	*	*	1.01	*	7.18	*	0.02	*	1.09	*
Rb	*	-0.34	-0.25	*	0.02	-0.13	*	*	1.81	*	*	0.64	1.36	*	0.62	-2.64
Sc	-5.61	*	-0.64	*	0.56	*	*	*	2.15	*	-0.32	*	-1.12	*	*	*
Sm	*	*	0.26	*	-0.92	*	*	*	1.43	*	-0.68	*	-0.08	*	1.19	*
Sr	-6.27	0.73	-0.14	*	-0.92	-0.25	*	*	1.27	*	2.08	5.83	1.45	*	0.51	-0.74
Ta	*	*	*	*	-0.94	*	*	*	-4.00	*	*	*	0.78	*	5.67	*
Tb	*	*	0.26	*	-1.14	*	*	*	0.76	*	1.90	*	0.19	*	0.76	*
Th	*	0.88	-0.86	*	0.26	1.53	*	*	2.80	*	*	*	5.47	*	*	4.65
Tl	*	-0.97	44.36	*	*	*	*	*	-1.08	*	*	*	*	*	*	*
Tm	*	*	0.35	*	-0.87	*	*	*	0.87	*	-4.27	*	0.16	*	0.79	*
U	*	0.21	0.03	*	0.04	8.15	*	*	0.15	*	*	*	-0.39	*	0.77	*
V	-5.75	-0.38	-0.17	*	0.29	0.52	*	*	0.44	*	-0.68	-2.86	-1.30	*	0.32	0.13
Y	*	-0.36	0.36	*	-0.70	1.23	*	*	1.23	*	0.43	2.46	1.01	*	0.24	*
Yb	*	*	-0.01	*	-0.27	*	*	*	0.41	*	-4.98	*	0.50	*	1.53	*
Zn	89.34	-0.74	-0.47	*	-0.70	-1.75	-1.44	*	1.96	*	0.28	3.22	-0.14	*	*	0.11
Zr	-4.28	*	-0.07	*	-1.15	0.37	*	*	-0.32	*	*	4.40	0.42	*	-4.40	0.00

Table 3 GeoPT24 Z-scores for analytical results submitted for Longmyndian greywacke, OU-10 (Dec. 2008)

Lab identifier	Y46	Y47	Y48	Y49	Y50	Y51	Y52	Y53	Y53	Y54	Y55	Y56	Y57	Y58	Y58	Y59
Sample	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality	1	1	2	1	2	1	2	1	2	2	2	2	2	1	2	1
SiO2	*	*	-0.33	-0.29	-0.60	0.28	0.94	-0.04	*	0.05	0.50	-4.23	0.23	0.06	*	*
TiO2	*	0.52	0.26	-1.18	-0.17	0.52	0.01	-2.89	*	-0.59	1.16	-0.59	1.54	-0.33	*	*
Al2O3	*	1.66	-0.05	0.87	-1.20	0.03	-0.76	-0.76	*	0.70	-0.18	5.99	-0.74	-0.15	*	*
Fe2O3	*	-0.38	-0.38	-1.02	-0.45	0.29	-0.76	-2.31	*	-0.83	0.22	-0.64	0.10	-0.19	*	*
MnO	*	0.00	0.00	0.00	0.00	-3.66	0.45	0.00	*	0.00	0.15	0.15	-0.15	-2.12	*	*
MgO	*	-5.54	-0.15	1.23	-1.54	-0.43	-0.89	-1.85	*	0.62	0.50	*	3.12	-3.08	*	*
CaO	*	-1.10	0.30	0.36	-0.31	-0.28	0.03	-1.10	*	-0.31	0.02	2.61	-0.22	0.50	*	*
Na2O	*	-0.47	-1.18	0.71	-0.35	-2.56	-1.33	0.00	*	-0.12	0.74	*	1.74	-0.19	*	*
K2O	*	2.03	0.00	-1.22	0.20	-0.16	-1.42	-1.62	*	-0.41	0.10	8.92	0.65	-0.65	*	*
P2O5	*	*	1.93	-3.87	3.87	2.51	-0.39	3.87	*	0.19	1.37	*	7.35	-0.39	*	*
LOI	*	*	-2.04	2.07	-8.69	0.02	-2.93	*	2.06	-2.17	7.04	*	*	-0.49	*	*
Ba	6.35	-1.14	-8.11	-3.62	-0.05	*	-1.10	1.24	*	-0.72	-0.38	0.43	2.32	*	1.94	-2.02
Be	*	*	*	1.78	*	*	-0.23	*	*	-0.90	-2.44	*	0.00	*	*	*
Cd	*	-13.16	*	3.83	0.78	*	*	-14.58	*	-0.51	-0.32	7.44	*	*	*	*
Ce	-0.05	0.57	-3.13	3.98	0.00	*	-0.57	-4.55	*	*	-0.10	-0.85	0.46	*	*	0.40
Co	*	-0.77	-5.30	-0.02	-0.16	-0.77	-0.36	-7.58	*	-0.23	-0.36	*	0.02	*	*	-0.45
Cr	*	0.00	-3.44	1.25	-1.25	0.94	-0.97	-0.63	*	*	-2.72	23.44	2.45	*	-0.94	*
Cs	*	0.40	*	4.99	0.08	*	-0.44	-13.52	*	0.00	-0.30	*	-0.07	*	*	-0.31
Cu	*	*	-1.03	-1.07	0.31	-3.85	-0.04	0.63	*	0.89	-0.98	19.10	-1.27	-3.31	*	2.95
Dy	0.08	0.21	*	-2.29	0.15	-1.55	-0.31	*	*	0.12	0.56	*	-0.28	*	*	-0.17
Er	0.25	*	*	-1.88	0.63	-1.00	-0.20	*	*	0.60	0.38	*	0.15	*	*	0.30
Eu	-0.39	0.19	*	-1.07	0.09	-1.66	-0.28	*	*	-0.70	*	-0.29	*	*	*	-0.67
Ga	*	*	1.51	1.51	0.00	-1.51	0.08	1.51	*	0.45	0.11	-0.15	0.55	*	-1.21	*
Gd	-0.70	*	*	-1.68	0.35	-1.43	-0.61	*	*	*	1.46	*	0.28	*	*	-0.45
Hf	0.28	0.51	*	-3.90	1.72	*	-1.01	-5.74	*	0.57	-1.23	*	-0.72	*	*	0.46
Ho	0.06	-2.43	*	-2.12	0.21	-1.14	-0.18	*	*	0.21	0.00	*	-0.45	*	*	0.37
La	0.01	0.00	-6.62	2.28	-0.31	-1.69	-0.82	-4.96	*	0.41	-0.36	-1.97	0.19	*	*	0.60
Li	*	*	*	3.11	0.38	*	*	*	*	*	*	*	*	*	*	-0.75
Lu	-0.09	0.00	*	0.63	0.31	-1.37	-0.31	*	*	0.47	-0.14	*	0.11	*	*	-0.06
Mo	*	*	*	2.78	*	*	*	12.94	*	*	-0.17	*	3.93	*	*	-0.72
Nb	-2.13	*	*	0.76	-0.63	*	-1.95	-1.26	*	-0.07	-0.25	-1.41	2.36	-1.26	*	*
Nd	0.31	-1.02	*	-2.79	0.16	-1.66	-0.57	0.33	*	0.27	-0.55	-1.92	0.31	*	*	-0.28
Ni	*	*	2.88	1.42	-0.22	-2.94	0.22	-1.85	*	-0.22	-0.28	-1.80	2.44	0.54	*	*
Pb	*	*	-0.33	1.63	0.47	-4.02	-0.20	-1.42	*	0.82	0.57	1.58	-1.28	-1.27	*	0.79
Pr	-0.03	*	*	-2.06	0.26	-1.12	-0.46	*	*	0.54	-0.53	*	0.11	*	*	-0.12
Rb	*	0.64	-6.54	4.22	0.17	-0.55	-0.51	-0.55	*	-0.04	-0.23	0.38	0.41	0.23	*	-0.60
Sc	*	0.59	*	1.12	-1.04	-1.28	-0.40	-2.07	*	*	0.41	*	-0.60	*	*	*
Sm	0.46	0.19	*	0.55	0.47	-1.28	-0.28	0.55	*	-0.02	0.00	*	-0.28	*	*	-0.55
Sr	*	*	-7.25	0.83	-0.29	-2.85	-0.37	-1.05	*	0.37	0.05	0.80	0.14	-0.52	*	-0.11
Ta	-3.49	0.16	*	21.17	*	*	-0.73	-11.46	*	0.39	-0.45	*	0.41	*	*	*
Tb	-0.58	-0.39	*	1.90	0.19	-1.47	-0.38	*	*	0.28	0.76	*	-0.08	*	*	-0.88
Th	-0.65	0.18	*	2.75	-0.21	-2.41	-1.00	3.06	*	0.49	-1.58	-0.21	1.81	*	-0.84	-0.82
Tl	*	*	*	*	-0.21	*	*	-10.02	*	*	*	*	*	*	*	*
Tm	0.44	*	*	-2.06	0.24	-1.13	-0.40	*	*	0.40	-0.15	*	-0.52	*	*	0.00
U	*	-0.16	*	1.24	0.50	-1.19	-0.60	-1.08	*	0.33	-1.01	*	-0.80	*	*	-0.18
V	*	2.44	-5.48	-0.68	1.69	0.26	-1.24	-1.92	*	-0.18	0.04	*	0.00	*	*	*
Y	-1.44	*	-2.14	3.42	0.17	-0.66	-0.77	-1.40	*	0.17	0.31	-0.02	-0.02	1.69	*	-0.75
Yb	0.59	1.21	*	1.40	0.06	-1.46	-0.17	-7.62	*	0.28	0.27	*	-0.43	*	*	-0.37
Zn	*	-7.28	-6.58	-1.40	-0.70	-1.40	-0.18	-0.56	*	0.56	-1.30	0.85	0.85	-1.78	*	*
Zr	1.47	*	-2.31	-8.35	-0.32	1.89	-2.26	-0.63	*	0.00	0.42	1.05	0.37	-0.15	*	0.08

Table 3 GeoPT24 Z-scores for analytical results submitted for Longmyndian greywacke, OU-10 (Dec. 2008)

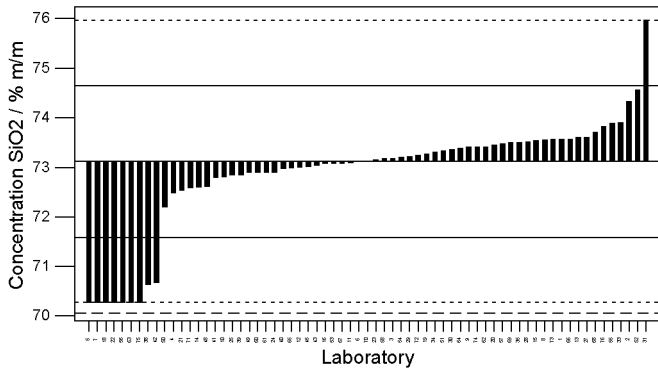
Lab identifier	Y59	Y60	Y61	Y62	Y63	Y63	Y64	Y65	Y66	Y67	Y68	Y69	Y70	Y71	Y72	Y73
Sample	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10	OU-10
Data quality	2	1	2	1	1	2	2	2	2	1	2	1	2	1	1	2
SiO2	*	-0.29	-0.14	0.38	*	-3.05	0.18	-0.08	0.29	-0.04	0.38	0.48	0.00	-0.69	0.16	0.28
TiO2	-1.00	1.37	0.18	0.29	-4.59	*	0.26	0.69	-0.17	-0.33	-0.59	-0.16	-0.04	1.12	1.37	-0.34
Al2O3	2.76	0.87	0.11	-0.28	-1.42	*	-0.48	0.44	-0.09	0.28	-0.28	-0.24	0.21	0.42	0.81	0.09
Fe2O3	-2.00	1.17	0.14	1.20	-1.28	*	0.33	0.07	0.14	0.14	0.14	0.92	0.26	5.44	2.21	-0.39
MnO	-0.55	0.00	*	1.11	0.00	*	0.00	0.30	0.00	3.03	0.00	-0.61	1.97	0.30	0.00	-0.08
MgO	-2.39	-0.62	-0.31	-0.57	3.08	*	-0.92	1.08	0.00	0.62	0.46	0.62	-2.00	-0.46	0.31	-0.08
CaO	-1.77	0.36	-0.31	0.33	1.33	*	0.18	-0.19	0.79	0.85	-0.55	0.85	-0.55	1.58	1.82	-0.20
Na2O	*	0.24	0.12	0.45	0.47	*	-2.47	-0.35	1.88	0.24	0.35	-0.24	0.94	0.71	0.00	1.12
K2O	*	-0.81	-0.41	0.53	3.24	*	0.00	0.00	0.61	0.41	-0.41	0.41	-0.41	0.81	-0.81	-0.02
P2O5	*	-3.87	*	0.74	*	*	0.00	0.00	0.00	0.00	-0.39	1.55	0.00	2.71	2.32	0.19
LOI	*	2.58	-1.14	-2.65	*	*	0.65	-0.50	-0.63	2.58	1.03	-2.03	-0.50	-2.54	3.60	-1.14
Ba	*	*	0.64	-0.18	1.81	*	-0.19	1.86	-2.29	-1.34	-0.24	5.64	1.14	2.48	-1.53	-1.57
Be	*	*	*	*	*	*	*	*	1.62	*	-0.79	*	0.44	1.67	*	*
Cd	*	*	*	*	*	*	*	*	0.94	*	-0.19	*	0.34	-11.58	-0.17	*
Ce	*	*	*	0.84	0.23	*	0.85	*	0.51	*	-0.65	*	0.28	-0.10	0.00	*
Co	*	*	*	*	-0.62	*	-0.76	*	2.04	-0.02	-0.31	*	-0.76	4.52	-0.02	0.14
Cr	*	*	*	-0.44	0.50	*	-0.94	*	2.19	20.63	4.06	4.25	0.94	11.25	3.13	-0.97
Cs	*	*	*	0.24	0.24	*	*	*	0.84	*	-0.16	*	*	0.16	-0.64	*
Cu	*	*	*	0.09	*	39.23	-5.50	*	3.44	-3.85	0.76	-0.89	-1.03	3.31	1.79	-1.25
Dy	*	*	*	1.96	1.87	*	*	*	0.94	*	-0.94	*	*	-0.08	-0.71	*
Er	*	*	*	1.04	*	*	*	*	1.18	*	-0.30	*	*	-0.02	-0.79	*
Eu	*	*	*	1.00	1.70	*	*	*	0.67	*	-0.28	*	*	0.31	-0.09	*
Ga	*	*	*	1.67	*	0.00	2.27	*	1.42	0.00	-0.53	1.36	0.00	*	1.36	*
Gd	*	*	*	1.00	*	*	*	*	0.78	*	-0.84	*	*	2.51	-1.02	*
Hf	*	*	*	0.49	1.93	*	*	*	1.10	8.04	-1.03	*	*	-1.29	0.14	*
Ho	*	*	*	1.73	*	*	*	*	0.99	*	-0.50	*	*	-0.21	-0.59	*
La	*	*	*	0.61	0.41	*	-1.45	*	-0.13	*	-0.83	*	1.14	0.18	-0.83	*
Li	*	*	*	*	*	*	*	*	1.87	*	-1.62	*	-0.80	0.94	0.83	*
Lu	*	*	*	0.52	-0.69	*	*	*	0.64	*	-0.78	*	*	0.31	0.22	*
Mo	*	*	*	*	*	*	*	*	1.20	*	-0.52	*	*	-2.31	0.24	*
Nb	-0.48	*	*	-0.82	*	*	0.49	*	1.39	3.23	-1.19	1.66	0.72	0.98	-2.20	*
Nd	*	*	*	0.70	5.53	*	*	*	0.52	*	-0.98	*	2.29	0.09	-0.40	*
Ni	*	*	0.00	-1.52	*	*	0.16	*	2.34	0.33	1.80	-0.54	1.25	3.59	2.61	5.06
Pb	*	*	-1.93	1.13	*	*	0.44	*	2.12	-1.42	-0.33	2.32	-0.48	-1.42	-1.04	-1.47
Pr	*	*	*	0.66	*	*	*	*	0.64	*	-0.86	*	*	0.49	-0.85	*
Rb	*	*	-0.36	0.28	0.64	*	0.32	1.22	1.28	0.05	0.02	0.17	0.02	2.43	-0.55	*
Sc	*	*	*	1.15	0.92	*	*	*	0.56	1.12	-0.24	*	-0.40	2.63	*	*
Sm	*	*	*	1.18	1.11	*	*	*	0.83	*	-0.72	*	*	0.55	-0.12	*
Sr	*	*	-0.88	1.47	*	-0.29	-0.76	-0.29	1.82	-0.58	0.41	-1.51	-0.21	1.45	-1.21	*
Ta	-0.81	*	*	-0.13	-1.88	*	*	*	0.39	*	-0.22	*	*	0.37	0.78	*
Tb	*	*	*	0.93	-0.96	*	*	*	0.44	*	-0.67	*	*	0.76	-0.88	*
Th	*	*	*	0.54	0.21	*	*	*	-1.03	3.06	-1.16	*	*	-3.27	-1.09	*
Tl	*	*	*	*	*	*	*	*	0.21	*	-0.64	*	*	*	*	*
Tm	*	*	*	0.35	*	*	*	*	0.82	*	-0.55	*	*	-0.47	-0.63	*
U	*	*	*	0.06	*	*	*	*	1.26	*	-0.37	*	*	-0.04	0.19	*
V	*	*	*	1.01	1.82	*	-0.49	*	2.15	1.82	-0.03	0.79	-0.49	2.44	-1.77	*
Y	*	*	*	1.42	*	*	-0.22	*	1.52	-0.43	-1.76	0.05	0.55	1.49	-1.30	*
Yb	*	*	*	0.40	-1.05	*	*	*	1.02	*	-0.27	*	*	0.63	-0.01	*
Zn	1.44	*	-0.13	0.87	-1.40	*	0.14	*	2.45	-0.14	1.40	1.41	0.35	3.64	1.79	-0.05
Zr	*	*	-0.08	-1.00	*	-1.36	-0.73	-0.32	1.68	1.89	-1.89	-0.52	0.11	2.73	-1.89	*

Table 3 GeoPT24 Z-scores for analytical results submitted for Longmyndian greywacke, OU-10 (Dec. 2008)

Lab identifier	Y74	Y75	Y76	Y77*	*submitted
Sample	OU-10	OU-10	OU-10	OU-10	too late for
Data quality	2	1	2	1	inclusion
SiO2	0.18	-7.68	0.46	*	
TiO2	-0.17	2.40	-0.59	*	
Al2O3	-0.22	1.58	-0.38	*	
Fe2O3	-0.32	-0.07	-0.25	*	
MnO	-1.51	3.03	0.00	*	
MgO	-0.77	1.48	0.00	*	
CaO	-0.19	3.21	-0.19	*	
Na2O	-0.71	-0.31	1.18	*	
K2O	-0.20	-0.61	0.81	*	
P2O5	0.00	0.77	-1.93	*	
LOI	1.16	*	*	*	
Ba	-0.05	-29.53	*	0.57	
Be	-1.46	-12.05	*	4.91	
Cd	0.60	193.48	*	3.73	
Ce	0.57	*	*	-0.34	
Co	-0.01	32.07	*	1.35	
Cr	-5.63	-20.24	*	0.38	
Cs	*	200.76	*	0.40	
Cu	3.00	-16.41	*	1.43	
Dy	0.31	-5.99	*	-0.71	
Er	0.02	-7.71	*	-0.60	
Eu	0.03	*	*	0.44	
Ga	*	-11.92	*	1.51	
Gd	-0.02	*	*	0.17	
Hf	*	*	*	-1.24	
Ho	*	*	*	-0.21	
La	-0.41	7.96	*	0.10	
Li	-1.19	-20.15	*	8.59	
Lu	*	16.66	*	-0.94	
Mo	*	*	*	6.21	
Nb	*	25.71	*	0.13	
Nd	-0.36	-1.72	*	0.22	
Ni	0.16	*	*	2.72	
Pb	1.20	*	*	3.31	
Pr	0.48	*	*	-0.02	
Rb	*	*	*	6.31	
Sc	*	*	*	4.94	
Sm	0.28	*	*	0.79	
Sr	0.49	-27.08	*	3.95	
Ta	*	1.12	*	-0.65	
Tb	-0.10	*	*	-0.40	
Th	-0.05	-15.24	*	-2.67	
Tl	*	6.00	*	-1.72	
Tm	*	23.17	*	-0.79	
U	0.04	922.27	*	-1.43	
V	*	-24.03	*	1.26	
Y	-0.22	-17.52	*	2.26	
Yb	-0.59	345.29	*	-0.79	
Zn	-0.07	20.41	*	2.21	
Zr	*	*	*	-0.84	

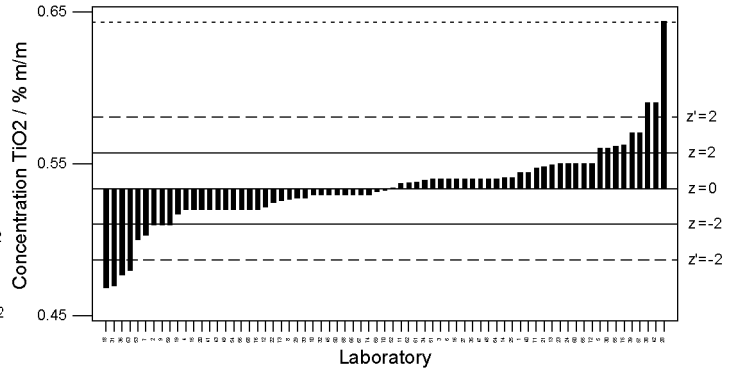
GeoPT24 - Barchart for SiO₂

Baseline is median



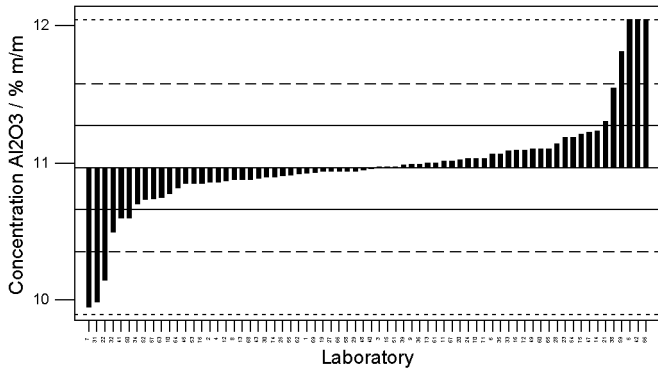
GeoPT24 - Barchart for TiO₂

Baseline is robust mean



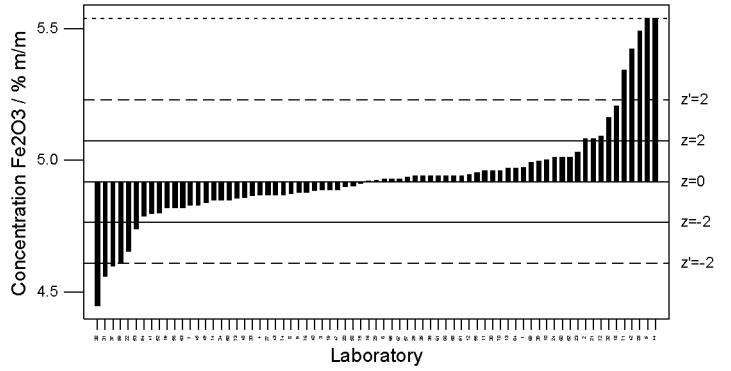
GeoPT24 - Barchart for Al₂O₃

Baseline is robust mean



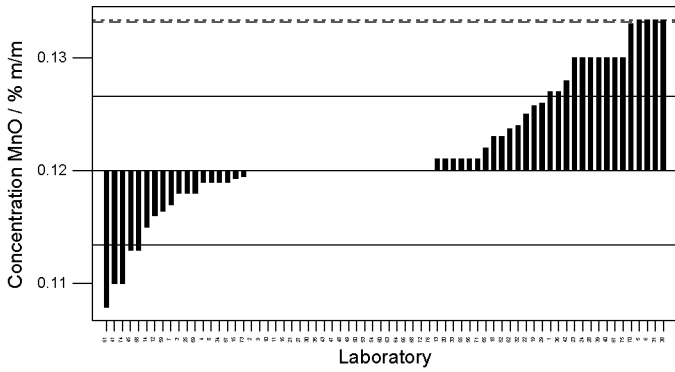
GeoPT24 - Barchart for Fe₂O₃

Baseline is robust mean



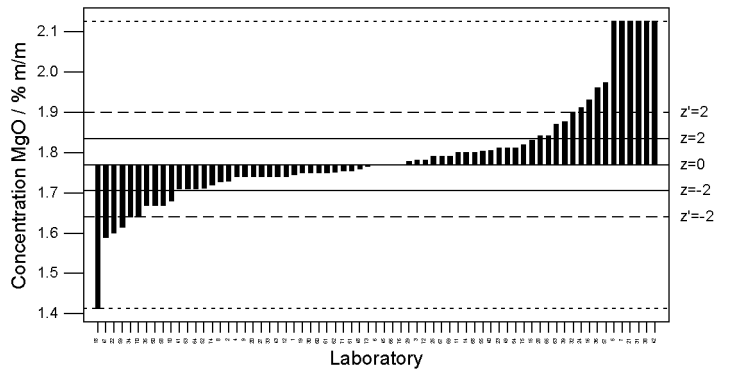
GeoPT24 - Barchart for MnO

Baseline is median



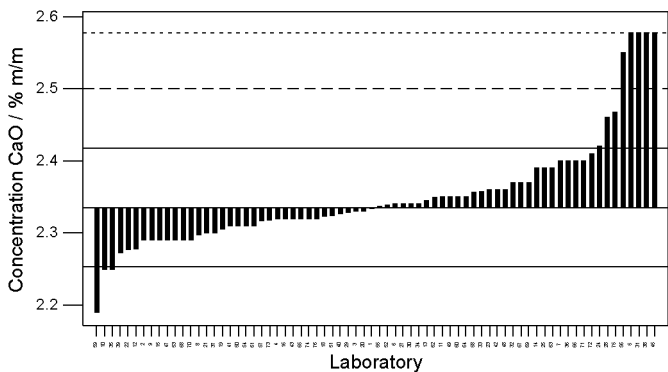
GeoPT24 - Barchart for MgO

Baseline is median



GeoPT24 - Barchart for CaO

Baseline is median



GeoPT 24 - Barchart for Na₂O

Baseline is median

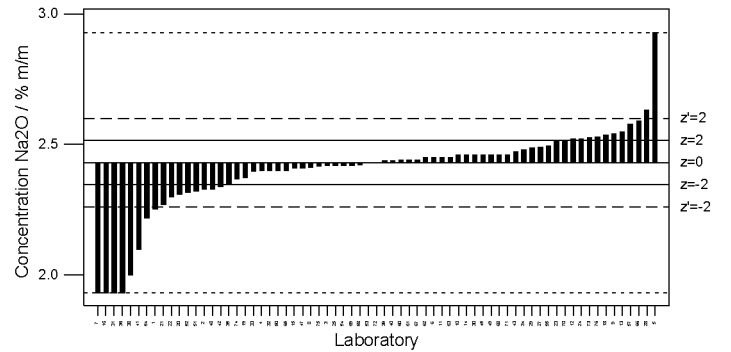
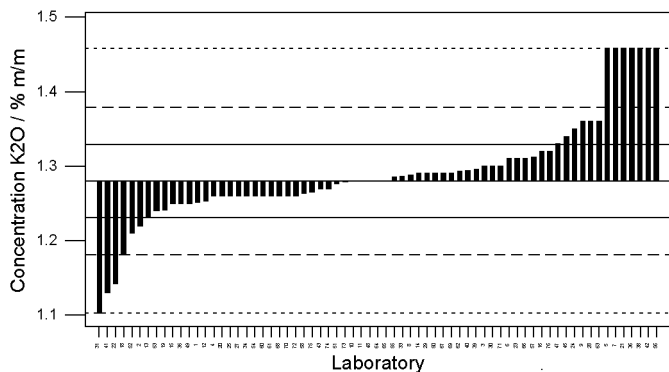
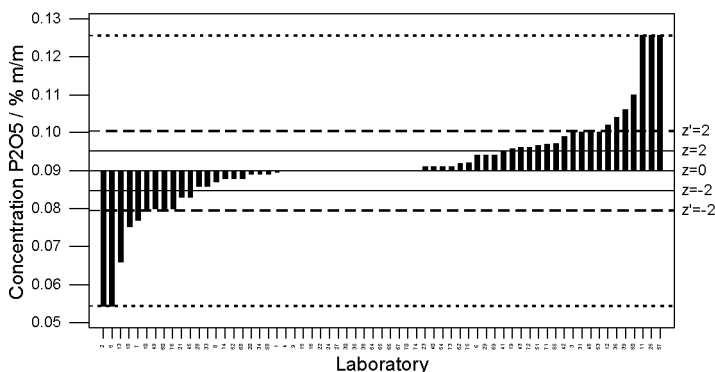


Figure 1: GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

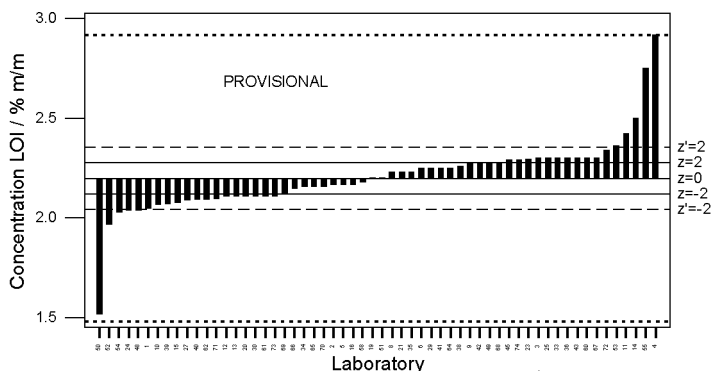
GeoPT24 - Barchart for K2O
Baseline is median



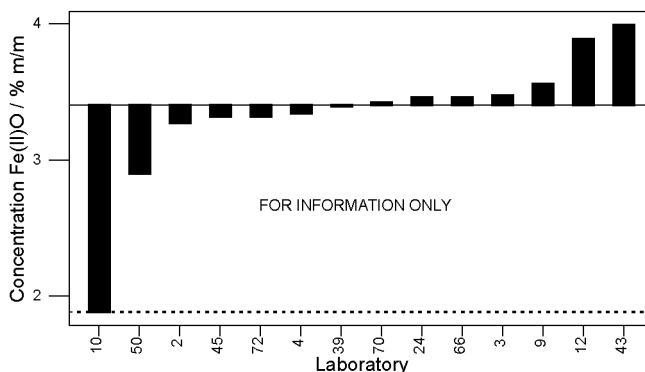
GeoPT24 - Barchart for P2O5
Baseline is median



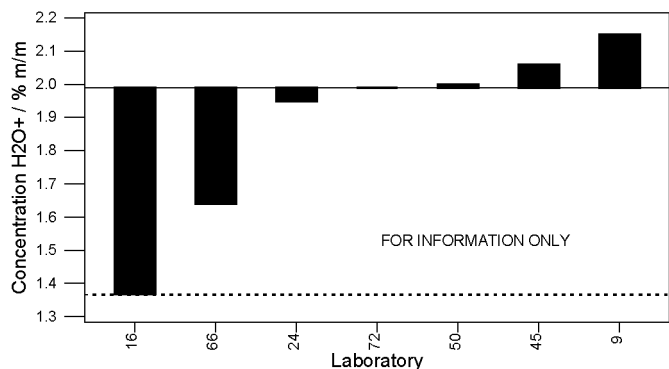
GeoPT24 - Barchart for LOI
Baseline is robust mean



GeoPT24 - Barchart for Fe(II)O
Baseline is robust mean



GeoPT 24 - Barchart for H2O+
Baseline is robust mean



GeoPT 24 - Barchart for CO2
Baseline is robust mean

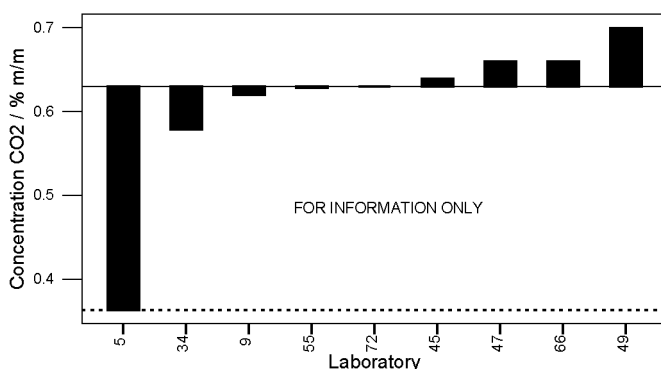
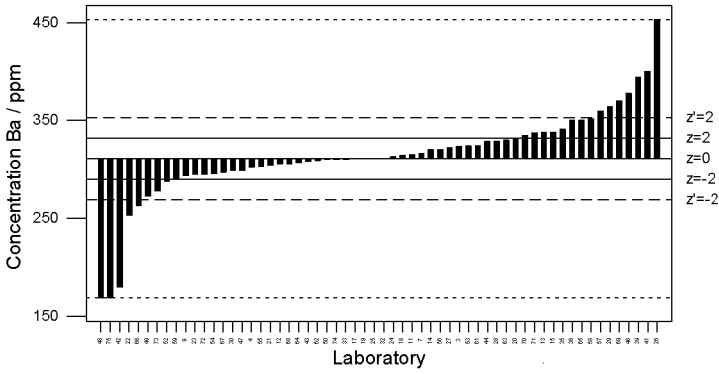


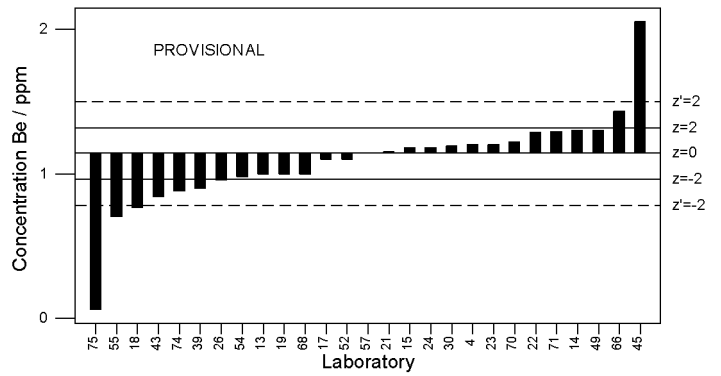
Figure 1 (cont'd): GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

Figure 2: GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for information only for elements for which values could not be assigned.

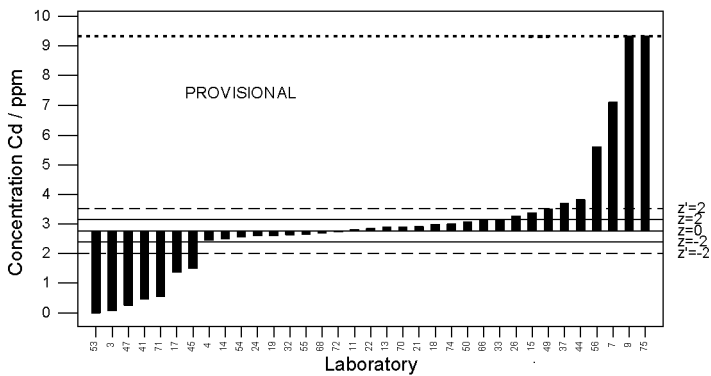
GeoPT24 - Barchart for Ba
Baseline is median



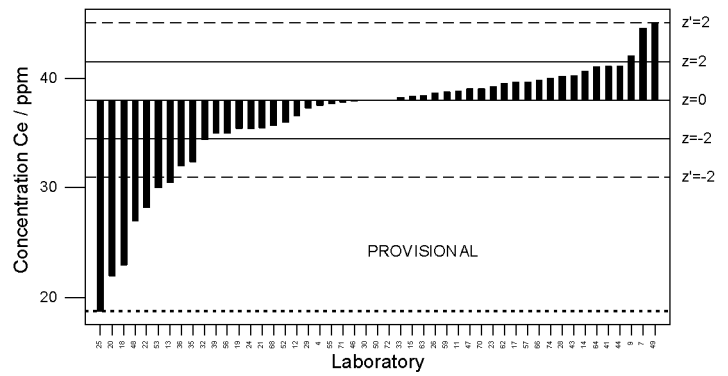
GeoPT24 - Barchart for Be
Baseline is median



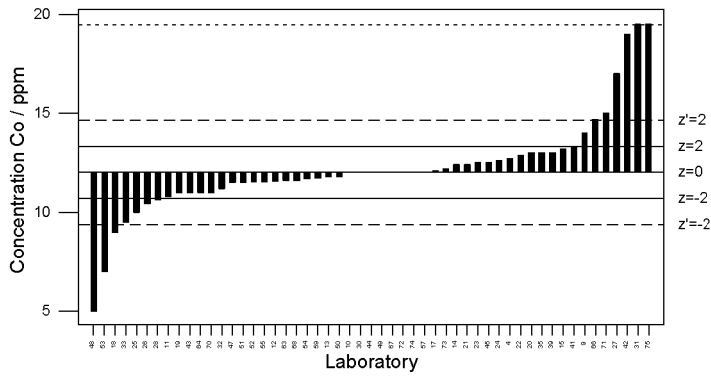
GeoPT24 - Barchart for Cd
Baseline is robust mean



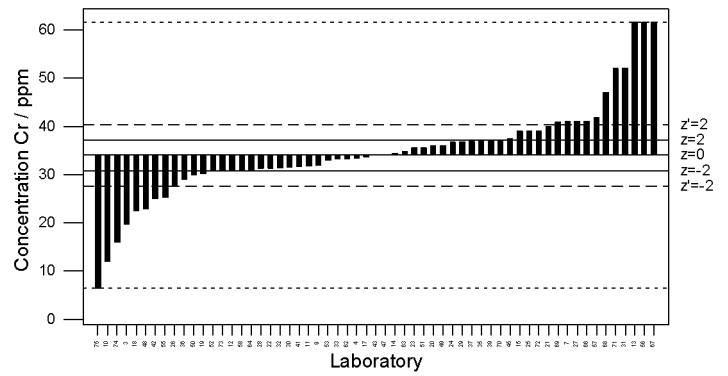
GeoPT24 - Barchart for Ce
Baseline is median



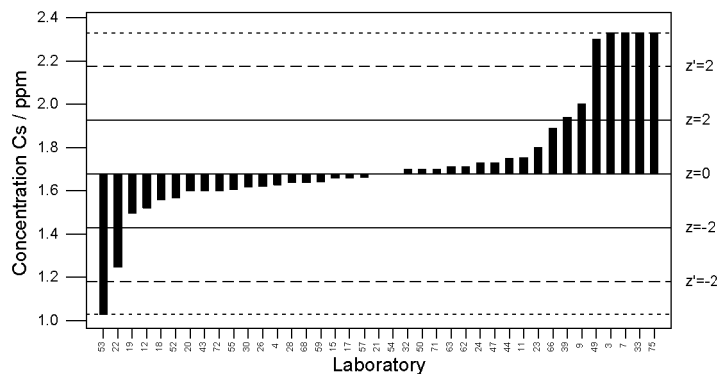
GeoPT24 - Barchart for Co
Baseline is robust mean



GeoPT24 - Barchart for Cr
Baseline is median



GeoPT24 - Barchart for Cs
Baseline is median



GeoPT24 - Barchart for Cu
Baseline is median

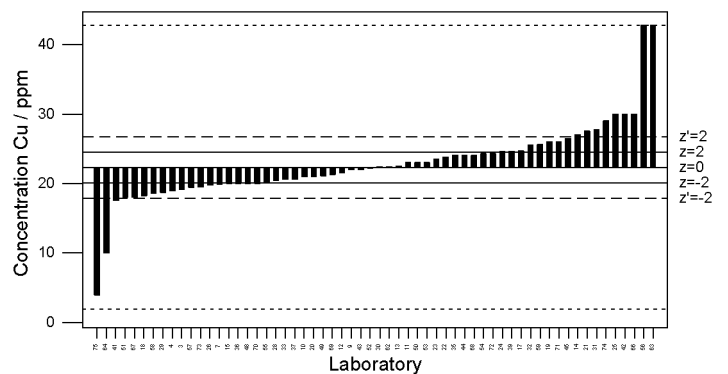
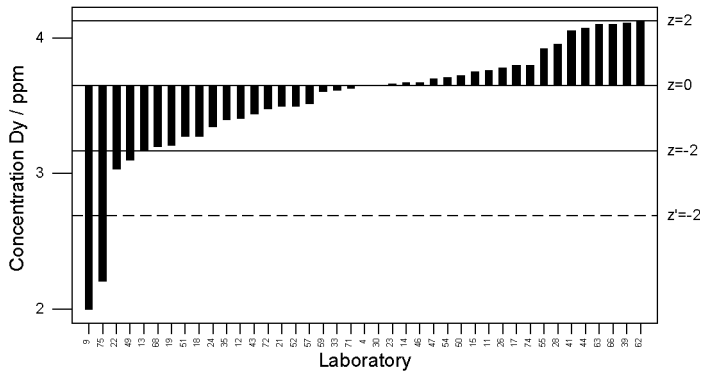


Figure 1: GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

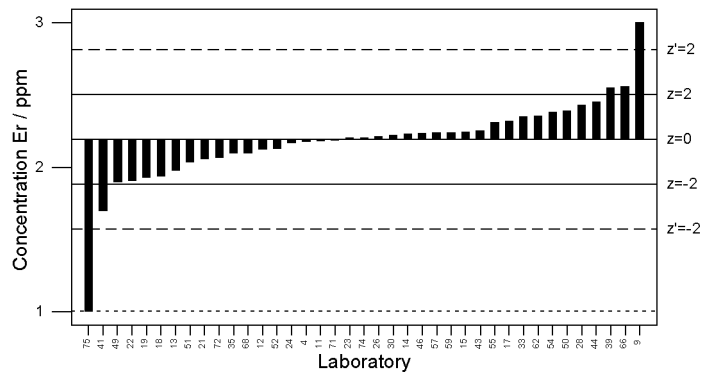
GeoPT24 - Barchart for Dy

Baseline is median



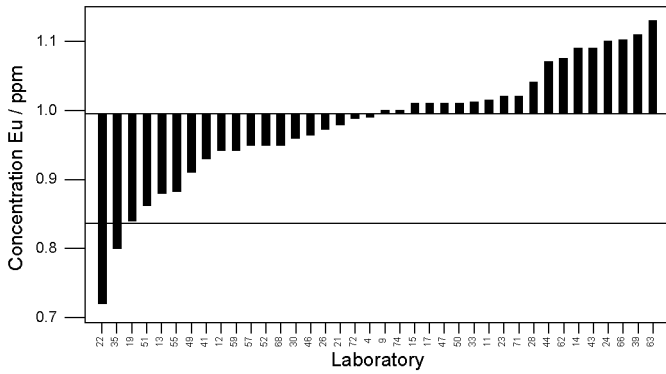
GeoPT24 - Barchart for Er

Baseline is robust mean



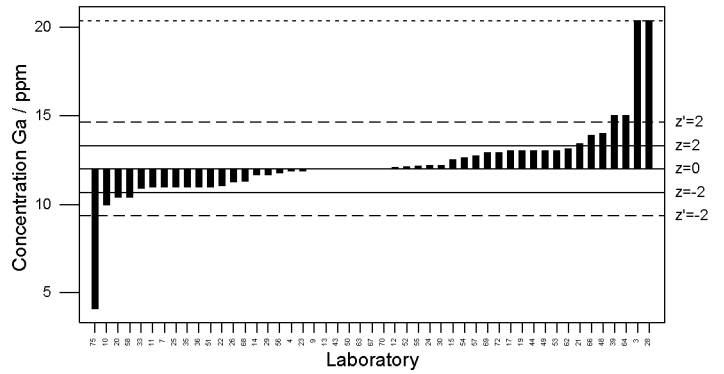
GeoPT24 - Barchart for Eu

Baseline is median



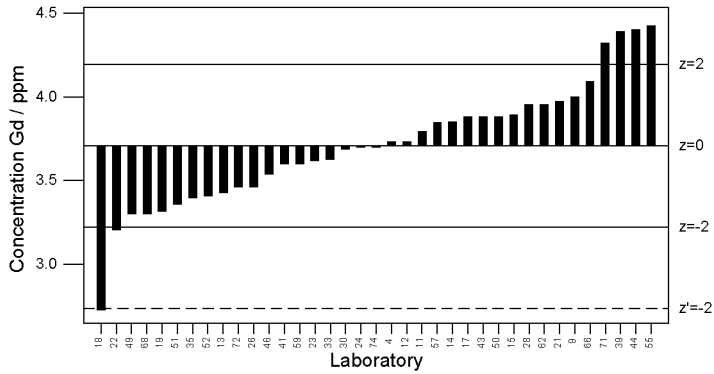
GeoPT24 - Barchart for Ga

Baseline is median



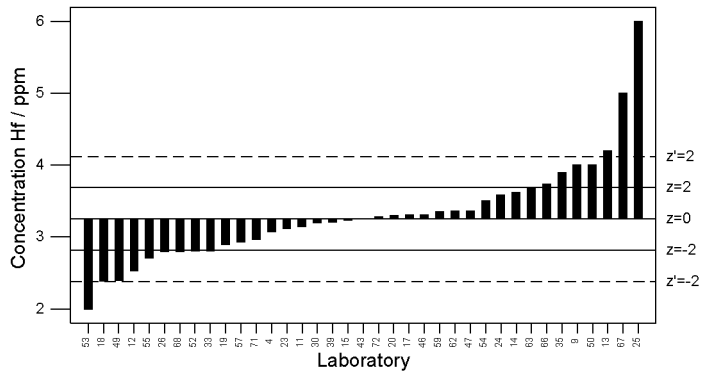
GeoPT24 - Barchart for Gd

Baseline is robust mean



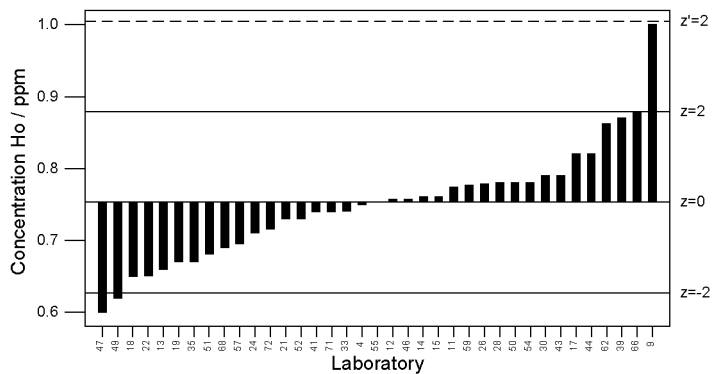
GeoPT24 - Barchart for Hf

Baseline is median



GeoPT24 - Barchart for Ho

Baseline is median



GeoPT24 - Barchart for La

Baseline is median

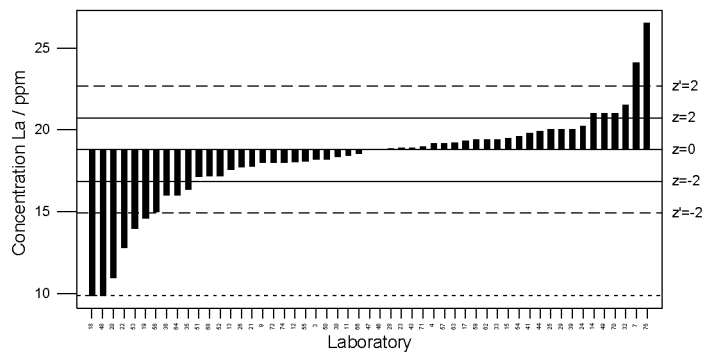


Figure 1: GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

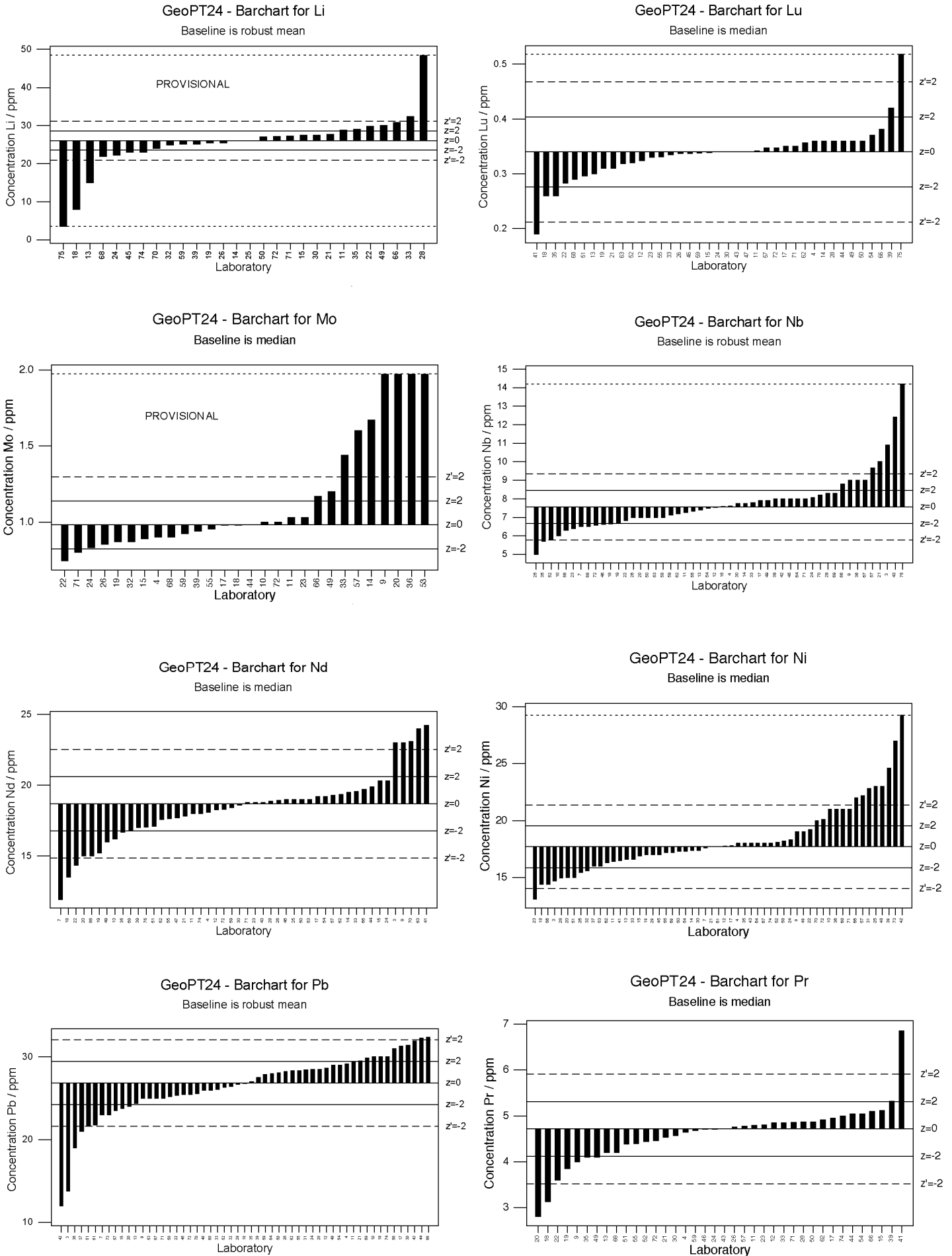


Figure 1 (cont'd): GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

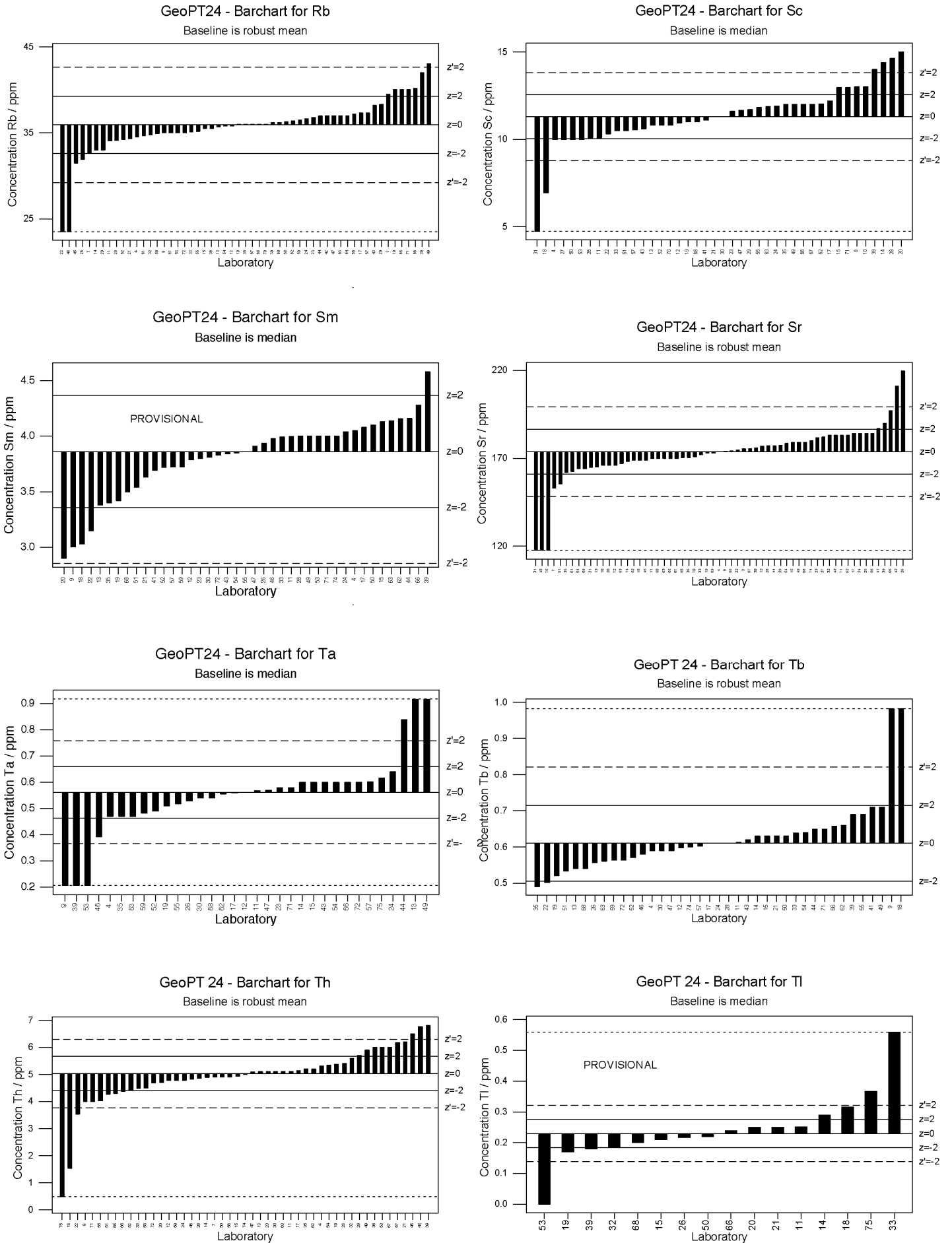
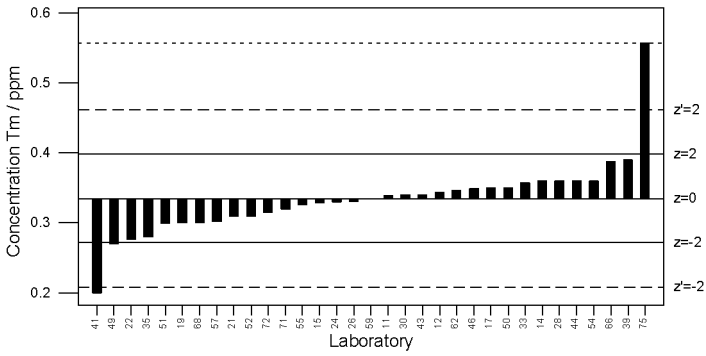
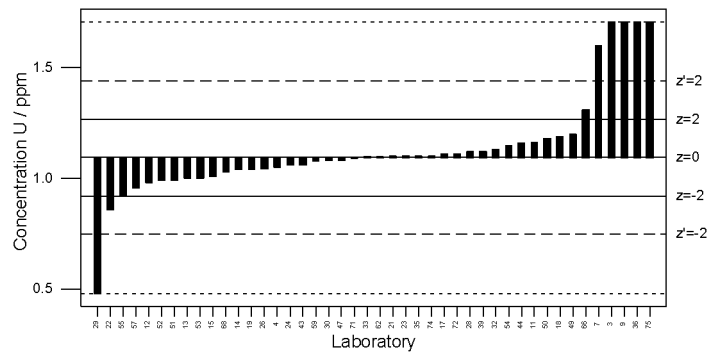


Figure 1 (cont'd): GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry labs (pecked lines).

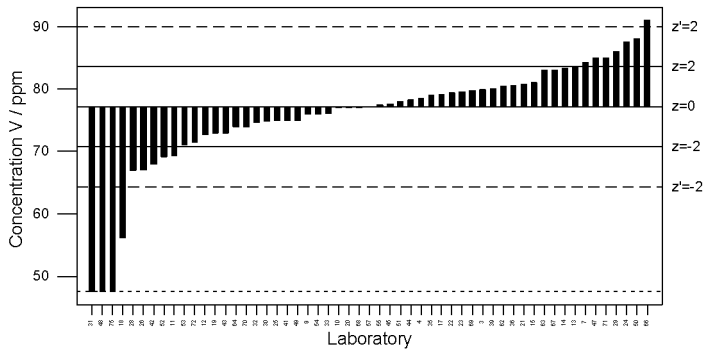
GeoPT 24 - Barchart for Tm
Baseline is median



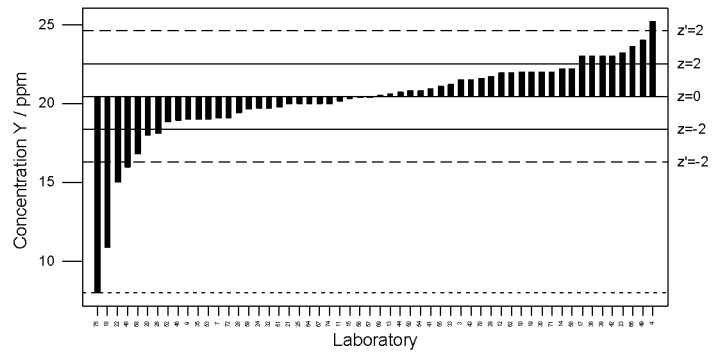
GeoPT 24 - Barchart for U
Baseline is robust mean



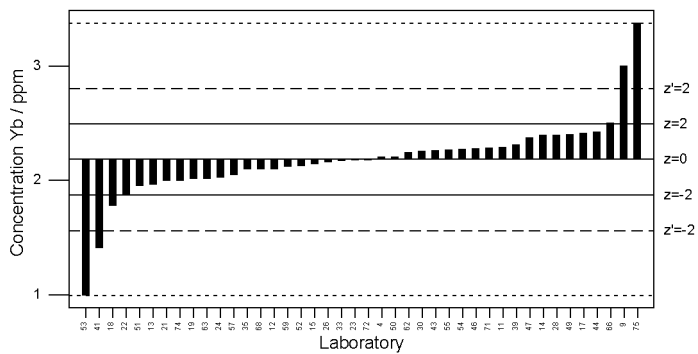
GeoPT 24 - Barchart for V
Baseline is median



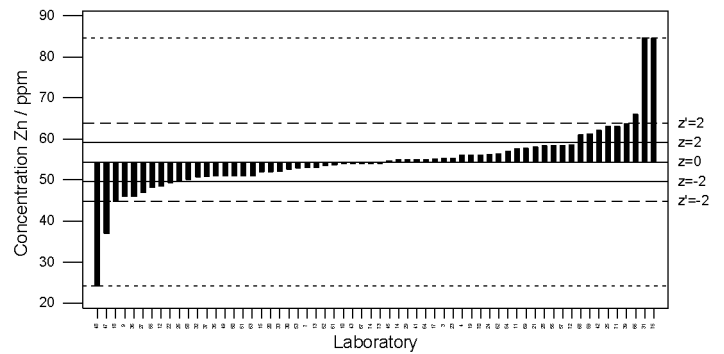
GeoPT 24 - Barchart for Y
Baseline is median



GeoPT 24 - Barchart for Yb
Baseline is robust mean



GeoPT 24 - Barchart for Zn
Baseline is robust mean



GeoPT 24 - Barchart for Zr
Baseline is median

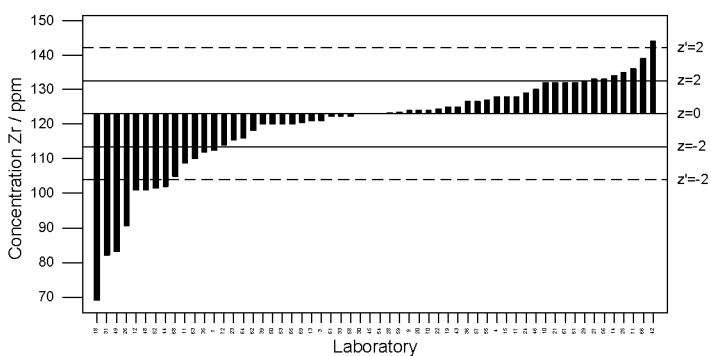
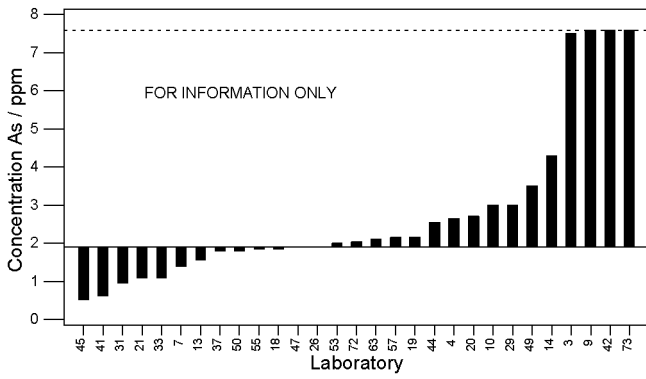


Figure 1 (cont'd): GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z < 2$ for applied geochemistry labs (pecked lines).

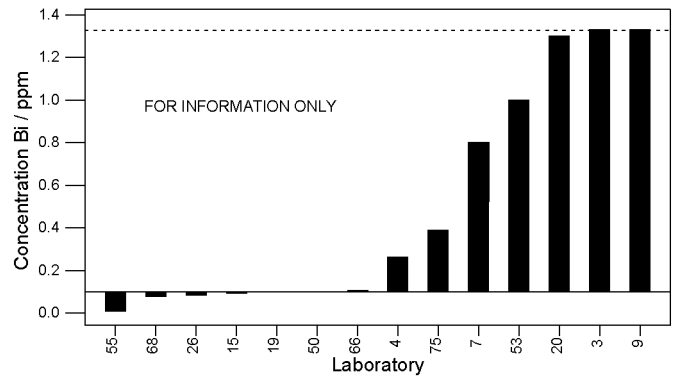
GeoPT24 - Barchart for As

Baseline is subjectively defined



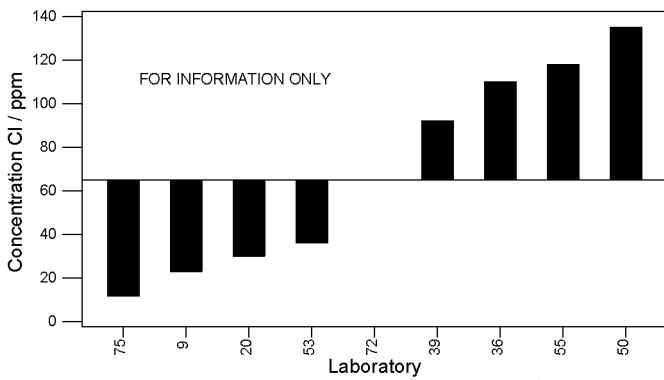
GeoPT24 - Barchart for Bi

Baseline is subjectively defined



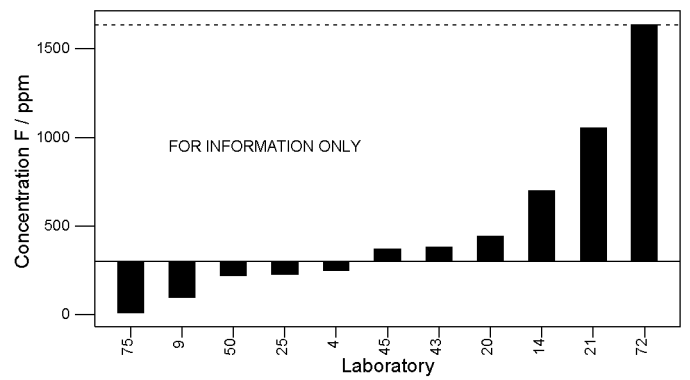
GeoPT24 - Barchart for Cl

Baseline is robust mean



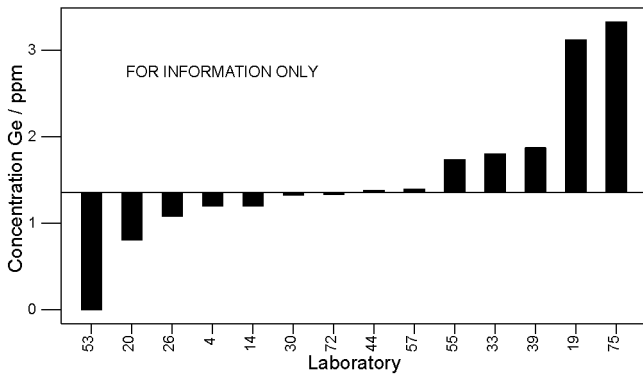
GeoPT24 - Barchart for F

Baseline is subjectively defined



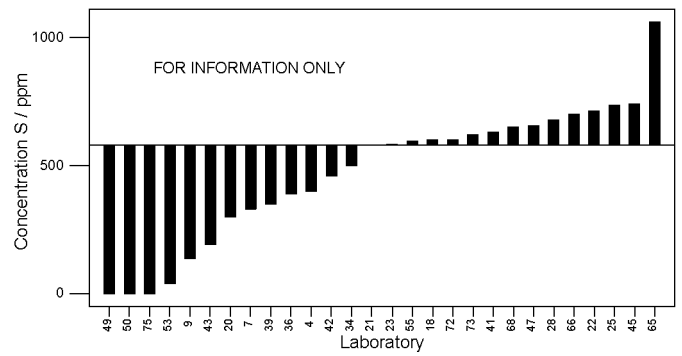
GeoPT24 - Barchart for Ge

Baseline is median



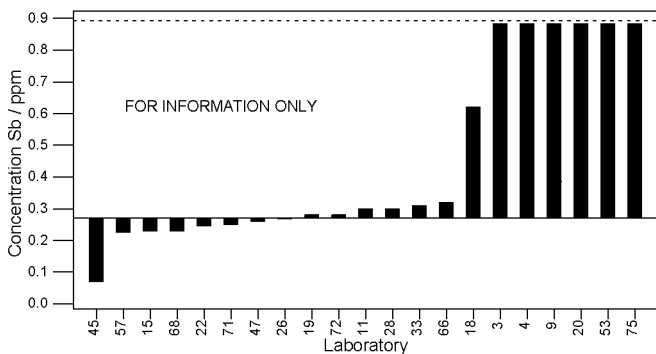
GeoPT24 - Barchart for S

Baseline is median



GeoPT24 - Barchart for Sb

Baseline is subjectively defined



GeoPT24 - Barchart for Sn

Baseline is subjectively defined

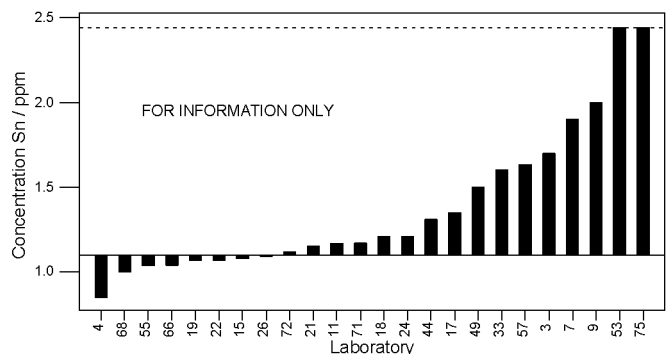


Figure 2: GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for information only for elements for which values could not be assigned.

GeoPT 24 - Barchart for W
Baseline is subjectively defined

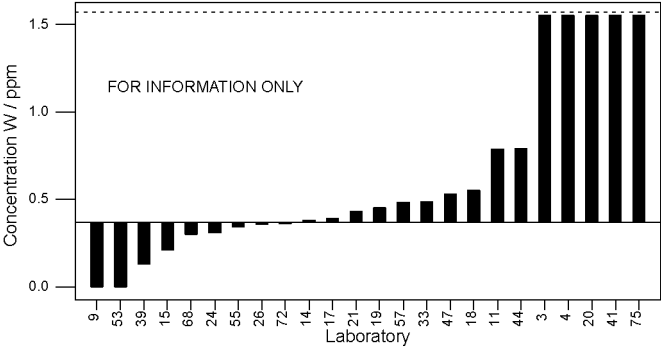


Figure 2 (cont'd): GeoPT24 – Longmyndian greywacke, OU-10. Data distribution charts for information only for elements for which values could not be assigned.

Multiple z-score chart GeoPT24

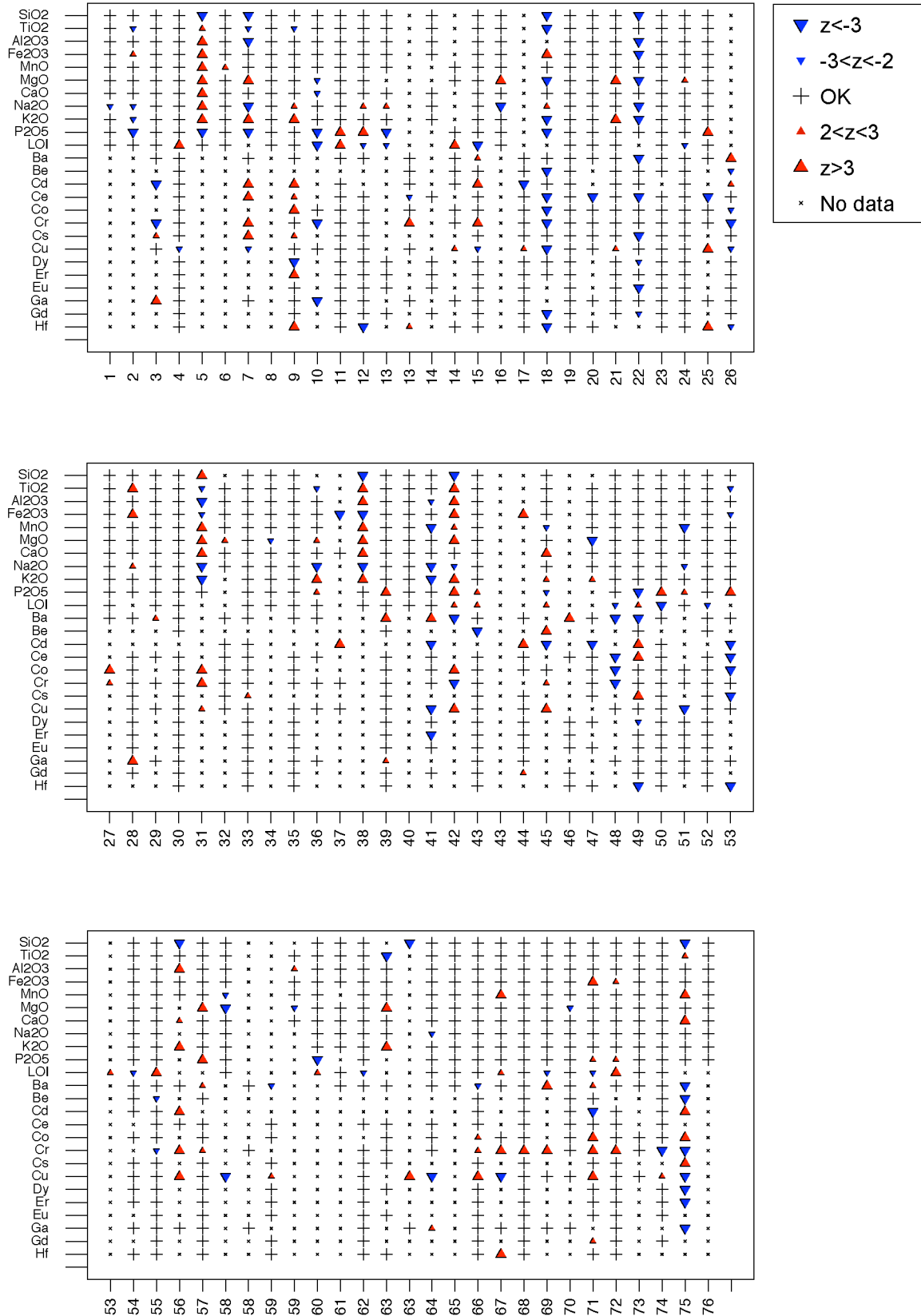


Figure 3a: GeoPT24 – Longmyndian greywacke, OU-10. Multiple z-score charts for laboratories participating in the GeoPT24 round. Symbols indicate whether or not an elemental result complies with the $-2 < z < +2$ criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: $z < -3$ (▼), $-3 < z < -2$ (◄), $+2 < z < +3$ (▲), $Z > +3$ (▲).

Multiple z-score chart GeoPT24

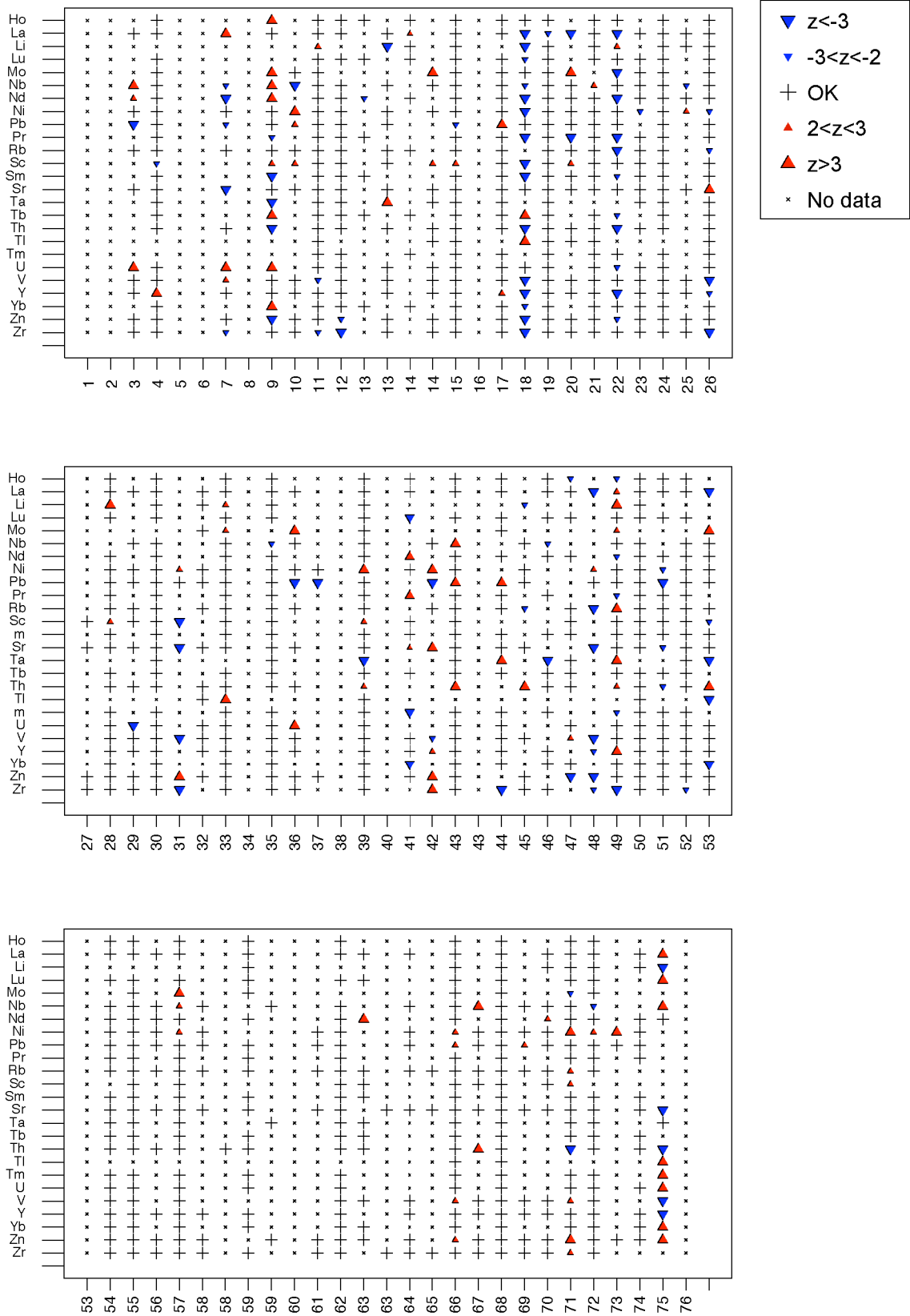


Figure 3b: GeoPT24 – Longmyndian greywacke, OU-10. Multiple z-score charts for laboratories participating in the GeoPT24 round. Symbols indicate whether or not an elemental result complies with the $-2 < z < +2$ criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: $z < -3$ (\blacktriangledown), $-3 < z < -2$ (\blacktriangledown), $+2 < z < +3$ (\blacktriangle), $Z > +3$ (\blacktriangle).