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Analyse Service GmbH

GeoPT 28, England - SBC-1, Shale

Veranstalter: International Association of Geoanalysts and Geostandards Newsletter - GeoPT28
Ringversuchsmaterial: SBC-1, (Shale)
RV geschlossen: 2011 – 1
Literatur: GeoPT28 Proficiency Testing Round (CRB Laborcode = C4)

Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
Na_2O*	0,19	0,22	0,04	---
MgO	2,62	2,6	0,05	0,27
Al_2O_3	20,94	21,00	0,26	-0,11
SiO_2	47,45	47,64	0,53	-0,18
P_2O5	0,366	0,37	0,009	-0,28
K_2O	3,49	3,45	0,057	-0,37
CaO	2,95	2,95	0,05	0,01
TiO_2	0,857	0,855	0,018	0,06
Fe_2O_3 tot	9,81	9,71	0,138	0,35
MnO	0,153	0,15	0,004	0,38
L.O.I.	9,83	10,23	0,14	1,38

Spurenelemente [µg/g]

	CRB	RV	1sRV	Z-Score
Ag*	0,9	0,78	---	---
As	28	25,7	1,3	0,93
Ba	810	788	23,1	0,48
Ce	120	108	4,3	1,38
Co	33	22,7	1,1	4,54
Cr	126	109	4,3	1,98
Cs	10	8,2	0,5	1,89
Cu	31	31,2	1,5	-0,07
F*	920	996	240	---
Ga	28	27	1,3	0,38
Hf	3,7	3,7	0,2	-0,08
La	59	52,5	2,3	1,41
Nb	15	15,3	0,8	-0,19
Nd	48	49,2	2,2	-0,26
Ni	86	82,8	3,4	0,46
Pb	38	35	1,6	0,92
Pr	11	12,6	0,7	-1,16
Rb	147	147	5,5	0,00
Sc	17	20	1	-1,47
Sm	8	9,6	0,5	-1,85
Sr	185	178	6,5	0,54

Th	16,4	15,8	0,8	0,33
U	5,1	5,8	0,4	-0,93
V	220	220	7,8	0,00
Y	37	36,5	1,7	0,16
Zn	189	186,8	6,8	0,16
Zr	137	134,3	5,1	0,27

Legende

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

Geo*PT*28 – AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES – REPORT ON ROUND 28 (Shale, SBC-1) / January 2011

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*Keywords: proficiency testing, quality assurance, Geo*PT*, Geo*PT*28 Round, SBC-1, shale*

Abstract

Results are presented for Geo*PT*28, round twenty-eight of the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. The sample distributed for this round was shale, SBC-1, supplied by Dr Stephen Wilson of the U.S. Geological Survey. 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-eighth round of Geo*PT*, the international proficiency testing programme, for geoanalytical laboratories 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 appropriate corrective action if this appears justified.

Steering Committee for Round 28: M. Thompson, P.C. Webb, P.J. Potts and S Wilson.

Sample Geo*PT*28: The shale, SBC-1, was produced by the U.S. Geological Survey, under direction of Dr S.Wilson. The test material was tested for grain size distribution and compositional homogeneity by the originating laboratory and was considered suitable for use in the Geo*PT* proficiency testing programme.

Timetable for Round 28:

Distribution of sample: September 2010.
Deadline for submission of analytical results: 10th December 2010.
Distribution of draft report: January/February 2011

Submission of results

Results submitted by 86 laboratories are listed in Table 1. One of these labs (C89) submitted too late for inclusion in the evaluation, the remainder of the data were used for the assessment of assigned values.

Assigned values

Following procedures described in earlier rounds, a robust statistical procedure was used to derive assigned concentration values [X_a], these being judged to be the best estimates of the true composition of this sample. Table 2 lists assigned and provisional values for 10 major components and 44 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 bar charts for each element to judge the distribution of results and the most favourable basis for defining the assigned values. In 18 cases the robust mean was used as the preferred value. In 33 cases the median value was preferred. In 3 cases a mode produced a baseline that had improved symmetry with the normally distributed portion of the graph. The procedure used to determine the mode was based on the analysis of mixed populations detailed in Thompson (2006) and first used in GeoPT to analyse round 23 data. Confidence in one such value (for Dy) was sufficient for it to be designated as assigned: the other two values (for Sn and Tl) obtained in this way were designated as provisional values.

Bar charts for 54 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: SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, MnO, MgO, CaO, K_2O, P_2O_5, LOI, As, Ba, Be, Bi, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Hf, Ho, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, W, Y, Yb, Zn, and Zr. Of these, only provisional values could be given to the 7 elements/components: LOI, As, Ba, Cd, Li, Sn and Tl.

Bar charts for the 14 elements/components, Fe(II)O, Na_2O, H_2O^+, CO_2, Ag, B, Cl, F, Hg, In, S, Se and Te are plotted in Figure 2 for information only, where the data were not amenable to the reliable determination of a 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. 1372 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. 1873 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, especially if it is outside the range -3<*z*<3, it would be advisable for the contributing laboratory to examine its procedures, and if necessary, to take action to ensure that determinations are not subject to unsuspected analytical bias. In this round, there were 20 laboratories with more than 20% of their *z*-scores outside the range -3<*z*<3.

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*-scores that exceeded the action limits. This chart is designed to help individual laboratories to judge their overall performance in this proficiency testing round.

Participation in future rounds

The benefit from proficiency testing arises from regular participation and laboratories are invited to contribute to the Geo*PT*29 round, the sample for which will be distributed during March 2011.

Acknowledgements

The authors thank John Watson and Liz Lomas (The Open University) for valued assistance in the distribution of samples and the production of this report.

Reference

Thompson, M. (2006). Using mixture models for bump-hunting in the results of proficiency tests. Accred. Qual. Assur., 10, 501-505.

Appendix 1

Publication status of proficiency testing reports

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

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

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

Geo*PT*4
Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson J.S. (1999b)
Geo*PT*4. 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).

Geo*PT*5
Thompson M., Potts P.J., Kane J.S., and Wilson S. (1999c)
Geo*PT*5. 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).

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

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

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

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

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

Geo*PT*11
Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Watson J.S. (2002)
GEO*PT*11 - an international proficiency test for analytical geochemistry laboratories - report on round 11 / July 2002 (OU-5 Leaton dolerite). International Association of Geoanalysts: Unpublished report.

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

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

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

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

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

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

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

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

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

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

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

Geo*PT*23
Webb, P.C., Thompson, M., Potts, P.J., Watson, J.S. and Kriete, C. (2008)
Geo*PT*23 - 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.

Geo*PT*24
Webb, P.C., Thompson, M., Potts, P.J. and Watson, J.S. (2009)
Geo*PT*24 - an international proficiency test for analytical geochemistry laboratories - report on round 24 / January 2009 (Longmyndian greywacke, OU-10). International Association of Geoanalysts: Unpublished report.

Geo*PT*25
Webb, P.C., Thompson, M., Potts, P.J. and Enzweiler, J. (2009)
Geo*PT*25 - an international proficiency test for analytical geochemistry laboratories - report on round 25 / July 2009 (Basalt, HTP-1). International Association of Geoanalysts: Unpublished report.

Geo*PT*26
Webb, P.C., Thompson, M., Potts, P.J. and Loubser, M. (2010)
Geo*PT*26 - an international proficiency test for analytical geochemistry laboratories - report on round 26 / January 2010 (Ordinary Portland cement, OPC-1). International Association of Geoanalysts: Unpublished report.

Geo*PT*27
Webb, P.C., Thompson, M., Potts, P.J. and Batjargal, B. (2010)
Geo*PT*27 - an international proficiency test for analytical geochemistry laboratories - report on round 27 / July 2010 (Andesite, MGL-AND). International Association of Geoanalysts: Unpublished report.

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C01	C02	C03	C04	C05	C05	C06	C07	C08	C09	C10	C11
Data Quality		2	2	1	2	1	2	1	1	1	2	1	1
SiO_2	% m/m	47.55	47.373	45.09	47.45	48		48.01	47.88		48.38	47.1	47.74
TiO_2	% m/m	0.82	0.864	0.84	0.857	0.877		0.84	0.87	0.86	0.859	0.853	0.855
Al_2O_3	% m/m	21.06	20.777	20.45	20.94	20.94		21.1	20.60	20.56	20.854	20.6	21.01
Fe_2O_3T	% m/m	9.45	9.930	9.65	9.81	10.05		9.44	9.82	9.73	9.765	9.95	9.83
Fe(II)O	% m/m			4.85									
MnO	% m/m	0.14	0.153	0.14	0.153	0.149		0.142	0.14	0.150	0.146	0.15	0.149
MgO	% m/m	2.61	2.564	2.33	2.62	2.459		2.57	2.59	2.57	2.77	2.51	2.66
CaO	% m/m	2.94	2.918	2.91	3.5	3.016		2.97	3.09	2.92	2.88	2.9	2.86
Na_2O	% m/m	0.21		0.24	0.19	0.256		0.27	0.41	0.23	0.207	0.22	0.253
K_2O	% m/m	3.41	3.461	3.38	3.49	3.461		3.44	3.53	3.408	3.24	3.33	3.44
P_2O_5	% m/m	0.35	0.384	0.33	0.366	0.349		0.37	0.36	0.37	0.379	0.643	0.37
H_2O+	% m/m												
CO_2	% m/m	6.96			3.1								
LOI	% m/m	11.01	10.985	9.83	9.83	9.36		10.87	9.77		10.11		10.1
Ag	mg kg^{-1}				0.9								
As	mg kg^{-1}				28		28		25	30.25	29.92	28.2	
Au	mg kg^{-1}												
B	mg kg^{-1}												
Ba	mg kg^{-1}				810		693		875	855.1	742	722	801
Be	mg kg^{-1}						3						2.97
Bi	mg kg^{-1}				3								0.77
Br	mg kg^{-1}												
Cd	mg kg^{-1}				0.9	0.14					0.14		0.12
Ce	mg kg^{-1}				120	107				113.81	104.78	109	107
Cl	mg kg^{-1}												
Co	mg kg^{-1}				33		20		23	25.6	20.97	22.4	22.5
Cr	mg kg^{-1}				126		108			114.78	115.04	116	106
Cs	mg kg^{-1}				10					8.33	8.01		8.39
Cu	mg kg^{-1}				31		24		28	32.01	28.32	26.6	30.6
Dy	mg kg^{-1}					7.06				7.69	6.72		7.25
Er	mg kg^{-1}					3.99				4.12	3.73		3.88
Eu	mg kg^{-1}					2.01				2.06	1.97		1.98
F	mg kg^{-1}				920								
Ga	mg kg^{-1}				28		27			29.86			27.1
Gd	mg kg^{-1}					8.73				8.73	8.54		8.70
Ge	mg kg^{-1}				0.05		2.1			2.25			1.92
Hf	mg kg^{-1}				3.7					3.8	2.45		3.79
Hg	mg kg^{-1}				0.8								
Ho	mg kg^{-1}					1.36				1.44	1.35		1.36
I	mg kg^{-1}				17								
In	mg kg^{-1}				0.05								
Ir	mg kg^{-1}												
La	mg kg^{-1}				59	50.4				53.64	49.98	59.2	52.9
Li	mg kg^{-1}						146						163
Lu	mg kg^{-1}					0.56				0.57	0.55		0.54
Mo	mg kg^{-1}				1.8	1.84							2.05
Nb	mg kg^{-1}				15		16		15.4	15.84	14	15.9	16.0
Nd	mg kg^{-1}				48	49.2				51.2	47.55		50.2
Ni	mg kg^{-1}				86		77		81		80.87	90.5	84.6
Os	mg kg^{-1}												
Pb	mg kg^{-1}				38		38		34	36.7	36	35.7	34.7
Pd	mg kg^{-1}												
Pr	mg kg^{-1}				11	12.7				12.58	12.06		12.8
Pt	mg kg^{-1}												
Rb	mg kg^{-1}				147		143		144	142.64	151	153	147
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}				2400								
Sb	mg kg^{-1}					0.97				1.01	0.89		
Sc	mg kg^{-1}				17					20.3	3.46	16.7	20.2
Se	mg kg^{-1}												
Sm	mg kg^{-1}				7.6	9.53				10.190	9.91		9.89
Sn	mg kg^{-1}				8					3.43	3.22	6.73	3.77
Sr	mg kg^{-1}				185		173		171	191.5	174	185	184
Ta	mg kg^{-1}									1.11	0.89		1.08
Tb	mg kg^{-1}					1.26				1.31	1.33		1.30
Te	mg kg^{-1}												
Th	mg kg^{-1}				16.4		18			15.66	16	16.8	15.5
Tl	mg kg^{-1}					0.91							0.89
Tm	mg kg^{-1}					0.55				0.58	0.55		0.56
U	mg kg^{-1}				5.1		6			5.9	5.52	6.66	5.61
V	mg kg^{-1}				220		230		260		205.93	218	219
W	mg kg^{-1}				23		2			1.81			1.62
Y	mg kg^{-1}				37		36		33	37.18	34.62	36.2	38.5
Yb	mg kg^{-1}					3.7				3.86	3.33		3.66
Zn	mg kg^{-1}				189		181		180	198.7	173.32	192	177
Zr	mg kg^{-1}				137		133		135	128.5	115.49	156	136

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23
Data Quality		1	2	1	2	1	1	2	1	2	1	2	2
SiO_2	% m/m		49.49	48.15	46.58	49.58	47.68	47.74	48.38	47.6		48.94	47.368
TiO_2	% m/m	0.84	0.84	0.86	0.847	1.08	0.99	0.850	0.86	0.83		0.87	0.834
Al_2O_3	% m/m		20.78	21.33	20.96	21.05	21.08	20.89	21.18	21.4		21.03	20.923
Fe_2O_3T	% m/m		9.55	9.79	9.84	10.54	9.69	9.71	9.97	9.4		9.81	9.610
Fe(II)O	% m/m			6.68		4.6			6.46				
MnO	% m/m		0.141	0.15	0.155	0.171	0.15	0.145	0.154	0.15		0.14	0.152
MgO	% m/m		2.49	2.64	2.51	1.42	3.7	2.61	2.72	2.59		2.55	2.570
CaO	% m/m		2.79	3.04	2.96	3.05	2.72	2.99	3.14	2.95		2.78	2.915
Na_2O	% m/m		0.243	0.24	0.24	0.18	0.09	0.270	0.23	0.22		0.19	0.203
K_2O	% m/m		3.33	3.50	3.41	3.31	2.85	3.56	3.56	3.6		3.44	3.428
P_2O_5	% m/m	0.35	0.357	0.37	0.37	0.26	0.29	0.369	0.39	0.43		0.33	0.378
H_2O+	% m/m			7.49					6.34	1.43			
CO_2	% m/m			7.92	7.59				7.48				
LOI	% m/m		9.50	9.54		10.5	11.24		10.3	9.47		9.49	10.118
Ag	mg kg^{-1}					0.280							
As	mg kg^{-1}		9.71			22.890			32.5			24.4	31
Au	mg kg^{-1}												
B	mg kg^{-1}					23.060			69				
Ba	mg kg^{-1}	788	806	693	836	659.590			786	976	744	718	824
Be	mg kg^{-1}	2.87	3.85			2.390			3.37				
Bi	mg kg^{-1}		0.73			0.590			0.77				
Br	mg kg^{-1}								0.47				
Cd	mg kg^{-1}		0.382			0.380				1.23			
Ce	mg kg^{-1}	104	107.3		100	88.220			110	124	103.4	108	101
Cl	mg kg^{-1}								20			195	
Co	mg kg^{-1}	20.4	23.7	25	34	19.630			22.4	29.6	20.7	25.6	22
Cr	mg kg^{-1}	101.9	123	112	113	96.090			114	145	102.8	109.0	107
Cs	mg kg^{-1}	8.11	8.29			6.670			8.44	8	6.1	7.2	11
Cu	mg kg^{-1}	27.4	33.3	30	27	29.110			31.7	40	22.4	31.4	40
Dy	mg kg^{-1}	6.23	6.07			5.310			6.84	7.75	6.5		
Er	mg kg^{-1}	3.53	3.28			2.870			3.64	4.43	3.8		
Eu	mg kg^{-1}	1.78	1.83			1.610			1.99	2.2	1.9		
F	mg kg^{-1}		955						1120				
Ga	mg kg^{-1}	25.4	26	28		24.970			28.7		25.8	26.3	27
Gd	mg kg^{-1}	8.10	7.81			6.620			8.14	9.9	8.6		
Ge	mg kg^{-1}					1.450			2.03				
Hf	mg kg^{-1}	4.13		5		2.670			3.69	4.38	6.1		
Hg	mg kg^{-1}								0.076				0.085
Ho	mg kg^{-1}	1.21	1.16			1.020			1.29	1.49	1.3		
I	mg kg^{-1}												
In	mg kg^{-1}								0.11				
Ir	mg kg^{-1}												
La	mg kg^{-1}	52.4	49.9		55	38.110			49.8	58	49.5	67.9	50
Li	mg kg^{-1}	149.8	200			147.260			164				
Lu	mg kg^{-1}	0.57	0.48			0.400			0.572	0.61	0.5		
Mo	mg kg^{-1}	2.09	2.38			1.980			2.31	5.2		3.1	
Nb	mg kg^{-1}	14.1	14.6	17		13.660			13.6	17.2	15.9	15.7	17
Nd	mg kg^{-1}	42.5	47.8		60	40.330			49.1	55.4	46.5	35.8	37
Ni	mg kg^{-1}	77.9	88.9	86	83	67.230			83	92	76.3	83.9	84
Os	mg kg^{-1}												
Pb	mg kg^{-1}	35.5	36.3	35		37.100			36.3	37.9		37.6	35
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	12.9	12.4			10.220			12.9	14	12.2		
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	141.4	156.3	157		133.440			147	167	127.7	145	152
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}		3436	6700	6000				6900			4750	
Sb	mg kg^{-1}		1.10			0.830			1.02			0.5	
Sc	mg kg^{-1}	13.7	21.9	20		6.670						24.0	20
Se	mg kg^{-1}					1.390			1.36				
Sm	mg kg^{-1}	9.45	9.47			7.860			9.95	11.1	9.4		
Sn	mg kg^{-1}		3.47			3.070			4.02	4.6		2.3	
Sr	mg kg^{-1}	170.2	194	190		155.380			191	225	168.8	176	178
Ta	mg kg^{-1}	1.09	1.1			0.940			1.21	1.19	1.4		
Tb	mg kg^{-1}	1.11	1.21			0.890			1.23	1.2	1.1		
Te	mg kg^{-1}		0.18			0.110							
Th	mg kg^{-1}	14.0	17.4	16		12.790			15.6	16.6	17	14.1	
Tl	mg kg^{-1}	0.88	0.956			0.780							
Tm	mg kg^{-1}	0.59	0.48			0.410			0.523	0.62	0.5		
U	mg kg^{-1}	5.13	6.05	8		5.380			5.96	6.08	5.4	4.7	6
V	mg kg^{-1}	206.8	252	234	227	204.060			217	295	203.2	241	219
W	mg kg^{-1}		1.71			1.530			1.63	4.6			
Y	mg kg^{-1}	31.8	30	41	36	24.080			36.5	39	31.9	36.4	39
Yb	mg kg^{-1}	3.46	3.21			2.750			3.67	4.06	3.4		
Zn	mg kg^{-1}		211	181	203	139.630			221	250		178	192
Zr	mg kg^{-1}	128.1	143	150	110	97.600			129	156	128.5	134	135

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C24	C25	C25	C26	C27	C27	C28	C29	C30	C31	C32	C33
Data Quality		1	1	2	1	1	2	2	2	2	1	1	2
SiO_2	% m/m		47.74		46.6	47.16		46.67	53.28	47.513	48.73	47.47	47.6
TiO_2	% m/m		0.888		0.88	0.96		0.847	0.933	0.837	0.90	0.854	
Al_2O_3	% m/m	21.8	21.455		18.24	20.87		20.86	23.37	21.043	22.65	21.16	20.75
Fe_2O_3T	% m/m	10.5	9.79		9.64	9.75		9.63	10.80	9.756	9.34	9.95	9.19
Fe(II)O	% m/m					4.88							
MnO	% m/m	0.158			0.134	0.152		0.151	0.158	0.135	0.13	0.147	
MgO	% m/m	2.76		2.698	2.41	2.54		2.48	2.840	2.620	2.56	2.64	2.42
CaO	% m/m	2.68	3.037		2.71	3.08		2.93	3.292	2.988	2.29	2.90	2.88
Na_2O	% m/m	0.23				0.25		0.25	0.272	0.198	0.42	0.241	0.21
K_2O	% m/m	3.33		3.41	3.39	3.59		3.40	3.884	3.493	3.71	3.46	3.31
P_2O_5	% m/m	0.363		0.349	0.2546	0.349		0.351	0.411	0.368	0.34	0.362	0.364
H_2O+	% m/m					6.22							
CO_2	% m/m	7.81				7.58		7.14	7.48				
LOI	% m/m			10.25		10.35		9.96	11.48	9.795		10.65	10.7
Ag	mg kg^{-1}			0.14									
As	mg kg^{-1}	24.9		15.4	24.3	22		28		29.5			30.1
Au	mg kg^{-1}												
B	mg kg^{-1}			66					212.1				
Ba	mg kg^{-1}	806.7		778	837.3	811		655	600.6	938.8	795		
Be	mg kg^{-1}	3.87		3.24			3.79				2.5		2.78
Bi	mg kg^{-1}	0.72			1.6								
Br	mg kg^{-1}												
Cd	mg kg^{-1}	0.363		0.47	3.1								0.37
Ce	mg kg^{-1}	107.3		117	109.7	119.3		110		139.0	96.4		
Cl	mg kg^{-1}								75.0				
Co	mg kg^{-1}	22.6		21		20		23.9			20		24.1
Cr	mg kg^{-1}	111.0		95.1	99.1		115	110	90.9	141.3	138		98
Cs	mg kg^{-1}	8.46			21.4								
Cu	mg kg^{-1}	37.63		30.3	28.1		35	23.3	35.5	36.0	36		32.2
Dy	mg kg^{-1}	7.57	7.46			6.85					5		6.9
Er	mg kg^{-1}	4.50	3.8			3.82					3		4.01
Eu	mg kg^{-1}	2.00	1.95			2.11					1.81		1.98
F	mg kg^{-1}			900		1205			1602.3				
Ga	mg kg^{-1}	27.9		24.3	25.1			26.2		30.8	6		28.1
Gd	mg kg^{-1}	8.98	7.85			8.72					8		9.21
Ge	mg kg^{-1}			1.71	0.6			7.5					
Hf	mg kg^{-1}	3.8		3.63				10.2					
Hg	mg kg^{-1}	0.083											
Ho	mg kg^{-1}	1.53	1.43			1.28							1.34
I	mg kg^{-1}												
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}	51.83		60	56.6	57.2		54		82.8	53.1		
Li	mg kg^{-1}	182.0				132			157.5		159		178.5
Lu	mg kg^{-1}	0.546	0.57			0.50					0.36		
Mo	mg kg^{-1}	2.30		2.1				2.6					2.15
Nb	mg kg^{-1}	16.67		13.4	14.1	14		16.2		16.5			14.9
Nd	mg kg^{-1}	51.1		45.2	50.4	55.0		45			49.4		46.9
Ni	mg kg^{-1}	81.93		79	84.2	78		83	58.5	96.3	79		84.8
Os	mg kg^{-1}												
Pb	mg kg^{-1}	35.97		30	35.4	35.3		33	34.0	43.5			36.7
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	12.15		12.8		12.94					11		12.45
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	146.7			140.3	138		141		162.8	96		
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}	643.3			2890	7480		4883	6320.0				
Sb	mg kg^{-1}	1.34		0.75									
Sc	mg kg^{-1}	20.27		20.8		18.2		21.1		24.8	19		19.9
Se	mg kg^{-1}	1.340			0.2								
Sm	mg kg^{-1}	10.23	9.53		17.1	10.04		11.8			8.76		9.57
Sn	mg kg^{-1}			4.1	6.2								
Sr	mg kg^{-1}	203.33		190	171.6	186		172		198.5	171		200
Ta	mg kg^{-1}	1.143		0.98									1.21
Tb	mg kg^{-1}	1.313	1.16			1.22					0.94		1.33
Te	mg kg^{-1}							15.9					
Th	mg kg^{-1}	16.43		17.4	19.1	14.1		19.4		20.5	15		17
Tl	mg kg^{-1}	0.923		0.65									0.89
Tm	mg kg^{-1}	0.628		0.57		0.53							0.6
U	mg kg^{-1}	5.853	6		5.1	4.5		6.6		7.8	5		
V	mg kg^{-1}	211.7		224	226.1	230		220	218.5	255.8	201		
W	mg kg^{-1}	1.800		1.7									
Y	mg kg^{-1}	37.00		35	34.5	34.33		39		43.3	35		
Yb	mg kg^{-1}	3.643		3.55	7.6	3.47					3.34		3.53
Zn	mg kg^{-1}	166.3		175	174.4		198	177	200.8	197.3	193		193
Zr	mg kg^{-1}	163.7		140	132.7	140		136	22.2	158.0	130		

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C34	C35	C36	C36	C37	C38	C39	C40	C41	C41	C42	C43
Data Quality		2	1	1	2	2	2	1	2	1	2	2	2
SiO_2	% m/m		47.60	47.05		47.74	46.36	48.470	48.8	47.62		47.115	46.48
TiO_2	% m/m		0.86	0.84		0.835	0.82	0.8069	0.841	0.854		0.838	0.89
Al_2O_3	% m/m		21.03	20.9		21.09	21.5	21.750	19	20.94		21.327	20.36
Fe_2O_3T	% m/m		9.84	9.59		8.93	8.85	9.572	10.5	9.73		9.585	10.50
Fe(II)O	% m/m												
MnO	% m/m		0.150	0.15		0.148	0.12	0.153	0.226	0.146			0.152
MgO	% m/m		3.47	2.78		2.55	2.35	2.628	3.96	2.57		2.66	2.49
CaO	% m/m		3.00	2.91		2.89	2.96	2.578	2.88	3.00		2.876	3.05
Na_2O	% m/m		0.16	0.21		0.225	0.25	0.192	0.274	0.17			0.21
K_2O	% m/m		3.45	3.65		3.37	3.6	3.436	3.32	3.48		3.356	3.7
P_2O_5	% m/m		0.35	0.36			0.41	0.364	0.343	0.340		0.371	0.35
H_2O+	% m/m			7.05									
CO_2	% m/m			7.61					7.22	1.96			
LOI	% m/m		10.15	10.7		10.95	11.26	10.05	10.43	9.88		19.58	9.8
Ag	mg kg^{-1}								0.65				
As	mg kg^{-1}		23		8			43.6	12.5			21.078	23
Au	mg kg^{-1}												
B	mg kg^{-1}					237							
Ba	mg kg^{-1}	824	681	777		782		694.6	715	768			980
Be	mg kg^{-1}							3.02	2.64				3.3
Bi	mg kg^{-1}				3				0.72				0.63
Br	mg kg^{-1}												
Cd	mg kg^{-1}				9			0.28	0.45				
Ce	mg kg^{-1}	108	109	120				117.0	97.5	105			88
Cl	mg kg^{-1}				0								
Co	mg kg^{-1}	22.9	23	25		11	57.1	24.1	25.9	23			21
Cr	mg kg^{-1}	106	107	116		102	38.94	94.1	116.31	110			133
Cs	mg kg^{-1}	8.1	8	5					4.97	7.91			5.9
Cu	mg kg^{-1}	32.9	23	32		71	100.8	26.7	22	29			32
Dy	mg kg^{-1}	7.1			5				7.34	6.94			4.7
Er	mg kg^{-1}	3.9			2				3.84	3.77			2.6
Eu	mg kg^{-1}	2.00			1				2.15	1.88			1.7
F	mg kg^{-1}				681	1045					1076		
Ga	mg kg^{-1}		25	28					29.4	25			26
Gd	mg kg^{-1}	8.2			10				9.4	8.24			6.9
Ge	mg kg^{-1}								0.29				
Hf	mg kg^{-1}		3	6		3			3	3.98			
Hg	mg kg^{-1}							0.05	0.105				
Ho	mg kg^{-1}	1.4			2				1.29	1.42			0.89
I	mg kg^{-1}												
In	mg kg^{-1}								0.104				0.09
Ir	mg kg^{-1}												
La	mg kg^{-1}	51.1	71	55				53.3	42.2	47.6			41
Li	mg kg^{-1}	175				162			159				167
Lu	mg kg^{-1}	0.55							0.51	0.55			0.38
Mo	mg kg^{-1}		2	3					4.81				
Nb	mg kg^{-1}		15	22					13.3	16.40			14
Nd	mg kg^{-1}	49.9	48	51					50.5	48.0			39
Ni	mg kg^{-1}	87.1	76	81		51	33.75	82.2	86.4	84.0		79.723	78
Os	mg kg^{-1}												
Pb	mg kg^{-1}	34.7	43	41			10.59	33.7	39.2	39.1		25.292	30
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	12.9			12				12.6	12.50			11
Pt	mg kg^{-1}												
Rb	mg kg^{-1}		145	153				150.5	231	145		126.792	142
Re	mg kg^{-1}								0.012				
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}				2197				6810		4852		8150
Sb	mg kg^{-1}				20				1.66				
Sc	mg kg^{-1}	15.2	19	20					15.1	28.0			16
Se	mg kg^{-1}							0.2	2				
Sm	mg kg^{-1}	10	8.000		14				10.4	9.56			7.6
Sn	mg kg^{-1}			3					3.2				
Sr	mg kg^{-1}	193	174	186		179		147.4	154.8	178			160
Ta	mg kg^{-1}			0					1.04				
Tb	mg kg^{-1}	1.2			2				1.25	1.26			0.96
Te	mg kg^{-1}								0.33				
Th	mg kg^{-1}	17.3	15	17					11.2	17.30			13
Tl	mg kg^{-1}							1.17	0.91				0.72
Tm	mg kg^{-1}	0.6							0.52	0.60			0.37
U	mg kg^{-1}	6.3	7	7				7.9	4.61	6.24			4.3
V	mg kg^{-1}	227	228	230				221.5	220	225			278
W	mg kg^{-1}			0					1.4				
Y	mg kg^{-1}	36.9	35	38		35			33.2	42.7			22
Yb	mg kg^{-1}	3.8			8				3.59	3.81			2.5
Zn	mg kg^{-1}	184	170	157		184	129	188.0	212	185		152.838	181
Zr	mg kg^{-1}	156	133	142		94				131			147
										C42 LOI later reported to be 10.5			

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C44	C45	C46	C47	C48	C49	C50	C51	C52	C54	C55	C56
Data Quality		2	1	2	2	2	2	1	2	1	1	2	2
SiO_2	% m/m		46.7	47.568	47.85	47.739	48.4	47.901	48.39	47.95	47.85266	47.56	46.9
TiO_2	% m/m		0.83	0.853	0.87	0.822	0.9	0.834	0.86	0.85	0.850265	0.84	0.88
Al_2O_3	% m/m		20.8	21.003	21.19	21.501	21.25	21.415	21.02	20.96	20.9412	20.3	21.5
Fe_2O_3T	% m/m		9.49	9.665	3.12	9.553	9.93	9.61	9.82	9.65	9.640557	9.7	9.58
Fe(II)O	% m/m				6.07	5.792				5.42		5.4	5.3
MnO	% m/m		0.15	0.154	0.15	0.126	0.151	0.151	0.15	0.145	0.144276	0.16	0.15
MgO	% m/m		2.56	2.585	2.55	2.569	2.69	2.711	2.59	2.6	2.656133	2.63	2.56
CaO	% m/m		2.97	3.007	2.89	2.747	3.03	2.996	2.99	2.976	2.997205	3.03	2.96
Na_2O	% m/m		0.24	0.219	0.17	0.266	0.38	0.166	0.25	0.287	0.256558	0.15	0.2
K_2O	% m/m		3.45	3.516	3.70	3.451	3.53	3.486	3.6	3.455	3.45901	3.6	3.59
P_2O_5	% m/m		0.37	0.375	0.39	0.360	0.38	0.383	0.38	0.373	0.370048	0.38	0.37
H_2O+	% m/m				7.15							7.32	6.3
CO_2	% m/m											6.8	
LOI	% m/m		10.43	10.36	10.22	11.061	9.99	9.98	9.56	11.34	9.45	10.66	10.5
Ag	mg kg^{-1}								0.01			0.15	0.12
As	mg kg^{-1}		36	26.3		27.2		22.1	27	32		25.3	23.5
Au	mg kg^{-1}												
B	mg kg^{-1}												
Ba	mg kg^{-1}	824.008		811.7	805	740.9	857	755	815	810.2	805.449	514	800
Be	mg kg^{-1}	3.01825	3.1	3.26	3.10			3.032	3.01	3.6	3.675	3.26	3.3
Bi	mg kg^{-1}	0.6335	0.6	0.684				0.756	0.67	0.9	0.6765	0.699	0.81
Br	mg kg^{-1}												
Cd	mg kg^{-1}	0.436	0.6	0.36				0.383	0.4	0.37	0.45	0.505	0.42
Ce	mg kg^{-1}	105.803	110	109.4	109	109	113.7	111.4	113	108.27	107.9695	81.56	110
Cl	mg kg^{-1}												60
Co	mg kg^{-1}	22.2855	22.4	22.1	22.1	28.91	23.58	23.6	21.7		21.761	24.42	23.2
Cr	mg kg^{-1}	100.2015		109.2	102	113.1	112.2	132	100	116	115.1	118.7	100
Cs	mg kg^{-1}	9.033	9.1	7.4	8.39	8.89	8.48	8.366	8.4	8.75	8.263	7.26	8.6
Cu	mg kg^{-1}	29.446		27.9	32.0	37.8	14.17	29.6	32	28	31.398	31.23	34
Dy	mg kg^{-1}	7.093	5.69		7.20	7.14	7.5	7.492	6.7	7.183	7.145	7.38	7.13
Er	mg kg^{-1}	3.921	3.27		3.90	3.84	4.05	4.071	3.5	3.748	3.89	4.05	3.84
Eu	mg kg^{-1}	2.147	2.06		1.95	2.25	2.07	2.079	2	2.0005	1.969	1.98	1.97
F	mg kg^{-1}									758		761	850
Ga	mg kg^{-1}	30.64	26	25.7	27.4	32.8	27.69	27.6	26	29.7	27.1775	27.54	29
Gd	mg kg^{-1}	8.7405	8.42		8.62	9.88	9.3	8.646	8	8.092	8.2625	8.39	8.44
Ge	mg kg^{-1}	0.145		1.3		2.18			1.6	1.53			2
Hf	mg kg^{-1}	4.0675	2.7	3.9	3.99	3.34	3.91	3.957	3.6	3.63	3.809	4.07	4
Hg	mg kg^{-1}											0.09	0.08
Ho	mg kg^{-1}	1.417	1.04		1.45	1.43	1.52	1.422	1.3	1.425	1.398	1.435	1.39
I	mg kg^{-1}			0.6									
In	mg kg^{-1}	0.035							0.09			0.107	0.13
Ir	mg kg^{-1}												
La	mg kg^{-1}	55.4265	50	54.4	52.0	61.2	54.51	53.4	54	54.82	51.948	33.64	53.5
Li	mg kg^{-1}	162.5445		176.6	160	174		172.1	167		183.035	158.7	170
Lu	mg kg^{-1}	0.604	0.4		0.57	0.53	0.58	0.582	0.52	0.53	0.546	0.566	0.59
Mo	mg kg^{-1}	5.81	2.6	2.6		2.43	2.95	2.982	2.3	2.3	2.0925	2.13	2.27
Nb	mg kg^{-1}	17.188	15.3	14.5	16.4	16	15.82	16.4	15	17.5	14.8175	15.95	15
Nd	mg kg^{-1}	49.494	58.5	54.8	50.0	50.2	52.28	51.01	51	51.7	48.6115	43.29	49.5
Ni	mg kg^{-1}	80.56	80	82.4	80.6	95.4	85.3	89.2	82	95	87.144	89.55	82
Os	mg kg^{-1}												
Pb	mg kg^{-1}	34.811	37	34.5	34.9	33.9		35.9	34	37.96	35.91	36.58	35
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	12.434	13.8		13.2	13.49	13.69	13.31	13	12.64	12.6735	10.58	13
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	140.036	143	143.5	150	146.2	154.3	153.9	145	155.2	145.7	61.33	148
Re	mg kg^{-1}								0.011				
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}							732	7120	6668		6700	0.73
Sb	mg kg^{-1}		2	1.2				1.078	0.91		0.906	1.103	0.9
Sc	mg kg^{-1}	19.501	18.3	20.2	20.8	20	20.57	21.3	20	20	19.6725	19.42	9.5
Se	mg kg^{-1}								1.5			1.5	
Sm	mg kg^{-1}	9.7075	9.0	9.1	9.95	11.49	10.52	10.44	10.1	9.688	9.791	9.7	10.1
Sn	mg kg^{-1}		3.3	3		6.82		4.12	3.3	2.3	3.42	3.44	4
Sr	mg kg^{-1}	179.0635		177.1	185	191.7	188.2	188.4	178	183.8	175.501	147.7	198
Ta	mg kg^{-1}	1.117	3.5	1.2	1.42	1.31	1.26	1.28	1.5	1.09	1.1335	1.151	1
Tb	mg kg^{-1}	1.361	1.1		1.24	1.27		1.366	1.3	1.252	1.2525	1.264	1.25
Te	mg kg^{-1}							0.185	0.2			0.15	0.14
Th	mg kg^{-1}	14.249	15.5	15.8	16.0	15.6	17.55	16.6	15.5	14.72	15.827	13.65	16.5
Tl	mg kg^{-1}	0.907	0.9	0.89		0.66		0.968	0.87			0.897	
Tm	mg kg^{-1}	0.6385	0.42		0.59	0.59		0.613	0.6		0.5665	0.593	0.59
U	mg kg^{-1}	4.9705	5.01	5.9	5.63	5.1	6.19	5.94	5.6	5.56	5.6385	5.91	6.1
V	mg kg^{-1}	219.4385		213	216	251.5	229.6	262	214	238.5	211.9965	227.6	220
W	mg kg^{-1}	1.12575		2.5		1.49		1.501	1.5		1.5325	1.67	3
Y	mg kg^{-1}	34.89425	26.4	35.1	37.2	36.6	39.1	37.2	35	36.7	36.52	37.81	36.5
Yb	mg kg^{-1}	3.80525	3.1	4.3	3.90	3.56	3.91	3.872	3.5	3.647	3.702	3.828	3.7
Zn	mg kg^{-1}	134.7383		185.5	182	205	194.5	202	188	191	189.912	218	179
Zr	mg kg^{-1}	124.4548		133.2	136	122	132.2	143.5	132	132.9	131.946	141.5	130
		8%										*C56 Sc later reported*	

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C57	C58	C59	C60	C61	C62	C63	C63	C64	C64	C65	C66
Data Quality		2	1	2	2	2	2	1	2	1	2	2	1
SiO_2	% m/m	47.94		47.4	47.9	47.53	47.75			47.433		46.538	46.465
TiO_2	% m/m			0.8502	0.87	0.87	0.88	0.794		0.893		0.867	0.79
Al_2O_3	% m/m	20.89		20.2	22	20.85	21.35	19.84		21.158		21.454	19.93
Fe_2O_3T	% m/m	9.61		9.52	9.84	9.75	10.09	9.965		9.672		9.572	9.128
Fe(II)O	% m/m					5.6							
MnO	% m/m	0.15		0.135	0.15	0.15	0.145	0.136		0.147		0.152	0.128
MgO	% m/m	2.612		2.65	2.62	2.54	2.62	2.089		2.519		2.601	2.471
CaO	% m/m	3.006		3	2.94	2.87	3.06	3.008		3.003		3.062	2.717
Na_2O	% m/m	0.228		0.253		0.2	0.22	0.228		0.257			0.204
K_2O	% m/m	3.497		3.33	3.57	3.53	3.48	3.529		3.454		3.506	3.17
P_2O_5	% m/m	0.382		0.398	0.38	0.36	0.41			0.363		0.376	0.34
H_2O+	% m/m			1.24									
CO_2	% m/m			9.31			7.2						
LOI	% m/m	9.544		10.2	9.84	11.17	9.64			10.02		10.02	
Ag	mg kg^{-1}												
As	mg kg^{-1}					25.3	27.5	30					
Au	mg kg^{-1}							0.013					
B	mg kg^{-1}						70						
Ba	mg kg^{-1}	700	815	791	870	713	804	760		768.3		779.1	753.5
Be	mg kg^{-1}	2.3		3.68			3.7					3.3	
Bi	mg kg^{-1}												
Br	mg kg^{-1}							0.57					
Cd	mg kg^{-1}												
Ce	mg kg^{-1}	100	108.1	103		120	102	113				106.14	
Cl	mg kg^{-1}			50									
Co	mg kg^{-1}		21.21	21.5		20	20	22.5		23.9		23.27	
Cr	mg kg^{-1}		103.6	110		109	106	114		106.9		107.4	
Cs	mg kg^{-1}		8.48					8.9				8.47	
Cu	mg kg^{-1}		28.7	30		43	31			26.9		31.2	
Dy	mg kg^{-1}	6.9	7.179	6.53		7.5	6.2	7.7				7.04	
Er	mg kg^{-1}	3.6	3.68	3.35		4	3.2					3.93	
Eu	mg kg^{-1}	1.9	1.914	1.78		1.9	1.9	2.1				1.98	
F	mg kg^{-1}			1080									
Ga	mg kg^{-1}		27.68	8.26		25	32	27.7		24.9		28.44	
Gd	mg kg^{-1}	8.6	8.78			9.2	6.3					8.1	
Ge	mg kg^{-1}												
Hf	mg kg^{-1}		3.394	3.5		4.4		3.98				3.56	
Hg	mg kg^{-1}												
Ho	mg kg^{-1}	1.2	1.346	1.2		1.5	1.1					1.37	
I	mg kg^{-1}												
In	mg kg^{-1}												
Ir	mg kg^{-1}												
La	mg kg^{-1}	49	50.6	46.3		55.8	48	53.1				48.41	
Li	mg kg^{-1}					153	155						
Lu	mg kg^{-1}		0.575	0.47			0.44	0.52				0.53	
Mo	mg kg^{-1}												
Nb	mg kg^{-1}		16.14	13.4		15	15			15.4		13.97	
Nd	mg kg^{-1}	47	49	45.2		53	45	52				48.38	
Ni	mg kg^{-1}		85.4	98		82	75			84		84.1	
Os	mg kg^{-1}												
Pb	mg kg^{-1}		33.08	50		36	35			32.1		35.45	
Pd	mg kg^{-1}												
Pr	mg kg^{-1}	12	12.56	11.5		13.5	10.3					12.91	
Pt	mg kg^{-1}												
Rb	mg kg^{-1}		152.9	152	170	138	152	155		149		150.59	
Re	mg kg^{-1}												
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}			6110	9700								
Sb	mg kg^{-1}							1.5					
Sc	mg kg^{-1}		20.25	18.6		20	20.7	21		22.8		19.8	
Se	mg kg^{-1}												
Sm	mg kg^{-1}	9.3	9.54	8.76		10	8.7	9.9				9.71	
Sn	mg kg^{-1}											3.64	
Sr	mg kg^{-1}	160	178	183	190	170	186	270		178.3		176.47	170
Ta	mg kg^{-1}		1.084	0.89				1.09				1.02	
Tb	mg kg^{-1}	1.3	1.328	1.2		1.3	1.1	1.23				1.21	
Te	mg kg^{-1}												
Th	mg kg^{-1}	16	15.9	14.4		18		16.4		14.8		15.03	
Tl	mg kg^{-1}											0.84	
Tm	mg kg^{-1}		0.583	0.5		0.6	0.46					0.56	
U	mg kg^{-1}	5.5	5.66	5.28		7		5.7		5.2		5.44	
V	mg kg^{-1}		214	227		212	216	222			249.9	218.4	
W	mg kg^{-1}							1.6					
Y	mg kg^{-1}	34	36.8			33	38			36.9		32.89	
Yb	mg kg^{-1}	3.5	3.579			3.9	3.1	3.7				3.63	
Zn	mg kg^{-1}		149		190	172	185	190		177.8		195.7	
Zr	mg kg^{-1}		121.6		130	132	142		220	138.3		120.64	
		to be 19.5											

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		**C67**	**C69**	**C70**	**C71**	**C73**	**C74**	**C75**	**C76**	**C77**	**C78**	**C79**	**C80**
Data Quality		**2**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**2**	**1**	**2**	**1**
SiO_2	% m/m	46.19	47.32	47.97		47.448	48.2	47.705	49.5	47.68	48.03	63.09	46.49
TiO_2	% m/m	0.92	0.82	0.944	0.81	0.865	0.88	0.85	0.9	0.858	0.844	1.81	0.87
Al_2O_3	% m/m	20.55	21.15	21.91	21.94	21.482	21	20.93	22.8	20.85	20.97	14.18	20.51
Fe_2O_3T	% m/m	10.82	9.49	9.783	9.57	9.914	9.71	9.672	9.79	9.57	9.709	9.92	9.65
Fe(II)O	% m/m			4.58									
MnO	% m/m	0.17	0.14	0.145	0.15	0.1502	0.14	0.147	0.161	0.144	0.15	0.16	0.15
MgO	% m/m	2.45	2.54	2.844	2.51	2.786	2.58	2.55		2.53	2.543	3.57	2.53
CaO	% m/m	2.6	2.91	3.17	2.91	3.164	3	2.966	2.97	2.934	2.927	2.13	2.94
Na_2O	% m/m	0.28	0.22	0.208	0.23	0.211	0.2	0.283		0.19	0.221	1.82	0.22
K_2O	% m/m	3.87	3.45	3.557	3.32	2.553	3.45	3.527	3.43	3.4	3.443	2.89	3.34
P_2O_5	% m/m	0.33	0.37	0.3898		0.3679	0.39	0.371		0.369	0.373	0.18	0.34
H_2O+	% m/m												
CO_2	% m/m												
LOI	% m/m	10.71	9.24	9.07	0.87	10.27	10.4	10.276		9.96	10.62		
Ag	mg kg^{-1}											0.15	4.5
As	mg kg^{-1}		15	4.654	27.4	21.6		24	30.4	32		21.49	23.7
Au	mg kg^{-1}				8.3								
B	mg kg^{-1}												
Ba	mg kg^{-1}	745		672	792	719.7		851	936	806		535.45	679.9
Be	mg kg^{-1}			3.794									
Bi	mg kg^{-1}			0.696									0.2
Br	mg kg^{-1}												0
Cd	mg kg^{-1}			0.421	0.56							1.95	0.2
Ce	mg kg^{-1}			97.95		111.1			120				78
Cl	mg kg^{-1}											90.6	15.5
Co	mg kg^{-1}	24	20	20.64	21	23.1		28		23		21.5	22.4
Cr	mg kg^{-1}	41	125	98	107	113.4		137	195	104		35.1	393.3
Cs	mg kg^{-1}			7.142	8	6.55							7.1
Cu	mg kg^{-1}	6	25	23.61		31.8		12	71.4	32		34	26.8
Dy	mg kg^{-1}			6.611	6.4								
Er	mg kg^{-1}			3.527									
Eu	mg kg^{-1}			1.802	2.4								
F	mg kg^{-1}												
Ga	mg kg^{-1}			24.87		30.5			26.3	25		44.78	26.7
Gd	mg kg^{-1}			7.663									
Ge	mg kg^{-1}			0.868		0.94							1.6
Hf	mg kg^{-1}			3.437	4.84	4.36							2
Hg	mg kg^{-1}												
Ho	mg kg^{-1}			1.216	1.52								
I	mg kg^{-1}												0
In	mg kg^{-1}			0.103									
Ir	mg kg^{-1}				0.0086								
La	mg kg^{-1}	124		47.32	52.5	60.9			48.7	47			55.3
Li	mg kg^{-1}												
Lu	mg kg^{-1}			0.482	0.54								
Mo	mg kg^{-1}	3		1.573		2.47						15.07	2.8
Nb	mg kg^{-1}	12		15.52		16.7			12.8	13		22.12	15.9
Nd	mg kg^{-1}			43.73	44	51.8			57			30.81	39.1
Ni	mg kg^{-1}	56	100	59.56	94	84.4		65	81.9	83		77.2	124.4
Os	mg kg^{-1}												
Pb	mg kg^{-1}	5	35	8.918		31.7		32	34.5	31		3.05	35.6
Pd	mg kg^{-1}												
Pr	mg kg^{-1}			11.82									
Pt	mg kg^{-1}												
Rb	mg kg^{-1}	251		136.2	146	147.4			160	144		343.01	140
Re	mg kg^{-1}			0.0091									
Rh	mg kg^{-1}												
Ru	mg kg^{-1}												
S	mg kg^{-1}	0.66	5900	7100	7440				14300			2260	
Sb	mg kg^{-1}			0.865	1.04								0.1
Sc	mg kg^{-1}			18.76	20.5	21.1				18		18.14	19.2
Se	mg kg^{-1}			4.13	1.1	1.75							1.7
Sm	mg kg^{-1}			8.384	9.76	8.32							9.4
Sn	mg kg^{-1}			5.397									3.1
Sr	mg kg^{-1}	172		164.5		174.3			195	173		334.93	173.6
Ta	mg kg^{-1}			1.016		0.6						1.39	0
Tb	mg kg^{-1}			1.196	0.98								
Te	mg kg^{-1}								0.8				0
Th	mg kg^{-1}	45	11	14.22	15.3	17.3			16.1	16		54.3	14.4
Tl	mg kg^{-1}			0.868		0.53							0
Tm	mg kg^{-1}			0.521									
U	mg kg^{-1}	12	4	4.682	5.8	5.26			6.2	9		6.92	4.4
V	mg kg^{-1}	175		185	255	230.2			371	210		223	210.7
W	mg kg^{-1}			1.223	1.7	2.51							0
Y	mg kg^{-1}	39		32.91		36.6			38.4	42		76.06	33.9
Yb	mg kg^{-1}			3.187	3.7	1.8							139.1
Zn	mg kg^{-1}	144	160	135.2		180.1		209	217	194		190.5	185.6
Zr	mg kg^{-1}	177		122.1		136.6		138	145	130		304.12	139

Table 1		GeoPT28 Contributed data for Shale, SBC-1 (Dec 2010)											
Lab. Identifier		C80	C81	C82	C83	C83	C84	C85	C86	C87	C88	C89*	C90^
Data Quality		2	1	2	1	2	2	2	2	2	1	2	1
SiO_2	% m/m			47.38	47.36		47.85		46.94	49.21	47.104	48.289	47.4
TiO_2	% m/m			0.87	0.849		0.9	0.69	0.847	0.87	0.8538	0.854	0.84
Al_2O_3	% m/m			20.98	21		20.66	22.69	21.06	22.29	20.817	21.153	20.9
Fe_2O_3T	% m/m			9.71	9.7		9.55	9.16	9.6	10.07	9.757	10.043	9.44
Fe(II)O	% m/m			5.42									
MnO	% m/m			0.149	0.1487		0.15	0.17	0.143	0.16	0.1482	0.151	0.14
MgO	% m/m			2.6	2.56		2.73	2.64	2.62	2.77	2.545	2.744	2.63
CaO	% m/m			2.98	2.95		3.06	2.93	2.9	3.91	2.981	3.097	3.00
Na_2O	% m/m			0.23	0.18		0.16	0.25	0.27	0.46	0.253	0.227	0.67
K_2O	% m/m			3.45	3.43		3.46	3.16	3.43	3.53	3.431	3.638	3.38
P_2O_5	% m/m			0.37	0.365		0.36	0.38	0.373	0.38	0.3713	0.369	0.4
H_2O+	% m/m						5.95				0.130		
CO_2	% m/m						3.03						
LOI	% m/m	10.98		10.56	10.4		10.09			9.96	10.120	10.5	10.17
Ag	mg kg^{-1}									0.14			0.22
As	mg kg^{-1}			28.6	27.6		27.3	30.5	17	23.7			28.3
Au	mg kg^{-1}									0.004			0.018
B	mg kg^{-1}						82.1			71			
Ba	mg kg^{-1}		902.77	668.3	812		737	784.92	556	966	800.6		857
Be	mg kg^{-1}						3.14	3.225		2.59			3.65
Bi	mg kg^{-1}		0.701			0.77		0.623		0.42			
Br	mg kg^{-1}									1.5			
Cd	mg kg^{-1}							0.394		0.25			0.26
Ce	mg kg^{-1}		98.783	135.8	110.3		105	87.688	110	95	113.3		100
Cl	mg kg^{-1}												
Co	mg kg^{-1}			25.2	23		20.8	22.037	17	23.7			27.8
Cr	mg kg^{-1}			106.8	122.6		106	126.74	89	81	103.5		104.8
Cs	mg kg^{-1}		8.039		9.62		8.12	7.596		0.29			
Cu	mg kg^{-1}			33	25.4		31.4	36.354	40	33.2			24.44
Dy	mg kg^{-1}		5.96		7.03		6.95	6.242	6.52	0.15			7.54
Er	mg kg^{-1}		3.077		3.82		3.61	3.292	3.48	1.1			4.1
Eu	mg kg^{-1}		1.812		2.08		2	1.915	2.14	0.95			1.87
F	mg kg^{-1}												
Ga	mg kg^{-1}			26.4	25.2		24.8	29.867	27	9.9	26.3		
Gd	mg kg^{-1}		7.303		8.7		8.92	8.595	8.02	1.65			9.11
Ge	mg kg^{-1}						1.96			0.16			
Hf	mg kg^{-1}		3.181		3.47		3.9			1.24			
Hg	mg kg^{-1}									0.085			
Ho	mg kg^{-1}		1.063		1.365		1.34	1.042	1.24	0.15			1.29
I	mg kg^{-1}									1			
In	mg kg^{-1}									0.05			
Ir	mg kg^{-1}									1E-07			
La	mg kg^{-1}		47.273	46.4	54.8		50.6	39.902	49.6	51.5	54.7		58.1
Li	mg kg^{-1}		155.214					172.52		192			
Lu	mg kg^{-1}		0.457		0.544		0.47	0.434	0.46	0.01			0.57
Mo	mg kg^{-1}		2.405		2.39			2.018		1.59			
Nb	mg kg^{-1}		12.874	17.7	14.93		15.3		15	0.04	16.9		
Nd	mg kg^{-1}		46.517	58.5	50.9		48.2	46.088	49.8	33.6	52.3		55.1
Ni	mg kg^{-1}			80.8	77.2		84.1	93.352	82	84.5			48.9
Os	mg kg^{-1}									0.00001			
Pb	mg kg^{-1}		32.959	37	35.1		37.1	33.155	32	23.2	24.8		35
Pd	mg kg^{-1}									0.002			0.015
Pr	mg kg^{-1}		11.865		13.41		12.6	10.425	12.9	3.15			13.59
Pt	mg kg^{-1}									0.001			
Rb	mg kg^{-1}		155.528	159.8	159.1		142	137.76	140	313	153.3		
Re	mg kg^{-1}									0.007			
Rh	mg kg^{-1}									0.001			
Ru	mg kg^{-1}									0.000001			
S	mg kg^{-1}						0.52			7795			7530
Sb	mg kg^{-1}				1		0.92	1.08		0.47			1.1
Sc	mg kg^{-1}				18.6		20.4	19.38	20.8	11.6	20.5		18.98
Se	mg kg^{-1}									0.83			0.900
Sm	mg kg^{-1}		9.039		10.12		9.69	8.898	10.11	4.2			9.930
Sn	mg kg^{-1}						3.55			2.65			
Sr	mg kg^{-1}		170.303	186.8	169		193	177.94	168	175	186.6		192
Ta	mg kg^{-1}		0.896		1.14		1.11	1.092		0.91			
Tb	mg kg^{-1}		1.016		1.28		1.2	1.063	1.13	0.14			1.34
Te	mg kg^{-1}							0.165		0.08			
Th	mg kg^{-1}		15.099	18.7	14.88		16.7	13.678	14.01	2.9	15.7		
Tl	mg kg^{-1}		0.891			0.81	0.83	0.715		0.42			
Tm	mg kg^{-1}		0.466		0.572		0.55	0.421	0.48	0.02			0.58
U	mg kg^{-1}		5.162	7.5	5.77		6.04	4.869	6	1.85	6.2		
V	mg kg^{-1}			227.5	217.8		224	219.39	220	198	219.7		217
W	mg kg^{-1}						1.52			0.86			
Y	mg kg^{-1}		25.935	37.9	37.4		35.5	24.294	29.7	30.3	37.9		38.5
Yb	mg kg^{-1}		3.023		3.7		3.64	3.28	3.06	3.71			3.66
Zn	mg kg^{-1}			198.5	199		179	194.68	170	189	188.7		200
Zr	mg kg^{-1}		97.99	135.9	120		142	94.549	138	93.6	138.4		159
												* late	^missing

Table 2 GeoPT28 Assigned values and statistical summary of contributed data for Shale, SBC-1

	Assigned value	Uncertainty of assigned value	Horwitz Target value	Uncertainty /Target	Number of reported results	Robust mean of results	Median of results	Status	Type of assigned value
	X_a	*sdm*	H_a	*sdm*/H_a	*n*				
	% m/m	% m/m	% m/m			% m/m	% m/m		
SiO_2	**47.64**	0.087	0.533	0.163	74	47.64	47.65	**Assigned**	Robust mean
TiO_2	**0.855**	0.003	0.018	0.145	77	0.858	0.855	**Assigned**	Median
Al_2O_3	**21.00**	0.037	0.266	0.138	79	21.03	21	**Assigned**	Median
Fe_2O_3T	**9.71**	0.025	0.138	0.182	79	9.71	9.71	**Assigned**	Robust mean
MnO	**0.150**	0.001	0.004	0.149	76	0.149	0.15	**Assigned**	Median
MgO	**2.60**	0.012	0.045	0.273	78	2.60	2.59	**Assigned**	Robust mean
CaO	**2.95**	0.011	0.050	0.221	79	2.95	2.96	**Assigned**	Robust mean
K_2O	**3.45**	0.012	0.057	0.204	79	3.46	3.45	**Assigned**	Median
P_2O_5	**0.370**	0.002	0.009	0.198	76	0.366	0.37	**Assigned**	Median
LOI	**10.23**	0.076	0.144	0.525	66	10.23	10.18	**Provisional**	Robust mean
	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}			mg kg^{-1}	mg kg^{-1}		
As	**25.7**	0.722	1.260	0.573	50	25.7	25.8	**Provisional**	Robust mean
Ba	**788**	7.742	23.099	0.335	71	776	788	**Provisional**	Median
Be	**3.19**	0.082	0.214	0.384	32	3.19	3.18	**Assigned**	Robust mean
Bi	**0.70**	0.021	0.059	0.346	25	0.72	0.701	**Assigned**	Median
Cd	**0.40**	0.019	0.037	0.525	29	0.43	0.4	**Provisional**	Median
Ce	**108.2**	0.919	4.276	0.215	60	107.8	108.19	**Assigned**	Median
Co	**22.7**	0.270	1.135	0.238	65	22.7	22.5	**Assigned**	Robust mean
Cr	**109**	1.249	4.303	0.290	69	109.8	109	**Assigned**	Median
Cs	**8.19**	0.108	0.477	0.226	44	8.05	8.19	**Assigned**	Median
Cu	**31.2**	0.580	1.487	0.390	67	30.7	31.2	**Assigned**	Median
Dy	**7.10**	0.089	0.423	0.210	46	6.83	6.95	**Assigned**	Mode
Er	**3.79**	0.049	0.248	0.198	44	3.68	3.79	**Assigned**	Median
Eu	**1.98**	0.018	0.143	0.122	46	1.97	1.98	**Assigned**	Median
Ga	**27.0**	0.290	1.315	0.220	56	27.0	27	**Assigned**	Robust mean
Gd	**8.54**	0.100	0.495	0.201	43	8.44	8.54	**Assigned**	Median
Hf	**3.74**	0.102	0.245	0.415	43	3.74	3.8	**Assigned**	Robust mean
Ho	**1.36**	0.017	0.104	0.167	44	1.33	1.36	**Assigned**	Median
La	**52.5**	0.636	2.312	0.275	63	52.5	52.5	**Assigned**	Robust mean
Li	**163**	2.505	6.057	0.414	29	165	163	**Provisional**	Median
Lu	**0.54**	0.008	0.047	0.170	42	0.52	0.54	**Assigned**	Median
Mo	**2.35**	0.068	0.165	0.412	36	2.44	2.35	**Assigned**	Median
Nb	**15.3**	0.195	0.812	0.240	60	15.3	15.4	**Assigned**	Robust mean
Nd	**49.2**	0.496	2.188	0.227	60	48.6	49.2	**Assigned**	Median
Ni	**82.8**	0.762	3.408	0.223	69	82.8	83	**Assigned**	Robust mean
Pb	**35**	0.324	1.639	0.197	66	34.9	35	**Assigned**	Median
Pr	**12.6**	0.100	0.688	0.145	45	12.4	12.6	**Assigned**	Median
Rb	**147**	1.103	5.548	0.199	65	148.1	147	**Assigned**	Median
Sb	**1.01**	0.032	0.080	0.398	26	1.02	1.01	**Assigned**	Median
Sc	**20**	0.200	1.019	0.196	55	19.5	20	**Assigned**	Median
Sm	**9.62**	0.111	0.547	0.204	53	9.62	9.7	**Assigned**	Robust mean
Sn	**3.3**	0.107	0.222	0.481	28	3.71	3.46	**Provisional**	Mode
Sr	**178**	1.438	6.527	0.220	68	180.1	178	**Assigned**	Median
Ta	**1.11**	0.030	0.087	0.338	39	1.11	1.1	**Assigned**	Robust mean
Tb	**1.23**	0.016	0.095	0.162	45	1.21	1.23	**Assigned**	Median
Th	**15.8**	0.213	0.836	0.254	64	15.8	15.9	**Assigned**	Robust mean
Tl	**0.89**	0.008	0.073	0.115	27	0.83	0.88	**Provisional**	Mode
Tm	**0.56**	0.010	0.049	0.194	39	0.55	0.56	**Assigned**	Median
U	**5.76**	0.108	0.354	0.304	65	5.76	5.77	**Assigned**	Robust mean
V	**220**	1.446	7.814	0.185	64	223	220	**Assigned**	Median
W	**1.62**	0.051	0.121	0.426	27	1.67	1.62	**Assigned**	Median
Y	**36.5**	0.314	1.697	0.185	64	35.8	36.45	**Assigned**	Median
Yb	**3.64**	0.039	0.240	0.162	49	3.59	3.64	**Assigned**	Median
Zn	**186.8**	1.690	6.800	0.249	68	185.7	186.8	**Assigned**	Median
Zr	**134.3**	1.589	5.137	0.309	65	134.3	134	**Assigned**	Robust mean

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C01**	**C02**	**C03**	**C04**	**C05**	**C05**	**C06**	**C07**	**C08**	**C09**	**C10**	**C11**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**2**	**2**	**1**	**2**	**1**	**2**	**1**	**1**	**1**	**2**	**1**	**1**
SiO_2	-0.09	-0.25	-4.79	-0.18	0.67	*	0.69	0.44	*	0.69	-1.02	0.18
TiO_2	-1.00	0.26	-0.86	0.06	1.26	*	-0.86	0.86	0.29	0.11	-0.11	0.00
Al_2O_3	0.11	-0.42	-2.07	-0.11	-0.23	*	0.38	-1.51	-1.66	-0.27	-1.51	0.04
Fe_2O_3T	-0.95	0.79	-0.46	0.35	2.44	*	-1.98	0.78	0.12	0.19	1.72	0.85
MnO	-1.25	0.38	-2.51	0.38	-0.25	*	-2.00	-2.51	0.00	-0.50	0.00	-0.25
MgO	0.16	-0.35	-5.91	0.27	-3.04	*	-0.57	-0.13	-0.57	1.94	-1.91	1.43
CaO	-0.13	-0.35	-0.86	5.45	1.25	*	0.33	2.72	-0.66	-0.73	-1.06	-1.86
K_2O	-0.35	0.10	-1.22	0.35	0.19	*	-0.17	1.40	-0.73	-1.83	-2.10	-0.17
P_2O_5	-1.16	0.81	-4.65	-0.23	-2.44	*	0.00	-1.16	0.00	0.52	31.77	0.00
LOI	2.71	2.62	-2.77	-1.38	-6.03	*	4.45	-3.18	*	-0.41	*	-0.89
As	*	*	*	0.93	*	0.93	*	-0.53	3.64	1.69	2.01	*
Ba	*	*	*	0.48	*	-2.06	*	3.77	2.91	-1.00	-2.86	0.56
Be	*	*	*	*	*	-0.44	*	*	*	*	*	-1.01
Bi	*	*	*	19.43	*	*	*	*	*	*	*	1.17
Cd	*	*	*	6.81	-7.08	*	*	*	*	-3.54	*	-7.62
Ce	*	*	*	1.38	-0.28	*	*	*	1.32	-0.40	0.19	-0.28
Co	*	*	*	4.54	*	-1.19	*	0.27	2.56	-0.76	-0.26	-0.17
Cr	*	*	*	1.98	*	-0.12	*	*	1.34	0.70	1.63	-0.70
Cs	*	*	*	1.89	*	*	*	*	0.29	-0.19	*	0.42
Cu	*	*	*	-0.07	*	-2.42	*	-2.15	0.54	-0.97	-3.09	-0.40
Dy	*	*	*	*	-0.09	*	*	*	1.41	-0.45	*	0.36
Er	*	*	*	*	0.83	*	*	*	1.35	-0.11	*	0.38
Eu	*	*	*	*	0.21	*	*	*	0.56	-0.04	*	0.00
Ga	*	*	*	0.38	*	0.00	*	*	2.18	*	*	0.08
Gd	*	*	*	*	0.38	*	*	*	0.38	0.00	*	0.32
Hf	*	*	*	-0.08	*	*	*	*	0.25	-2.63	*	0.21
Ho	*	*	*	*	0.05	*	*	*	0.82	-0.02	*	0.05
La	*	*	*	1.41	-0.89	*	*	*	0.51	-0.54	2.92	0.19
Li	*	*	*	*	*	-1.40	*	*	*	*	*	0.00
Lu	*	*	*	*	0.53	*	*	*	0.74	0.16	*	0.11
Mo	*	*	*	-1.65	-3.06	*	*	*	*	*	*	-1.79
Nb	*	*	*	-0.19	*	0.43	*	0.12	0.66	-0.80	0.73	0.86
Nd	*	*	*	-0.26	0.02	*	*	*	0.94	-0.37	*	0.48
Ni	*	*	*	0.46	*	-0.86	*	-0.54	*	-0.29	2.25	0.52
Pb	*	*	*	0.92	*	0.92	*	-0.61	1.04	0.31	0.43	-0.18
Pr	*	*	*	-1.16	0.15	*	*	*	-0.03	-0.39	*	0.29
Rb	*	*	*	0.00	*	-0.36	*	-0.54	-0.79	0.36	1.08	0.00
Sb	*	*	*	*	-0.44	*	*	*	0.06	-0.72	*	*
Sc	*	*	*	-1.47	*	*	*	*	0.29	-8.11	-3.24	0.20
Sm	*	*	*	-1.85	-0.17	*	*	*	1.04	0.26	*	0.49
Sn	*	*	*	10.51	*	*	*	*	0.46	-0.24	15.31	1.99
Sr	*	*	*	0.54	*	-0.38	*	-1.07	2.07	-0.31	1.07	0.92
Ta	*	*	*	*	*	*	*	*	0.03	-1.25	*	-0.31
Tb	*	*	*	*	0.31	*	*	*	0.84	0.52	*	0.73
Th	*	*	*	0.33	*	1.29	*	*	-0.22	0.10	1.15	-0.41
Tl	*	*	*	*	0.26	*	*	*	*	*	*	-0.02
Tm	*	*	*	*	-0.20	*	*	*	0.41	-0.10	*	0.00
U	*	*	*	-0.93	*	0.35	*	*	0.41	-0.33	2.56	-0.41
V	*	*	*	0.00	*	0.64	*	5.12	*	-0.90	-0.26	-0.13
W	*	*	*	88.71	*	1.58	*	*	1.58	*	*	0.00
Y	*	*	*	0.16	*	-0.13	*	-2.03	0.43	-0.54	-0.15	1.21
Yb	*	*	*	*	0.24	*	*	*	0.91	-0.65	*	0.07
Zn	*	*	*	0.16	*	-0.43	*	-1.00	1.75	-0.99	0.77	-1.44
Zr	*	*	*	0.27	*	-0.12	*	0.15	-1.12	-1.83	4.23	0.34

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C12**	**C13**	**C14**	**C15**	**C16**	**C17**	**C18**	**C19**	**C20**	**C21**	**C22**	**C23**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**1**	**2**	**1**	**2**	**1**	**1**	**2**	**1**	**2**	**1**	**2**	**2**
SiO_2	*	1.73	0.95	-1.00	3.64	0.07	0.09	1.38	-0.04	*	1.22	-0.26
TiO_2	-0.86	-0.43	0.29	-0.23	12.85	7.71	-0.14	0.29	-0.71	*	0.43	-0.60
Al_2O_3	*	-0.41	1.24	-0.08	0.19	0.30	-0.21	0.68	0.75	*	0.06	-0.15
Fe_2O_3T	*	-0.59	0.56	0.46	6.00	-0.17	-0.01	1.86	-1.13	*	0.35	-0.37
MnO	*	-1.13	0.00	0.63	5.26	0.00	-0.63	1.00	0.00	*	-1.25	0.25
MgO	*	-1.18	0.98	-0.95	-26.15	24.55	0.16	2.76	-0.06	*	-0.51	-0.29
CaO	*	-1.63	1.73	0.07	1.93	-4.65	0.37	3.72	-0.03	*	-1.73	-0.38
K_2O	*	-1.05	0.87	-0.35	-2.44	-10.48	0.96	1.92	1.31	*	-0.09	-0.19
P_2O_5	-2.33	-0.76	0.00	0.00	-12.80	-9.31	-0.06	2.33	3.49	*	-2.33	0.47
LOI	*	-2.53	-4.78	*	1.88	7.02	*	0.49	-2.63	*	-2.56	-0.38
As	*	-6.33	*	*	-2.20	*	*	5.43	*	*	-0.50	2.12
Ba	0.00	0.39	-4.11	1.04	-5.56	*	*	-0.09	4.07	-1.91	-1.52	0.78
Be	-1.48	1.55	*	*	-3.72	*	*	0.86	*	*	*	*
Bi	*	0.25	*	*	-1.88	*	*	1.17	*	*	*	*
Cd	*	-0.25	*	*	-0.55	*	*	*	11.30	*	*	*
Ce	-0.98	-0.10	*	-0.96	-4.67	*	*	0.42	1.85	-1.12	-0.02	-0.84
Co	-2.02	0.44	2.04	4.98	-2.70	*	*	-0.26	3.05	-1.76	1.28	-0.30
Cr	-1.65	1.63	0.70	0.47	-3.00	*	*	1.16	4.18	-1.44	0.00	-0.23
Cs	-0.17	0.10	*	*	-3.19	*	*	0.52	-0.20	-4.38	-1.04	2.94
Cu	-2.56	0.71	-0.81	-1.41	-1.41	*	*	0.34	2.96	-5.92	0.07	2.96
Dy	-2.05	-1.21	*	*	-4.23	*	*	-0.61	0.77	-1.41	*	*
Er	-1.03	-1.02	*	*	-3.69	*	*	-0.59	1.30	0.06	*	*
Eu	-1.40	-0.52	*	*	-2.59	*	*	0.07	0.77	-0.56	*	*
Ga	-1.21	-0.38	0.76	*	-1.54	*	*	1.30	*	-0.91	-0.27	0.00
Gd	-0.89	-0.74	*	*	-3.88	*	*	-0.81	1.37	0.12	*	*
Hf	1.60	*	5.15	*	-4.36	*	*	-0.20	1.31	9.63	*	*
Ho	-1.40	-0.94	*	*	-3.24	*	*	-0.63	0.65	-0.53	*	*
La	-0.03	-0.55	*	0.55	-6.21	*	*	-1.15	1.20	-1.28	3.34	-0.53
Li	-2.18	3.05	*	*	-2.60	*	*	0.17	*	*	*	*
Lu	0.74	-0.58	*	*	-2.87	*	*	0.79	0.80	-0.74	*	*
Mo	-1.55	0.11	*	*	-2.21	*	*	-0.21	8.65	*	2.29	*
Nb	-1.48	-0.43	2.09	*	-2.03	*	*	-2.10	1.17	0.73	0.24	1.04
Nd	-3.04	-0.31	*	2.48	-4.03	*	*	-0.02	1.43	-1.21	-3.05	-2.78
Ni	-1.45	0.89	0.93	0.02	-4.58	*	*	0.05	1.34	-1.92	0.16	0.17
Pb	0.31	0.40	0.00	*	1.28	*	*	0.79	0.88	*	0.79	0.00
Pr	0.44	-0.15	*	*	-3.46	*	*	0.44	1.02	-0.58	*	*
Rb	-1.01	0.84	1.80	*	-2.44	*	*	0.00	1.80	-3.48	-0.18	0.45
Sb	*	0.59	*	*	-2.18	*	*	0.19	*	*	-3.14	*
Sc	-6.18	0.93	0.00	*	-13.08	*	*	*	*	*	1.96	0.00
Sm	-0.31	-0.14	*	*	-3.22	*	*	0.60	1.35	-0.40	*	*
Sn	*	0.32	*	*	-1.17	*	*	3.11	2.86	*	-2.32	*
Sr	-1.20	1.23	1.84	*	-3.47	*	*	1.99	3.60	-1.41	-0.15	0.00
Ta	-0.20	-0.04	*	*	-1.92	*	*	1.18	0.47	3.36	*	*
Tb	-1.26	-0.10	*	*	-3.57	*	*	0.00	-0.16	-1.36	*	*
Th	-2.20	0.93	0.19	*	-3.65	*	*	-0.29	0.45	1.39	-1.04	*
Tl	-0.16	0.45	*	*	-1.53	*	*	*	*	*	*	*
Tm	0.61	-0.82	*	*	-3.07	*	*	-0.76	0.61	-1.23	*	*
U	-1.77	0.42	6.35	*	-1.06	*	*	0.58	0.46	-1.00	-1.49	0.35
V	-1.69	2.05	1.79	0.45	-2.04	*	*	-0.38	4.80	-2.15	1.34	-0.06
W	*	0.37	*	*	-0.75	*	*	0.08	12.37	*	*	*
Y	-2.74	-1.90	2.68	-0.13	-7.29	*	*	0.03	0.75	-2.68	-0.01	0.75
Yb	-0.76	-0.90	*	*	-3.72	*	*	0.11	0.87	-1.01	*	*
Zn	*	1.78	-0.85	1.19	-6.94	*	*	5.03	4.65	*	-0.65	0.38
Zr	-1.20	0.85	3.07	-2.36	-7.14	*	*	-1.02	2.12	-1.12	-0.03	0.07

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C24**	**C25**	**C25**	**C26**	**C27**	**C27**	**C28**	**C29**	**C30**	**C31**	**C32**	**C33**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**2**	**2**	**1**	**1**	**2**
SiO_2	*	0.18	*	-1.96	-0.91	*	-0.91	5.29	-0.12	2.04	-0.33	-0.04
TiO_2	*	1.89	*	1.43	6.00	*	-0.23	2.23	-0.51	2.57	-0.06	*
Al_2O_3	3.01	1.71	*	-10.39	-0.49	*	-0.26	4.46	0.08	6.21	0.60	-0.47
Fe_2O_3T	5.71	0.56	*	-0.53	0.27	*	-0.30	3.94	0.16	-2.70	1.72	-1.89
MnO	2.00	*	*	-4.01	0.50	*	0.13	1.00	-1.88	-5.01	-0.75	*
MgO	3.65	*	1.14	-4.13	-1.24	*	-1.29	2.72	0.27	-0.80	0.98	-1.95
CaO	-5.45	1.67	*	-4.85	2.52	*	-0.23	3.37	0.35	-13.22	-1.06	-0.73
K_2O	-2.10	*	-0.35	-1.05	2.44	*	-0.44	3.79	0.38	4.54	0.17	-1.22
P_2O_5	-0.81	*	-1.22	-13.43	-2.44	*	-1.11	2.39	-0.12	-3.49	-0.93	-0.35
LOI	*	*	0.07	*	0.84	*	-0.93	4.34	-1.50	*	2.92	1.63
As	-0.61	*	-4.07	-1.08	-2.91	*	0.93	*	1.52	*	*	1.76
Ba	0.81	*	-0.22	2.13	1.00	*	-2.88	-4.06	3.26	0.30	*	*
Be	3.19	*	0.13	*	*	1.41	*	*	*	-3.21	*	-0.95
Bi	0.32	*	*	15.20	*	*	*	*	*	*	*	*
Cd	-1.01	*	0.95	73.52	*	*	*	*	*	*	*	-0.41
Ce	-0.21	*	1.03	0.35	2.60	*	0.21	*	3.60	-2.76	*	*
Co	-0.08	*	-0.75	*	-2.37	*	0.53	*	*	-2.37	*	0.62
Cr	0.47	*	-1.62	-2.30	*	0.70	0.12	-2.10	3.75	6.74	*	-1.28
Cs	0.56	*	*	27.67	*	*	*	*	*	*	*	*
Cu	4.32	*	-0.30	-2.08	*	1.28	-2.66	1.45	1.61	3.23	*	0.34
Dy	1.12	0.86	*	*	-0.58	*	*	*	*	-4.96	*	-0.23
Er	2.89	0.06	*	*	0.14	*	*	*	*	-3.17	*	0.45
Eu	0.14	-0.21	*	*	0.91	*	*	*	*	-1.19	*	0.00
Ga	0.69	*	-1.03	-1.44	*	*	-0.30	*	1.45	-15.97	*	0.42
Gd	0.89	-1.40	*	*	0.36	*	*	*	*	-1.09	*	0.68
Hf	0.25	*	-0.22	*	*	*	13.18	*	*	*	*	*
Ho	1.69	0.72	*	*	-0.72	*	*	*	*	*	*	-0.07
La	-0.27	*	1.63	1.79	2.05	*	0.33	*	6.56	0.28	*	*
Li	3.14	*	*	*	-5.12	*	*	-0.45	*	-0.66	*	1.28
Lu	0.23	0.74	*	*	-0.74	*	*	*	*	-3.72	*	*
Mo	-0.27	*	-0.74	*	*	*	0.77	*	*	*	*	-0.59
Nb	1.68	*	-1.17	-1.48	-1.61	*	0.55	*	0.74	*	*	-0.25
Nd	0.89	*	-0.90	0.57	2.67	*	-0.95	*	*	0.11	*	-0.51
Ni	-0.27	*	-0.56	0.40	-1.42	*	0.02	-3.57	1.98	-1.13	*	0.29
Pb	0.59	*	-1.52	0.24	0.18	*	-0.61	-0.31	2.59	*	*	0.52
Pr	-0.65	*	0.15	*	0.49	*	*	*	*	-2.32	*	-0.11
Rb	-0.05	*	*	-1.21	-1.62	*	-0.54	*	1.42	-9.19	*	*
Sb	4.17	*	-1.59	*	*	*	*	*	*	*	*	*
Sc	0.26	*	0.39	*	-1.77	*	0.54	*	2.36	-0.98	*	-0.05
Sm	1.11	-0.17	*	13.66	0.77	*	1.99	*	*	-1.57	*	-0.05
Sn	*	*	1.74	12.92	*	*	*	*	*	*	*	*
Sr	3.88	*	0.92	-0.98	1.23	*	-0.46	*	1.57	-1.07	*	1.69
Ta	0.41	*	-0.73	*	*	*	*	*	*	*	*	0.59
Tb	0.87	-0.73	*	*	-0.10	*	*	*	*	-3.04	*	0.52
Th	0.71	*	0.93	3.90	-2.08	*	2.13	*	2.79	-1.01	*	0.69
Tl	0.44	*	-1.66	*	*	*	*	*	*	*	*	-0.01
Tm	1.39	*	0.10	*	-0.61	*	*	*	*	*	*	0.41
U	0.28	0.69	*	-1.85	-3.55	*	1.19	*	2.89	-2.13	*	*
V	-1.06	*	0.26	0.78	1.28	*	0.00	-0.10	2.29	-2.43	*	*
W	1.49	*	0.33	*	*	*	*	*	*	*	*	*
Y	0.32	*	-0.43	-1.15	-1.25	*	0.75	*	2.02	-0.85	*	*
Yb	0.00	*	-0.19	16.50	-0.72	*	*	*	*	-1.26	*	-0.24
Zn	-3.02	*	-0.87	-1.82	*	0.82	-0.72	1.03	0.77	0.91	*	0.46
Zr	5.73	*	0.56	-0.30	1.12	*	0.17	-10.91	2.31	-0.83	*	*

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C34**	**C35**	**C36**	**C36**	**C37**	**C38**	**C39**	**C40**	**C41**	**C41**	**C42**	**C43**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**2**	**1**	**1**	**2**	**2**	**2**	**1**	**2**	**1**	**2**	**2**	**2**
SiO_2	*	-0.08	-1.11	*	0.09	-1.20	1.55	1.09	-0.04	*	-0.50	-1.09
TiO_2	*	0.29	-0.86	*	-0.57	-1.00	-2.75	-0.40	-0.06	*	-0.49	1.00
Al_2O_3	*	0.11	-0.38	*	0.17	0.94	2.82	-3.77	-0.23	*	0.62	-1.20
Fe_2O_3T	*	0.92	-0.89	*	-2.84	-3.13	-1.02	2.85	0.12	*	-0.46	2.85
MnO	*	0.00	0.00	*	-0.25	-3.76	0.75	9.52	-1.00	*	*	0.25
MgO	*	19.44	4.10	*	-0.51	-2.73	0.72	15.17	-0.57	*	0.71	-1.18
CaO	*	0.93	-0.86	*	-0.63	0.07	-7.48	-0.73	0.93	*	-0.77	0.96
K_2O	*	0.00	3.49	*	-0.70	1.31	-0.24	-1.14	0.52	*	-0.82	2.18
P_2O_5	*	-2.33	-1.16	*	*	2.33	-0.70	-1.57	-3.49	*	0.06	-1.16
LOI	*	-0.55	3.27	*	2.50	3.58	-1.24	0.70	-2.42	*	32.43	-1.49
As	*	-2.12	*	-7.01	*	*	14.24	-5.23	*	*	-1.82	-1.06
Ba	0.78	-4.63	-0.48	*	-0.13	*	-4.04	-1.58	-0.87	*	*	4.16
Be	*	*	*	*	*	*	-0.78	-1.28	*	*	*	0.27
Bi	*	*	*	19.43	*	*	*	0.16	*	*	*	-0.60
Cd	*	*	*	117.09	*	*	-3.27	0.68	*	*	*	*
Ce	-0.02	0.19	2.76	*	*	*	2.06	-1.25	-0.75	*	*	-2.36
Co	0.09	0.27	2.04	*	-5.15	15.17	1.24	1.41	0.27	*	*	-0.75
Cr	-0.35	-0.47	1.63	*	-0.81	-8.14	-3.46	0.85	0.23	*	*	2.79
Cs	-0.10	-0.40	-6.68	*	*	*	*	-3.37	-0.59	*	*	-2.40
Cu	0.57	-5.51	0.54	*	13.38	23.40	-3.03	-3.09	-1.48	*	*	0.27
Dy	0.00	*	*	-2.48	*	*	*	0.29	-0.37	*	*	-2.83
Er	0.23	*	*	-3.60	*	*	*	0.11	-0.06	*	*	-2.39
Eu	0.07	*	*	-3.43	*	*	*	0.59	-0.70	*	*	-0.98
Ga	*	-1.52	0.76	*	*	*	*	0.91	-1.52	*	*	-0.38
Gd	-0.34	*	*	1.48	*	*	*	0.87	-0.61	*	*	-1.66
Hf	*	-3.01	9.23	*	-1.51	*	*	-1.51	0.99	*	*	*
Ho	0.22	*	*	3.11	*	*	*	-0.31	0.63	*	*	-2.25
La	-0.29	8.02	1.10	*	*	*	0.36	-2.22	-2.10	*	*	-2.48
Li	0.99	*	*	*	-0.08	*	*	-0.33	*	*	*	0.33
Lu	0.16	*	*	*	*	*	*	-0.27	0.32	*	*	-1.65
Mo	*	-2.09	3.97	*	*	*	*	7.47	*	*	*	*
Nb	*	-0.38	8.25	*	*	*	*	-1.24	1.35	*	*	-0.80
Nd	0.17	-0.53	0.85	*	*	*	*	0.31	-0.53	*	*	-2.32
Ni	0.63	-2.01	-0.54	*	-4.67	-7.20	-0.19	0.52	0.34	*	-0.46	-0.71
Pb	-0.09	4.88	3.66	*	*	-7.44	-0.79	1.28	2.50	*	-2.96	-1.52
Pr	0.22	*	*	-0.44	*	*	*	0.00	-0.15	*	*	-1.16
Rb	*	-0.36	1.08	*	*	*	0.63	7.57	-0.36	*	-1.82	-0.45
Sb	*	*	*	118.24	*	*	*	4.08	*	*	*	*
Sc	-2.36	-0.98	0.00	*	*	*	*	-2.40	7.85	*	*	-1.96
Sm	0.35	-2.96	*	4.00	*	*	*	0.71	-0.11	*	*	-1.85
Sn	*	*	-1.48	*	*	*	*	-0.29	*	*	*	*
Sr	1.15	-0.61	1.23	*	0.08	*	-4.69	-1.78	0.00	*	*	-1.38
Ta	*	*	-12.70	*	*	*	*	-0.39	*	*	*	*
Tb	-0.16	*	*	4.04	*	*	*	0.10	0.31	*	*	-1.42
Th	0.87	-1.01	1.39	*	*	*	*	-2.78	1.75	*	*	-1.70
Tl	*	*	*	*	*	*	3.84	0.13	*	*	*	-1.18
Tm	0.41	*	*	*	*	*	*	-0.41	0.82	*	*	-1.94
U	0.77	3.52	3.52	*	*	*	6.06	-1.62	1.37	*	*	-2.06
V	0.45	1.02	1.28	*	*	*	0.19	0.00	0.64	*	*	3.71
W	*	*	-13.44	*	*	*	*	-0.91	*	*	*	*
Y	0.13	-0.85	0.91	*	-0.43	*	*	-0.96	3.68	*	*	-4.26
Yb	0.33	*	*	9.08	*	*	*	-0.11	0.70	*	*	-2.38
Zn	-0.21	-2.47	-4.38	*	-0.21	-4.25	0.18	1.85	-0.27	*	-2.50	-0.43
Zr	2.12	-0.24	1.51	*	-3.92	*	*	*	-0.63	*	*	1.24

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C44**	**C45**	**C46**	**C47**	**C48**	**C49**	**C50**	**C51**	**C52**	**C54**	**C55**	**C56**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**2**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**1**	**1**	**2**	**2**
SiO_2	*	-1.77	-0.07	0.19	0.09	0.71	0.48	0.70	0.58	0.39	-0.08	-0.70
TiO_2	*	-1.43	-0.06	0.43	-0.94	1.29	-1.20	0.14	-0.29	-0.27	-0.43	0.71
Al_2O_3	*	-0.75	0.01	0.36	0.94	0.47	1.56	0.04	-0.15	-0.22	-1.32	0.94
Fe_2O_3T	*	-1.62	-0.17	-23.89	-0.58	0.79	-0.75	0.39	-0.46	-0.52	-0.05	-0.48
MnO	*	0.00	0.50	0.00	-3.01	0.13	0.25	0.00	-1.25	-1.43	1.25	0.00
MgO	*	-0.80	-0.12	-0.51	-0.30	1.05	2.56	-0.06	0.09	1.34	0.38	-0.40
CaO	*	0.33	0.53	-0.63	-2.06	0.76	0.85	0.37	0.45	0.87	0.76	0.07
K_2O	*	0.00	0.58	2.18	0.01	0.70	0.63	1.31	0.09	0.16	1.31	1.22
P_2O_5	*	0.00	0.29	1.16	-0.58	0.58	1.51	0.58	0.35	0.01	0.58	0.00
LOI	*	1.40	0.46	-0.03	2.89	-0.83	-1.73	-2.32	7.71	-5.40	1.50	0.94
As	*	8.21	0.25	*	0.61	*	-2.83	0.53	5.03	*	-0.14	-0.86
Ba	0.78	*	0.51	0.37	-1.02	1.49	-1.43	0.58	0.96	0.76	-5.93	0.26
Be	-0.39	-0.40	0.17	-0.20	*	*	-0.72	-0.41	1.93	2.28	0.17	0.27
Bi	-0.57	-1.71	-0.14	*	*	*	0.93	-0.26	3.36	-0.41	-0.02	0.92
Cd	0.49	5.45	-0.55	*	*	*	-0.46	0.00	-0.82	1.36	1.43	0.27
Ce	-0.28	0.42	0.14	0.10	0.10	0.65	0.75	0.56	0.02	-0.05	-3.11	0.21
Co	-0.18	-0.26	-0.26	-0.26	2.74	0.39	0.80	-0.44	*	-0.82	0.76	0.22
Cr	-1.02	*	0.02	-0.81	0.48	0.37	5.35	-1.05	1.63	1.42	1.13	-1.05
Cs	0.88	1.90	-0.83	0.21	0.73	0.30	0.37	0.22	1.17	0.15	-0.98	0.43
Cu	-0.59	*	-1.11	0.27	2.22	-5.73	-1.08	0.27	-2.15	0.13	0.01	0.94
Dy	0.00	-3.33	*	0.12	0.05	0.48	0.94	-0.47	0.21	0.12	0.34	0.04
Er	0.27	-2.08	*	0.23	0.11	0.53	1.15	-0.58	-0.15	0.42	0.53	0.11
Eu	0.58	0.56	*	-0.11	0.94	0.31	0.69	0.07	0.14	-0.08	0.00	-0.04
Ga	1.39	-0.76	-0.49	0.15	2.21	0.26	0.46	-0.38	2.06	0.14	0.21	0.76
Gd	0.20	-0.24	*	0.08	1.35	0.77	0.21	-0.55	-0.91	-0.56	-0.15	-0.10
Hf	0.67	-4.23	0.33	0.51	-0.81	0.35	0.89	-0.28	-0.44	0.29	0.68	0.53
Ho	0.30	-3.04	*	0.46	0.36	0.80	0.65	-0.27	0.68	0.42	0.39	0.17
La	0.64	-1.06	0.42	-0.10	1.89	0.44	0.41	0.33	1.02	-0.22	-4.07	0.22
Li	-0.04	*	1.12	-0.25	0.91	*	1.50	0.33	*	3.31	-0.36	0.58
Lu	0.73	-2.87	*	0.37	-0.05	0.48	1.00	-0.16	-0.11	0.23	0.33	0.58
Mo	10.50	1.55	0.77	*	0.26	1.83	3.86	-0.14	-0.27	-1.53	-0.65	-0.23
Nb	1.16	-0.01	-0.50	0.67	0.43	0.32	1.35	-0.19	2.70	-0.60	0.40	-0.19
Nd	0.08	4.27	1.29	0.19	0.24	0.72	0.85	0.42	1.17	-0.25	-1.34	0.08
Ni	-0.33	-0.83	-0.06	-0.33	1.84	0.36	1.87	-0.12	3.57	1.26	0.98	-0.12
Pb	-0.06	1.22	-0.15	-0.03	-0.34	*	0.55	-0.31	1.81	0.56	0.48	0.00
Pr	-0.12	1.74	*	0.44	0.65	0.79	1.03	0.29	0.06	0.11	-1.47	0.29
Rb	-0.63	-0.72	-0.32	0.27	-0.07	0.66	1.24	-0.18	1.48	-0.23	-7.72	0.09
Sb	*	12.39	1.21	*	*	*	0.91	-0.59	*	-1.23	0.61	-0.65
Sc	-0.24	-1.67	0.10	0.39	0.00	0.28	1.28	0.00	0.00	-0.32	-0.28	-5.15
Sm	0.08	-1.14	-0.48	0.30	1.71	0.82	1.50	0.44	0.12	0.31	0.07	0.44
Sn	*	-0.13	-0.74	*	7.86	*	3.56	-0.06	-4.63	0.41	0.25	1.51
Sr	0.08	*	-0.07	0.54	1.05	0.78	1.59	0.00	0.89	-0.38	-2.32	1.53
Ta	0.06	27.44	0.53	1.79	1.16	0.88	1.98	2.25	-0.20	0.30	0.25	-0.61
Tb	0.69	-1.36	*	0.05	0.21	*	1.43	0.37	0.23	0.24	0.18	0.10
Th	-0.95	-0.41	-0.02	0.10	-0.14	1.02	0.91	-0.20	-1.34	-0.02	-1.31	0.39
Tl	0.11	0.12	-0.01	*	-1.59	*	1.06	-0.15	*	*	0.04	*
Tm	0.80	-2.86	*	0.31	0.31	*	1.08	0.41	*	0.13	0.34	0.31
U	-1.11	-2.11	0.20	-0.18	-0.93	0.61	0.52	-0.22	-0.55	-0.33	0.22	0.49
V	-0.04	*	-0.45	-0.26	2.02	0.61	5.38	-0.38	2.37	-1.02	0.49	0.00
W	-2.05	*	3.65	*	-0.54	*	-0.99	-0.50	*	-0.73	0.21	5.73
Y	-0.46	-5.92	-0.40	0.22	0.04	0.78	0.44	-0.43	0.15	0.04	0.40	0.01
Yb	0.34	-2.26	1.37	0.54	-0.17	0.56	0.96	-0.30	0.02	0.25	0.39	0.12
Zn	-3.83	*	-0.10	-0.35	1.34	0.57	2.24	0.09	0.62	0.46	2.29	-0.57
Zr	-0.95	*	-0.10	0.17	-1.19	-0.20	1.80	-0.22	-0.26	-0.45	0.71	-0.41

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C57**	**C58**	**C59**	**C60**	**C61**	**C62**	**C63**	**C63**	**C64**	**C64**	**C65**	**C66**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**2**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**1**	**2**	**2**	**1**
SiO_2	0.28	*	-0.23	0.24	-0.11	0.10	*	*	-0.39	*	-1.04	-2.21
TiO_2	*	*	-0.14	0.43	0.43	0.71	-3.48	*	2.17	*	0.34	-3.71
Al_2O_3	-0.21	*	-1.51	1.88	-0.28	0.66	-4.37	*	0.59	*	0.85	-4.03
Fe_2O_3T	-0.37	*	-0.70	0.46	0.13	1.37	1.83	*	-0.30	*	-0.51	-4.24
MnO	0.00	*	-1.88	0.00	0.00	-0.63	-3.51	*	-0.75	*	0.25	-5.51
MgO	0.18	*	0.60	0.27	-0.62	0.27	-11.27	*	-1.71	*	0.06	-2.77
CaO	0.53	*	0.47	-0.13	-0.83	1.06	1.09	*	0.99	*	1.08	-4.71
K_2O	0.41	*	-1.05	1.05	0.70	0.26	1.38	*	0.07	*	0.49	-4.89
P_2O_5	0.70	*	1.63	0.58	-0.58	2.33	*	*	-0.81	*	0.35	-3.49
LOI	-2.37	*	-0.10	-1.35	3.26	-2.04	*	*	-1.45	*	-0.72	*
As	*	*	*	*	-0.14	0.73	3.44	*	*	*	*	*
Ba	-1.91	1.17	0.07	1.78	-1.62	0.35	-1.21	*	-0.85	*	-0.19	-1.49
Be	-2.07	*	1.15	*	*	1.20	*	*	*	*	0.27	*
Bi	*	*	*	*	*	*	*	*	*	*	*	*
Cd	*	*	*	*	*	*	*	*	*	*	*	*
Ce	-0.96	-0.02	-0.61	*	1.38	-0.72	1.13	*	*	*	-0.24	*
Co	*	-1.31	-0.52	*	-1.19	-1.19	-0.17	*	1.07	*	0.26	*
Cr	*	-1.26	0.12	*	0.00	-0.35	1.16	*	-0.49	*	-0.19	*
Cs	*	0.60	*	*	*	*	1.48	*	*	*	0.29	*
Cu	*	-1.68	-0.40	*	3.97	-0.07	*	*	-2.89	*	0.00	*
Dy	-0.23	0.20	-0.67	*	0.48	-1.06	1.43	*	*	*	-0.07	*
Er	-0.37	-0.42	-0.88	*	0.43	-1.18	*	*	*	*	0.29	*
Eu	-0.28	-0.46	-0.70	*	-0.28	-0.28	0.84	*	*	*	0.00	*
Ga	*	0.52	-7.12	*	-0.76	1.90	0.53	*	-1.59	*	0.55	*
Gd	0.06	0.49	*	*	0.67	-2.26	*	*	*	*	-0.44	*
Hf	*	-1.40	-0.49	*	1.35	*	0.99	*	*	*	-0.36	*
Ho	-0.75	-0.09	-0.75	*	0.70	-1.23	*	*	*	*	0.07	*
La	-0.75	-0.80	-1.33	*	0.72	-0.96	0.28	*	*	*	-0.88	*
Li	*	*	*	*	-0.83	-0.66	*	*	*	*	*	*
Lu	*	0.85	-0.69	*	*	-1.01	-0.32	*	*	*	-0.05	*
Mo	*	*	*	*	*	*	*	*	*	*	*	*
Nb	*	1.03	-1.17	*	-0.19	-0.19	*	*	0.12	*	-0.82	*
Nd	-0.49	-0.07	-0.90	*	0.88	-0.95	1.30	*	*	*	-0.18	*
Ni	*	0.75	2.22	*	-0.12	-1.15	*	*	0.34	*	0.19	*
Pb	*	-1.17	4.57	*	0.31	0.00	*	*	-1.77	*	0.14	*
Pr	-0.44	-0.06	-0.80	*	0.65	-1.67	*	*	*	*	0.23	*
Rb	*	1.06	0.45	2.07	-0.81	0.45	1.44	*	0.36	*	0.32	*
Sb	*	*	*	*	*	*	6.16	*	*	*	*	*
Sc	*	0.25	-0.69	*	0.00	0.34	0.98	*	2.75	*	-0.10	*
Sm	-0.29	-0.15	-0.79	*	0.35	-0.84	0.51	*	*	*	0.08	*
Sn	*	*	*	*	*	*	*	*	*	*	0.70	*
Sr	-1.38	0.00	0.38	0.92	-0.61	0.61	14.10	*	0.05	*	-0.12	-1.23
Ta	*	-0.27	-1.25	*	*	*	-0.20	*	*	*	-0.50	*
Tb	0.37	1.03	-0.16	*	0.37	-0.68	0.00	*	*	*	-0.10	*
Th	0.10	0.07	-0.86	*	1.29	*	0.67	*	-1.24	*	-0.48	*
Tl	*	*	*	*	*	*	*	*	*	*	-0.35	*
Tm	*	0.47	-0.61	*	0.41	-1.02	*	*	*	*	0.00	*
U	-0.36	-0.27	-0.67	*	1.76	*	-0.16	*	-1.57	*	-0.45	*
V	*	-0.77	0.45	*	-0.51	-0.26	0.26	*	*	1.91	-0.10	*
W	*	*	*	*	*	*	-0.17	*	*	*	*	*
Y	-0.72	0.21	*	*	-1.02	0.46	*	*	0.27	*	-1.05	*
Yb	-0.30	-0.27	*	*	0.54	-1.13	0.24	*	*	*	-0.03	*
Zn	*	-5.56	*	0.24	-1.09	-0.13	0.47	*	-1.32	*	0.65	*
Zr	*	-2.46	*	-0.41	-0.22	0.75	*	8.35	0.79	*	-1.33	*

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C67**	**C69**	**C70**	**C71**	**C73**	**C74**	**C75**	**C76**	**C77**	**C78**	**C79**	**C80**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**2**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**2**	**1**	**2**	**1**
SiO_2	-1.36	-0.30	0.31	*	-0.37	1.05	0.06	1.74	0.03	0.73	14.50	-2.17
TiO_2	1.86	-1.00	2.54	-2.57	0.57	1.43	-0.14	1.29	0.09	-0.63	27.28	0.86
Al_2O_3	-0.85	0.28	1.71	3.54	1.81	0.00	-0.13	3.39	-0.28	-0.11	-12.84	-1.84
Fe_2O_3T	4.01	-0.81	0.25	-1.04	1.46	-0.02	-0.15	0.28	-0.52	-0.03	0.75	-0.46
MnO	2.51	-1.25	-0.63	0.00	0.05	-2.51	-0.38	1.38	-0.75	0.00	1.25	0.00
MgO	-1.62	-0.62	2.76	-1.91	4.23	-0.35	-0.51	*	-0.73	-1.17	10.83	-1.46
CaO	-3.52	-0.43	2.16	-0.86	4.20	0.93	0.13	0.17	-0.19	-0.52	-8.20	-0.27
K_2O	3.67	0.00	0.93	-2.27	-15.66	0.00	0.67	-0.17	-0.44	-0.12	-4.89	-1.92
P_2O_5	-2.33	0.00	1.15	*	-0.24	2.33	0.06	*	-0.06	0.35	-11.05	-3.49
LOI	1.67	-3.43	-4.02	-64.92	0.29	1.19	0.16	*	-0.93	2.71	*	*
As	*	-4.23	-8.34	1.38	-3.23	*	-0.66	1.88	2.51	*	-1.66	-1.56
Ba	-0.93	*	-2.51	0.17	-2.96	*	1.36	3.20	0.39	*	-5.47	-4.68
Be	*	*	1.42	*	*	*	*	*	*	*	*	*
Bi	*	*	-0.04	*	*	*	*	*	*	*	*	-8.47
Cd	*	*	0.29	4.36	*	*	*	*	*	*	21.10	-5.45
Ce	*	*	-1.20	*	0.68	*	*	1.38	*	*	*	-7.06
Co	0.58	-1.19	-0.90	-1.49	0.36	*	2.34	*	0.14	*	-0.52	-0.26
Cr	-7.90	1.86	-1.28	-0.47	1.02	*	3.25	9.99	-0.58	*	-8.59	66.07
Cs	*	*	-1.10	-0.40	-3.44	*	*	*	*	*	*	-2.29
Cu	-8.47	-2.08	-2.55	*	0.40	*	-6.46	13.52	0.27	*	0.94	-2.96
Dy	*	*	-0.57	-1.65	*	*	*	*	*	*	*	*
Er	*	*	-0.52	*	*	*	*	*	*	*	*	*
Eu	*	*	-0.62	2.94	*	*	*	*	*	*	*	*
Ga	*	*	-0.81	*	2.66	*	*	-0.27	-0.76	*	6.76	-0.23
Gd	*	*	-0.89	*	*	*	*	*	*	*	*	*
Hf	*	*	-0.61	4.49	2.54	*	*	*	*	*	*	-7.09
Ho	*	*	-0.67	1.59	*	*	*	*	*	*	*	*
La	15.47	*	-1.11	0.02	3.65	*	*	-0.81	-1.18	*	*	1.23
Li	*	*	*	*	*	*	*	*	*	*	*	*
Lu	*	*	-0.56	0.11	*	*	*	*	*	*	*	*
Mo	1.99	*	-2.34	*	0.76	*	*	*	*	*	38.56	2.76
Nb	-2.04	*	0.13	*	1.72	*	*	-1.54	-1.42	*	4.20	0.73
Nd	*	*	-1.24	-2.35	1.21	*	*	1.79	*	*	-4.19	-4.59
Ni	-3.94	2.52	-3.41	3.28	0.46	*	-2.62	-0.14	0.02	*	-0.83	12.20
Pb	-9.15	0.00	-7.95	*	-2.01	*	-0.92	-0.15	-1.22	*	-9.74	0.37
Pr	*	*	-0.57	*	*	*	*	*	*	*	*	*
Rb	9.37	*	-0.97	-0.18	0.07	*	*	1.17	-0.27	*	17.67	-1.26
Sb	*	*	-0.87	0.44	*	*	*	*	*	*	*	-11.27
Sc	*	*	-0.61	0.49	1.08	*	*	*	-0.98	*	-0.91	-0.79
Sm	*	*	-1.13	0.25	-2.38	*	*	*	*	*	*	-0.40
Sn	*	*	4.65	*	*	*	*	*	*	*	*	-1.03
Sr	-0.46	*	-1.03	*	-0.57	*	*	1.30	-0.38	*	12.02	-0.67
Ta	*	*	-0.52	*	-5.82	*	*	*	*	*	1.62	-12.70
Tb	*	*	-0.18	-2.62	*	*	*	*	*	*	*	*
Th	17.44	-2.90	-0.97	-0.65	1.75	*	*	0.16	0.10	*	23.00	-1.72
Tl	*	*	-0.16	*	-4.98	*	*	*	*	*	*	-12.29
Tm	*	*	-0.40	*	*	*	*	*	*	*	*	*
U	8.83	-2.48	-1.52	0.13	-1.40	*	*	0.63	4.59	*	1.65	-3.83
V	-2.88	*	-2.24	4.48	1.31	*	*	9.66	-0.64	*	0.19	-1.19
W	*	*	-1.65	0.66	7.39	*	*	*	*	*	*	-13.44
Y	0.75	*	-1.04	*	0.09	*	*	0.57	1.64	*	11.67	-1.50
Yb	*	*	-0.95	0.24	-7.68	*	*	*	*	*	*	564.73
Zn	-3.15	-1.97	-3.79	*	-0.99	*	1.63	2.22	0.53	*	0.27	-0.18
Zr	4.16	*	-1.18	*	0.46	*	0.37	1.05	-0.41	*	16.54	0.92

Table 3	GeoPT28 *Z*-scores for contributed data, Shale SBC-1 (Dec. 2010)											
Lab. Code	**C80**	**C81**	**C82**	**C83**	**C83**	**C84**	**C85**	**C86**	**C87**	**C88**	**C89****	**C90^**
Sample	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**	**SBC-1**
Data Quality	**2**	**1**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**1**	**2**	**1**
SiO_2	*	*	-0.25	-0.53	*	0.19	*	-0.66	1.47	-1.01	0.61	-0.46
TiO_2	*	*	0.43	-0.34	*	1.29	-4.71	-0.23	0.43	-0.07	-0.03	-0.86
Al_2O_3	*	*	-0.04	0.00	*	-0.64	3.18	0.11	2.43	-0.69	0.29	-0.38
Fe_2O_3T	*	*	-0.01	-0.09	*	-0.59	-2.00	-0.41	1.29	0.32	1.20	-1.98
MnO	*	*	-0.13	-0.33	*	0.00	2.51	-0.88	1.25	-0.45	0.13	-2.51
MgO	*	*	0.05	-0.80	*	1.49	0.49	0.27	1.94	-1.13	1.65	0.76
CaO	*	*	0.27	-0.07	*	1.06	-0.23	-0.53	9.53	0.55	1.43	0.93
K_2O	*	*	0.00	-0.35	*	0.09	-2.53	-0.17	0.70	-0.33	1.64	-1.22
P_2O_5	*	*	0.00	-0.58	*	-0.58	0.58	0.17	0.58	0.15	-0.06	3.49
LOI	2.61	*	1.15	1.19	*	-0.48	*	*	-0.93	-0.75	0.94	-0.41
As	*	*	1.17	1.54	*	0.65	1.92	-3.44	-0.78	*	*	2.09
Ba	*	4.97	-2.59	1.04	*	-1.10	-0.07	-5.02	3.85	0.55	*	2.99
Be	*	*	*	*	*	-0.11	0.09	*	-1.39	*	*	2.17
Bi	*	0.00	*	*	0.58	*	-0.66	*	-2.38	*	*	*
Cd	*	*	*	*	*	*	-0.08	*	-2.04	*	*	-3.81
Ce	*	-2.20	3.23	0.50	*	-0.37	-2.40	0.21	-1.54	1.20	*	-1.91
Co	*	*	1.11	0.27	*	-0.83	-0.29	-2.51	0.44	*	*	4.50
Cr	*	*	-0.26	3.16	*	-0.35	2.06	-2.32	-3.25	-1.28	*	-0.98
Cs	*	-0.32	*	2.99	*	-0.07	-0.62	*	-8.28	*	*	*
Cu	*	*	0.61	-3.90	*	0.07	1.73	2.96	0.67	*	*	-4.55
Dy	*	-2.69	*	-0.16	*	-0.17	-1.01	-0.68	-8.22	*	*	1.05
Er	*	-2.86	*	0.14	*	-0.35	-0.99	-0.62	-5.42	*	*	1.27
Eu	*	-1.18	*	0.70	*	0.07	-0.23	0.56	-3.60	*	*	-0.77
Ga	*	*	-0.23	-1.37	*	-0.84	1.09	0.00	-6.50	-0.53	*	*
Gd	*	-2.50	*	0.32	*	0.38	0.06	-0.53	-6.96	*	*	1.15
Hf	*	-2.27	*	-1.09	*	0.33	*	*	-5.09	*	*	*
Ho	*	-2.82	*	0.10	*	-0.07	-1.51	-0.56	-5.82	*	*	-0.63
La	*	-2.24	-1.31	1.01	*	-0.40	-2.72	-0.62	-0.21	0.97	*	2.44
Li	*	-1.29	*	*	*	*	0.79	*	2.39	*	*	*
Lu	*	-1.66	*	0.19	*	-0.69	-1.07	-0.80	-5.58	*	*	0.74
Mo	*	0.36	*	0.27	*	*	-0.99	*	-2.29	*	*	*
Nb	*	-2.99	1.47	-0.46	*	0.00	*	-0.19	-9.40	1.96	*	*
Nd	*	-1.20	2.14	0.80	*	-0.22	-0.70	0.15	-3.55	1.44	*	2.72
Ni	*	*	-0.30	-1.65	*	0.19	1.54	-0.12	0.24	*	*	-9.96
Pb	*	-1.25	0.61	0.06	*	0.64	-0.56	-0.92	-3.60	-6.22	*	0.00
Pr	*	-1.07	*	1.18	*	0.00	-1.58	0.22	-6.86	*	*	1.44
Rb	*	1.54	1.15	2.18	*	-0.45	-0.83	-0.63	14.96	1.14	*	*
Sb	*	*	*	-0.06	*	-0.53	0.47	*	-3.33	*	*	1.18
Sc	*	*	*	-1.37	*	0.20	-0.30	0.39	-4.12	0.49	*	-1.00
Sm	*	-1.06	*	0.91	*	0.06	-0.66	0.45	-4.95	*	*	0.56
Sn	*	*	*	*	*	0.50	*	*	-1.53	*	*	*
Sr	*	-1.18	0.67	-1.38	*	1.15	-0.01	-0.77	-0.23	1.32	*	2.14
Ta	*	-2.42	*	0.38	*	0.02	-0.09	*	-1.13	*	*	*
Tb	*	-2.24	*	0.52	*	-0.16	-0.88	-0.52	-5.72	*	*	1.15
Th	*	-0.89	1.71	-1.15	*	0.51	-1.29	-1.09	-7.74	-0.17	*	*
Tl	*	0.00	*	*	-0.56	-0.42	-1.22	*	-3.25	*	*	*
Tm	*	-1.92	*	0.25	*	-0.10	-1.42	-0.82	-5.52	*	*	0.41
U	*	-1.68	2.47	0.04	*	0.40	-1.25	0.35	-5.52	1.26	*	*
V	*	*	0.48	-0.28	*	0.26	-0.04	0.00	-1.41	-0.04	*	-0.38
W	*	*	*	*	*	-0.41	*	*	-3.15	*	*	*
Y	*	-6.20	0.43	0.56	*	-0.28	-3.58	-1.99	-1.81	0.85	*	1.21
Yb	*	-2.59	*	0.24	*	-0.01	-0.76	-1.22	0.14	*	*	0.07
Zn	*	*	0.86	1.79	*	-0.57	0.58	-1.24	0.16	0.28	*	1.94
Zr	*	-7.06	0.16	-2.78	*	0.75	-3.87	0.37	-3.96	0.81	*	4.82
											**late	^missing

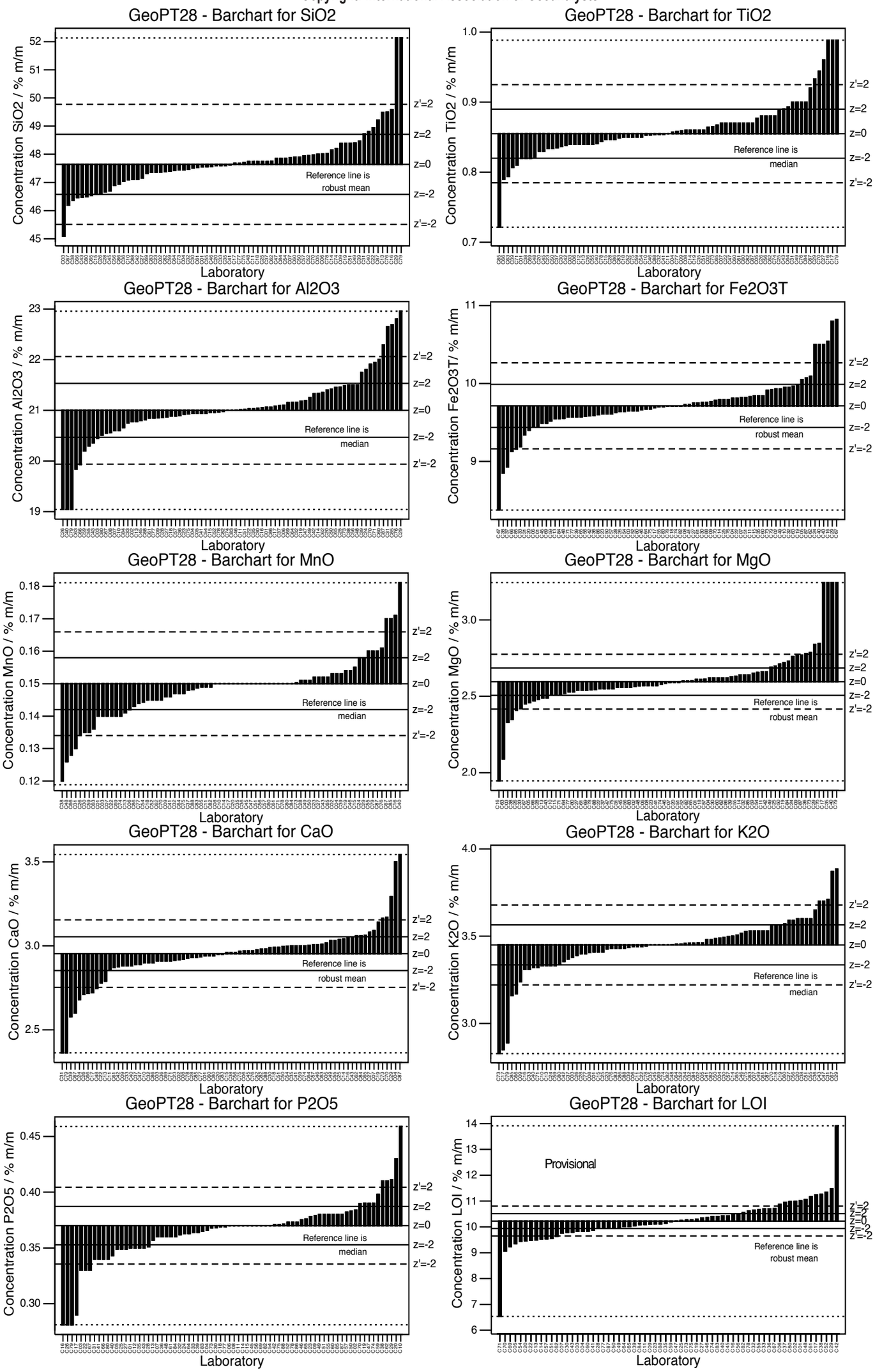


Figure 1: GeoPT28 – Shale, SBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

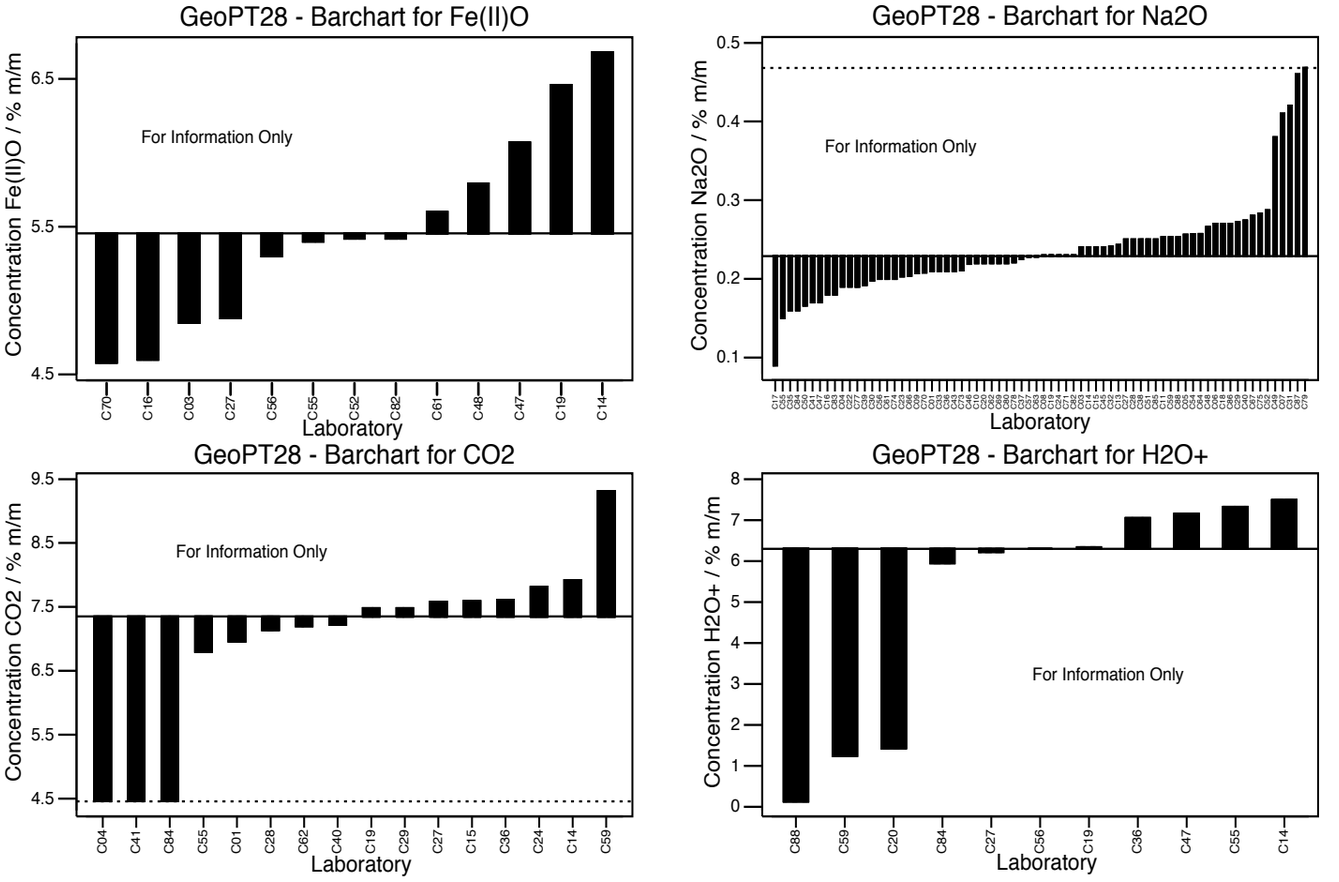
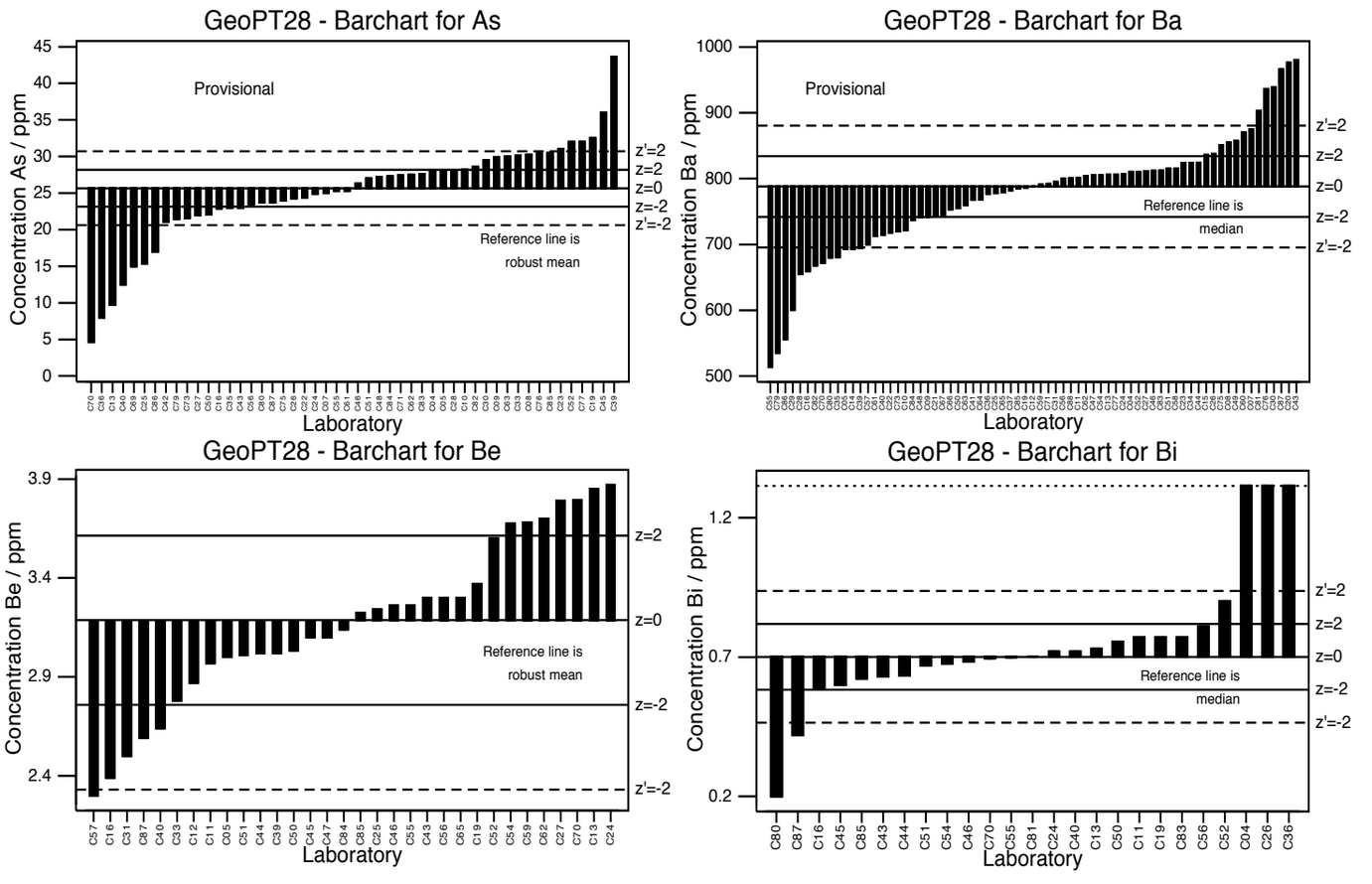


Figure 2: GeoPT28 – Shale, SBC-1. Data distribution charts for information only for elements for which values could not be assigned.



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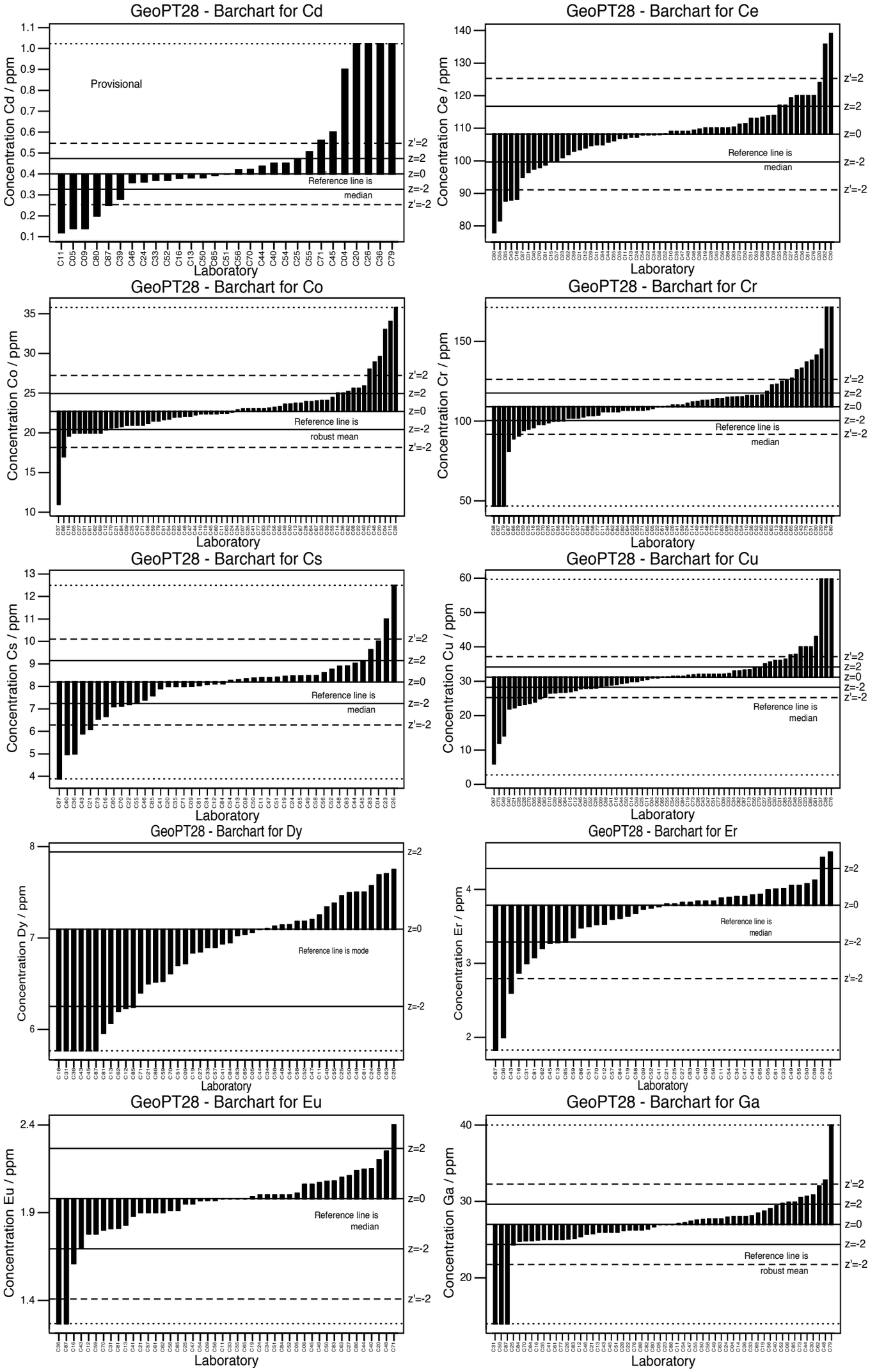

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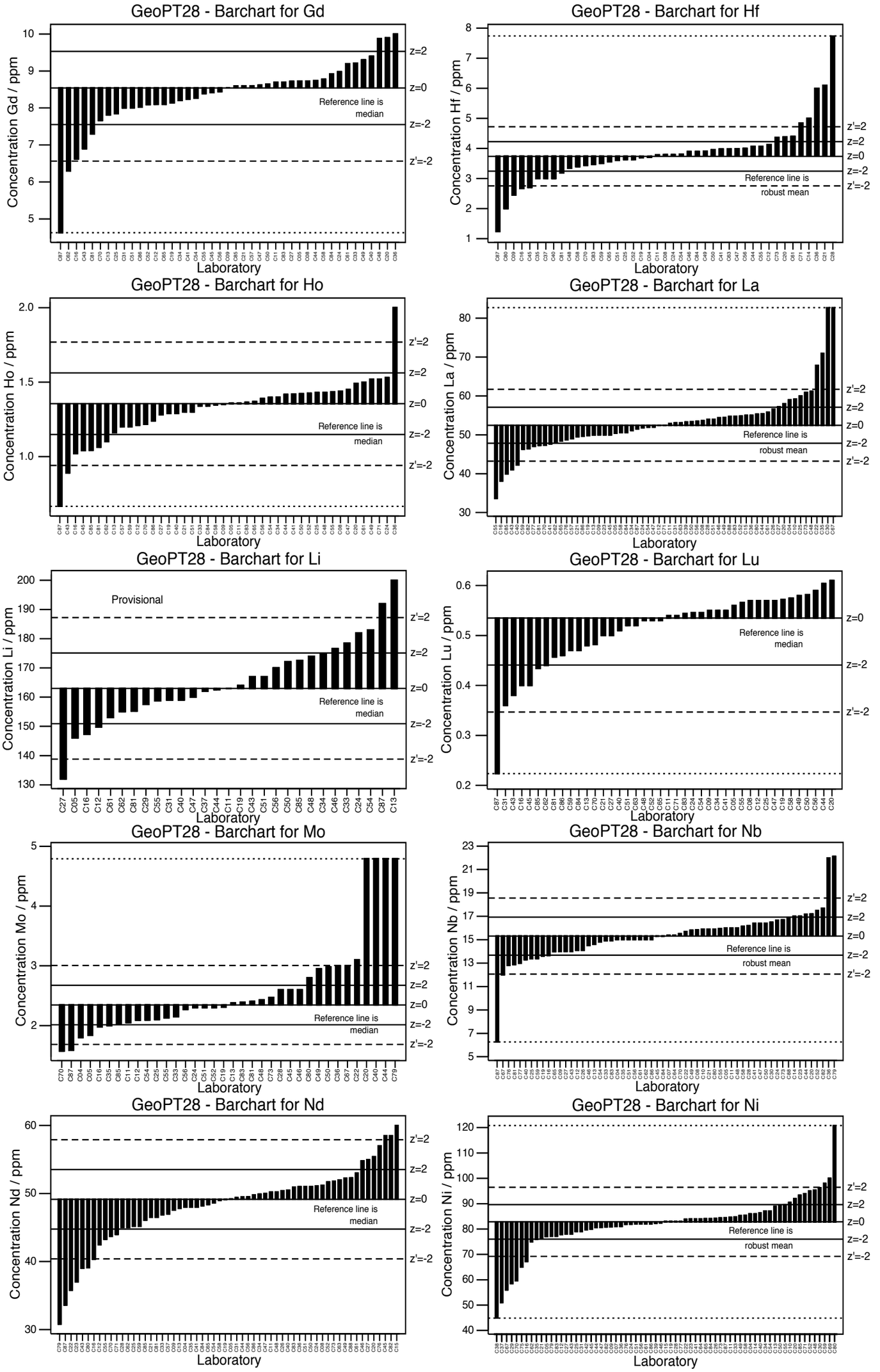

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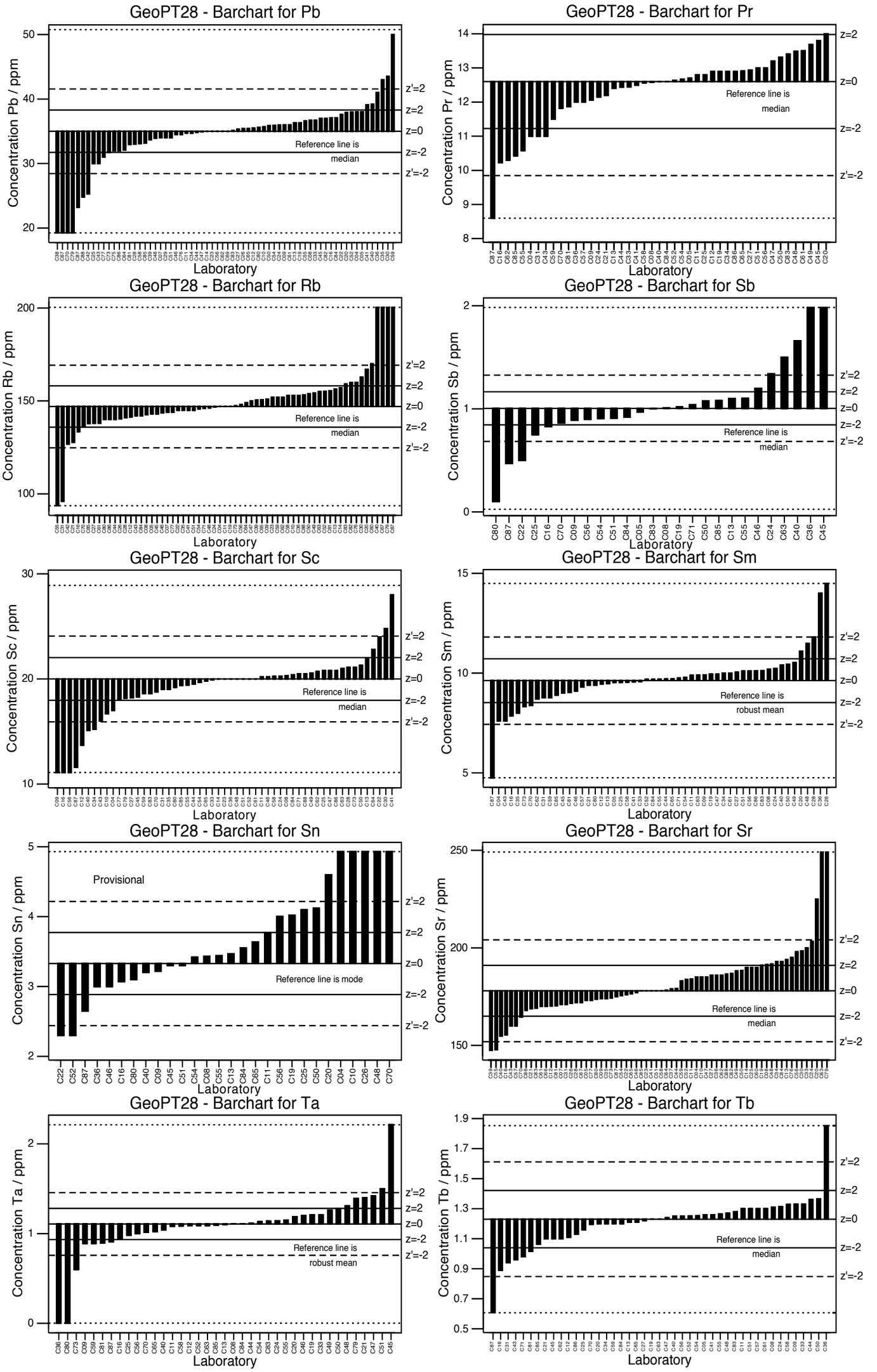

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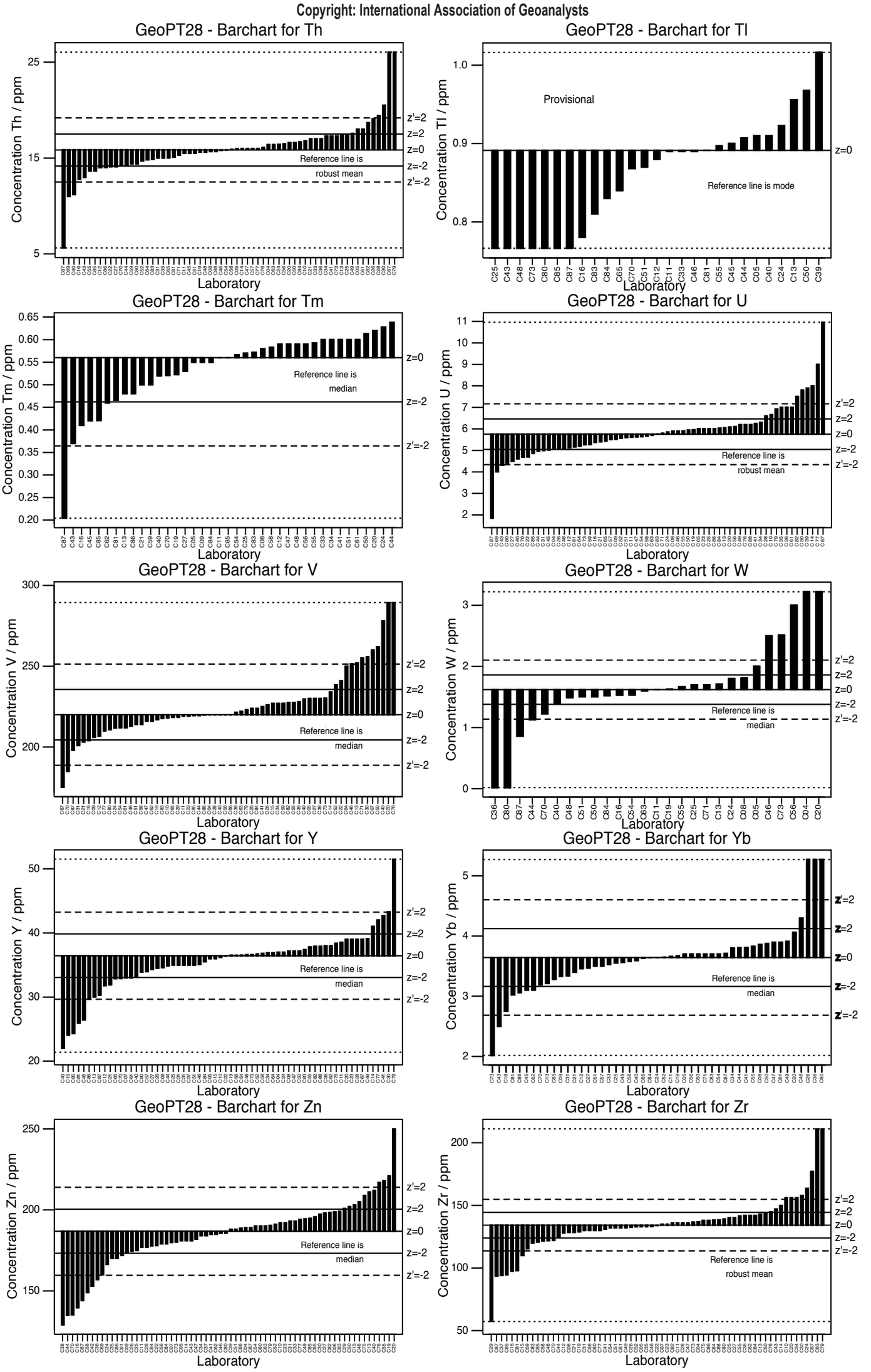

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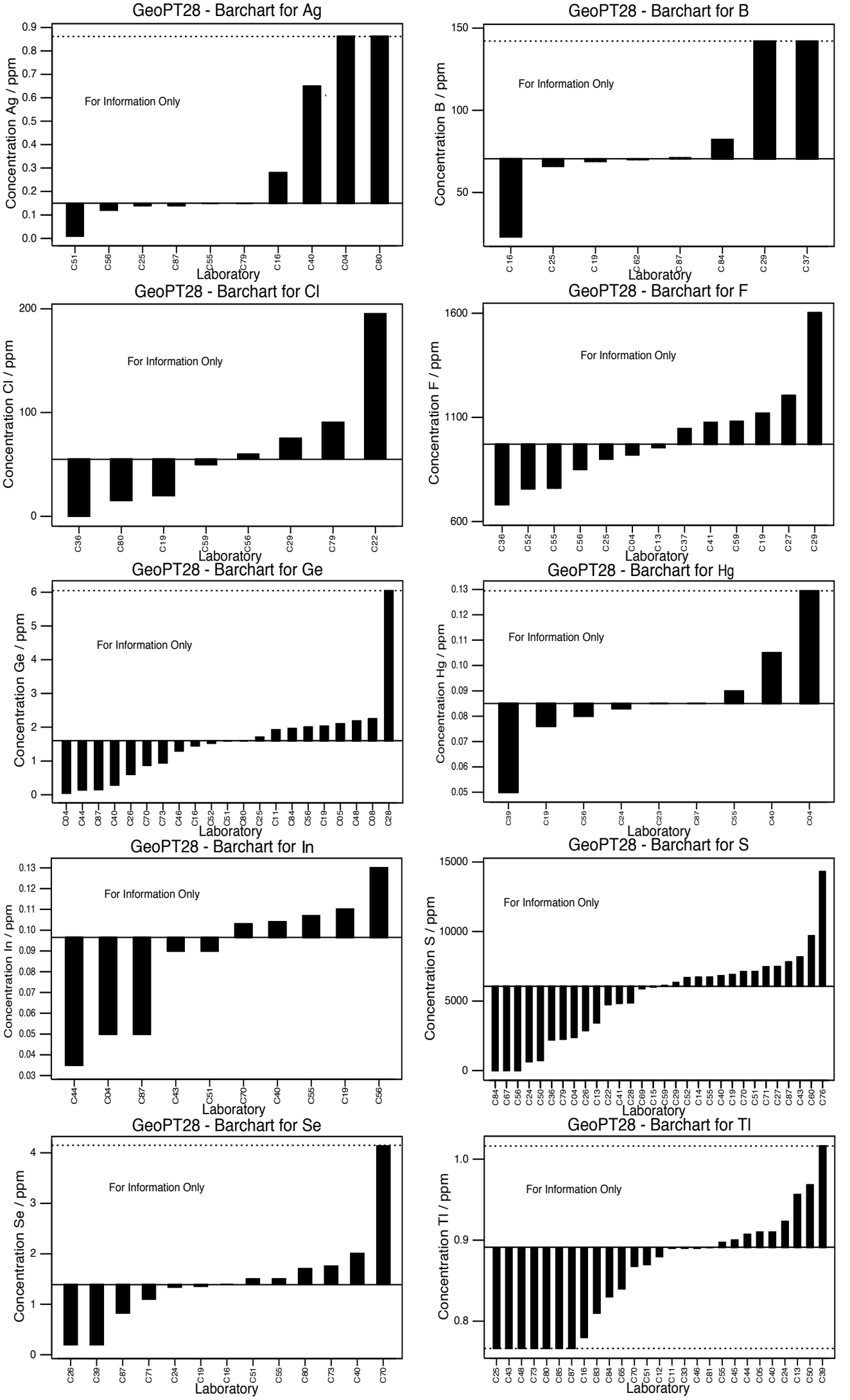

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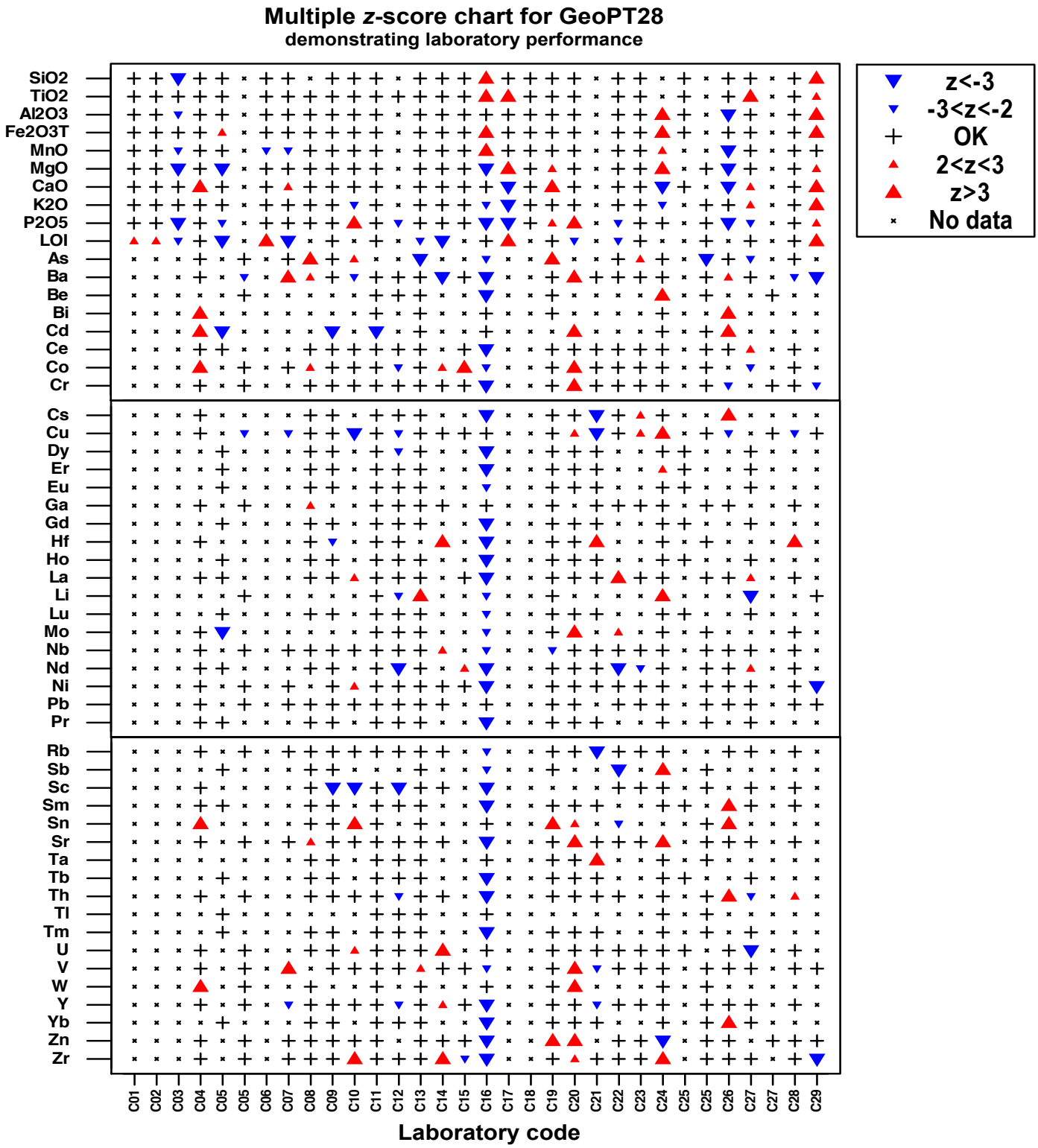
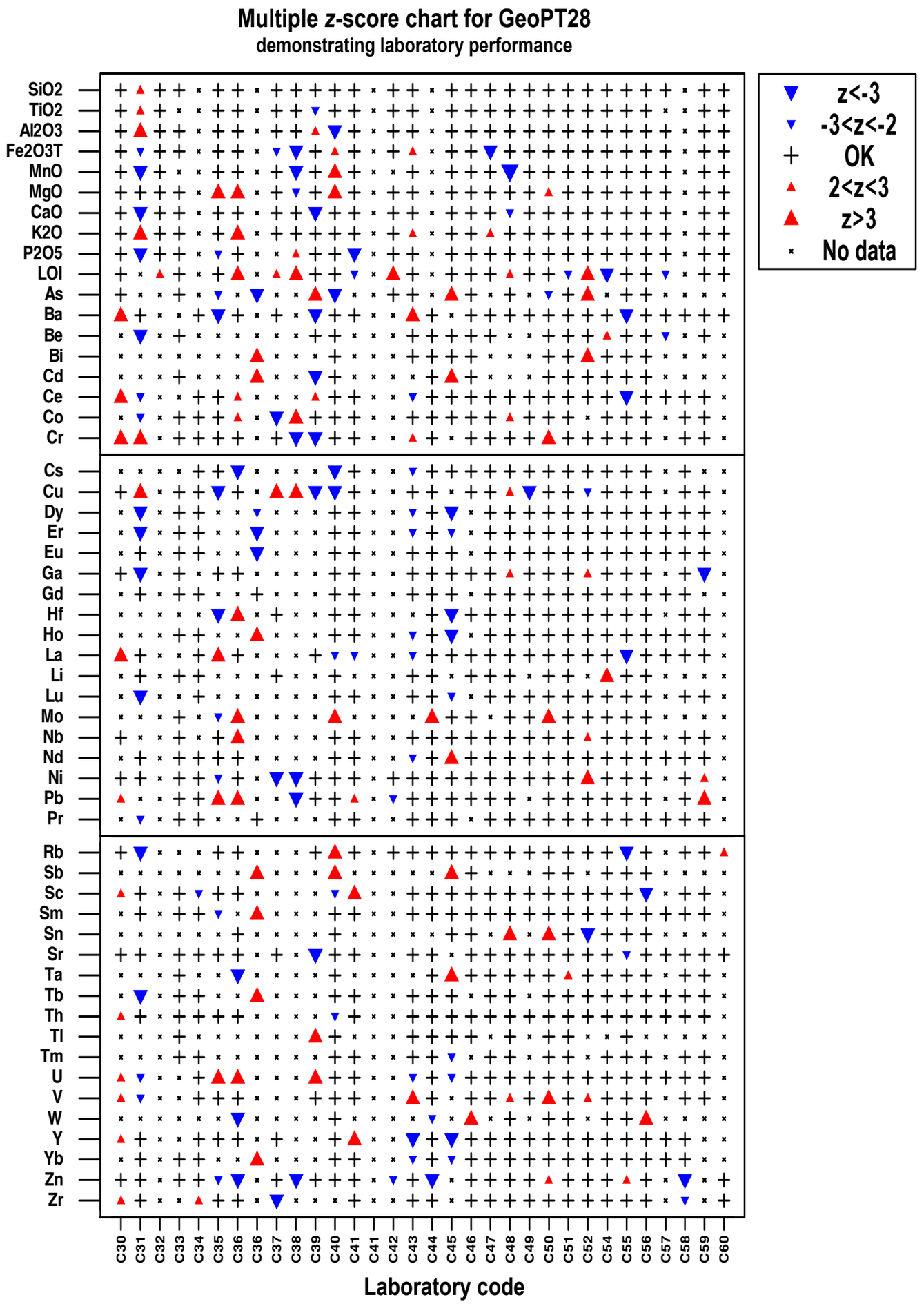


Figure 3: GeoPT28 – Shale, SBC-1. Multiple *z*-score charts for laboratories participating in the GeoPT28 round. Symbols indicate whether or not an elemental result complies with the -2<*z*<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: *z*<-3 (▼), -3<*z*<-2 (▾), +2<*z*<+3 (▴), *z*>+3 (▲).



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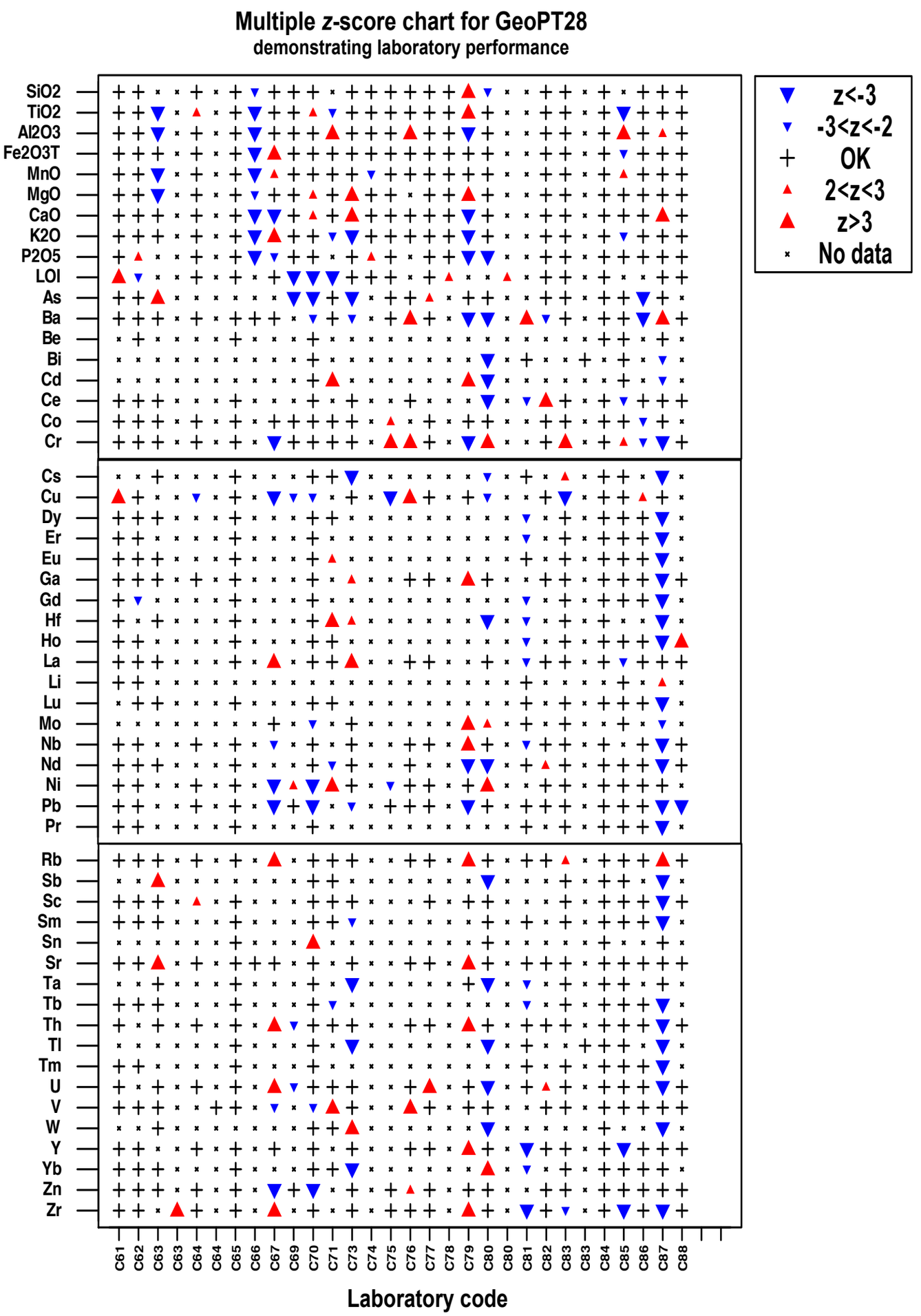

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