Geo*PT*33 — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 33 (Ball Clay, DBC-1) / July-August 2013

Peter C. Webb[1]*, Michael Thompson[2], Philip J. Potts[1]
Bartek Prusisz[3] and Kevin Young[3]

[1]Department of Environment, Earth and Ecosystems, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

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

[3] Sibelco Europe, Moneystone Quarry, Whiston, Staffs, UK.

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

*Keywords: proficiency testing, quality assurance, Geo*PT*, Geo*PT*33, round 33, DBC-1, ball clay*

Abstract

Results are presented for Geo*PT*33, the subject of round thirty-three of the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. The test sample distributed in this round is a ball clay, DBC-1, prepared by Sibelco Europe under the direction of Bartek Prusisz and Kevin Young. In this report, the data contributed from 89 laboratories are listed, together with an assessment of consensus values, consequent *z*-scores and charts to show the distribution of contributed results and the overall performance of participating laboratories.

Introduction

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

Steering Committee for Round 33: P.C. Webb (results coordinator), M. Thompson (statistical advisor), P.J. Potts (analytical advisor), B. Prusisz and K. Young (provision of DBC-1).

Timetable for Round 33:

Distribution of sample: March 2013.
Deadline for submission of analytical results: 14th June 2013.
Distribution of draft report: August 2013

Sample details

Geo*PT*33: The ball clay test material, DBC-1, was produced by Sibelco Europe under the direction of Bartek Prusisz and Kevin Young. The test material was evaluated for homogeneity by XRF analysis at the Open

University and as a result, the sample was considered suitable for use in this proficiency test.

Submission of results

The results submitted for Geo*PT*33 (DBC-1) by 89 laboratories are listed in Table 1. All of these data were used to assess respective assigned values. Three additional sets of data were submitted late.

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. Values were assigned on the basis that: (i) sufficient laboratories had contributed data for an element, and (ii) the statistical assessment gave confidence that the results distribution showed a central portion approximating to a normal distribution. Part of this assessment involved examining a bar chart of contributed data for each element to judge the distribution of results.

In this round it was apparent that there was confusion about what H_2O^+ represents. Five laboratories reported values of 1-2%, and eight reported values between 8 and 10.5 %. As noted in the Instructions to Analysts, point 7(ii), H_2O^+ is the 'structural' water contained in minerals and remaining *after* drying. Therefore H_2O^+ is the loss of mass between the dried state (105°C) and the ignited state (ca. 1000°C), not the loss *during* drying, which is H_2O^- (not required by GeoPT).

Table 2 lists assigned and provisional values for 10 major components and 47 trace elements in Geo*PT*33 (DBC-1). Bar charts for the 57 elements/components of Geo*PT*33 that were judged to have satisfactory distributions for consensus values to be assigned or provisional values to be given are shown in Figure 1.1 and 1.2. These are: SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, MgO, CaO*, Na_2O*, K_2O, P_2O_5, LOI*, As*, Ba, Be, Bi*, C(tot)*,Ce, Co*, Cr, Cs, Cu*, Dy, Er*, Eu, Ga, Gd, Ge*, Hf, Hg*, Ho, La, Li, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb*, Sc, Se*, 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 16 marked '*'. Instances of provisional status were recorded because i) a relatively small number of measurements contributed to the consensus, or ii) the degree of consensus was less than ideal because results were significantly dispersed in relation to the target value or the distribution was in part assymmetrical.

Some major (minor) elements, in particular, MnO, MgO, CaO, Na_2O and P_2O_5were at particularly low levels in this sample, giving rise to greater than usual dispersion of data relative to that in many other Geo*PT* rounds. The essentially symmetrical distributions of MgO, CaO, Na_2O and P_2O_5 results allowed values to be assigned or provisionally assigned in the case of CaO and Na_2O.

Many REE data distributions exhibited prominent low tails and robust means often appeared biased towards low values. Medians were generally preferred as they gave a more symmetrical distribution of contributed data. The reason for the low tails has yet to be investigated. There are correlations in the apparent deficiencies reported for a range of REEs, but no correlation with Zr. The suspicion is that the bias may be due to incomplete dissolution of a REE-rich mineral or minerals such as monazite in circumstances when acid digestion was used for sample preparation. Monazite is a residual mineral when granite is chemically weathered to produce kaolinite. Ball clay is a water-lain deposit comprising the products of weathering and residual minerals, such as monazite.

There were striking high tails for a number of metals, in particular, MnO, Bi, Co, Cu, Zn and Cd. Values for some are close to detection limits for XRF analysis, but that should not be the cause for Cu and Zn high tails.

In 28 cases the robust mean was used to define the consensus value but in 24 cases the median value was preferred. In 5 cases a mode provided the most

satisfactory consensus value. The procedure used to determine the mode was based on the analysis of mixed populations detailed in Thompson (2006) and first used for Geo*PT*23. Values obtained in this way were, in all cases, designated as provisional values. Bar charts for the 12 elements/components: Fe(II)O, MnO, H_2O^+, CO_2, Ag, B, C(org), Cd, F, In, S and Te are plotted in Figure 2.1 and 2.2 for information only, as the data were insufficient or too variable for 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. For Geo*PT*33, 1614 results of data quality 1 were submitted.

Data quality 2 for laboratories working to an 'applied geochemistry' standard of performance, where, although precision and accuracy are still important, the main objective is to provide results on large numbers of samples collected, for example, as part of geochemical mapping projects or geochemical exploration programmes. For Geo*PT*33, 1815 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*; 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 for contributors to Geo*PT*33 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, 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 multiple *z*-score charts for Geo*PT*33 in Figure 3. In these charts, the *z*-score performance for each element is distinguished by symbols that make it simple to identify whether the results were satisfactory or gave *z*-scores that exceeded the action limits. This chart is designed to help individual laboratories to judge their overall performance in this proficiency testing round.

Participants should always review their *z*-scores in accord with their own fitness-for-purpose criteria.

Participation in future rounds

The benefit from proficiency testing arises from regular participation and laboratories are invited to contribute to the Geo*PT*34 round, the sample for which will be distributed during September 2013.

Acknowledgements

The authors thank Liz Lomas for valued assistance in distributing both the sample and the report; Charles Gowing and BGS laboratory staff for dividing the sample; and John Watson for

assistance with labelling and packaging the DBC-1 samples.

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.

Contd.

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.

Geo*PT*28
Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2011) Geo*PT*28 - an international proficiency test for analytical geochemistry laboratories - report on round 28 / January 2011 (Shale, SBC-1). International Association of Geoanalysts: Unpublished report.

Geo*PT*29
Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2011) Geo*PT*29 - an international proficiency test for analytical geochemistry laboratories - report on round 29 / July 2011 (Nephelinite, NKT-1). International Association of Geoanalysts: Unpublished report.

Geo*PT*30
Webb, P.C., Thompson, M., Potts, P.J., Long, D. and Batjargal, B. (2012)
Geo*PT*30 - an international proficiency test for analytical geochemistry laboratories - report on round 30 / January 2012 (Syenite, CG-2) and 30A (Limestone, ML-2). International Association of Geoanalysts: Unpublished report.

Geo*PT*31
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2012) Geo*PT*31 - an international proficiency test for analytical geochemistry laboratories - report on round 31 / July 2012 (Modified river sediment, SdAR-1). International Association of Geoanalysts: Unpublished report.

Geo*PT*32
Webb, P.C., Thompson, M., Potts, P.J and Webber, E. (2013) Geo*PT*32 - an international proficiency test for analytical geochemistry laboratories - report on round 32 / January 2013 (Woodstock Basalt, WG-1). International Association of Geoanalysts: Unpublished report

Table 1		GeoPT33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11
Data Quality		2	2	2	1	1	2	2	1	1	1	1
SiO_2	g 100g^{-1}	52.31	52.32	52.28		52.09	50.86	51.38	52.147	52.41	52.21	52.19
TiO_2	g 100g^{-1}	1.13	1.12	1.13	0.993	1.09	1.14	1.1	1.112	1.13	1.13	1.15
Al_2O_3	g 100g^{-1}	32.17	31.75	32.4		31.75	30.8	31.61	31.931	32.3	32	31.97
Fe_2O_3T	g 100g^{-1}	1.2	0.93	0.92		1.04	1.01	0.92	0.919	0.87	0.94	0.87
Fe(II)O	g 100g^{-1}					0.32						
MnO	g 100g^{-1}	0.0021	0.0042	0.009		0.00	0.005		0.006		0.009	
MgO	g 100g^{-1}	0.34	0.35	0.35		0.40	0.24	0.33	0.349	0.37	0.41	0.40
CaO	g 100g^{-1}	0.3	0.18	0.2		0.20	0.29	0.18	0.187	0.19	0.192	0.23
Na_2O	g 100g^{-1}	0.36	0.42	0.29		0.67	0.05	0.41	0.425	0.38	0.391	0.42
K_2O	g 100g^{-1}	2.61	2.81	2.66		2.64	2.47	2.65	2.629	2.67	2.658	2.67
P_2O_5	g 100g^{-1}	0.08	0.07	0.071	0.067	0.09	0.0065	0.08	0.075	0.07	0.073	0.08
H_2O^+	g 100g^{-1}	1.68										
CO_2	g 100g^{-1}											
LOI	g 100g^{-1}	11.15	9.49	9.65		9.74	11.49	9.98	10.09	9.86	11.5353	10.23
Ag	mg kg^{-1}						0.1				0.198	
As	mg kg^{-1}			16			3.2	10.5			7.285	
Au	mg kg^{-1}											
B	mg kg^{-1}						16.3					
Ba	mg kg^{-1}	336	494	517	451.6		554	456.9	533.4	475	487.3	492
Be	mg kg^{-1}						0.5				4.14	3.86
Bi	mg kg^{-1}				2.036		0.8				2.52	
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}			7600						4000		
C(org)	mg kg^{-1}			7500								
Cd	mg kg^{-1}						0.01				0.14	
Ce	mg kg^{-1}			115	119.2		72.8	142.6			120	
Cl	mg kg^{-1}										119	
Co	mg kg^{-1}	3		5	2.06		1.3		2.3	3	2	1.87
Cr	mg kg^{-1}	35	112	121	108.9		70	105	5.1	114	160	104
Cs	mg kg^{-1}				65.43						63	
Cu	mg kg^{-1}	27	23	14	19.76		38	22.8	18.8	6	23	20.2
Dy	mg kg^{-1}				5.11		1.5				5.62	5.92
Er	mg kg^{-1}				3.294		0.7				2.99	3.11
Eu	mg kg^{-1}				1.968		0.9				1.72	1.79
F	mg kg^{-1}										1244	
Ga	mg kg^{-1}		54	60				53.7	51.2	54	52.79	
Gd	mg kg^{-1}				9.841		3.2				7.19	7.48
Ge	mg kg^{-1}						1.1				2.32	
Hf	mg kg^{-1}			4.3	4.393		0.4			7	5.08	
Hg	mg kg^{-1}						0.5					
Ho	mg kg^{-1}				0.955		0.2				1.1	1.07
I	mg kg^{-1}											
In	mg kg^{-1}											
Ir	mg kg^{-1}											
La	mg kg^{-1}	36	61	77	61.2		27.7	89.8			63.85	
Li	mg kg^{-1}						115					115
Lu	mg kg^{-1}				0.414		0.1				0.466	0.45
Mo	mg kg^{-1}	12		4							2.27	
N	mg kg^{-1}											
Nb	mg kg^{-1}	13			24.08		3	27.9	26.1	33	27.77	
Nd	mg kg^{-1}			48	50.9		23.8	55.8			52.56	51.6
Ni	mg kg^{-1}	13	24	25	23.02		3.2	24	28.1	18	23	24.8
Os	mg kg^{-1}											
Pb	mg kg^{-1}	95		49	53.34		15.8	59.5	56.1	60	53.21	
Pd	mg kg^{-1}											
Pr	mg kg^{-1}			17	14.11		7.4				14.48	14.2
Pt	mg kg^{-1}											
Rb	mg kg^{-1}	119		206	192.3			215.9	197.9	213	201.68	
Re	mg kg^{-1}											
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}	75		132			800				178	
Sb	mg kg^{-1}						1.1				2.44	4.48
Sc	mg kg^{-1}		16		17.26		7.6		6.4	18	20	
Se	mg kg^{-1}										4	14.000
Sm	mg kg^{-1}			8	9.346		4.1				9.580	9.530
Sn	mg kg^{-1}			22	20.4		5.2	31.2			27.97	
Sr	mg kg^{-1}	131	129	129	129.7		128.4	131.6	134.6	141	140	
Ta	mg kg^{-1}			5	2.412						2.59	
Tb	mg kg^{-1}				1.318		0.3				1.08	1.06
Te	mg kg^{-1}											
Th	mg kg^{-1}	14			17.98		6.4	22.1	21.2	23	18.1	16.6
Tl	mg kg^{-1}											0.95
Tm	mg kg^{-1}				0.393		0.1					0.43
U	mg kg^{-1}				6.005		2.1	7.7		12	6.36	5.34
V	mg kg^{-1}	181	143	144	134.4			130.8	93.1	146	156	
W	mg kg^{-1}				17.08						10.3	
Y	mg kg^{-1}	47	22	20	21.57		6.9	145.7	29.4	33	27.52	
Yb	mg kg^{-1}				2.845		0.6				2.99	3.01
Zn	mg kg^{-1}	48	29	22	15.72		36	18.5	19.4	14	22	
Zr	mg kg^{-1}	250	185	167	154.2			169.5	189.3	187	189.13	

Table 1		**Geo*PT*33 Contributed data for ball clay, DBC-1 (June 2013)**										
Lab. Code		H11	H12	H13	H14	H15	H16	H17	H18	H19	H20	H21
Data Quality		2	1	1	2	2	2	2	2	2	2	1
SiO_2	g 100g^{-1}			52.11	52.17	51.8		44.8	52.2	52.657		52.07
TiO_2	g 100g^{-1}			1.15	1.09	1.1	0.946	1.05	1.08	1.147		1.13
Al_2O_3	g 100g^{-1}			31.13	31.95	31.8	32.40	30.03	32.1	31.91		31.49
Fe_2O_3T	g 100g^{-1}			1.02	0.9	0.907	0.858	0.821	0.92	0.95	0.3	0.93
Fe(II)O	g 100g^{-1}			0.21								0.39
MnO	g 100g^{-1}			0.007	0.006		0.0045	0.0045	0.004	0.0036	0.003	0.004
MgO	g 100g^{-1}			0.41	0.31	0.379	0.342		0.31	0.377		0.36
CaO	g 100g^{-1}			0.20	0.16	0.177	0.214	0.155	0.18	0.18		0.2
Na_2O	g 100g^{-1}			0.41	0.26	0.4	0.391		0.43	0.36		0.4
K_2O	g 100g^{-1}			2.64	2.6	2.63	2.384	2.37	2.65	2.7		2.65
P_2O_5	g 100g^{-1}			0.075	0.07	0.072	0.0657		0.077	0.063		0.08
H_2O^+	g 100g^{-1}			9.89								
CO_2	g 100g^{-1}							0.12				
LOI	g 100g^{-1}			10.50	10.21	10.2	11.18		10.03	9.66		9.93
Ag	mg kg^{-1}		0.127									
As	mg kg^{-1}	9.3	9.377		9		11.367	3.4		8.3		8.34
Au	mg kg^{-1}											
B	mg kg^{-1}											101
Ba	mg kg^{-1}		376.2		485	429	468.692	595		452	118	461
Be	mg kg^{-1}		3.684	4.02	3.26		4.298					3.76
Bi	mg kg^{-1}	1.4	2.157	1.27	2					1.9		2.09
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}			*6850**			6214			6800		6386
C(org)	mg kg^{-1}											6417
Cd	mg kg^{-1}		0.048	0.30	0.19			3.3				
Ce	mg kg^{-1}	116	78.12	123.8	108	134	101.375	138		92.3		121
Cl	mg kg^{-1}											21.3
Co	mg kg^{-1}		1.778	3.0	2.81		2.091			4.1	12	1.99
Cr	mg kg^{-1}		69.55	92.3	98	105	104.378	146		76	52	110
Cs	mg kg^{-1}		62.13		64.24	57	58.24	62.2		61.3		62.3
Cu	mg kg^{-1}		19.89	26.4	12	29.9	30.237	36.6		20.6		21.4
Dy	mg kg^{-1}		2.52	5.83	4.17		4.590					5.49
Er	mg kg^{-1}		1.261	3.04	3.07		2.576					2.73
Eu	mg kg^{-1}		0.949	1.99	2.11		1.715					1.77
F	mg kg^{-1}			855		1089						755
Ga	mg kg^{-1}	52	33.79	64.0	56.95	49.7	59.820	48.7		52.3		54.9
Gd	mg kg^{-1}		3.919	7.25	8.33		7.797					6.82
Ge	mg kg^{-1}					3.3		5		1.5		3.12
Hf	mg kg^{-1}		4.697		4.31	5.1				6.6		4.57
Hg	mg kg^{-1}			0.677			0.768					0.711
Ho	mg kg^{-1}		0.43	1.13	0.74		0.744					0.98
I	mg kg^{-1}									1.5		
In	mg kg^{-1}		0.164									0.13
Ir	mg kg^{-1}											
La	mg kg^{-1}	65	42.01	69.67	54.73	69	51.477	69.6		66.4		64.2
Li	mg kg^{-1}		107.9	122	120.5		160.147					131
Lu	mg kg^{-1}		0.171	0.50	0.34		0.357					0.456
Mo	mg kg^{-1}	2.4	1.522	1.20	3.07	2.6	2.612			2.2		2.65
N	mg kg^{-1}											
Nb	mg kg^{-1}	26.3	24.81	26.9	26.57	24.8		21.1		25.4		22.9
Nd	mg kg^{-1}		32.31	55.03	42.24	58	49.222	55		37		51.5
Ni	mg kg^{-1}		22.94	27.3	22	27.3	23.586	20.7		21.8		23.9
Os	mg kg^{-1}											
Pb	mg kg^{-1}	53	50.32	54.9	65.35	54.5	50.270	59.3		50.5		52.5
Pd	mg kg^{-1}											
Pr	mg kg^{-1}		8.739	14.98	13.45		11.781					13.3
Pt	mg kg^{-1}											
Rb	mg kg^{-1}	183	183.2	190.2	176.9	189	212.470	193		190.7		192
Re	mg kg^{-1}		0.00438									
Rh	mg kg^{-1}											
Ru	mg kg^{-1}		0.038									
S	mg kg^{-1}						158			155	209	619
Sb	mg kg^{-1}		3.209		2.74		1.854			6		2.74
Sc	mg kg^{-1}	16	10.87		15.97	16.5	18.096			13.2		20.59
Se	mg kg^{-1}		2.108					2.5		3.3		2.95
Sm	mg kg^{-1}		5.244	10.06	8.54		9.073			12.2		9.54
Sn	mg kg^{-1}		20.87		18.25	21				28.2		25
Sr	mg kg^{-1}	127	96.49	145	127	132	128.854	131		132.2		136
Ta	mg kg^{-1}		4.21		2.4		2.753			2.7		2.67
Tb	mg kg^{-1}		0.437	1.12	1.23		0.897					0.993
Te	mg kg^{-1}				0.21		0.0475			2.5		
Th	mg kg^{-1}		10.35		17.22	18.6	15.754	17.7		16.9		17.7
Tl	mg kg^{-1}		1.348		1.36		1.192			0.6		
Tm	mg kg^{-1}		0.172	0.48	0.31		0.340					0.426
U	mg kg^{-1}		6.247	6.04	6.63	6.4	4.903			6.7		5.93
V	mg kg^{-1}	123	118	133.9	130	126	142.355			104.5	140	133
W	mg kg^{-1}				11	15.6	26.053			15.5		17.1
Y	mg kg^{-1}	26	6.017	27.13	23.24	27.9	17.413	25.3		26.2		26.8
Yb	mg kg^{-1}		1.172	3.20	2.37		2.508			2.5		2.94
Zn	mg kg^{-1}	17	17.1	29.9	22.47	27.7	30.89	15.7		18.1		26.6
Zr	mg kg^{-1}	181	163.2	183.4	163	188	141.477	186		188.7		178
				** revised following reporting error*								

Table 1		GeoPT33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H22	H23	H24	H25	H25	H26	H27	H28	H29	H30	H31
Data Quality		1	1	2	1	2	2	2	2	1	2	1
SiO_2	g 100g^{-1}	51.54	51.8991	52.06	48.41		52.179	52.24	52.15	52.05	52.43	53.9
TiO_2	g 100g^{-1}	1.267	1.1276	1.12	1.02		1.16	1.13	1.09	1.13	1.155	1.16
Al_2O_3	g 100g^{-1}	31.79	31.9275	32.08	34.33		32.151	31.68	31.81	32.02	32.25	32.1
Fe_2O_3T	g 100g^{-1}	0.92	0.9522	0.93	0.99		0.954	0.95	0.96	0.96	0.951	0.936
Fe(II)O	g 100g^{-1}						0.211					
MnO	g 100g^{-1}	0.0045	0.016	0.0059	0.020		0.007			0.010		0.004
MgO	g 100g^{-1}	0.354		0.35	0.62		0.365	0.28	0.36	0.40	0.359	0.55
CaO	g 100g^{-1}	0.17	0.2192	0.19	0.14		0.207	0.19	0.2	0.21	0.187	0.18
Na_2O	g 100g^{-1}	0.32		0.41	0.47		0.239	0.4	0.4	0.34	0.383	0.4
K_2O	g 100g^{-1}	2.61	2.7469	2.66	2.28		2.71	2.64	2.56	2.64	2.708	2.58
P_2O_5	g 100g^{-1}	0.0715	0.0686	0.073	0.04		0.079	0.08	0.08	0.06	0.074	0.071
H_2O^+	g 100g^{-1}	1.46						9.47				
CO_2	g 100g^{-1}											
LOI	g 100g^{-1}	10.6	9.84	9.87		10.65	9.98	10.34	10.32	9.9	9.999	
Ag	mg kg^{-1}			0.1	0			0.159			0.4	
As	mg kg^{-1}	9.11	8.52	9	9.4			3.14		11		7.6
Au	mg kg^{-1}											
B	mg kg^{-1}			84								
Ba	mg kg^{-1}	510	509.304	491	457		577	454	422	424	498.2	539
Be	mg kg^{-1}	4.7	1.92	4				3.69	4.11		2.9	
Bi	mg kg^{-1}			2.1	0.9			10.8			1.61	1.4
Br	mg kg^{-1}				0							
C(tot)	mg kg^{-1}											
C(org)	mg kg^{-1}											
Cd	mg kg^{-1}	0.10			0			0.18				1.6
Ce	mg kg^{-1}	116.2	131.611	123	111.9			118	109	114	129.4	122.8
Cl	mg kg^{-1}				5.4							
Co	mg kg^{-1}	2.47	3.078	2.2	2.1		3	2.24	2.04	3	2.62	
Cr	mg kg^{-1}	106	114.293	135	95.2		96	104	83.5			101.4
Cs	mg kg^{-1}	66.0		65	52.3			77.8	65.8			77.9
Cu	mg kg^{-1}	20.0	19.681	26	19.8		44	25	22.6	15	21	23.5
Dy	mg kg^{-1}	5.756		6				4.72	4.38		5.52	
Er	mg kg^{-1}	3.055		3				2.25	2.24		2.79	
Eu	mg kg^{-1}	1.756		1.9				1.62	1.41		1.95	
F	mg kg^{-1}											
Ga	mg kg^{-1}	54		55	46.8			48.6	39.1	50		53.4
Gd	mg kg^{-1}	7.24		7.5				6.04	6.1		6.89	
Ge	mg kg^{-1}			2.8	1.8				2.78			1.9
Hf	mg kg^{-1}	4.32		5.5	4.2			6.11	4.87	5		3.3
Hg	mg kg^{-1}		1.026					0.613			0.83	
Ho	mg kg^{-1}	1.089		1.1				0.86	0.78		1.17	
I	mg kg^{-1}	18			1							
In	mg kg^{-1}			0.13								
Ir	mg kg^{-1}											
La	mg kg^{-1}	62.15	80.647	65	4.6			59.7	57.1	95	67.18	67.4
Li	mg kg^{-1}	148		144				138	123		126.6	
Lu	mg kg^{-1}	0.460		0.45				0.38	0.32			
Mo	mg kg^{-1}	1.76		2.7	2.5			2.36		2	2.51	
N	mg kg^{-1}											
Nb	mg kg^{-1}	23.2		27	25.1		42	25.7	27.3	25		23.2
Nd	mg kg^{-1}	49.93		53	52			52.4	43.5	52	55.9	
Ni	mg kg^{-1}	20.20	25.077	29	21.7		26	25.3	24.8	22	21.6	24.3
Os	mg kg^{-1}											
Pb	mg kg^{-1}	48.5	55.428	54	57.2		58	71.5	52.9	55	49.8	52.2
Pd	mg kg^{-1}											
Pr	mg kg^{-1}	13.52		15				13.7	12.1		14.9	
Pt	mg kg^{-1}											
Rb	mg kg^{-1}	211	197.136	195	191.2		231	207	186	193		188.6
Re	mg kg^{-1}											
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}		307.55251	258								341.3
Sb	mg kg^{-1}	2.53		2.8	4.2			0.78			3.52	5.2
Sc	mg kg^{-1}	14.4		19	14.3			12.8	11	19		
Se	mg kg^{-1}		2.889	3	3.000							0.700
Sm	mg kg^{-1}	9.464		10.1	9.700			8.91	7.79	12.000	9.51	
Sn	mg kg^{-1}			26	25.6			25.45			20.4	29.3
Sr	mg kg^{-1}	139.0	131.746	145	136.8		147	142	120	133	131.4	124.8
Ta	mg kg^{-1}	2.13		2.4	2.2			2.31	2.54			
Tb	mg kg^{-1}	1.054		1.08				0.91	0.8		1.03	
Te	mg kg^{-1}				0							
Th	mg kg^{-1}	16.31		18.5	15.5		31	18.2	16.2	17	19.69	23.9
Tl	mg kg^{-1}	1.20		1.4	0.4			1.17			1.51	
Tm	mg kg^{-1}	0.461		0.42				0.38	0.33			
U	mg kg^{-1}	5.64		6.2	4.7			6.52	6.06	6.5	5.81	4.9
V	mg kg^{-1}	151.5	140.382	143	127.2		182	139	134	128	122	149.4
W	mg kg^{-1}	15.5		16	15.1			21.8				16.4
Y	mg kg^{-1}	27.27		25.8	24.9		47	21.8	19.4	28	29.9	27.9
Yb	mg kg^{-1}	2.91		2.9	1.7			2.36	2.17		2.83	
Zn	mg kg^{-1}	37.5	22.046	22	19.2		29	26.4	22	20	26.1	22.6
Zr	mg kg^{-1}	171		205	190.1		219	186	184	188		184.5

Table 1		**Geo*PT*33 Contributed data for ball clay, DBC-1 (June 2013)**										
Lab. Code		H32	H33	H34	H35	H36	H37	H38	H39	H40	H41	H41
Data Quality		2	2	2	2	2	2	2	2	2	1	2
SiO_2	g 100g^{-1}	51.98	52.06	50.65	52.19	51.422		51.31	63.11	51.966		
TiO_2	g 100g^{-1}	1.14	1.126	1.07	1.13	1.114	1.027	1.04	1.09	1.188	1.084	
Al_2O_3	g 100g^{-1}	31.92	31.888	31.29	31.8	31.786	28.98	31.28	34.75	32.771	30.799	
Fe_2O_3T	g 100g^{-1}	0.917	0.939	0.91	0.93	0.916	0.917	1.18	1.15	0.973	0.944	
Fe(II)O	g 100g^{-1}			0.26								
MnO	g 100g^{-1}		0.0024	30.39	0.004		0.004	0.01			0.004	
MgO	g 100g^{-1}	0.324	0.26	0.35	0.338	0.303	0.34	*0.32**	0.372	0.36		
CaO	g 100g^{-1}	0.194	0.192	0.178	0.178	0.178		*0.18**	0.203	0.199		0.126
Na_2O	g 100g^{-1}	0.404	0.367	0.38	0.378	0.366	0.478	0.37	0.443	0.391	0.398	
K_2O	g 100g^{-1}	2.65	2.668	2.59	2.57	2.682	2.493	*2.7**	3.11	2.723	2.602	
P_2O_5	g 100g^{-1}	0.07	0.0688	0.072	0.076	0.064	0.071	0.08	0.106	0.069		
H_2O^+	g 100g^{-1}			10.15		1.202						
CO_2	g 100g^{-1}			2.08								
LOI	g 100g^{-1}		9.8	11.26	10.15	10.126		10.1		9.88		
Ag	mg kg^{-1}				0.3	0.6						
As	mg kg^{-1}				3.6	9.1	6.985		142.3		8.6	
Au	mg kg^{-1}											
B	mg kg^{-1}											
Ba	mg kg^{-1}		472	484.1	482	424.8	459.8			506.4	440	
Be	mg kg^{-1}			4.33	3.3		3.75		16.26	4.3		
Bi	mg kg^{-1}			1.8	1.7				0.911			
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}											
C(org)	mg kg^{-1}									6200		
Cd	mg kg^{-1}			0.057	1.4		0.434		0.012			
Ce	mg kg^{-1}			113.34	128	99.0	124.6			120.28	130	
Cl	mg kg^{-1}											
Co	mg kg^{-1}			2.05	1.5	3.1	2.059		1.87	2.22	2.06	
Cr	mg kg^{-1}		111	108	107	97.2	105.6		124.1	115.8	116	
Cs	mg kg^{-1}			65.272	61.3	56.7	67.5		77.66	64.64	68.8	
Cu	mg kg^{-1}			21.6	36.3	20.3	21.2		34.23	21.2		
Dy	mg kg^{-1}			5.551			6.061			5.8	6.4	
Er	mg kg^{-1}			2.984			3.169			3.11		
Eu	mg kg^{-1}			1.6994			1.822			1.8	1.86	
F	mg kg^{-1}											
Ga	mg kg^{-1}			52.95	59	50.7	47.73		68.69	52.83	59	
Gd	mg kg^{-1}			6.641			7.635			7.12		
Ge	mg kg^{-1}					1.3						
Hf	mg kg^{-1}			4.96	7.3	5.4	5.06			4.72	5.3	
Hg	mg kg^{-1}				0.7							
Ho	mg kg^{-1}			1.0312			1.096			1.08		
I	mg kg^{-1}				0.7							
In	mg kg^{-1}			0.1337	0.1							
Ir	mg kg^{-1}											
La	mg kg^{-1}			60.49	69.2	59.5	67.13			68.25	66.9	
Li	mg kg^{-1}			132.5	93.8		143.3		146.8			
Lu	mg kg^{-1}			0.4501			0.488			0.46	0.43	
Mo	mg kg^{-1}			2.93	2.1	2.5	2.38		2.48	2.72		
N	mg kg^{-1}											
Nb	mg kg^{-1}			25.564	26.5	25.2	25.47		43.95	23.5		
Nd	mg kg^{-1}			51.69	47.6	51.4	53.82			53.38		
Ni	mg kg^{-1}			24.4	18.6	23.1	24.5		23.54	27.6		
Os	mg kg^{-1}											
Pb	mg kg^{-1}			53	55.8	54.7	53.9		59.91	48.21		
Pd	mg kg^{-1}											
Pr	mg kg^{-1}			14.223			14.89			14.24		
Pt	mg kg^{-1}											
Rb	mg kg^{-1}			192.39	189	193.5	197.2		234.1	196.52	201	
Re	mg kg^{-1}											
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}		74									
Sb	mg kg^{-1}			2.94	2.1	1.9	2.8		2.97		3	
Sc	mg kg^{-1}			19.1	17.5	15.8			17.42	18.5	19.8	
Se	mg kg^{-1}					2.9	4.2					
Sm	mg kg^{-1}			9.42	9.5	11.3	10.14			9.98	9.900	
Sn	mg kg^{-1}			25.76	24.4	23.5	25.3			24.89		
Sr	mg kg^{-1}		133	131	135	134.6	146.8		161.2	141.9		120
Ta	mg kg^{-1}			2.535	1	3.2	2.405			2.44	2.57	
Tb	mg kg^{-1}			0.9555			0.934			1.01	1.05	
Te	mg kg^{-1}				0.65							
Th	mg kg^{-1}			19.146	11.4	19.0	18.22		22.41	17.99	19.9	
Tl	mg kg^{-1}			1.336	1.7	1.1	0.645		2.66			
Tm	mg kg^{-1}			0.44			0.463			0.45		
U	mg kg^{-1}			6.528		7.1	6.145		6.12	6.14	6.4	
V	mg kg^{-1}		152	132.2	131	127.0	136.6		166.1	147.5	143	
W	mg kg^{-1}			16.67	11.6	19.0	16.2				17.2	
Y	mg kg^{-1}			27.1	31.3	28.6	26.66		23.86	29.2		
Yb	mg kg^{-1}			2.959		2.9	3.235			3.15	3.1	
Zn	mg kg^{-1}		20	21	21.7	19.1	24.4		39.77	7.5		
Zr	mg kg^{-1}		275	188	179	187.8	159.7			194.3		250
								** revised following reporting error*				

Table 1		GeoPT33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H42	H43	H44	H44	H45	H46	H47	H48	H49	H50	H51
Data Quality		2	1	1	2	1	2	2	1	1	2	2
SiO_2	g 100g^{-1}	52.32	51.73	51.57		50.29		51.77	52.01	52.74		52.08
TiO_2	g 100g^{-1}	1.41	1.12	1.133		0.98		1.09	1.13	1.14		1.158
Al_2O_3	g 100g^{-1}	31.811	31.66	31.57		30.5		31.17	31.72	31.6		32.04
Fe_2O_3T	g 100g^{-1}	0.965	0.89	0.965		0.89		0.93	0.95	0.95		0.96
Fe(II)O	g 100g^{-1}	0.183							0.27			
MnO	g 100g^{-1}	0.006				0.01		0.004	0.010	0.004		
MgO	g 100g^{-1}	0.361	0.31		0.372	0.32		0.33	0.44	0.44		
CaO	g 100g^{-1}	0.21	0.21		0.2745	0.19		0.13	0.26	0.2		
Na_2O	g 100g^{-1}	0.508	0.33	0.37		0.49		0.36	0.35	0.41		0.4
K_2O	g 100g^{-1}	2.88	2.61	2.17		2.53		2.52	2.64	2.63		2.69
P_2O_5	g 100g^{-1}	0.062	0.12		0.107	0.085		0.07	0.06	0.068		
H_2O^+	g 100g^{-1}					0.99			9.13			
CO_2	g 100g^{-1}								0.22			
LOI	g 100g^{-1}	9.981	10.76		11.0	12.04		11.38	9.85	10		9.69
Ag	mg kg^{-1}				0.25				0.19			
As	mg kg^{-1}				8.8		49		3.16			
Au	mg kg^{-1}											
B	mg kg^{-1}				110.0		133					115
Ba	mg kg^{-1}	221			320.0	487	544	500	368	471	506	485
Be	mg kg^{-1}	2.6			3.93		4		3.94			4.45
Bi	mg kg^{-1}								2			
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}							7000				7090
C(org)	mg kg^{-1}				0.78				0.81			6840
Cd	mg kg^{-1}						0.35		0.02			
Ce	mg kg^{-1}	169			127.2	112	126	130	108	119	118	
Cl	mg kg^{-1}											
Co	mg kg^{-1}	3			2.4		6		1.92			
Cr	mg kg^{-1}	90			100.64	107	114	110	90	107	129	
Cs	mg kg^{-1}	47.58			62.0		67		68.1			
Cu	mg kg^{-1}	19.17			31.0	25	24	30	22.3	27.9	22	22
Dy	mg kg^{-1}	3.75			6.02	5	6.06		3.58	4.08		5.96
Er	mg kg^{-1}	1.87				3	3.18		1.66	2.34		3.12
Eu	mg kg^{-1}	1.30				2	1.85		1.38	1.67		1.71
F	mg kg^{-1}	1170							625			
Ga	mg kg^{-1}	63			50.0		54.8		41.2			59
Gd	mg kg^{-1}	5.65			8.10	5	7.22		5.33	7.03		7.67
Ge	mg kg^{-1}	2.32			3.2		2.71		3.28			
Hf	mg kg^{-1}	4.00			5.49				5.48			
Hg	mg kg^{-1}				0.72				0.712			
Ho	mg kg^{-1}	0.67				1	1.11		0.66	0.86		1.19
I	mg kg^{-1}											
In	mg kg^{-1}								0.11			
Ir	mg kg^{-1}											
La	mg kg^{-1}	77			65.6	64	70.3	60	55.7	61	69.3	
Li	mg kg^{-1}				142.0	131	117		116	142	140	120
Lu	mg kg^{-1}	0.31					0.48		0.22	0.43		0.49
Mo	mg kg^{-1}	3			3.6				2.38			
N	mg kg^{-1}											
Nb	mg kg^{-1}	30			27.29		25.2		26.9		19	28
Nd	mg kg^{-1}	55			53.4	49	54.8		44.7	50.5	48	50.4
Ni	mg kg^{-1}	23			30.0	21	28	30	22.4	23.5	24.7	22
Os	mg kg^{-1}											
Pb	mg kg^{-1}	48.00			52		65		43.2	56.3		55
Pd	mg kg^{-1}											
Pr	mg kg^{-1}	11.14			14.6	15	15.35		12.1	13.5	13.9	14.4
Pt	mg kg^{-1}											
Rb	mg kg^{-1}	214			194.0	196	211		187			196
Re	mg kg^{-1}											
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}	235							200			
Sb	mg kg^{-1}						2.68		0.55			
Sc	mg kg^{-1}	21			18.0	18	17.3		6.19		19.6	18.2
Se	mg kg^{-1}								2.980			
Sm	mg kg^{-1}	7.20			9.55	10.0	10.01		7.570	9.460	8.63	8.39
Sn	mg kg^{-1}	17.0			29.0		28.6		25.2			21.5
Sr	mg kg^{-1}	147			147.0	144	137		112	129	140	132
Ta	mg kg^{-1}	3.89			3.50		2.59		2.78			
Tb	mg kg^{-1}	0.71			1.04	1	1.13		0.73	0.92		1.27
Te	mg kg^{-1}								0.14			
Th	mg kg^{-1}	15.0			15.8		19.32		14.6	19.4		
Tl	mg kg^{-1}	1.29			1.5		1.34		1.38			
Tm	mg kg^{-1}	0.28					0.47		0.24	0.38		0.54
U	mg kg^{-1}	7.00			5.8	6	6.31		5.01	6.38		
V	mg kg^{-1}	208			100	128	136	140	138	132	144	143
W	mg kg^{-1}	16.0			16.0		21		15			
Y	mg kg^{-1}	29			27.0	23	27.82	30	15.3	21.8		26.3
Yb	mg kg^{-1}	2.08			3.2	3	3.17		1.38	2.6		2.98
Zn	mg kg^{-1}	26			28	21	54	20	27.7	28.3	25	23.5
Zr	mg kg^{-1}	178			266	172	182	140	188			183

Table 1		Geo*PT*33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H52	H53	H54	H55	H56	H57	H58	H59	H60	H61	H62
Data Quality		1	2	2	1	1	2	2	1	2	2	1
SiO_2	g 100g^{-1}	52.39	52.17	51.8	51.85	51.2			56.773	52.1	53.36	50.98
TiO_2	g 100g^{-1}	1.14	1.14	1.16	1.15	1.08			1.228	1.12	1.01	1.382
Al_2O_3	g 100g^{-1}	31.89	31.57	31.8	32.53	32.2		33.4	34.269	32.0	31.15	32.52
Fe_2O_3T	g 100g^{-1}	0.92	0.97	1.31	0.94	0.94		0.885	0.971	0.861	1.13	0.94
Fe(II)O	g 100g^{-1}											0.17
MnO	g 100g^{-1}		0.01	0.01	0.006	0.004		0.0043	0.004		0.0042	
MgO	g 100g^{-1}	0.38	0.4	0.35	0.35	0.35		0.345	0.402	0.377	0.539	0.38
CaO	g 100g^{-1}	0.18	0.29	0.27	0.20	0.18		0.175	0.209		0.305	0.26
Na_2O	g 100g^{-1}	0.39	0.41	0.34	0.39	0.52		1.35	0.432		0.314	0.56
K_2O	g 100g^{-1}	2.64	2.65	2.53	2.65	2.32		2.87	3.026	2.59	2.65	2.88
P_2O_5	g 100g^{-1}	0.071	0.08	0.05	0.076	0.07		0.0679	0.085		0.0378	0.057
H_2O^+	g 100g^{-1}			8.4							8.94	
CO_2	g 100g^{-1}										0.091	
LOI	g 100g^{-1}	9.9	10.25	9.6	9.72	10.43			1.873	10.15	9.81	10.8
Ag	mg kg^{-1}					0.04					0.335	3.059
As	mg kg^{-1}				7						2.68	9.706
Au	mg kg^{-1}										0.023	
B	mg kg^{-1}										37	50.791
Ba	mg kg^{-1}		612	446	447	500	458	477	486.2		538	406.766
Be	mg kg^{-1}		3.8	3.85		3.74		4.81	3.833		2.85	4.419
Bi	mg kg^{-1}								2.026		1.12	2.076
Br	mg kg^{-1}										0.9	
C(tot)	mg kg^{-1}	6430									6990	
C(org)	mg kg^{-1}										6742	
Cd	mg kg^{-1}					0.027					0.075	0.150
Ce	mg kg^{-1}		123	122	113	116	105	124.7	124.7		77	86.490
Cl	mg kg^{-1}										23	
Co	mg kg^{-1}		4.2	2	3	13.1	1.82	2.18	2.113		1.85	2.130
Cr	mg kg^{-1}		107.7	101	91	133	102		103.8		223	114.346
Cs	mg kg^{-1}		58.9	66	63		63.5	66.4	66.25		48.9	59.941
Cu	mg kg^{-1}		22.8	23	20	41.2	25.7	20.4	21.28		21.5	29.808
Dy	mg kg^{-1}		5.7	5.7		6.72	5.19	4.57	5.080		3.5	3.597
Er	mg kg^{-1}		3	2.8		2.6	2.82	2.47	2.660		2.2	1.885
Eu	mg kg^{-1}		1.8	1.77		1.5	1.59	1.82	1.806		0.73	1.296
F	mg kg^{-1}											
Ga	mg kg^{-1}		49.2	51	53			55.9	53.36		39.4	57.220
Gd	mg kg^{-1}		8.1	7.7		6.51	6.56	7.38	6.887		5.9	4.621
Ge	mg kg^{-1}				2.8						1.05	3.568
Hf	mg kg^{-1}		5.2	4.3	6.4				4.992		2.65	5.417
Hg	mg kg^{-1}										0.722	
Ho	mg kg^{-1}		1.1	0.96		0.94	0.97	0.83	0.885		0.84	0.653
I	mg kg^{-1}										0.05	
In	mg kg^{-1}										0.052	
Ir	mg kg^{-1}										0.00003	
La	mg kg^{-1}		66.1	64	62	64.7	53.8	64.4	65.40		54.2	44.027
Li	mg kg^{-1}			142			132	140	147.20		74.9	170.08012
Lu	mg kg^{-1}		0.5	0.5		0.45		0.42	0.418		0.23	0.303
Mo	mg kg^{-1}		2.5		2.5	6.81		3.81	2.445		2.49	2.927
N	mg kg^{-1}											
Nb	mg kg^{-1}		24.5	26	25			24.7	24.93		25.2	28.889
Nd	mg kg^{-1}		53.5	52	50	50	45.2	52.6	54.31		0.28	38.061
Ni	mg kg^{-1}		22.2	21	23	28	23.2	25.1	21.80		18.1	26.834
Os	mg kg^{-1}										0.00001	
Pb	mg kg^{-1}		24	50	50	56	47	53	53.52	51.19	26.3	54.719
Pd	mg kg^{-1}										0.0004	
Pr	mg kg^{-1}		15	14		14.5	12.5	14.7	14.35		6.2	10.608
Pt	mg kg^{-1}										0.00069	
Rb	mg kg^{-1}		193	183	192		189	190.3	200.5		143	197.040
Re	mg kg^{-1}										0.00009	
Rh	mg kg^{-1}										0.0022	
Ru	mg kg^{-1}										0.0005	
S	mg kg^{-1}		149			238					112	
Sb	mg kg^{-1}							3.04	3.230		3.82	3.070
Sc	mg kg^{-1}		19.5	18	17	18.2	17.5		20.78		14.5	17.263
Se	mg kg^{-1}				3.700	0.620					2.13	3.054
Sm	mg kg^{-1}		9.9	10.3		9.500	8.59	9.76	8.920		7.5	6.962
Sn	mg kg^{-1}			22				28	22.22		18.9	25.315
Sr	mg kg^{-1}		135	132	130	130	138	135	138.8		169	105.854
Ta	mg kg^{-1}		2.8	1.6					3.082		8.9	2.944
Tb	mg kg^{-1}			1.08		1.25	0.94	1	0.941		0.62	0.604
Te	mg kg^{-1}										0.061	0.049
Th	mg kg^{-1}		18.9	18	21		14.9		19.46		3.58	13.688
Tl	mg kg^{-1}		0.7	1.2				1.4			1.05	1.446
Tm	mg kg^{-1}		0.4	0.48			0.4	0.37	0.393		0.35	0.289
U	mg kg^{-1}		5.9	6.6	4.5		5.45	5.93	6.325		4.65	6.681188
V	mg kg^{-1}		138	132	125	135	134	141	143.7		121	147.387
W	mg kg^{-1}		15		12	9.39		16.4	16.92		14.6	20.265
Y	mg kg^{-1}		28.9	25	23	21	23.9		22.34		21.5	11.342
Yb	mg kg^{-1}		3.1	3	3.7		2.81	2.66	2.833		2.65	2.030
Zn	mg kg^{-1}		25.6	25	19	27.6		18	19.50		14.8	35.889
Zr	mg kg^{-1}		176.3	193	185	237	191		174.0		108	188.716

Table 1		GeoPT33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H63	H64	H65	H66	H67	H68	H69	H70	H71	H72	H73
Data Quality		2	1	2	2	1	1	1	1	2	2	1
SiO_2	g 100g^{-1}	52.29	52.16	51.78	51.316		51.75	52.41	52.426	51.87	50.35	51.563
TiO_2	g 100g^{-1}	1.16	1.11	1.16	1.176	1.14	1.11	1.17	1.111	1.114	1.11	1.109
Al_2O_3	g 100g^{-1}	32.07	30.71	31.83	31.245		31.51	31.25	31.516	31.69	31.92	32.365
Fe_2O_3T	g 100g^{-1}	1.08		0.94	0.915	0.971	0.95	0.98	0.9065	0.949	0.79	1.064
Fe(II)O	g 100g^{-1}			0.17								
MnO	g 100g^{-1}		0.003	0.00117	0.004	0.005	0.00389	0.010	0.004		0.006	0.004
MgO	g 100g^{-1}	0.29	0.34	0.36	0.334		0.39	0.30	0.35	0.367	0.44	0.36
CaO	g 100g^{-1}	0.17	0.16	0.18	0.199		0.21	0.24	0.1792	0.224	0.23	0.184
Na_2O	g 100g^{-1}		0.39	0.35	0.378		0.42	0.51	0.3875	0.426	0.69	0.41
K_2O	g 100g^{-1}	2.8		2.66	2.659		2.58	2.68	2.614	2.649	2.63	2.739
P_2O_5	g 100g^{-1}	0.09	0.057	0.07	0.060		0.072	0.07	0.066	0.07	0.08	0.072
H_2O^+	g 100g^{-1}								10.266			
CO_2	g 100g^{-1}	2.47										3.322
LOI	g 100g^{-1}	9.73		10.52	10.506		10.52	10.4		10.54		
Ag	mg kg^{-1}											
As	mg kg^{-1}		7.5	9.6		8.229			14.97			10.367
Au	mg kg^{-1}											
B	mg kg^{-1}											
Ba	mg kg^{-1}		437	432	476	461.04	463	432	494.7	467.6		514
Be	mg kg^{-1}					3.513	4.01					3.833
Bi	mg kg^{-1}					2.22	2.1					2.073
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}	6725							6530	7039		
C(org)	mg kg^{-1}											
Cd	mg kg^{-1}		0.12						0.0237			0.367
Ce	mg kg^{-1}					123.2	117		129.96			124.33
Cl	mg kg^{-1}											
Co	mg kg^{-1}		1.7		1	2.23	2.07	2	2.045	13.8		2.277
Cr	mg kg^{-1}			96	100		99	107	115.8	69.8		103.333
Cs	mg kg^{-1}					64.08	64.6	70.5				64.533
Cu	mg kg^{-1}		18.7	20	21	22.33	21.5	31	23.01	27.5		26.033
Dy	mg kg^{-1}		5.4			5.186	5.26	4.76	5.982			5.74
Er	mg kg^{-1}					2.747	2.8	2.54	3.079			2.4
Eu	mg kg^{-1}					1.707	1.66	1.56	1.875			1.907
F	mg kg^{-1}				758					1152		
Ga	mg kg^{-1}		46.55	50	52		50.9					57
Gd	mg kg^{-1}					6.464	6.71	6.44	8.057			9.777
Ge	mg kg^{-1}						3.06					3.357
Hf	mg kg^{-1}		4.36		7		4.8	3.87				4.837
Hg	mg kg^{-1}											0.507
Ho	mg kg^{-1}					0.9437	0.97	0.91	1.039			1.297
I	mg kg^{-1}											
In	mg kg^{-1}											
Ir	mg kg^{-1}											
La	mg kg^{-1}					64.05	61.9	58.1	69.58			65.367
Li	mg kg^{-1}			131.3	135	134.6	143					154.333
Lu	mg kg^{-1}		0.33			0.4265	0.42	0.38	0.4658			0.452
Mo	mg kg^{-1}		2.39			2.29	2.73					2.767
N	mg kg^{-1}								886.7			
Nb	mg kg^{-1}		20.9	25			25.9	23				24.333
Nd	mg kg^{-1}					50.96	49.4	45.5	56.75			55.267
Ni	mg kg^{-1}		20.1	24	23	23.95	24.4	30	23.65	20		27.333
Os	mg kg^{-1}											
Pb	mg kg^{-1}		42.9	55	93	52.61	54.4	43	51.42	44.3		57.3
Pd	mg kg^{-1}											
Pr	mg kg^{-1}					13.61	13.6	12.4	15.44			16.1
Pt	mg kg^{-1}											
Rb	mg kg^{-1}			189		194.09	197	64	207.3			186.333
Re	mg kg^{-1}											
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}	215							193			1200
Sb	mg kg^{-1}		2.17									2.91
Sc	mg kg^{-1}			15			17.1		22.5			18.3
Se	mg kg^{-1}											3.740
Sm	mg kg^{-1}					9.395	9.04	8.30	10.530			10.467
Sn	mg kg^{-1}		19.3	23			25.8		28.03			
Sr	mg kg^{-1}			132	127	129.1	128	135	138.9			144.333
Ta	mg kg^{-1}		2.2				2.36	3.29				2.847
Tb	mg kg^{-1}					0.8893	0.96	0.86	1.023			1.09
Te	mg kg^{-1}		0.06									
Th	mg kg^{-1}			19		18.72	16.8	16.7	21.75			19.133
Tl	mg kg^{-1}		1.18			1.494	1.44		1.413			1.513
Tm	mg kg^{-1}					0.4126	0.41	0.4	0.4867			0.529
U	mg kg^{-1}		5.02			6.22	6	5.94	6.831			6.527
V	mg kg^{-1}		116	117		140.2	133	140	145.7	149.5		134
W	mg kg^{-1}		14.8	15		14.67						17.4
Y	mg kg^{-1}			28	23	22.36	26.4	23.4	25.35			27.8
Yb	mg kg^{-1}					2.891	2.72	2.8	3.088			3.107
Zn	mg kg^{-1}		23.1	18	20	20.65	21	64	22.7	21.5		28.233
Zr	mg kg^{-1}			194	244		185	134	128.8	204		174.67

Table 1		GeoPT33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H74	H74	H75	H76	H77	H78	H79	H80	H81	H82	H83
Data Quality		1	2	2	1	2	2	1	2	1	1	2
SiO_2	g 100g^{-1}	53.22		53.1		51.7	53.03	52.17	51.25	52.22	51.617	52.005
TiO_2	g 100g^{-1}	1.118		1.13	1.07	1.1	1.14	1.12	1.12	1.197	1.1095	1.111
Al_2O_3	g 100g^{-1}	33.05		32.3	28.64	31.1	32.21	31.93	31.59	32.00	31.344	31.821
Fe_2O_3T	g 100g^{-1}	0.94		0.88	0.85	0.92	0.950	0.93	0.93	0.92	0.937	0.931
Fe(II)O	g 100g^{-1}											
MnO	g 100g^{-1}	0.004		0.0026	0.003		0.0044	0.003		0.005	0.006	0.009
MgO	g 100g^{-1}	0.36		0.45	0.28		0.340	0.35	0.36	0.26	0.36	0.364
CaO	g 100g^{-1}	0.175		0.21	0.17		0.19	0.18	0.18	0.17	0.226	0.193
Na_2O	g 100g^{-1}	0.365		0.367	0.35		0.309	0.38	0.39	0.34	0.376	0.425
K_2O	g 100g^{-1}	2.621		2.75	2.36	2.58	2.65	2.69	2.61	2.67	2.639	2.701
P_2O_5	g 100g^{-1}	0.0498		0.086	0.07		0.077	0.072	0.07	0.067	0.0785	0.069
H_2O^+	g 100g^{-1}									10.28		
CO_2	g 100g^{-1}									2.27		
LOI	g 100g^{-1}	10.039		11	10.45	11.4	8.63	9.69	10.7	10.33	10.54	9.650
Ag	mg kg^{-1}				0.08				1			
As	mg kg^{-1}				3.52	8.5	9.2					10.0
Au	mg kg^{-1}											
B	mg kg^{-1}											
Ba	mg kg^{-1}	460		483	536.57		619	468	455	486	491.1	594.0
Be	mg kg^{-1}	3.67			3.92							
Bi	mg kg^{-1}				1.19	1.95	1.9					
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}								6700			
C(org)	mg kg^{-1}											
Cd	mg kg^{-1}				0.07		0.14					
Ce	mg kg^{-1}	116.97			132.58	123	137		120	137	125.2	177.0
Cl	mg kg^{-1}											
Co	mg kg^{-1}	2.48			1.94		2.3	2	2.1			
Cr	mg kg^{-1}	117.7		104	111.61		102	94	117	114	104.9	141.0
Cs	mg kg^{-1}	73.01			63.16	62.8	79	55	67.4	65.5	66.342	
Cu	mg kg^{-1}	20.38		24	21.59	21	26	12	29	18	21.5	22.0
Dy	mg kg^{-1}	5.21			6.13	5.99	4.9		6.04	5.93	6.419	
Er	mg kg^{-1}	2.71			2.47	3.07	2.8		3.02	3.11	3.191	
Eu	mg kg^{-1}	1.777			1.98	1.84	2.1		1.92	1.85	1.995	
F	mg kg^{-1}											
Ga	mg kg^{-1}	47.9			54.38	58.2	56	48	55	50	56.2	60.0
Gd	mg kg^{-1}	7.39			8.92		8.8		8.22	7.76	7.649	
Ge	mg kg^{-1}				7.53		2					
Hf	mg kg^{-1}	4.64			5.52				5	5.76	4.969	
Hg	mg kg^{-1}						0.719					
Ho	mg kg^{-1}	0.97			0.73	1.14	0.89		1.17	1.15	1.216	
I	mg kg^{-1}											
In	mg kg^{-1}						0.14					
Ir	mg kg^{-1}											
La	mg kg^{-1}	61.36			71.44	65.1	75	70	69.7	64.1	67.498	103.0
Li	mg kg^{-1}	155			134.7	138.5						
Lu	mg kg^{-1}	0.423			0.48		0.42		0.51	0.51	0.47	
Mo	mg kg^{-1}				2.76		2.2		3			
N	mg kg^{-1}											
Nb	mg kg^{-1}	26.07			26.58	27	27	26	27.4	28.8	24.914	27.0
Nd	mg kg^{-1}	51.69			53.28	52.6	49	53	55	54.2	54.356	
Ni	mg kg^{-1}	26.93		28	22.24	23.7	25		27	26	22.9	28.0
Os	mg kg^{-1}											
Pb	mg kg^{-1}	53.24		42	46.66		51.7	55	55	64.50	54.591	67.0
Pd	mg kg^{-1}											
Pr	mg kg^{-1}	13.9			14.65		16		15.6	15.10	15.139	
Pt	mg kg^{-1}											
Rb	mg kg^{-1}	168			151.86	196.5	196	200	183	222.0	198.25	216.0
Re	mg kg^{-1}				0							
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}								70	775		
Sb	mg kg^{-1}				3.03							
Sc	mg kg^{-1}	19.08			16.97		16.1	15		16	18.73	19.0
Se	mg kg^{-1}											
Sm	mg kg^{-1}	10.111			9.990	9.74	10		10.4	9.98	10.504	
Sn	mg kg^{-1}				13.09	21.6	23.8		27			
Sr	mg kg^{-1}	115.5		133	115.13	138.5	136	136	137	147	138.2	148.0
Ta	mg kg^{-1}	2.72			0.45				2.9	2.63	2.574	
Tb	mg kg^{-1}	1.02			0.94	1.11	1.1		1.23	1.07	1.137	
Te	mg kg^{-1}											
Th	mg kg^{-1}	18.86			21.28		19.9	19	20	21.90	19.6	24.0
Tl	mg kg^{-1}				0.47	1.51	1.4		1			
Tm	mg kg^{-1}				0.45		0.39		0.49	0.49	0.482	
U	mg kg^{-1}	6.48			7.06	6.08	6.50	6.5	6.61	7.14	6.239	8.0
V	mg kg^{-1}	149.4		144	217.32	159	134		123	140	139.4	161.0
W	mg kg^{-1}				9.65		19.1	16	18			
Y	mg kg^{-1}	22.94			20.03	27.4	21	29	27.6	29.5	28.513	32.0
Yb	mg kg^{-1}	2.915			3.05	3.01	2.9		3.14	3.22	3.057	
Zn	mg kg^{-1}		16.7	27	33.03		34	20	35	20	22.1	24.0
Zr	mg kg^{-1}	159.35			186.55	199	198	196	173	170	179.9	185.0

Table 1		GeoPT33 Contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code		H84	H84	H85	H86	H87	H88	H89	H90*	H91*	H92*	H93$
Data Quality		1	2	1	2	2	1	1	1	2	2	2
SiO_2	g 100g^{-1}	50.93			51.78	50.31	52.4			57.25	51.85	52.3
TiO_2	g 100g^{-1}	1.13			1.11	1.17	1.13			1.2	1.09	1.13
Al_2O_3	g 100g^{-1}	31.28			31.47	32.86	32.3			35.94	31.26	31.9
Fe_2O_3T	g 100g^{-1}	0.92			0.91	1.125	0.88			1.24	0.92	0.93
Fe(II)O	g 100g^{-1}	0.06										
MnO	g 100g^{-1}	0.000				0.0055		0.00381		0.02		
MgO	g 100g^{-1}	0.33			0.35	0.88	0.31			0.33	0.35	0.36
CaO	g 100g^{-1}	0.2			0.18	0.433	0.17			0.31	0.19	0.19
Na_2O	g 100g^{-1}	0.41			0.34	0.473	0.43			0.34	0.42	0.4
K_2O	g 100g^{-1}	2.69			2.64	2.429	2.66			2.86	2.65	2.65
P_2O_5	g 100g^{-1}	0.06			0.06	0.0648	0.07			0.03	0.06	0.08
H_2O^+	g 100g^{-1}						1.31			1.7		
CO_2	g 100g^{-1}											
LOI	g 100g^{-1}	9.53			10.18	10.05	9.91			11.24	10.67	10.1
Ag	mg kg^{-1}						1					
As	mg kg^{-1}		5		10		28					
Au	mg kg^{-1}											
B	mg kg^{-1}											
Ba	mg kg^{-1}	492		450.54		493.2	501	447	493.55	400		
Be	mg kg^{-1}					4.244	3.7	4.22				
Bi	mg kg^{-1}							2.2				
Br	mg kg^{-1}											
C(tot)	mg kg^{-1}										5600	
C(org)	mg kg^{-1}											
Cd	mg kg^{-1}		6									
Ce	mg kg^{-1}	94.3		114.94		131	123	112	118.051			
Cl	mg kg^{-1}		8									
Co	mg kg^{-1}	3		1.939	12	2.328	4.6	1.98				
Cr	mg kg^{-1}	105		107.46	144	108.4	0.01	94.8		100		
Cs	mg kg^{-1}	68		57.97		66.71	58.5	62.6	65.192			
Cu	mg kg^{-1}	28		21.7	18	34.06	60.2	21.2				
Dy	mg kg^{-1}	4		5.87		5.839	5.73	5.04	4.03			
Er	mg kg^{-1}	2.2		3.07		3.28	2.78	2.64	1.997			
Eu	mg kg^{-1}	1.5		1.666		2.079	1.53	1.54	1.587			
F	mg kg^{-1}		208									
Ga	mg kg^{-1}	68		53.8		57.6	53.8	48.8				
Gd	mg kg^{-1}	6.2		7.6		7.95	8.31	6.43	6.021			
Ge	mg kg^{-1}					2.967	0.9	3.06				
Hf	mg kg^{-1}	10		4.73		5.368	3.96	4.74	4.566			
Hg	mg kg^{-1}											
Ho	mg kg^{-1}	0.8		1.074		1.148	0.84	0.95	0.734			
I	mg kg^{-1}											
In	mg kg^{-1}						0.1					
Ir	mg kg^{-1}											
La	mg kg^{-1}	46.9		61.9		69.17	56.1	59.1	63.933			
Li	mg kg^{-1}						136	142	134.384			
Lu	mg kg^{-1}	0.3		0.458		0.495	0.35	0.39	0.36			
Mo	mg kg^{-1}	12				2.759		2.64				
N	mg kg^{-1}											
Nb	mg kg^{-1}	168		27.59		28.41		22.6	23.771			
Nd	mg kg^{-1}	47		50.82		57.49	58.1	47	52.342			
Ni	mg kg^{-1}	30		25.96	45	27.15	22.9	24.1				
Os	mg kg^{-1}											
Pb	mg kg^{-1}	60		55.39	59	32.77	55.7	55.1	53.774			
Pd	mg kg^{-1}											
Pr	mg kg^{-1}	10.8		13.7		15.54	15.8	12.9	14.49			
Pt	mg kg^{-1}											
Rb	mg kg^{-1}	203		202.01		206.4	184	191				
Re	mg kg^{-1}											
Rh	mg kg^{-1}											
Ru	mg kg^{-1}											
S	mg kg^{-1}		30				0.03					
Sb	mg kg^{-1}					2.369	2.29					
Sc	mg kg^{-1}	17		19.96		19.75	21.3	16.2				
Se	mg kg^{-1}											
Sm	mg kg^{-1}	7.900		9.04		10.01	10.200	8.53	9.657			
Sn	mg kg^{-1}	4				26.94		23.9				
Sr	mg kg^{-1}	123		123.92		139.6	137	125	135.49	600		
Ta	mg kg^{-1}	0		2.55		2.966		1.95	2.468			
Tb	mg kg^{-1}	0.7		1.088		1.103	0.85	0.91				
Te	mg kg^{-1}											
Th	mg kg^{-1}	24		18.88	17	19.75		16.3	19.556			
Tl	mg kg^{-1}						1.37	1.53	1.599			
Tm	mg kg^{-1}			0.453		0.459		0.41	0.367			
U	mg kg^{-1}	8		6.16		6.527	5.19	5.89	5.934			
V	mg kg^{-1}	117		135.27		146.5	137	133				
W	mg kg^{-1}	15				17.73	63					
Y	mg kg^{-1}	17.7		26.97		29.31	27.4	25.3	16.786			
Yb	mg kg^{-1}			3.05		3.283	2.5	2.65	2.281			
Zn	mg kg^{-1}	23		22.06	39	32.98	42	20				
Zr	mg kg^{-1}	188		169.3		187.1		182	154.636	500		
									*submitted late	*submitted late	*submitted late	$omitted in error

Table 2 GeoPT33 Assigned values and statistical summary of contributed data for ball clay, DBC-1

	Assigned value	Uncertainty of assigned value	Horwitz Target value	Uncertainty /Target	Number of reported results	Median of results	Robust mean of results	Status of consensus value	Type of consensus value
	X_a	sdm	H_a	sdm/H_a	n				
	g $100g^{-1}$	g $100g^{-1}$	g $100g^{-1}$			g $100g^{-1}$	g $100g^{-1}$		
SiO_2	51.98	0.0663	0.574	0.116	75	52.07	51.975	assigned	robust mean
TiO_2	1.123	0.0041	0.022	0.185	81	1.128	1.123	assigned	robust mean
Al_2O_3	31.82	0.059	0.378	0.156	80	31.826	31.824	assigned	robust mean
Fe_2O_3T	0.937	0.0049	0.019	0.258	81	0.937	0.937	assigned	robust mean
MgO	0.356	0.0048	0.008	0.582	75	0.354	0.356	assigned	robust mean
CaO	0.196	0.003	0.005	0.623	76	0.192	0.196	provisional	robust mean
Na_2O	0.394	0.0059	0.009	0.647	75	0.391	0.394	provisional	robust mean
K_2O	2.637	0.0092	0.046	0.202	79	2.64	2.637	assigned	robust mean
P_2O_5	0.071	0.001	0.002	0.487	76	0.0705	0.071	assigned	robust mean
LOI	10.13	0.058	0.143	0.407	69	10.126	10.204	provisional	median
	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}			mg kg^{-1}	mg kg^{-1}		
As	9	0.324	0.517	0.627	41	9	8.511	provisional	median
Ba	476.1	5.041	15.056	0.335	76	476.5	476.10	assigned	robust mean
Be	3.875	0.0773	0.253	0.306	39	3.86	3.875	assigned	robust mean
Bi	2.04	0.038	0.147	0.259	28	1.975	1.805	provisional	mode
C(tot)	6713	121.64	142.540	0.850	14	6712.5	6646.40	provisional	median
Ce	119.9	1.5	4.665	0.322	63	120.28	119.87	assigned	robust mean
Co	2.06	0.03	0.148	0.203	63	2.2	2.408	provisional	mode
Cr	105.3	1.633	4.178	0.391	73	105	105.28	assigned	robust mean
Cs	64.0	0.6901	2.738	0.252	51	64.533	64.00	assigned	robust mean
Cu	21.35	0.24	1.077	0.223	77	22	23.42	provisional	mode
Dy	5.52	0.0996	0.341	0.292	51	5.52	5.299	assigned	median
Er	2.8	0.0578	0.192	0.301	48	2.8	2.754	provisional	median
Eu	1.77	0.029	0.130	0.223	49	1.77	1.738	assigned	median
Ga	53.3	0.6426	2.342	0.274	60	53.38	53.26	assigned	robust mean
Gd	7.23	0.1541	0.429	0.359	48	7.23	7.135	assigned	median
Ge	3.02	0.11	0.205	0.538	25	2.8	2.584	provisional	mode
Hf	4.975	0.1206	0.313	0.386	47	4.969	4.975	assigned	robust mean
Hg	0.712	0.0144	0.060	0.240	13	0.712	0.701	provisional	median
Ho	0.97	0.0278	0.078	0.357	48	0.97	0.963	assigned	median
La	64.4	0.8513	2.752	0.309	67	64.4	63.95	assigned	median
Li	135	1.994	5.161	0.386	39	135	134.03	assigned	median
Lu	0.43	0.0109	0.039	0.280	46	0.43	0.418	assigned	median
Mo	2.51	0.0543	0.175	0.310	43	2.51	2.610	assigned	median
Nb	25.8	0.292	1.266	0.231	60	25.8	25.81	assigned	robust mean
Nd	51.69	0.4973	2.283	0.218	61	51.69	51.11	assigned	median
Ni	24.0	0.3359	1.189	0.283	76	23.975	24.19	assigned	median
Pb	53.5	0.6491	2.349	0.276	73	53.9	53.46	assigned	robust mean
Pr	14.21	0.1653	0.762	0.217	50	14.212	13.975	assigned	median
Rb	194.0	1.132	7.024	0.161	66	194.05	195.29	assigned	median
Sb	2.809	0.1526	0.192	0.793	31	2.8	2.809	provisional	robust mean
Sc	17.3	0.3397	0.901	0.377	56	17.46	17.302	assigned	robust mean
Se	3.006	0.2149	0.204	1.055	18	2.99	3.006	provisional	robust mean
Sm	9.53	0.1119	0.543	0.206	57	9.53	9.391	assigned	median
Sn	24.4	0.6483	1.207	0.537	41	24.4	23.775	provisional	median
Sr	134.1	0.989	5.132	0.193	75	133	134.13	assigned	robust mean
Ta	2.632	0.0808	0.182	0.444	41	2.59	2.632	assigned	robust mean
Tb	1.01	0.0191	0.081	0.236	49	1.01	0.991	assigned	median
Th	18.33	0.3639	0.946	0.385	62	18.55	18.325	assigned	robust mean
Tl	1.348	0.0391	0.103	0.379	35	1.348	1.279	assigned	median
Tm	0.411	0.0114	0.038	0.304	40	0.411	0.411	assigned	median
U	6.184	0.0869	0.376	0.231	61	6.22	6.184	assigned	robust mean
V	137.5	1.423	5.242	0.271	75	138	137.51	assigned	robust mean
W	16.1	0.4596	0.848	0.542	39	16	16.098	provisional	robust mean
Y	26.35	0.5139	1.288	0.399	70	26.35	25.597	assigned	median
Yb	2.905	0.0408	0.198	0.206	52	2.905	2.84	assigned	median
Zn	21	0.64	1.062	0.603	76	22.535	24.154	provisional	mode
Zr	183.4	1.971	6.694	0.294	67	185	183.37	assigned	robust mean

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11
Data Quality	2	2	2	1	1	2	2	1	1	1	1
SiO_2	0.29	0.30	0.27	*	0.20	-0.97	-0.52	0.30	0.76	0.41	0.37
TiO_2	0.16	-0.07	0.16	-5.89	-1.49	0.39	-0.52	-0.49	0.32	0.32	1.23
Al_2O_3	0.46	-0.10	0.76	*	-0.20	-1.35	-0.28	0.28	1.26	0.46	0.39
Fe_2O_3T	6.94	-0.19	-0.46	*	5.43	1.92	-0.46	-0.96	-3.55	0.15	-3.55
MgO	-0.98	-0.38	-0.38	*	5.25	-6.99	-1.58	-0.87	1.65	6.45	5.25
CaO	10.36	-1.61	0.38	*	0.77	9.36	-1.61	-1.83	-1.23	-0.83	6.75
Na_2O	-1.87	1.44	-5.73	*	30.47	-18.97	0.89	3.44	-1.53	-0.32	2.88
K_2O	-0.29	1.90	0.26	*	0.07	-1.83	0.15	-0.17	0.73	0.47	0.73
P_2O_5	2.03	-0.32	-0.09	-2.06	8.78	-15.27	2.03	1.71	-0.64	0.77	4.07
LOI	3.58	-2.22	-1.67	*	-2.70	4.77	-0.51	-0.25	-1.86	9.86	0.73
As	*	*	6.77	*	*	-5.61	1.45	*	*	-3.32	*
Ba	-4.65	0.59	1.36	-1.63	*	2.59	-0.64	3.81	-0.07	0.74	1.06
Be	*	*	*	*	*	-6.68	*	*	*	1.05	-0.06
Bi	*	*	*	-0.03	*	-4.23	*	*	*	3.28	*
C(tot)	*	*	3.11	*	*	*	*	*	-19.03	*	*
Ce	*	*	-0.52	-0.14	*	-5.05	2.44	*	*	0.03	*
Co	3.18	*	9.95	0.00	*	-2.57	*	1.62	6.36	-0.41	-1.29
Cr	-8.41	0.80	1.88	0.87	*	-4.22	-0.03	-23.98	2.09	13.10	-0.31
Cs	*	*	*	0.52	*	*	*	*	*	-0.37	*
Cu	2.62	0.77	-3.41	-1.48	*	7.73	0.67	-2.37	-14.25	1.53	-1.07
Dy	*	*	*	-1.20	*	-5.89	*	*	*	0.29	1.17
Er	*	*	*	2.58	*	-5.47	*	*	*	0.99	1.62
Eu	*	*	*	1.52	*	-3.35	*	*	*	-0.38	0.15
Ga	*	0.16	1.44	*	*	*	0.09	-0.88	0.31	-0.20	*
Gd	*	*	*	6.08	*	-4.69	*	*	*	-0.09	0.58
Ge	*	*	*	*	*	-4.69	*	*	*	-3.42	*
Hf	*	*	-1.08	-1.86	*	-7.32	*	*	6.48	0.34	*
Hg	*	*	*	*	*	-1.77	*	*	*	*	*
Ho	*	*	*	-0.19	*	-4.94	*	*	*	1.67	1.28
La	-5.16	-0.62	2.29	-1.16	*	-6.67	4.61	*	*	-0.20	*
Li	*	*	*	*	*	-1.94	*	*	*	*	-3.88
Lu	*	*	*	-0.41	*	-4.23	*	*	*	0.92	0.51
Mo	27.15	*	4.26	*	*	*	*	*	*	-1.37	*
Nb	-5.06	*	*	-1.37	*	-9.01	0.83	0.23	5.68	1.55	*
Nd	*	*	-0.81	-0.35	*	-6.11	0.90	*	*	0.38	-0.04
Ni	-4.62	0.01	0.43	-0.80	*	-8.74	0.01	3.47	-5.03	-0.82	0.69
Pb	8.84	*	-0.95	-0.05	*	-8.01	1.29	1.12	2.78	-0.11	*
Pr	*	*	1.83	-0.13	*	-4.47	*	*	*	0.35	-0.02
Rb	-5.34	*	0.85	-0.25	*	*	1.56	0.55	2.70	1.09	*
Sb	*	*	*	*	*	-4.44	*	*	*	-1.92	8.68
Sc	*	-0.72	*	-0.05	*	-5.38	*	-12.10	0.77	2.99	*
Se	*	*	*	*	*	*	*	*	*	4.88	53.97
Sm	*	*	-1.41	-0.34	*	-5.00	*	*	*	0.09	0.00
Sn	*	*	-0.99	-3.31	*	-7.96	2.82	*	*	2.96	*
Sr	-0.31	-0.50	-0.50	-0.86	*	-0.56	-0.25	0.09	1.34	1.14	*
Ta	*	*	6.51	-1.21	*	*	*	*	*	-0.23	*
Tb	*	*	*	3.82	*	-4.40	*	*	*	0.87	0.62
Th	-2.29	*	*	-0.36	*	-6.30	1.99	3.04	4.94	-0.24	-1.82
Tl	*	*	*	*	*	*	*	*	*	*	-3.86
Tm	*	*	*	-0.49	*	-4.14	*	*	*	*	0.50
U	*	*	*	-0.48	*	-5.43	2.02	*	15.47	0.47	-2.24
V	4.15	0.52	0.62	-0.59	*	*	-0.64	-8.47	1.62	3.53	*
W	*	*	*	1.16	*	*	*	*	*	-6.84	*
Y	8.02	-1.69	-2.46	-3.71	*	-7.55	46.33	2.37	5.16	0.91	*
Yb	*	*	*	-0.30	*	-5.82	*	*	*	0.43	0.53
Zn	12.71	3.77	0.47	-4.97	*	7.06	-1.18	-1.51	-6.59	0.94	*
Zr	4.98	0.12	-1.22	-4.36	*	*	-1.04	0.89	0.54	0.86	*

Table 3	GeoPT33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20	H21
Data Quality	2	1	1	2	2	2	2	2	2	2	1
SiO_2	*	*	0.24	0.17	-0.15	*	-6.26	0.20	0.59	*	0.17
TiO_2	*	*	1.23	-0.75	-0.52	-4.01	-1.65	-0.97	0.55	*	0.32
Al_2O_3	*	*	-1.84	0.17	-0.03	0.76	-2.37	0.36	0.11	*	-0.88
Fe_2O_3T	*	*	4.37	-0.98	-0.80	-2.09	-3.07	-0.46	0.34	-16.83	-0.38
MgO	*	*	6.45	-2.78	1.36	-0.86	*	-2.78	1.24	*	0.45
CaO	*	*	0.77	-3.61	-1.91	1.78	-4.11	-1.61	-1.61	*	0.77
Na_2O	*	*	1.78	-7.39	0.34	-0.16	*	1.99	-1.87	*	0.68
K_2O	*	*	0.07	-0.40	-0.07	-2.77	-2.93	0.15	0.70	*	0.29
P_2O_5	*	*	1.71	-0.32	0.15	-1.33	*	1.33	-1.97	*	4.07
LOI	*	*	2.62	0.29	0.26	3.69	*	-0.34	-1.63	*	-1.37
As	0.29	0.73	*	0.00	*	2.29	-5.41	*	-0.68	*	-1.28
Ba	*	-6.64	*	0.30	-1.56	-0.25	3.95	*	-0.80	-11.89	-1.00
Be	*	-0.76	0.57	-1.22	*	0.84	*	*	*	*	-0.46
Bi	-2.18	0.80	-5.25	-0.14	*	*	*	*	-0.48	*	0.34
C(tot)	*	*	*0.48**	*	*	-1.75	*	*	0.31	*	-2.29
Ce	-0.42	-8.95	0.84	-1.27	1.51	-1.98	1.94	*	-2.96	*	0.24
Co	*	-1.91	6.36	2.54	*	0.10	*	*	6.90	33.63	-0.47
Cr	*	-8.55	-3.11	-0.87	-0.03	-0.11	4.87	*	-3.50	-6.38	1.13
Cs	*	-0.68	*	0.04	-1.28	-1.05	-0.33	*	-0.49	*	-0.62
Cu	*	-1.36	4.69	-4.34	3.97	4.12	7.08	*	-0.35	*	0.05
Dy	*	-8.79	0.91	-1.98	*	-1.36	*	*	*	*	-0.09
Er	*	-8.02	1.25	0.70	*	-0.58	*	*	*	*	-0.37
Eu	*	-6.32	1.69	1.31	*	-0.21	*	*	*	*	0.00
Ga	-0.27	-8.31	4.58	0.79	-0.76	1.40	-0.97	*	-0.21	*	0.70
Gd	*	-7.71	0.05	1.28	*	0.66	*	*	*	*	-0.95
Ge	*	*	*	*	0.68	*	4.84	*	-3.72	*	0.49
Hf	*	-0.89	*	-1.06	0.20	*	*	*	2.60	*	-1.30
Hg	*	*	-0.58	*	*	0.47	*	*	*	*	-0.02
Ho	*	-6.93	2.05	-1.48	*	-1.45	*	*	*	*	0.13
La	0.11	-8.14	1.92	-1.76	0.84	-2.35	0.94	*	0.36	*	-0.07
Li	*	-5.25	-2.52	-1.41	*	2.44	*	*	*	*	-0.78
Lu	*	-6.63	1.79	-1.15	*	-0.93	*	*	*	*	0.67
Mo	-0.31	-5.65	-7.49	1.60	0.26	0.29	*	*	-0.89	*	0.80
Nb	0.19	-0.79	0.86	0.30	-0.40	*	-1.86	*	-0.16	*	-2.30
Nd	*	-8.49	1.46	-2.07	1.38	-0.54	0.72	*	-3.22	*	-0.08
Ni	*	-0.87	2.80	-0.83	1.40	-0.16	-1.38	*	-0.91	*	-0.06
Pb	-0.10	-1.34	0.61	2.53	0.22	-0.68	1.24	*	-0.63	*	-0.41
Pr	*	-7.18	1.01	-0.50	*	-1.59	*	*	*	*	-1.20
Rb	-0.79	-1.54	-0.55	-1.22	-0.36	1.31	-0.07	*	-0.24	*	-0.29
Sb	*	2.08	*	-0.18	*	-2.48	*	*	8.29	*	-0.36
Sc	-0.72	-7.14	*	-0.74	-0.45	0.44	*	*	-2.28	*	3.65
Se	*	-4.41	*	*	*	*	-1.24	*	0.72	*	-0.27
Sm	*	-7.89	0.98	-0.91	*	-0.42	*	*	2.46	*	0.02
Sn	*	-2.93	*	-2.55	-1.41	*	*	*	1.57	*	0.50
Sr	-0.69	-7.33	2.12	-0.69	-0.21	-0.51	-0.31	*	-0.19	*	0.37
Ta	*	8.67	*	-0.64	*	0.33	*	*	0.19	*	0.21
Tb	*	-7.10	1.36	1.36	*	-0.70	*	*	*	*	-0.21
Th	*	-8.43	*	-0.58	0.15	-1.36	-0.33	*	-0.75	*	-0.66
Tl	*	0.00	*	0.06	*	-0.76	*	*	-3.63	*	*
Tm	*	-6.36	1.83	-1.35	*	-0.95	*	*	*	*	0.39
U	*	0.17	-0.38	0.59	0.29	-1.70	*	*	0.69	*	-0.68
V	-1.38	-3.72	-0.69	-0.72	-1.10	0.46	*	*	-3.15	0.24	-0.86
W	*	*	*	-3.01	-0.29	5.87	*	*	-0.35	*	1.18
Y	-0.14	-15.79	0.61	-1.21	0.60	-3.47	-0.41	*	-0.06	*	0.35
Yb	*	-8.76	1.49	-1.35	*	-1.00	*	*	-1.02	*	0.18
Zn	-1.88	-3.67	8.38	0.69	3.15	4.66	-2.49	*	-1.37	*	5.27
Zr	-0.18	-3.01	0.01	-1.52	0.35	-3.13	0.20	*	0.40	*	-0.80
			** revised following reporting error*								

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H22	H23	H24	H25	H25	H26	H27	H28	H29	H30	H31
Data Quality	1	1	2	1	2	2	2	2	1	2	1
SiO_2	-0.76	-0.13	0.07	-6.22	*	0.18	0.23	0.15	0.13	0.40	3.36
TiO_2	6.53	0.21	-0.07	-4.66	*	0.84	0.16	-0.75	0.32	0.73	1.68
Al_2O_3	-0.09	0.27	0.34	6.63	*	0.43	-0.19	-0.02	0.52	0.56	0.73
Fe_2O_3T	-0.91	0.79	-0.19	2.79	*	0.44	0.34	0.60	1.20	0.36	-0.07
MgO	-0.27	*	-0.38	31.69	*	0.52	-4.58	0.22	5.25	0.16	23.28
CaO	-5.22	4.60	-0.61	-11.20	*	1.08	-0.61	0.38	2.76	-0.91	-3.22
Na_2O	-8.15	*	0.89	8.40	*	-8.54	0.34	0.34	-5.94	-0.60	0.68
K_2O	-0.58	2.42	0.26	-7.83	*	0.81	0.04	-0.84	0.07	0.78	-1.24
P_2O_5	0.06	-1.30	0.38	-14.77	*	1.80	2.03	2.03	-5.35	0.62	-0.17
LOI	3.32	-2.00	-0.90	*	1.83	-0.51	0.75	0.68	-1.58	-0.44	*
As	0.21	-0.93	0.00	0.77	*	*	-5.67	*	3.87	*	-2.71
Ba	2.25	2.21	0.50	-1.27	*	3.35	-0.73	-1.80	-3.46	0.73	4.18
Be	3.26	-7.73	0.25	*	*	*	-0.37	0.46	*	-1.93	*
Bi	*	*	0.20	-7.78	*	*	29.88	*	*	-1.47	-4.37
C(tot)	*	*	*	*	*	*	*	*	*	*	*
Ce	-0.79	2.52	0.34	-1.71	*	*	-0.20	-1.17	-1.26	1.02	0.63
Co	2.77	6.89	0.47	0.27	*	3.18	0.61	-0.07	6.36	1.89	*
Cr	0.17	2.16	3.56	-2.41	*	-1.11	-0.15	-2.61	*	*	-0.93
Cs	0.73	*	0.18	-4.27	*	*	2.52	0.33	*	*	5.08
Cu	-1.25	-1.55	2.16	-1.44	*	10.51	1.69	0.58	-5.89	-0.16	2.00
Dy	0.69	*	0.70	*	*	*	-1.17	-1.67	*	0.00	*
Er	1.33	*	0.52	*	*	*	-1.43	-1.46	*	-0.03	*
Eu	-0.11	*	0.50	*	*	*	-0.58	-1.39	*	0.69	*
Ga	0.31	*	0.37	-2.76	*	*	-1.00	-3.02	-1.39	*	0.06
Gd	0.02	*	0.31	*	*	*	-1.39	-1.32	*	-0.40	*
Ge	*	*	-0.54	-5.96	*	*	*	-0.59	*	*	-5.48
Hf	-2.10	*	0.84	-2.48	*	*	1.82	-0.17	0.08	*	-5.36
Hg	*	5.24	*	*	*	*	-0.83	*	*	0.98	*
Ho	1.53	*	0.83	*	*	*	-0.71	-1.22	*	1.28	*
La	-0.82	5.90	0.11	-21.73	*	*	-0.85	-1.33	11.12	0.51	1.09
Li	2.52	*	0.87	*	*	*	0.29	-1.16	*	-0.81	*
Lu	0.77	*	0.26	*	*	*	-0.64	-1.41	*	*	*
Mo	-4.29	*	0.54	-0.06	*	*	-0.43	*	-2.92	0.00	*
Nb	-2.06	*	0.47	-0.56	*	6.40	-0.04	0.59	-0.64	*	-2.06
Nd	-0.77	*	0.29	0.14	*	*	0.16	-1.79	0.14	0.92	*
Ni	-3.18	0.93	2.11	-1.91	*	0.85	0.56	0.35	-1.66	-1.00	0.27
Pb	-2.11	0.84	0.12	1.59	*	0.97	3.84	-0.12	0.66	-0.78	-0.54
Pr	-0.91	*	0.52	*	*	*	-0.34	-1.38	*	0.45	*
Rb	2.41	0.44	0.07	-0.41	*	2.63	0.92	-0.57	-0.15	*	-0.78
Sb	-1.45	*	-0.02	7.23	*	*	-5.28	*	*	1.85	12.43
Sc	-3.22	*	0.94	-3.33	*	*	-2.50	-3.50	1.88	*	*
Se	*	-0.57	-0.01	-0.03	*	*	*	*	*	*	-11.32
Sm	-0.12	*	0.52	0.31	*	*	-0.57	-1.60	4.55	-0.02	*
Sn	*	*	0.66	0.99	*	*	0.44	*	*	-1.66	4.06
Sr	0.95	-0.46	1.06	0.52	*	1.25	0.77	-1.38	-0.22	-0.27	-1.82
Ta	-2.76	*	-0.64	-2.37	*	*	-0.88	-0.25	*	*	*
Tb	0.55	*	0.43	*	*	*	-0.62	-1.30	*	0.12	*
Th	-2.13	*	0.09	-2.99	*	6.70	-0.07	-1.12	-1.40	0.72	5.89
Tl	-1.44	*	0.25	-9.20	*	*	-0.86	*	*	0.79	*
Tm	1.32	*	0.12	*	*	*	-0.42	-1.08	*	*	*
U	-1.45	*	0.02	-3.95	*	*	0.45	-0.16	0.84	-0.50	-3.41
V	2.67	0.55	0.52	-1.97	*	4.24	0.14	-0.34	-1.82	-1.48	2.27
W	-0.71	*	-0.06	-1.18	*	*	3.36	*	*	*	0.36
Y	0.71	*	-0.21	-1.13	*	8.02	-1.77	-2.70	1.28	1.38	1.20
Yb	0.03	*	-0.01	-6.09	*	*	-1.38	-1.86	*	-0.19	*
Zn	15.53	0.98	0.47	-1.69	*	3.77	2.54	0.47	-0.94	2.40	1.51
Zr	-1.85	*	1.62	1.01	*	2.66	0.20	0.05	0.69	*	0.17

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H32	H33	H34	H35	H36	H37	H38	H39	H40	H41	H41
Data Quality	2	2	2	2	2	2	2	2	2	1	2
SiO_2	0.00	0.07	-1.16	0.19	-0.48	*	-0.58	9.71	-0.01	*	*
TiO_2	0.39	0.07	-1.20	0.16	-0.20	-2.17	-1.88	-0.75	1.47	-1.76	*
Al_2O_3	0.13	0.08	-0.71	-0.03	-0.05	-3.76	-0.72	3.87	1.25	-2.71	*
Fe_2O_3T	-0.53	0.05	-0.72	-0.19	-0.56	-0.53	6.41	5.62	0.94	0.36	*
MgO	-1.94	-5.78	-0.38	-1.10	-3.20	-0.98	*-2.18**	0.94	0.22	*	*
CaO	-0.21	-0.41	-1.81	-1.81	-1.81	*	*-1.60**	0.68	0.28	*	-7.00
Na_2O	0.56	-1.48	-0.77	-0.88	-1.54	4.64	-1.32	2.71	-0.16	0.46	*
K_2O	0.15	0.34	-0.51	-0.73	0.50	-1.58	*0.70**	5.19	0.95	-0.76	*
P_2O_5	-0.32	-0.60	0.15	1.09	-1.73	-0.09	2.03	8.16	-0.56	*	*
LOI	*	-1.14	3.97	0.08	0.00	*	-0.09	*	-0.86	*	*
As	*	*	*	-5.22	0.10	-1.95	*	128.88	*	-0.77	*
Ba	*	-0.14	0.27	0.20	-1.70	-0.54	*	*	1.01	-2.40	*
Be	*	*	0.90	-1.14	*	-0.25	*	24.50	0.84	*	*
Bi	*	*	-0.82	-1.16	*	*	*	-3.85	*	*	*
C(tot)	*	*	*	*	*	*	*	*	*	*	*
Ce	*	*	-0.70	0.87	-2.24	0.51	*	*	0.04	2.17	*
Co	*	*	-0.03	-1.89	3.52	0.00	*	-0.64	0.54	0.00	*
Cr	*	0.68	0.33	0.21	-0.97	0.04	*	2.25	1.26	2.57	*
Cs	*	*	0.23	-0.49	-1.33	0.64	*	2.49	0.12	1.75	*
Cu	*	*	0.12	6.94	-0.49	-0.07	*	5.98	-0.07	*	*
Dy	*	*	0.05	*	*	0.79	*	*	0.41	2.58	*
Er	*	*	0.48	*	*	0.96	*	*	0.81	*	*
Eu	*	*	-0.27	*	*	0.20	*	*	0.12	0.69	*
Ga	*	*	-0.07	1.22	-0.55	-1.18	*	3.29	-0.09	2.45	*
Gd	*	*	-0.69	*	*	0.47	*	*	-0.13	*	*
Ge	*	*	*	*	-4.20	*	*	*	*	*	*
Hf	*	*	-0.02	3.72	0.68	0.14	*	*	-0.41	1.04	*
Hg	*	*	*	-0.10	*	*	*	*	*	*	*
Ho	*	*	0.39	*	*	0.81	*	*	0.71	*	*
La	*	*	-0.71	0.87	-0.89	0.50	*	*	0.70	0.91	*
Li	*	*	-0.24	-3.99	*	0.80	*	1.14	*	*	*
Lu	*	*	0.26	*	*	0.74	*	*	0.38	0.00	*
Mo	*	*	1.20	-1.17	-0.03	-0.37	*	-0.09	0.60	*	*
Nb	*	*	-0.10	0.27	-0.24	-0.13	*	7.17	-0.91	*	*
Nd	*	*	0.00	-0.90	-0.06	0.47	*	*	0.37	*	*
Ni	*	*	0.18	-2.26	-0.37	0.22	*	-0.18	1.52	*	*
Pb	*	*	-0.10	0.50	0.26	0.09	*	1.37	-1.12	*	*
Pr	*	*	0.01	*	*	0.45	*	*	0.02	*	*
Rb	*	*	-0.12	-0.36	-0.04	0.23	*	2.85	0.18	0.99	*
Sb	*	*	0.34	-1.84	-2.36	-0.02	*	0.42	*	0.99	*
Sc	*	*	1.00	0.11	-0.83	*	*	0.07	0.66	2.77	*
Se	*	*	*	*	-0.26	2.93	*	*	*	*	*
Sm	*	*	-0.10	-0.03	1.63	0.56	*	*	0.41	0.68	*
Sn	*	*	0.56	0.00	-0.37	0.37	*	*	0.20	*	*
Sr	*	-0.11	-0.31	0.09	0.05	1.24	*	2.64	0.76	*	-1.38
Ta	*	*	-0.27	-4.48	1.56	-0.62	*	*	-0.53	-0.34	*
Tb	*	*	-0.34	*	*	-0.47	*	*	0.00	0.50	*
Th	*	*	0.43	-3.66	0.36	-0.06	*	2.16	-0.18	1.66	*
Tl	*	*	-0.06	1.71	-1.20	-3.41	*	6.36	*	*	*
Tm	*	*	0.38	*	*	0.69	*	*	0.51	*	*
U	*	*	0.46	*	1.22	-0.05	*	-0.09	-0.06	0.57	*
V	*	1.38	-0.51	-0.62	-1.00	-0.09	*	2.73	0.95	1.05	*
W	*	*	0.34	-2.65	1.71	0.06	*	*	*	1.30	*
Y	*	*	0.29	1.92	0.87	0.12	*	-0.97	1.11	*	*
Yb	*	*	0.14	*	-0.01	0.83	*	*	0.62	0.99	*
Zn	*	-0.47	0.00	0.33	-0.89	1.60	*	8.84	-6.35	*	*
Zr	*	6.85	0.35	-0.33	0.33	-1.77	*	*	0.82	*	4.98
							** revised following reporting error*				

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H42	H43	H44	H44	H45	H46	H47	H48	H49	H50	H51
Data Quality	2	1	1	2	1	2	2	1	1	2	2
SiO_2	0.30	-0.43	-0.71	*	-2.94	*	-0.18	0.06	1.33	*	0.09
TiO_2	6.50	-0.13	0.46	*	-6.48	*	-0.75	0.32	0.77	*	0.80
Al_2O_3	-0.02	-0.43	-0.67	*	-3.50	*	-0.87	-0.28	-0.59	*	0.29
Fe_2O_3T	0.73	-2.50	1.47	*	-2.50	*	-0.19	0.67	0.67	*	0.60
MgO	0.28	-5.56	*	0.94	-4.36	*	-1.58	10.06	10.06	*	*
CaO	1.38	2.76	*	7.82	-1.23	*	-6.60	12.74	0.77	*	*
Na_2O	6.30	-7.05	-2.63	*	10.61	*	-1.87	-4.84	1.78	*	0.34
K_2O	2.67	-0.58	-10.24	*	-2.34	*	-1.28	0.07	-0.15	*	0.59
P_2O_5	-2.21	22.90	*	8.39	6.42	*	-0.32	-5.35	-1.59	*	*
LOI	-0.51	4.44	*	3.06	13.39	*	4.39	-1.93	-0.88	*	-1.53
As	*	*	*	-0.19	*	38.67	*	-11.29	*	*	*
Ba	-8.47	*	*	-5.18	0.72	2.26	0.79	-7.18	-0.34	0.99	0.30
Be	-2.52	*	*	0.11	*	0.25	*	0.26	*	*	1.14
Bi	*	*	*	*	*	*	*	-0.27	*	*	*
C(tot)	*	*	*	*	*	*	1.01	*	*	*	1.32
Ce	5.27	*	*	0.79	-1.69	0.66	1.09	-2.55	-0.19	-0.20	*
Co	3.18	*	*	1.15	*	13.33	*	-0.95	*	*	*
Cr	-1.83	*	*	-0.56	0.41	1.04	0.57	-3.66	0.41	2.84	*
Cs	-3.00	*	*	-0.37	*	0.55	*	1.50	*	*	*
Cu	-1.01	*	*	4.48	3.39	1.23	4.01	0.88	6.08	0.30	0.30
Dy	-2.59	*	*	0.73	-1.52	0.79	*	-5.68	-4.22	*	0.64
Er	-2.42	*	*	*	1.04	0.99	*	-5.94	-2.40	*	0.83
Eu	-1.81	*	*	*	1.77	0.31	*	-3.00	-0.77	*	-0.23
Ga	2.08	*	*	-0.70	*	0.33	*	-5.15	*	*	1.22
Gd	-1.84	*	*	1.01	-5.19	-0.01	*	-4.43	-0.47	*	0.51
Ge	-1.71	*	*	0.44	*	-0.76	*	1.27	*	*	*
Hf	-1.56	*	*	0.82	*	*	*	1.62	*	*	*
Hg	*	*	*	0.07	*	*	*	0.00	*	*	*
Ho	-1.92	*	*	*	0.38	0.90	*	-3.98	-1.41	*	1.41
La	2.29	*	*	0.22	-0.15	1.07	-0.80	-3.16	-1.24	0.89	*
Li	*	*	*	0.68	-0.78	-1.74	*	-3.68	1.36	0.48	-1.45
Lu	-1.54	*	*	*	*	0.64	*	-5.38	0.00	*	0.77
Mo	1.40	*	*	3.12	*	*	*	-0.74	*	*	*
Nb	1.66	*	*	0.59	*	-0.24	*	0.86	*	-2.69	0.87
Nd	0.72	*	*	0.37	-1.18	0.68	*	-3.06	-0.52	-0.81	-0.28
Ni	-0.41	*	*	2.53	-2.50	1.69	2.53	-1.32	-0.40	0.30	-0.83
Pb	-1.16	*	*	-0.31	*	2.46	*	-4.37	1.21	*	0.33
Pr	-2.01	*	*	0.25	1.03	0.75	*	-2.77	-0.93	-0.20	0.12
Rb	1.42	*	*	0.00	0.28	1.21	*	-1.00	*	*	0.14
Sb	*	*	*	*	*	-0.34	*	-11.75	*	*	*
Sc	2.05	*	*	0.39	0.77	0.00	*	-12.33	*	1.28	0.50
Se	*	*	*	*	*	*	*	-0.13	*	*	*
Sm	-2.15	*	*	0.02	0.87	0.44	*	-3.61	-0.13	-0.83	-1.05
Sn	-3.07	*	*	1.91	*	1.74	*	0.66	*	*	-1.20
Sr	1.25	*	*	1.25	1.92	0.28	*	-4.31	-1.00	0.57	-0.21
Ta	3.46	*	*	2.39	*	-0.11	*	0.82	*	*	*
Tb	-1.86	*	*	0.19	-0.12	0.74	*	-3.47	-1.12	*	1.61
Th	-1.76	*	*	-1.33	*	0.53	*	-3.94	1.14	*	*
Tl	-0.28	*	*	0.74	*	-0.04	*	0.31	*	*	*
Tm	-1.75	*	*	*	*	0.78	*	-4.56	-0.83	*	1.71
U	1.09	*	*	-0.51	-0.49	0.17	*	-3.12	0.52	*	*
V	6.72	*	*	-3.58	-1.82	-0.14	0.24	0.09	-1.05	0.62	0.52
W	-0.06	*	*	-0.06	*	2.89	*	-1.30	*	*	*
Y	1.03	*	*	0.25	-2.60	0.57	1.42	-8.58	-3.53	*	-0.02
Yb	-2.08	*	*	0.75	0.48	0.67	*	-7.71	-1.54	*	0.19
Zn	2.35	*	*	3.29	0.00	15.53	-0.47	6.31	6.87	1.88	1.18
Zr	-0.40	*	*	6.17	-1.70	-0.10	-3.24	0.69	*	*	-0.03

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H52	H53	H54	H55	H56	H57	H58	H59	H60	H61	H62
Data Quality	1	2	2	1	1	2	2	1	2	2	1
SiO_2	0.72	0.17	-0.15	-0.22	-1.35	*	*	8.37	0.11	1.21	-1.74
TiO_2	0.77	0.39	0.84	1.23	-1.94	*	*	4.76	-0.07	-2.56	11.74
Al_2O_3	0.17	-0.34	-0.03	1.87	0.99	*	2.08	6.47	0.23	-0.89	1.84
Fe_2O_3T	-0.91	0.87	9.85	0.15	0.15	*	-1.38	1.78	-2.01	5.09	0.15
MgO	2.85	2.63	-0.38	-0.75	-0.75	*	-0.68	5.49	1.24	10.98	2.85
CaO	-3.22	9.36	7.37	0.77	-3.22	*	-2.11	2.56	*	10.86	12.74
Na_2O	-0.43	0.89	-2.97	-0.43	13.92	*	52.75	4.21	*	-4.41	18.33
K_2O	0.07	0.15	-1.17	0.29	-6.95	*	2.56	8.54	-0.51	0.15	5.34
P_2O_5	-0.17	2.03	-5.03	2.18	-0.64	*	-0.82	6.42	*	-7.90	-6.77
LOI	-1.58	0.43	-1.84	-2.84	2.13	*	*	-57.74	0.08	-1.11	4.72
As	*	*	*	-3.87	*	*	*	*	*	-6.11	1.37
Ba	*	4.51	-1.00	-1.93	1.59	-0.60	0.03	0.67	*	2.06	-4.61
Be	*	-0.15	-0.05	*	-0.53	*	1.85	-0.17	*	-2.03	2.15
Bi	*	*	*	*	*	*	*	-0.10	*	-3.14	0.25
C(tot)	-1.98	*	*	*	*	*	*	*	*	0.97	*
Ce	*	0.34	0.23	-1.47	-0.83	-1.59	0.52	1.04	*	-4.60	-7.16
Co	*	7.24	-0.20	6.36	74.70	-0.81	0.41	0.36	*	-0.71	0.47
Cr	*	0.29	-0.51	-3.42	6.63	-0.39	*	-0.35	*	14.09	2.17
Cs	*	-0.93	0.37	-0.37	*	-0.09	0.44	0.82	*	-2.76	-1.48
Cu	*	0.67	0.77	-1.25	18.43	2.02	-0.44	-0.07	*	0.07	7.85
Dy	*	0.26	0.26	*	3.51	-0.48	-1.39	-1.29	*	-2.96	-5.63
Er	*	0.52	0.00	*	-1.04	0.05	-0.86	-0.73	*	-1.56	-4.77
Eu	*	0.12	0.00	*	-2.08	-0.69	0.19	0.28	*	-4.00	-3.65
Ga	*	-0.87	-0.48	-0.11	*	*	0.56	0.04	*	-2.96	1.69
Gd	*	1.01	0.55	*	-1.68	-0.78	0.17	-0.80	*	-1.55	-6.08
Ge	*	*	*	-1.08	*	*	*	*	*	-4.82	2.68
Hf	*	0.36	-1.08	4.56	*	*	*	0.06	*	-3.72	1.41
Hg	*	*	*	*	*	*	*	*	*	0.08	*
Ho	*	0.83	-0.06	*	-0.38	0.00	-0.90	-1.09	*	-0.83	-4.07
La	*	0.31	-0.07	-0.87	0.11	-1.93	0.00	0.36	*	-1.85	-7.40
Li	*	*	0.68	*	*	-0.29	0.48	2.36	*	-5.82	6.80
Lu	*	0.90	0.90	*	0.51	*	-0.13	-0.31	*	-2.56	-3.25
Mo	*	-0.03	*	-0.06	24.60	*	3.72	-0.37	*	-0.06	2.39
Nb	*	-0.52	0.08	-0.64	*	*	-0.44	-0.70	*	-0.24	2.43
Nd	*	0.40	0.07	-0.74	-0.74	-1.42	0.20	1.15	*	-11.26	-5.97
Ni	*	-0.75	-1.25	-0.82	3.39	-0.33	0.47	-1.83	*	-2.47	2.41
Pb	*	-6.27	-0.74	-1.47	1.08	-1.37	-0.10	0.03	-0.48	-5.78	0.54
Pr	*	0.52	-0.14	*	0.38	-1.12	0.32	0.18	*	-5.25	-4.73
Rb	*	-0.07	-0.79	-0.29	*	-0.36	-0.27	0.92	*	-3.63	0.43
Sb	*	*	*	*	*	*	0.60	2.19	*	2.63	1.35
Sc	*	1.22	0.39	-0.34	1.00	0.11	*	3.86	*	-1.55	-0.04
Se	*	*	*	3.41	-11.71	*	*	*	*	-2.15	0.24
Sm	*	0.34	0.71	*	-0.06	-0.87	0.21	-1.12	*	-1.87	-4.73
Sn	*	*	-0.99	*	*	*	1.49	-1.81	*	-2.28	0.76
Sr	*	0.09	-0.21	-0.80	-0.80	0.38	0.09	0.91	*	3.40	-5.51
Ta	*	0.46	-2.83	*	*	*	*	2.47	*	17.22	1.72
Tb	*	*	0.43	*	2.98	-0.43	-0.06	-0.86	*	-2.42	-5.03
Th	*	0.30	-0.17	2.83	*	-1.81	*	1.20	*	-7.79	-4.90
Tl	*	-3.14	-0.72	*	*	*	0.25	*	*	-1.45	0.95
Tm	*	-0.15	0.91	*	*	-0.15	-0.55	-0.49	*	-0.82	-3.25
U	*	-0.38	0.55	-4.48	*	-0.98	-0.34	0.38	*	-2.04	1.32
V	*	0.05	-0.53	-2.39	-0.48	-0.34	0.33	1.18	*	-1.58	1.88
W	*	-0.65	*	-4.84	-7.91	*	0.18	0.97	*	-0.88	4.92
Y	*	0.99	-0.52	-2.60	-4.15	-0.95	*	-3.11	*	-1.88	-11.65
Yb	*	0.49	0.24	4.02	*	-0.24	-0.62	-0.36	*	-0.64	-4.42
Zn	*	2.17	1.88	-1.88	6.21	*	-1.41	-1.41	*	-2.92	14.02
Zr	*	-0.53	0.72	0.24	8.01	0.57	*	-1.40	*	-5.63	0.80

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H63	H64	H65	H66	H67	H68	H69	H70	H71	H72	H73
Data Quality	2	1	2	2	1	1	1	1	2	2	1
SiO_2	0.27	0.32	-0.17	-0.57	*	-0.39	0.76	0.79	-0.09	-1.42	-0.72
TiO_2	0.84	-0.59	0.84	1.20	0.77	-0.59	2.13	-0.54	-0.20	-0.29	-0.63
Al_2O_3	0.32	-2.95	0.01	-0.77	*	-0.83	-1.52	-0.82	-0.18	0.13	1.43
Fe_2O_3T	3.77	*	0.07	-0.59	1.78	0.67	2.26	-1.62	0.31	-3.89	6.70
MgO	-3.98	-1.96	0.22	-1.34	*	4.05	-6.76	-0.75	0.64	5.03	0.45
CaO	-2.61	-7.21	-1.61	0.28	*	2.76	8.75	-3.38	2.78	3.38	-2.42
Na_2O	*	-0.43	-2.42	-0.88	*	2.88	12.81	-0.70	1.77	16.34	1.78
K_2O	1.79	*	0.26	0.25	*	-1.24	0.95	-0.50	0.14	-0.07	2.25
P_2O_5	4.39	-6.77	-0.32	-2.68	*	0.30	-0.64	-2.53	-0.32	2.03	0.30
LOI	-1.39	*	1.38	1.33	*	2.76	1.92	*	1.45	*	*
As	*	-2.90	0.58	*	-1.49	*	*	11.54	*	*	2.64
Ba	*	-2.60	-1.47	0.00	-1.00	-0.87	-2.93	1.24	-0.28	*	2.52
Be	*	*	*	*	-1.43	0.53	*	*	*	*	-0.17
Bi	*	*	*	*	1.23	0.41	*	*	*	*	0.23
C(tot)	0.04	*	*	*	*	*	*	-1.28	1.15	*	*
Ce	*	*	*	*	0.71	-0.62	*	2.16	*	*	0.96
Co	*	-2.44	*	-3.59	1.15	0.07	-0.41	-0.10	39.72	*	1.47
Cr	*	*	-1.11	-0.63	*	-1.50	0.41	2.52	-4.25	*	-0.47
Cs	*	*	*	*	0.03	0.22	2.37	*	*	*	0.19
Cu	*	-2.46	-0.63	-0.16	0.91	0.14	8.96	1.54	2.85	*	4.35
Dy	*	-0.35	*	*	-0.98	-0.76	-2.23	1.35	*	*	0.64
Er	*	*	*	*	-0.28	0.00	-1.36	1.45	*	*	-2.09
Eu	*	*	*	*	-0.48	-0.85	-1.62	0.81	*	*	1.05
Ga	*	-2.87	-0.70	-0.27	*	-1.01	*	*	*	*	1.60
Gd	*	*	*	*	-1.78	-1.21	-1.84	1.93	*	*	5.93
Ge	*	*	*	*	*	0.20	*	*	*	*	1.65
Hf	*	-1.97	*	3.24	*	-0.56	-3.53	*	*	*	-0.44
Hg	*	*	*	*	*	*	*	*	*	*	-3.42
Ho	*	*	*	*	-0.34	0.00	-0.77	0.89	*	*	4.20
La	*	*	*	*	-0.13	-0.91	-2.29	1.88	*	*	0.35
Li	*	*	-0.36	0.00	-0.08	1.55	*	*	*	*	3.75
Lu	*	-2.56	*	*	-0.09	-0.26	-1.28	0.92	*	*	0.56
Mo	*	-0.69	*	*	-1.26	1.26	*	*	*	*	1.47
Nb	*	-3.88	-0.32	*	*	0.07	-2.22	*	*	*	-1.17
Nd	*	*	*	*	-0.32	-1.00	-2.71	2.22	*	*	1.57
Ni	*	-3.26	0.01	-0.41	-0.02	0.36	5.07	-0.27	-1.67	*	2.82
Pb	*	-4.49	0.33	8.42	-0.36	0.40	-4.45	-0.87	-1.95	*	1.63
Pr	*	*	*	*	-0.79	-0.80	-2.38	1.61	*	*	2.48
Rb	*	*	-0.36	*	0.01	0.42	-18.52	1.89	*	*	-1.10
Sb	*	-3.32	*	*	*	*	*	*	*	*	0.52
Sc	*	*	-1.28	*	*	-0.22	*	5.77	*	*	1.11
Se	*	*	*	*	*	*	*	*	*	*	3.61
Sm	*	*	*	*	-0.25	-0.90	-2.27	1.84	*	*	1.73
Sn	*	-4.23	-0.58	*	*	1.16	*	3.01	*	*	*
Sr	*	*	-0.21	-0.69	-0.98	-1.19	0.17	0.93	*	*	1.99
Ta	*	-2.37	*	*	*	-1.49	3.62	*	*	*	1.18
Tb	*	*	*	*	-1.50	-0.62	-1.86	0.16	*	*	0.99
Th	*	*	0.36	*	0.42	-1.61	-1.72	3.62	*	*	0.85
Tl	*	-1.63	*	*	1.42	0.89	*	0.63	*	*	1.60
Tm	*	*	*	*	0.03	-0.03	-0.30	2.01	*	*	3.13
U	*	-3.10	*	*	0.10	-0.49	-0.65	1.72	*	*	0.91
V	*	-4.10	-1.96	*	0.51	-0.86	0.47	1.56	1.14	*	-0.67
W	*	-1.53	-0.65	*	-1.68	*	*	*	*	*	1.54
Y	*	*	0.64	-1.30	-3.10	0.04	-2.29	-0.78	*	*	1.13
Yb	*	*	*	*	-0.07	-0.93	-0.53	0.92	*	*	1.02
Zn	*	1.98	-1.41	-0.47	-0.33	0.00	40.48	1.60	0.24	*	6.81
Zr	*	*	0.79	4.53	*	0.24	-7.38	-8.15	1.54	*	-1.30

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H74	H74	H75	H76	H77	H78	H79	H80	H81	H82	H83
Data Quality	1	2	2	1	2	2	1	2	1	1	2
SiO_2	2.17	*	0.98	*	-0.24	0.92	0.34	-0.63	0.43	-0.62	0.03
TiO_2	-0.22	*	0.16	-2.40	-0.52	0.39	-0.13	-0.07	3.36	-0.61	-0.27
Al_2O_3	3.24	*	0.63	-8.42	-0.96	0.51	0.28	-0.31	0.46	-1.27	0.00
Fe_2O_3T	0.15	*	-1.51	-4.61	-0.46	0.34	-0.38	-0.19	-0.91	-0.01	-0.16
MgO	0.45	*	5.63	-9.17	*	-0.98	-0.75	0.22	-11.57	0.45	0.46
CaO	-4.22	*	1.38	-5.22	*	-0.61	-3.22	-1.61	-5.22	5.96	-0.31
Na_2O	-3.19	*	-1.48	-4.84	*	-4.68	-1.53	-0.21	-5.94	-1.97	1.72
K_2O	-0.34	*	1.24	-6.07	-0.62	0.15	1.17	-0.29	0.73	0.05	0.71
P_2O_5	-10.16	*	3.45	-0.64	*	1.33	0.30	-0.32	-2.06	3.36	-0.56
LOI	-0.61	*	3.06	2.27	4.46	-5.23	-3.05	2.01	1.43	2.90	-1.67
As	*	*	*	-10.60	-0.48	0.19	*	*	*	*	0.97
Ba	-1.07	*	0.23	4.02	*	4.75	-0.54	-0.70	0.66	1.00	3.92
Be	-0.81	*	*	0.18	*	*	*	*	*	*	*
Bi	*	*	*	-5.80	-0.31	-0.48	*	*	*	*	*
C(tot)	*	*	*	*	*	*	*	-0.04	*	*	*
Ce	-0.62	*	*	2.72	0.34	1.84	*	0.01	3.67	1.14	6.12
Co	2.84	*	*	-0.81	*	0.81	-0.41	0.14	*	*	*
Cr	2.97	*	-0.15	1.52	*	-0.39	-2.70	1.40	2.09	-0.09	4.27
Cs	3.29	*	*	-0.31	-0.22	2.74	-3.29	0.62	0.55	0.86	*
Cu	-0.90	*	1.23	0.22	-0.16	2.16	-8.68	3.55	-3.11	0.14	0.30
Dy	-0.91	*	*	1.79	0.69	-0.91	*	0.76	1.20	2.63	*
Er	-0.47	*	*	-1.72	0.70	0.00	*	0.57	1.62	2.04	*
Eu	0.05	*	*	1.62	0.27	1.27	*	0.58	0.62	1.73	*
Ga	-2.29	*	*	0.48	1.05	0.58	-2.25	0.37	-1.39	1.25	1.44
Gd	0.37	*	*	3.94	*	1.83	*	1.15	1.23	0.98	*
Ge	*	*	*	22.05	*	-2.49	*	*	*	*	*
Hf	-1.07	*	*	1.74	*	*	*	0.04	2.51	-0.02	*
Hg	*	*	*	*	*	0.06	*	*	*	*	*
Ho	0.00	*	*	-3.08	1.09	-0.51	*	1.28	2.31	3.16	*
La	-1.10	*	*	2.56	0.13	1.93	2.03	0.96	-0.11	1.13	7.01
Li	3.88	*	*	-0.06	0.34	*	*	*	*	*	*
Lu	-0.18	*	*	1.28	*	-0.13	*	1.02	2.05	1.02	*
Mo	*	*	*	1.43	*	-0.89	*	1.40	*	*	*
Nb	0.21	*	*	0.61	0.47	0.47	0.15	0.63	2.36	-0.71	0.47
Nd	0.00	*	*	0.70	0.20	-0.59	0.57	0.72	1.10	1.17	*
Ni	2.49	*	1.69	-1.46	-0.12	0.43	*	1.27	1.70	-0.90	1.69
Pb	-0.09	*	-2.44	-2.89	*	-0.37	0.66	0.33	4.70	0.48	2.88
Pr	-0.41	*	*	0.58	*	1.17	*	0.91	1.17	1.22	*
Rb	-3.71	*	*	-6.01	0.18	0.14	0.85	-0.79	3.98	0.60	1.56
Sb	*	*	*	1.15	*	*	*	*	*	*	*
Sc	1.97	*	*	-0.37	*	-0.67	-2.55	*	-1.45	1.58	0.94
Se	*	*	*	*	*	*	*	*	*	*	*
Sm	1.07	*	*	0.85	0.19	0.43	*	0.80	0.83	1.79	*
Sn	*	*	*	-9.37	-1.16	-0.25	*	1.08	*	*	*
Sr	-3.63	*	-0.11	-3.70	0.43	0.18	0.37	0.28	2.51	0.79	1.35
Ta	0.49	*	*	-11.99	*	*	*	0.74	-0.01	-0.32	*
Tb	0.12	*	*	-0.87	0.62	0.56	*	1.36	0.74	1.57	*
Th	0.57	*	*	3.12	*	0.83	0.71	0.89	3.78	1.35	3.00
Tl	*	*	*	-8.52	0.79	0.25	*	-1.69	*	*	*
Tm	*	*	*	1.03	*	-0.28	*	1.05	2.09	1.88	*
U	0.79	*	*	2.33	-0.14	0.42	0.84	0.57	2.54	0.15	2.42
V	2.27	*	0.62	15.22	2.05	-0.34	*	-1.38	0.47	0.36	2.24
W	*	*	*	-7.61	*	1.77	-0.12	1.12	*	*	*
Y	-2.65	*	*	-4.91	0.41	-2.08	2.06	0.49	2.45	1.68	2.19
Yb	0.05	*	*	0.73	0.27	-0.01	*	0.59	1.59	0.77	*
Zn	*	-2.02	2.82	11.33	*	6.12	-0.94	6.59	-0.94	1.04	1.41
Zr	-3.59	*	*	0.48	1.17	1.09	1.89	-0.77	-2.00	-0.52	0.12

Table 3	Geo*PT*33 Z-scores for contributed data for ball clay, DBC-1 (June 2013)										
Lab. Code	H84	H84	H85	H86	H87	H88	H89	H90*	H91*	H92*	H93$
Data Quality	1	2	1	2	2	1	1	1	2	2	2
SiO_2	-1.82	*	*	-0.17	-1.45	0.74	*	*	4.60	-0.11	0.28
TiO_2	0.32	*	*	-0.29	1.07	0.32	*	*	1.75	-0.75	0.16
Al_2O_3	-1.44	*	*	-0.47	1.37	1.26	*	*	5.44	-0.75	0.10
Fe_2O_3T	-0.91	*	*	-0.72	4.96	-3.02	*	*	8.00	-0.45	-0.19
MgO	-3.16	*	*	-0.38	31.46	-5.56	*	*	-1.58	-0.38	0.22
CaO	0.77	*	*	-1.61	23.63	-5.22	*	*	11.38	-0.60	-0.60
Na_2O	1.78	*	*	-2.97	4.37	3.99	*	*	-2.97	1.44	0.34
K_2O	1.17	*	*	0.04	-2.28	0.51	*	*	2.45	0.15	0.15
P_2O_5	-5.35	*	*	-2.68	-1.55	-0.64	*	*	-9.74	-2.68	2.02
LOI	-4.17	*	*	0.19	-0.27	-1.51	*	*	3.90	1.90	-0.09
As	*	-3.87	*	0.97	*	36.74	*	*	*	*	*
Ba	1.06	*	-1.70	*	0.57	1.65	-1.93	1.16	-2.53	*	*
Be	*	*	*	*	0.73	-0.69	1.36	*	*	*	*
Bi	*	*	*	*	*	*	1.09	*	*	*	*
C(tot)	*	*	*	*	*	*	*	*	*	-3.90	*
Ce	-5.48	*	-1.06	*	1.19	0.67	-1.69	-0.39	*	*	*
Co	6.36	*	-0.82	33.63	0.91	17.19	-0.54	*	*	*	*
Cr	-0.07	*	0.52	4.63	0.37	-25.20	-2.51	*	-0.63	*	*
Cs	1.46	*	-2.20	*	0.49	-2.01	-0.51	0.44	*	*	*
Cu	6.17	*	0.32	-1.55	5.90	36.06	-0.14	*	*	*	*
Dy	-4.45	*	1.03	*	0.47	0.62	-1.41	-4.36	*	*	*
Er	-3.13	*	1.41	*	1.25	-0.10	-0.83	-4.19	*	*	*
Eu	-2.08	*	-0.80	*	1.19	-1.85	-1.77	-1.41	*	*	*
Ga	6.29	*	0.23	*	0.93	0.23	-1.91	*	*	*	*
Gd	-2.40	*	0.86	*	0.84	2.52	-1.86	-2.82	*	*	*
Ge	*	*	*	*	-0.13	-10.37	0.20	*	*	*	*
Hf	16.08	*	-0.78	*	0.63	-3.25	-0.75	-1.31	*	*	*
Hg	*	*	*	*	*	*	*	*	*	*	*
Ho	-2.18	*	1.33	*	1.14	-1.67	-0.26	-3.03	*	*	*
La	-6.36	*	-0.91	*	0.87	-3.02	-1.93	-0.17	*	*	*
Li	*	*	*	*	*	0.19	1.36	-0.12	*	*	*
Lu	-3.33	*	0.72	*	0.83	-2.05	-1.02	-1.79	*	*	*
Mo	54.29	*	*	*	0.71	*	0.74	*	*	*	*
Nb	112.35	*	1.41	*	1.03	*	-2.54	-1.61	*	*	*
Nd	-2.05	*	-0.38	*	1.27	2.81	-2.05	0.29	*	*	*
Ni	5.07	*	1.67	8.84	1.34	-0.90	0.11	*	*	*	*
Pb	2.78	*	0.82	1.18	-4.40	0.95	0.70	0.13	*	*	*
Pr	-4.47	*	-0.67	*	0.87	2.08	-1.72	0.37	*	*	*
Rb	1.28	*	1.13	*	0.88	-1.43	-0.43	*	*	*	*
Sb	*	*	*	*	-1.14	-2.70	*	*	*	*	*
Sc	-0.34	*	2.95	*	1.36	4.44	-1.22	*	*	*	*
Se	*	*	*	*	*	*	*	*	*	*	*
Sm	-3.00	*	-0.90	*	0.44	1.23	-1.84	0.23	*	*	*
Sn	-16.91	*	*	*	1.05	*	-0.41	*	*	*	*
Sr	-2.17	*	-1.99	*	0.53	0.56	-1.78	0.27	45.39	*	*
Ta	-14.46	*	-0.45	*	0.92	*	-3.75	-0.90	*	*	*
Tb	-3.84	*	0.97	*	0.58	-1.98	-1.24	*	*	*	*
Th	6.00	*	0.59	-0.70	0.75	*	-2.14	1.30	*	*	*
Tl	*	*	*	*	*	0.21	1.77	2.44	*	*	*
Tm	*	*	1.11	*	0.63	*	-0.03	-1.18	*	*	*
U	4.83	*	-0.06	*	0.46	-2.64	-0.78	-0.66	*	*	*
V	-3.91	*	-0.43	*	0.86	-0.10	-0.86	*	*	*	*
W	-1.30	*	*	*	0.96	55.34	*	*	*	*	*
Y	-6.72	*	0.48	*	1.15	0.82	-0.82	-7.42	*	*	*
Yb	*	*	0.73	*	0.96	-2.05	-1.29	-3.15	*	*	*
Zn	1.88	*	1.00	8.47	5.64	19.77	-0.94	*	*	*	*
Zr	0.69	*	-2.10	*	0.28	*	-0.20	-4.29	23.65	*	*
								*submitted late	*submitted late	*submitted late	$omitted in error

Copyright: International Association of Geoanalysts

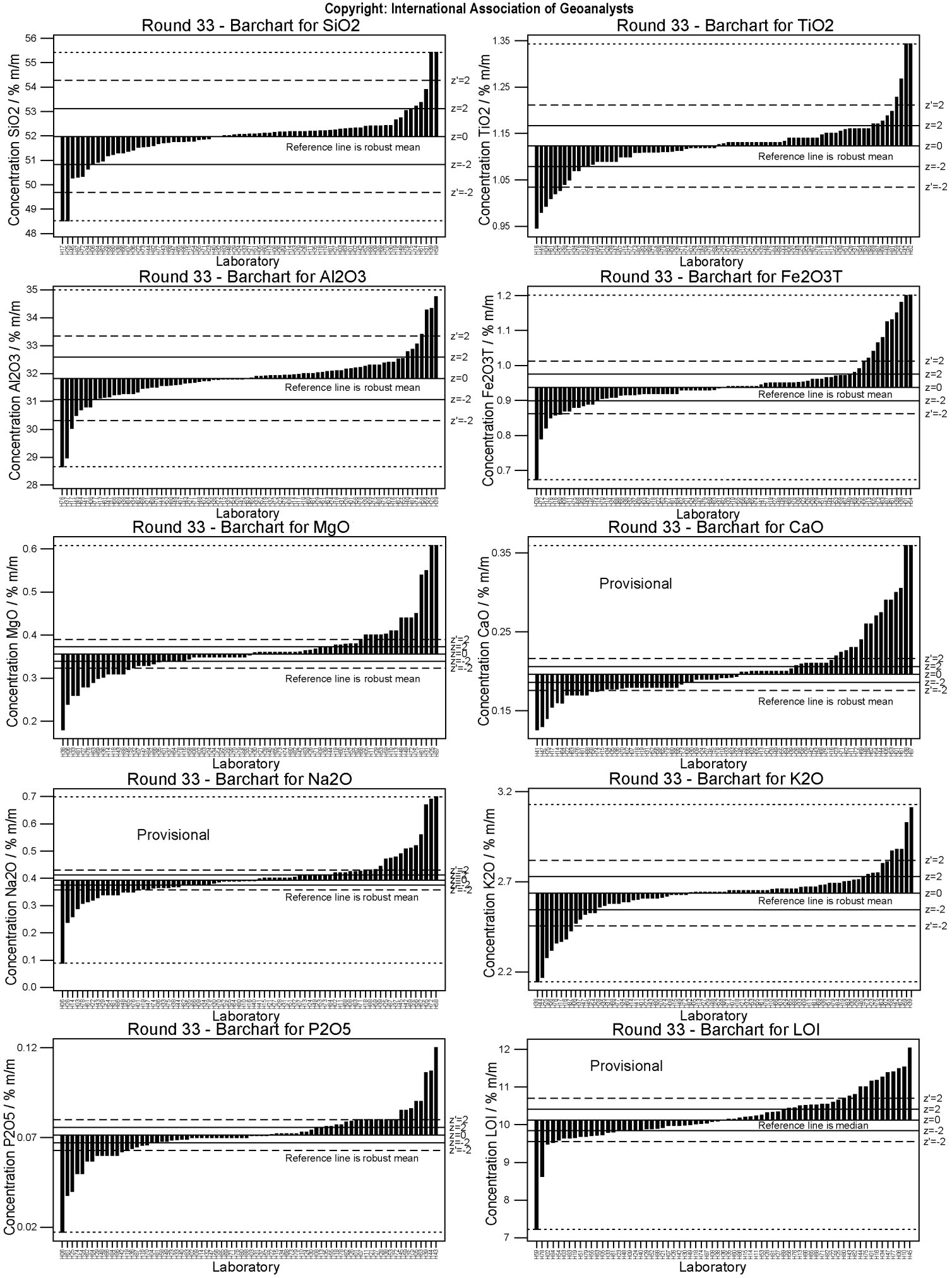

Figure 1.1: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

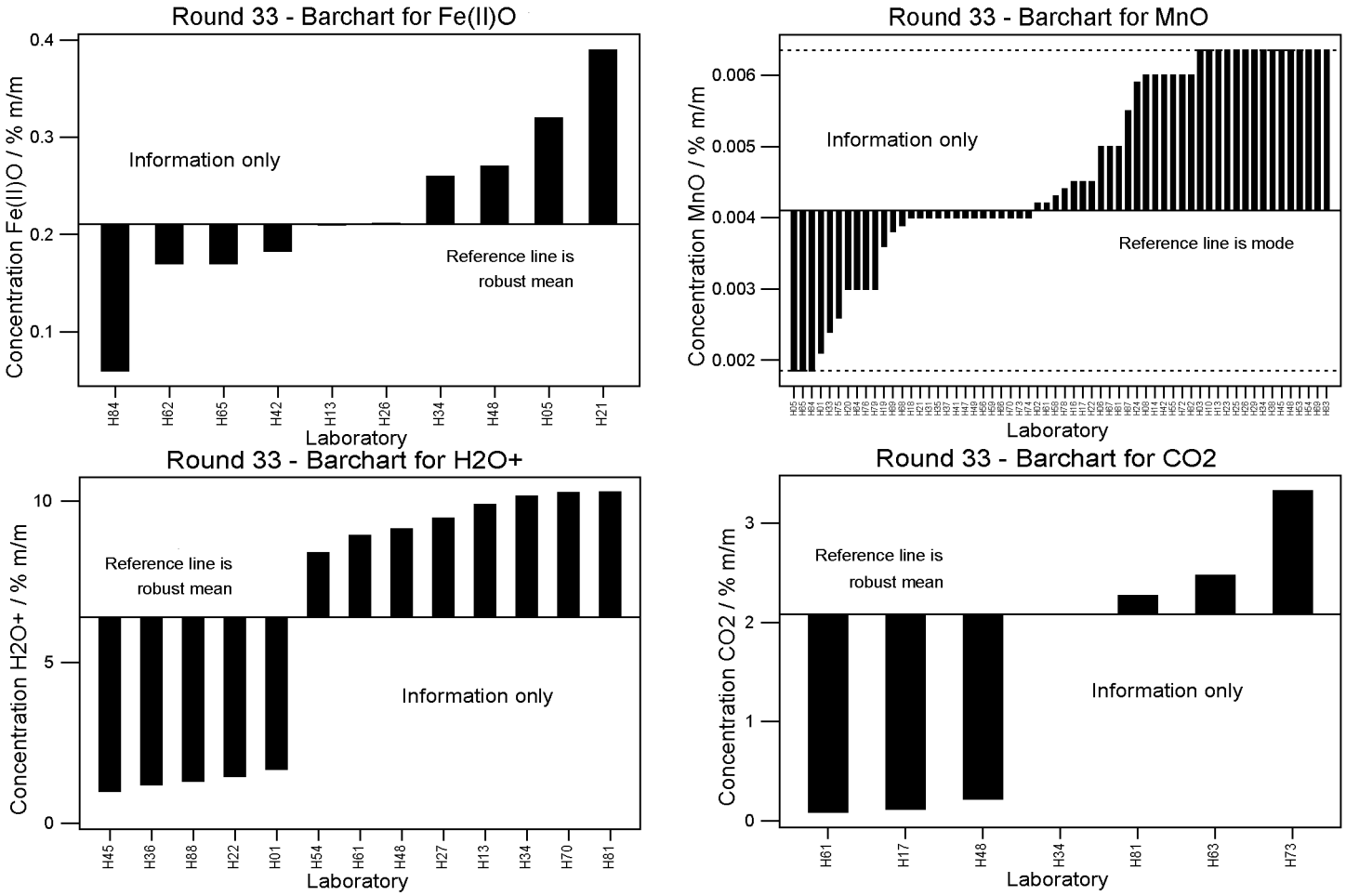

Figure 2.1: GeoPT33 – Ball clay, DBC-1. Data distribution charts for information only for elements for which values could not be assigned.

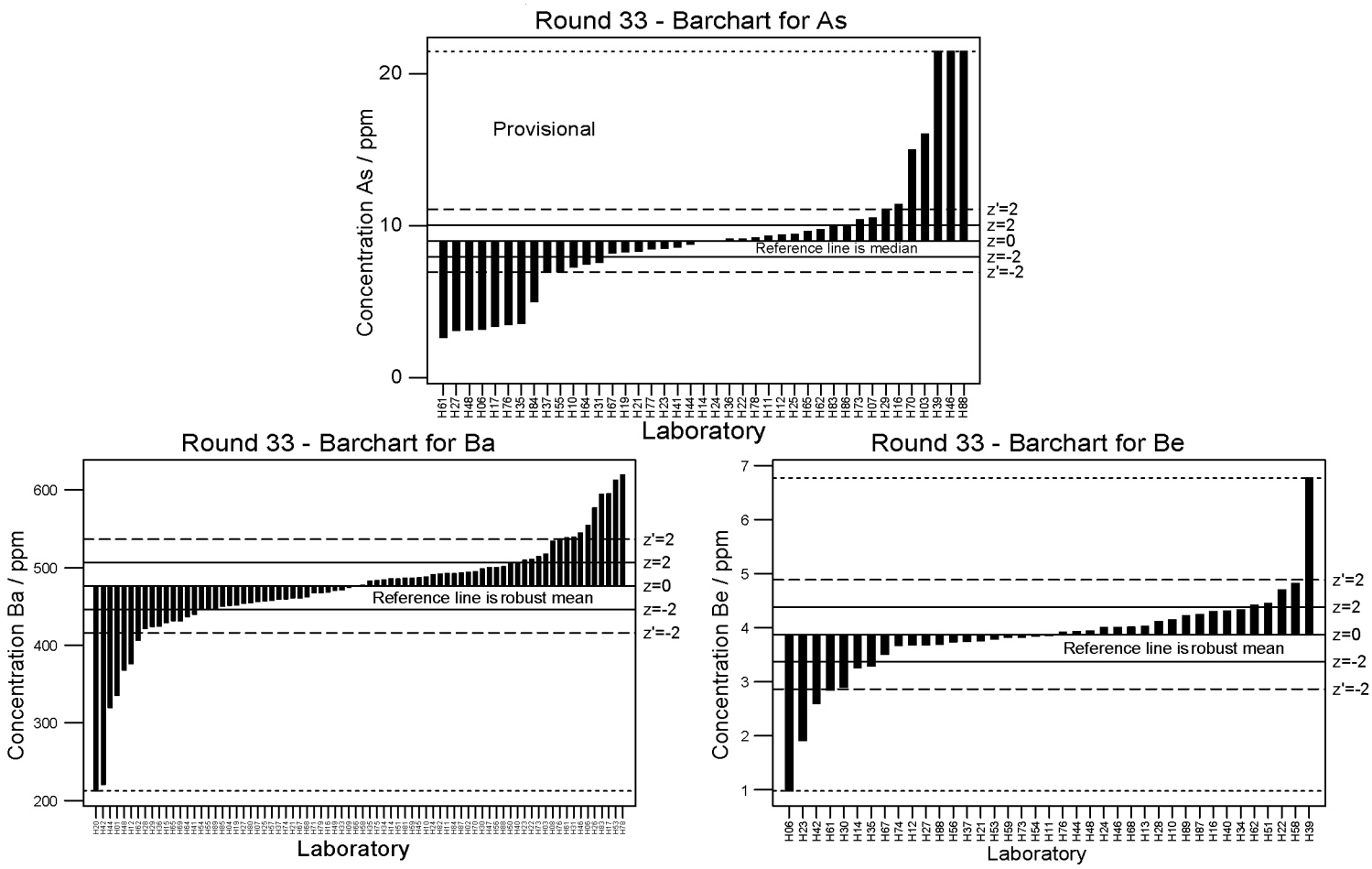

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

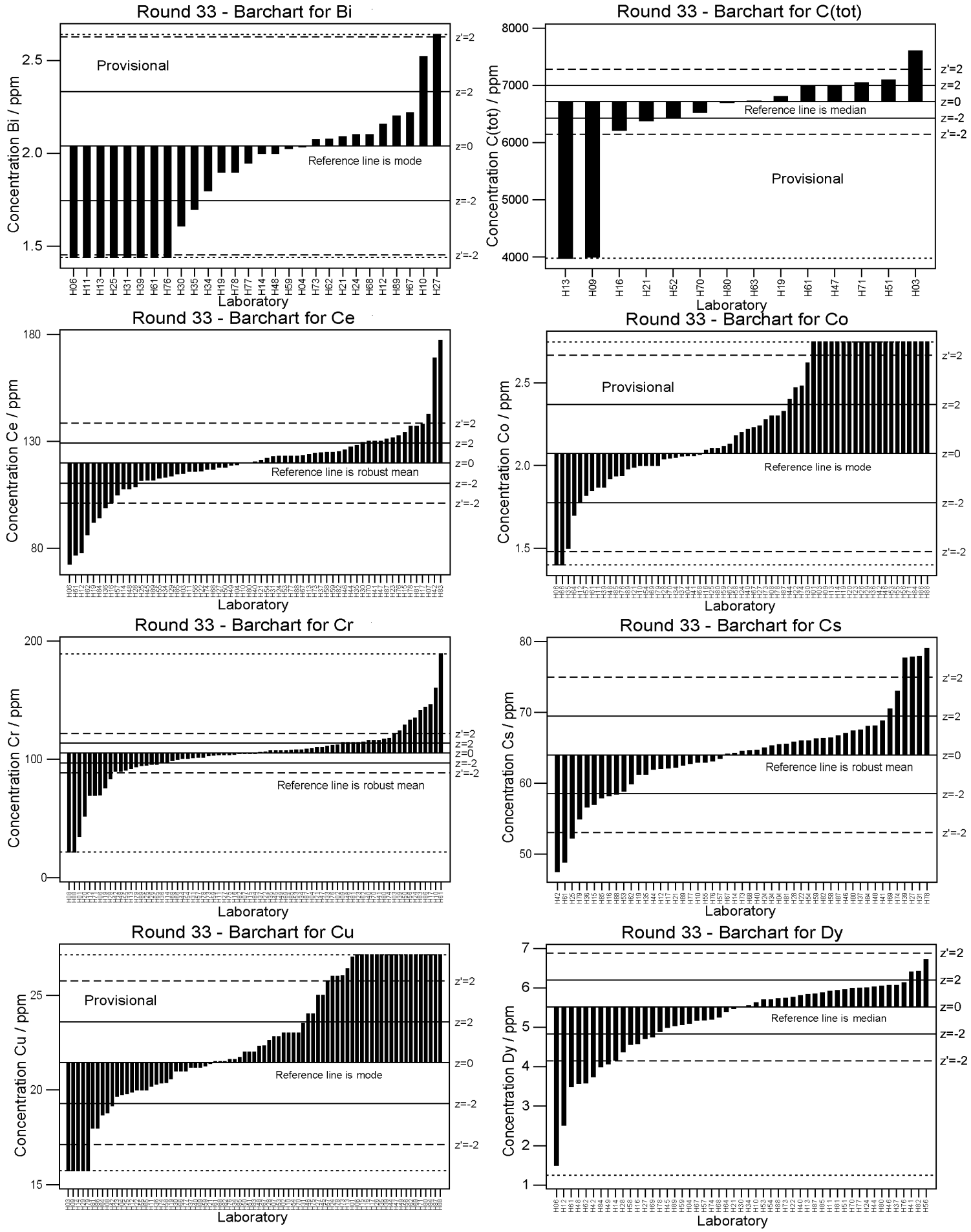

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

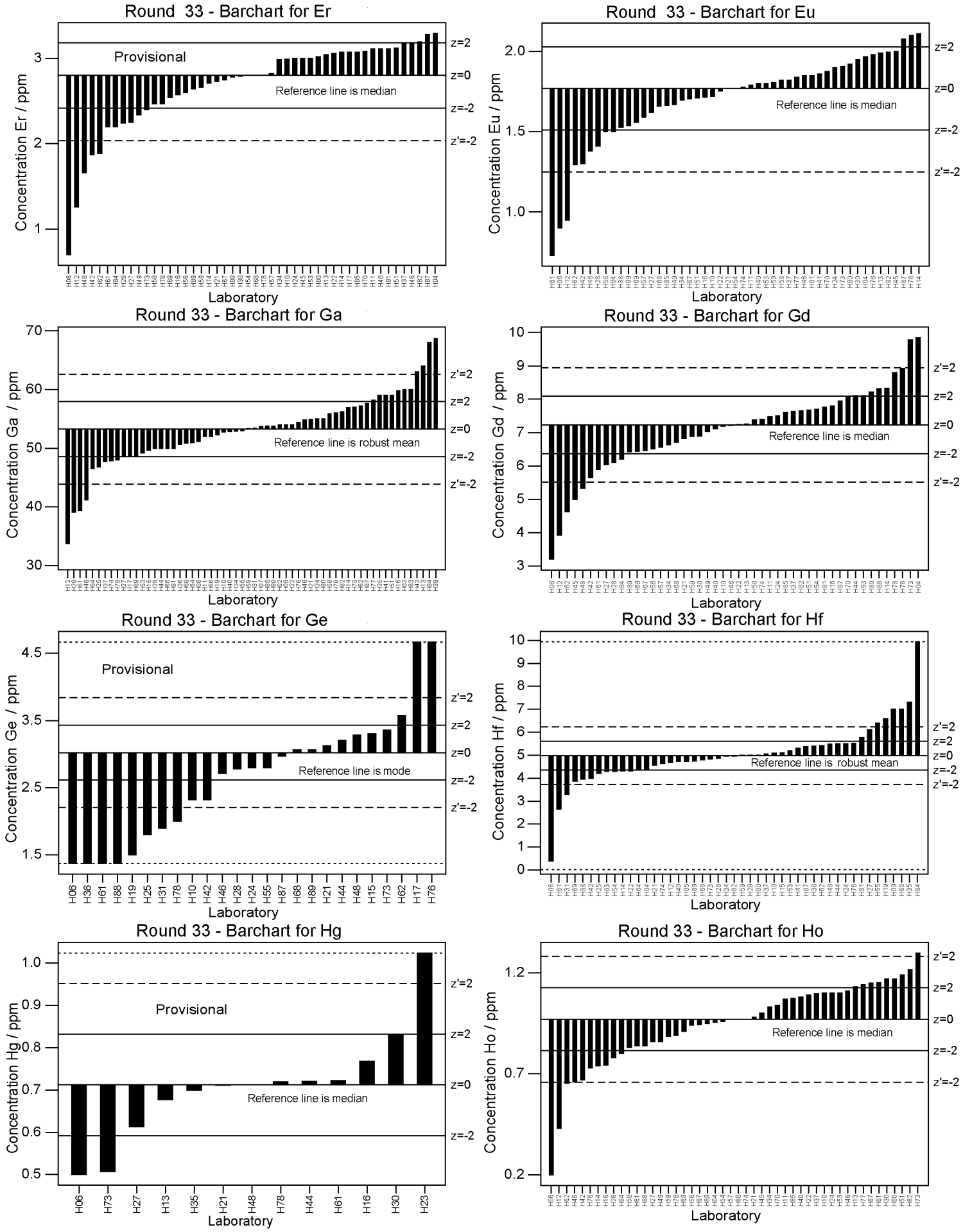

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

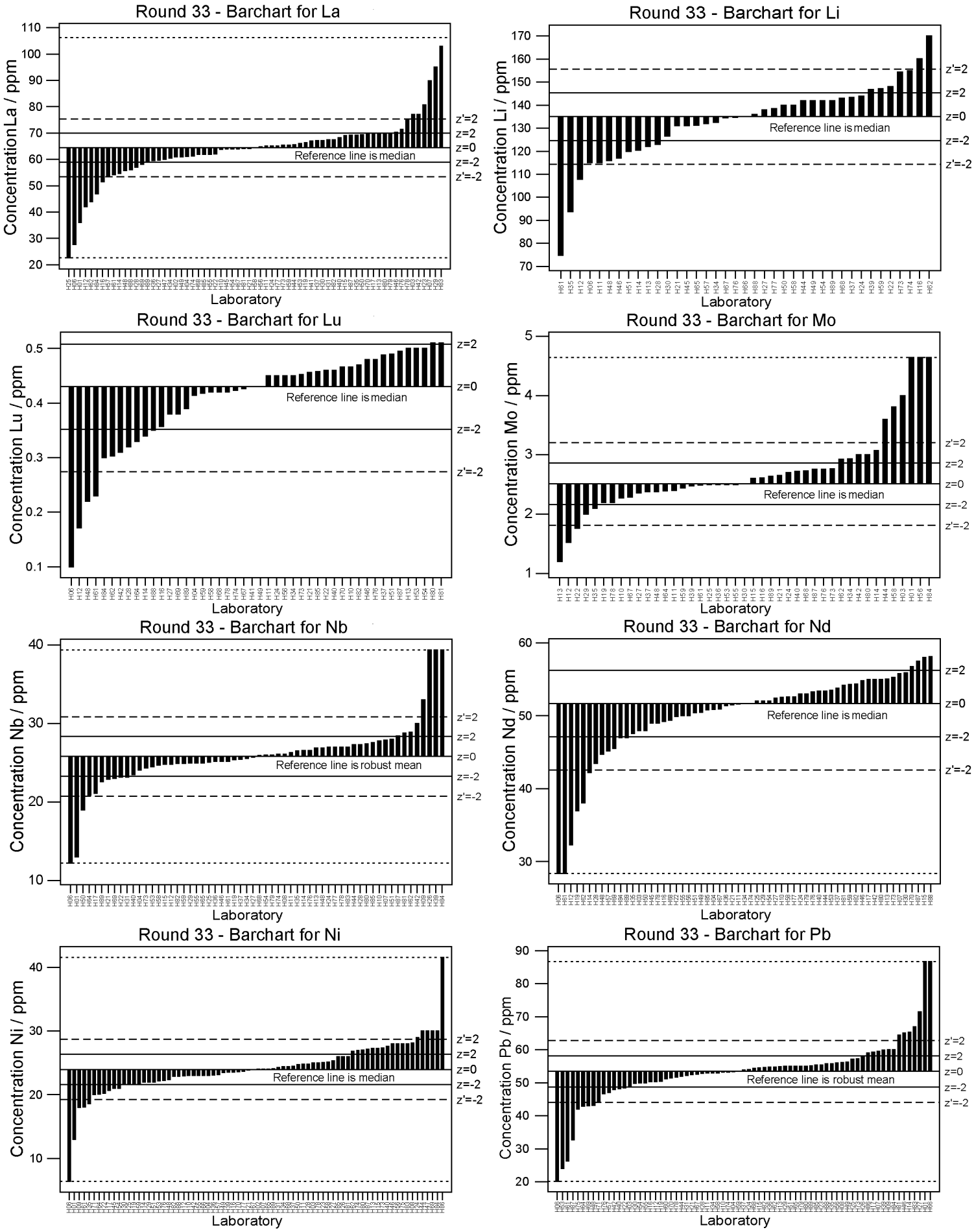

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

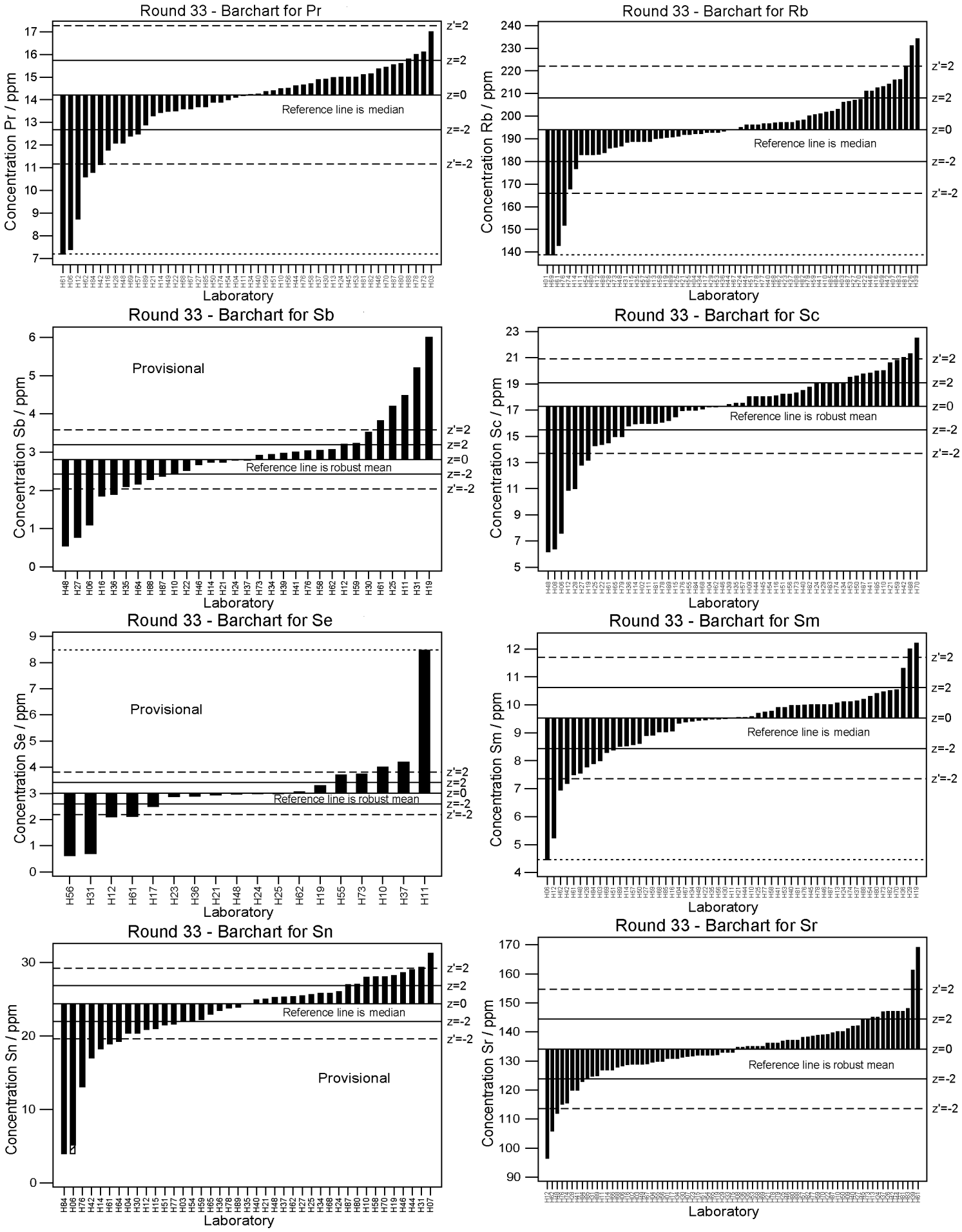

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

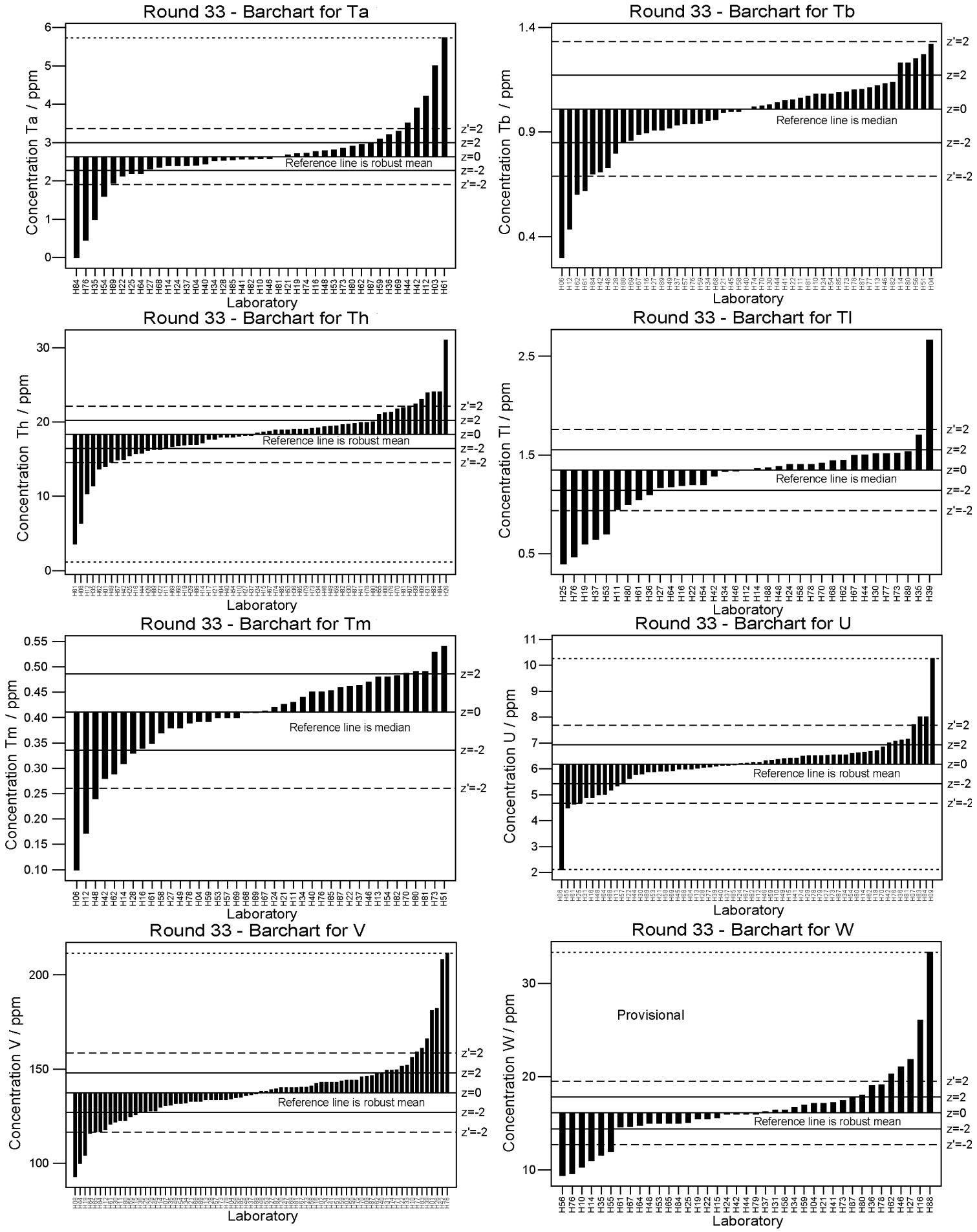

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

Copyright: International Association of Geochemists

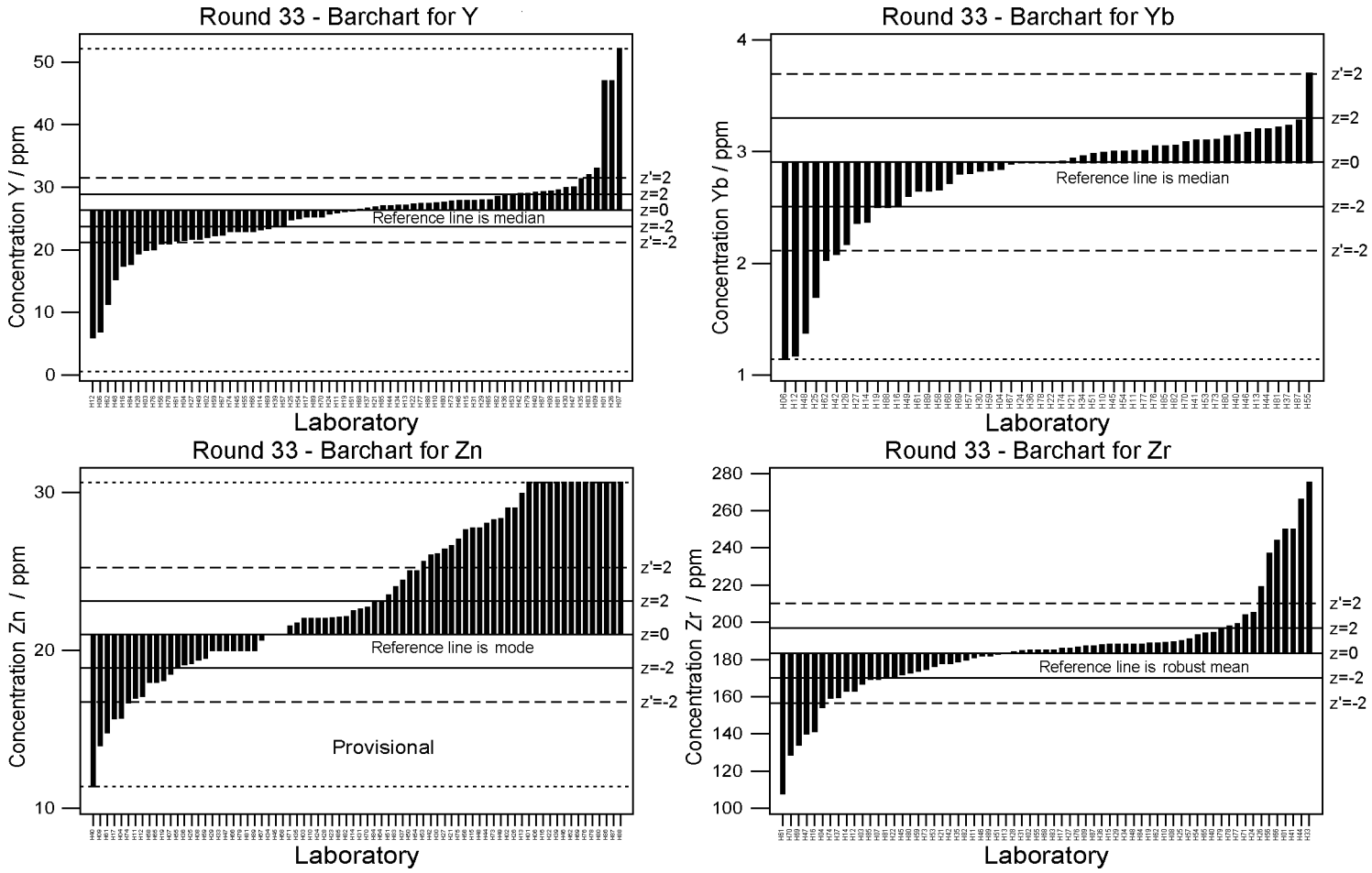

Figure 1.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

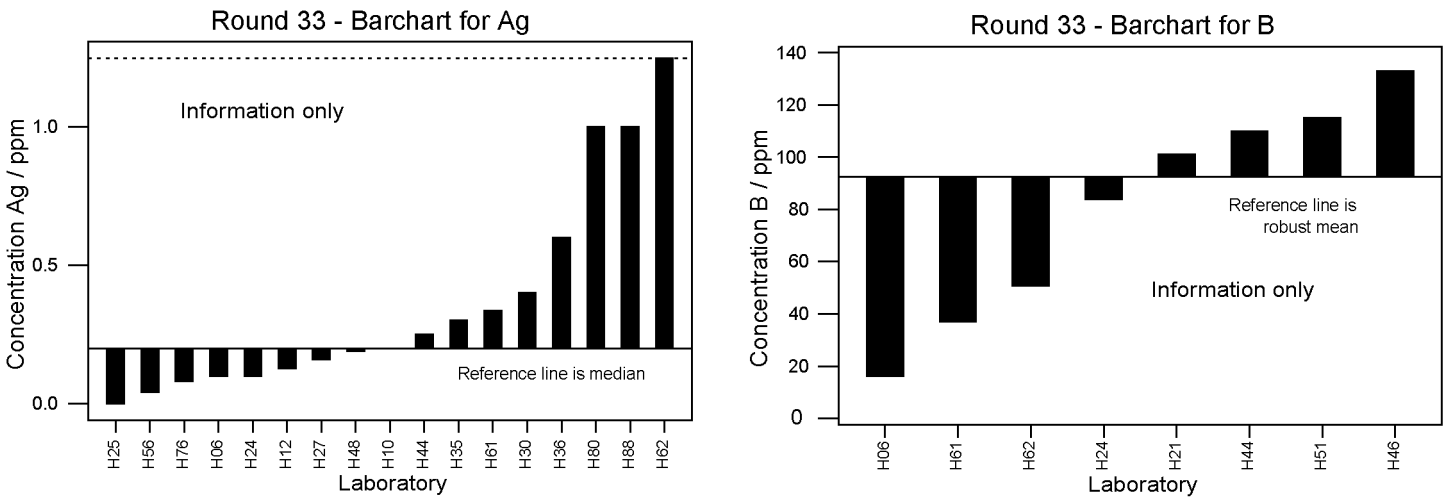

Figure 2.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for information only for elements for which values could not be assigned.

Copyright: International Association of Geochemists

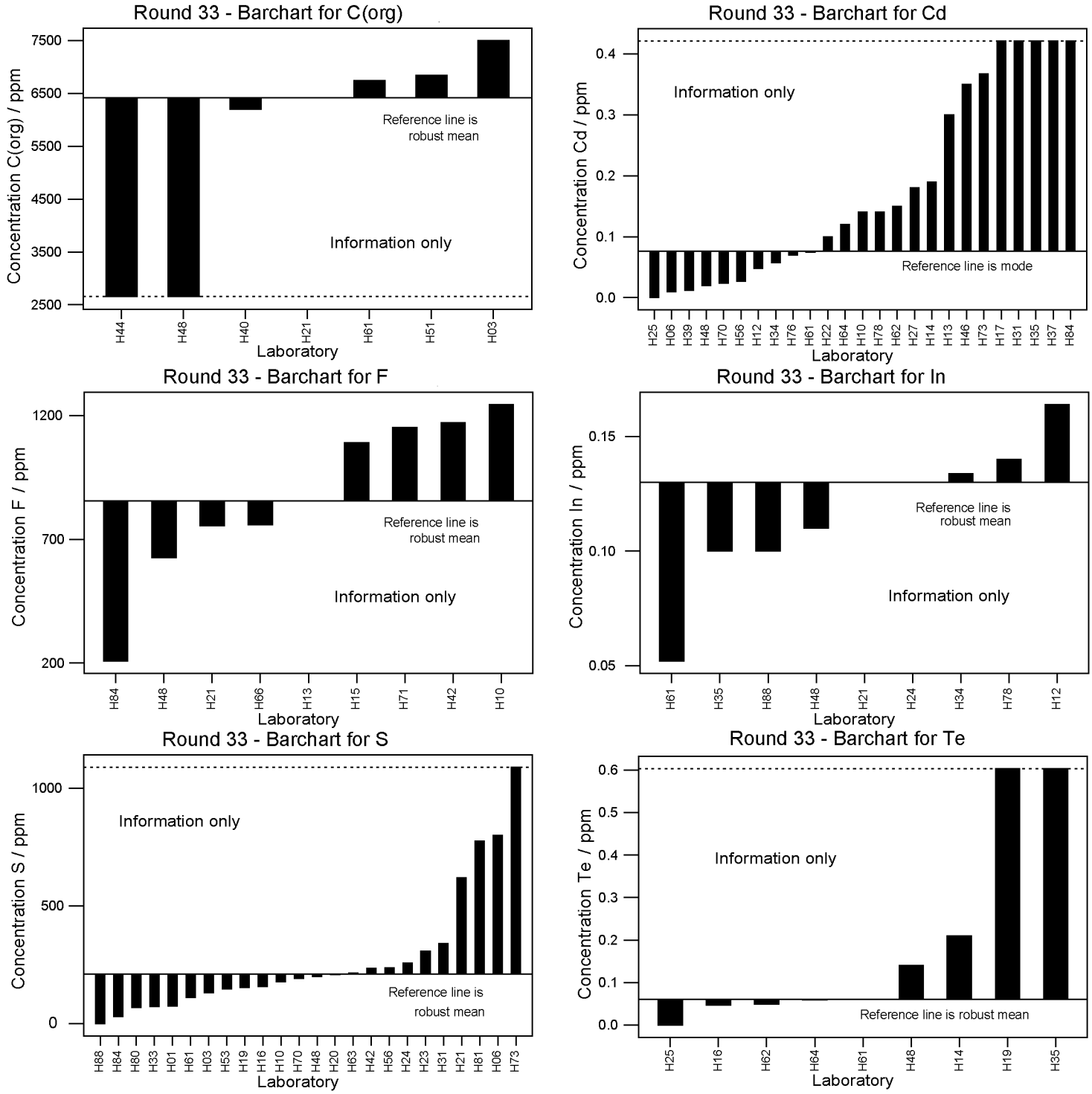

Figure 2.2: GeoPT33 – Ball clay, DBC-1. Data distribution charts for information only for elements for which values could not be assigned.

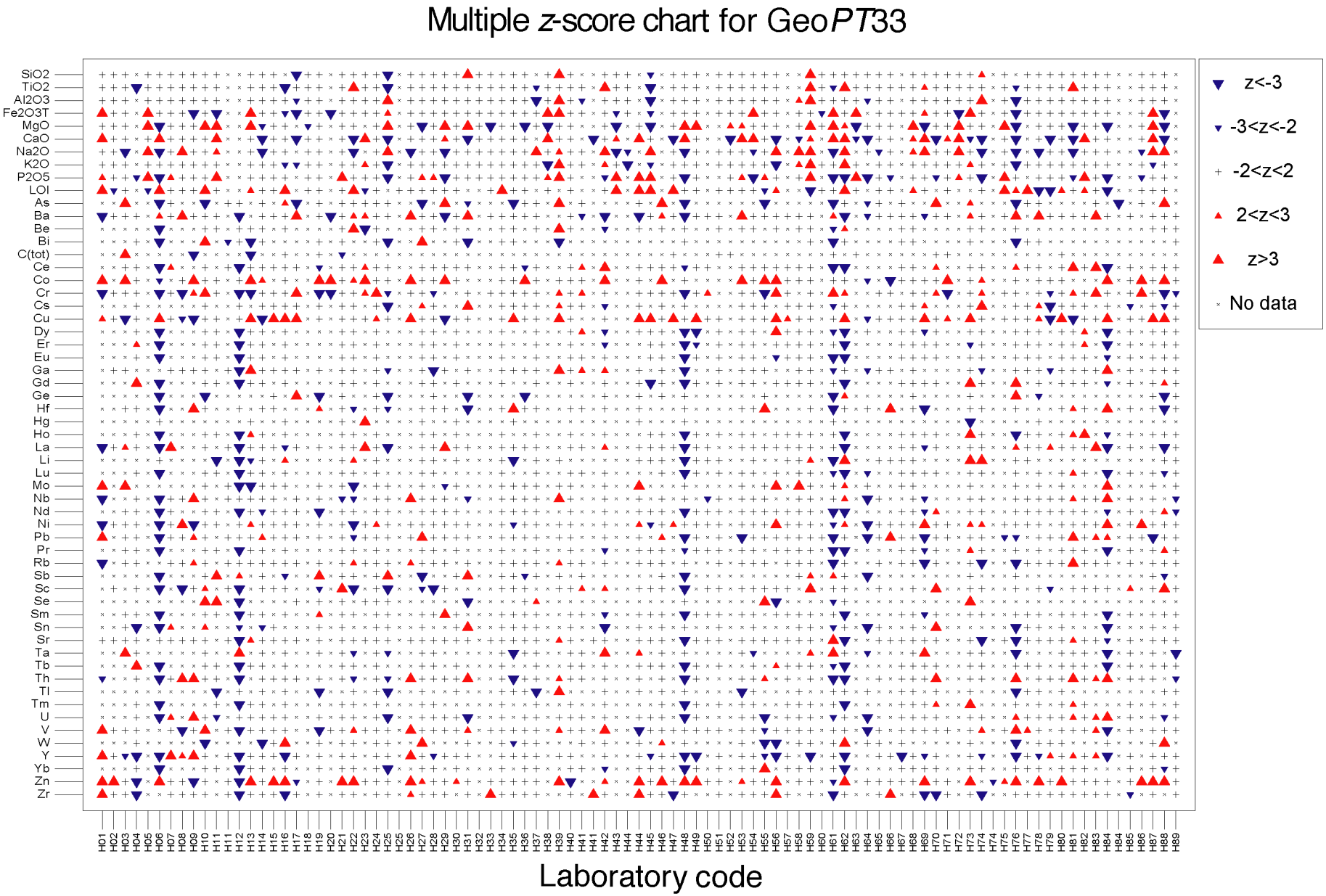

Figure 3: GeoPT33 – ball clay, DBC-1. Multiple z-score charts for laboratories participating in the GeoPT33 round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria. Satisfactory data are plotted as '+'. Data for other categories are plotted as follows: z<-3 (▼), -3<z<-2 (▾), +2<z<+3 (▴), Z>+3 (▲).