Geo*PT*40A — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 40A (Calcareous organic-rich shale, ShTX-1) / January 2017

Peter C. Webb[1]*, Michael Thompson[2], Philip J. Potts[1], Charles J. B. Gowing[3] and Stephen A. Wilson[4]

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

[2]School of Biological and Chemical Sciences, Birkbeck University of London, Malet Street, London WC1E 7HX, UK.

[3]British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, NG12 5GG, UK.

[4]U.S. Geological Survey, Box 25046, MS 964D, Denver Federal Centre, Denver, CO 80225, USA.

*Corresponding author, Peter Webb: e-mail geopt@macace.net

*Keywords: proficiency testing, quality assurance, Geo*PT*, Geo*PT*40A, Round 40A, ShTX-1, Calcareous organic-rich shale*

Abstract

Results are presented for Round 40A of the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. The test material distributed in this supplementary round of Geo*PT* was a calcareous organic-rich shale, ShTX-1, supplied by Dr Stephen Wilson of the U.S. Geological Survey. In this report, the data contributed by 99 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 fortieth 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. In circumstances where *z*-scores are unsatisfactory, a participating laboratory is encouraged to investigate for unsuspected analytical bias and to take corrective action if this appears justified.

Steering Committee for Round 40A: P.C. Webb (results coordinator), M. Thompson (statistical advisor), P.J. Potts and C.J.B. Gowing (analytical advisors), S.A. Wilson (provision of ShTX-1).

Timetable for Round 40A:
Distribution of sample: September 2016
Results submission deadline: 14th December 2016
Release of report: February 2017

Test Material details

Geo*PT*40A: The calcareous organic-rich shale test material, ShTX-1, was supplied by Dr Stephen Wilson. The test material was evaluated for homogeneity by the originator, and as a result, the sample was considered suitable for use in this proficiency test.

Submission of results

3348 results were submitted for Geo*PT*40A (ShTX-1) by 99 laboratories as listed in Table 1, where results designated as data quality 1 (see ***Z*-score analysis** section below) are shown in bold and results of data quality 2 are shown underlined. Results from all laboratories submitting data were used to assess respective assigned values. Regrettably there was one laboratory reporting 5 values of '0' (i.e. zero), for this round. We should emphasise that as stated in the ***Instructions to Analysts***, such values should not be reported. These 5 values were excluded from consideration in the data assessment process.

Assigned values

Following procedures described in earlier rounds, robust statistical procedures were used to derive assigned mass fraction values [X_a] for measurands in this test sample, these values being judged to be the best available estimates of the true composition. Values were assigned on the basis that: i) sufficient laboratories had contributed data for a measurand, and ii) visual assessment gave confidence that a substantial proportion of the results distribution was symmetrically disposed. Part of this assessment involved examining bar charts of contributed data for each measurand to judge the distribution of results (presented in Figures 1 and 2). For this round it has also been possible to view data distributions according to analytical procedure and assess the comparative quality of data obtained using different procedures.

Many datasets were normally disposed and showed remarkable symmetry with relatively little dispersion of data. Consequently, in 14 cases the robust mean was used to define an appropriate consensus value. However, many other datasets were slightly skewed and some, more severely skewed. In the majority of such cases medians provided a satisfactory estimator for defining consensus values: 27 cases in all. Where the median did not provide a symmetrical distribution of data about the consensus, the mode was preferred, and was used in 12 cases for defining a consensus.

In most cases, a mode was used as a consequence of an asymmetric distribution of results involving a high tail of highly variable data. Sometimes, but not always, the reason for the high tail was because XRF data had been reported for mass fractions close to the detection limit for the technique and measured values consequently had poor precision and accuracy. A significant proportion of XRF data was highly variable for Cr, Cs, Nb, Pb, Sc and U. Modes also provided more appropriate estimators for those major elements where significant numbers of contributed data were heavily rounded, i.e. MnO and K_2O. In seven cases, modes were sufficiently well defined by techniques appropriate for the mass fraction present to justify designation of assigned values. In the other five cases provisional status was allocated (see Table 2). The procedure used to determine the mode generally involved the estimation of the mass fraction corresponding to the maximum value of the kernel density distribution for the dataset. This provided a consensus value that represented the most coherent part of the data distribution where data were symmetrically disposed. In the case of MnO, however, the high degree of rounding of much of the contributed data prohibited the use of this procedure, but the Lientz mode (Lientz, 1969) provided a sensible solution.

Table 2 lists assigned and provisional values for 10 major components and 43 trace elements in Geo*PT*40A (ShTX-1). Bar charts for the 53 measurands of Geo*PT*40A that were judged to have satisfactory distributions for consensus values to be designated as assigned or provisional values are shown in Figure 1. These are: SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, MnO*, MgO*, CaO, K_2O, P_2O_5, LOI, As*, Ba, Be, Bi*, C(tot)*, 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, Sr, Ta*, Tb, Th, Tl, Tm, U, V, Y, Yb, Zn and Zr. Of these, provisional values were given to the 8 measurands marked '*'. Instances of provisional status were recorded because either i) a relatively small number of results contributed to the consensus, or ii) the results were unduly dispersed in relation to the target value, or iii) the distribution of values was notably skewed.

Bar charts for the 17 measurands: Fe(II)O, Na_2O, H_2O^+, CO_2, Ag, B, C(org), Cl, F, Ge, Hg, In, S, Se, Sn, Te and W are plotted in Figure 2 for information only, as the data were insufficient in number, the distribution too highly skewed or too variable for the reliable determination of a consensus for the estimation of *z*-scores. It is noteworthy that reported values for Hg and In were particularly consistent, with median values of 0.046 and 0.057 mg kg^{-1} respectively, but insufficient values were submitted to justify reporting *z*-scores.

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*40A, 1500 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*40A, 1848 results of data quality 2 were submitted.

The target standard deviation (H_a) for each measurand 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 mass fraction of the element; the factor k = 0.01 for pure geochemistry laboratories and k = 0.02 for applied geochemistry laboratories.

Z-scores were calculated for each elemental measurement submitted by each laboratory from:

$$z = [X - X_a] / H_a$$

Where X is the contributed measurement, X_a is the assigned value and H_a is the target standard deviation (all as mass fractions). *Z*-score values for results contributed to Geo*PT*40A are listed in Table 3. Results designated as data quality 1 are shown in bold: results of data quality 2 are shown underlined. *Z*-scores derived from provisional values are shown in italics.

Participating laboratories are invited to assess their performance using the following criteria:–

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 $-3<z<3$, contributing laboratories are advised to examine their procedures, and if necessary, take action to ensure that determinations are not subject to unsuspected analytical bias.

Overall performance

A summary of the overall performance of individual laboratories for this round is plotted in multiple *z*-score charts 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 Round 41, the test sample for which will be distributed during March 2017.

Acknowledgements

The authors thank Cynthia Turner for much-valued assistance in distributing this sample and Thomas Meisel for development of software which has greatly assisted the investigation of data according to analytical procedure and enabled analysis of datasets involving alternative modes as provided in the package "Modeest", which is available as an "R" package (*https://cran.r-project.org/web/packages/modeest/modeest.pdf*).

Reference

Lientz (1969) On estimating points of local maxima and minima of density functions. Nonparametric Techniques in Statistical Inference (ed. M.L. Puri, Cambridge University Press , p.275-282.

Appendix 1

Publication status of proficiency testing reports. Previous reports are available for download from the IAG website (http://www.geoanalyst.org/).

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.

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 (Calcareous organic-rich shale, 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.

Geo*PT*33
Webb, P.C., Thompson, M., Potts, P.J., Prusisz, B., and Young, K. (2013)
Geo*PT*33 - an international proficiency test for analytical geochemistry laboratories - report on round 33 / July-August 2013 (Ball Clay, DBC-1). International Association of Geoanalysts: Unpublished report.

Geo*PT*34
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2014)
Geo*PT*34 - an international proficiency test for analytical geochemistry laboratories - report on round 34 (Granite, GRI-1) / January 2014. International Association of Geoanalysts: Unpublished report.

Geo*PT*35
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2014)
Geo*PT*35 - an international proficiency test for analytical geochemistry laboratories - report on round 35 (Tonalite, TLM-1) / August 2014. International Association of Geoanalysts: Unpublished report.

Geo*PT*35A
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2014)
Geo*PT*35A - an international proficiency test for analytical geochemistry laboratories - report on round 35A (Metalliferous sediment, SdAR-H1) / August 2014. International Association of Geoanalysts: Unpublished report.

Geo*PT*36
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*36 - an international proficiency test for analytical geochemistry laboratories - report on round 36 (Gabbro, GSM-1) / January 2015. International Association of Geoanalysts: Unpublished report.

Geo*PT*36A
Webb, P.C., Thompson, M., Potts, P.J and Wilson, S. (2015)
Geo*PT*36A - an international proficiency test for analytical geochemistry laboratories - report on round 36A (Metal-rich sediment, SdAR-M2) / January 2015. International Association of Geoanalysts: Unpublished report.

Geo*PT*37
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Burnham, M. (2015)
Geo*PT*37 - an international proficiency test for analytical geochemistry laboratories - report on round 37 (Rhyolite, ORPT-1) / July 2015. International Association of Geoanalysts: Unpublished report.

Geo*PT*37A
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S. (2015)
Geo*PT*37A - an international proficiency test for analytical geochemistry laboratories - report on round 37A (Blended sediment, SdAR-L2) / July 2015. International Association of Geoanalysts: Unpublished report.

Geo*PT*38
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2016)
Geo*PT*38 - an international proficiency test for analytical geochemistry laboratories - report on round 38 (Gabbro, OU-7) / January 2016. International Association of Geoanalysts: Unpublished report.

Geo*PT*38A
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Meisel, T. (2016)
Geo*PT*38A - an international proficiency test for analytical geochemistry laboratories – special report on round 38A (Modified harzburgite, HARZ01) / June 2016. International Association of Geoanalysts: Unpublished report.

Geo*PT*39
Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2016)
Geo*PT*39 - an international proficiency test for analytical geochemistry laboratories - report on round 39 (Syenite, SyMP-1) / July 2016. International Association of Geoanalysts: Unpublished report.

Geo*PT*39A
Webb, P.C., Thompson, M., Potts, P.J, and Gowing, C.J.B. (2016)
Geo*PT*39A - an international proficiency test for analytical geochemistry laboratories - report on round 39A (Nepheline syenite, MNS-1) / July 2016. International Association of Geoanalysts: Unpublished report.

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X12	X13	X14
SiO2	g 100g^{-1}	23.82	22.8	25	31.92	**23.08**			**25.3**	**25.23**	25.7	24.9	**25.83**	**23.3**
TiO2	g 100g^{-1}	0.188	0.196	0.16	0.19				**0.2**	**0.18**	0.18	0.17	**0.16**	**0.17**
Al2O3	g 100g^{-1}	3.496	3.48	3.9	5.67	**4.15**			**4**	**4.06**	3.88	3.97	**4.06**	**3.93**
Fe2O3T	g 100g^{-1}	1.396	1.76	1.5	1.57	**2.234**			**1.6**	**1.83**	1.57	1.6	**1.72**	**1.61**
Fe(II)O	g 100g^{-1}								**0.33**					
MnO	g 100g^{-1}	0.012	0.012		0.011	**0.008**			**0.01**	**0.01**		0.012	**0.01**	**0.02**
MgO	g 100g^{-1}	0.352	0.296	0.4	0.4	**2.34**			**0.5**	**0.36**	0.4	0.4	**0.44**	**0.28**
CaO	g 100g^{-1}	35.182	34.9	34	35.83	**31.15**			**34.7**	**31.71**	32.2	32.87	**32.55**	**33.8**
Na2O	g 100g^{-1}	0.02	0.045		0.04	**0.42**			**0.02**	**0.01**		0.07	**0.03**	**0.02**
K2O	g 100g^{-1}	0.283	0.33	0.33	0.31	**0.72**			**0.4**	**0.34**	0.39	0.25	**0.35**	**0.17**
P2O5	g 100g^{-1}	0.093	0.088						**0.1**	**0.08**	0.096	0.09	**0.11**	**0.08**
H2O+	g 100g^{-1}										5.35			
CO2	g 100g^{-1}													
LOI	g 100g^{-1}	31.09	32.41	31.64	28.4	**31.29**	31.85		**31.5**	**32.09**	31.2	31.68	**32**	**31.58**
Ag	mg kg^{-1}			0.2	0.034				**0.8**		0.6			
As	mg kg^{-1}	15.1		16.2	12.13			17	**16.9**	**17**	13	15	**14**	**4**
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}	57.7		74.2				66	**79.5**	**83**	81	71	**40**	
Be	mg kg^{-1}			0.91					**1.07**		1			
Bi	mg kg^{-1}	0.9		0.28	0.133				**0.2**		0.44			
Br	mg kg^{-1}													
C(org)	mg kg^{-1}										4.33			
C(tot)	mg kg^{-1}										11.5			
Cd	mg kg^{-1}			2.21	1.67				**0.39**		2.16	1.7		
Ce	mg kg^{-1}	35.1		23.7	21.3				**26.2**	**30**	20.2	25	**19**	
Cl	mg kg^{-1}													
Co	mg kg^{-1}	7.4		6.3	5.69				**6.5**	**8**	9.1	7	**4**	
Cr	mg kg^{-1}	24.1	125.2	29	43.9			26	**36.9**	**27**	28	29	**26**	
Cs	mg kg^{-1}	8.6							**3.3**	**8**	5.17	3		
Cu	mg kg^{-1}	29.5	44.07	37.1	31.53			27	**37.4**	**29**	39.1	28	**20**	**24**
Dy	mg kg^{-1}			1.68	1.376				**1.9**		1.51			
Er	mg kg^{-1}			0.99	0.816				**1**		1.03			
Eu	mg kg^{-1}			0.44	0.39				**0.5**		0.47			
F	mg kg^{-1}												**247**	
Ga	mg kg^{-1}	5		6.7	6.2				**7**	**5**	7	6	**10**	**5**
Gd	mg kg^{-1}			2.05	1.67				**2**		1.91			
Ge	mg kg^{-1}				0.406				**0.2**					
Hf	mg kg^{-1}			1.3	0.975				**1.1**		1.06			
Hg	mg kg^{-1}													
Ho	mg kg^{-1}			0.36	0.304				**0.4**		0.31			
I	mg kg^{-1}	3.6												
In	mg kg^{-1}										0.04			
La	mg kg^{-1}	14.5		12.8	12.3				**14.4**	**4**	4.7	13	**12**	
Li	mg kg^{-1}			26.4							30			
Lu	mg kg^{-1}			0.17	0.124				**0.15**		0.14			
Mo	mg kg^{-1}	43.2	0.006	52.2	47.8				**50**	**39**	42.2	44		**50**
Nb	mg kg^{-1}	4.6		5.7	4.42				**6.2**	**5**	6.6	5	**43**	**8**
Nd	mg kg^{-1}	14.1		10.8	10.24				**11.6**	**6**	7.5	11	**8**	
Ni	mg kg^{-1}	65	72.7	82.5	64.37			68	**78.3**	**65**	114	69	**90**	**57**
Pb	mg kg^{-1}	1.5		6.5	4.41				**5.3**	**19**	18	6	**2**	**2**
Pd	mg kg^{-1}													
Pr	mg kg^{-1}			2.82	2.43				**3.1**		3.12			
Pt	mg kg^{-1}													
Rb	mg kg^{-1}	17	0.002	16.6	13.25			16	**17.1**	**20**	17.6	16	**17**	**19**
Re	mg kg^{-1}			0.153										
Rh	mg kg^{-1}													
S	mg kg^{-1}		13800	1.72	18531				**16400**		1.67	11200	**15202**	
Sb	mg kg^{-1}	5		3.48	2.04				**3.5**		2.91	2.8		
Sc	mg kg^{-1}	5.7		3.7	4.25				**23.3**		3.5		**14**	
Se	mg kg^{-1}	5.5									7	5		
Sm	mg kg^{-1}	6.8		2.21	1.75				**2.1**		2.5			
Sn	mg kg^{-1}	1.4			1.31				**0.8**		1.2	0.7		
Sr	mg kg^{-1}	938.2		1085	1072			940	**1160**	**966**	1160	970	**773**	**979**
Ta	mg kg^{-1}				0.226				**0.3**		0.6			
Tb	mg kg^{-1}			0.28	0.237				**0.3**		0.33			
Te	mg kg^{-1}	3.8									0.31			
Th	mg kg^{-1}	3.5		2.62	1.856				**2.3**	**5**	3.9	2		
Tl	mg kg^{-1}	1.7		2.93							2.9	3		
Tm	mg kg^{-1}			0.16	0.118						0.14			
U	mg kg^{-1}	12.4		8.55	8.16			12	**10**	**10.5**	9.5	10		**16**
V	mg kg^{-1}	348.6	0.057	483	434.9			376	**466**	**411**	450	407	**207**	
W	mg kg^{-1}	0.4			12.36				**0.8**	**4**	0.4			**1**
Y	mg kg^{-1}	9.5		9.5	7.85			11	**8.7**	**10**	9.9	10	**7**	**12**
Yb	mg kg^{-1}	0.7		1.07	0.835				**1**		1.1	2		
Zn	mg kg^{-1}	89.8		112	56.6			89	**103**	**90**	109	91	**103**	**91**
Zr	mg kg^{-1}	46.1	0.005	56	44.4			60	**46**	**49**	50.6	53		**95**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X15	X16	X17	X18	X21	X22	X23	X24	X25	X26	X29	X31	X32
SiO2	$g\,100g^{-1}$	**26.81**	**25.1**	**24.25**	25.1	25.22	**24.6**	25.503	**25.18**	25	**25.28**	26.587	25.26	
TiO2	$g\,100g^{-1}$	**0.17**	**0.16**	**0.167**	0.17	0.167	**0.17**	0.18	**0.175**	0.18	**0.18**	0.14	0.17	
Al2O3	$g\,100g^{-1}$	**4.24**	**3.7**	**3.82**	3.83	4.61	**3.92**	4.076	**4.002**	3.96	**4.02**	4.394	4.02	
Fe2O3T	$g\,100g^{-1}$	**1.7**	**1.53**	**1.62**	1.48	1.55	**1.64**	1.688	**1.577**	1.62	**1.61**	1.437	1.64	
Fe(II)O	$g\,100g^{-1}$	**0.14**	**0.39**											
MnO	$g\,100g^{-1}$	**0.005**	**0.01**	**0.016**	0.02	0.011	**0.004**	0.014	**0.014**	0.013	**0.01**	0.015	0.016	
MgO	$g\,100g^{-1}$	**0.37**	**0.45**	**0.39**	0.29	0.405	**0.39**		**0.479**	0.55	**0.49**	0.586	0.39	
CaO	$g\,100g^{-1}$	**34.29**	**31.58**	**32.18**	32.6	32.38	**33.18**	34.04	**32.735**	33.05	**32.62**	35.435	32.95	
Na2O	$g\,100g^{-1}$	**0.016**	**0.19**		0.03	0.055	**0.31**	0.07	**0.048**	0.04	**0.08**	0.027	0.03	
K2O	$g\,100g^{-1}$	**0.35**	**0.34**	**0.33**	0.35	0.326	**0.68**	0.339	**0.319**	0.33	**0.33**	0.358	0.3	
P2O5	$g\,100g^{-1}$	**0.1**	**0.097**	**0.096**	0.11	0.096	**0.38**	0.097	**0.096**	0.099	**0.1**	0.145	0.1	
H2O+	$g\,100g^{-1}$				4.43						**0.75**			
CO2	$g\,100g^{-1}$				24.6	24.8		28.67		24.15				
LOI	$g\,100g^{-1}$	**31.61**	**32.85**	**32.14**	31.65	32.7	**31.5**		**31.48**	31.53	**34.59**	30.912	**31.16**	
Ag	$mg\,kg^{-1}$		**0.25**											
As	$mg\,kg^{-1}$	**7.85**	**12.07**			20.8	**8.13**		**12.8**	15		12		
Au	$mg\,kg^{-1}$													
B	$mg\,kg^{-1}$													
Ba	$mg\,kg^{-1}$	**83.5**	**123**	**62.9**	69	70.4		91	64.19	59		28		**84**
Be	$mg\,kg^{-1}$	**1.02**	**1.1**		1.01	1.03			1.017					**1.03**
Bi	$mg\,kg^{-1}$	**0.23**										10		**0.31**
Br	$mg\,kg^{-1}$													
C(org)	$mg\,kg^{-1}$					51430		117920.000		53300				
C(tot)	$mg\,kg^{-1}$					119100.000		39670	119000.000	119200.000	**11.76**			
Cd	$mg\,kg^{-1}$	**1.98**	**2**			2.4	**3.08**							**1.04**
Ce	$mg\,kg^{-1}$	**28.4**	**20.1**	**17.8**	**25**	25.25			23.467	31				**27.26**
Cl	$mg\,kg^{-1}$					100	**138.610**			130				
Co	$mg\,kg^{-1}$	**6.1**	**4.4**	7	6.5	6.16			5.276	1				**0.71**
Cr	$mg\,kg^{-1}$	**29.6**	**28**	**60**	31	26.3		44	28.18	25		125		**36.19**
Cs	$mg\,kg^{-1}$	**4.21**		**2.59**	3.3				2.133					**4.43**
Cu	$mg\,kg^{-1}$	**34.4**	**32**	**39**	36	34.3	**15.8**	40	33.64	33				**36.74**
Dy	$mg\,kg^{-1}$	**1.52**	**1.93**	**1.17**	**1.69**	1.77			1.693					**1.86**
Er	$mg\,kg^{-1}$	**0.94**	**0.98**	**0.67**	**0.98**	1.04			0.959					**1.16**
Eu	$mg\,kg^{-1}$	**0.45**	**0.475**	**0.35**	**0.45**	0.48			0.455					**0.52**
F	$mg\,kg^{-1}$			944		475				550				
Ga	$mg\,kg^{-1}$	**6.27**			6.2				6.553	8				**7.07**
Gd	$mg\,kg^{-1}$	**2.06**	**2.9**	**1.35**	**1.96**	2.01			1.966					**2.24**
Ge	$mg\,kg^{-1}$	**0.051**							0.216					
Hf	$mg\,kg^{-1}$	**0.94**		**0.8**	1.2	3.41			1.096	2				**1.44**
Hg	$mg\,kg^{-1}$													**0.043**
Ho	$mg\,kg^{-1}$	**0.31**	**0.45**	**0.23**	**0.34**	0.362			0.324					**0.41**
I	$mg\,kg^{-1}$													
In	$mg\,kg^{-1}$	**0.046**												
La	$mg\,kg^{-1}$	**14.3**	**15.76**	**11.6**	**14.1**	13.73			13.19	25				**14.99**
Li	$mg\,kg^{-1}$	**23**			25.8	28.2			23.76					**26.84**
Lu	$mg\,kg^{-1}$	**0.15**	**0.15**	**0.1**	**0.15**	0.158			0.144					**0.18**
Mo	$mg\,kg^{-1}$	**51.7**	**45.4**		52	49.5	**62.45**		**47.6**			44		**54.5**
Nb	$mg\,kg^{-1}$	**6.38**		**5.42**	5.9	9			5.52	10				**7.27**
Nd	$mg\,kg^{-1}$	**11.3**	**11.72**	**8.4**	**10.9**	11.3			10.83	11				**12.31**
Ni	$mg\,kg^{-1}$	**76.5**	**87.1**	**86**	75	76.6	**33.19**	99	71.71	72				**84.06**
Pb	$mg\,kg^{-1}$	**8.3**	**6**	**3.82**	6.5	5.3	**8.82**	26	5.371	10				**6.73**
Pd	$mg\,kg^{-1}$						**0.79**							
Pr	$mg\,kg^{-1}$	**2.89**	**2.72**	**2.36**	**2.96**	2.99			2.835	7				**3.49**
Pt	$mg\,kg^{-1}$													
Rb	$mg\,kg^{-1}$	**17.9**	**11.14**	**15.1**	18.5	18			17.64	12				**14.8**
Re	$mg\,kg^{-1}$													
Rh	$mg\,kg^{-1}$													
S	$mg\,kg^{-1}$		**15000**	**17820**		17905	**1.49**		15860	12891				
Sb	$mg\,kg^{-1}$	**3.17**	**1.6**			3.29	**14.82**		3.8			11		**3.53**
Sc	$mg\,kg^{-1}$	**3.6**	**2.8**	**3.2**	3.6	3.09			4.79					
Se	$mg\,kg^{-1}$	**0.12**	**4.25**				**12.76**							
Sm	$mg\,kg^{-1}$	**2.14**	**2.25**	**1.52**	**2.04**	2.17			2.108	5				**2.23**
Sn	$mg\,kg^{-1}$	**1.05**			0.93									**0.98**
Sr	$mg\,kg^{-1}$	**880**	**860**	**874**	1010	1030		970	1107	1042		634		**950.2**
Ta	$mg\,kg^{-1}$	**0.44**		0.96	0.4	0.702			0.261					**0.39**
Tb	$mg\,kg^{-1}$	**0.31**	**0.51**	**0.2**	**0.3**	0.302			0.266					**0.35**
Te	$mg\,kg^{-1}$	**0.057**	**0.2**				**0.3**							
Th	$mg\,kg^{-1}$	**3.07**		**1.82**	2.75	3.17			2.713					**3.23**
Tl	$mg\,kg^{-1}$	**2.87**			2.86									
Tm	$mg\,kg^{-1}$	**0.15**	**0.19**	**0.11**	**0.15**	0.153			0.134					**0.17**
U	$mg\,kg^{-1}$	**9.94**		**6.65**	8.9	9.32			8.7					**10.16**
V	$mg\,kg^{-1}$	**439**	**410**	**492**	450	401		354	425	421		279		**509.510**
W	$mg\,kg^{-1}$	**0.37**		0.2	0.49									**0.54**
Y	$mg\,kg^{-1}$	**9.73**	**11**	**9**	9.8	10.03			9.394	10		7		**10.31**
Yb	$mg\,kg^{-1}$	**0.99**	**1**	**0.68**	**0.99**	1.02			0.995					**1.21**
Zn	$mg\,kg^{-1}$	**100**	**117**	**109**	93	103	**44.5**	128	72.06	97				**121.580**
Zr	$mg\,kg^{-1}$	**61.3**		**41.7**	48	110		70	45.92	61				**58.94**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X33	X34	X35	X36	X37	X38	X41	X43	X45	X46	X47	X48	X49
SiO2	g 100g^{-1}		24.92	25.29	25.2	25.13		24.511	25.03	29.17	25.32	26.03	20.11	
TiO2	g 100g^{-1}		0.18	0.176		0.18	0.165		0.175	0.175	0.17	0.18	0.36	
Al2O3	g 100g^{-1}		4.09	4.07	4.2	4.129	4.065		4.03	4.53	4	4.1	4.43	
Fe2O3T	g 100g^{-1}		1.63	1.68	1.71	1.653	1.363		1.63	1.47	1.65	1.65	2.13	
Fe(II)O	g 100g^{-1}									0.7				
MnO	g 100g^{-1}			0.015			0.011		0.012	0.008	0.01	0.02	0.02	
MgO	g 100g^{-1}		0.41	0.442		0.403	0.441		0.44	0.62	0.37	0.61	0.7	
CaO	g 100g^{-1}		32.49	33.79	33	33.649	30.86		32.65	31.64	32.21	33.92	40.16	
Na2O	g 100g^{-1}		0.06	0.008					0.047	0.14	0.05	0.15	0.07	
K2O	g 100g^{-1}		0.28	0.338		0.346	0.1		0.34	0.32	0.34	0.29	0.39	
P2O5	g 100g^{-1}		0.11	0.101		0.098	0.013		0.098	0.089	0.1	10	0.09	
H2O+	g 100g^{-1}						0.91							
CO2	g 100g^{-1}													
LOI	g 100g^{-1}		31.3	32.93	32.5	31.37		31.614	31.31	31.6	32.53	32.07	31.51	
Ag	mg kg^{-1}			0.198						0.338	0.14			
As	mg kg^{-1}			15.272						11.963	16			12.815
Au	mg kg^{-1}													
B	mg kg^{-1}									14.132				
Ba	mg kg^{-1}		61.01	79.134		72.4			68.9	76.931	76		20	70.959
Be	mg kg^{-1}			1.097		1	1		0.98	0.766	0.9			0.816
Bi	mg kg^{-1}			0.216			0.25			0.213				
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}										126900.000			
Cd	mg kg^{-1}			1.738			2.1			1.505	1.86			
Ce	mg kg^{-1}	44.3	18.29	23.164		22.93	23.12		24.3	22.651	24.8		22.91	23.486
Cl	mg kg^{-1}													
Co	mg kg^{-1}			8.301		6.11	5.29		6.29	6.558	5.92		87	
Cr	mg kg^{-1}		24.76	40.703		32.3			29.2	24.951	30.5		43	
Cs	mg kg^{-1}			3.402		2.91	2.99		3.08	3.254			2.82	2.627
Cu	mg kg^{-1}			38.833		32.6	38.96		33.5	24.122	32.2		25	30.967
Dy	mg kg^{-1}	2.13	1.62	1.644		1.53	1.59		1.68	1.796	1.77		1.36	1.576
Er	mg kg^{-1}	1.15	0.959	0.969		0.92	0.92		0.99	1.092	1.04		0.84	0.890
Eu	mg kg^{-1}		0.453	0.473		0.43	0.44		0.46	0.482	0.45		0.42	0.405
F	mg kg^{-1}							552						
Ga	mg kg^{-1}		6.41	6.193		6.24	5.69		6.36	5.458	5.61		5.44	
Gd	mg kg^{-1}	6.96	2.273	1.903		1.71	1.97		1.91	2.115	1.94		1.73	1.807
Ge	mg kg^{-1}									0.154			4.46	
Hf	mg kg^{-1}		1.989	1.202		1.1			1.19	1.192			0.89	1.095
Hg	mg kg^{-1}													
Ho	mg kg^{-1}		0.291	0.341			0.31		0.34	0.368	0.36		0.28	0.309
I	mg kg^{-1}													
In	mg kg^{-1}													
La	mg kg^{-1}	43.9	13.743	12.831		12.55	12.51		13.5	12.466	13.5		13.52	12.649
Li	mg kg^{-1}			26.236			24.86		21.3	23.286	21.5			21.133
Lu	mg kg^{-1}		0.04	0.149			0.127		0.15	0.154	0.16		0.12	0.134
Mo	mg kg^{-1}		34.19	61.315		45.2	45.61		47.8	44.701	48.6			
Nb	mg kg^{-1}		7.501	6.131		5.11			6.08	5.354	5.05		6	6.482
Nd	mg kg^{-1}	16.5	11.232	10.587		10.3	10.44		11	11.362	11.5		9.47	10.309
Ni	mg kg^{-1}		54.37	87.286		75.9	79.63		83.2	67.793	76.7		71	
Pb	mg kg^{-1}		8.67	5.864					6.1	5.762	5.27		34	5.183
Pd	mg kg^{-1}													
Pr	mg kg^{-1}	4.66	2.93	2.786		2.72	2.82		2.89	3.049	2.98		2.67	2.681
Pt	mg kg^{-1}													
Rb	mg kg^{-1}		11.428	20.32		15.98	14.46		16.6	15.464	17.1		15	15.962
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
S	mg kg^{-1}			1.88	17000						17200			
Sb	mg kg^{-1}			3.159			2.96			2.325	3.32			
Sc	mg kg^{-1}	54	7.8	3.666		3.6			3.64	3.948	12.4		4	3.713
Se	mg kg^{-1}									3.479	7.2			
Sm	mg kg^{-1}	2.76	2.128	2.112		1.94	1.82		2.12	2.174	2.14		1.8	1.840
Sn	mg kg^{-1}			0.751					0.88	0.734				0.614
Sr	mg kg^{-1}		1080	1200.257		995.380			1045	932.552	937		984	1022.800
Ta	mg kg^{-1}		0.669	0.279					0.3	0.675			0.21	0.274
Tb	mg kg^{-1}		0.25	0.297			0.286		0.28	0.287	0.28		0.26	0.273
Te	mg kg^{-1}			0.049						0.059				
Th	mg kg^{-1}		2.79	2.687		2.57			2.79	2.85	3.08		2.08	2.753
Tl	mg kg^{-1}			2.597		1.54	3.03			2.781	2.86			
Tm	mg kg^{-1}		0.099	0.15			0.139		0.14	0.159	0.15		0.12	0.140
U	mg kg^{-1}		10.003	12.096		8.56	8.29		9.17	9.123	9.97			8.476
V	mg kg^{-1}		330.830	564.963		419.3	407.8		414	376.714	484			
W	mg kg^{-1}			0.361			0.53			0.412			0.78	
Y	mg kg^{-1}	17	10.71	10.648		8.6			10.2	8.352	9.67		8.5	9.056
Yb	mg kg^{-1}	1.78	0.885	0.978		0.92	0.93		0.98	1.023	0.98		0.82	0.945
Zn	mg kg^{-1}		73.58	113.952		112.2			92.5	62.399	94.6		101	
Zr	mg kg^{-1}		46.44	71.78		48.26			48.9	45.677	42.5		85	50.969

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X50	X51	X52	X53	X54	X55	X57	X59	X60	X62	X63	X66	X67
SiO2	g 100g^{-1}	**25.113**	26.8	**26.42**	25.04	26.5	24.9		25.38	26.38	25.14	25.05	**25.086**	
TiO2	g 100g^{-1}	**0.174**	0.18	**0.16**	0.145	0.2	0.183		0.18	0.172	0.19	0.176	**0.181**	
Al2O3	g 100g^{-1}	**3.991**	4.26	**4.13**	3.988	4	4.82		4.18	4.02	4.1	4	**4.016**	
Fe2O3T	g 100g^{-1}		1.74	**1.6**	1.616	1.54	1.56		1.68	1.54	1.51	1.68	**1.582**	
Fe(II)O	g 100g^{-1}										0.39			
MnO	g 100g^{-1}		0.014	**0.01**	0.014	0.012	0.015		0.013		0.015	0.013	**0.012**	
MgO	g 100g^{-1}	**0.42**	0.51	**0.59**	0.454	0.34			0.4		0.48	0.45	**0.43**	
CaO	g 100g^{-1}	**32.843**	34.63	**31.71**	32.42	28	33.74		32.69	33.2	33.63	33.048	**33.028**	
Na2O	g 100g^{-1}		0.08	**0.71**		0.037			0.12		0.05	0.07	**0.048**	
K2O	g 100g^{-1}	**0.329**	0.37	**0.31**	0.331	0.34	0.268		0.19	0.33	0.37	0.239	**0.345**	
P2O5	g 100g^{-1}	**0.097**	0.11	**0.13**	0.099	0.086			0.105		0.114	0.092	**0.099**	
H2O+	g 100g^{-1}										1.32			
CO2	g 100g^{-1}					24.4		41.07			25.04			
LOI	g 100g^{-1}	**31.34**	31.18	**32.84**	31.19	35.2			32.5	31.35	32.4	31.25	**31.33**	
Ag	mg kg^{-1}													**0.04**
As	mg kg^{-1}				20.16		28		13	16.7		16.5		**5.67**
Au	mg kg^{-1}													
B	mg kg^{-1}									18				**15.6**
Ba	mg kg^{-1}	**93**	87.2	**73**	77.75	75	67		87	81	185	70.6	**76.4**	**75.8**
Be	mg kg^{-1}		1.11							0.87				**0.95**
Bi	mg kg^{-1}													**0.38**
Br	mg kg^{-1}								3					
C(org)	mg kg^{-1}				126000.000					42600	52734			
C(tot)	mg kg^{-1}				53600	12.07		112100.000		117300.000	121082.000			
Cd	mg kg^{-1}					2.2				1.9		1.8		**0.66**
Ce	mg kg^{-1}		26.4	**24**	27.92	24.7	3		26.3	26.2		22.5	**25.4**	**24.2**
Cl	mg kg^{-1}					80								
Co	mg kg^{-1}		10		8.034	6.7			4					**6.56**
Cr	mg kg^{-1}	**31**	28.2	**53**	51.64	32						30	**34.3**	**29.6**
Cs	mg kg^{-1}		3.16			3						4		**3.15**
Cu	mg kg^{-1}	**39**	30.9	**37**	39.13	31	63		28	30		51	**37.6**	**34.6**
Dy	mg kg^{-1}		1.84	**1.6**		1.65			1.76	1.65			**1.76**	**1.64**
Er	mg kg^{-1}		1.04	**1.1**		0.97			1.02	1.02				**0.98**
Eu	mg kg^{-1}		0.48	**0.5**		0.46			0.47	0.42				**0.43**
F	mg kg^{-1}					640					660			
Ga	mg kg^{-1}		6.83	**14**	7.054	6.8			3			6.5	**5.71**	**6.36**
Gd	mg kg^{-1}		2	**1.8**		1.92	41		1.97	2.13				**1.94**
Ge	mg kg^{-1}		0.27											**0.4**
Hf	mg kg^{-1}		1.45											**1.26**
Hg	mg kg^{-1}					0.044		0.043			0.062			
Ho	mg kg^{-1}		0.37	**0.4**		0.33			0.35	0.33				**0.33**
I	mg kg^{-1}													
In	mg kg^{-1}													**0.07**
La	mg kg^{-1}	**11**	13.9	**14**	20.97	13.5	11		14.5	13.2		11.3	**13.9**	**13.7**
Li	mg kg^{-1}		26.2	**24**		24				25				**23.6**
Lu	mg kg^{-1}		0.16	**0.2**		0.15			0.13	0.14				**0.15**
Mo	mg kg^{-1}		52.6	**40**	61.56	51	45		55			47.3	**46.3**	**49.6**
Nb	mg kg^{-1}		6.59		7.332		3		11			6.75	**6.7**	**6.37**
Nd	mg kg^{-1}		11.6	**10**		11	8		11.6	11		10.9	**8.4**	**11.1**
Ni	mg kg^{-1}	**70**	97.8	**69**	81.22	78	65		70	71		78.8	**71.9**	**78.2**
Pb	mg kg^{-1}	**10**	7.02	**14**	5.505	6.3			3				**3.3**	**6.75**
Pd	mg kg^{-1}													
Pr	mg kg^{-1}		3.19	**3**		3	19		3.2	3.01				**2.95**
Pt	mg kg^{-1}													
Rb	mg kg^{-1}	**14**	18.8	**18**	16.5	17	17		16	18		19.8	**16.7**	**17**
Re	mg kg^{-1}													**0.086**
Rh	mg kg^{-1}													
S	mg kg^{-1}				17300	14930	16800	14900			17336			
Sb	mg kg^{-1}					3.3						2.85		
Sc	mg kg^{-1}		5.84	**3**	15.26				3.5	3.6				**3.99**
Se	mg kg^{-1}													**0.43**
Sm	mg kg^{-1}		2.16	**2**		2.07			2.17	1.93			**2.7**	**2.08**
Sn	mg kg^{-1}					1.1						0.9		
Sr	mg kg^{-1}	**989**	1019	**990**	1177	1036	1080		855	1034	1074	1031	**1052.500**	**1021**
Ta	mg kg^{-1}		0.51											**0.45**
Tb	mg kg^{-1}		0.31	**0.3**		0.29			0.28	0.31				**0.29**
Te	mg kg^{-1}													
Th	mg kg^{-1}		2.93						2.65			13.3	**1.8**	**2.74**
Tl	mg kg^{-1}		2.95			3.07								**3.36**
Tm	mg kg^{-1}		0.17	**0.2**		0.14			0.13	0.14				**0.15**
U	mg kg^{-1}		8.69	**9.7**	10.1	9.2	9		6			13	**9.9**	**8.98**
V	mg kg^{-1}	**531**	401	**367**	460.9	415	451		312	424		439	**397.5**	**408**
W	mg kg^{-1}		0.72											**0.3**
Y	mg kg^{-1}		10	**9**	9.859		8		9.6	9.1		13.5	**10.17**	**9.81**
Yb	mg kg^{-1}		1.06	**1**		0.99			0.92	1				**0.98**
Zn	mg kg^{-1}	**96**	89	**101**	110.6	96	96		93	101		102	**97.3**	**93.6**
Zr	mg kg^{-1}	**49**	54.9	**71**	64.2	60	69		117	54		51.8	**52.9**	**53.2**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X68	X71	X72	X73	X74	X76	X77	X78	X79	X80	X81	X82	X83
SiO2	g $100g^{-1}$	**27.3**		**22.76**	25.42		27.8	25.6	25.1		24.98		**25.03**	20
TiO2	g $100g^{-1}$	**0.19**		**0.19**	0.173	0.002	0.17	0.184	0.17		0.17	**0.155**	**0.18**	0.43
Al2O3	g $100g^{-1}$	**4.31**		**3.66**	3.963	0.383	3.62	4.09	3.94		3.95	**3.93**	**3.94**	
Fe2O3T	g $100g^{-1}$	**1.73**	**1.57**	**1.74**	1.612	1.236	2.13	1.65	1.61		1.55	**1.601**	**1.61**	4.2
Fe(II)O	g $100g^{-1}$												**0.53**	4.2
MnO	g $100g^{-1}$	**0.01**	**0.012**		0.008	0.01	0.01					**0.012**	**0.012**	0.03
MgO	g $100g^{-1}$	**0.46**	**0.424**	**0.19**	0.367	0.25	0.35	0.44	0.41		0.37	**0.496**	**0.42**	7.41
CaO	g $100g^{-1}$	**37.64**	**33.2**	**35.6**	32.46	27.341	22.89	33.1	32.7		32.62	**32.456**	**32.98**	68.02
Na2O	g $100g^{-1}$	**0.03**				0.016	0.1		0.04			**0.038**		
K2O	g $100g^{-1}$	**0.36**		**0.32**	0.239	0.074	0.32	0.33	0.33		0.34	**0.337**	**0.33**	0.8
P2O5	g $100g^{-1}$	**0.11**			0.086	0.024	0.1	0.098	0.14		0.09		**0.1**	
H2O+	g $100g^{-1}$													
CO2	g $100g^{-1}$													
LOI	g $100g^{-1}$	**26.1**		**32.66**	31.52		31.8	31.78	31.7		31.11		**0.86**	31.36
Ag	mg kg^{-1}					0.142								
As	mg kg^{-1}		**16.09**			12.978						**16.5**	**26**	14.71
Au	mg kg^{-1}													
B	mg kg^{-1}					4.436								
Ba	mg kg^{-1}	**78.1**	**75.93**			34.315		107				62	**71**	186
Be	mg kg^{-1}					0.545								
Bi	mg kg^{-1}					0.166		0.78						
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}				120000.000									
Cd	mg kg^{-1}					1.686	5.34	2.17		**2.24**				
Ce	mg kg^{-1}	**27.4**	**24.54**			8.65		18.62		**24.1**		**25.7**		919
Cl	mg kg^{-1}											50		
Co	mg kg^{-1}	**6.2**	**7.65**			4.467	7.14	7				**5.92**	**7**	63
Cr	mg kg^{-1}	**30.7**	**31.14**			11.833	73					**29.7**	**37**	63
Cs	mg kg^{-1}		**3.04**					2.95		**3.35**		**2.89**		
Cu	mg kg^{-1}		**34.25**			22.95	52	30					**44**	43
Dy	mg kg^{-1}		**1.64**			1.096		1.48		**1.65**		**1.74**		2.32
Er	mg kg^{-1}	1.7	**0.963**			0.659		0.64		**0.96**				
Eu	mg kg^{-1}	0.5	**0.45**			0.31		0.44		**0.45**		**0.442**		0.32
F	mg kg^{-1}													
Ga	mg kg^{-1}		**6.46**					5.91		**6.4**			**8**	
Gd	mg kg^{-1}	2.2	**2.04**			1.42		1.49		**1.84**				
Ge	mg kg^{-1}					0.025		0.69		**0.39**				
Hf	mg kg^{-1}		**1.05**					0.92				**1.27**		
Hg	mg kg^{-1}													
Ho	mg kg^{-1}		**0.341**			0.22		0.35		**0.33**				
I	mg kg^{-1}													
In	mg kg^{-1}													
La	mg kg^{-1}	**14.1**	**13.32**			5.1		11.85		**13.6**		**13.12**		18
Li	mg kg^{-1}					2.264		22.58						
Lu	mg kg^{-1}		**0.147**			0.095		0.15		**0.15**		**0.132**		1.12
Mo	mg kg^{-1}					36.46		56.04				**43**		40
Nb	mg kg^{-1}	**5.5**	**6.06**			0.091				**16.3**			**10**	10
Nd	mg kg^{-1}	**11.3**	**11.24**			4.585		9.01		**10.7**		**12**		383
Ni	mg kg^{-1}	**87**	**92.65**			57.945	67.2					83	**78**	84
Pb	mg kg^{-1}		**6.15**			4.085	0.64						**10**	9.89
Pd	mg kg^{-1}													
Pr	mg kg^{-1}		**2.96**			1.098		2.29		**2.91**				
Pt	mg kg^{-1}													
Rb	mg kg^{-1}	0.4	**16.79**			4.14		20		**16.3**		**16.2**	**18**	12
Re	mg kg^{-1}													
Rh	mg kg^{-1}													
S	mg kg^{-1}			**1.48**	18400						16300			
Sb	mg kg^{-1}									**3.11**		**3.3**		
Sc	mg kg^{-1}	**3.8**	**3.4**			2.438		3.47		**5.48**		**3.49**		
Se	mg kg^{-1}					4.748						**5.8**		
Sm	mg kg^{-1}	**2.1**	**2.13**			1.237		1.46		**2.01**		**2**		
Sn	mg kg^{-1}					0.074				**0.86**				10
Sr	mg kg^{-1}	**1118**	**999.8**	**0.07**		570.050		1016			1050	**1070**	**1062**	989
Ta	mg kg^{-1}		**0.28**							**0.4**		**0.31**		
Tb	mg kg^{-1}		**0.304**			0.197		0.29		**0.3**		**0.266**		1
Te	mg kg^{-1}													
Th	mg kg^{-1}	2.7	**2.72**			1.647				**3.13**		**2.67**	**7**	5.7
Tl	mg kg^{-1}					1.967		2.9		**2.54**				
Tm	mg kg^{-1}		**0.154**			0.093		0.12		**0.14**				1
U	mg kg^{-1}		**8.79**			5.106		8.91		**9.02**		**8.9**	**10**	10
V	mg kg^{-1}	**465**	**433.7**	**0.03**		210.670	412.4	436				**431**	**389**	435
W	mg kg^{-1}					0.149				**0.5**		0.45		30
Y	mg kg^{-1}	**10.3**	**10.13**			5.98		9.34		**9.14**			**17**	
Yb	mg kg^{-1}	**1**	**0.926**			0.629		0.91		**0.93**		**0.88**		6
Zn	mg kg^{-1}		**85.2**			66.727	239.2	107				**104**	**98**	90
Zr	mg kg^{-1}	**53.3**	**48.02**			6.401		36				68	**45**	60

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X84	X87	X88	X89	X90	X91	X93	X94	X96	X97	X98	X101	X103
SiO2	g 100g^{-1}	27.52		25.1		24.45	26.1		25.29	25.2	25.07	24.96		27.18
TiO2	g 100g^{-1}	0.16	0.169	0.17	0.158	0.18	0.18		0.199	0.169	0.17	0.17		0.32
Al2O3	g 100g^{-1}	5.37		3.94		3.97	4.33		3.935	3.503	3.97	4.04		4.5
Fe2O3T	g 100g^{-1}	1.37		1.59	1.731	1.84	1.7		1.525	1.59	1.65	1.6		1.54
Fe(II)O	g 100g^{-1}										1.2	0.86		
MnO	g 100g^{-1}	0.01	0.012	0.01	0.006		0.013		0.012	0.012	0.036		0.012	
MgO	g 100g^{-1}	0.18		0.45		0.46	0.42		0.379	0.416	0.43	0.41		0.24
CaO	g 100g^{-1}	34.67		33.2		32.91	34.41		31.443	32.04	33.31	32.56		30.26
Na2O	g 100g^{-1}	0.01		0.09					0.065	0.052	0.05	0.04		0.15
K2O	g 100g^{-1}	0.38		0.37		0.34	0.27		0.379	0.325	0.34	0.33		
P2O5	g 100g^{-1}	0.09		0.1			0.119		0.094	0.099	0.1	0.1		0.11
H2O+	g 100g^{-1}									5.337	6.8	2.48		
CO2	g 100g^{-1}								24.965		24.6			
LOI	g 100g^{-1}	30.07		31.83		31.9	32.14		31.404		30.7	34.95		32.47
Ag	mg kg^{-1}								16.668		0.34			
As	mg kg^{-1}				14		16.4		17.538		14.6	16.284	15.33	
Au	mg kg^{-1}													
B	mg kg^{-1}	63.8							120.948			19		
Ba	mg kg^{-1}	68.5	67.007	110.2	78.6		63.4		67.731	72.97	76.54	74.457	62.98	310
Be	mg kg^{-1}	1	0.969	0.8				1.182			0.861	0.97		
Bi	mg kg^{-1}				0.083		3		0.924		0.2	0.274		
Br	mg kg^{-1}													
C(org)	mg kg^{-1}								48787.700		5.2	52219		
C(tot)	mg kg^{-1}								124431.900	118100.000	114000.000	122653.000		
Cd	mg kg^{-1}	1.9							2.121		2.3	2.040		
Ce	mg kg^{-1}	22.1	23.890	24.1	22.719		31.5	27.131	24.807		25	25.029	24.05	
Cl	mg kg^{-1}										60	28		
Co	mg kg^{-1}	6.9	6.219	6.3			6.2		6.023		6.8	5.954	7.36	6
Cr	mg kg^{-1}	32.7	28.962	29.1	21		31.6		30.479		32.8	31.014	36.76	11
Cs	mg kg^{-1}		3.101	3.9	3.96		34.6				2.9	3.366	3.09	
Cu	mg kg^{-1}	69.3	33.140	28.2	30	28	30.2		41.606		36.06	38.074	26.87	20
Dy	mg kg^{-1}	1.5	1.685	1.6	1.635			1.618	1.752		1.66	1.626		
Er	mg kg^{-1}	0.9	0.946	0.9	0.933			0.984	1.037		1	0.92		
Eu	mg kg^{-1}	0.4	0.451	0.5	0.423			0.468	0.469		0.51	0.453		
F	mg kg^{-1}										459	699		
Ga	mg kg^{-1}		6.277	5.9	7		5.9		6.168		7	6.656	6.03	
Gd	mg kg^{-1}	1.9	1.892	1.8	1.706			2.324	2.028		2.08	1.828		
Ge	mg kg^{-1}							0.239				0.254		
Hf	mg kg^{-1}		1.180	1.2	1.555			1.196	1.098		2	1.174		
Hg	mg kg^{-1}										0.046	0.051		
Ho	mg kg^{-1}	0.3	0.332	0.3	0.315			0.302	0.346		0.36	0.336		
I	mg kg^{-1}													
In	mg kg^{-1}											0.037		
La	mg kg^{-1}	11.9	13.197	13.2	11.835		19	15.252	13.502		12.9	13.795	14	20
Li	mg kg^{-1}	21.9	24.700		25.725				38.703		25	24.3		
Lu	mg kg^{-1}	0.1	0.147	0.2	0.139			0.152	0.147		0.16	0.148		
Mo	mg kg^{-1}	47.9	49.494	50.1	49.8	47	46.9		53.701		50.8	47.323	47.85	24
Nb	mg kg^{-1}		6.009	5.5	6.1	6	4.6		5.177		5	5.130	4.97	
Nd	mg kg^{-1}	10	10.771	10.8	11.062		11.2	11.674	11.17		10.9	10.760		
Ni	mg kg^{-1}		80.405	73.4	61	104	71.1		78.374		76	78.040	72.84	43
Pb	mg kg^{-1}	4	5.938	0.2	4.7		4.2		8.031		6.83	5.943	5.94	17
Pd	mg kg^{-1}													
Pr	mg kg^{-1}	2.6	2.880	2.9	2.937			2.889	2.977		2.96	2.894		
Pt	mg kg^{-1}													
Rb	mg kg^{-1}		16.682	18.3	15.5	20	16.9		16.691		18	17.738	17.81	16
Re	mg kg^{-1}								0.133					
Rh	mg kg^{-1}													
S	mg kg^{-1}	1242		15600		17700			17994	12550	16500	17906		15820
Sb	mg kg^{-1}				3.5				3.822		3.3	3.168		
Sc	mg kg^{-1}	4	3.805	3.4	9.4		7.2					3.73	9.91	
Se	mg kg^{-1}	28.2					8.3					6.77		
Sm	mg kg^{-1}	1.8	2.023	2.1	2.023		4.4	2.22	2.18		2.1	2.077		
Sn	mg kg^{-1}	2.3	0.895	0.2				0.611	2.308		2	0.909		
Sr	mg kg^{-1}	978	1040.302	985.5	961.7	956	975		1006.289	1063	1018	1061.213	975.340	803
Ta	mg kg^{-1}		0.295	0.3	0.233				0.169			0.318		
Tb	mg kg^{-1}	0.3	0.283	0.3	0.282			0.306	0.287		0.28	0.268		
Te	mg kg^{-1}													
Th	mg kg^{-1}		2.698	2.7	2.547				2.59		2.9	2.690	3.22	6
Tl	mg kg^{-1}			1.1	3.164				2.975		3.1			
Tm	mg kg^{-1}	0.1	0.142	0.2	0.142			0.158	0.147		0.14	0.135		
U	mg kg^{-1}		8.946	8.5	13.1		10.9	8.051	8.152		9.48	8.877	9.38	4
V	mg kg^{-1}	530.1	412.948	402.2	335		388		399.129		431	436.688	444.920	248
W	mg kg^{-1}			0.5					0.774		1			
Y	mg kg^{-1}	8.8	9.980	9.8	8.9	10	8.1		9.552		9.7	9.583	9.14	6
Yb	mg kg^{-1}	0.9	0.964	0.9	0.905			0.929	0.967		1.11	0.975		
Zn	mg kg^{-1}	102.6	91.230	129.3	85.5	125	91.4		135.462		107	110.034	95.83	84
Zr	mg kg^{-1}		49.789	51.1	32.5		54.9		49.831	111.2	53	52.273	48.39	153

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X104	X105	X107	X108	X109	X110	X112	X113	X114	X115	X116	X119	X120
SiO2	g 100g^{-1}	**25.03**	**24.97**	25.18	25.161	24.656	24.99	**24.91**	**24.93**	**25.31**	24.92	24.83	24.97	25.47
TiO2	g 100g^{-1}	**0.18**	**0.2**	0.17	0.165	0.17	0.19	**0.179**	**0.17**	**0.32**	0.17	0.17	0.16	0.18
Al2O3	g 100g^{-1}	**3.97**	**3.93**	4.03	3.975	3.976	4.13	**4.07**	**4.02**	**3.88**	3.92	3.91	4	4.08
Fe2O3T	g 100g^{-1}	**1.58**	**1.64**	1.62	1.611	1.588	1.7	**1.82**	**1.638**	**1.59**	1.65	1.6	1.59	1.49
Fe(II)O	g 100g^{-1}				0.687									0.1
MnO	g 100g^{-1}	**0.01**		0.02	0.012		0.012	**0.02**	**0.011**		0.01	0.01	0.01	0.012
MgO	g 100g^{-1}	**0.68**	**0.4**	0.38	0.414	0.398	0.442	**0.403**	**0.463**	**0.33**	0.43	0.35	0.46	0.4
CaO	g 100g^{-1}	**33.25**	**32.77**	33.06	33.081	32.481	32.14	**33.9**	**33.014**	**33.1**	32.8	32.8	32.89	33.08
Na2O	g 100g^{-1}	**0.05**	**0.04**	0.03	0.057		0.05		**0.041**		0.05	0.01	0.05	
K2O	g 100g^{-1}	**0.34**	**0.32**	0.32	0.288	0.348	0.34	**0.351**	**0.33**	**0.34**	0.33	0.33	0.33	0.25
P2O5	g 100g^{-1}	**0.1**	**0.09**	0.094	0.098	0.099	0.09	**0.105**	**0.096**	**0.1**	0.1	0.1	0.1	0.102
H2O+	g 100g^{-1}				2.677			**0.44**						
CO2	g 100g^{-1}													
LOI	g 100g^{-1}	**32.9**	**35.65**	30.6	31.03	31.74		**7.65**	**32.55**	33.26	31.13	31.75	32.02	31.86
Ag	mg kg^{-1}							**0.332**			0.21			
As	mg kg^{-1}							**15.2**	**20**	**14.1**	16.3			12
Au	mg kg^{-1}							**0.01**			1			
B	mg kg^{-1}													
Ba	mg kg^{-1}	**16**			74.895		72	**38.3**	**63**	**64.2**	77	75.9	74.1	62.7
Be	mg kg^{-1}				0.991						0.95		1.01	0.935
Bi	mg kg^{-1}				0.242						0.25			0.272
Br	mg kg^{-1}													
C(org)	mg kg^{-1}							**52600**				45100		
C(tot)	mg kg^{-1}		**121000.000**		121478.000		120000.000	**108200.000**			11.53	117000.000		158000.000
Cd	mg kg^{-1}				1.841			**2.23**			2.08			2.29
Ce	mg kg^{-1}	**41**			23.848			**25.7**	**25**	**31.4**	23.8	25.2	25.8	22.87
Cl	mg kg^{-1}								**132**					
Co	mg kg^{-1}				6.697			**12.3**	**4**	**5.2**	5.9		6.4	7.36
Cr	mg kg^{-1}				32.137		30	**109**		**28.1**	28	40	28.6	29
Cs	mg kg^{-1}				2.749			**3.16**	**17**		3.7	2.99	3.37	3.24
Cu	mg kg^{-1}	**13**			34.895			**40.4**	**34**	**31.2**	36		34.3	26
Dy	mg kg^{-1}				1.709			**1.41**			1.6	1.62	1.75	1.89
Er	mg kg^{-1}				0.973			**0.529**			0.9	0.94	1.01	1.18
Eu	mg kg^{-1}				0.478			**0.101**			0.46	0.44	0.464	
F	mg kg^{-1}								**749**	600				
Ga	mg kg^{-1}				6.125			**5.41**	**7**	**5.5**	6.21	6.6	6.34	6
Gd	mg kg^{-1}				1.834			**1.39**			1.8	1.79	2.03	
Ge	mg kg^{-1}										0.1		0.269	
Hf	mg kg^{-1}				1.149			**1.54**			1.3	1.2	1.18	
Hg	mg kg^{-1}													0.05
Ho	mg kg^{-1}				0.337			**0.285**			0.3	0.33	0.348	0.376
I	mg kg^{-1}													
In	mg kg^{-1}				0.041			**0.044**			0.04			0.046
La	mg kg^{-1}				13.298		10	**11.9**	**12**	**14.5**	13	14.1	14	14.99
Li	mg kg^{-1}				25.693			**17.4**			24		27	24.39
Lu	mg kg^{-1}				0.143			**0.109**			0.14	0.15	0.152	0.168
Mo	mg kg^{-1}				48.275			**49.5**	**45**	**41.5**	49.5			45.5
Nb	mg kg^{-1}				5.609			**8.14**		**4.9**	5.64	6.2	5.92	4.5
Nd	mg kg^{-1}	**12**			11.179			**4.73**	**16**	**13.2**	10.8	11.6	11.4	11.62
Ni	mg kg^{-1}	**52**			70.065		58	**56.7**	**81**	**64**	70		80.7	91.35
Pb	mg kg^{-1}				5.325			**7.41**	**3**	**4.2**	6.4		6.29	
Pd	mg kg^{-1}							**2.8**						
Pr	mg kg^{-1}				2.972			**0.519**			2.9	2.8	3.01	3.16
Pt	mg kg^{-1}							**0.123**						
Rb	mg kg^{-1}				14.828			**7.97**	**18**	**15.6**	16.5	16.9	17.5	17.88
Re	mg kg^{-1}										0.15			
Rh	mg kg^{-1}							**0.787**						
S	mg kg^{-1}		**18300**		1.513	15481	17900	**17500**	**42569**	14255	18000			14200
Sb	mg kg^{-1}				3.285			**3.43**	**1**		3.13			
Sc	mg kg^{-1}				9.329			**2.41**	**37**	**8.4**	3.3		3.88	3.22
Se	mg kg^{-1}									**5.6**	6.2			
Sm	mg kg^{-1}				2.102			**1.43**			2.1	2.25	2.16	2.36
Sn	mg kg^{-1}				1.143			**1.52**			0.9	1		2.5
Sr	mg kg^{-1}	**1072**			1054.155			**870**	**973**	**916.4**	1069	1035	1080	1120
Ta	mg kg^{-1}				0.289					**2.2**	0.3	0.4	0.304	
Tb	mg kg^{-1}				0.281			**0.01**			0.3	0.28	0.298	0.342
Te	mg kg^{-1}							**0.16**						
Th	mg kg^{-1}				2.712			**2.86**	**9**		2.7	2.85	2.79	2.95
Tl	mg kg^{-1}				0.173			**2.39**	**2**	**2.9**	2.94			3.08
Tm	mg kg^{-1}				0.145			**0.133**			0.2	0.16	0.151	0.165
U	mg kg^{-1}				9.003			**9.3**	**5**	**10.2**	8.8	9.78	9.22	9.35
V	mg kg^{-1}	**548**			431.227		431	**471**	**480**	**412.7**	416	465	419	401
W	mg kg^{-1}				0.414			**1.67**			0.4	1		
Y	mg kg^{-1}				10.175			**9.4**	**8**	**9.6**	9.3	9.3	10.5	9
Yb	mg kg^{-1}				0.982			**1.14**			0.9	0.99	1	1.13
Zn	mg kg^{-1}	**105**			102.127		91	**86.9**	**98**	**89.8**	99		92.9	98.15
Zr	mg kg^{-1}	**25**			51.737		47	**25.1**	**64**	**60.7**	56	51	54	48

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 1 - GeoPT40A Contributed data for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code		X121	X122	X123	X124	X126	X127	X128	-	-	-	-	-	-
SiO2	g 100g^{-1}	24.74	25.09	25.59		26.58	**26.52**	**25.46**						
TiO2	g 100g^{-1}	0.17	0.17	0.17	0.17	0.158	**0.174**	**0.2**						
Al2O3	g 100g^{-1}	3.91	4	4.08	3.78	4.027	**4.285**	**3.98**						
Fe2O3T	g 100g^{-1}	1.62	1.58	1.61	1.64	2.041	**1.695**	**1.67**						
Fe(II)O	g 100g^{-1}					0.354		**0.35**						
MnO	g 100g^{-1}	0.01		0.009		0.026	**0.008**	**0.01**						
MgO	g 100g^{-1}	0.46	0.42	0.435	0.39	0.424	**0.442**	**0.43**						
CaO	g 100g^{-1}	32.58	32.85	32.95	31.7	34.33	**34.87**	**33.84**						
Na2O	g 100g^{-1}	0.04	0.03	0.02		0.221	**0.040**							
K2O	g 100g^{-1}	0.29	0.34	0.34	0.34	0.370	**0.348**	**0.22**						
P2O5	g 100g^{-1}	0.21	0.08	0.010		0.103	**0.101**	**0.08**						
H2O+	g 100g^{-1}		1.19											
CO2	g 100g^{-1}							**37.01**						
LOI	g 100g^{-1}	31.21	31.13			31.1								
Ag	mg kg^{-1}					0.26								
As	mg kg^{-1}	15					**15.33**	8						
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}	50			70.2		**74.47**	**69**						
Be	mg kg^{-1}					0.75	**0.957**							
Bi	mg kg^{-1}					0.213								
Br	mg kg^{-1}													
C(org)	mg kg^{-1}					54400		**51700**						
C(tot)	mg kg^{-1}			119100.000		118100.000								
Cd	mg kg^{-1}					1.635		15						
Ce	mg kg^{-1}	57			26.1		**24.27**	**36**						
Cl	mg kg^{-1}							19						
Co	mg kg^{-1}				6.82	5.22	**6.233**	**12**						
Cr	mg kg^{-1}	33			34.3		**31.23**	**54**						
Cs	mg kg^{-1}				3.84		**3.333**	**10**						
Cu	mg kg^{-1}	23			37.7	31.77	**36.53**	**40**						
Dy	mg kg^{-1}				1.68			**2.267**						
Er	mg kg^{-1}				0.95			**1.421**						
Eu	mg kg^{-1}				0.48			**0.534**						
F	mg kg^{-1}							342						
Ga	mg kg^{-1}	6					**6.4**	**9**						
Gd	mg kg^{-1}				1.96			**2.641**						
Ge	mg kg^{-1}													
Hf	mg kg^{-1}							**10**						
Hg	mg kg^{-1}					0.035	**0.047**							
Ho	mg kg^{-1}				0.35			**0.481**						
I	mg kg^{-1}													
In	mg kg^{-1}													
La	mg kg^{-1}	23			14.2		**14.3**	**31**						
Li	mg kg^{-1}				21.7	20.4	**22**							
Lu	mg kg^{-1}				0.14			**0.093**						
Mo	mg kg^{-1}					45.359	**51.83**	**33**						
Nb	mg kg^{-1}	3					**5.6**	**34**						
Nd	mg kg^{-1}				11.6		**10.97**	**15.504**						
Ni	mg kg^{-1}	74			86.9	69.6	**76.83**	**81**						
Pb	mg kg^{-1}	12			5.46	6.66	**6.577**	**14**						
Pd	mg kg^{-1}													
Pr	mg kg^{-1}				3.13			**4.09**						
Pt	mg kg^{-1}													
Rb	mg kg^{-1}	18			18.5		**17.87**	**17**						
Re	mg kg^{-1}					0.103								
Rh	mg kg^{-1}													
S	mg kg^{-1}		17141	17800		16730		5763						
Sb	mg kg^{-1}					3.205		23						
Sc	mg kg^{-1}	12				3.06	**2.973**	**41**						
Se	mg kg^{-1}					4.42	**6.233**							
Sm	mg kg^{-1}				1.98			**2.674**						
Sn	mg kg^{-1}					1.25		**2**						
Sr	mg kg^{-1}	1045			1013		**1073**	**1152**						
Ta	mg kg^{-1}													
Tb	mg kg^{-1}				0.27			**0.341**						
Te	mg kg^{-1}													
Th	mg kg^{-1}	2			2.74		**2.66**							
Tl	mg kg^{-1}													
Tm	mg kg^{-1}				0.15			**0.184**						
U	mg kg^{-1}	9			8.97		**8.91**	**9**						
V	mg kg^{-1}	447			365	355	**452.7**	**419**						
W	mg kg^{-1}													
Y	mg kg^{-1}	9			10.3		**14.53**	**5**						
Yb	mg kg^{-1}				0.92			**1.22**						
Zn	mg kg^{-1}	95			86.7	83.93	**104.6**	**101**						
Zr	mg kg^{-1}	55						**102**						

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2

Table 2 - GeoPT40A Assigned values and statistical summary for Calcareous organic-rich shale, ShTX-1.

	Assigned Value	Uncertainty of assigned value	Horwitz Target Value	Uncertainty/ Target	Number of reported results	Robust Mean of results	Robust SD of results	Median 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	g 100g⁻¹		
SiO2	25.13	0.03789	0.3094	0.1225	81	25.26	0.6875	25.13	Assigned	Median
TiO2	0.1751	0.001296	0.004553	0.2846	84	0.1751	0.01188	0.1734	Assigned	Robust Mean
Al2O3	4	0.01302	0.06494	0.2005	83	4.023	0.154	4	Assigned	Median
Fe2O3T	1.612	0.006754	0.03	0.2251	85	1.623	0.08871	1.612	Assigned	Median
MnO	0.01105	0.000075	0.0004354	0.1723	69	0.012	0.002987	0.012	Provisional	Mode
MgO	0.421	0.006849	0.009591	0.7142	81	0.421	0.06164	0.42	Provisional	Robust Mean
CaO	32.95	0.09166	0.3894	0.2354	85	33.05	1.11	32.95	Assigned	Median
K2O	0.337	0.004505	0.007939	0.5674	82	0.3303	0.03383	0.33	Assigned	Mode
P2O5	0.099	0.0008329	0.002804	0.297	73	0.09847	0.009475	0.099	Assigned	Median
LOI	31.61	0.07361	0.376	0.1958	75	31.71	0.7541	31.61	Assigned	Median
	mg kg⁻¹	mg kg⁻¹	mg kg⁻¹			mg kg⁻¹	mg kg⁻¹	mg kg⁻¹		
As	15.05	0.4153	0.8004	0.5189	46	14.8	2.775	15.05	Provisional	Median
Ba	72.98	1.122	3.061	0.3666	70	72.64	11.43	72.98	Assigned	Median
Be	0.9999	0.01347	0.07998	0.1684	32	0.9664	0.1018	0.9855	Assigned	Mode
Bi	0.236	0.02315	0.02346	0.9867	23	0.3173	0.1813	0.25	Provisional	Mode
C(tot)	119100	823.7	1641	0.5021	26	113100	14530	118600	Provisional	Mode
Cd	2.02	0.05766	0.1453	0.3967	32	1.991	0.3581	2.02	Assigned	Median
Ce	24.75	0.2935	1.221	0.2403	66	24.87	3.244	24.75	Assigned	Median
Co	6.35	0.1288	0.3846	0.3349	56	6.472	1.269	6.35	Assigned	Median
Cr	29.65	0.7484	1.424	0.5256	64	32.49	7.293	30.85	Assigned	Mode
Cs	3.101	0.08805	0.2092	0.4209	42	3.398	0.647	3.247	Assigned	Mode
Cu	33.82	0.7597	1.592	0.4771	70	33.57	6.727	33.82	Assigned	Median
Dy	1.667	0.02104	0.1234	0.1705	50	1.667	0.1488	1.65	Assigned	Robust Mean
Er	0.9734	0.01262	0.07817	0.1614	48	0.9734	0.08743	0.9715	Assigned	Robust Mean
Eu	0.4538	0.005147	0.04088	0.1259	48	0.4538	0.03566	0.4531	Assigned	Robust Mean
Ga	6.277	0.07731	0.3808	0.203	53	6.317	0.68	6.277	Assigned	Median
Gd	1.95	0.03103	0.141	0.22	48	1.95	0.215	1.95	Assigned	Robust Mean
Hf	1.18	0.01924	0.09207	0.209	36	1.232	0.2412	1.194	Assigned	Mode
Ho	0.3358	0.005702	0.03165	0.1801	45	0.3346	0.03515	0.3358	Assigned	Median
La	13.49	0.1883	0.7294	0.2581	68	13.49	1.553	13.5	Assigned	Robust Mean
Li	24.14	0.4354	1.196	0.3641	34	24.14	2.539	24.15	Assigned	Robust Mean
Lu	0.149	0.001946	0.01587	0.1226	47	0.1451	0.01789	0.149	Assigned	Median
Mo	47.8	0.5891	2.136	0.2758	57	47.39	5.268	47.8	Assigned	Median
Nb	5.609	0.2231	0.3461	0.6446	56	6.102	1.411	6	Provisional	Mode
Nd	11	0.1121	0.6133	0.1827	63	10.97	0.9833	11	Assigned	Median
Ni	74.92	1.277	3.13	0.4082	71	74.92	10.76	75.9	Assigned	Robust Mean
Pb	6.05	0.2871	0.3691	0.7779	60	6.425	2.924	6.05	Provisional	Median
Pr	2.937	0.02478	0.1997	0.1241	49	2.928	0.2198	2.937	Assigned	Median
Rb	16.9	0.1963	0.8833	0.2223	69	16.66	1.824	16.9	Assigned	Median
Sb	3.275	0.08498	0.2191	0.3879	31	3.275	0.4732	3.29	Assigned	Robust Mean
Sc	3.6	0.09905	0.2375	0.4172	51	5.173	2.856	3.8	Assigned	Mode
Sm	2.102	0.02077	0.1503	0.1382	53	2.099	0.2104	2.102	Assigned	Median
Sr	1017	8.445	28.69	0.2944	74	1010	79.57	1017	Assigned	Median
Ta	0.2917	0.008234	0.02809	0.2932	30	0.3755	0.1534	0.307	Provisional	Mode
Tb	0.2898	0.003462	0.02793	0.124	47	0.2898	0.02373	0.29	Assigned	Robust Mean
Th	2.74	0.03529	0.1883	0.1874	51	2.811	0.475	2.74	Assigned	Median
Tl	2.9	0.04851	0.1976	0.2455	27	2.706	0.4882	2.9	Assigned	Median
Tm	0.1471	0.003188	0.0157	0.203	45	0.1471	0.02139	0.1465	Assigned	Robust Mean
U	9	0.1083	0.5172	0.2095	61	9.27	0.9404	9.123	Assigned	Mode
V	419	5.067	13.51	0.3751	72	417.4	51.37	419	Assigned	Median
Y	9.6	0.1072	0.5463	0.1963	66	9.541	1.006	9.6	Assigned	Median
Yb	0.9783	0.01326	0.0785	0.1689	52	0.9783	0.09562	0.98	Assigned	Robust Mean
Zn	97.77	1.396	3.924	0.3559	70	97.77	11.68	97.15	Assigned	Robust Mean
Zr	52.59	1.193	2.317	0.5149	66	54.04	11.51	52.59	Assigned	Median

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X12	X13	X14
SiO2	-2.12	-3.77	-0.21	10.97	-6.63	*	*	0.55	0.32	0.92	-0.37	2.26	-5.92
TiO2	1.41	2.29	-1.66	1.63	*	*	*	5.46	1.07	0.53	-0.56	-3.33	-1.13
Al2O3	-3.88	-4.00	-0.77	12.86	2.31	*	*	0.00	0.92	-0.92	-0.23	0.92	-1.08
Fe2O3T	-3.60	2.47	-1.87	-0.70	20.73	*	*	-0.40	7.27	-0.70	-0.20	3.60	-0.07
MnO	1.09	0.52	*	-0.06	-7.69	*	*	-2.41	-2.41	*	1.09	-2.41	20.56
MgO	-3.60	-6.52	-1.09	-1.09	200.10	*	*	8.24	-6.36	-1.09	-1.09	1.98	-14.70
CaO	2.87	2.50	1.35	3.70	-4.62	*	*	4.49	-3.18	-0.96	-0.10	-1.03	2.18
K2O	-3.40	-0.44	-0.44	-1.70	48.24	*	*	7.94	0.38	3.34	-5.48	1.64	-21.04
P2O5	-1.07	-1.96	*	*	*	*	*	0.36	-6.78	-0.53	-1.60	3.92	-6.78
LOI	-0.69	1.06	0.04	-4.27	-0.85	0.32	*	-0.29	1.28	-0.55	0.09	1.04	-0.08
As	0.03	*	0.72	-1.82	*	*	1.22	2.31	2.44	-1.28	-0.03	-1.31	-13.81
Ba	-2.50	*	0.20	*	*	*	-1.14	2.13	3.27	1.31	-0.32	-10.78	*
Be	*	*	-0.56	*	*	*	*	0.88	*	0.00	*	*	*
Bi	14.15	*	0.94	-2.20	*	*	*	-1.53	*	4.35	*	*	*
C(tot)	*	*	*	*	*	*	*	*	*	-36.30	*	*	*
Cd	*	*	0.65	-1.20	*	*	*	-11.21	*	0.48	-1.10	*	*
Ce	4.24	*	-0.43	-1.41	*	*	*	1.19	4.30	-1.86	0.10	-4.71	*
Co	1.37	*	-0.07	-0.86	*	*	*	0.39	4.29	3.58	0.85	-6.11	*
Cr	-1.95	33.55	-0.23	5.00	*	*	-1.28	5.09	-1.86	-0.58	-0.23	-2.56	*
Cs	13.14	*	*	*	*	*	*	0.95	23.42	4.94	-0.24	*	*
Cu	-1.36	3.22	1.03	-0.72	*	*	-2.14	2.25	-3.03	1.66	-1.83	-8.68	-6.17
Dy	*	*	0.05	-1.18	*	*	*	1.89	*	-0.63	*	*	*
Er	*	*	0.11	-1.01	*	*	*	0.34	*	0.36	*	*	*
Eu	*	*	-0.17	-0.78	*	*	*	1.13	*	0.20	*	*	*
Ga	-1.68	*	0.56	-0.10	*	*	*	1.90	-3.35	0.95	-0.36	9.78	-3.35
Gd	*	*	0.36	-0.99	*	*	*	0.36	*	-0.14	*	*	*
Hf	*	*	0.65	-1.11	*	*	*	-0.87	*	-0.65	*	*	*
Ho	*	*	0.38	-0.50	*	*	*	2.03	*	-0.41	*	*	*
La	0.69	*	-0.47	-0.82	*	*	*	1.25	-13.01	-6.03	-0.34	-2.04	*
Li	*	*	0.94	*	*	*	*	*	*	2.45	*	*	*
Lu	*	*	0.66	-0.79	*	*	*	0.06	*	-0.28	*	*	*
Mo	-1.08	-11.19	1.03	0.00	*	*	*	1.03	-4.12	-1.31	-0.89	*	1.03
Nb	-1.46	*	0.13	-1.72	*	*	*	1.71	-1.76	1.43	-0.88	108.04	6.91
Nd	2.53	*	-0.16	-0.62	*	*	*	0.98	-8.15	-2.85	0.00	-4.89	*
Ni	-1.59	-0.36	1.21	-1.69	*	*	-1.11	1.08	-3.17	6.24	-0.95	4.82	-5.73
Pb	-6.16	*	0.61	-2.22	*	*	*	-2.03	35.09	16.19	-0.07	-10.97	-10.97
Pr	*	*	-0.29	-1.27	*	*	*	0.82	*	0.46	*	*	*
Rb	0.06	-9.57	-0.17	-2.07	*	*	-0.51	0.23	3.51	0.40	-0.51	0.11	2.38
Sb	3.94	*	0.47	-2.82	*	*	*	1.03	*	-0.83	-1.08	*	*
Sc	4.42	*	0.21	1.37	*	*	*	82.96	*	-0.21	*	43.80	*
Sm	15.62	*	0.36	-1.17	*	*	*	-0.01	*	1.32	*	*	*
Sr	-1.37	*	1.19	0.96	*	*	-1.34	4.98	-1.78	2.49	-0.82	-8.50	-1.32
Ta	*	*	*	-1.17	*	*	*	0.29	*	5.49	*	*	*
Tb	*	*	-0.17	-0.94	*	*	*	0.37	*	0.72	*	*	*
Th	2.02	*	-0.32	-2.35	*	*	*	-2.34	12.00	3.08	-1.96	*	*
Tl	-3.04	*	0.08	*	*	*	*	*	*	0.00	0.25	*	*
Tm	*	*	0.41	-0.93	*	*	*	*	*	-0.23	*	*	*
U	3.29	*	-0.43	-0.81	*	*	2.90	1.93	2.90	0.48	0.97	*	13.54
V	-2.61	-15.51	2.37	0.59	*	*	-1.59	3.48	-0.59	1.15	-0.44	-15.70	*
Y	-0.09	*	-0.09	-1.60	*	*	1.28	-1.65	0.73	0.27	0.37	-4.76	4.39
Yb	-1.77	*	0.58	-0.91	*	*	*	0.28	*	0.78	6.51	*	*
Zn	-1.02	*	1.81	-5.25	*	*	-1.12	1.33	-1.98	1.43	-0.86	1.33	-1.73
Zr	-1.40	-11.35	0.74	-1.77	*	*	1.60	-2.84	-1.55	-0.43	0.09	*	18.31

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X15	X16	X17	X18	X21	X22	X23	X24	X25	X26	X29	X31	X32
SiO2	5.43	-0.10	-2.84	-0.05	0.15	-1.71	0.60	0.16	-0.21	0.48	2.35	0.21	*
TiO2	-1.13	-3.33	-1.79	-0.56	-0.89	-1.13	0.53	-0.03	0.53	1.07	-3.86	-0.56	*
Al2O3	3.70	-4.62	-2.77	-1.31	4.70	-1.23	0.59	0.03	-0.31	0.31	3.03	0.15	*
Fe2O3T	2.93	-2.73	0.27	-2.20	-1.03	0.93	1.27	-1.17	0.13	-0.07	-2.92	0.47	*
MnO	-13.90	-2.41	11.37	10.28	0.40	-16.19	3.27	6.78	2.24	-2.41	4.54	5.68	*
MgO	-5.32	3.03	-3.23	-6.83	-0.83	-3.23	*	6.05	6.73	7.20	8.60	-1.62	*
CaO	3.44	-3.52	-1.98	-0.45	-0.73	0.59	1.40	-0.55	0.13	-0.85	3.19	0.00	*
K2O	1.64	0.38	-0.88	0.82	-0.69	43.21	0.13	-2.27	-0.44	-0.88	1.32	-2.33	*
P2O5	0.36	-0.71	-1.07	1.96	-0.50	100.20	-0.36	-1.07	0.00	0.36	8.20	0.18	*
LOI	0.00	3.30	1.41	0.05	1.45	-0.29	*	-0.35	-0.11	7.93	-0.93	-1.20	*
As	-9.00	-3.72	*	*	3.59	-8.65	*	-2.81	-0.03	*	-1.91	*	*
Ba	3.44	16.34	-3.30	-0.65	-0.42	*	2.94	-1.44	-2.28	*	-7.35	*	3.60
Be	0.25	1.25	*	0.06	0.19	*	*	0.11	*	*	*	*	0.38
Bi	-0.26	*	*	*	*	*	*	*	*	*	208.12	*	3.15
C(tot)	*	*	*	*	0.00	*	-24.21	-0.03	0.03	-72.59	*	*	*
Cd	-0.27	-0.14	*	*	1.31	7.29	*	*	*	*	*	*	-6.74
Ce	2.99	-3.81	-5.69	0.20	0.20	*	*	-0.53	2.56	*	*	*	2.06
Co	-0.65	-5.07	0.85	0.20	-0.25	*	*	-1.40	-6.96	*	*	*	-14.67
Cr	-0.04	-1.16	21.31	0.47	-1.18	*	5.04	-0.52	-1.63	*	33.48	*	4.59
Cs	5.30	*	-2.44	0.47	*	*	*	-2.31	*	*	*	*	6.35
Cu	0.36	-1.14	3.25	0.68	0.15	-11.32	1.94	-0.06	-0.26	*	*	*	1.83
Dy	-1.19	2.13	-4.02	0.19	0.42	*	*	0.11	*	*	*	*	1.57
Er	-0.43	0.09	-3.88	0.09	0.43	*	*	-0.09	*	*	*	*	2.39
Eu	-0.09	0.52	-2.54	-0.09	0.32	*	*	0.01	*	*	*	*	1.62
Ga	-0.02	*	*	-0.10	*	*	*	0.36	2.26	*	*	*	2.08
Gd	0.78	6.74	-4.25	0.07	0.21	*	*	0.06	*	*	*	*	2.06
Hf	-2.61	*	-4.13	0.11	12.11	*	*	-0.46	4.45	*	*	*	2.82
Ho	-0.82	3.61	-3.34	0.13	0.41	*	*	-0.19	*	*	*	*	2.34
La	1.11	3.11	-2.59	0.84	0.16	*	*	-0.21	7.89	*	*	*	2.06
Li	-0.95	*	*	0.69	1.70	*	*	-0.16	*	*	*	*	2.26
Lu	0.06	0.06	-3.09	0.06	0.28	*	*	-0.16	*	*	*	*	1.95
Mo	1.83	-1.12	*	0.98	0.40	6.86	*	-0.09	*	*	-0.89	*	3.14
Nb	2.23	*	-0.55	0.42	4.90	*	*	-0.13	6.34	*	*	*	4.80
Nd	0.49	1.17	-4.24	-0.16	0.24	*	*	-0.14	0.00	*	*	*	2.14
Ni	0.50	3.89	3.54	0.01	0.27	-13.34	3.85	-0.51	-0.47	*	*	*	2.92
Pb	6.10	-0.14	-6.04	0.61	-1.02	7.51	27.03	-0.92	5.35	*	*	*	1.84
Pr	-0.24	-1.09	-2.89	0.12	0.13	*	*	-0.26	10.17	*	*	*	2.77
Rb	1.13	-6.52	-2.04	0.91	0.62	*	*	0.42	-2.77	*	*	*	-2.38
Sb	-0.48	-7.64	*	*	0.03	52.69	*	1.20	*	*	17.63	*	1.17
Sc	0.00	-3.37	-1.68	0.00	-1.07	*	*	2.51	*	*	*	*	*
Sm	0.25	0.98	-3.87	-0.41	0.23	*	*	0.02	9.64	*	*	*	0.85
Sr	-4.78	-5.47	-4.98	-0.12	0.23	*	-0.82	1.57	0.44	*	-6.67	*	-2.33
Ta	5.28	*	11.90	1.93	7.30	*	*	-0.55	*	*	*	*	3.50
Tb	0.72	7.89	-3.21	0.37	0.22	*	*	-0.43	*	*	*	*	2.16
Th	1.75	*	-4.89	0.03	1.14	*	*	-0.07	*	*	*	*	2.60
Tl	-0.15	*	*	-0.10	*	*	*	*	*	*	*	*	*
Tm	0.18	2.73	-2.36	0.18	0.19	*	*	-0.42	*	*	*	*	1.46
U	1.82	*	-4.54	-0.10	0.31	*	*	-0.29	*	*	*	*	2.24
V	1.48	-0.67	5.40	1.15	-0.67	*	-2.41	0.22	0.07	*	-5.18	*	6.70
Y	0.24	2.56	-1.10	0.18	0.39	*	*	-0.19	0.37	*	-2.38	*	1.30
Yb	0.15	0.28	-3.80	0.15	0.27	*	*	0.11	*	*	*	*	2.95
Zn	0.57	4.90	2.86	-0.61	0.67	-13.58	3.85	-3.28	-0.10	*	*	*	6.07
Zr	3.76	*	-4.70	-0.99	12.39	*	3.76	-1.44	1.82	*	*	*	2.74

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X33	X34	X35	X36	X37	X38	X41	X43	X45	X46	X47	X48	X49
SiO2	*	-0.34	**0.52**	0.11	0.00	*	-1.00	**-0.32**	6.53	0.61	**2.91**	**-16.23**	*
TiO2	*	0.53	**0.19**	*	0.53	**-2.23**	*	**-0.03**	-0.02	-1.13	**1.07**	**40.60**	*
Al2O3	*	0.69	**1.08**	1.54	0.99	**1.00**	*	**0.46**	4.08	0.00	**1.54**	**6.62**	*
Fe2O3T	*	0.30	**2.27**	1.63	0.68	**-8.30**	*	**0.60**	-2.37	1.27	**1.27**	**17.26**	*
MnO	*	*	***9.07***	*	*	***-0.11***	*	***2.18***	*-4.08*	*-2.41*	***20.56***	***20.56***	*
MgO	*	*-0.57*	***2.19***	*	*-0.94*	***2.09***	*	***1.98***	*10.38*	*-5.32*	***19.71***	***29.09***	*
CaO	*	-0.59	**2.16**	0.06	0.90	**-5.37**	*	**-0.77**	-1.68	-1.90	**2.49**	**18.51**	*
K2O	*	-3.59	**0.13**	*	0.57	**-29.85**	*	**0.38**	-1.07	0.38	**-5.92**	**6.68**	*
P2O5	*	1.96	**0.71**	*	-0.18	**-30.67**	*	**-0.36**	-1.78	0.18	**3530.67**	**-3.21**	*
LOI	*	-0.41	**3.51**	1.18	-0.32	*	0.01	**-0.80**	-0.01	2.45	0.61	**-0.27**	*
As	*	*	***0.28***	*	*	*	*	*	*-1.93*	*1.19*	*	*	***-2.79***
Ba	*	-1.96	**2.01**	*	-0.10	*	*	**-1.33**	0.64	0.99	*	**-17.31**	**-0.66**
Be	*	*	**1.21**	*	0.00	**0.00**	*	**-0.25**	-1.46	-1.25	*	*	**-2.30**
Bi	*	*	***-0.85***	*	*	***0.60***	*	*	*-0.49*	*	*	*	*
C(tot)	*	*	*	*	*	*	*	*	*	*4.75*	*	*	*
Cd	*	*	**-1.94**	*	*	**0.55**	*	*	-1.77	-1.10	*	*	*
Ce	8.00	-2.64	**-1.30**	*	-0.75	**-1.33**	*	**-0.37**	-0.86	0.04	*	**-1.51**	**-1.03**
Co	*	*	**5.07**	*	-0.31	**-2.76**	*	**-0.16**	0.27	-1.12	*	**209.72**	*
Cr	*	-1.72	**7.76**	*	0.93	*	*	**-0.32**	-1.65	0.60	*	**9.38**	*
Cs	*	*	**1.44**	*	-0.46	**-0.53**	*	**-0.10**	0.36	*	*	**-1.34**	**-2.27**
Cu	*	*	**3.15**	*	-0.38	**3.23**	*	**-0.20**	-3.05	-1.02	*	**-5.54**	**-1.79**
Dy	1.88	-0.19	**-0.18**	*	-0.55	**-0.62**	*	**0.11**	0.52	0.84	*	**-2.48**	**-0.73**
Er	1.13	-0.09	**-0.06**	*	-0.34	**-0.68**	*	**0.21**	0.76	0.85	*	**-1.71**	**-1.07**
Eu	*	-0.01	**0.47**	*	-0.29	**-0.34**	*	**0.15**	0.34	-0.09	*	**-0.83**	**-1.20**
Ga	*	0.18	**-0.22**	*	-0.05	**-1.54**	*	**0.22**	-1.07	-0.88	*	**-2.20**	*
Gd	17.76	1.15	**-0.33**	*	-0.85	**0.14**	*	**-0.28**	0.59	-0.07	*	**-1.56**	**-1.01**
Hf	*	4.39	**0.24**	*	-0.44	*	*	**0.11**	0.06	*	*	**-3.15**	**-0.93**
Ho	*	-0.71	**0.16**	*	*	**-0.82**	*	**0.13**	0.51	0.76	*	**-1.76**	**-0.86**
La	20.85	0.17	**-0.90**	*	-0.64	**-1.34**	*	**0.01**	-0.70	0.01	*	**0.04**	**-1.15**
Li	*	*	**1.75**	*	*	**0.60**	*	**-2.38**	-0.36	-2.21	*	*	**-2.52**
Lu	*	-3.43	**0.00**	*	*	**-1.39**	*	**0.06**	0.16	0.69	*	**-1.83**	**-0.97**
Mo	*	-3.19	**6.33**	*	-0.61	**-1.03**	*	**0.00**	-0.73	0.37	*	*	*
Nb	*	*2.73*	***1.51***	*	*-0.72*	*	*	***1.36***	*-0.37*	*-0.81*	*	***1.13***	***2.52***
Nd	4.48	0.19	**-0.67**	*	-0.57	**-0.91**	*	**0.00**	0.30	0.82	*	**-2.49**	**-1.13**
Ni	*	-3.28	**3.95**	*	0.16	**1.50**	*	**2.64**	-1.14	0.57	*	**-1.25**	*
Pb	*	*3.55*	***-0.50***	*	*	*	*	***0.14***	*-0.39*	*-2.11*	*	***75.73***	***-2.35***
Pr	4.31	-0.02	**-0.76**	*	-0.54	**-0.59**	*	**-0.24**	0.28	0.22	*	**-1.34**	**-1.28**
Rb	*	-3.10	**3.87**	*	-0.52	**-2.76**	*	**-0.34**	-0.81	0.11	*	**-2.15**	**-1.06**
Sb	*	*	**-0.53**	*	*	**-1.44**	*	*	-2.17	0.21	*	*	*
Sc	106.13	8.84	**0.28**	*	0.00	*	*	**0.17**	0.73	18.53	*	**1.68**	**0.48**
Sm	2.19	0.09	**0.07**	*	-0.54	**-1.88**	*	**0.12**	0.24	0.25	*	**-2.01**	**-1.74**
Sr	*	1.10	**6.39**	*	-0.38	*	*	**0.98**	-1.47	-1.39	*	**-1.15**	**0.20**
Ta	*	*6.72*	***-0.45***	*	*	*	*	***0.29***	*6.82*	*	*	***-2.91***	***-0.65***
Tb	*	-0.71	**0.26**	*	*	**-0.13**	*	**-0.35**	-0.05	-0.35	*	**-1.07**	**-0.60**
Th	*	0.13	**-0.28**	*	-0.45	*	*	**0.27**	0.29	1.81	*	**-3.50**	**0.07**
Tl	*	*	**-1.53**	*	-3.44	**0.66**	*	*	-0.30	-0.20	*	*	*
Tm	*	-1.53	**0.18**	*	*	**-0.52**	*	**-0.45**	0.38	0.18	*	**-1.73**	**-0.44**
U	*	0.97	**5.99**	*	-0.43	**-1.37**	*	**0.33**	0.12	1.88	*	*	**-1.01**
V	*	-3.26	**10.81**	*	0.01	**-0.83**	*	**-0.37**	-1.57	4.81	*	*	*
Y	6.77	1.02	**1.92**	*	-0.92	*	*	**1.10**	-1.14	0.13	*	**-2.01**	**-1.00**
Yb	5.11	-0.59	**-0.00**	*	-0.37	**-0.61**	*	**0.02**	0.28	0.02	*	**-2.02**	**-0.42**
Zn	*	-3.08	**4.12**	*	1.84	*	*	**-1.34**	-4.51	-0.81	*	**0.82**	*
Zr	*	-1.33	**8.28**	*	-0.93	*	*	**-1.59**	-1.49	-2.18	*	**13.99**	**-0.70**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X50	X51	X52	X53	X54	X55	X57	X59	X60	X62	X63	X66	X67
SiO2	**-0.05**	2.70	**4.17**	-0.15	2.21	-0.37	*	0.40	2.02	0.02	-0.13	**-0.14**	*
TiO2	**-0.25**	0.53	**-3.33**	-3.28	2.73	0.86	*	0.53	-0.35	1.63	0.09	**1.22**	*
Al2O3	**-0.14**	2.00	**2.00**	-0.09	0.00	6.31	*	1.39	0.15	0.77	0.00	**0.25**	*
Fe2O3T	*	2.13	**-0.40**	0.07	-1.20	-0.87	*	1.13	-1.20	-1.70	1.13	**-1.00**	*
MnO	*	*3.39*	***-2.41***	*3.16*	*1.09*	*4.65*	*	*2.24*	*	*4.54*	*2.24*	***2.41***	*
MgO	***-0.10***	*4.64*	***17.62***	*1.74*	*-4.22*	*	*	*-1.09*	*	*3.08*	*1.51*	***0.94***	*
CaO	**-0.27**	2.16	**-3.18**	-0.68	-6.36	1.01	*	-0.33	0.32	0.87	0.13	**0.20**	*
K2O	**-1.01**	2.08	**-3.40**	-0.35	0.19	-4.35	*	-9.26	-0.44	2.08	-6.17	**1.01**	*
P2O5	**-0.78**	1.96	**11.05**	-0.04	-2.32	*	*	1.07	*	2.67	-1.25	**0.11**	*
LOI	**-0.72**	-0.57	**3.27**	-0.56	4.77	*	*	1.18	-0.35	1.05	-0.48	**-0.74**	*
As	*	*	*	*3.19*	*	*8.09*	*	*-1.28*	*1.03*	*	*0.91*	*	***-11.72***
Ba	**6.54**	2.32	**0.00**	0.78	0.33	-0.98	*	2.29	1.31	18.30	-0.39	**1.12**	**0.92**
Be	*	0.69	*	*	*	*	*	*	-0.81	*	*	*	**-0.62**
Bi	*	*	*	*	*	*	*	*	*	*	*	*	***6.14***
C(tot)	*	*	*	*-19.96*	*-36.30*	*	*-2.13*	*	*-0.55*	*0.60*	*	*	*
Cd	*	*	*	*	0.62	*	*	*	-0.41	*	-0.76	*	**-9.36**
Ce	*	0.68	**-0.61**	1.30	-0.02	-8.90	*	0.63	0.59	*	-0.92	**0.53**	**-0.45**
Co	*	4.75	*	2.19	0.46	*	*	-3.06	*	*	*	*	**0.55**
Cr	**0.95**	-0.51	**16.40**	7.72	0.83	*	*	*	*	*	0.12	**3.27**	**-0.04**
Cs	*	0.14	*	*	-0.24	*	*	*	*	*	2.15	*	**0.23**
Cu	**3.25**	-0.92	**2.00**	1.67	-0.89	9.16	*	-1.83	-1.20	*	5.39	**2.37**	**0.49**
Dy	*	0.70	**-0.54**	*	-0.07	*	*	0.38	-0.07	*	*	**0.76**	**-0.22**
Er	*	0.43	**1.62**	*	-0.02	*	*	0.30	0.30	*	*	*	**0.09**
Eu	*	0.32	**1.13**	*	0.08	*	*	0.20	-0.41	*	*	*	**-0.58**
Ga	*	0.73	**20.28**	1.02	0.69	*	*	-4.30	*	*	0.29	**-1.49**	**0.22**
Gd	*	0.18	**-1.06**	*	-0.10	138.45	*	0.07	0.64	*	*	*	**-0.07**
Hf	*	1.47	*	*	*	*	*	*	*	*	*	*	**0.87**
Ho	*	0.54	**2.03**	*	-0.09	*	*	0.22	-0.09	*	*	*	**-0.18**
La	**-3.41**	0.28	**0.70**	5.13	0.01	-1.71	*	0.69	-0.20	*	-1.50	**0.56**	**0.29**
Li	*	0.86	**-0.12**	*	-0.06	*	*	*	0.36	*	*	*	**-0.45**
Lu	*	0.35	**3.21**	*	0.03	*	*	-0.60	-0.28	*	*	*	**0.06**
Mo	*	1.12	**-3.65**	3.22	0.75	-0.66	*	1.69	*	*	-0.12	**-0.70**	**0.84**
Nb	*	*1.42*	*	*2.49*	*	*-3.77*	*	*7.79*	*	*	*1.65*	***3.15***	***2.20***
Nd	*	0.49	**-1.63**	*	0.00	-2.45	*	0.49	0.00	*	-0.08	**-4.24**	**0.16**
Ni	**-1.57**	3.65	**-1.89**	1.01	0.49	-1.59	*	-0.79	-0.63	*	0.62	**-0.97**	**1.05**
Pb	***10.70***	*1.31*	***21.54***	*-0.74*	*0.34*	*	*	*-4.13*	*	*	*	***-7.45***	***1.90***
Pr	*	0.63	**0.32**	*	0.16	40.21	*	0.66	0.18	*	*	*	**0.07**
Rb	**-3.28**	1.08	**1.25**	-0.23	0.06	0.06	*	-0.51	0.62	*	1.64	**-0.23**	**0.11**
Sb	*	*	*	*	0.06	*	*	*	*	*	-0.97	*	*
Sc	*	4.72	**-2.53**	24.55	*	*	*	-0.21	0.00	*	*	*	**1.64**
Sm	*	0.19	**-0.68**	*	-0.11	*	*	0.23	-0.57	*	*	**3.98**	**-0.15**
Sr	**-0.98**	0.03	**-0.94**	2.79	0.33	1.10	*	-2.82	0.30	0.99	0.24	**1.24**	**0.14**
Ta	*	*3.89*	*	*	*	*	*	*	*	*	*	*	***5.63***
Tb	*	0.36	**0.37**	*	0.00	*	*	-0.17	0.36	*	*	*	**0.01**
Th	*	0.50	*	*	*	*	*	-0.24	*	*	28.04	**-4.99**	**0.00**
Tl	*	0.13	*	*	0.43	*	*	*	*	*	*	*	**2.33**
Tm	*	0.73	**3.37**	*	-0.23	*	*	-0.54	-0.23	*	*	*	**0.18**
U	*	-0.30	**1.35**	1.06	0.19	0.00	*	-2.90	*	*	3.87	**1.74**	**-0.04**
V	**8.29**	-0.67	**-3.85**	1.55	-0.15	1.18	*	-3.96	0.19	*	0.74	**-1.59**	**-0.81**
Y	*	0.37	**-1.10**	0.24	*	-1.46	*	0.00	-0.46	*	3.57	**1.04**	**0.38**
Yb	*	0.52	**0.28**	*	0.07	*	*	-0.37	0.14	*	*	*	**0.02**
Zn	**-0.45**	-1.12	**0.82**	1.63	-0.23	-0.23	*	-0.61	0.41	*	0.54	**-0.12**	**-1.06**
Zr	**-1.55**	0.50	**7.95**	2.51	1.60	3.54	*	13.90	0.31	*	-0.17	**0.14**	**0.26**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X68	X71	X72	X73	X74	X76	X77	X78	X79	X80	X81	X82	X83
SiO2	**7.01**	*	**-7.66**	0.47	*	4.32	0.76	-0.05	*	-0.24	*	**-0.32**	-8.29
TiO2	**3.26**	*	**3.26**	-0.24	-19.01	-0.56	0.97	-0.56	*	-0.56	**-4.42**	**1.07**	27.99
Al2O3	**4.77**	*	**-5.24**	-0.28	-27.85	-2.93	0.69	-0.46	*	-0.38	**-1.08**	**-0.92**	*
Fe2O3T	**3.93**	**-1.40**	**4.27**	0.00	-6.27	8.63	0.63	-0.03	*	-1.03	**-0.37**	**-0.07**	43.13
MnO	***-2.41***	***2.18***	*	*-3.04*	*-1.21*	*-1.21*	*	*	*	*	***2.87***	***2.18***	*21.76*
MgO	***4.07***	***0.31***	***-24.08***	*-2.81*	*-8.91*	*-3.70*	*0.99*	*-0.57*	*	*-2.66*	***7.82***	***-0.10***	*364.37*
CaO	**12.04**	**0.64**	**6.80**	-0.63	-7.20	-12.92	0.19	-0.32	*	-0.42	**-1.27**	**0.08**	45.03
K2O	**2.90**	*	**-2.14**	-6.17	-16.56	-1.07	-0.44	-0.44	*	0.19	**0.00**	**-0.88**	29.16
P2O5	**3.92**	*	*	-2.39	-13.37	0.18	-0.18	7.31	*	-1.60	*	**0.36**	*
LOI	**-14.66**	*	**2.79**	-0.12	*	0.25	0.23	0.12	*	-0.66	*	**-81.79**	-0.33
As	*	***1.30***	*	*	*-1.29*	*	*	*	*	*	***1.81***	***13.68***	*-0.21*
Ba	**1.67**	**0.96**	*	*	-6.32	*	5.56	*	*	*	-1.79	**-0.65**	18.46
Be	*	*	*	*	-2.84	*	*	*	*	*	*	*	*
Bi	*	*	*	*	*-1.49*	*	*11.60*	*	*	*	*	*	*
C(tot)	*	*	*	*0.27*	*	*	*	*	*	*	*	*	*
Cd	*	*	*	*	-1.15	11.42	0.52	*	**1.51**	*	*	*	*
Ce	**2.17**	**-0.17**	*	*	-6.59	*	-2.51	*	**-0.53**	*	**0.78**	*	366.09
Co	**-0.39**	**3.38**	*	*	-2.45	1.03	0.85	*	*	*	**-1.12**	**1.69**	73.66
Cr	**0.74**	**1.05**	*	*	-6.26	15.22	*	*	*	*	**0.04**	**5.16**	11.71
Cs	*	**-0.29**	*	*	*	*	-0.36	*	**1.19**	*	**-1.01**	*	*
Cu	*	**0.27**	*	*	-3.41	5.71	-1.20	*	*	*	*	**6.39**	2.88
Dy	*	**-0.22**	*	*	-2.31	*	-0.76	*	**-0.13**	*	**0.59**	*	2.65
Er	4.65	**-0.13**	*	*	-2.01	*	-2.13	*	**-0.17**	*	*	*	*
Eu	0.56	**-0.09**	*	*	-1.76	*	-0.17	*	**-0.09**	*	**-0.29**	*	-1.64
Ga	*	**0.48**	*	*	*	*	-0.48	*	**0.32**	*	*	**4.53**	*
Gd	0.89	**0.64**	*	*	-1.88	*	-1.63	*	**-0.78**	*	*	*	*
Hf	*	**-1.41**	*	*	*	*	-1.41	*	*	*	**0.98**	*	*
Ho	*	**0.16**	*	*	-1.83	*	0.22	*	**-0.18**	*	*	*	*
La	**0.84**	**-0.23**	*	*	-5.75	*	-1.12	*	**0.15**	*	**-0.51**	*	3.09
Li	*	*	*	*	-9.15	*	-0.65	*	*	*	*	*	*
Lu	*	**-0.13**	*	*	-1.70	*	0.03	*	**0.06**	*	**-1.07**	*	30.59
Mo	*	*	*	*	-2.65	*	1.93	*	*	*	**-2.25**	*	-1.83
Nb	***-0.31***	***1.30***	*	*	*-7.97*	*	*	*	***30.89***	*	*	***12.69***	*6.34*
Nd	**0.49**	**0.39**	*	*	-5.23	*	-1.62	*	**-0.49**	*	**1.63**	*	303.28
Ni	**3.86**	**5.66**	*	*	-2.71	-1.23	*	*	*	*	1.29	**0.98**	1.45
Pb	*	***0.27***	*	*	*-2.66*	*-7.33*	*	*	*	*	*	***10.70***	*5.20*
Pr	*	**0.12**	*	*	-4.60	*	-1.62	*	**-0.14**	*	*	*	*
Rb	-9.34	**-0.12**	*	*	-7.22	*	1.75	*	**-0.68**	*	**-0.79**	**1.25**	-2.77
Sb	*	*	*	*	*	*	*	*	**-0.75**	*	**0.12**	*	*
Sc	**0.84**	**-0.84**	*	*	-2.45	*	-0.27	*	**7.92**	*	**-0.46**	*	*
Sm	**-0.01**	**0.19**	*	*	-2.88	*	-2.14	*	**-0.61**	*	**-0.68**	*	*
Sr	**3.52**	**-0.60**	**-35.45**	*	-7.79	*	-0.02	*	*	0.58	**1.85**	**1.57**	-0.49
Ta	*	***-0.42***	*	*	*	*	*	*	***3.85***	*	***0.65***	*	*
Tb	*	**0.51**	*	*	-1.66	*	0.00	*	**0.37**	*	**-0.85**	*	12.72
Th	-0.11	**-0.11**	*	*	-2.90	*	*	*	**2.07**	*	**-0.37**	**22.62**	7.86
Tl	*	*	*	*	-2.36	*	0.00	*	**-1.82**	*	*	*	*
Tm	*	**0.44**	*	*	-1.72	*	-0.86	*	**-0.45**	*	*	*	27.16
U	*	**-0.41**	*	*	-3.76	*	-0.09	*	**0.04**	*	**-0.19**	**1.93**	0.97
V	**3.41**	**1.09**	**-31.02**	*	-7.71	-0.24	0.63	*	*	*	**0.89**	**-2.22**	0.59
Y	**1.28**	**0.97**	*	*	-3.31	*	-0.24	*	**-0.84**	*	*	**13.55**	*
Yb	**0.28**	**-0.67**	*	*	-2.22	*	-0.43	*	**-0.61**	*	**-1.25**	*	31.98
Zn	*	**-3.20**	*	*	-3.96	18.02	1.18	*	*	*	**1.59**	**0.06**	-0.99
Zr	**0.31**	**-1.97**	*	*	-9.97	*	-3.58	*	*	*	3.33	**-3.27**	1.60

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X84	X87	X88	X89	X90	X91	X93	X94	X96	X97	X98	X101	X103
SiO2	3.86	*	-0.10	*	-2.20	3.14	*	0.26	0.23	-0.10	-0.55	*	3.31
TiO2	-1.66	-1.33	-1.13	-3.77	1.07	1.07	*	2.66	-1.28	-0.56	-1.13	*	15.91
Al2O3	10.55	*	-0.92	*	-0.46	5.08	*	-0.50	-7.65	-0.23	0.62	*	3.85
Fe2O3T	-4.03	*	-0.73	3.97	7.60	2.93	*	-1.45	-0.73	0.63	-0.40	*	-1.20
MnO	-1.21	2.41	-2.41	-11.60	*	4.48	*	0.63	2.87	28.65	*	1.44	*
MgO	-12.56	*	3.03	*	4.07	-0.10	*	-2.19	-0.54	0.47	-1.15	*	-9.44
CaO	2.21	*	0.64	*	-0.10	3.75	*	-1.93	-2.34	0.46	-1.00	*	-3.45
K2O	2.71	*	4.16	*	0.38	-8.44	*	2.63	-1.47	0.19	-0.88	*	*
P2O5	-1.60	*	0.36	*	*	7.13	*	-0.86	0.00	0.18	0.36	*	1.96
LOI	-2.05	*	0.59	*	0.77	1.41	*	-0.27	*	-1.21	8.88	*	1.14
As	*	*	*	-1.31	*	1.69	*	1.55	*	-0.28	1.54	0.17	*
Ba	-0.73	-1.95	12.16	1.83	*	-3.13	*	-0.86	-0.00	0.58	0.48	-1.63	38.72
Be	0.00	-0.39	-2.50	*	*	*	1.14	*	*	-0.87	-0.37	*	*
Bi	*	*	*	-6.52	*	58.91	*	14.66	*	-0.77	1.64	*	*
C(tot)	*	*	*	*	*	*	*	1.63	-0.61	-1.55	2.17	*	*
Cd	-0.41	*	*	*	*	*	*	0.35	*	0.96	0.14	*	*
Ce	-1.08	-0.70	-0.53	-1.66	*	5.53	0.97	0.02	*	0.10	0.23	-0.29	*
Co	0.72	-0.34	-0.13	*	*	-0.39	*	-0.43	*	0.59	-1.03	1.31	-0.46
Cr	1.07	-0.48	-0.39	-6.07	*	1.37	*	0.29	*	1.11	0.96	2.50	-6.55
Cs	*	0.00	3.82	4.10	*	150.57	*	*	*	-0.48	1.27	-0.03	*
Cu	11.14	-0.43	-3.53	-2.40	-1.83	-2.27	*	2.44	*	0.70	2.67	-2.18	-4.34
Dy	-0.67	0.15	-0.54	-0.26	*	*	-0.20	0.35	*	-0.03	-0.33	*	*
Er	-0.47	-0.34	-0.94	-0.52	*	*	0.07	0.41	*	0.17	-0.68	*	*
Eu	-0.66	-0.07	1.13	-0.75	*	*	0.17	0.18	*	0.69	-0.02	*	*
Ga	*	0.00	-0.99	1.90	*	-0.99	*	-0.14	*	0.95	1.00	-0.32	*
Gd	-0.18	-0.41	-1.06	-1.73	*	*	1.33	0.28	*	0.46	-0.86	*	*
Hf	*	0.00	0.22	4.07	*	*	0.09	-0.45	*	4.45	-0.07	*	*
Ho	-0.57	-0.11	-1.13	-0.66	*	*	-0.53	0.16	*	0.38	0.00	*	*
La	-1.09	-0.40	-0.40	-2.27	*	7.55	1.21	0.01	*	-0.40	0.42	0.35	4.46
Li	-0.94	0.47	*	1.32	*	*	*	6.09	*	0.36	0.13	*	*
Lu	-1.54	-0.15	3.21	-0.63	*	*	0.09	-0.08	*	0.35	-0.09	*	*
Mo	0.02	0.79	1.08	0.94	-0.19	-0.42	*	1.38	*	0.70	-0.22	0.01	-5.57
Nb	*	1.16	-0.31	1.42	1.13	-2.92	*	-0.62	*	-0.88	-1.39	-0.92	*
Nd	-0.82	-0.37	-0.33	0.10	*	0.33	0.55	0.14	*	-0.08	-0.39	*	*
Ni	*	1.75	-0.49	-4.45	9.29	-1.22	*	0.55	*	0.17	1.00	-0.33	-5.10
Pb	-2.78	-0.30	-15.85	-3.66	*	-5.01	*	2.68	*	1.06	-0.29	-0.15	14.83
Pr	-0.84	-0.29	-0.19	0.00	*	*	-0.12	0.10	*	0.06	-0.22	*	*
Rb	*	-0.25	1.59	-1.59	3.51	0.00	*	-0.12	*	0.62	0.95	0.52	-0.51
Sb	*	*	*	1.03	*	*	*	1.25	*	0.06	-0.49	*	*
Sc	0.84	0.86	-0.84	24.43	*	15.16	*	*	*	*	0.55	13.29	*
Sm	-1.00	-0.52	-0.01	-0.53	*	7.64	0.39	0.26	*	-0.01	-0.16	*	*
Sr	-0.68	0.81	-1.10	-1.93	-2.13	-1.46	*	-0.19	1.60	0.02	1.54	-0.73	-3.73
Ta	*	0.10	0.29	-2.09	*	*	*	-2.18	*	*	0.92	*	*
Tb	0.18	-0.26	0.37	-0.28	*	*	0.29	-0.05	*	-0.17	-0.79	*	*
Th	*	-0.22	-0.21	-1.02	*	*	*	-0.40	*	0.42	-0.27	1.27	8.66
Tl	*	*	-9.11	1.34	*	*	*	0.19	*	0.51	*	*	*
Tm	-1.50	-0.31	3.37	-0.33	*	*	0.35	-0.02	*	-0.23	-0.80	*	*
U	*	-0.10	-0.97	7.93	*	3.67	-0.92	-0.82	*	0.46	-0.24	0.37	-4.83
V	4.11	-0.45	-1.24	-6.22	*	-2.30	*	-0.74	*	0.44	1.31	0.96	-6.33
Y	-0.73	0.70	0.37	-1.28	0.37	-2.75	*	-0.04	*	0.09	-0.03	-0.42	-3.29
Yb	-0.50	-0.19	-1.00	-0.93	*	*	-0.31	-0.07	*	0.84	-0.04	*	*
Zn	0.62	-1.67	8.04	-3.13	6.94	-1.62	*	4.80	*	1.18	3.13	-0.25	-1.75
Zr	*	-1.21	-0.64	-8.67	*	1.00	*	-0.59	25.30	0.09	-0.14	-0.91	21.67

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

Lab Code	X104	X105	X107	X108	X109	X110	X112	X113	X114	X115	X116	X119	X120
SiO2	-0.32	-0.52	0.08	0.05	-0.77	-0.23	-0.71	-0.65	0.58	-0.34	-0.48	-0.26	0.55
TiO2	1.07	5.46	-0.56	-1.11	-0.56	1.63	0.85	-1.13	31.82	-0.56	-0.56	-1.66	0.53
Al2O3	-0.46	-1.08	0.23	-0.19	-0.18	1.00	1.08	0.31	-1.85	-0.62	-0.69	0.00	0.62
Fe2O3T	-1.07	0.93	0.13	-0.02	-0.40	1.47	6.93	0.87	-0.73	0.63	-0.20	-0.37	-2.03
MnO	-2.41	*	10.28	1.09	*	1.09	20.56	-0.11	*	-1.21	-1.21	-1.21	0.98
MgO	27.01	-2.19	-2.14	-0.36	-1.20	1.10	-1.87	4.38	-9.49	0.47	-3.70	2.03	-1.09
CaO	0.77	-0.46	0.14	0.17	-0.60	-1.04	2.44	0.16	0.39	-0.19	-0.19	-0.08	0.17
K2O	0.38	-2.14	-1.07	-3.09	0.69	0.19	1.76	-0.88	0.38	-0.44	-0.44	-0.44	-5.48
P2O5	0.36	-3.21	-0.89	-0.18	0.00	-1.60	2.14	-1.07	0.36	0.18	0.18	0.18	0.53
LOI	3.43	10.75	-1.34	-0.77	0.17	*	-63.73	2.50	2.19	-0.64	0.19	0.55	0.33
As	*	*	*	*	*	*	0.19	6.18	-1.19	0.78	*	*	-1.91
Ba	-18.62	*	*	0.31	*	-0.16	-11.33	-3.26	-2.87	0.66	0.48	0.18	-1.68
Be	*	*	*	-0.06	*	*	*	*	*	-0.31	*	0.06	-0.41
Bi	*	*	*	0.13	*	*	*	*	*	0.30	*	*	0.77
C(tot)	*	1.16	*	0.72	*	0.27	-6.64	*	*	-36.30	-0.64	*	11.86
Cd	*	*	*	-0.62	*	*	1.45	*	*	0.21	*	*	0.93
Ce	13.30	*	*	-0.37	*	*	0.78	0.20	5.44	-0.39	0.18	0.43	-0.77
Co	*	*	*	0.45	*	*	15.47	-6.11	-2.99	-0.59	*	0.07	1.31
Cr	*	*	*	0.87	*	0.12	55.73	*	-1.09	-0.58	3.63	-0.37	-0.23
Cs	*	*	*	-0.84	*	*	0.28	66.44	*	1.43	-0.27	0.64	0.33
Cu	-13.08	*	*	0.34	*	*	4.13	0.11	-1.65	0.68	*	0.15	-2.46
Dy	*	*	*	0.17	*	*	-2.08	*	*	-0.27	-0.19	0.34	0.90
Er	*	*	*	-0.00	*	*	-5.68	*	*	-0.47	-0.21	0.23	1.32
Eu	*	*	*	0.30	*	*	-8.63	*	*	0.08	-0.17	0.12	*
Ga	*	*	*	-0.20	*	*	-2.28	1.90	-2.04	-0.09	0.42	0.08	-0.36
Gd	*	*	*	-0.41	*	*	-3.97	*	*	-0.53	-0.57	0.29	*
Hf	*	*	*	-0.17	*	*	3.91	*	*	0.65	0.11	-0.00	*
Ho	*	*	*	0.02	*	*	-1.60	*	*	-0.57	-0.09	0.19	0.64
La	*	*	*	-0.13	*	-2.39	-2.18	-2.04	1.38	-0.34	0.42	0.35	1.03
Li	*	*	*	0.65	*	*	-5.64	*	*	-0.06	*	1.20	0.10
Lu	*	*	*	-0.19	*	*	-2.52	*	*	-0.28	0.03	0.09	0.60
Mo	*	*	*	0.11	*	*	0.80	-1.31	-2.95	0.40	*	*	-0.54
Nb	*	*	*	0.00	*	*	7.31	*	-2.05	0.04	0.85	0.45	-1.60
Nd	1.63	*	*	0.15	*	*	-10.22	8.15	3.59	-0.16	0.49	0.33	0.51
Ni	-7.32	*	*	-0.78	*	-2.70	-5.82	1.94	-3.49	-0.79	*	0.92	2.62
Pb	*	*	*	-0.98	*	*	3.69	-8.26	-5.01	0.47	*	0.33	*
Pr	*	*	*	0.09	*	*	-12.11	*	*	-0.09	-0.34	0.18	0.56
Rb	*	*	*	-1.17	*	*	-10.11	1.25	-1.47	-0.23	0.00	0.34	0.55
Sb	*	*	*	0.02	*	*	0.71	-10.38	*	-0.33	*	*	*
Sc	*	*	*	12.06	*	*	-5.01	140.66	20.21	-0.63	*	0.59	-0.80
Sm	*	*	*	0.00	*	*	-4.47	*	*	-0.01	0.49	0.19	0.86
Sr	1.92	*	*	0.65	*	*	-5.12	-1.53	-3.51	0.91	0.31	1.10	1.80
Ta	*	*	*	-0.05	*	*	*	*	67.94	0.15	1.93	0.22	*
Tb	*	*	*	-0.16	*	*	-10.02	*	*	0.18	-0.17	0.15	0.94
Th	*	*	*	-0.07	*	*	0.64	33.24	*	-0.11	0.29	0.13	0.56
Tl	*	*	*	-6.90	*	*	-2.58	-4.55	0.00	0.10	*	*	0.46
Tm	*	*	*	-0.07	*	*	-0.90	*	*	1.68	0.41	0.12	0.57
U	*	*	*	0.00	*	*	0.58	-7.73	2.32	-0.19	0.75	0.21	0.34
V	9.55	*	*	0.45	*	0.44	3.85	4.52	-0.47	-0.11	1.70	0.00	-0.67
Y	*	*	*	0.53	*	*	-0.37	-2.93	0.00	-0.27	-0.27	0.82	-0.55
Yb	*	*	*	0.02	*	*	2.06	*	*	-0.50	0.07	0.14	0.97
Zn	1.84	*	*	0.56	*	-0.86	-2.77	0.06	-2.03	0.16	*	-0.62	0.05
Zr	-11.91	*	*	-0.18	*	-1.21	-11.86	4.93	3.50	0.74	-0.34	0.31	-0.99

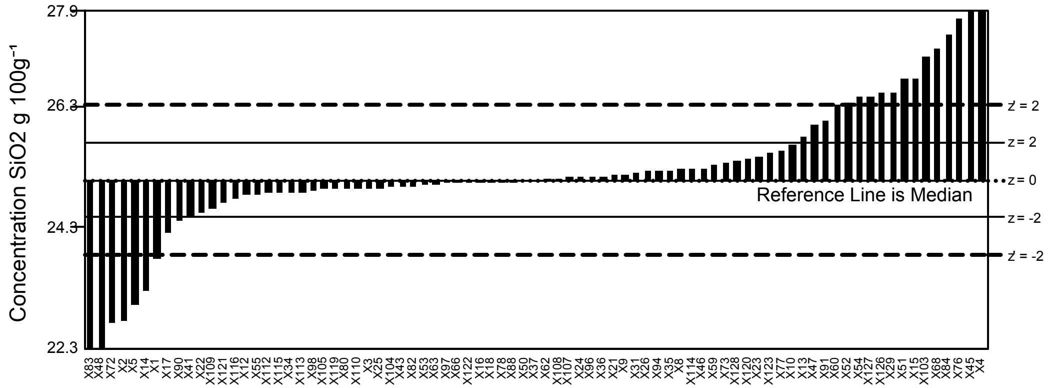
Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

Table 3 - GeoPT40A Z-scores for Calcareous organic-rich shale, ShTX-1. 14/12/2016

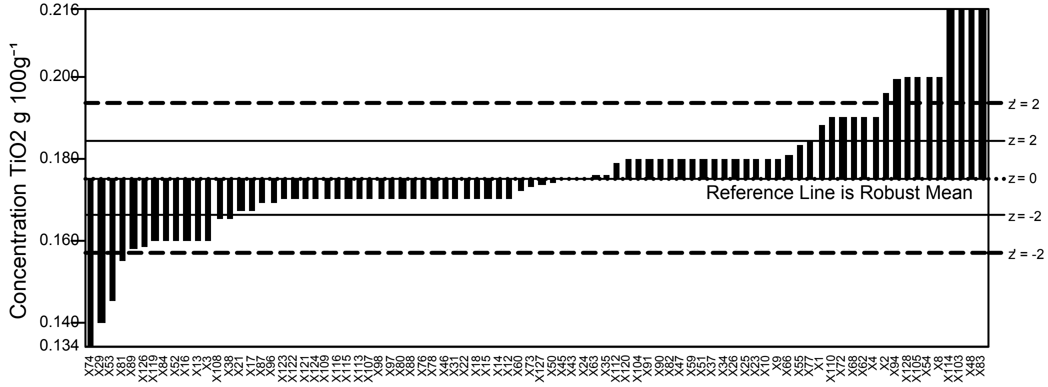
Lab Code	X121	X122	X123	X124	X126	X127	X128
SiO2	-0.63	-0.06	0.74	*	2.34	**4.49**	**1.07**
TiO2	-0.56	-0.56	-0.56	-0.56	-1.85	**-0.32**	**5.46**
Al2O3	-0.69	0.00	0.62	-1.69	0.21	**4.39**	**-0.31**
Fe2O3T	0.13	-0.53	-0.03	0.47	7.15	**2.77**	**1.93**
MnO	*-1.21*	*	*-2.35*	*	*17.28*	***-6.32***	***-2.41***
MgO	*2.03*	*-0.05*	*0.73*	*-1.62*	*0.15*	***2.19***	***0.94***
CaO	-0.48	-0.13	0.00	-1.60	1.77	**4.93**	**2.29**
K2O	-2.96	0.19	0.19	0.19	2.07	**1.35**	**-14.74**
P2O5	19.79	-3.39	-15.82	*	0.77	**0.71**	**-6.78**
LOI	-0.53	-0.64	*	*	-0.68	*	*
As	*-0.03*	*	*	*	*	***0.35***	*-4.40*
Ba	-3.75	*	*	-0.45	*	**0.49**	**-1.30**
Be	*	*	*	*	-1.56	**-0.54**	*
Bi	*	*	*	*	*-0.49*	*	*
C(tot)	*	*	*0.00*	*	*-0.30*	*	*
Cd	*	*	*	*	-1.32	*	44.66
Ce	13.20	*	*	0.55	*	**-0.39**	**9.21**
Co	*	*	*	0.61	-1.47	**-0.30**	**14.69**
Cr	1.18	*	*	1.63	*	**1.11**	**17.10**
Cs	*	*	*	1.77	*	**1.11**	**32.98**
Cu	-3.40	*	*	1.22	-0.64	**1.70**	**3.88**
Dy	*	*	*	0.05	*	*	**4.86**
Er	*	*	*	-0.15	*	*	**5.73**
Eu	*	*	*	0.32	*	*	**1.96**
Ga	-0.36	*	*	*	*	**0.32**	**7.15**
Gd	*	*	*	0.04	*	*	**4.90**
Hf	*	*	*	*	*	*	**95.79**
Ho	*	*	*	0.22	*	*	**4.59**
La	6.52	*	*	0.49	*	**1.11**	**24.01**
Li	*	*	*	-1.02	-1.56	**-1.79**	*
Lu	*	*	*	-0.28	*	*	**-3.53**
Mo	*	*	*	*	-0.57	**1.89**	**-6.93**
Nb	*-3.77*	*	*	*	*	***-0.03***	***82.04***
Nd	*	*	*	0.49	*	**-0.05**	**7.34**
Ni	-0.15	*	*	1.91	-0.85	**0.61**	**1.94**
Pb	*8.06*	*	*	*-0.80*	*0.83*	***1.43***	***21.54***
Pr	*	*	*	0.48	*	*	**5.77**
Rb	0.62	*	*	0.91	*	**1.10**	**0.11**
Sb	*	*	*	*	-0.16	*	45.01
Sc	17.69	*	*	*	-1.14	**-2.64**	**157.50**
Sm	*	*	*	-0.41	*	*	**3.80**
Sr	0.49	*	*	-0.07	*	**1.95**	**4.71**
Ta	*	*	*	*	*	*	*
Tb	*	*	*	-0.35	*	*	**1.84**
Th	-1.96	*	*	0.00	*	**-0.42**	*
Tl	*	*	*	*	*	*	*
Tm	*	*	*	0.09	*	*	**2.35**
U	0.00	*	*	-0.03	*	**-0.17**	**0.00**
V	1.04	*	*	-2.00	-2.37	**2.49**	**0.00**
Y	-0.55	*	*	0.64	*	**9.02**	**-8.42**
Yb	*	*	*	-0.37	*	*	**3.08**
Zn	-0.35	*	*	-1.41	-1.76	**1.74**	**0.82**
Zr	0.52	*	*	*	*	*	**21.33**

Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

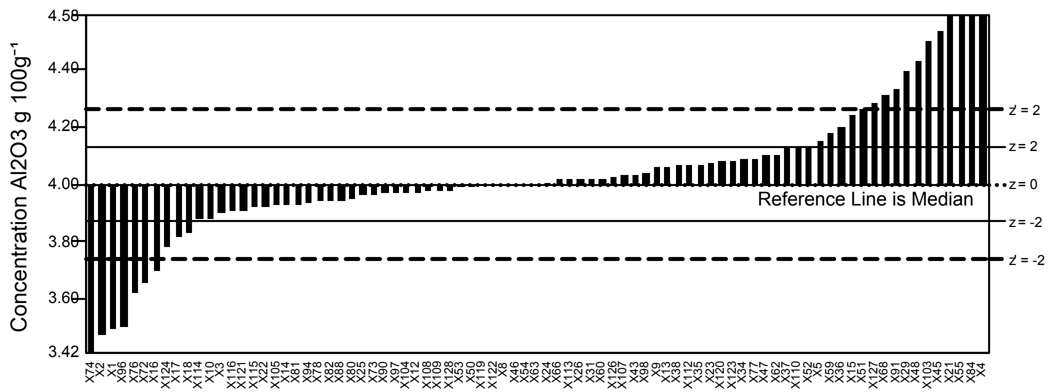
GeoPT40A - Barchart for SiO2



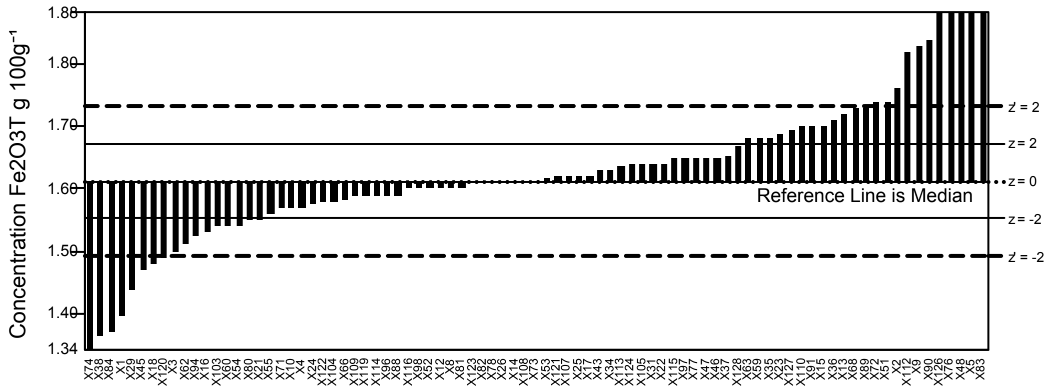
GeoPT40A - Barchart for TiO2



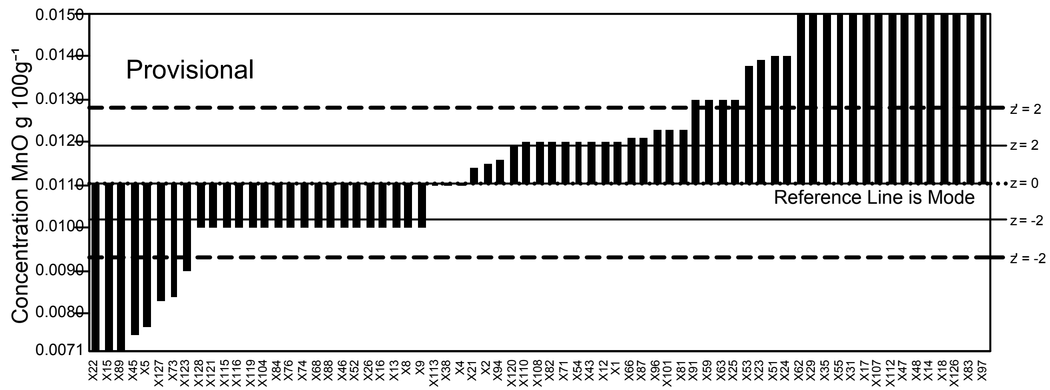
GeoPT40A - Barchart for Al2O3



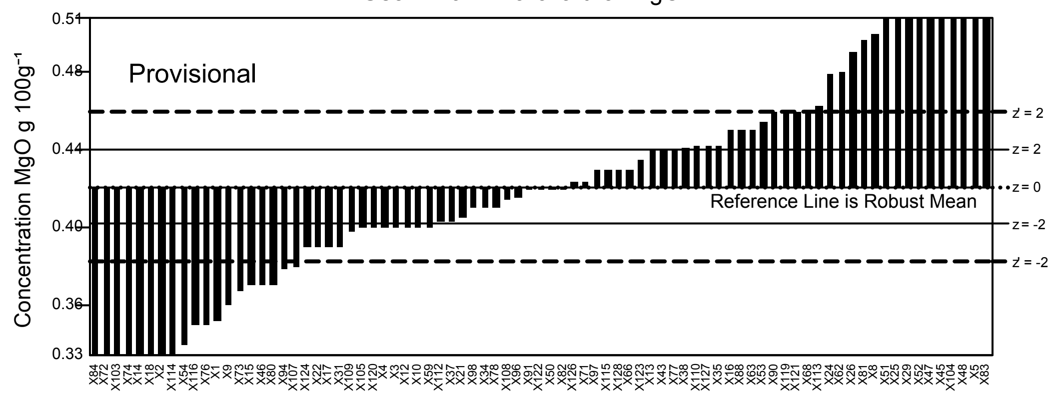
GeoPT40A - Barchart for Fe2O3T



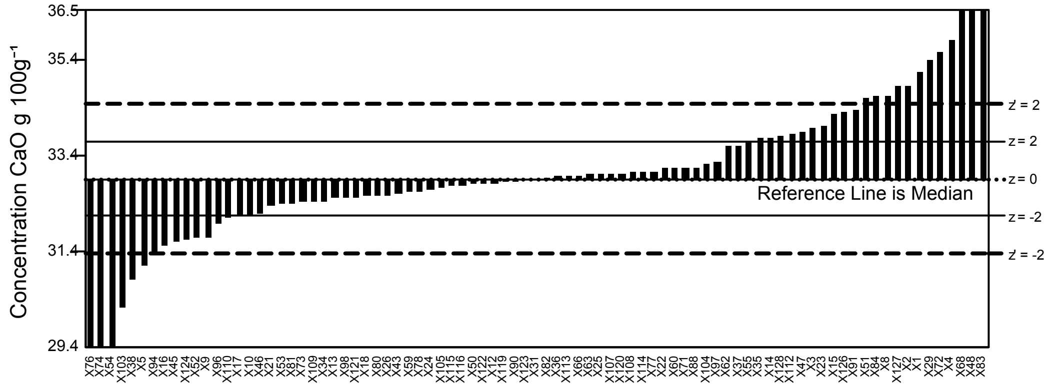
GeoPT40A - Barchart for MnO



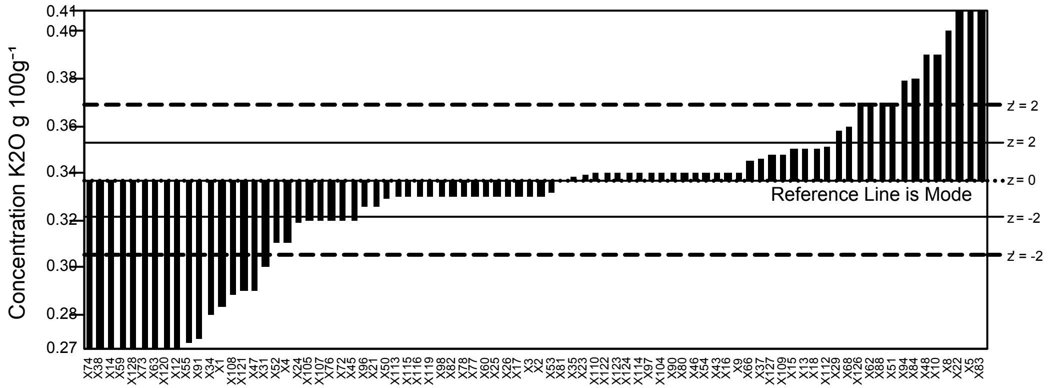
GeoPT40A - Barchart for MgO



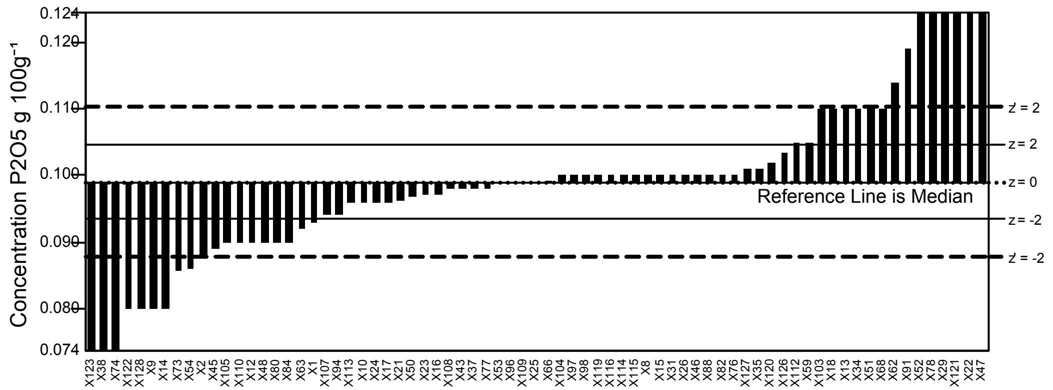
GeoPT40A - Barchart for CaO



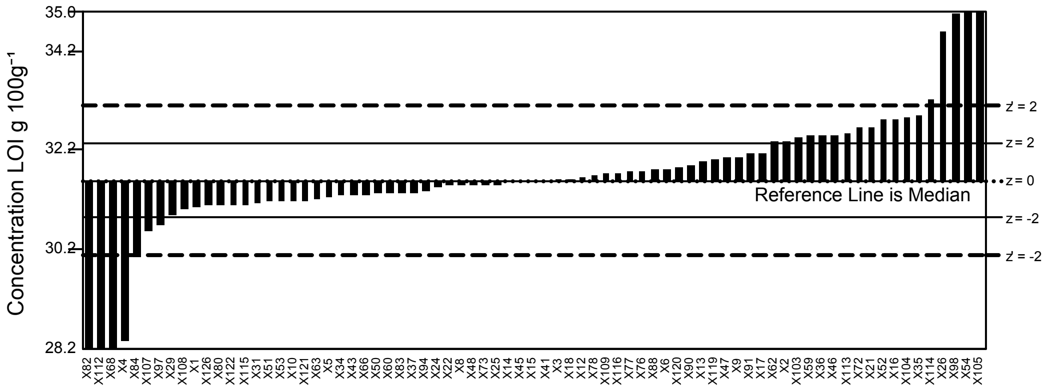
GeoPT40A - Barchart for K2O



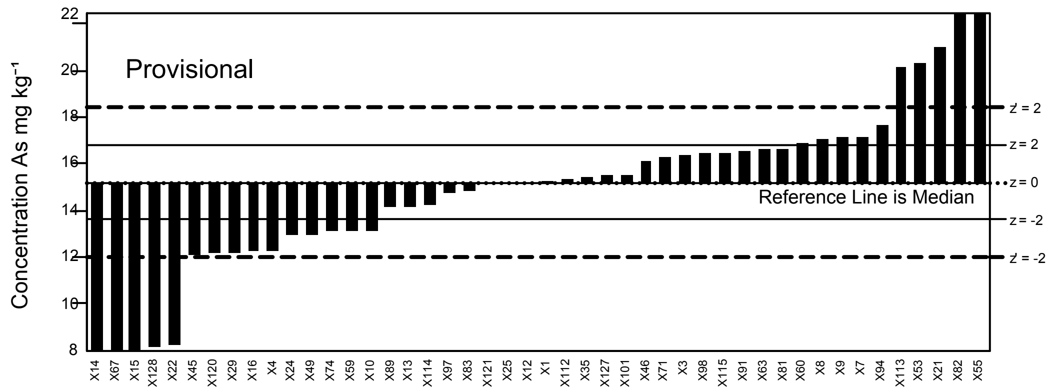
GeoPT40A - Barchart for P2O5



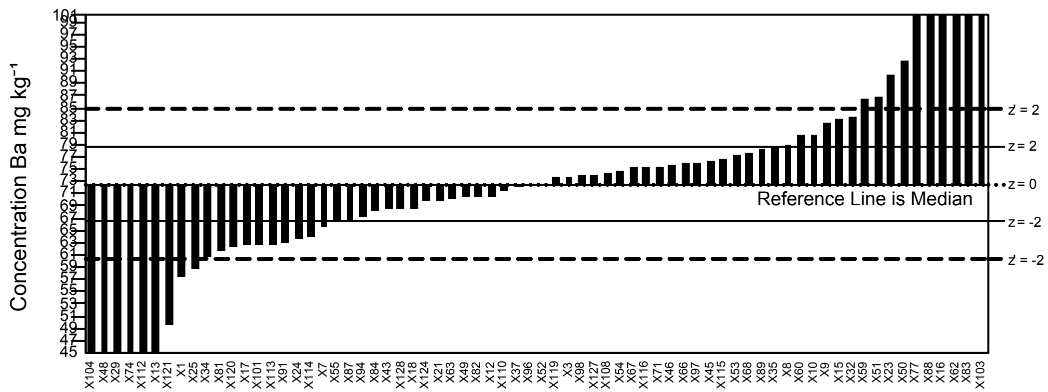
GeoPT40A - Barchart for LOI



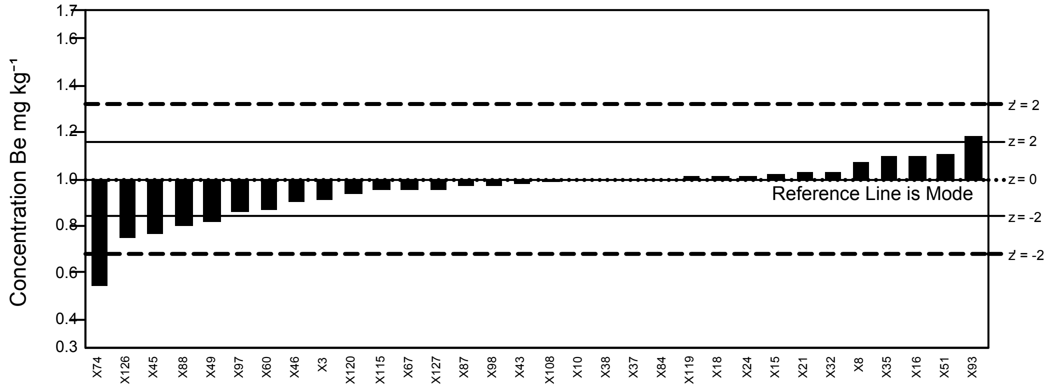
GeoPT40A - Barchart for As



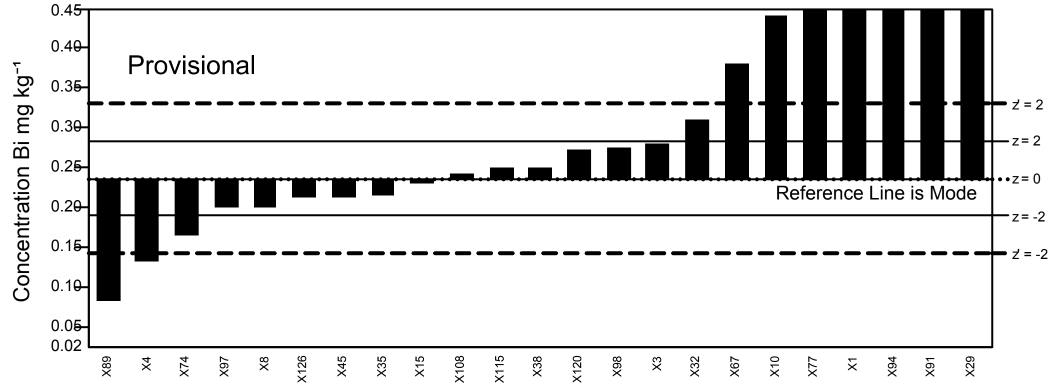
GeoPT40A - Barchart for Ba



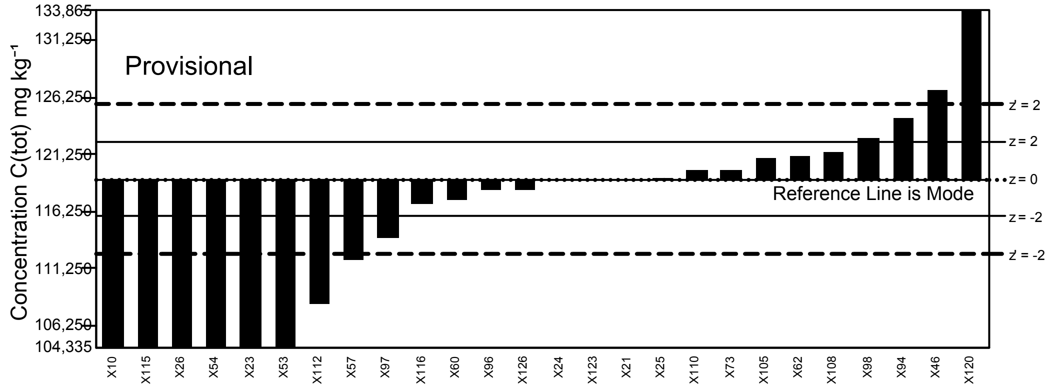
GeoPT40A - Barchart for Be



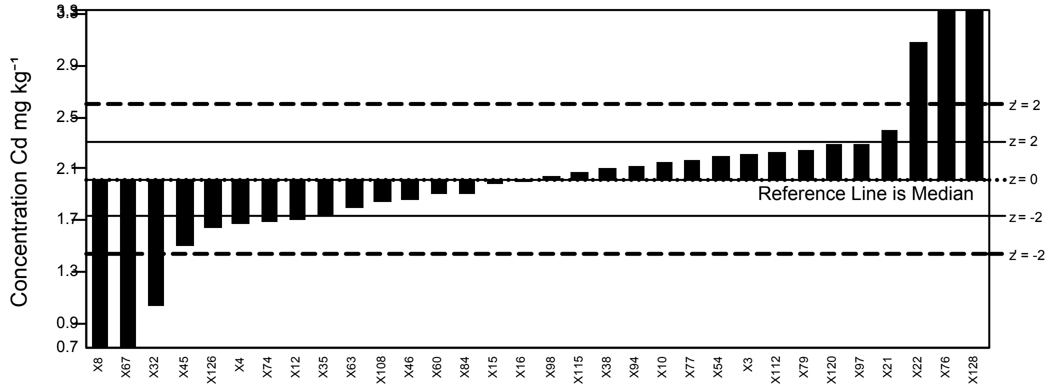
GeoPT40A - Barchart for Bi



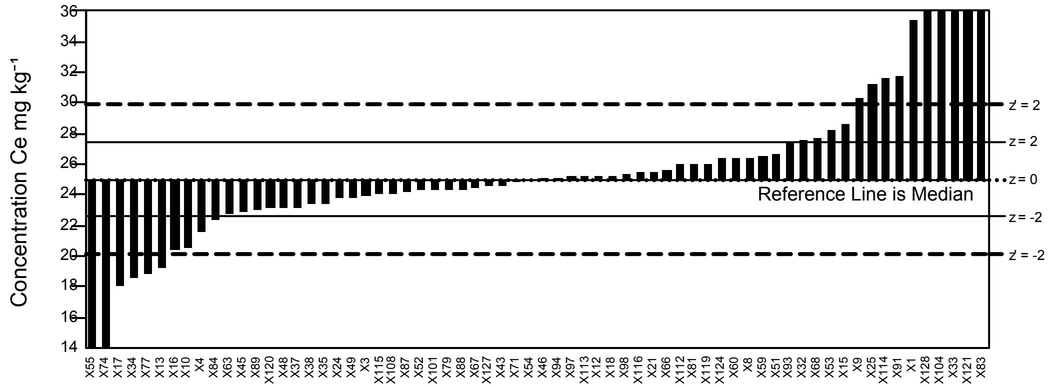
GeoPT40A - Barchart for C(tot)



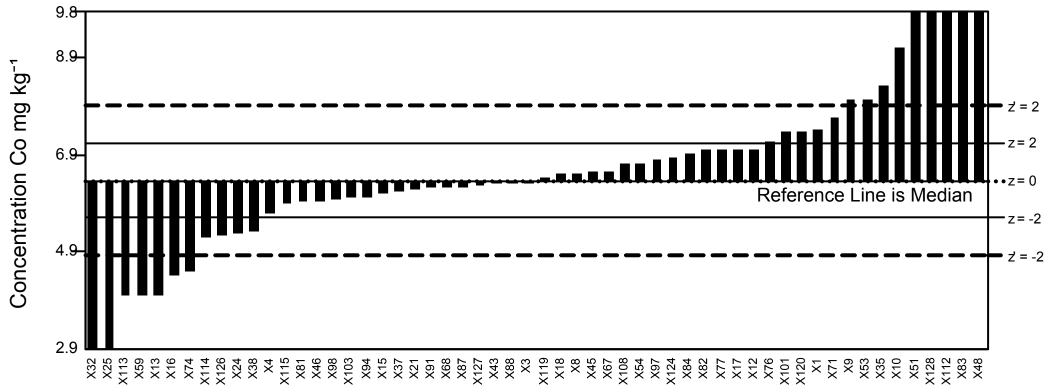
GeoPT40A - Barchart for Cd

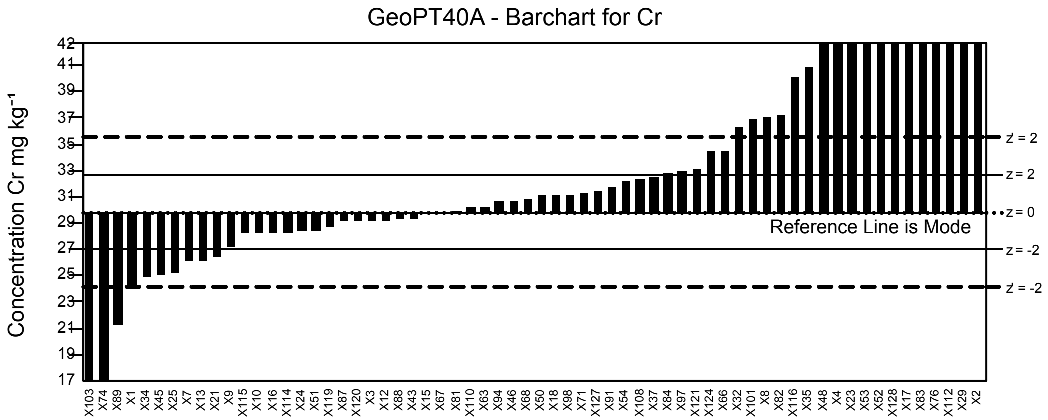


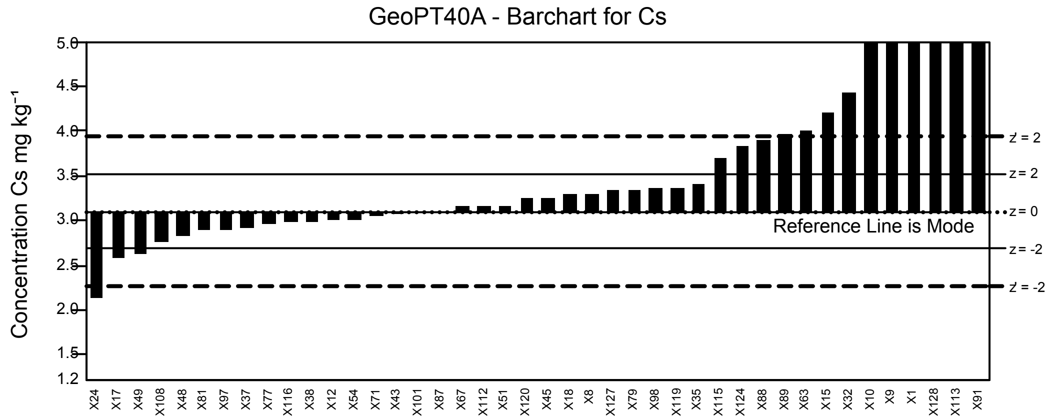
GeoPT40A - Barchart for Ce

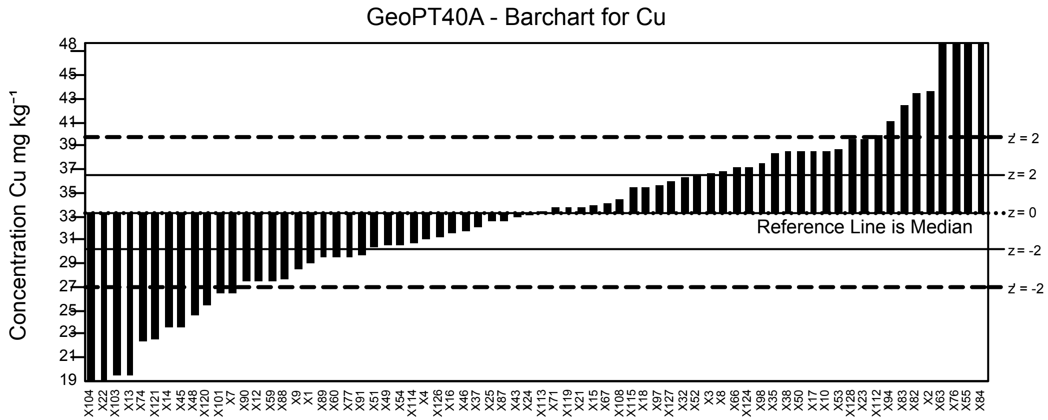


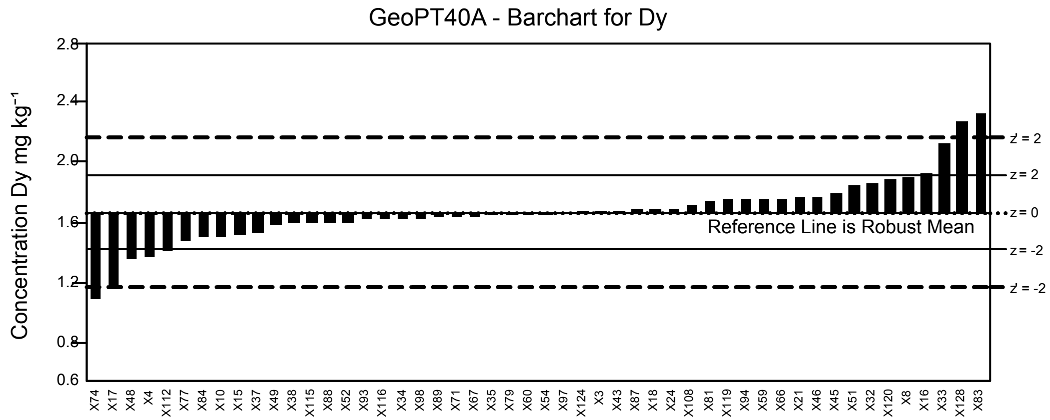
GeoPT40A - Barchart for Co

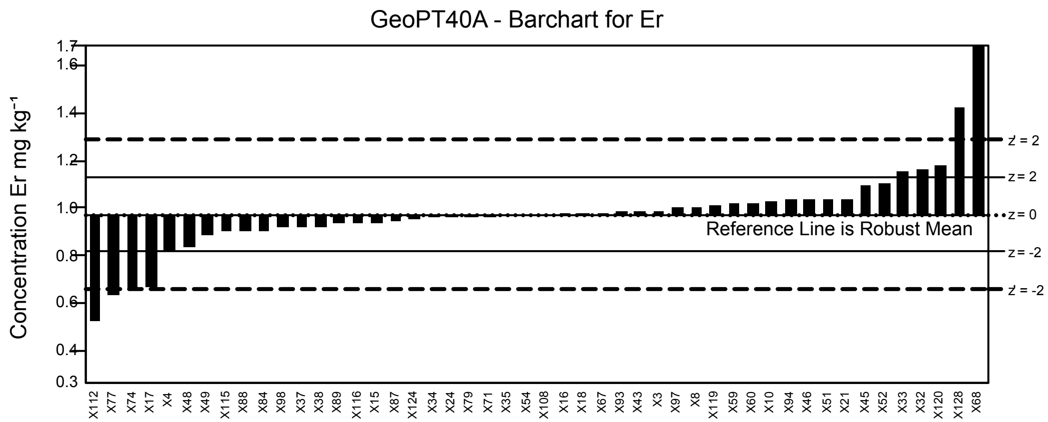


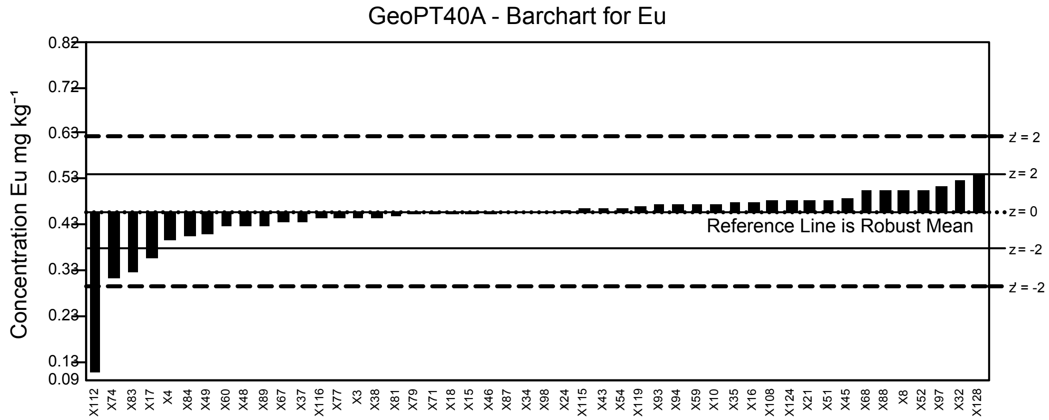

GeoPT40A - Barchart for Cr
Concentration Cr mg kg⁻¹
42 41 39 37 35 33 31 29 27 25 23 21 19 17
z' = 2
z = 2
z = 0
Reference Line is Mode
z = -2
z' = -2
X103 X74 X89 X1 X34 X45 X25 X7 X13 X21 X9 X115 X10 X16 X114 X24 X51 X119 X87 X120 X3 X12 X88 X43 X15 X67 X81 X110 X63 X94 X46 X68 X50 X18 X98 X71 X127 X91 X54 X108 X37 X84 X97 X121 X124 X66 X32 X101 X8 X82 X116 X35 X48 X4 X23 X53 X52 X128 X17 X83 X76 X112 X29 X2


GeoPT40A - Barchart for Cs
Concentration Cs mg kg⁻¹
5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.2
z' = 2
z = 2
z = 0
Reference Line is Mode
z = -2
z' = -2
X24 X17 X49 X108 X48 X81 X97 X37 X77 X116 X38 X12 X54 X71 X43 X101 X87 X67 X112 X51 X120 X45 X18 X8 X127 X79 X98 X119 X35 X115 X124 X88 X89 X63 X15 X32 X10 X9 X1 X128 X113 X91

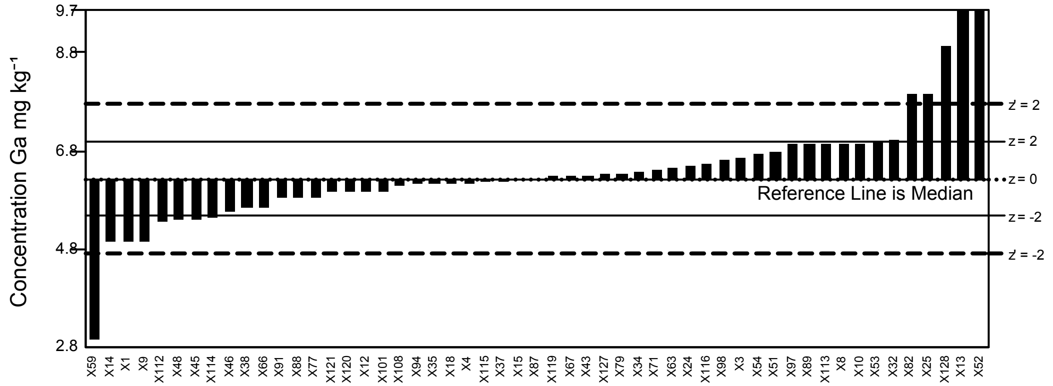

GeoPT40A - Barchart for Cu
Concentration Cu mg kg⁻¹
48 45 43 41 39 37 35 33 31 29 27 25 23 21 19
z' = 2
z = 2
z = 0
Reference Line is Median
z = -2
z' = -2
X104 X22 X103 X13 X74 X121 X14 X45 X48 X120 X101 X7 X90 X12 X59 X88 X9 X1 X89 X60 X77 X91 X51 X49 X54 X114 X4 X126 X16 X46 X37 X25 X87 X43 X24 X113 X71 X119 X21 X15 X67 X108 X115 X18 X97 X127 X32 X52 X3 X8 X66 X124 X98 X35 X38 X50 X17 X10 X53 X128 X23 X112 X94 X83 X82 X2 X63 X76 X55 X84


GeoPT40A - Barchart for Dy
Concentration Dy mg kg⁻¹
2.8 2.4 2.0 1.6 1.2 0.8 0.6
z' = 2
z = 2
z = 0
Reference Line is Robust Mean
z = -2
z' = -2
X74 X17 X48 X4 X112 X77 X84 X10 X15 X37 X49 X38 X115 X88 X52 X93 X116 X34 X98 X89 X71 X67 X35 X79 X60 X54 X97 X124 X3 X43 X87 X18 X24 X108 X81 X119 X94 X59 X66 X21 X46 X45 X51 X32 X120 X8 X16 X33 X128 X83

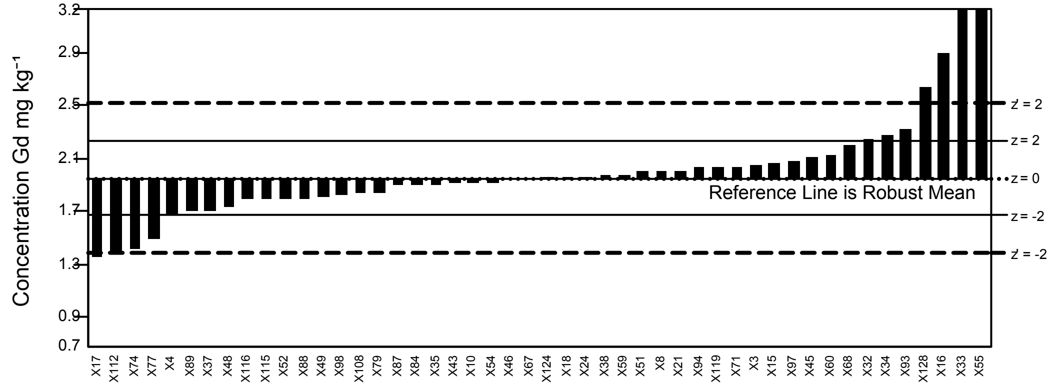

GeoPT40A - Barchart for Er
Concentration Er mg kg⁻¹
1.7 1.6 1.4 1.2 1.0 0.8 0.6 0.4 0.3
z' = 2
z = 2
z = 0
Reference Line is Robust Mean
z = -2
z' = -2
X112 X77 X74 X17 X4 X48 X49 X115 X88 X84 X98 X37 X38 X89 X116 X15 X87 X124 X34 X24 X79 X71 X35 X54 X108 X16 X18 X67 X93 X43 X3 X97 X8 X119 X59 X60 X10 X94 X46 X51 X21 X45 X52 X33 X32 X120 X128 X68


GeoPT40A - Barchart for Eu
Concentration Eu mg kg⁻¹
0.82 0.72 0.63 0.53 0.43 0.33 0.23 0.13 0.09
z' = 2
z = 2
z = 0
Reference Line is Robust Mean
z = -2
z' = -2
X112 X74 X83 X17 X4 X84 X49 X60 X48 X89 X67 X37 X116 X77 X3 X38 X81 X79 X71 X18 X15 X46 X87 X34 X98 X24 X115 X43 X54 X119 X93 X94 X59 X10 X35 X16 X108 X124 X21 X51 X45 X68 X88 X8 X52 X97 X32 X128

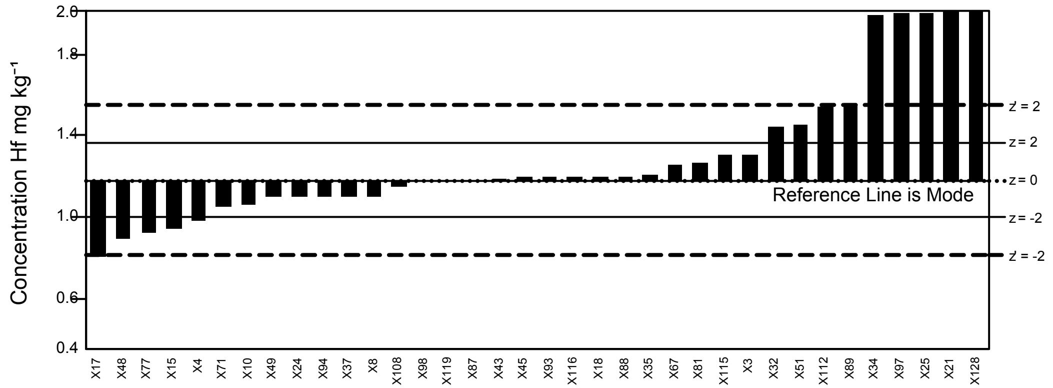
GeoPT40A - Barchart for Ga



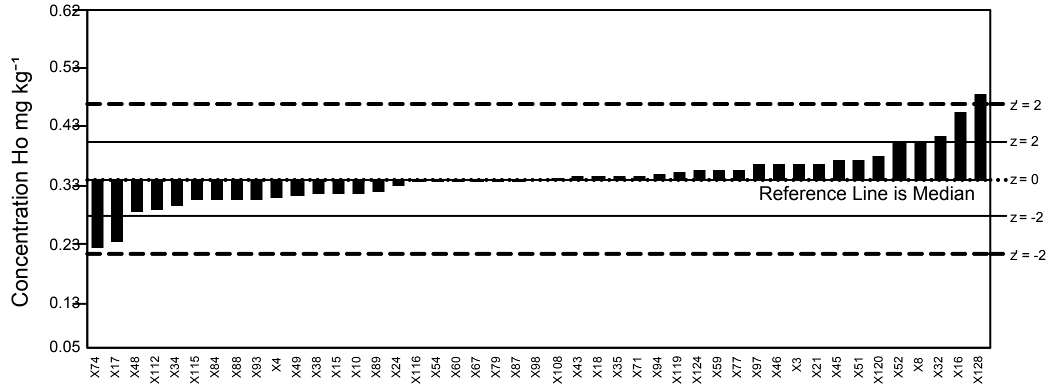
GeoPT40A - Barchart for Gd



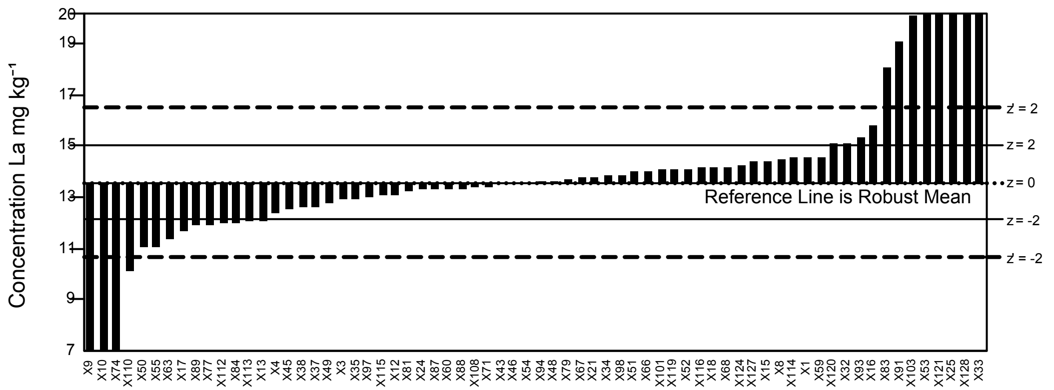
GeoPT40A - Barchart for Hf



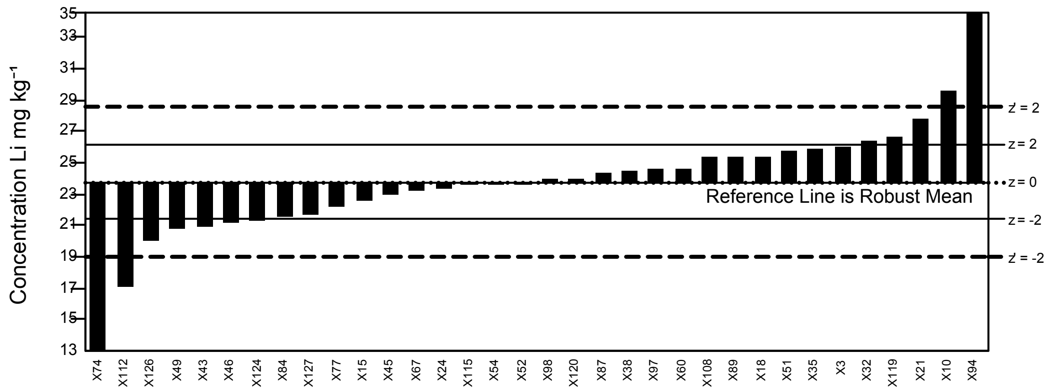
GeoPT40A - Barchart for Ho



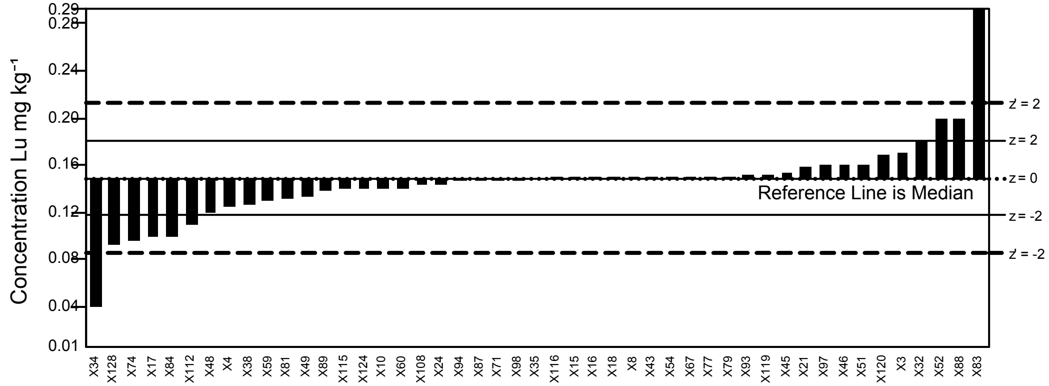
GeoPT40A - Barchart for La



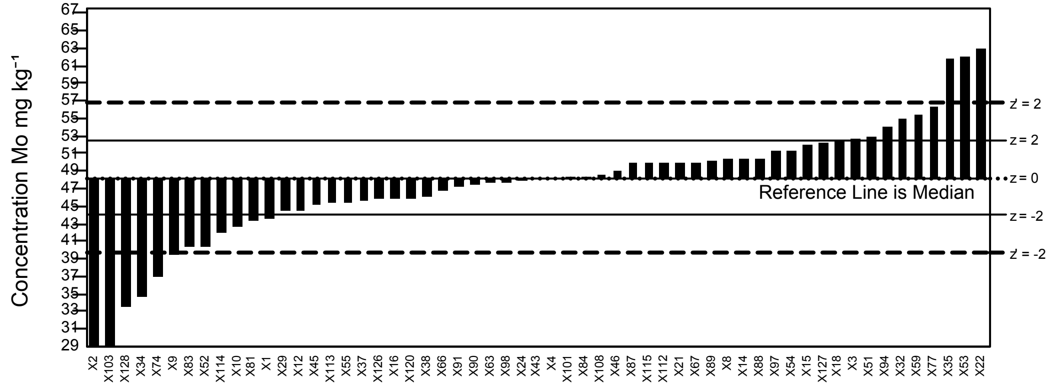
GeoPT40A - Barchart for Li



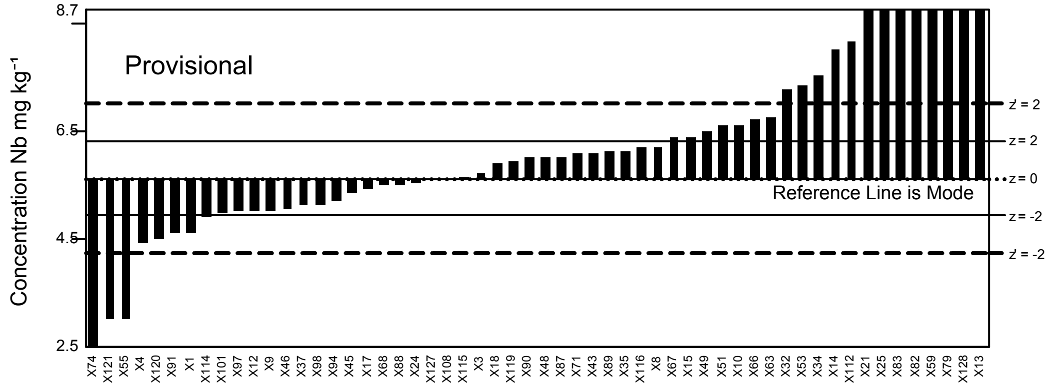
GeoPT40A - Barchart for Lu



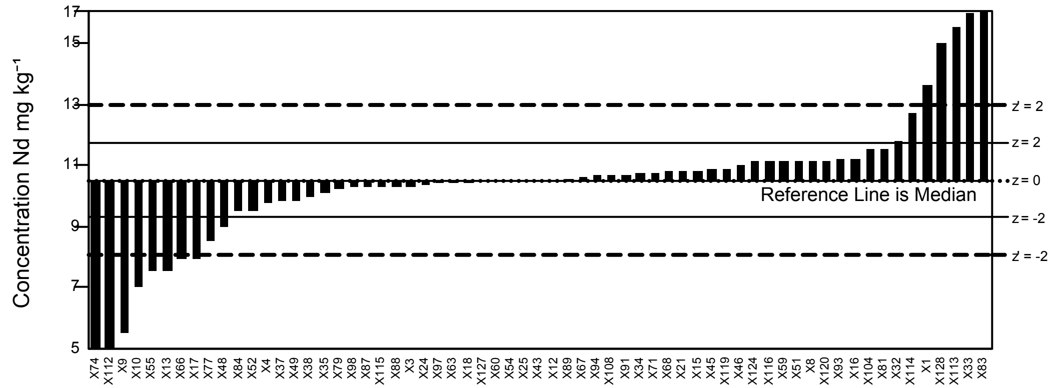
GeoPT40A - Barchart for Mo



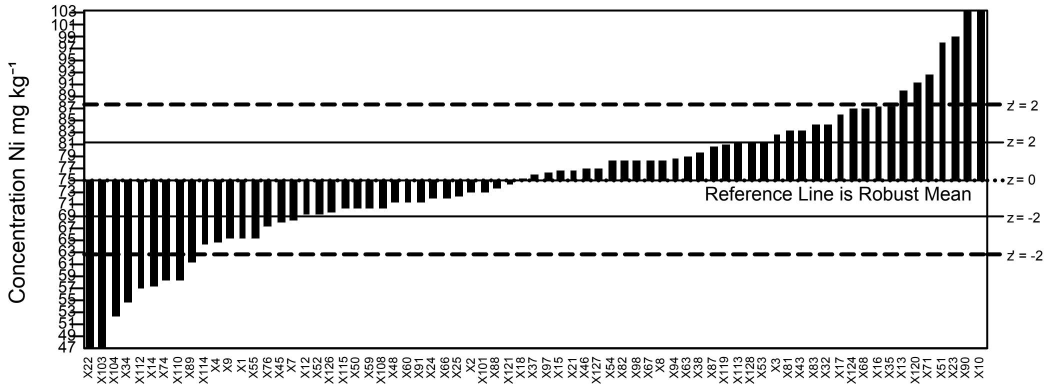
GeoPT40A - Barchart for Nb



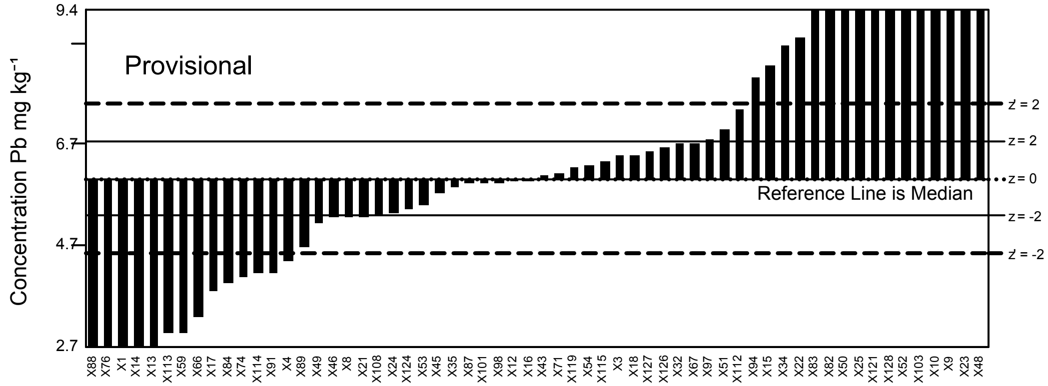
GeoPT40A - Barchart for Nd

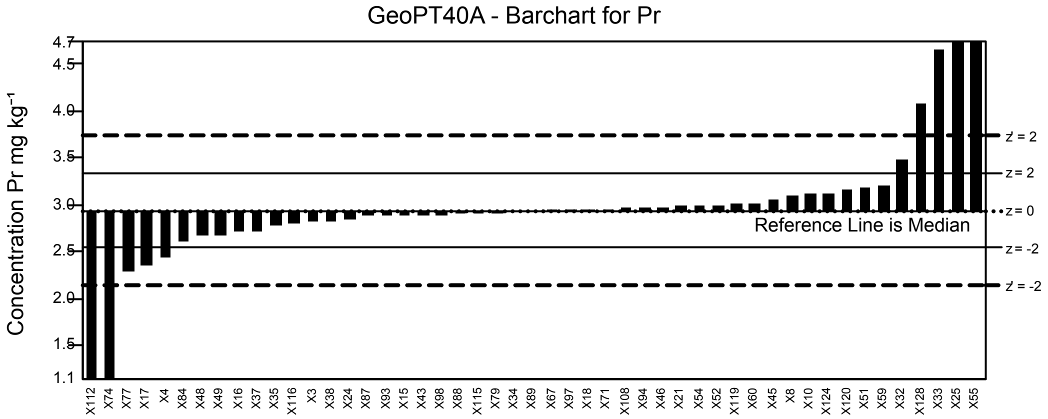


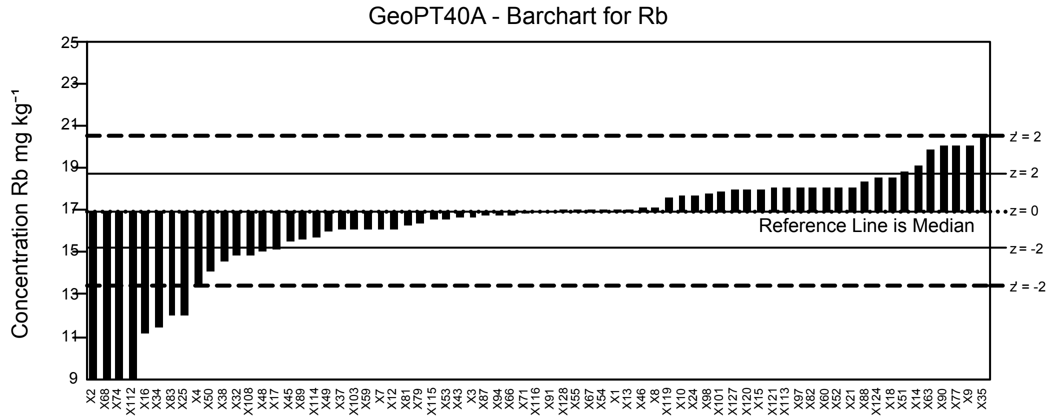
GeoPT40A - Barchart for Ni

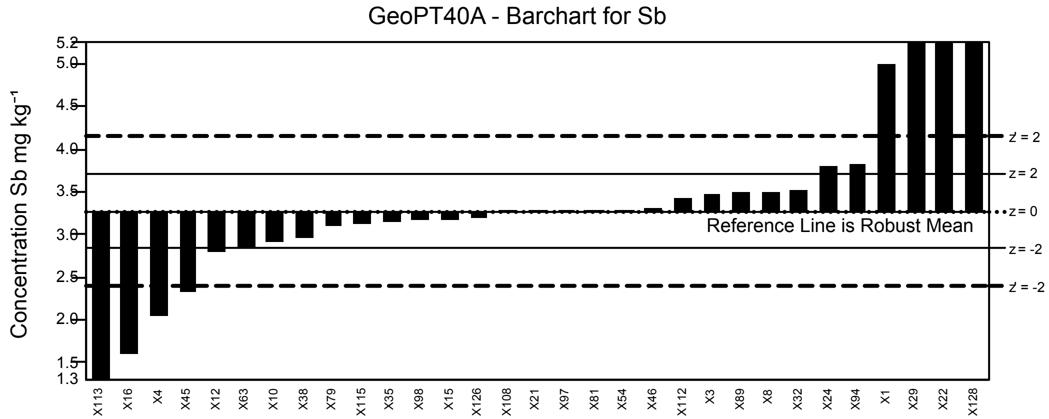


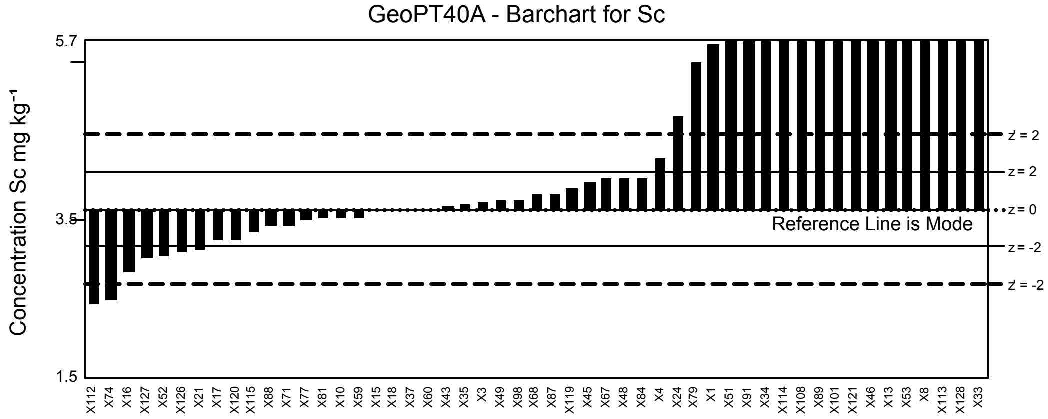
GeoPT40A - Barchart for Pb

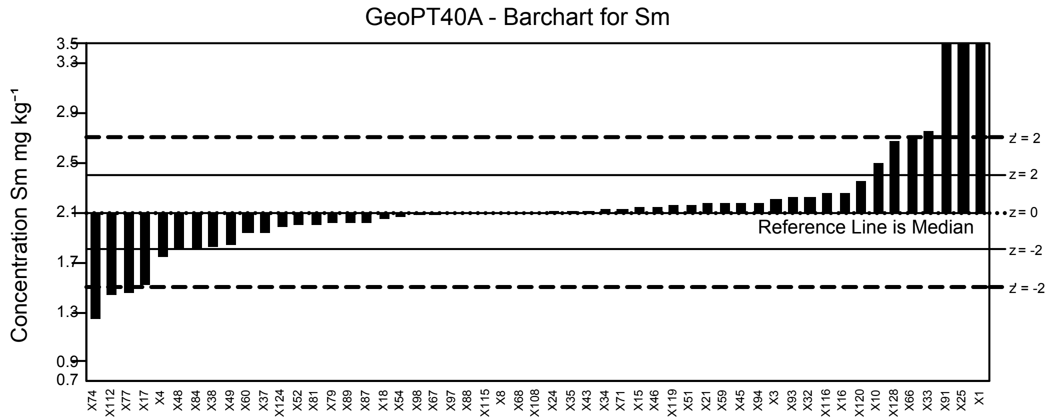


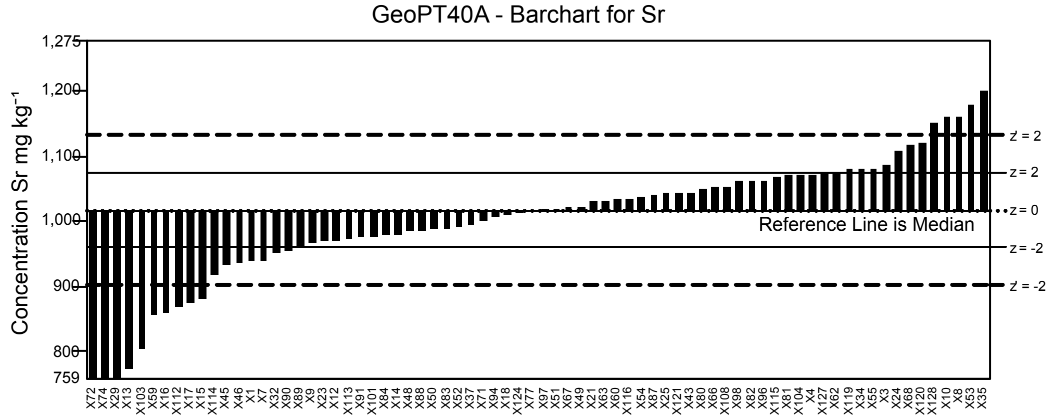

GeoPT40A - Barchart for Pr
Concentration Pr mg kg⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2


GeoPT40A - Barchart for Rb
Concentration Rb mg kg⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2

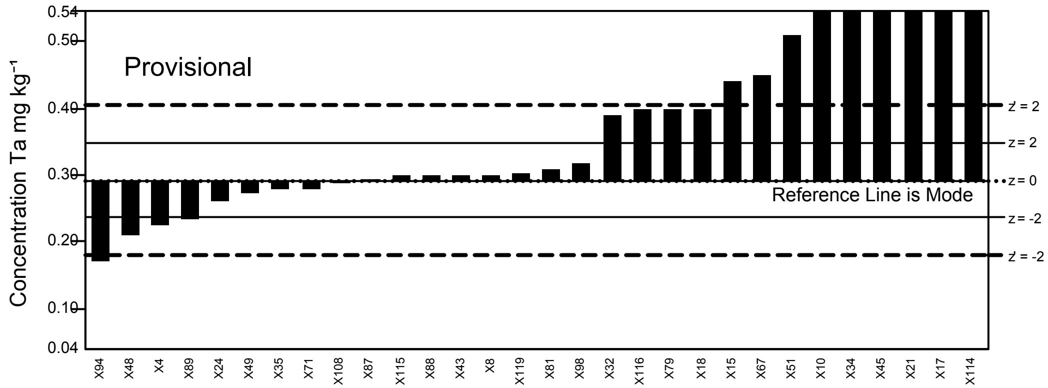

GeoPT40A - Barchart for Sb
Concentration Sb mg kg⁻¹
Reference Line is Robust Mean
z' = 2
z = 2
z = 0
z = -2
z' = -2


GeoPT40A - Barchart for Sc
Concentration Sc mg kg⁻¹
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2

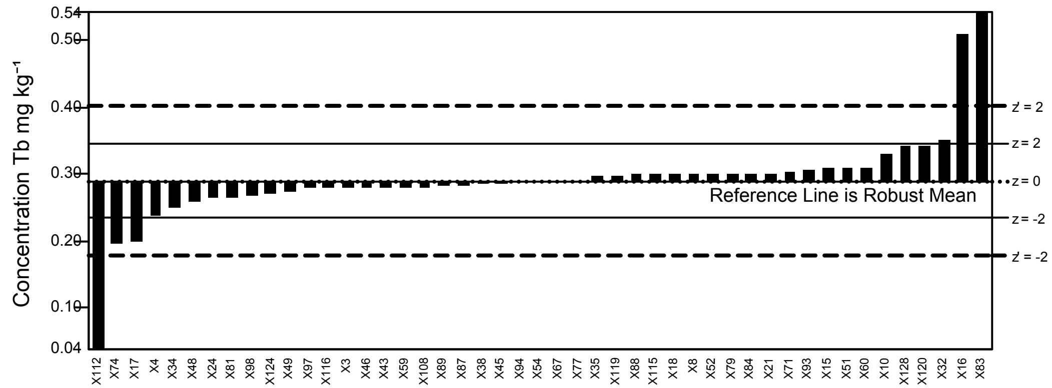

GeoPT40A - Barchart for Sm
Concentration Sm mg kg⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2


GeoPT40A - Barchart for Sr
Concentration Sr mg kg⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2

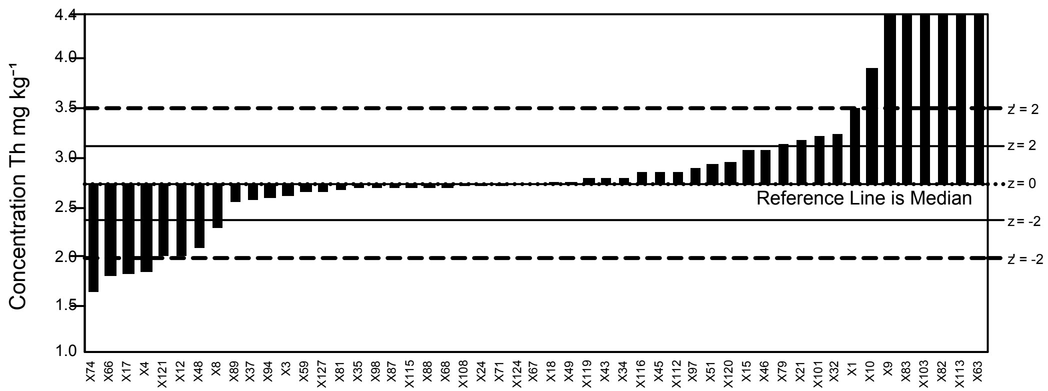
GeoPT40A - Barchart for Ta



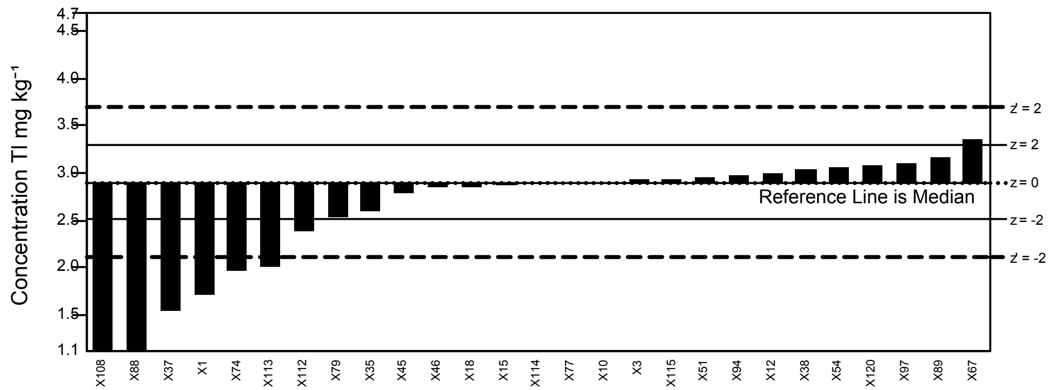
GeoPT40A - Barchart for Tb



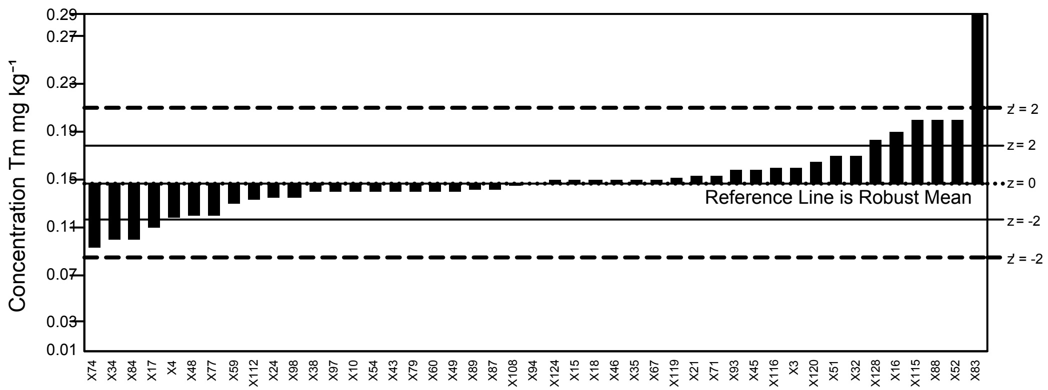
GeoPT40A - Barchart for Th



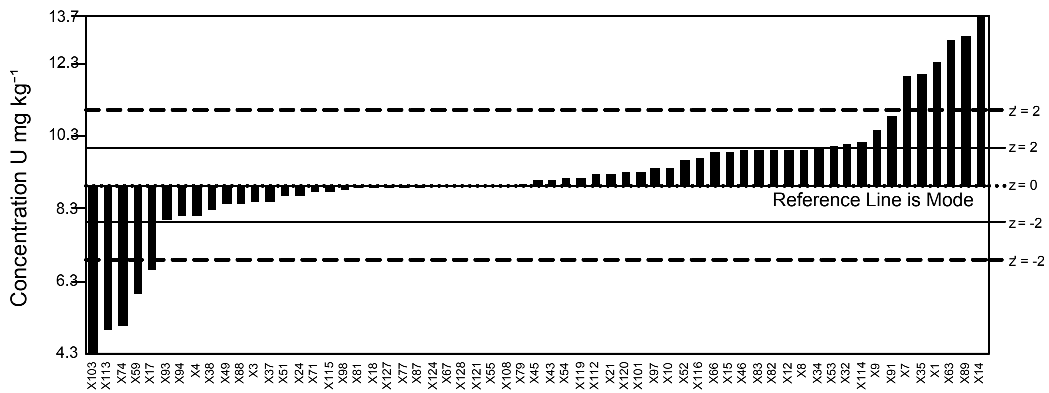
GeoPT40A - Barchart for Tl

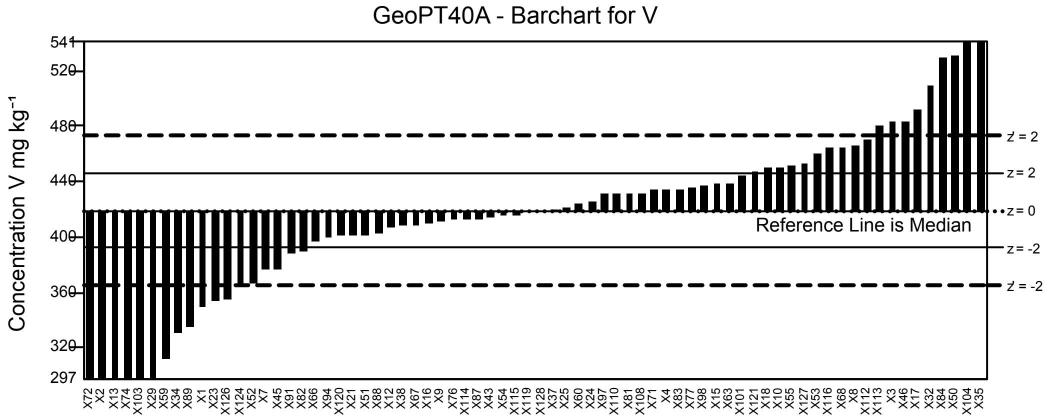


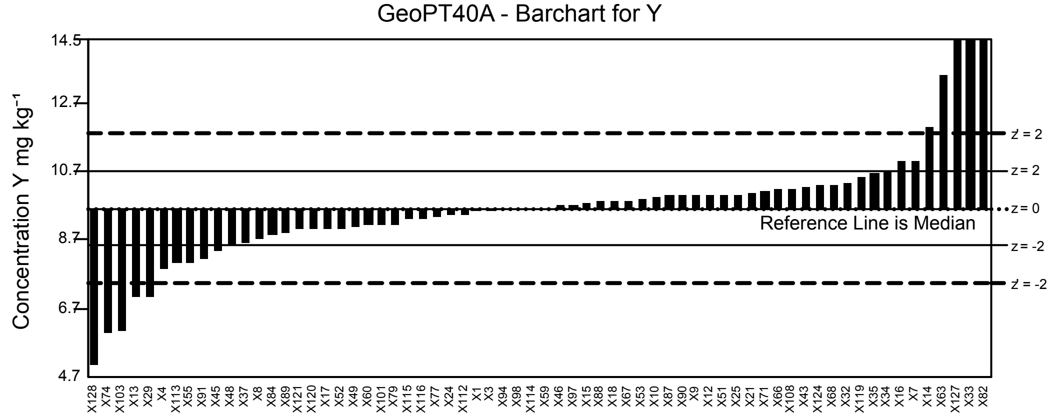
GeoPT40A - Barchart for Tm

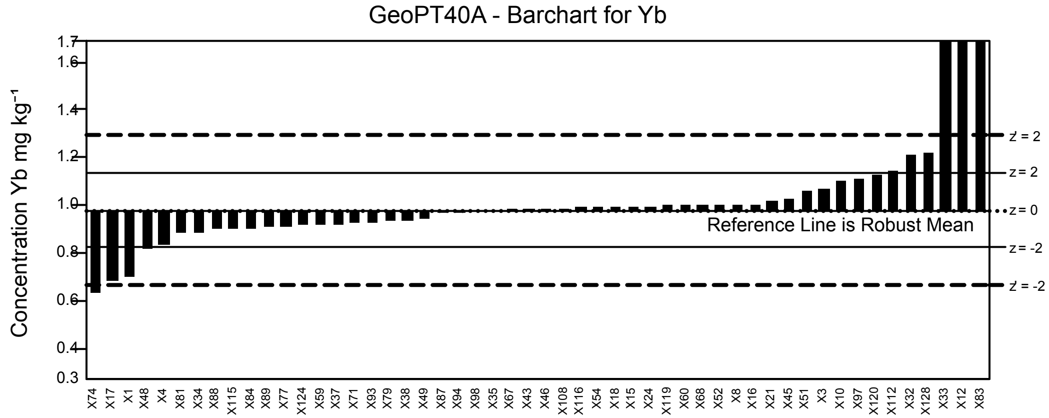


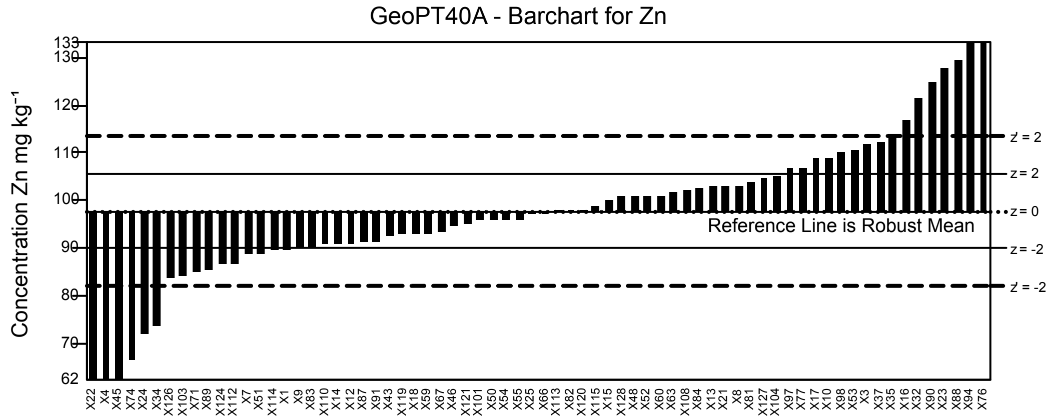
GeoPT40A - Barchart for U











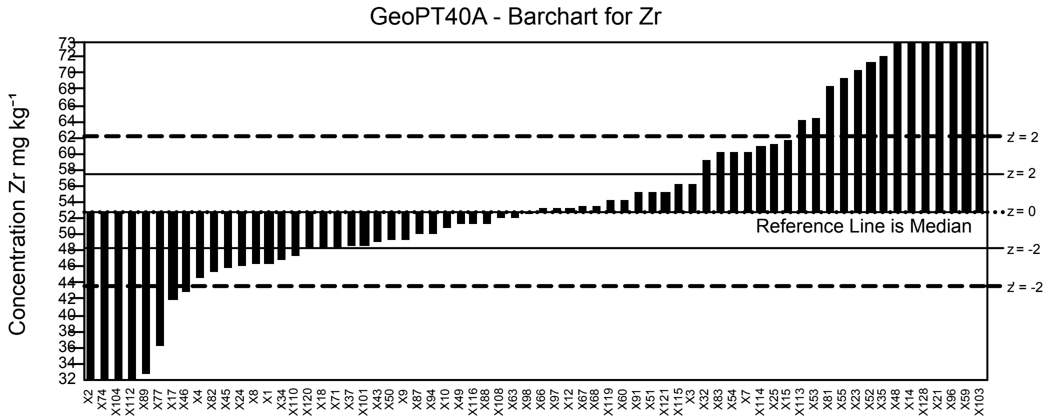
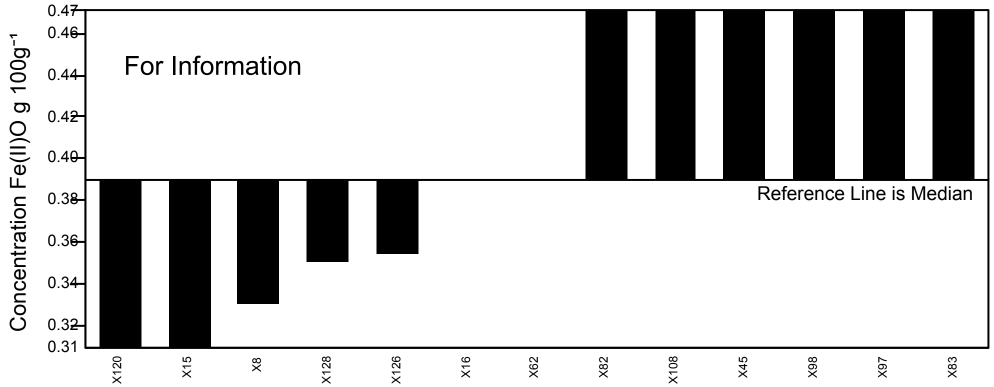
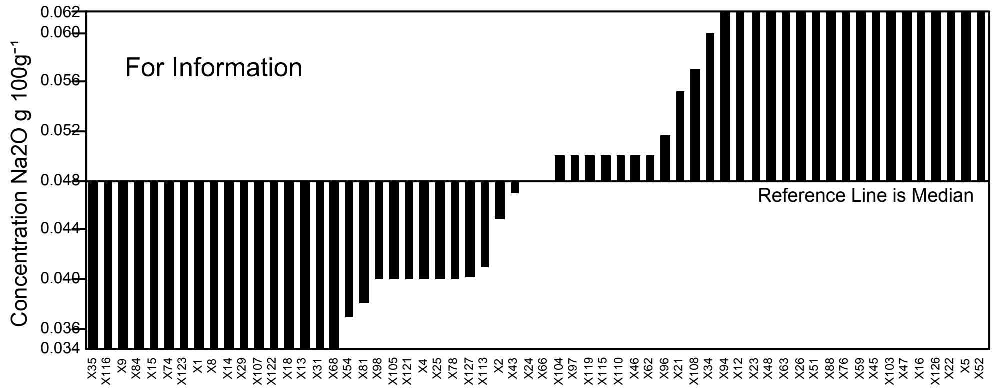


Figure 1: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

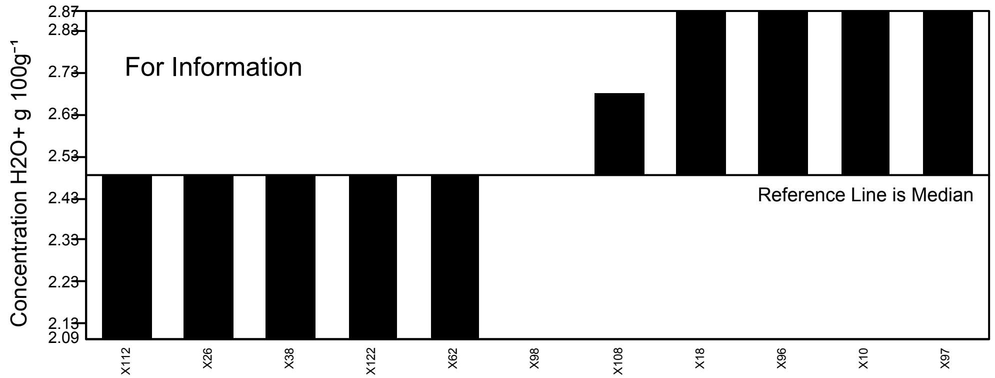
GeoPT40A - Barchart for Fe(II)O



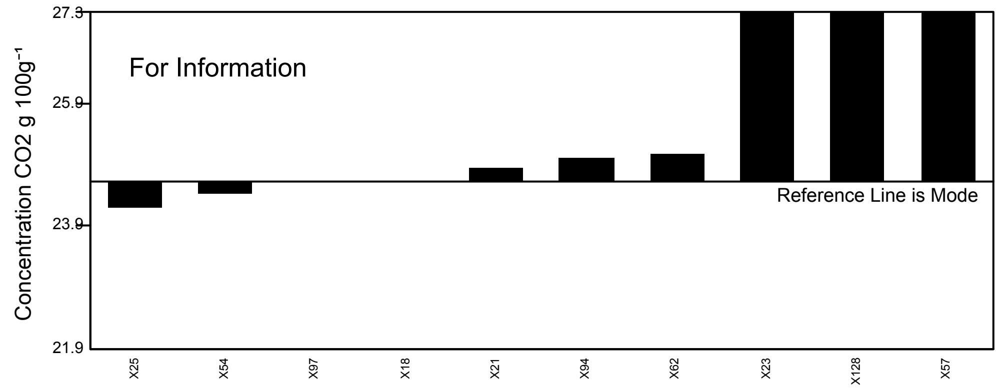
GeoPT40A - Barchart for Na2O



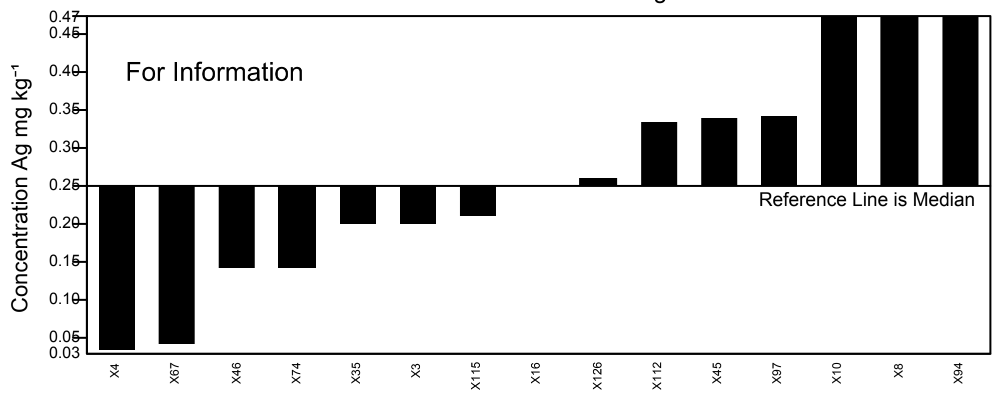
GeoPT40A - Barchart for H2O+



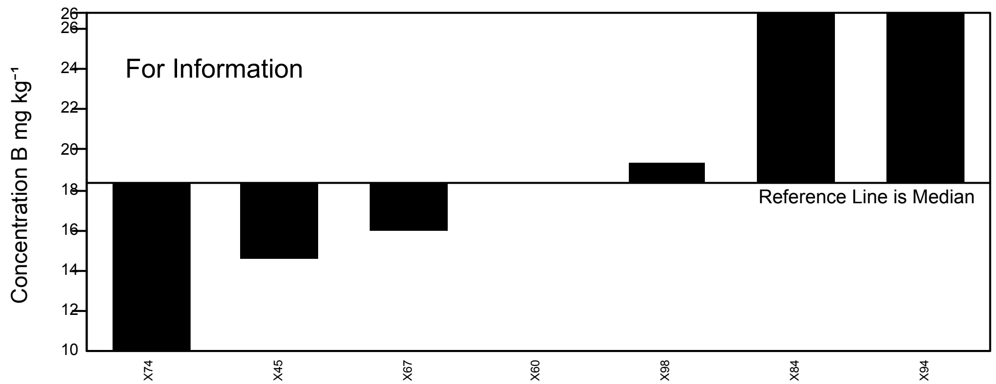
GeoPT40A - Barchart for CO2



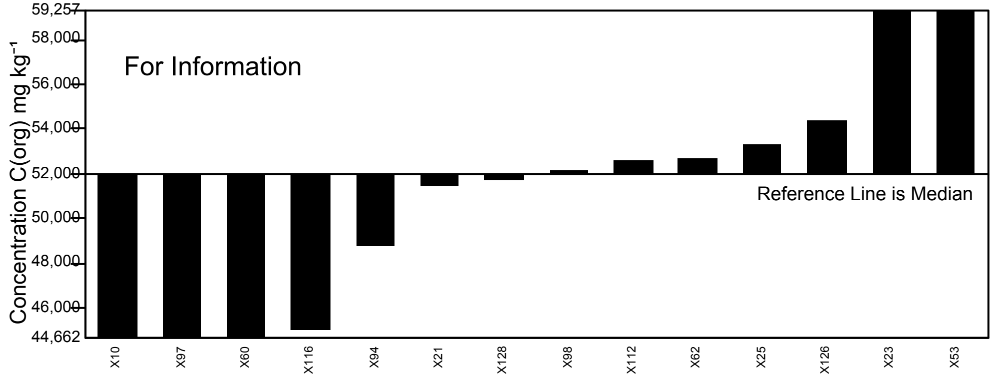
GeoPT40A - Barchart for Ag



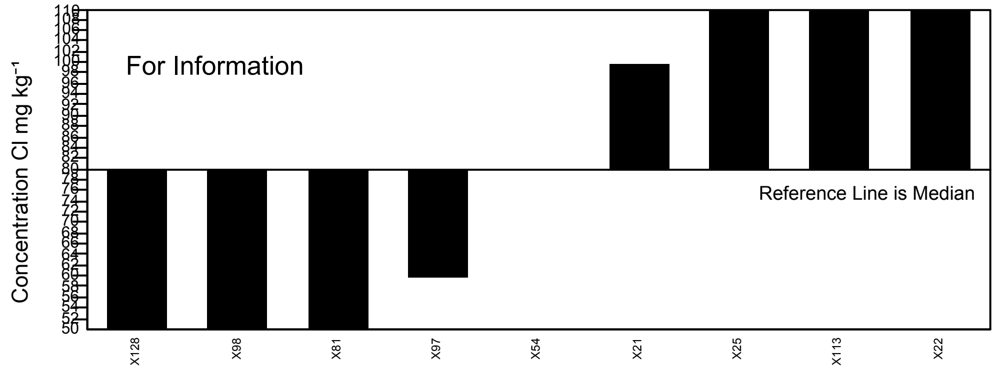
GeoPT40A - Barchart for B



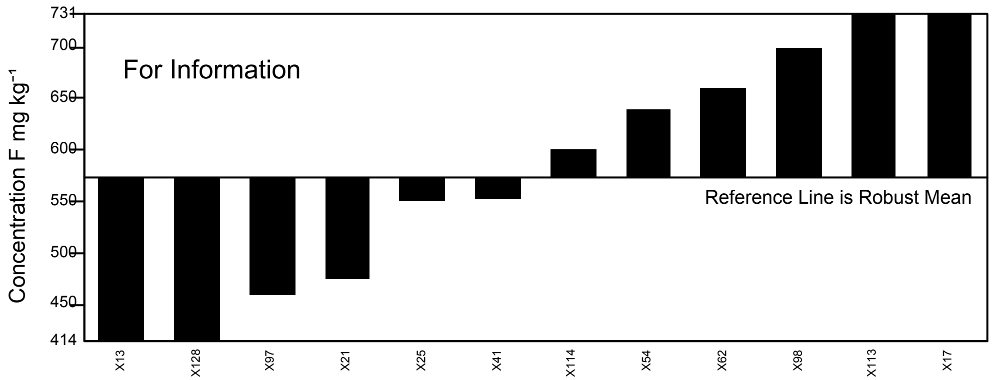
GeoPT40A - Barchart for C(org)



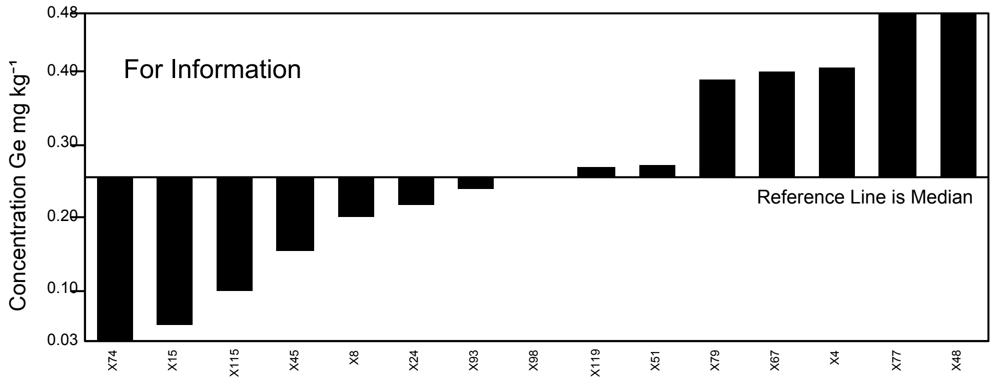
GeoPT40A - Barchart for Cl



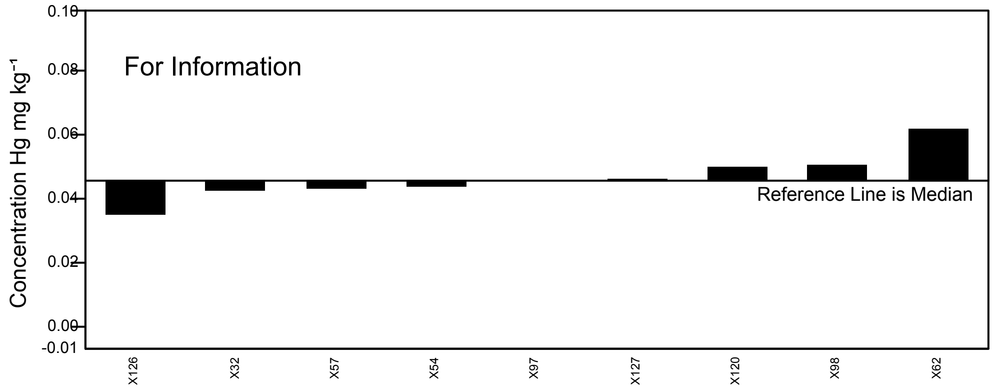
GeoPT40A - Barchart for F



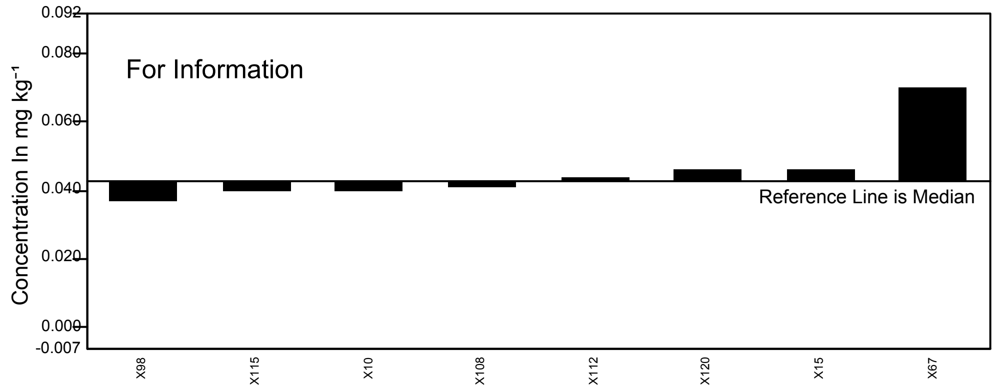
GeoPT40A - Barchart for Ge

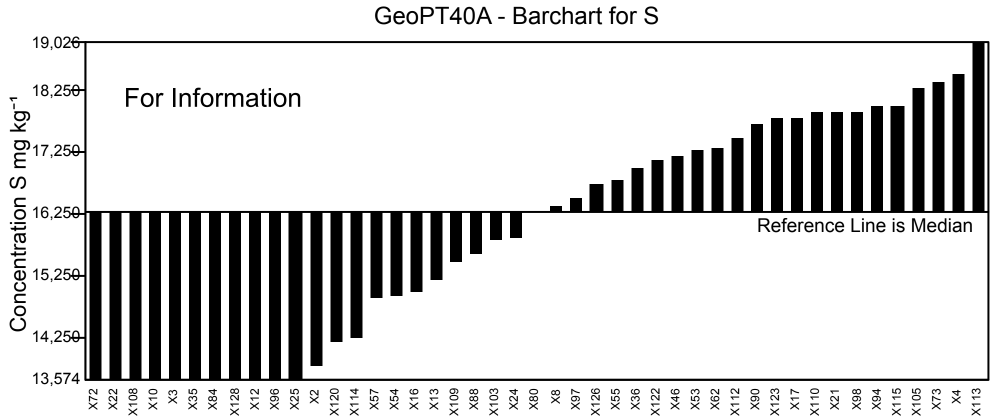


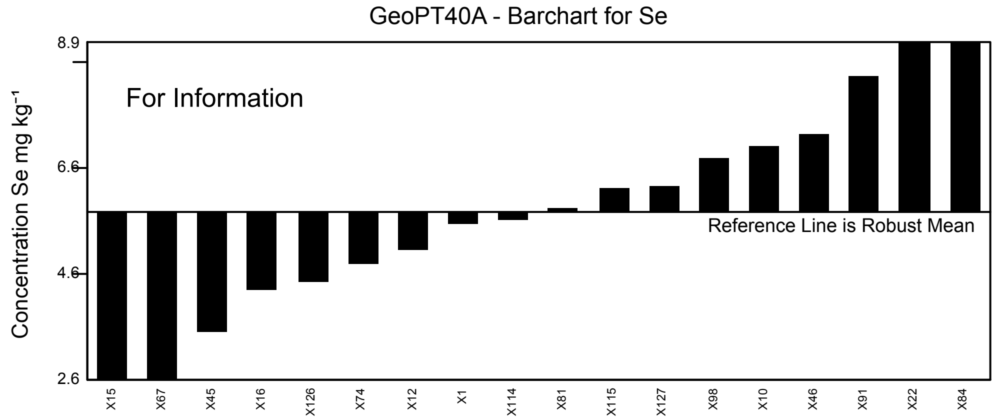
GeoPT40A - Barchart for Hg

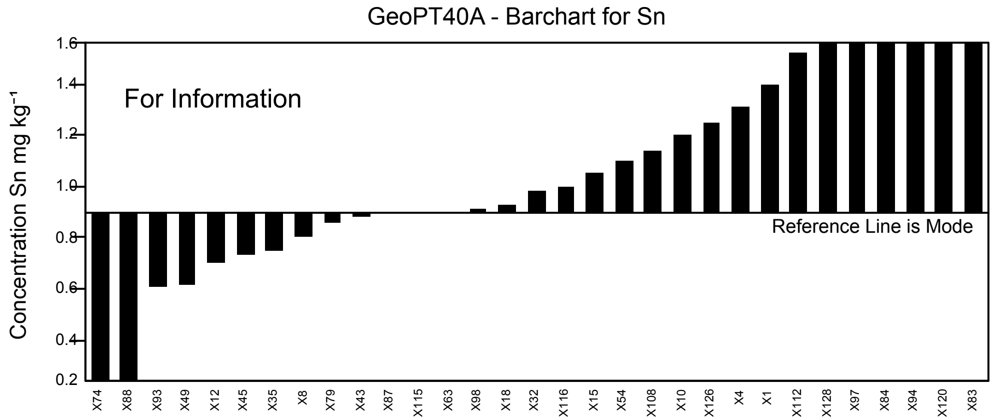


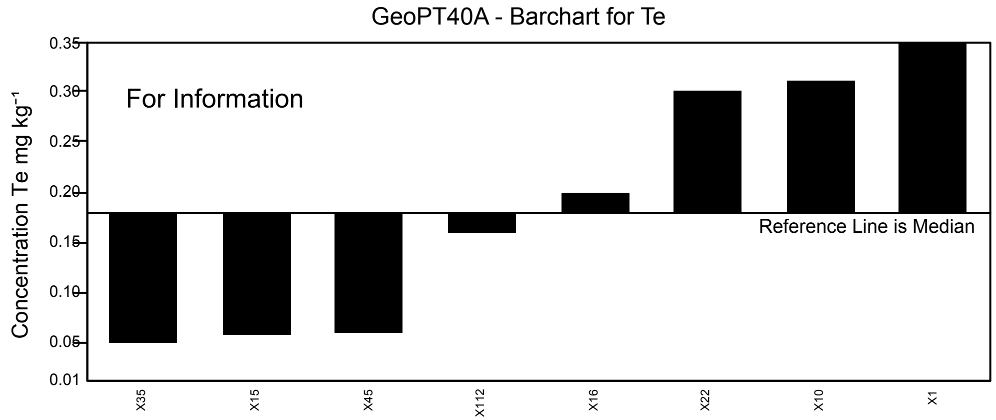
GeoPT40A - Barchart for In











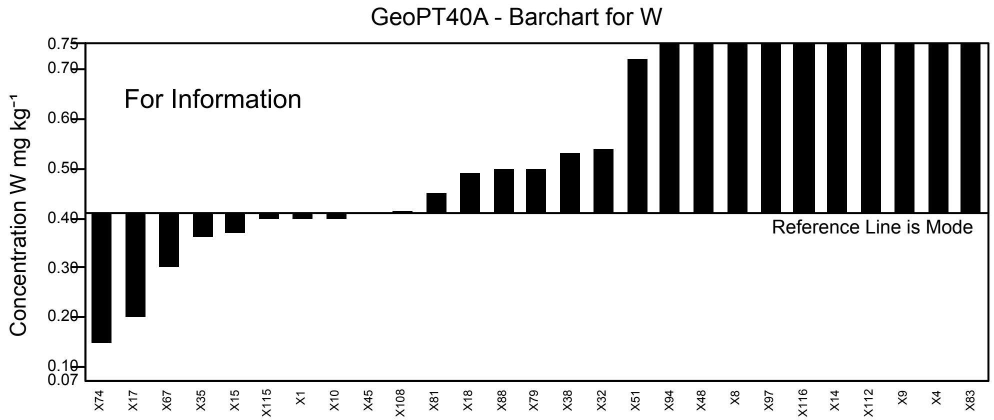


Figure 2: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Data distribution charts provided for information only for elements for which values could not be assigned.

Multiple Z-Score Chart for GeoPT40A

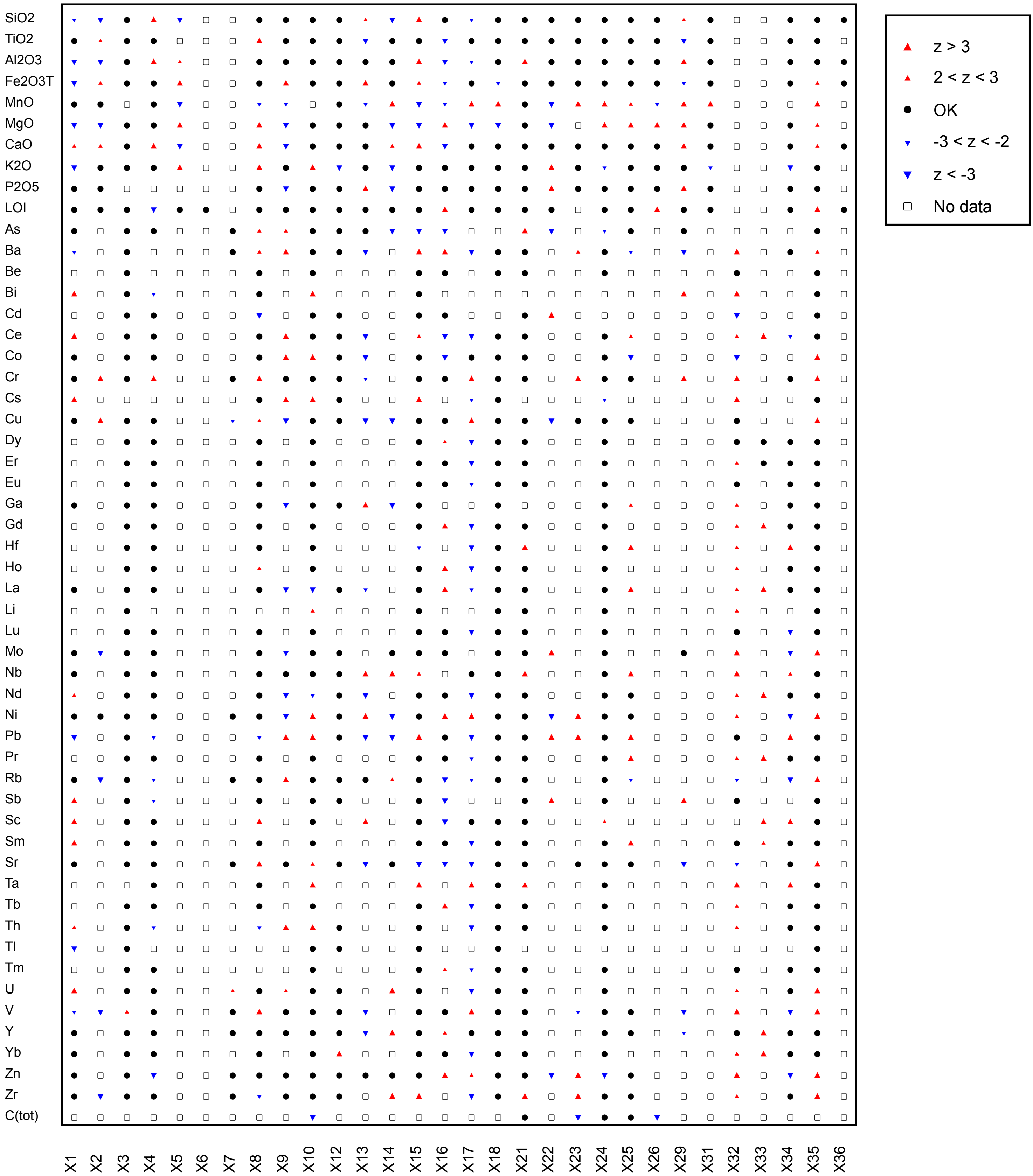


Figure 3: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Multiple z-score charts for laboratories participating in the GeoPT40A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT40A

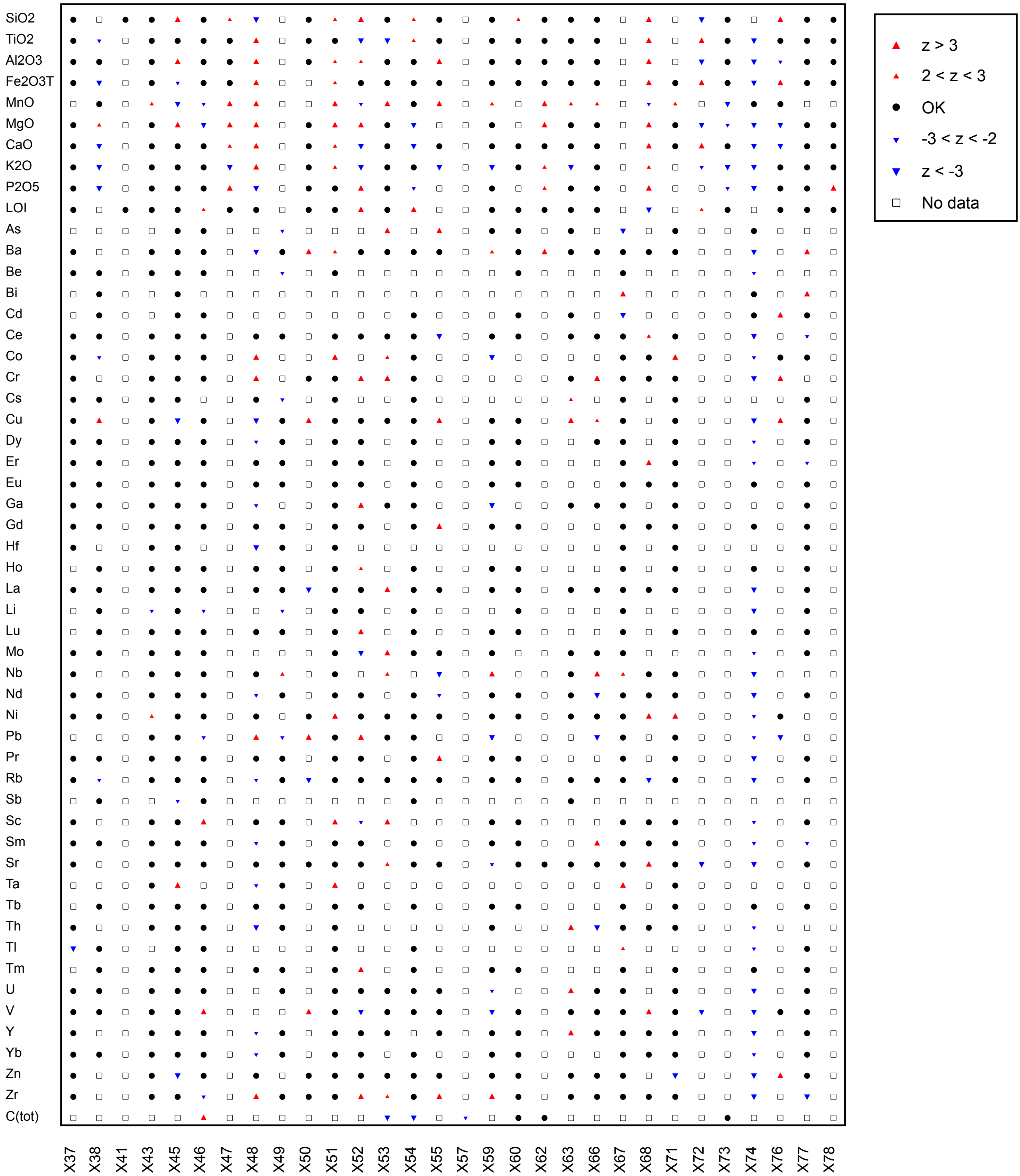


Figure 3: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Multiple z-score charts for laboratories participating in the GeoPT40A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT40A

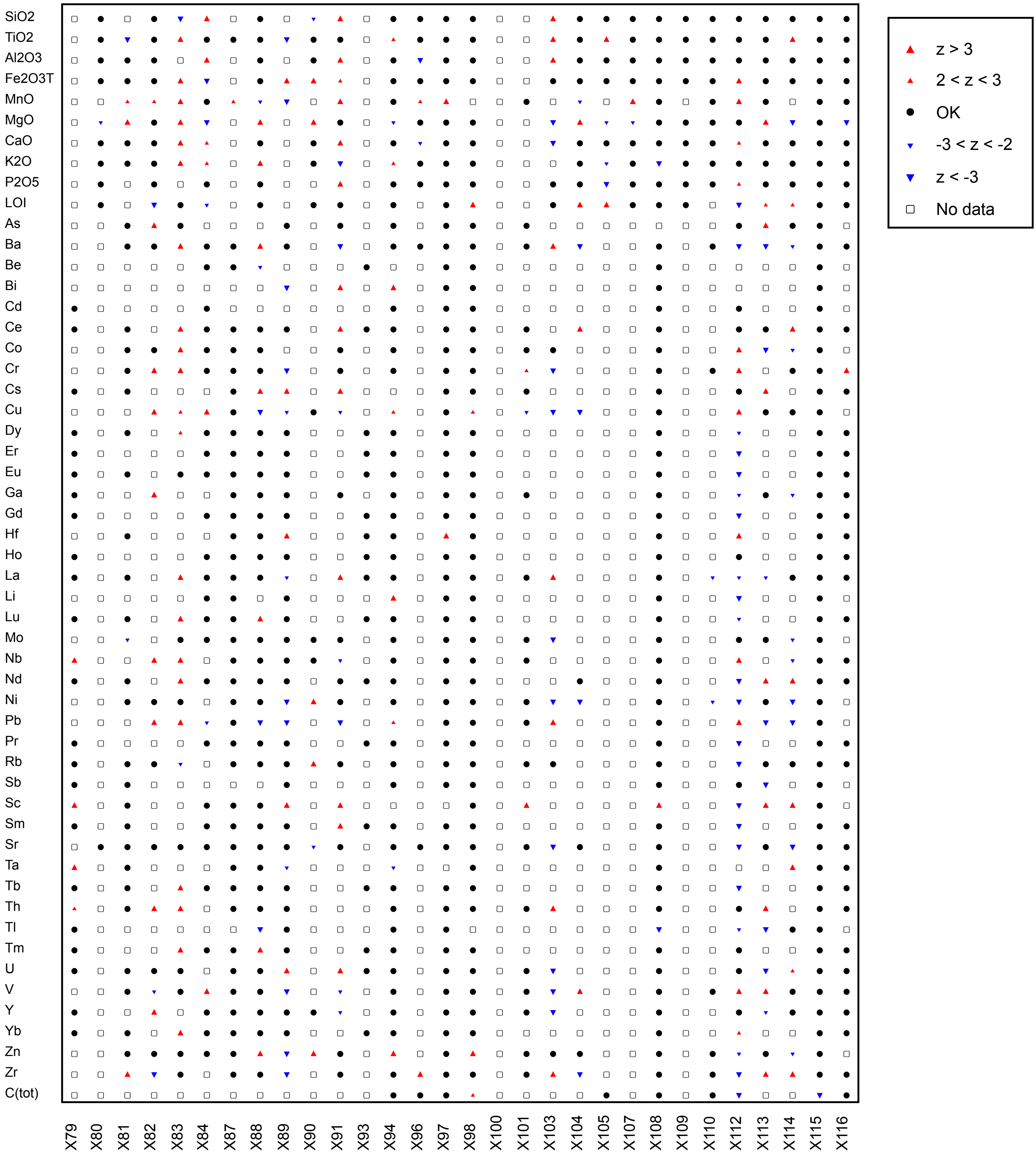


Figure 3: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Multiple z-score charts for laboratories participating in the GeoPT40A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT40A

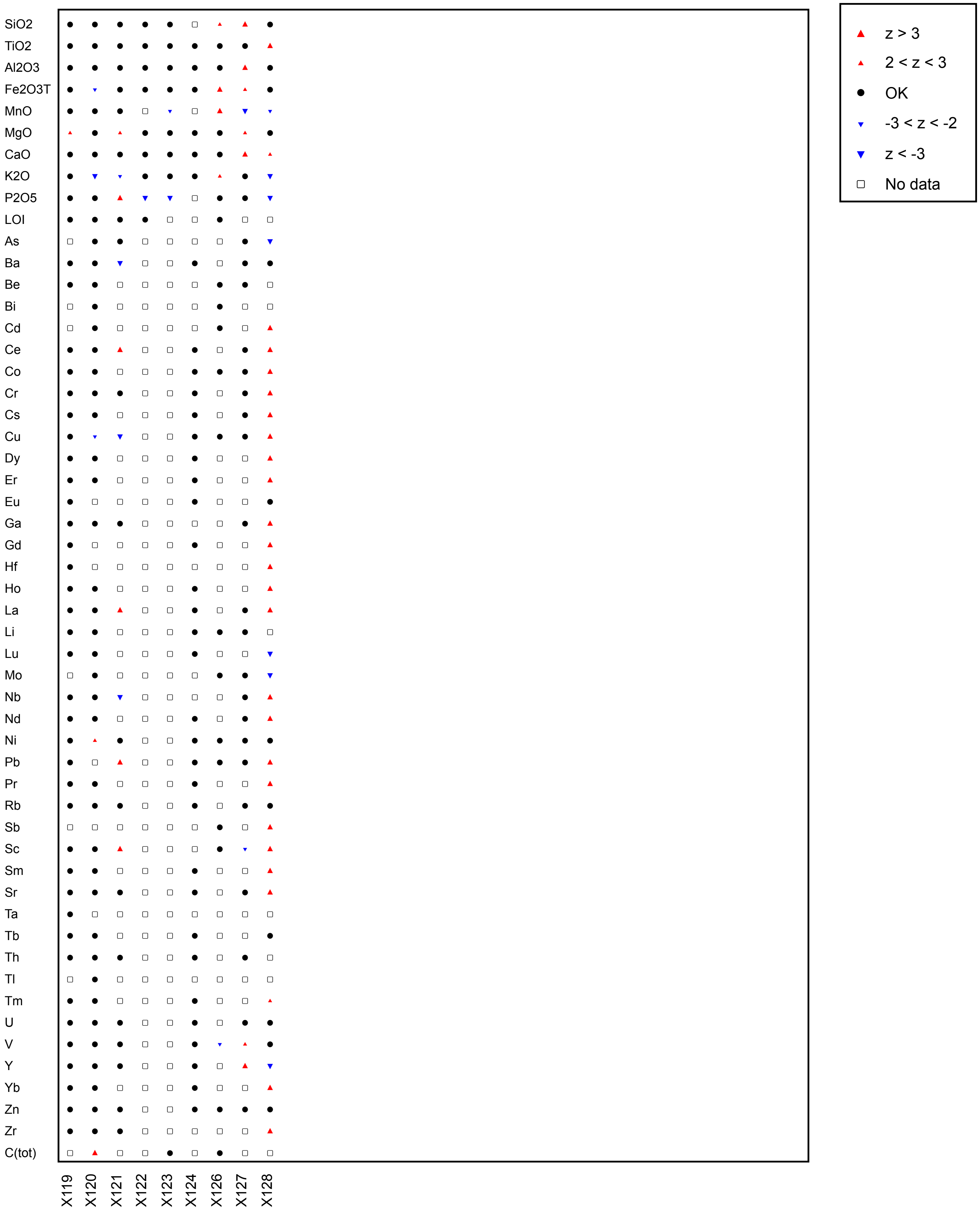


Figure 3: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Multiple z-score charts for laboratories participating in the GeoPT40A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).