

Ringversuch GeoPT 40A, England - ShTX-1, Calcareous organic-rich shale

Veranstalter des Ringversuchs: International Association of Geoanalysts and Geostandards Newsletter - GeoPT40A

Ringversuchsmaterial: ShTX-1, Calcareous organic-rich shale

RV abgeschlossen: 2017 - 2

Literatur: Report - GeoPT40A Proficiency Testing Round 40A (Laborcode CRB = X25)

Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
MgO	0,550	0,420	0,010	6,730
Al ₂ O ₃	3,960	4,000	0,065	-0,310
SiO ₂	25,000	25,130	0,309	-0,210
P ₂ O ₅	0,099	0,099	0,003	0,000
K ₂ O	0,330	0,337	0,008	-0,440
CaO	33,050	32,950	0,389	0,130
TiO ₂	0,180	0,175	0,005	0,530
Fe ₂ O ₃ tot	1,620	1,612	0,030	0,130
MnO	0,013	0,011	0,001	1,940
L.O.I.	31,540	31,610	0,380	-0,110
TC	11,920	11,910	0,164	0,030
TOC*	5,330	4,950	0,580	

Spurenelemente [µg/g]

	CRB	RV	1sRV	Z-Score
As	15,00	15,10	0,80	0,03
Ba	59,00	73,00	3,10	-2,28
Ce	31,00	24,80	1,20	2,56
Cl *	130,00	94,00	41,00	
Cr	25,00	29,70	1,40	-1,63
Cu	33,00	33,80	1,60	-0,26
F *	550,00	606,00	162,00	
Ga	8,00	6,30	0,40	2,26
Hf	2,00	1,18	0,10	4,45
Nd	11,00	11,00	0,60	0,00
Ni	72,00	74,90	3,10	-0,47
Pb	10,00	6,10	0,40	5,35
Rb	12,00	16,90	0,90	-2,77
Sr	1042,00	1017,00	28,70	0,44
V	421,00	419,00	13,50	0,07
Y	10,00	9,60	0,50	0,37
Zn	97,00	97,80	3,90	-0,10
Zr	61,00	52,60	2,30	1,82

Legende

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

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

GeoPT40A — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 40A (Calcareous organic-rich shale, ShTX-1) / January 2017

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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 GeoPT 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, GeoPT, 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

GeoPT40A: 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 GeoPT40A (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 K₂O. 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 46 trace elements in GeoPT40A (ShTX-1). Bar charts for the 56 measurands of GeoPT40A 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: SiO₂, TiO₂, Al₂O₃, Fe₂O₃T, MnO*, MgO*, CaO, Na₂O, K₂O, P₂O₅, 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, Na₂O, H₂O⁺, CO₂, 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 GeoPT40A, 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 GeoPT40A, 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:

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

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 GeoPT40A 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/>).

GeoPT1

Thompson M., Potts P.J., Kane J.S. and Webb P.C. (1996)
GeoPT1. International proficiency test for analytical geochemistry laboratories - Report on round 1. *Geostandards Newsletter: The Journal of Geostandards and Geoanalysis*, 20, 295-325.

GeoPT2

Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson, J.S. (1998)
GeoPT2. International proficiency test for analytical geochemistry laboratories - Report on round 2. *Geostandards Newsletter: The Journal of Geostandards and Geoanalysis*, 22 127-156.

GeoPT3

Thompson M., Potts P.J., Kane J.S. and Chappell B.W. (1999a)
GeoPT3. International proficiency test for analytical geochemistry laboratories - Report on round 3. *Geostandards Newsletter: The Journal of Geostandards and Geoanalysis*, 23, 87-121.

GeoPT4

Thompson M., Potts P.J., Kane J.S., Webb P.C. and Watson J.S. (1999b)
GeoPT4. International proficiency test for analytical geochemistry laboratories - Report on round 4. Published in the electronic version of *Geostandards Newsletter: The Journal of Geostandards and Geoanalysis* (Summer 2000).

GeoPT5

Thompson M., Potts P.J., Kane J.S., and Wilson S. (1999c)
GeoPT5. International proficiency test for analytical geochemistry laboratories - Report on round 5. Published in the electronic version of *Geostandards Newsletter: The Journal of Geostandards and Geoanalysis* (Summer 2000).

GeoPT6

Potts P.J., Thompson M., Kane J.S., Webb P.C. and Carignan J. (2000)
GEOPT6 - an international proficiency test for analytical geochemistry laboratories - report on round 6 (OU-3: Nanhon microgranite) and 6A (CAL-S: CRPG limestone). International Association of Geoanalysts: Unpublished report.

GeoPT7

Potts P.J., Thompson M., Kane J.S., and Petrov L.L. (2000)
GEOPT7 - an international proficiency test for analytical geochemistry laboratories - report on round 7 (GBPG-1 Garnet-biotite plagiogneiss). International Association of Geoanalysts: Unpublished report.

GeoPT8

Potts P.J., Thompson M., Kane J.S., Webb, P.C. and Watson J.S. (2000)
GEOPT8 - an international proficiency test for analytical geochemistry laboratories - report on round 8 / February 2001 (OU-4 Penmaenmawr microdiortite). International Association of Geoanalysts: Unpublished report.

GeoPT9

Potts P.J., Thompson M., Webb, P.C. and Watson J.S. (2001)
GEOPT9 - an international proficiency test for analytical geochemistry laboratories - report on round 9 / July 2001 (OU-6 Penrhyn slate). International Association of Geoanalysts: Unpublished report.

GeoPT10

Potts P.J., Thompson M., Webb, P.C., Watson J.S. and Wang Yimin (2001)
GEOPT10 - an international proficiency test for analytical geochemistry laboratories - report on round 10 / December 2001 (CH-1 Marine sediment). International Association of Geoanalysts: Unpublished report.

GeoPT11

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Watson J.S. (2002)
GEOPT11 - an international proficiency test for analytical geochemistry laboratories - report on round 11 / July 2002 (OU-5 Leaton dolerite). International Association of Geoanalysts: Unpublished report.

GeoPT12

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Batjargal B. (2003)
GEOPT12 - an international proficiency test for analytical geochemistry laboratories - report on round 12 / January 2003 (GAS Serpentine). International Association of Geoanalysts: Unpublished report.

GeoPT13

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Kaspar H.U. (2003)
GEOPT13 - an international proficiency test for analytical geochemistry laboratories - report on round 13 / July 2003 (Köln Loess). International Association of Geoanalysts: Unpublished report.

GeoPT14

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and B. Batjargal (2004)
GeoPT14 - an international proficiency test for analytical geochemistry laboratories - report on round 14 / January 2004 (OShBO - alkaline granite). International Association of Geoanalysts: Unpublished report.

GeoPT15

Potts P.J., Thompson M., Chenery S.R., Webb, P.C. and Wang Yimin (2004)
GeoPT15 - an international proficiency test for analytical geochemistry laboratories - report on round 15 / June 2004 (Ocean floor sediment MSAN). International Association of Geoanalysts: Unpublished report.

GeoPT16

Potts P.J., Thompson M., Webb, P.C. and S.Wilson (2005)
GeoPT16 - an international proficiency test for analytical geochemistry laboratories - report on round 16 / February 2005 (Nevada basalt, BNV-1). International Association of Geoanalysts: Unpublished report.

GeoPT17

Potts P.J., Thompson M., Webb, P.C. and J. Nicholas Walsh (2005)
GeoPT17 - an international proficiency test for analytical geochemistry laboratories - report on round 17 / July 2005 (Calcareous sandstone, OU-8). International Association of Geoanalysts: Unpublished report.

GeoPT18

Webb, P.C., Thompson M., Potts P.J. and L. Paul Bedard (2006)
GeoPT18 - an international proficiency test for analytical geochemistry laboratories - report on round 18 / Jan 2006 (Quartz Diorite, KPT-1). International Association of Geoanalysts: Unpublished report.

GeoPT19

Webb, P.C., Thompson M., Potts P.J. and B. Batjargal (2006)
GeoPT19 - an international proficiency test for analytical geochemistry laboratories - report on round 19 / July 2006 (Gabbro, MGR-N). International Association of Geoanalysts: Unpublished report.

GeoPT20

Webb, P.C., Thompson M., Potts P.J. and M. Burnham (2007)
GeoPT20 - an international proficiency test for analytical geochemistry laboratories - report on round 20 / Jan 2007 (Ultramafic rock, OPY-1). International Association of Geoanalysts: Unpublished report.

GeoPT21

Webb, P.C., Thompson M., Potts P.J. and B. Batjargal (2007)
GeoPT21 - an international proficiency test for analytical geochemistry laboratories - report on round 21 / July 2007 (Granite, MGT-1). International Association of Geoanalysts: Unpublished report.

GeoPT22

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

GeoPT23

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

GeoPT24

Webb, P.C., Thompson, M., Potts, P.J. and Watson, J.S. (2009)
GeoPT24 - an international proficiency test for analytical geochemistry laboratories - report on round 24 / January 2009 (Longmyndian greywacke, OU-10). International Association of Geoanalysts: Unpublished report.

GeoPT25

Webb, P.C., Thompson, M., Potts, P.J. and Enzweiler, J. (2009)
GeoPT25 - an international proficiency test for analytical geochemistry laboratories - report on round 25 / July 2009 (Basalt, HTP-1). International Association of Geoanalysts: Unpublished report.

GeoPT26

Webb, P.C., Thompson, M., Potts, P.J. and Loubser, M. (2010)
GeoPT26 - 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.

GeoPT27

Webb, P.C., Thompson, M., Potts, P.J. and Batjargal, B. (2010)
GeoPT27 - an international proficiency test for analytical geochemistry laboratories - report on round 27 / July 2010 (Andesite, MGL-AND). International Association of Geoanalysts: Unpublished report.

GeoPT28

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2011)
GeoPT28 - an international proficiency test for analytical geochemistry laboratories - report on round 28 / January 2011 (Shale, SBC-1). International Association of Geoanalysts: Unpublished report.

GeoPT29

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2011)
GeoPT29 - an international proficiency test for analytical geochemistry laboratories - report on round 29 / July 2011 (Nephelinite, NKT-1). International Association of Geoanalysts: Unpublished report.

GeoPT30

Webb, P.C., Thompson, M., Potts, P.J., Long, D. and Batjargal, B. (2012)
GeoPT30 - 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.

GeoPT31

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2012)
GeoPT31 - 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.

GeoPT32

Webb, P.C., Thompson, M., Potts, P.J. and Webber, E. (2013)
GeoPT32 - an international proficiency test for analytical geochemistry laboratories - report on round 32 / January 2013 (Woodstock Basalt, WG-1). International Association of Geoanalysts: Unpublished report.

GeoPT33

Webb, P.C., Thompson, M., Potts, P.J., Prusisz, B., and Young, K. (2013)
GeoPT33 - 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.

GeoPT34

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2014)
GeoPT34 - an international proficiency test for analytical geochemistry laboratories - report on round 34 (Granite, GRI-1) / January 2014. International Association of Geoanalysts: Unpublished report.

GeoPT35

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2014)
GeoPT35 - an international proficiency test for analytical geochemistry laboratories - report on round 35 (Tonalite, TLM-1) / August 2014. International Association of Geoanalysts: Unpublished report.

GeoPT35A

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2014)
GeoPT35A - an international proficiency test for analytical geochemistry laboratories - report on round 35A (Metalliferous sediment, SdAR-H1) / August 2014. International Association of Geoanalysts: Unpublished report.

GeoPT36

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2015)
GeoPT36 - an international proficiency test for analytical geochemistry laboratories - report on round 36 (Gabbro, GSM-1) / January 2015. International Association of Geoanalysts: Unpublished report.

GeoPT36A

Webb, P.C., Thompson, M., Potts, P.J. and Wilson, S. (2015)
GeoPT36A - 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.

GeoPT37

Webb, P.C., Thompson, M., Potts, P.J., Gowing, C.J.B. and Burnham, M. (2015)
GeoPT37 - an international proficiency test for analytical geochemistry laboratories - report on round 37 (Rhyolite, ORPT-1) / July 2015. International Association of Geoanalysts: Unpublished report.

GeoPT37A

Webb, P.C., Thompson, M., Potts, P.J., Gowing, C.J.B. and Wilson, S. (2015)
GeoPT37A - an international proficiency test for analytical geochemistry laboratories - report on round 37A (Blended sediment, SdAR-L2) / July 2015. International Association of Geoanalysts: Unpublished report.

GeoPT38

Webb, P.C., Thompson, M., Potts, P.J., Gowing, C.J.B. and Wilson, S.A. (2016)
GeoPT38 - an international proficiency test for analytical geochemistry laboratories - report on round 38 (Gabbro, OU-7) / January 2016. International Association of Geoanalysts: Unpublished report.

GeoPT38A

Webb, P.C., Thompson, M., Potts, P.J., Gowing, C.J.B. and Meisel, T. (2016)
GeoPT38A - an international proficiency test for analytical geochemistry laboratories – special report on round 38A (Modified harzburgite, HARZ01) / June 2016. International Association of Geoanalysts: Unpublished report.

GeoPT39

Webb, P.C., Thompson, M., Potts, P.J, Gowing, C.J.B. and Wilson, S.A. (2016)
GeoPT39 - an international proficiency test for analytical geochemistry laboratories - report on round 39 (Syenite, SyMP-1) / July 2016. International Association of Geoanalysts: Unpublished report.

GeoPT39A

Webb, P.C., Thompson, M., Potts, P.J, and Gowing, C.J.B. (2016)
GeoPT39A - 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	<u>23.82</u>	<u>22.8</u>	<u>25</u>	<u>31.92</u>	<u>23.08</u>			<u>25.3</u>	<u>25.23</u>	<u>25.7</u>	<u>24.9</u>	<u>25.83</u>	<u>23.3</u>
TiO2	g 100g ⁻¹	<u>0.188</u>	<u>0.196</u>	<u>0.16</u>	<u>0.19</u>				<u>0.2</u>	<u>0.18</u>	<u>0.18</u>	<u>0.17</u>	<u>0.16</u>	<u>0.17</u>
Al2O3	g 100g ⁻¹	<u>3.496</u>	<u>3.48</u>	<u>3.9</u>	<u>5.67</u>	<u>4.15</u>			<u>4</u>	<u>4.06</u>	<u>3.88</u>	<u>3.97</u>	<u>4.06</u>	<u>3.93</u>
Fe2O3T	g 100g ⁻¹	<u>1.396</u>	<u>1.76</u>	<u>1.5</u>	<u>1.57</u>	<u>2.234</u>			<u>1.6</u>	<u>1.83</u>	<u>1.57</u>	<u>1.6</u>	<u>1.72</u>	<u>1.61</u>
Fe(II)O	g 100g ⁻¹								<u>0.33</u>					
MnO	g 100g ⁻¹	<u>0.012</u>	<u>0.012</u>		<u>0.011</u>	<u>0.008</u>			<u>0.01</u>	<u>0.01</u>		<u>0.012</u>	<u>0.01</u>	<u>0.02</u>
MgO	g 100g ⁻¹	<u>0.352</u>	<u>0.296</u>	<u>0.4</u>	<u>0.4</u>	<u>2.34</u>			<u>0.5</u>	<u>0.36</u>	<u>0.4</u>	<u>0.4</u>	<u>0.44</u>	<u>0.28</u>
CaO	g 100g ⁻¹	<u>35.182</u>	<u>34.9</u>	<u>34</u>	<u>35.83</u>	<u>31.15</u>			<u>34.7</u>	<u>31.71</u>	<u>32.2</u>	<u>32.87</u>	<u>32.55</u>	<u>33.8</u>
Na2O	g 100g ⁻¹	<u>0.02</u>	<u>0.045</u>		<u>0.04</u>	<u>0.42</u>			<u>0.02</u>	<u>0.01</u>		<u>0.07</u>	<u>0.03</u>	<u>0.02</u>
K2O	g 100g ⁻¹	<u>0.283</u>	<u>0.33</u>	<u>0.33</u>	<u>0.31</u>	<u>0.72</u>			<u>0.4</u>	<u>0.34</u>	<u>0.39</u>	<u>0.25</u>	<u>0.35</u>	<u>0.17</u>
P2O5	g 100g ⁻¹	<u>0.093</u>	<u>0.088</u>						<u>0.1</u>	<u>0.08</u>	<u>0.096</u>	<u>0.09</u>	<u>0.11</u>	<u>0.08</u>
H2O+	g 100g ⁻¹										<u>5.35</u>			
CO2	g 100g ⁻¹													
LOI	g 100g ⁻¹	<u>31.09</u>	<u>32.41</u>	<u>31.64</u>	<u>28.4</u>	<u>31.29</u>	<u>31.85</u>		<u>31.5</u>	<u>32.09</u>	<u>31.2</u>	<u>31.68</u>	<u>32</u>	<u>31.58</u>
Ag	mg kg ⁻¹			<u>0.2</u>	<u>0.034</u>				<u>0.8</u>		<u>0.6</u>			
As	mg kg ⁻¹	<u>15.1</u>		<u>16.2</u>	<u>12.13</u>			<u>17</u>	<u>16.9</u>	<u>17</u>	<u>13</u>	<u>15</u>	<u>14</u>	<u>4</u>
Au	mg kg ⁻¹													
B	mg kg ⁻¹													
Ba	mg kg ⁻¹	<u>57.7</u>		<u>74.2</u>				<u>66</u>	<u>79.5</u>	<u>83</u>	<u>81</u>	<u>71</u>	<u>40</u>	
Be	mg kg ⁻¹			<u>0.91</u>					<u>1.07</u>		<u>1</u>			
Bi	mg kg ⁻¹	<u>0.9</u>		<u>0.28</u>	<u>0.133</u>				<u>0.2</u>		<u>0.44</u>			
Br	mg kg ⁻¹													
C(org)	mg kg ⁻¹										<u>4.33</u>			
C(tot)	mg kg ⁻¹										<u>11.5</u>			
Cd	mg kg ⁻¹			<u>2.21</u>	<u>1.67</u>				<u>0.39</u>		<u>2.16</u>	<u>1.7</u>		
Ce	mg kg ⁻¹	<u>35.1</u>		<u>23.7</u>	<u>21.3</u>				<u>26.2</u>	<u>30</u>	<u>20.2</u>	<u>25</u>	<u>19</u>	
Cl	mg kg ⁻¹													
Co	mg kg ⁻¹	<u>7.4</u>		<u>6.3</u>	<u>5.69</u>				<u>6.5</u>	<u>8</u>	<u>9.1</u>	<u>7</u>	<u>4</u>	
Cr	mg kg ⁻¹	<u>24.1</u>	<u>125.2</u>	<u>29</u>	<u>43.9</u>			<u>26</u>	<u>36.9</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>26</u>	
Cs	mg kg ⁻¹	<u>8.6</u>							<u>3.3</u>	<u>8</u>	<u>5.17</u>	<u>3</u>		
Cu	mg kg ⁻¹	<u>29.5</u>	<u>44.07</u>	<u>37.1</u>	<u>31.53</u>			<u>27</u>	<u>37.4</u>	<u>29</u>	<u>39.1</u>	<u>28</u>	<u>20</u>	<u>24</u>
Dy	mg kg ⁻¹			<u>1.68</u>	<u>1.376</u>				<u>1.9</u>		<u>1.51</u>			
Er	mg kg ⁻¹			<u>0.99</u>	<u>0.816</u>				<u>1</u>		<u>1.03</u>			
Eu	mg kg ⁻¹			<u>0.44</u>	<u>0.39</u>				<u>0.5</u>		<u>0.47</u>			
F	mg kg ⁻¹												<u>247</u>	
Ga	mg kg ⁻¹	<u>5</u>		<u>6.7</u>	<u>6.2</u>				<u>7</u>	<u>5</u>	<u>7</u>	<u>6</u>	<u>10</u>	<u>5</u>
Gd	mg kg ⁻¹			<u>2.05</u>	<u>1.67</u>				<u>2</u>		<u>1.91</u>			
Ge	mg kg ⁻¹				<u>0.406</u>				<u>0.2</u>					
Hf	mg kg ⁻¹			<u>1.3</u>	<u>0.975</u>				<u>1.1</u>		<u>1.06</u>			
Hg	mg kg ⁻¹													
Ho	mg kg ⁻¹			<u>0.36</u>	<u>0.304</u>				<u>0.4</u>		<u>0.31</u>			
I	mg kg ⁻¹	<u>3.6</u>												
In	mg kg ⁻¹										<u>0.04</u>			
La	mg kg ⁻¹	<u>14.5</u>		<u>12.8</u>	<u>12.3</u>				<u>14.4</u>	<u>4</u>	<u>4.7</u>	<u>13</u>	<u>12</u>	
Li	mg kg ⁻¹			<u>26.4</u>							<u>30</u>			
Lu	mg kg ⁻¹			<u>0.17</u>	<u>0.124</u>				<u>0.15</u>		<u>0.14</u>			
Mo	mg kg ⁻¹	<u>43.2</u>	<u>0.006</u>	<u>52.2</u>	<u>47.8</u>				<u>50</u>	<u>39</u>	<u>42.2</u>	<u>44</u>		<u>50</u>
Nb	mg kg ⁻¹	<u>4.6</u>		<u>5.7</u>	<u>4.42</u>				<u>6.2</u>	<u>5</u>	<u>6.6</u>	<u>5</u>	<u>43</u>	<u>8</u>
Nd	mg kg ⁻¹	<u>14.1</u>		<u>10.8</u>	<u>10.24</u>				<u>11.6</u>	<u>6</u>	<u>7.5</u>	<u>11</u>	<u>8</u>	
Ni	mg kg ⁻¹	<u>65</u>	<u>72.7</u>	<u>82.5</u>	<u>64.37</u>			<u>68</u>	<u>78.3</u>	<u>65</u>	<u>114</u>	<u>69</u>	<u>90</u>	<u>57</u>
Pb	mg kg ⁻¹	<u>1.5</u>		<u>6.5</u>	<u>4.41</u>				<u>5.3</u>	<u>19</u>	<u>18</u>	<u>6</u>	<u>2</u>	<u>2</u>
Pd	mg kg ⁻¹													
Pr	mg kg ⁻¹			<u>2.82</u>	<u>2.43</u>				<u>3.1</u>		<u>3.12</u>			
Pt	mg kg ⁻¹													
Rb	mg kg ⁻¹	<u>17</u>	<u>0.002</u>	<u>16.6</u>	<u>13.25</u>			<u>16</u>	<u>17.1</u>	<u>20</u>	<u>17.6</u>	<u>16</u>	<u>17</u>	<u>19</u>
Re	mg kg ⁻¹			<u>0.153</u>										
Rh	mg kg ⁻¹													
S	mg kg ⁻¹		<u>13800</u>	<u>1.72</u>	<u>18531</u>				<u>16400</u>		<u>1.67</u>	<u>11200</u>	<u>15202</u>	
Sb	mg kg ⁻¹	<u>5</u>		<u>3.48</u>	<u>2.04</u>				<u>3.5</u>		<u>2.91</u>	<u>2.8</u>		
Sc	mg kg ⁻¹	<u>5.7</u>		<u>3.7</u>	<u>4.25</u>				<u>23.3</u>		<u>3.5</u>		<u>14</u>	
Se	mg kg ⁻¹	<u>5.5</u>									<u>7</u>	<u>5</u>		
Sm	mg kg ⁻¹	<u>6.8</u>		<u>2.21</u>	<u>1.75</u>				<u>2.1</u>		<u>2.5</u>			
Sn	mg kg ⁻¹	<u>1.4</u>			<u>1.31</u>				<u>0.8</u>		<u>1.2</u>	<u>0.7</u>		
Sr	mg kg ⁻¹	<u>938.2</u>		<u>1085</u>	<u>1072</u>			<u>940</u>	<u>1160</u>	<u>966</u>	<u>1160</u>	<u>970</u>	<u>773</u>	<u>979</u>
Ta	mg kg ⁻¹			<u>0.226</u>					<u>0.3</u>		<u>0.6</u>			
Tb	mg kg ⁻¹			<u>0.28</u>	<u>0.237</u>				<u>0.3</u>		<u>0.33</u>			
Te	mg kg ⁻¹	<u>3.8</u>									<u>0.31</u>			
Th	mg kg ⁻¹	<u>3.5</u>		<u>2.62</u>	<u>1.856</u>				<u>2.3</u>	<u>5</u>	<u>3.9</u>	<u>2</u>		
Tl	mg kg ⁻¹	<u>1.7</u>		<u>2.93</u>							<u>2.9</u>	<u>3</u>		
Tm	mg kg ⁻¹			<u>0.16</u>	<u>0.118</u>						<u>0.14</u>			
U	mg kg ⁻¹	<u>12.4</u>		<u>8.55</u>	<u>8.16</u>			<u>12</u>	<u>10</u>	<u>10.5</u>	<u>9.5</u>	<u>10</u>		<u>16</u>
V	mg kg ⁻¹	<u>348.6</u>	<u>0.057</u>	<u>483</u>	<u>434.9</u>			<u>376</u>	<u>466</u>	<u>411</u>	<u>450</u>	<u>407</u>	<u>207</u>	
W	mg kg ⁻¹	<u>0.4</u>			<u>12.36</u>				<u>0.8</u>	<u>4</u>	<u>0.4</u>			<u>1</u>
Y	mg kg ⁻¹	<u>9.5</u>		<u>9.5</u>	<u>7.85</u>			<u>11</u>	<u>8.7</u>	<u>10</u>	<u>9.9</u>	<u>10</u>	<u>7</u>	<u>12</u>
Yb	mg kg ⁻¹	<u>0.7</u>		<u>1.07</u>	<u>0.835</u>				<u>1</u>		<u>1.1</u>	<u>2</u>		
Zn	mg kg ⁻¹	<u>89.8</u>		<u>112</u>	<u>56.6</u>			<u>89</u>	<u>103</u>	<u>90</u>	<u>109</u>	<u>91</u>	<u>103</u>	<u>91</u>
Zr	mg kg ⁻¹	<u>46.1</u>	<u>0.005</u>	<u>56</u>	<u>44.4</u>			<u>60</u>	<u>46</u>	<u>49</u>	<u>50.6</u>	<u>53</u>		<u>95</u>

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	<u>25.1</u>	<u>25.22</u>	24.6	<u>25.503</u>	25.18	<u>25</u>	25.28	<u>26.587</u>	<u>25.26</u>
TiO2	g 100g ⁻¹	0.17	0.16	0.167	<u>0.17</u>	<u>0.167</u>	0.17	<u>0.18</u>	0.175	<u>0.18</u>	0.18	<u>0.14</u>	<u>0.17</u>
Al2O3	g 100g ⁻¹	4.24	3.7	3.82	<u>3.83</u>	<u>4.61</u>	3.92	<u>4.076</u>	4.002	<u>3.96</u>	4.02	<u>4.394</u>	<u>4.02</u>
Fe2O3T	g 100g ⁻¹	1.7	1.53	1.62	<u>1.48</u>	<u>1.55</u>	1.64	<u>1.688</u>	1.577	<u>1.62</u>	1.61	<u>1.437</u>	<u>1.64</u>
Fe(II)O	g 100g ⁻¹	0.14	0.39										
MnO	g 100g ⁻¹	0.005	0.01	0.016	<u>0.02</u>	<u>0.011</u>	0.004	<u>0.014</u>	0.014	<u>0.013</u>	0.01	<u>0.015</u>	<u>0.016</u>
MgO	g 100g ⁻¹	0.37	0.45	0.39	<u>0.29</u>	<u>0.405</u>	0.39		0.479	<u>0.55</u>	0.49	<u>0.586</u>	<u>0.39</u>
CaO	g 100g ⁻¹	34.29	31.58	32.18	<u>32.6</u>	<u>32.38</u>	33.18	<u>34.04</u>	32.735	<u>33.05</u>	32.62	<u>35.435</u>	<u>32.95</u>
Na2O	g 100g ⁻¹	0.016	0.19		<u>0.03</u>	<u>0.055</u>	0.31	<u>0.07</u>	0.048	<u>0.04</u>	0.08	<u>0.027</u>	<u>0.03</u>
K2O	g 100g ⁻¹	0.35	0.34	0.33	<u>0.35</u>	<u>0.326</u>	0.68	<u>0.339</u>	0.319	<u>0.33</u>	0.33	<u>0.358</u>	<u>0.3</u>
P2O5	g 100g ⁻¹	0.1	0.097	0.096	<u>0.11</u>	<u>0.096</u>	0.38	<u>0.097</u>	0.096	<u>0.099</u>	0.1	<u>0.145</u>	<u>0.1</u>
H2O+	g 100g ⁻¹				<u>4.43</u>						0.75		
CO2	g 100g ⁻¹				<u>24.6</u>	<u>24.8</u>		<u>28.67</u>		<u>24.15</u>			
LOI	g 100g ⁻¹	31.61	32.85	32.14	<u>31.65</u>	<u>32.7</u>	31.5		31.48	<u>31.53</u>	34.59	<u>30.912</u>	31.16
Ag	mg kg ⁻¹		0.25										
As	mg kg ⁻¹	7.85	12.07			<u>20.8</u>	8.13		12.8	<u>15</u>		<u>12</u>	
Au	mg kg ⁻¹												
B	mg kg ⁻¹												
Ba	mg kg ⁻¹	83.5	123	62.9	<u>69</u>	<u>70.4</u>		<u>91</u>	64.19	<u>59</u>		<u>28</u>	84
Be	mg kg ⁻¹	1.02	1.1		<u>1.01</u>	<u>1.03</u>			<u>1.017</u>				1.03
Bi	mg kg ⁻¹	0.23										<u>10</u>	0.31
Br	mg kg ⁻¹												
C(org)	mg kg ⁻¹					<u>51430</u>		<u>117920.000</u>		<u>53300</u>			
C(tot)	mg kg ⁻¹					<u>119100.000</u>		<u>39670</u>	<u>119000.000</u>	<u>119200.000</u>	11.76		
Cd	mg kg ⁻¹	1.98	2			<u>2.4</u>	3.08						1.04
Ce	mg kg ⁻¹	28.4	20.1	17.8	25	<u>25.25</u>			<u>23.467</u>	<u>31</u>			27.26
Cl	mg kg ⁻¹					<u>100</u>	138.610			<u>130</u>			
Co	mg kg ⁻¹	6.1	4.4	<u>7</u>	<u>6.5</u>	<u>6.16</u>			<u>5.276</u>	<u>1</u>			0.71
Cr	mg kg ⁻¹	29.6	28	60	<u>31</u>	<u>26.3</u>		<u>44</u>	<u>28.18</u>	<u>25</u>		<u>125</u>	36.19
Cs	mg kg ⁻¹	4.21		2.59	<u>3.3</u>				<u>2.133</u>				4.43
Cu	mg kg ⁻¹	34.4	32	39	<u>36</u>	<u>34.3</u>	15.8	<u>40</u>	<u>33.64</u>	<u>33</u>			36.74
Dy	mg kg ⁻¹	1.52	1.93	1.17	1.69	<u>1.77</u>			<u>1.693</u>				1.86
Er	mg kg ⁻¹	0.94	0.98	0.67	0.98	<u>1.04</u>			<u>0.959</u>				1.16
Eu	mg kg ⁻¹	0.45	0.475	0.35	0.45	<u>0.48</u>			<u>0.455</u>				0.52
F	mg kg ⁻¹			<u>944</u>		<u>475</u>				<u>550</u>			
Ga	mg kg ⁻¹	6.27			<u>6.2</u>				<u>6.553</u>	<u>8</u>			7.07
Gd	mg kg ⁻¹	2.06	2.9	1.35	1.96	<u>2.01</u>			<u>1.966</u>				2.24
Ge	mg kg ⁻¹	0.051							<u>0.216</u>				
Hf	mg kg ⁻¹	0.94		0.8	<u>1.2</u>	<u>3.41</u>			<u>1.096</u>	<u>2</u>			1.44
Hg	mg kg ⁻¹												0.043
Ho	mg kg ⁻¹	0.31	0.45	0.23	0.34	<u>0.362</u>			<u>0.324</u>				0.41
I	mg kg ⁻¹												
In	mg kg ⁻¹	0.046											
La	mg kg ⁻¹	14.3	15.76	11.6	14.1	<u>13.73</u>			<u>13.19</u>	<u>25</u>			14.99
Li	mg kg ⁻¹	23			<u>25.8</u>	<u>28.2</u>			<u>23.76</u>				26.84
Lu	mg kg ⁻¹	0.15	0.15	0.1	0.15	<u>0.158</u>			<u>0.144</u>				0.18
Mo	mg kg ⁻¹	51.7	45.4		<u>52</u>	<u>49.5</u>	62.45		47.6		<u>44</u>		54.5
Nb	mg kg ⁻¹	6.38		5.42	<u>5.9</u>	<u>9</u>			<u>5.52</u>	<u>10</u>			7.27
Nd	mg kg ⁻¹	11.3	11.72	8.4	10.9	<u>11.3</u>			<u>10.83</u>	<u>11</u>			12.31
Ni	mg kg ⁻¹	76.5	87.1	86	<u>75</u>	<u>76.6</u>	33.19	<u>99</u>	<u>71.71</u>	<u>72</u>			84.06
Pb	mg kg ⁻¹	8.3	6	3.82	<u>6.5</u>	<u>5.3</u>	8.82	<u>26</u>	<u>5.371</u>	<u>10</u>			6.73
Pd	mg kg ⁻¹						0.79						
Pr	mg kg ⁻¹	2.89	2.72	2.36	2.96	<u>2.99</u>			<u>2.835</u>	<u>7</u>			3.49
Pt	mg kg ⁻¹												
Rb	mg kg ⁻¹	17.9	11.14	15.1	<u>18.5</u>	<u>18</u>			<u>17.64</u>	<u>12</u>			14.8
Re	mg kg ⁻¹												
Rh	mg kg ⁻¹												
S	mg kg ⁻¹		15000	17820		<u>17905</u>	1.49		<u>15860</u>	<u>12891</u>			
Sb	mg kg ⁻¹	3.17	1.6			<u>3.29</u>	14.82		<u>3.8</u>			<u>11</u>	3.53
Sc	mg kg ⁻¹	3.6	2.8	3.2	<u>3.6</u>	<u>3.09</u>			<u>4.79</u>				
Se	mg kg ⁻¹	0.12	4.25				12.76						
Sm	mg kg ⁻¹	2.14	2.25	1.52	2.04	<u>2.17</u>			<u>2.108</u>	<u>5</u>			2.23
Sn	mg kg ⁻¹	1.05			<u>0.93</u>								0.98
Sr	mg kg ⁻¹	880	860	874	<u>1010</u>	<u>1030</u>		<u>970</u>	<u>1107</u>	<u>1042</u>		<u>634</u>	950.2
Ta	mg kg ⁻¹	0.44		<u>0.96</u>	<u>0.4</u>	<u>0.702</u>			<u>0.261</u>				0.39
Tb	mg kg ⁻¹	0.31	0.51	0.2	0.3	<u>0.302</u>			<u>0.266</u>				0.35
Te	mg kg ⁻¹	0.057	0.2				0.3						
Th	mg kg ⁻¹	3.07		1.82	<u>2.75</u>	<u>3.17</u>			<u>2.713</u>				3.23
Tl	mg kg ⁻¹	2.87			<u>2.86</u>								
Tm	mg kg ⁻¹	0.15	0.19	0.11	0.15	<u>0.153</u>			<u>0.134</u>				0.17
U	mg kg ⁻¹	9.94		6.65	<u>8.9</u>	<u>9.32</u>			<u>8.7</u>				10.16
V	mg kg ⁻¹	439	410	492	<u>450</u>	<u>401</u>		<u>354</u>	<u>425</u>	<u>421</u>		<u>279</u>	509.510
W	mg kg ⁻¹	0.37		<u>0.2</u>	<u>0.49</u>								0.54
Y	mg kg ⁻¹	9.73	11	9	<u>9.8</u>	<u>10.03</u>			<u>9.394</u>	<u>10</u>		<u>7</u>	10.31
Yb	mg kg ⁻¹	0.99	1	0.68	0.99	<u>1.02</u>			<u>0.995</u>				1.21
Zn	mg kg ⁻¹	100	117	109	<u>93</u>	<u>103</u>	44.5	<u>128</u>	<u>72.06</u>	<u>97</u>			121.580
Zr	mg kg ⁻¹	61.3		41.7	<u>48</u>	<u>110</u>		<u>70</u>	<u>45.92</u>	<u>61</u>			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		<u>24.92</u>	25.29	<u>25.2</u>	<u>25.13</u>		<u>24.511</u>	25.03	<u>29.17</u>	25.32	26.03	20.11	
TiO2	g 100g ⁻¹		<u>0.18</u>	0.176		<u>0.18</u>	0.165		0.175	<u>0.175</u>	0.17	0.18	0.36	
Al2O3	g 100g ⁻¹		<u>4.09</u>	4.07	<u>4.2</u>	<u>4.129</u>	4.065		4.03	<u>4.53</u>	4	4.1	4.43	
Fe2O3T	g 100g ⁻¹		<u>1.63</u>	1.68	<u>1.71</u>	<u>1.653</u>	1.363		1.63	<u>1.47</u>	1.65	1.65	2.13	
Fe(II)O	g 100g ⁻¹									<u>0.7</u>				
MnO	g 100g ⁻¹			0.015			0.011		0.012	<u>0.008</u>	0.01	0.02	0.02	
MgO	g 100g ⁻¹		<u>0.41</u>	0.442		<u>0.403</u>	0.441		0.44	<u>0.62</u>	0.37	0.61	0.7	
CaO	g 100g ⁻¹		<u>32.49</u>	33.79	<u>33</u>	<u>33.649</u>	30.86		32.65	<u>31.64</u>	32.21	33.92	40.16	
Na2O	g 100g ⁻¹		<u>0.06</u>	0.008					0.047	<u>0.14</u>	0.05	0.15	0.07	
K2O	g 100g ⁻¹		<u>0.28</u>	0.338		<u>0.346</u>	0.1		0.34	<u>0.32</u>	0.34	0.29	0.39	
P2O5	g 100g ⁻¹		<u>0.11</u>	0.101		<u>0.098</u>	0.013		0.098	<u>0.089</u>	0.1	10	0.09	
H2O+	g 100g ⁻¹						0.91							
CO2	g 100g ⁻¹													
LOI	g 100g ⁻¹		<u>31.3</u>	32.93	<u>32.5</u>	<u>31.37</u>		<u>31.614</u>	31.31	<u>31.6</u>	32.53	<u>32.07</u>	31.51	
Ag	mg kg ⁻¹			0.198						<u>0.338</u>	0.14			
As	mg kg ⁻¹			15.272						<u>11.963</u>	16			12.815
Au	mg kg ⁻¹													
B	mg kg ⁻¹									<u>14.132</u>				
Ba	mg kg ⁻¹		<u>61.01</u>	79.134		<u>72.4</u>			68.9	<u>76.931</u>	76		20	70.959
Be	mg kg ⁻¹			1.097		<u>1</u>	1		0.98	<u>0.766</u>	0.9			0.816
Bi	mg kg ⁻¹			0.216			0.25			<u>0.213</u>				
Br	mg kg ⁻¹													
C(org)	mg kg ⁻¹													
C(tot)	mg kg ⁻¹										126900.000			
Cd	mg kg ⁻¹			1.738			2.1			<u>1.505</u>	1.86			
Ce	mg kg ⁻¹	<u>44.3</u>	<u>18.29</u>	23.164		<u>22.93</u>	23.12		24.3	<u>22.651</u>	24.8		22.91	23.486
Cl	mg kg ⁻¹													
Co	mg kg ⁻¹			8.301		<u>6.11</u>	5.29		6.29	<u>6.558</u>	5.92		87	
Cr	mg kg ⁻¹		<u>24.76</u>	40.703		<u>32.3</u>			29.2	<u>24.951</u>	30.5		43	
Cs	mg kg ⁻¹			3.402		<u>2.91</u>	2.99		3.08	<u>3.254</u>			2.82	2.627
Cu	mg kg ⁻¹			38.833		<u>32.6</u>	38.96		33.5	<u>24.122</u>	32.2		25	30.967
Dy	mg kg ⁻¹	<u>2.13</u>	<u>1.62</u>	1.644		<u>1.53</u>	1.59		1.68	<u>1.796</u>	1.77		1.36	1.576
Er	mg kg ⁻¹	<u>1.15</u>	<u>0.959</u>	0.969		<u>0.92</u>	0.92		0.99	<u>1.092</u>	1.04		0.84	0.890
Eu	mg kg ⁻¹		<u>0.453</u>	0.473		<u>0.43</u>	0.44		0.46	<u>0.482</u>	0.45		0.42	0.405
F	mg kg ⁻¹							<u>552</u>						
Ga	mg kg ⁻¹		<u>6.41</u>	6.193		<u>6.24</u>	5.69		6.36	<u>5.458</u>	<u>5.61</u>		5.44	
Gd	mg kg ⁻¹	<u>6.96</u>	<u>2.273</u>	1.903		<u>1.71</u>	1.97		1.91	<u>2.115</u>	1.94		1.73	1.807
Ge	mg kg ⁻¹									<u>0.154</u>			4.46	
Hf	mg kg ⁻¹		<u>1.989</u>	1.202		<u>1.1</u>			1.19	<u>1.192</u>			0.89	1.095
Hg	mg kg ⁻¹													
Ho	mg kg ⁻¹		<u>0.291</u>	0.341			0.31		0.34	<u>0.368</u>	0.36		0.28	0.309
I	mg kg ⁻¹													
In	mg kg ⁻¹													
La	mg kg ⁻¹	<u>43.9</u>	<u>13.743</u>	12.831		<u>12.55</u>	12.51		13.5	<u>12.466</u>	13.5		13.52	12.649
Li	mg kg ⁻¹			26.236			24.86		21.3	<u>23.286</u>	21.5			21.133
Lu	mg kg ⁻¹		<u>0.04</u>	0.149			0.127		0.15	<u>0.154</u>	0.16		0.12	0.134
Mo	mg kg ⁻¹		<u>34.19</u>	61.315		<u>45.2</u>	45.61		47.8	<u>44.701</u>	48.6			
Nb	mg kg ⁻¹		<u>7.501</u>	6.131		<u>5.11</u>			6.08	<u>5.354</u>	<u>5.05</u>		6	6.482
Nd	mg kg ⁻¹	<u>16.5</u>	<u>11.232</u>	10.587		<u>10.3</u>	10.44		11	<u>11.362</u>	11.5		9.47	10.309
Ni	mg kg ⁻¹		<u>54.37</u>	87.286		<u>75.9</u>	79.63		83.2	<u>67.793</u>	76.7		71	
Pb	mg kg ⁻¹		<u>8.67</u>	5.864					6.1	<u>5.762</u>	5.27		34	5.183
Pd	mg kg ⁻¹													
Pr	mg kg ⁻¹	<u>4.66</u>	<u>2.93</u>	2.786		<u>2.72</u>	2.82		2.89	<u>3.049</u>	2.98		2.67	2.681
Pt	mg kg ⁻¹													
Rb	mg kg ⁻¹		<u>11.428</u>	20.32		<u>15.98</u>	14.46		16.6	<u>15.464</u>	17.1		15	15.962
Re	mg kg ⁻¹													
Rh	mg kg ⁻¹													
S	mg kg ⁻¹			<u>1.88</u>	<u>17000</u>						17200			
Sb	mg kg ⁻¹			3.159			2.96			<u>2.325</u>	3.32			
Sc	mg kg ⁻¹	<u>54</u>	<u>7.8</u>	3.666		<u>3.6</u>			3.64	<u>3.948</u>	<u>12.4</u>		4	3.713
Se	mg kg ⁻¹									<u>3.479</u>	7.2			
Sm	mg kg ⁻¹	<u>2.76</u>	<u>2.128</u>	2.112		<u>1.94</u>	1.82		2.12	<u>2.174</u>	2.14		1.8	1.840
Sn	mg kg ⁻¹			0.751					0.88	<u>0.734</u>				0.614
Sr	mg kg ⁻¹		<u>1080</u>	1200.257		<u>995.380</u>			1045	<u>932.552</u>	<u>937</u>		984	1022.800
Ta	mg kg ⁻¹		<u>0.669</u>	0.279					0.3	<u>0.675</u>			0.21	0.274
Tb	mg kg ⁻¹		<u>0.25</u>	0.297			0.286		0.28	<u>0.287</u>	0.28		0.26	0.273
Te	mg kg ⁻¹			0.049						<u>0.059</u>				
Th	mg kg ⁻¹		<u>2.79</u>	2.687		<u>2.57</u>			2.79	<u>2.85</u>	3.08		2.08	2.753
Tl	mg kg ⁻¹			2.597		<u>1.54</u>	3.03			<u>2.781</u>	2.86			
Tm	mg kg ⁻¹		<u>0.099</u>	0.15			0.139		0.14	<u>0.159</u>	0.15		0.12	0.140
U	mg kg ⁻¹		<u>10.003</u>	12.096		<u>8.56</u>	8.29		9.17	<u>9.123</u>	9.97			8.476
V	mg kg ⁻¹		<u>330.830</u>	564.963		<u>419.3</u>	407.8		414	<u>376.714</u>	484			
W	mg kg ⁻¹			0.361			0.53			<u>0.412</u>			0.78	
Y	mg kg ⁻¹	<u>17</u>	<u>10.71</u>	10.648		<u>8.6</u>			10.2	<u>8.352</u>	9.67		8.5	9.056
Yb	mg kg ⁻¹	<u>1.78</u>	<u>0.885</u>	0.978		<u>0.92</u>	0.93		0.98	<u>1.023</u>	0.98		0.82	0.945
Zn	mg kg ⁻¹		<u>73.58</u>	113.952		<u>112.2</u>			92.5	<u>62.399</u>	94.6		101	
Zr	mg kg ⁻¹		<u>46.44</u>	71.78		<u>48.26</u>			48.9	<u>45.677</u>	<u>42.5</u>		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		X68	X71	X72	X73	X74	X76	X77	X78	X79	X80	X81	X82	X83
SiO2	g 100g ⁻¹	27.3		22.76	<u>25.42</u>		<u>27.8</u>	<u>25.6</u>	<u>25.1</u>		<u>24.98</u>		25.03	<u>20</u>
TiO2	g 100g ⁻¹	0.19		0.19	<u>0.173</u>	<u>0.002</u>	<u>0.17</u>	<u>0.184</u>	<u>0.17</u>		<u>0.17</u>	0.155	0.18	<u>0.43</u>
Al2O3	g 100g ⁻¹	4.31		3.66	<u>3.963</u>	<u>0.383</u>	<u>3.62</u>	<u>4.09</u>	<u>3.94</u>		<u>3.95</u>	3.93	3.94	
Fe2O3T	g 100g ⁻¹	1.73	1.57	1.74	<u>1.612</u>	<u>1.236</u>	<u>2.13</u>	<u>1.65</u>	<u>1.61</u>		<u>1.55</u>	1.601	1.61	<u>4.2</u>
Fe(II)O	g 100g ⁻¹												0.53	<u>4.2</u>
MnO	g 100g ⁻¹	0.01	0.012		<u>0.008</u>	<u>0.01</u>	<u>0.01</u>					0.012	0.012	<u>0.03</u>
MgO	g 100g ⁻¹	0.46	0.424	0.19	<u>0.367</u>	<u>0.25</u>	<u>0.35</u>	<u>0.44</u>	<u>0.41</u>		<u>0.37</u>	0.496	0.42	<u>7.41</u>
CaO	g 100g ⁻¹	37.64	33.2	35.6	<u>32.46</u>	<u>27.341</u>	<u>22.89</u>	<u>33.1</u>	<u>32.7</u>		<u>32.62</u>	32.456	32.98	<u>68.02</u>
Na2O	g 100g ⁻¹	0.03				<u>0.016</u>	<u>0.1</u>		<u>0.04</u>				0.038	
K2O	g 100g ⁻¹	0.36		0.32	<u>0.239</u>	<u>0.074</u>	<u>0.32</u>	<u>0.33</u>	<u>0.33</u>		<u>0.34</u>	0.337	0.33	<u>0.8</u>
P2O5	g 100g ⁻¹	0.11			<u>0.086</u>	<u>0.024</u>	<u>0.1</u>	<u>0.098</u>	<u>0.14</u>		<u>0.09</u>		0.1	
H2O+	g 100g ⁻¹													
CO2	g 100g ⁻¹													
LOI	g 100g ⁻¹	26.1		32.66	<u>31.52</u>		<u>31.8</u>	<u>31.78</u>	<u>31.7</u>		<u>31.11</u>		0.86	<u>31.36</u>
Ag	mg kg ⁻¹					<u>0.142</u>								
As	mg kg ⁻¹		16.09			<u>12.978</u>						16.5	26	<u>14.71</u>
Au	mg kg ⁻¹													
B	mg kg ⁻¹					<u>4.436</u>								
Ba	mg kg ⁻¹	78.1	75.93			<u>34.315</u>		107				62	71	<u>186</u>
Be	mg kg ⁻¹					<u>0.545</u>								
Bi	mg kg ⁻¹					<u>0.166</u>		<u>0.78</u>						
Br	mg kg ⁻¹													
C(org)	mg kg ⁻¹													
C(tot)	mg kg ⁻¹				<u>120000.000</u>									
Cd	mg kg ⁻¹					<u>1.686</u>	<u>5.34</u>	<u>2.17</u>		2.24				
Ce	mg kg ⁻¹	27.4	24.54			<u>8.65</u>		<u>18.62</u>				25.7		<u>919</u>
Cl	mg kg ⁻¹											50		
Co	mg kg ⁻¹	6.2	7.65			<u>4.467</u>	<u>7.14</u>	<u>7</u>				5.92	7	<u>63</u>
Cr	mg kg ⁻¹	30.7	31.14			<u>11.833</u>	<u>73</u>					29.7	37	<u>63</u>
Cs	mg kg ⁻¹		3.04					<u>2.95</u>		3.35		2.89		
Cu	mg kg ⁻¹		34.25			<u>22.95</u>	<u>52</u>	<u>30</u>					44	<u>43</u>
Dy	mg kg ⁻¹		1.64			<u>1.096</u>		<u>1.48</u>				1.74		<u>2.32</u>
Er	mg kg ⁻¹	<u>1.7</u>	0.963			<u>0.659</u>		<u>0.64</u>		0.96				
Eu	mg kg ⁻¹	<u>0.5</u>	0.45			<u>0.31</u>		<u>0.44</u>		0.45		0.442		<u>0.32</u>
F	mg kg ⁻¹													
Ga	mg kg ⁻¹		6.46					<u>5.91</u>		6.4			8	
Gd	mg kg ⁻¹	<u>2.2</u>	2.04			<u>1.42</u>		<u>1.49</u>		1.84				
Ge	mg kg ⁻¹					<u>0.025</u>		<u>0.69</u>		0.39				
Hf	mg kg ⁻¹		1.05					<u>0.92</u>				1.27		
Hg	mg kg ⁻¹													
Ho	mg kg ⁻¹		0.341			<u>0.22</u>		<u>0.35</u>		0.33				
I	mg kg ⁻¹													
In	mg kg ⁻¹													
La	mg kg ⁻¹	14.1	13.32			<u>5.1</u>		<u>11.85</u>		13.6		13.12		<u>18</u>
Li	mg kg ⁻¹					<u>2.264</u>		<u>22.58</u>						
Lu	mg kg ⁻¹		0.147			<u>0.095</u>		<u>0.15</u>		0.15		0.132		<u>1.12</u>
Mo	mg kg ⁻¹					<u>36.46</u>		<u>56.04</u>				43		<u>40</u>
Nb	mg kg ⁻¹	5.5	6.06			<u>0.091</u>				16.3			10	<u>10</u>
Nd	mg kg ⁻¹	11.3	11.24			<u>4.585</u>		<u>9.01</u>		10.7		12		<u>383</u>
Ni	mg kg ⁻¹	87	92.65			<u>57.945</u>	<u>67.2</u>					83	78	<u>84</u>
Pb	mg kg ⁻¹		6.15			<u>4.085</u>	<u>0.64</u>						10	<u>9.89</u>
Pd	mg kg ⁻¹													
Pr	mg kg ⁻¹		2.96			<u>1.098</u>		<u>2.29</u>		2.91				
Pt	mg kg ⁻¹													
Rb	mg kg ⁻¹	<u>0.4</u>	16.79			<u>4.14</u>		<u>20</u>		16.3		16.2	18	<u>12</u>
Re	mg kg ⁻¹													
Rh	mg kg ⁻¹													
S	mg kg ⁻¹			1.48	<u>18400</u>						<u>16300</u>			
Sb	mg kg ⁻¹									3.11		3.3		
Sc	mg kg ⁻¹	3.8	3.4			<u>2.438</u>		<u>3.47</u>		5.48		3.49		
Se	mg kg ⁻¹					<u>4.748</u>						5.8		
Sm	mg kg ⁻¹	2.1	2.13			<u>1.237</u>		<u>1.46</u>		2.01		2		
Sn	mg kg ⁻¹					<u>0.074</u>				0.86				<u>10</u>
Sr	mg kg ⁻¹	1118	999.8	0.07		<u>570.050</u>		<u>1016</u>			<u>1050</u>	1070	1062	<u>989</u>
Ta	mg kg ⁻¹		0.28							0.4		0.31		
Tb	mg kg ⁻¹		0.304			<u>0.197</u>		<u>0.29</u>		0.3		0.266		<u>1</u>
Te	mg kg ⁻¹													
Th	mg kg ⁻¹	<u>2.7</u>	2.72			<u>1.647</u>				3.13		2.67	7	<u>5.7</u>
Tl	mg kg ⁻¹					<u>1.967</u>		<u>2.9</u>		2.54				
Tm	mg kg ⁻¹		0.154			<u>0.093</u>		<u>0.12</u>		0.14				<u>1</u>
U	mg kg ⁻¹		8.79			<u>5.106</u>		<u>8.91</u>		9.02		8.9	10	<u>10</u>
V	mg kg ⁻¹	465	433.7	0.03		<u>210.670</u>	<u>412.4</u>	<u>436</u>				431	389	<u>435</u>
W	mg kg ⁻¹					<u>0.149</u>				0.5		<u>0.45</u>		<u>30</u>
Y	mg kg ⁻¹	10.3	10.13			<u>5.98</u>		<u>9.34</u>		9.14			17	
Yb	mg kg ⁻¹	1	0.926			<u>0.629</u>		<u>0.91</u>		0.93		0.88		<u>6</u>
Zn	mg kg ⁻¹		85.2			<u>66.727</u>	<u>239.2</u>	<u>107</u>				104	98	<u>90</u>
Zr	mg kg ⁻¹	53.3	48.02			<u>6.401</u>		<u>36</u>				68	45	<u>60</u>

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	s_{dm}	H_a	s_{dm}/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	2.701	0.001956	0.186	0.01052	27	2.706	0.4882	2.9	Assigned	Mode
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	<u>-2.12</u>	<u>-3.77</u>	<u>-0.21</u>	<u>10.97</u>	<u>-6.63</u>	*	*	<u>0.55</u>	<u>0.32</u>	<u>0.92</u>	<u>-0.37</u>	<u>2.26</u>	<u>-5.92</u>
TiO2	<u>1.41</u>	<u>2.29</u>	<u>-1.66</u>	<u>1.63</u>	*	*	*	<u>5.46</u>	<u>1.07</u>	<u>0.53</u>	<u>-0.56</u>	<u>-3.33</u>	<u>-1.13</u>
Al2O3	<u>-3.88</u>	<u>-4.00</u>	<u>-0.77</u>	<u>12.86</u>	<u>2.31</u>	*	*	<u>0.00</u>	<u>0.92</u>	<u>-0.92</u>	<u>-0.23</u>	<u>0.92</u>	<u>-1.08</u>
Fe2O3T	<u>-3.60</u>	<u>2.47</u>	<u>-1.87</u>	<u>-0.70</u>	<u>20.73</u>	*	*	<u>-0.40</u>	<u>7.27</u>	<u>-0.70</u>	<u>-0.20</u>	<u>3.60</u>	<u>-0.07</u>
MnO	<u>1.09</u>	<u>0.52</u>	*	<u>-0.06</u>	<u>-7.69</u>	*	*	<u>-2.41</u>	<u>-2.41</u>	*	<u>1.09</u>	<u>-2.41</u>	<u>20.56</u>
MgO	<u>-3.60</u>	<u>-6.52</u>	<u>-1.09</u>	<u>-1.09</u>	<u>200.10</u>	*	*	<u>8.24</u>	<u>-6.36</u>	<u>-1.09</u>	<u>-1.09</u>	<u>1.98</u>	<u>-14.70</u>
CaO	<u>2.87</u>	<u>2.50</u>	<u>1.35</u>	<u>3.70</u>	<u>-4.62</u>	*	*	<u>4.49</u>	<u>-3.18</u>	<u>-0.96</u>	<u>-0.10</u>	<u>-1.03</u>	<u>2.18</u>
K2O	<u>-3.40</u>	<u>-0.44</u>	<u>-0.44</u>	<u>-1.70</u>	<u>48.24</u>	*	*	<u>7.94</u>	<u>0.38</u>	<u>3.34</u>	<u>-5.48</u>	<u>1.64</u>	<u>-21.04</u>
P2O5	<u>-1.07</u>	<u>-1.96</u>	*	*	*	*	*	<u>0.36</u>	<u>-6.78</u>	<u>-0.53</u>	<u>-1.60</u>	<u>3.92</u>	<u>-6.78</u>
LOI	<u>-0.69</u>	<u>1.06</u>	<u>0.04</u>	<u>-4.27</u>	<u>-0.85</u>	<u>0.32</u>	*	<u>-0.29</u>	<u>1.28</u>	<u>-0.55</u>	<u>0.09</u>	<u>1.04</u>	<u>-0.08</u>
As	<u>0.03</u>	*	<u>0.72</u>	<u>-1.82</u>	*	*	<u>1.22</u>	<u>2.31</u>	<u>2.44</u>	<u>-1.28</u>	<u>-0.03</u>	<u>-1.31</u>	<u>-13.81</u>
Ba	<u>-2.50</u>	*	<u>0.20</u>	*	*	*	<u>-1.14</u>	<u>2.13</u>	<u>3.27</u>	<u>1.31</u>	<u>-0.32</u>	<u>-10.78</u>	*
Be	*	*	<u>-0.56</u>	*	*	*	*	<u>0.88</u>	*	<u>0.00</u>	*	*	*
Bi	<u>14.15</u>	*	<u>0.94</u>	<u>-2.20</u>	*	*	*	<u>-1.53</u>	*	<u>4.35</u>	*	*	*
C(tot)	*	*	*	*	*	*	*	*	*	<u>-36.30</u>	*	*	*
Cd	*	*	<u>0.65</u>	<u>-1.20</u>	*	*	*	<u>-11.21</u>	*	<u>0.48</u>	<u>-1.10</u>	*	*
Ce	<u>4.24</u>	*	<u>-0.43</u>	<u>-1.41</u>	*	*	*	<u>1.19</u>	<u>4.30</u>	<u>-1.86</u>	<u>0.10</u>	<u>-4.71</u>	*
Co	<u>1.37</u>	*	<u>-0.07</u>	<u>-0.86</u>	*	*	*	<u>0.39</u>	<u>4.29</u>	<u>3.58</u>	<u>0.85</u>	<u>-6.11</u>	*
Cr	<u>-1.95</u>	<u>33.55</u>	<u>-0.23</u>	<u>5.00</u>	*	*	<u>-1.28</u>	<u>5.09</u>	<u>-1.86</u>	<u>-0.58</u>	<u>-0.23</u>	<u>-2.56</u>	*
Cs	<u>13.14</u>	*	*	*	*	*	*	<u>0.95</u>	<u>23.42</u>	<u>4.94</u>	<u>-0.24</u>	*	*
Cu	<u>-1.36</u>	<u>3.22</u>	<u>1.03</u>	<u>-0.72</u>	*	*	<u>-2.14</u>	<u>2.25</u>	<u>-3.03</u>	<u>1.66</u>	<u>-1.83</u>	<u>-8.68</u>	<u>-6.17</u>
Dy	*	*	<u>0.05</u>	<u>-1.18</u>	*	*	*	<u>1.89</u>	*	<u>-0.63</u>	*	*	*
Er	*	*	<u>0.11</u>	<u>-1.01</u>	*	*	*	<u>0.34</u>	*	<u>0.36</u>	*	*	*
Eu	*	*	<u>-0.17</u>	<u>-0.78</u>	*	*	*	<u>1.13</u>	*	<u>0.20</u>	*	*	*
Ga	<u>-1.68</u>	*	<u>0.56</u>	<u>-0.10</u>	*	*	*	<u>1.90</u>	<u>-3.35</u>	<u>0.95</u>	<u>-0.36</u>	<u>9.78</u>	<u>-3.35</u>
Gd	*	*	<u>0.36</u>	<u>-0.99</u>	*	*	*	<u>0.36</u>	*	<u>-0.14</u>	*	*	*
Hf	*	*	<u>0.65</u>	<u>-1.11</u>	*	*	*	<u>-0.87</u>	*	<u>-0.65</u>	*	*	*
Ho	*	*	<u>0.38</u>	<u>-0.50</u>	*	*	*	<u>2.03</u>	*	<u>-0.41</u>	*	*	*
La	<u>0.69</u>	*	<u>-0.47</u>	<u>-0.82</u>	*	*	*	<u>1.25</u>	<u>-13.01</u>	<u>-6.03</u>	<u>-0.34</u>	<u>-2.04</u>	*
Li	*	*	<u>0.94</u>	*	*	*	*	*	*	<u>2.45</u>	*	*	*
Lu	*	*	<u>0.66</u>	<u>-0.79</u>	*	*	*	<u>0.06</u>	*	<u>-0.28</u>	*	*	*
Mo	<u>-1.08</u>	<u>-11.19</u>	<u>1.03</u>	<u>0.00</u>	*	*	*	<u>1.03</u>	<u>-4.12</u>	<u>-1.31</u>	<u>-0.89</u>	*	<u>1.03</u>
Nb	<u>-1.46</u>	*	<u>0.13</u>	<u>-1.72</u>	*	*	*	<u>1.71</u>	<u>-1.76</u>	<u>1.43</u>	<u>-0.88</u>	<u>108.04</u>	<u>6.91</u>
Nd	<u>2.53</u>	*	<u>-0.16</u>	<u>-0.62</u>	*	*	*	<u>0.98</u>	<u>-8.15</u>	<u>-2.85</u>	<u>0.00</u>	<u>-4.89</u>	*
Ni	<u>-1.59</u>	<u>-0.36</u>	<u>1.21</u>	<u>-1.69</u>	*	*	<u>-1.11</u>	<u>1.08</u>	<u>-3.17</u>	<u>6.24</u>	<u>-0.95</u>	<u>4.82</u>	<u>-5.73</u>
Pb	<u>-6.16</u>	*	<u>0.61</u>	<u>-2.22</u>	*	*	*	<u>-2.03</u>	<u>35.09</u>	<u>16.19</u>	<u>-0.07</u>	<u>-10.97</u>	<u>-10.97</u>
Pr	*	*	<u>-0.29</u>	<u>-1.27</u>	*	*	*	<u>0.82</u>	*	<u>0.46</u>	*	*	*
Rb	<u>0.06</u>	<u>-9.57</u>	<u>-0.17</u>	<u>-2.07</u>	*	*	<u>-0.51</u>	<u>0.23</u>	<u>3.51</u>	<u>0.40</u>	<u>-0.51</u>	<u>0.11</u>	<u>2.38</u>
Sb	<u>3.94</u>	*	<u>0.47</u>	<u>-2.82</u>	*	*	*	<u>1.03</u>	*	<u>-0.83</u>	<u>-1.08</u>	*	*
Sc	<u>4.42</u>	*	<u>0.21</u>	<u>1.37</u>	*	*	*	<u>82.96</u>	*	<u>-0.21</u>	*	<u>43.80</u>	*
Sm	<u>15.62</u>	*	<u>0.36</u>	<u>-1.17</u>	*	*	*	<u>-0.01</u>	*	<u>1.32</u>	*	*	*
Sr	<u>-1.37</u>	*	<u>1.19</u>	<u>0.96</u>	*	*	<u>-1.34</u>	<u>4.98</u>	<u>-1.78</u>	<u>2.49</u>	<u>-0.82</u>	<u>-8.50</u>	<u>-1.32</u>
Ta	*	*	*	<u>-1.17</u>	*	*	*	<u>0.29</u>	*	<u>5.49</u>	*	*	*
Tb	*	*	<u>-0.17</u>	<u>-0.94</u>	*	*	*	<u>0.37</u>	*	<u>0.72</u>	*	*	*
Th	<u>2.02</u>	*	<u>-0.32</u>	<u>-2.35</u>	*	*	*	<u>-2.34</u>	<u>12.00</u>	<u>3.08</u>	<u>-1.96</u>	*	*
Tl	<u>-2.69</u>	*	<u>0.62</u>	*	*	*	*	*	*	<u>0.54</u>	<u>0.80</u>	*	*
Tm	*	*	<u>0.41</u>	<u>-0.93</u>	*	*	*	*	*	<u>-0.23</u>	*	*	*
U	<u>3.29</u>	*	<u>-0.43</u>	<u>-0.81</u>	*	*	<u>2.90</u>	<u>1.93</u>	<u>2.90</u>	<u>0.48</u>	<u>0.97</u>	*	<u>13.54</u>
V	<u>-2.61</u>	<u>-15.51</u>	<u>2.37</u>	<u>0.59</u>	*	*	<u>-1.59</u>	<u>3.48</u>	<u>-0.59</u>	<u>1.15</u>	<u>-0.44</u>	<u>-15.70</u>	*
Y	<u>-0.09</u>	*	<u>-0.09</u>	<u>-1.60</u>	*	*	<u>1.28</u>	<u>-1.65</u>	<u>0.73</u>	<u>0.27</u>	<u>0.37</u>	<u>-4.76</u>	<u>4.39</u>
Yb	<u>-1.77</u>	*	<u>0.58</u>	<u>-0.91</u>	*	*	*	<u>0.28</u>	*	<u>0.78</u>	<u>6.51</u>	*	*
Zn	<u>-1.02</u>	*	<u>1.81</u>	<u>-5.25</u>	*	*	<u>-1.12</u>	<u>1.33</u>	<u>-1.98</u>	<u>1.43</u>	<u>-0.86</u>	<u>1.33</u>	<u>-1.73</u>
Zr	<u>-1.40</u>	<u>-11.35</u>	<u>0.74</u>	<u>-1.77</u>	*	*	<u>1.60</u>	<u>-2.84</u>	<u>-1.55</u>	<u>-0.43</u>	<u>0.09</u>	*	<u>18.31</u>

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	<u>-0.05</u>	0.15	-1.71	0.60	0.16	-0.21	0.48	2.35	0.21	*
TiO2	-1.13	-3.33	-1.79	<u>-0.56</u>	<u>-0.89</u>	-1.13	0.53	-0.03	0.53	1.07	<u>-3.86</u>	<u>-0.56</u>	*
Al2O3	3.70	-4.62	-2.77	<u>-1.31</u>	4.70	-1.23	0.59	0.03	<u>-0.31</u>	0.31	3.03	0.15	*
Fe2O3T	2.93	-2.73	0.27	<u>-2.20</u>	<u>-1.03</u>	0.93	1.27	-1.17	0.13	-0.07	<u>-2.92</u>	0.47	*
MnO	<i>-13.90</i>	<i>-2.41</i>	<i>11.37</i>	<u>10.28</u>	0.40	<i>-16.19</i>	<u>3.27</u>	6.78	<u>2.24</u>	<i>-2.41</i>	<u>4.54</u>	<u>5.68</u>	*
MgO	-5.32	3.03	-3.23	<u>-6.83</u>	<u>-0.83</u>	-3.23	*	6.05	<u>6.73</u>	7.20	<u>8.60</u>	<u>-1.62</u>	*
CaO	3.44	-3.52	-1.98	<u>-0.45</u>	<u>-0.73</u>	0.59	1.40	-0.55	0.13	-0.85	3.19	0.00	*
K2O	1.64	0.38	-0.88	0.82	<u>-0.69</u>	43.21	0.13	-2.27	<u>-0.44</u>	-0.88	1.32	<u>-2.33</u>	*
P2O5	0.36	-0.71	-1.07	1.96	<u>-0.50</u>	100.20	<u>-0.36</u>	-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	<u>-0.11</u>	7.93	<u>-0.93</u>	<u>-1.20</u>	*
As	<i>-9.00</i>	<i>-3.72</i>	*	*	3.59	<i>-8.65</i>	*	<i>-2.81</i>	<u>-0.03</u>	*	<i>-1.91</i>	*	*
Ba	3.44	16.34	-3.30	<u>-0.65</u>	<u>-0.42</u>	*	2.94	<u>-1.44</u>	<u>-2.28</u>	*	<u>-7.35</u>	*	3.60
Be	0.25	1.25	*	0.06	0.19	*	*	0.11	*	*	*	*	0.38
Bi	<i>-0.26</i>	*	*	*	*	*	*	*	*	*	208.12	*	3.15
C(tot)	*	*	*	*	0.00	*	<u>-24.21</u>	<u>-0.03</u>	0.03	<i>-72.59</i>	*	*	*
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	<u>-0.25</u>	*	*	-1.40	<u>-6.96</u>	*	*	*	-14.67
Cr	-0.04	-1.16	21.31	0.47	<u>-1.18</u>	*	5.04	<u>-0.52</u>	<u>-1.63</u>	*	33.48	*	4.59
Cs	5.30	*	-2.44	0.47	*	*	*	<u>-2.31</u>	*	*	*	*	6.35
Cu	0.36	-1.14	3.25	0.68	0.15	-11.32	1.94	<u>-0.06</u>	<u>-0.26</u>	*	*	*	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	*	*	<u>-0.09</u>	*	*	*	*	2.39
Eu	-0.09	0.52	-2.54	-0.09	0.32	*	*	0.01	*	*	*	*	1.62
Ga	-0.02	*	*	<u>-0.10</u>	*	*	*	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	*	*	<u>-0.46</u>	4.45	*	*	*	2.82
Ho	-0.82	3.61	-3.34	0.13	0.41	*	*	<u>-0.19</u>	*	*	*	*	2.34
La	1.11	3.11	-2.59	0.84	0.16	*	*	<u>-0.21</u>	7.89	*	*	*	2.06
Li	-0.95	*	*	0.69	1.70	*	*	<u>-0.16</u>	*	*	*	*	2.26
Lu	0.06	0.06	-3.09	0.06	0.28	*	*	<u>-0.16</u>	*	*	*	*	1.95
Mo	1.83	-1.12	*	0.98	0.40	6.86	*	-0.09	*	*	<u>-0.89</u>	*	3.14
Nb	2.23	*	<i>-0.55</i>	0.42	4.90	*	*	<u>-0.13</u>	6.34	*	*	*	4.80
Nd	0.49	1.17	-4.24	-0.16	0.24	*	*	<u>-0.14</u>	0.00	*	*	*	2.14
Ni	0.50	3.89	3.54	0.01	0.27	-13.34	3.85	<u>-0.51</u>	<u>-0.47</u>	*	*	*	2.92
Pb	6.10	<i>-0.14</i>	<i>-6.04</i>	0.61	<u>-1.02</u>	7.51	27.03	<u>-0.92</u>	5.35	*	*	*	1.84
Pr	-0.24	-1.09	-2.89	0.12	0.13	*	*	<u>-0.26</u>	10.17	*	*	*	2.77
Rb	1.13	-6.52	-2.04	0.91	0.62	*	*	0.42	<u>-2.77</u>	*	*	*	-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	<u>-1.07</u>	*	*	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	<u>-0.12</u>	0.23	*	<u>-0.82</u>	1.57	0.44	*	<u>-6.67</u>	*	-2.33
Ta	5.28	*	<u>11.90</u>	1.93	7.30	*	*	<u>-0.55</u>	*	*	*	*	3.50
Tb	0.72	7.89	-3.21	0.37	0.22	*	*	<u>-0.43</u>	*	*	*	*	2.16
Th	1.75	*	-4.89	0.03	1.14	*	*	<u>-0.07</u>	*	*	*	*	2.60
Tl	0.91	*	*	0.43	*	*	*	*	*	*	*	*	*
Tm	0.18	2.73	-2.36	0.18	0.19	*	*	<u>-0.42</u>	*	*	*	*	1.46
U	1.82	*	-4.54	<u>-0.10</u>	0.31	*	*	<u>-0.29</u>	*	*	*	*	2.24
V	1.48	-0.67	5.40	1.15	<u>-0.67</u>	*	<u>-2.41</u>	0.22	0.07	*	<u>-5.18</u>	*	6.70
Y	0.24	2.56	-1.10	0.18	0.39	*	*	<u>-0.19</u>	0.37	*	<u>-2.38</u>	*	1.30
Yb	0.15	0.28	-3.80	0.15	0.27	*	*	0.11	*	*	*	*	2.95
Zn	0.57	4.90	2.86	<u>-0.61</u>	0.67	-13.58	3.85	<u>-3.28</u>	<u>-0.10</u>	*	*	*	6.07
Zr	3.76	*	-4.70	<u>-0.99</u>	12.39	*	3.76	<u>-1.44</u>	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	*	<u>-0.34</u>	0.52	<u>0.11</u>	<u>0.00</u>	*	<u>-1.00</u>	-0.32	<u>6.53</u>	0.61	2.91	-16.23	*
TiO2	*	<u>0.53</u>	0.19	*	<u>0.53</u>	-2.23	*	-0.03	<u>-0.02</u>	-1.13	1.07	40.60	*
Al2O3	*	<u>0.69</u>	1.08	<u>1.54</u>	<u>0.99</u>	1.00	*	0.46	<u>4.08</u>	0.00	1.54	6.62	*
Fe2O3T	*	<u>0.30</u>	2.27	<u>1.63</u>	<u>0.68</u>	-8.30	*	0.60	<u>-2.37</u>	1.27	1.27	17.26	*
MnO	*	*	9.07	*	*	-0.11	*	2.18	<u>-4.08</u>	-2.41	20.56	20.56	*
MgO	*	<u>-0.57</u>	2.19	*	<u>-0.94</u>	2.09	*	1.98	<u>10.38</u>	-5.32	19.71	29.09	*
CaO	*	<u>-0.59</u>	2.16	<u>0.06</u>	<u>0.90</u>	-5.37	*	-0.77	<u>-1.68</u>	-1.90	2.49	18.51	*
K2O	*	<u>-3.59</u>	0.13	*	<u>0.57</u>	-29.85	*	0.38	<u>-1.07</u>	0.38	-5.92	6.68	*
P2O5	*	<u>1.96</u>	0.71	*	<u>-0.18</u>	-30.67	*	-0.36	<u>-1.78</u>	<u>0.18</u>	3530.67	-3.21	*
LOI	*	<u>-0.41</u>	3.51	<u>1.18</u>	<u>-0.32</u>	*	<u>0.01</u>	-0.80	<u>-0.01</u>	2.45	<u>0.61</u>	-0.27	*
As	*	*	0.28	*	*	*	*	*	<u>-1.93</u>	1.19	*	*	-2.79
Ba	*	<u>-1.96</u>	2.01	*	<u>-0.10</u>	*	*	-1.33	<u>0.64</u>	0.99	*	-17.31	-0.66
Be	*	*	1.21	*	<u>0.00</u>	0.00	*	-0.25	<u>-1.46</u>	-1.25	*	*	-2.30
Bi	*	*	-0.85	*	*	0.60	*	*	<u>-0.49</u>	*	*	*	*
C(tot)	*	*	*	*	*	*	*	*	*	4.75	*	*	*
Cd	*	*	-1.94	*	*	0.55	*	*	<u>-1.77</u>	-1.10	*	*	*
Ce	<u>8.00</u>	<u>-2.64</u>	-1.30	*	<u>-0.75</u>	-1.33	*	-0.37	<u>-0.86</u>	0.04	*	-1.51	-1.03
Co	*	*	5.07	*	<u>-0.31</u>	-2.76	*	-0.16	<u>0.27</u>	-1.12	*	209.72	*
Cr	*	<u>-1.72</u>	7.76	*	<u>0.93</u>	*	*	-0.32	<u>-1.65</u>	0.60	*	9.38	*
Cs	*	*	1.44	*	<u>-0.46</u>	-0.53	*	-0.10	<u>0.36</u>	*	*	-1.34	-2.27
Cu	*	*	3.15	*	<u>-0.38</u>	3.23	*	-0.20	<u>-3.05</u>	-1.02	*	-5.54	-1.79
Dy	<u>1.88</u>	<u>-0.19</u>	-0.18	*	<u>-0.55</u>	-0.62	*	0.11	<u>0.52</u>	0.84	*	-2.48	-0.73
Er	<u>1.13</u>	<u>-0.09</u>	-0.06	*	<u>-0.34</u>	-0.68	*	0.21	<u>0.76</u>	0.85	*	-1.71	-1.07
Eu	*	<u>-0.01</u>	0.47	*	<u>-0.29</u>	-0.34	*	0.15	<u>0.34</u>	-0.09	*	-0.83	-1.20
Ga	*	<u>0.18</u>	-0.22	*	<u>-0.05</u>	-1.54	*	0.22	<u>-1.07</u>	<u>-0.88</u>	*	-2.20	*
Gd	<u>17.76</u>	<u>1.15</u>	-0.33	*	<u>-0.85</u>	0.14	*	-0.28	<u>0.59</u>	-0.07	*	-1.56	-1.01
Hf	*	<u>4.39</u>	0.24	*	<u>-0.44</u>	*	*	0.11	<u>0.06</u>	*	*	-3.15	-0.93
Ho	*	<u>-0.71</u>	0.16	*	*	-0.82	*	0.13	<u>0.51</u>	0.76	*	-1.76	-0.86
La	<u>20.85</u>	<u>0.17</u>	-0.90	*	<u>-0.64</u>	-1.34	*	0.01	<u>-0.70</u>	0.01	*	0.04	-1.15
Li	*	*	1.75	*	*	0.60	*	-2.38	<u>-0.36</u>	-2.21	*	*	-2.52
Lu	*	<u>-3.43</u>	0.00	*	*	-1.39	*	0.06	<u>0.16</u>	0.69	*	-1.83	-0.97
Mo	*	<u>-3.19</u>	6.33	*	<u>-0.61</u>	-1.03	*	0.00	<u>-0.73</u>	0.37	*	*	*
Nb	*	<u>2.73</u>	1.51	*	<u>-0.72</u>	*	*	1.36	<u>-0.37</u>	<u>-0.81</u>	*	1.13	2.52
Nd	<u>4.48</u>	<u>0.19</u>	-0.67	*	<u>-0.57</u>	-0.91	*	0.00	<u>0.30</u>	0.82	*	-2.49	-1.13
Ni	*	<u>-3.28</u>	3.95	*	<u>0.16</u>	1.50	*	2.64	<u>-1.14</u>	0.57	*	-1.25	*
Pb	*	<u>3.55</u>	-0.50	*	*	*	*	0.14	<u>-0.39</u>	-2.11	*	75.73	-2.35
Pr	<u>4.31</u>	<u>-0.02</u>	-0.76	*	<u>-0.54</u>	-0.59	*	-0.24	<u>0.28</u>	0.22	*	-1.34	-1.28
Rb	*	<u>-3.10</u>	3.87	*	<u>-0.52</u>	-2.76	*	-0.34	<u>-0.81</u>	<u>0.11</u>	*	-2.15	-1.06
Sb	*	*	-0.53	*	*	-1.44	*	*	<u>-2.17</u>	0.21	*	*	*
Sc	<u>106.13</u>	<u>8.84</u>	0.28	*	<u>0.00</u>	*	*	0.17	<u>0.73</u>	<u>18.53</u>	*	1.68	0.48
Sm	<u>2.19</u>	<u>0.09</u>	0.07	*	<u>-0.54</u>	-1.88	*	0.12	<u>0.24</u>	0.25	*	-2.01	-1.74
Sr	*	<u>1.10</u>	6.39	*	<u>-0.38</u>	*	*	0.98	<u>-1.47</u>	<u>-1.39</u>	*	-1.15	0.20
Ta	*	<u>6.72</u>	-0.45	*	*	*	*	0.29	<u>6.82</u>	*	*	-2.91	-0.65
Tb	*	<u>-0.71</u>	0.26	*	*	-0.13	*	-0.35	<u>-0.05</u>	-0.35	*	-1.07	-0.60
Th	*	<u>0.13</u>	-0.28	*	<u>-0.45</u>	*	*	0.27	<u>0.29</u>	1.81	*	-3.50	0.07
Tl	*	*	-0.56	*	<u>-3.12</u>	1.77	*	*	<u>0.22</u>	0.86	*	*	*
Tm	*	<u>-1.53</u>	0.18	*	*	-0.52	*	-0.45	<u>0.38</u>	0.18	*	-1.73	-0.44
U	*	<u>0.97</u>	5.99	*	<u>-0.43</u>	-1.37	*	0.33	<u>0.12</u>	1.88	*	*	-1.01
V	*	<u>-3.26</u>	10.81	*	<u>0.01</u>	-0.83	*	-0.37	<u>-1.57</u>	4.81	*	*	*
Y	<u>6.77</u>	<u>1.02</u>	1.92	*	<u>-0.92</u>	*	*	1.10	<u>-1.14</u>	0.13	*	-2.01	-1.00
Yb	<u>5.11</u>	<u>-0.59</u>	-0.00	*	<u>-0.37</u>	-0.61	*	0.02	<u>0.28</u>	0.02	*	-2.02	-0.42
Zn	*	<u>-3.08</u>	4.12	*	<u>1.84</u>	*	*	-1.34	<u>-4.51</u>	-0.81	*	0.82	*
Zr	*	<u>-1.33</u>	8.28	*	<u>-0.93</u>	*	*	-1.59	<u>-1.49</u>	<u>-2.18</u>	*	13.99	-0.70

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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	<u>2.70</u>	4.17	<u>-0.15</u>	<u>2.21</u>	<u>-0.37</u>	*	<u>0.40</u>	<u>2.02</u>	<u>0.02</u>	<u>-0.13</u>	-0.14	*
TiO2	-0.25	<u>0.53</u>	-3.33	<u>-3.28</u>	<u>2.73</u>	<u>0.86</u>	*	<u>0.53</u>	<u>-0.35</u>	<u>1.63</u>	<u>0.09</u>	1.22	*
Al2O3	-0.14	<u>2.00</u>	2.00	<u>-0.09</u>	<u>0.00</u>	<u>6.31</u>	*	<u>1.39</u>	<u>0.15</u>	<u>0.77</u>	<u>0.00</u>	0.25	*
Fe2O3T	*	<u>2.13</u>	-0.40	<u>0.07</u>	<u>-1.20</u>	<u>-0.87</u>	*	<u>1.13</u>	<u>-1.20</u>	<u>-1.70</u>	<u>1.13</u>	-1.00	*
MnO	*	<u>3.39</u>	-2.41	<u>3.16</u>	<u>1.09</u>	<u>4.65</u>	*	<u>2.24</u>	*	<u>4.54</u>	<u>2.24</u>	2.41	*
MgO	-0.10	<u>4.64</u>	17.62	<u>1.74</u>	<u>-4.22</u>	*	*	<u>-1.09</u>	*	<u>3.08</u>	<u>1.51</u>	0.94	*
CaO	-0.27	<u>2.16</u>	-3.18	<u>-0.68</u>	<u>-6.36</u>	<u>1.01</u>	*	<u>-0.33</u>	<u>0.32</u>	<u>0.87</u>	<u>0.13</u>	0.20	*
K2O	-1.01	<u>2.08</u>	-3.40	<u>-0.35</u>	<u>0.19</u>	<u>-4.35</u>	*	<u>-9.26</u>	<u>-0.44</u>	<u>2.08</u>	<u>-6.17</u>	1.01	*
P2O5	-0.78	<u>1.96</u>	11.05	<u>-0.04</u>	<u>-2.32</u>	*	*	<u>1.07</u>	*	<u>2.67</u>	<u>-1.25</u>	0.11	*
LOI	-0.72	<u>-0.57</u>	3.27	<u>-0.56</u>	<u>4.77</u>	*	*	<u>1.18</u>	<u>-0.35</u>	<u>1.05</u>	<u>-0.48</u>	-0.74	*
As	*	*	*	<u>3.19</u>	*	<u>8.09</u>	*	<u>-1.28</u>	<u>1.03</u>	*	<u>0.91</u>	*	-11.72
Ba	6.54	<u>2.32</u>	0.00	<u>0.78</u>	<u>0.33</u>	<u>-0.98</u>	*	<u>2.29</u>	<u>1.31</u>	<u>18.30</u>	<u>-0.39</u>	1.12	0.92
Be	*	<u>0.69</u>	*	*	*	*	*	*	<u>-0.81</u>	*	*	*	-0.62
Bi	*	*	*	*	*	*	*	*	*	*	*	*	6.14
C(tot)	*	*	*	<u>-19.96</u>	<u>-36.30</u>	*	<u>-2.13</u>	*	<u>-0.55</u>	<u>0.60</u>	*	*	*
Cd	*	*	*	*	<u>0.62</u>	*	*	*	<u>-0.41</u>	*	<u>-0.76</u>	*	-9.36
Ce	*	<u>0.68</u>	-0.61	<u>1.30</u>	<u>-0.02</u>	<u>-8.90</u>	*	<u>0.63</u>	<u>0.59</u>	*	<u>-0.92</u>	0.53	-0.45
Co	*	<u>4.75</u>	*	<u>2.19</u>	<u>0.46</u>	*	*	<u>-3.06</u>	*	*	*	*	0.55
Cr	0.95	<u>-0.51</u>	16.40	<u>7.72</u>	<u>0.83</u>	*	*	*	*	*	<u>0.12</u>	3.27	-0.04
Cs	*	<u>0.14</u>	*	*	<u>-0.24</u>	*	*	*	*	*	<u>2.15</u>	*	0.23
Cu	3.25	<u>-0.92</u>	2.00	<u>1.67</u>	<u>-0.89</u>	<u>9.16</u>	*	<u>-1.83</u>	<u>-1.20</u>	*	<u>5.39</u>	2.37	0.49
Dy	*	<u>0.70</u>	-0.54	*	<u>-0.07</u>	*	*	<u>0.38</u>	<u>-0.07</u>	*	*	0.76	-0.22
Er	*	<u>0.43</u>	1.62	*	<u>-0.02</u>	*	*	<u>0.30</u>	<u>0.30</u>	*	*	*	0.09
Eu	*	<u>0.32</u>	1.13	*	<u>0.08</u>	*	*	<u>0.20</u>	<u>-0.41</u>	*	*	*	-0.58
Ga	*	<u>0.73</u>	20.28	<u>1.02</u>	<u>0.69</u>	*	*	<u>-4.30</u>	*	*	<u>0.29</u>	-1.49	0.22
Gd	*	<u>0.18</u>	-1.06	*	<u>-0.10</u>	<u>138.45</u>	*	<u>0.07</u>	<u>0.64</u>	*	*	*	-0.07
Hf	*	<u>1.47</u>	*	*	*	*	*	*	*	*	*	*	0.87
Ho	*	<u>0.54</u>	2.03	*	<u>-0.09</u>	*	*	<u>0.22</u>	<u>-0.09</u>	*	*	*	-0.18
La	-3.41	<u>0.28</u>	0.70	<u>5.13</u>	<u>0.01</u>	<u>-1.71</u>	*	<u>0.69</u>	<u>-0.20</u>	*	<u>-1.50</u>	0.56	0.29
Li	*	<u>0.86</u>	-0.12	*	<u>-0.06</u>	*	*	*	<u>0.36</u>	*	*	*	-0.45
Lu	*	<u>0.35</u>	3.21	*	<u>0.03</u>	*	*	<u>-0.60</u>	<u>-0.28</u>	*	*	*	0.06
Mo	*	<u>1.12</u>	-3.65	<u>3.22</u>	<u>0.75</u>	<u>-0.66</u>	*	<u>1.69</u>	*	*	<u>-0.12</u>	-0.70	0.84
Nb	*	<u>1.42</u>	*	<u>2.49</u>	*	<u>-3.77</u>	*	<u>7.79</u>	*	*	<u>1.65</u>	3.15	2.20
Nd	*	<u>0.49</u>	-1.63	*	<u>0.00</u>	<u>-2.45</u>	*	<u>0.49</u>	<u>0.00</u>	*	<u>-0.08</u>	-4.24	0.16
Ni	-1.57	<u>3.65</u>	-1.89	<u>1.01</u>	<u>0.49</u>	<u>-1.59</u>	*	<u>-0.79</u>	<u>-0.63</u>	*	<u>0.62</u>	-0.97	1.05
Pb	10.70	<u>1.31</u>	21.54	<u>-0.74</u>	<u>0.34</u>	*	*	<u>-4.13</u>	*	*	*	-7.45	1.90
Pr	*	<u>0.63</u>	0.32	*	<u>0.16</u>	<u>40.21</u>	*	<u>0.66</u>	<u>0.18</u>	*	*	*	0.07
Rb	-3.28	<u>1.08</u>	1.25	<u>-0.23</u>	<u>0.06</u>	<u>0.06</u>	*	<u>-0.51</u>	<u>0.62</u>	*	<u>1.64</u>	-0.23	0.11
Sb	*	*	*	*	<u>0.06</u>	*	*	*	*	*	<u>-0.97</u>	*	*
Sc	*	<u>4.72</u>	-2.53	<u>24.55</u>	*	*	*	<u>-0.21</u>	<u>0.00</u>	*	*	*	1.64
Sm	*	<u>0.19</u>	-0.68	*	<u>-0.11</u>	*	*	<u>0.23</u>	<u>-0.57</u>	*	*	3.98	-0.15
Sr	-0.98	<u>0.03</u>	-0.94	<u>2.79</u>	<u>0.33</u>	<u>1.10</u>	*	<u>-2.82</u>	<u>0.30</u>	<u>0.99</u>	<u>0.24</u>	1.24	0.14
Ta	*	<u>3.89</u>	*	*	*	*	*	*	*	*	*	*	5.63
Tb	*	<u>0.36</u>	0.37	*	<u>0.00</u>	*	*	<u>-0.17</u>	<u>0.36</u>	*	*	*	0.01
Th	*	<u>0.50</u>	*	*	*	*	*	<u>-0.24</u>	*	*	<u>28.04</u>	-4.99	0.00
Tl	*	<u>0.67</u>	*	*	<u>0.99</u>	*	*	*	*	*	*	*	3.54
Tm	*	<u>0.73</u>	3.37	*	<u>-0.23</u>	*	*	<u>-0.54</u>	<u>-0.23</u>	*	*	*	0.18
U	*	<u>-0.30</u>	1.35	<u>1.06</u>	<u>0.19</u>	<u>0.00</u>	*	<u>-2.90</u>	*	*	<u>3.87</u>	1.74	-0.04
V	8.29	<u>-0.67</u>	-3.85	<u>1.55</u>	<u>-0.15</u>	<u>1.18</u>	*	<u>-3.96</u>	<u>0.19</u>	*	<u>0.74</u>	-1.59	-0.81
Y	*	<u>0.37</u>	-1.10	<u>0.24</u>	*	<u>-1.46</u>	*	<u>0.00</u>	<u>-0.46</u>	*	<u>3.57</u>	1.04	0.38
Yb	*	<u>0.52</u>	0.28	*	<u>0.07</u>	*	*	<u>-0.37</u>	<u>0.14</u>	*	*	*	0.02
Zn	-0.45	<u>-1.12</u>	0.82	<u>1.63</u>	<u>-0.23</u>	<u>-0.23</u>	*	<u>-0.61</u>	<u>0.41</u>	*	<u>0.54</u>	-0.12	-1.06
Zr	-1.55	<u>0.50</u>	7.95	<u>2.51</u>	<u>1.60</u>	<u>3.54</u>	*	<u>13.90</u>	<u>0.31</u>	*	<u>-0.17</u>	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	<u>0.47</u>	*	4.32	<u>0.76</u>	<u>-0.05</u>	*	<u>-0.24</u>	*	-0.32	-8.29
TiO2	3.26	*	3.26	<u>-0.24</u>	<u>-19.01</u>	<u>-0.56</u>	<u>0.97</u>	<u>-0.56</u>	*	<u>-0.56</u>	-4.42	1.07	<u>27.99</u>
Al2O3	4.77	*	-5.24	<u>-0.28</u>	<u>-27.85</u>	<u>-2.93</u>	<u>0.69</u>	<u>-0.46</u>	*	<u>-0.38</u>	-1.08	-0.92	*
Fe2O3T	3.93	-1.40	4.27	<u>0.00</u>	<u>-6.27</u>	<u>8.63</u>	<u>0.63</u>	<u>-0.03</u>	*	<u>-1.03</u>	-0.37	-0.07	<u>43.13</u>
MnO	-2.41	2.18	*	<u>-3.04</u>	<u>-1.21</u>	<u>-1.21</u>	*	*	*	*	2.87	2.18	<u>21.76</u>
MgO	4.07	0.31	-24.08	<u>-2.81</u>	<u>-8.91</u>	<u>-3.70</u>	<u>0.99</u>	<u>-0.57</u>	*	<u>-2.66</u>	7.82	-0.10	<u>364.37</u>
CaO	12.04	0.64	6.80	<u>-0.63</u>	<u>-7.20</u>	<u>-12.92</u>	<u>0.19</u>	<u>-0.32</u>	*	<u>-0.42</u>	-1.27	0.08	<u>45.03</u>
K2O	2.90	*	-2.14	<u>-6.17</u>	<u>-16.56</u>	<u>-1.07</u>	<u>-0.44</u>	<u>-0.44</u>	*	<u>0.19</u>	0.00	-0.88	<u>29.16</u>
P2O5	3.92	*	*	<u>-2.39</u>	<u>-13.37</u>	<u>0.18</u>	<u>-0.18</u>	<u>7.31</u>	*	<u>-1.60</u>	*	0.36	*
LOI	-14.66	*	2.79	<u>-0.12</u>	*	<u>0.25</u>	<u>0.23</u>	<u>0.12</u>	*	<u>-0.66</u>	*	-81.79	<u>-0.33</u>
As	*	1.30	*	*	<u>-1.29</u>	*	*	*	*	*	1.81	13.68	<u>-0.21</u>
Ba	1.67	0.96	*	*	<u>-6.32</u>	*	<u>5.56</u>	*	*	*	<u>-1.79</u>	-0.65	<u>18.46</u>
Be	*	*	*	*	<u>-2.84</u>	*	*	*	*	*	*	*	*
Bi	*	*	*	*	<u>-1.49</u>	*	<u>11.60</u>	*	*	*	*	*	*
C(tot)	*	*	*	<u>0.27</u>	*	*	*	*	*	*	*	*	*
Cd	*	*	*	*	<u>-1.15</u>	<u>11.42</u>	<u>0.52</u>	*	1.51	*	*	*	*
Ce	2.17	-0.17	*	*	<u>-6.59</u>	*	<u>-2.51</u>	*	-0.53	*	0.78	*	<u>366.09</u>
Co	-0.39	3.38	*	*	<u>-2.45</u>	<u>1.03</u>	<u>0.85</u>	*	*	*	-1.12	1.69	<u>73.66</u>
Cr	0.74	1.05	*	*	<u>-6.26</u>	<u>15.22</u>	*	*	*	*	0.04	5.16	<u>11.71</u>
Cs	*	-0.29	*	*	*	*	<u>-0.36</u>	*	1.19	*	-1.01	*	*
Cu	*	0.27	*	*	<u>-3.41</u>	<u>5.71</u>	<u>-1.20</u>	*	*	*	*	6.39	<u>2.88</u>
Dy	*	-0.22	*	*	<u>-2.31</u>	*	<u>-0.76</u>	*	-0.13	*	0.59	*	<u>2.65</u>
Er	<u>4.65</u>	-0.13	*	*	<u>-2.01</u>	*	<u>-2.13</u>	*	-0.17	*	*	*	*
Eu	<u>0.56</u>	-0.09	*	*	<u>-1.76</u>	*	<u>-0.17</u>	*	-0.09	*	-0.29	*	<u>-1.64</u>
Ga	*	0.48	*	*	*	*	<u>-0.48</u>	*	0.32	*	*	4.53	*
Gd	<u>0.89</u>	0.64	*	*	<u>-1.88</u>	*	<u>-1.63</u>	*	-0.78	*	*	*	*
Hf	*	-1.41	*	*	*	*	<u>-1.41</u>	*	*	*	0.98	*	*
Ho	*	0.16	*	*	<u>-1.83</u>	*	<u>0.22</u>	*	-0.18	*	*	*	*
La	0.84	-0.23	*	*	<u>-5.75</u>	*	<u>-1.12</u>	*	0.15	*	-0.51	*	<u>3.09</u>
Li	*	*	*	*	<u>-9.15</u>	*	<u>-0.65</u>	*	*	*	*	*	*
Lu	*	-0.13	*	*	<u>-1.70</u>	*	<u>0.03</u>	*	0.06	*	-1.07	*	<u>30.59</u>
Mo	*	*	*	*	<u>-2.65</u>	*	<u>1.93</u>	*	*	*	-2.25	*	<u>-1.83</u>
Nb	-0.31	1.30	*	*	<u>-7.97</u>	*	*	*	30.89	*	*	12.69	<u>6.34</u>
Nd	0.49	0.39	*	*	<u>-5.23</u>	*	<u>-1.62</u>	*	-0.49	*	1.63	*	<u>303.28</u>
Ni	3.86	5.66	*	*	<u>-2.71</u>	<u>-1.23</u>	*	*	*	*	<u>1.29</u>	0.98	<u>1.45</u>
Pb	*	0.27	*	*	<u>-2.66</u>	<u>-7.33</u>	*	*	*	*	*	10.70	<u>5.20</u>
Pr	*	0.12	*	*	<u>-4.60</u>	*	<u>-1.62</u>	*	-0.14	*	*	*	*
Rb	<u>-9.34</u>	-0.12	*	*	<u>-7.22</u>	*	<u>1.75</u>	*	-0.68	*	-0.79	1.25	<u>-2.77</u>
Sb	*	*	*	*	*	*	*	*	-0.75	*	0.12	*	*
Sc	0.84	-0.84	*	*	<u>-2.45</u>	*	<u>-0.27</u>	*	7.92	*	-0.46	*	*
Sm	-0.01	0.19	*	*	<u>-2.88</u>	*	<u>-2.14</u>	*	-0.61	*	-0.68	*	*
Sr	3.52	-0.60	-35.45	*	<u>-7.79</u>	*	<u>-0.02</u>	*	*	<u>0.58</u>	1.85	1.57	<u>-0.49</u>
Ta	*	-0.42	*	*	*	*	*	*	3.85	*	0.65	*	*
Tb	*	0.51	*	*	<u>-1.66</u>	*	<u>0.00</u>	*	0.37	*	-0.85	*	<u>12.72</u>
Th	<u>-0.11</u>	-0.11	*	*	<u>-2.90</u>	*	*	*	2.07	*	-0.37	22.62	<u>7.86</u>
Tl	*	*	*	*	<u>-1.97</u>	*	<u>0.54</u>	*	-0.86	*	*	*	*
Tm	*	0.44	*	*	<u>-1.72</u>	*	<u>-0.86</u>	*	-0.45	*	*	*	<u>27.16</u>
U	*	-0.41	*	*	<u>-3.76</u>	*	<u>-0.09</u>	*	0.04	*	-0.19	1.93	<u>0.97</u>
V	3.41	1.09	-31.02	*	<u>-7.71</u>	<u>-0.24</u>	<u>0.63</u>	*	*	*	0.89	-2.22	<u>0.59</u>
Y	1.28	0.97	*	*	<u>-3.31</u>	*	<u>-0.24</u>	*	-0.84	*	*	13.55	*
Yb	0.28	-0.67	*	*	<u>-2.22</u>	*	<u>-0.43</u>	*	-0.61	*	-1.25	*	<u>31.98</u>
Zn	*	-3.20	*	*	<u>-3.96</u>	<u>18.02</u>	<u>1.18</u>	*	*	*	1.59	0.06	<u>-0.99</u>
Zr	0.31	-1.97	*	*	<u>-9.97</u>	*	<u>-3.58</u>	*	*	*	<u>3.33</u>	-3.27	<u>1.60</u>

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	<u>3.86</u>	*	-0.10	*	-2.20	3.14	*	<u>0.26</u>	0.23	<u>-0.10</u>	-0.55	*	<u>3.31</u>
TiO2	<u>-1.66</u>	-1.33	-1.13	-3.77	1.07	1.07	*	<u>2.66</u>	-1.28	<u>-0.56</u>	-1.13	*	<u>15.91</u>
Al2O3	<u>10.55</u>	*	-0.92	*	-0.46	5.08	*	<u>-0.50</u>	-7.65	<u>-0.23</u>	0.62	*	<u>3.85</u>
Fe2O3T	<u>-4.03</u>	*	-0.73	3.97	7.60	2.93	*	<u>-1.45</u>	-0.73	<u>0.63</u>	-0.40	*	<u>-1.20</u>
MnO	<u>-1.21</u>	2.41	-2.41	<i>-11.60</i>	*	4.48	*	<u>0.63</u>	2.87	<u>28.65</u>	*	<u>1.44</u>	*
MgO	<u>-12.56</u>	*	3.03	*	4.07	-0.10	*	<u>-2.19</u>	-0.54	<u>0.47</u>	-1.15	*	<u>-9.44</u>
CaO	<u>2.21</u>	*	0.64	*	-0.10	3.75	*	<u>-1.93</u>	-2.34	<u>0.46</u>	-1.00	*	<u>-3.45</u>
K2O	<u>2.71</u>	*	4.16	*	0.38	-8.44	*	<u>2.63</u>	-1.47	<u>0.19</u>	-0.88	*	*
P2O5	<u>-1.60</u>	*	0.36	*	*	7.13	*	<u>-0.86</u>	0.00	<u>0.18</u>	0.36	*	<u>1.96</u>
LOI	<u>-2.05</u>	*	0.59	*	0.77	1.41	*	<u>-0.27</u>	*	<u>-1.21</u>	8.88	*	<u>1.14</u>
As	*	*	*	<i>-1.31</i>	*	1.69	*	<u>1.55</u>	*	<u>-0.28</u>	1.54	<u>0.17</u>	*
Ba	<u>-0.73</u>	-1.95	12.16	1.83	*	-3.13	*	<u>-0.86</u>	-0.00	<u>0.58</u>	0.48	<u>-1.63</u>	<u>38.72</u>
Be	<u>0.00</u>	-0.39	-2.50	*	*	*	<u>1.14</u>	*	*	<u>-0.87</u>	-0.37	*	*
Bi	*	*	*	<i>-6.52</i>	*	<u>58.91</u>	*	<u>14.66</u>	*	<u>-0.77</u>	1.64	*	*
C(tot)	*	*	*	*	*	*	*	<u>1.63</u>	<i>-0.61</i>	<u>-1.55</u>	2.17	*	*
Cd	<u>-0.41</u>	*	*	*	*	*	*	<u>0.35</u>	*	<u>0.96</u>	0.14	*	*
Ce	<u>-1.08</u>	-0.70	-0.53	-1.66	*	5.53	<u>0.97</u>	<u>0.02</u>	*	<u>0.10</u>	0.23	<u>-0.29</u>	*
Co	<u>0.72</u>	-0.34	-0.13	*	*	-0.39	*	<u>-0.43</u>	*	<u>0.59</u>	-1.03	<u>1.31</u>	<u>-0.46</u>
Cr	<u>1.07</u>	-0.48	-0.39	-6.07	*	1.37	*	<u>0.29</u>	*	<u>1.11</u>	0.96	<u>2.50</u>	<u>-6.55</u>
Cs	*	0.00	3.82	4.10	*	150.57	*	*	*	<u>-0.48</u>	1.27	<u>-0.03</u>	*
Cu	<u>11.14</u>	-0.43	-3.53	-2.40	<u>-1.83</u>	-2.27	*	<u>2.44</u>	*	<u>0.70</u>	2.67	<u>-2.18</u>	<u>-4.34</u>
Dy	<u>-0.67</u>	0.15	-0.54	-0.26	*	*	<u>-0.20</u>	<u>0.35</u>	*	<u>-0.03</u>	-0.33	*	*
Er	<u>-0.47</u>	-0.34	-0.94	-0.52	*	*	<u>0.07</u>	<u>0.41</u>	*	<u>0.17</u>	-0.68	*	*
Eu	<u>-0.66</u>	-0.07	1.13	-0.75	*	*	<u>0.17</u>	<u>0.18</u>	*	<u>0.69</u>	-0.02	*	*
Ga	*	0.00	-0.99	1.90	*	-0.99	*	<u>-0.14</u>	*	<u>0.95</u>	1.00	<u>-0.32</u>	*
Gd	<u>-0.18</u>	-0.41	-1.06	-1.73	*	*	<u>1.33</u>	<u>0.28</u>	*	<u>0.46</u>	-0.86	*	*
Hf	*	0.00	0.22	4.07	*	*	<u>0.09</u>	<u>-0.45</u>	*	<u>4.45</u>	-0.07	*	*
Ho	<u>-0.57</u>	-0.11	-1.13	-0.66	*	*	<u>-0.53</u>	<u>0.16</u>	*	<u>0.38</u>	0.00	*	*
La	<u>-1.09</u>	-0.40	-0.40	-2.27	*	7.55	<u>1.21</u>	<u>0.01</u>	*	<u>-0.40</u>	0.42	<u>0.35</u>	<u>4.46</u>
Li	<u>-0.94</u>	0.47	*	1.32	*	*	*	<u>6.09</u>	*	<u>0.36</u>	0.13	*	*
Lu	<u>-1.54</u>	-0.15	3.21	-0.63	*	*	<u>0.09</u>	<u>-0.08</u>	*	<u>0.35</u>	-0.09	*	*
Mo	<u>0.02</u>	0.79	1.08	0.94	<u>-0.19</u>	-0.42	*	<u>1.38</u>	*	<u>0.70</u>	-0.22	<u>0.01</u>	<u>-5.57</u>
Nb	*	1.16	<i>-0.31</i>	1.42	1.13	-2.92	*	<u>-0.62</u>	*	<u>-0.88</u>	-1.39	<u>-0.92</u>	*
Nd	<u>-0.82</u>	-0.37	-0.33	0.10	*	0.33	<u>0.55</u>	<u>0.14</u>	*	<u>-0.08</u>	-0.39	*	*
Ni	*	1.75	-0.49	-4.45	9.29	-1.22	*	<u>0.55</u>	*	<u>0.17</u>	1.00	<u>-0.33</u>	<u>-5.10</u>
Pb	<u>-2.78</u>	-0.30	<i>-15.85</i>	<i>-3.66</i>	*	<i>-5.01</i>	*	<u>2.68</u>	*	<u>1.06</u>	-0.29	<u>-0.15</u>	<u>14.83</u>
Pr	<u>-0.84</u>	-0.29	-0.19	0.00	*	*	<u>-0.12</u>	<u>0.10</u>	*	<u>0.06</u>	-0.22	*	*
Rb	*	-0.25	1.59	-1.59	3.51	0.00	*	<u>-0.12</u>	*	<u>0.62</u>	0.95	<u>0.52</u>	<u>-0.51</u>
Sb	*	*	*	1.03	*	*	*	<u>1.25</u>	*	<u>0.06</u>	-0.49	*	*
Sc	<u>0.84</u>	0.86	-0.84	24.43	*	15.16	*	*	*	*	0.55	<u>13.29</u>	*
Sm	<u>-1.00</u>	-0.52	-0.01	-0.53	*	7.64	<u>0.39</u>	<u>0.26</u>	*	<u>-0.01</u>	-0.16	*	*
Sr	<u>-0.68</u>	0.81	-1.10	-1.93	-2.13	-1.46	*	<u>-0.19</u>	1.60	<u>0.02</u>	1.54	<u>-0.73</u>	<u>-3.73</u>
Ta	*	0.10	0.29	<i>-2.09</i>	*	*	*	<u>-2.18</u>	*	*	0.92	*	*
Tb	<u>0.18</u>	-0.26	0.37	-0.28	*	*	<u>0.29</u>	<u>-0.05</u>	*	<u>-0.17</u>	-0.79	*	*
Th	*	-0.22	-0.21	-1.02	*	*	*	<u>-0.40</u>	*	<u>0.42</u>	-0.27	<u>1.27</u>	<u>8.66</u>
Tl	*	*	-8.61	2.49	*	*	*	<u>0.74</u>	*	<u>1.07</u>	*	*	*
Tm	<u>-1.50</u>	-0.31	3.37	-0.33	*	*	<u>0.35</u>	<u>-0.02</u>	*	<u>-0.23</u>	-0.80	*	*
U	*	-0.10	-0.97	7.93	*	3.67	<u>-0.92</u>	<u>-0.82</u>	*	<u>0.46</u>	-0.24	<u>0.37</u>	<u>-4.83</u>
V	<u>4.11</u>	-0.45	-1.24	-6.22	*	-2.30	*	<u>-0.74</u>	*	<u>0.44</u>	1.31	<u>0.96</u>	<u>-6.33</u>
Y	<u>-0.73</u>	0.70	0.37	-1.28	<u>0.37</u>	-2.75	*	<u>-0.04</u>	*	<u>0.09</u>	-0.03	<u>-0.42</u>	<u>-3.29</u>
Yb	<u>-0.50</u>	-0.19	-1.00	-0.93	*	*	<u>-0.31</u>	<u>-0.07</u>	*	<u>0.84</u>	-0.04	*	*
Zn	<u>0.62</u>	-1.67	8.04	-3.13	6.94	-1.62	*	<u>4.80</u>	*	<u>1.18</u>	3.13	<u>-0.25</u>	<u>-1.75</u>
Zr	*	-1.21	-0.64	-8.67	*	1.00	*	<u>-0.59</u>	25.30	<u>0.09</u>	-0.14	<u>-0.91</u>	<u>21.67</u>

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	<u>0.08</u>	<u>0.05</u>	<u>-0.77</u>	<u>-0.23</u>	-0.71	-0.65	0.58	<u>-0.34</u>	<u>-0.48</u>	<u>-0.26</u>	0.55
TiO2	1.07	5.46	<u>-0.56</u>	<u>-1.11</u>	<u>-0.56</u>	<u>1.63</u>	0.85	-1.13	31.82	<u>-0.56</u>	<u>-0.56</u>	<u>-1.66</u>	0.53
Al2O3	-0.46	-1.08	<u>0.23</u>	<u>-0.19</u>	<u>-0.18</u>	<u>1.00</u>	1.08	0.31	-1.85	<u>-0.62</u>	<u>-0.69</u>	<u>0.00</u>	<u>0.62</u>
Fe2O3T	-1.07	0.93	<u>0.13</u>	<u>-0.02</u>	<u>-0.40</u>	<u>1.47</u>	6.93	0.87	-0.73	<u>0.63</u>	<u>-0.20</u>	<u>-0.37</u>	<u>-2.03</u>
MnO	-2.41	*	<u>10.28</u>	<u>1.09</u>	*	<u>1.09</u>	20.56	-0.11	*	<u>-1.21</u>	<u>-1.21</u>	<u>-1.21</u>	<u>0.98</u>
MgO	27.01	-2.19	<u>-2.14</u>	<u>-0.36</u>	<u>-1.20</u>	<u>1.10</u>	-1.87	4.38	-9.49	<u>0.47</u>	<u>-3.70</u>	<u>2.03</u>	<u>-1.09</u>
CaO	0.77	-0.46	<u>0.14</u>	<u>0.17</u>	<u>-0.60</u>	<u>-1.04</u>	2.44	0.16	0.39	<u>-0.19</u>	<u>-0.19</u>	<u>-0.08</u>	0.17
K2O	0.38	-2.14	<u>-1.07</u>	<u>-3.09</u>	<u>0.69</u>	<u>0.19</u>	1.76	-0.88	0.38	<u>-0.44</u>	<u>-0.44</u>	<u>-0.44</u>	<u>-5.48</u>
P2O5	0.36	-3.21	<u>-0.89</u>	<u>-0.18</u>	<u>0.00</u>	<u>-1.60</u>	2.14	-1.07	0.36	<u>0.18</u>	<u>0.18</u>	<u>0.18</u>	0.53
LOI	3.43	10.75	<u>-1.34</u>	<u>-0.77</u>	<u>0.17</u>	*	-63.73	2.50	<u>2.19</u>	<u>-0.64</u>	<u>0.19</u>	<u>0.55</u>	<u>0.33</u>
As	*	*	*	*	*	*	0.19	6.18	-1.19	<u>0.78</u>	*	*	<u>-1.91</u>
Ba	-18.62	*	*	<u>0.31</u>	*	<u>-0.16</u>	-11.33	-3.26	-2.87	<u>0.66</u>	<u>0.48</u>	0.18	-1.68
Be	*	*	*	<u>-0.06</u>	*	*	*	*	*	<u>-0.31</u>	*	<u>0.06</u>	<u>-0.41</u>
Bi	*	*	*	<u>0.13</u>	*	*	*	*	*	<u>0.30</u>	*	*	<u>0.77</u>
C(tot)	*	1.16	*	<u>0.72</u>	*	<u>0.27</u>	-6.64	*	*	<u>-36.30</u>	<u>-0.64</u>	*	<u>11.86</u>
Cd	*	*	*	<u>-0.62</u>	*	*	1.45	*	*	<u>0.21</u>	*	*	<u>0.93</u>
Ce	13.30	*	*	<u>-0.37</u>	*	*	0.78	0.20	5.44	<u>-0.39</u>	0.18	0.43	<u>-0.77</u>
Co	*	*	*	<u>0.45</u>	*	*	15.47	-6.11	-2.99	<u>-0.59</u>	*	<u>0.07</u>	1.31
Cr	*	*	*	<u>0.87</u>	*	<u>0.12</u>	55.73	*	-1.09	<u>-0.58</u>	3.63	<u>-0.37</u>	<u>-0.23</u>
Cs	*	*	*	<u>-0.84</u>	*	*	0.28	66.44	*	<u>1.43</u>	<u>-0.27</u>	0.64	0.33
Cu	-13.08	*	*	<u>0.34</u>	*	*	4.13	0.11	-1.65	<u>0.68</u>	*	0.15	<u>-2.46</u>
Dy	*	*	*	<u>0.17</u>	*	*	-2.08	*	*	<u>-0.27</u>	<u>-0.19</u>	0.34	0.90
Er	*	*	*	<u>-0.00</u>	*	*	-5.68	*	*	<u>-0.47</u>	<u>-0.21</u>	0.23	1.32
Eu	*	*	*	<u>0.30</u>	*	*	-8.63	*	*	<u>0.08</u>	<u>-0.17</u>	<u>0.12</u>	*
Ga	*	*	*	<u>-0.20</u>	*	*	-2.28	1.90	-2.04	<u>-0.09</u>	<u>0.42</u>	<u>0.08</u>	<u>-0.36</u>
Gd	*	*	*	<u>-0.41</u>	*	*	-3.97	*	*	<u>-0.53</u>	<u>-0.57</u>	<u>0.29</u>	*
Hf	*	*	*	<u>-0.17</u>	*	*	3.91	*	*	<u>0.65</u>	<u>0.11</u>	<u>-0.00</u>	*
Ho	*	*	*	<u>0.02</u>	*	*	-1.60	*	*	<u>-0.57</u>	<u>-0.09</u>	0.19	0.64
La	*	*	*	<u>-0.13</u>	*	<u>-2.39</u>	-2.18	-2.04	1.38	<u>-0.34</u>	<u>0.42</u>	<u>0.35</u>	1.03
Li	*	*	*	<u>0.65</u>	*	*	-5.64	*	*	<u>-0.06</u>	*	1.20	0.10
Lu	*	*	*	<u>-0.19</u>	*	*	-2.52	*	*	<u>-0.28</u>	<u>0.03</u>	<u>0.09</u>	0.60
Mo	*	*	*	<u>0.11</u>	*	*	0.80	-1.31	-2.95	<u>0.40</u>	*	*	<u>-0.54</u>
Nb	*	*	*	<u>0.00</u>	*	*	7.31	*	-2.05	<u>0.04</u>	<u>0.85</u>	<u>0.45</u>	<u>-1.60</u>
Nd	1.63	*	*	<u>0.15</u>	*	*	-10.22	8.15	3.59	<u>-0.16</u>	<u>0.49</u>	<u>0.33</u>	0.51
Ni	-7.32	*	*	<u>-0.78</u>	*	<u>-2.70</u>	-5.82	1.94	-3.49	<u>-0.79</u>	*	<u>0.92</u>	<u>2.62</u>
Pb	*	*	*	<u>-0.98</u>	*	*	3.69	-8.26	-5.01	<u>0.47</u>	*	<u>0.33</u>	*
Pr	*	*	*	<u>0.09</u>	*	*	-12.11	*	*	<u>-0.09</u>	<u>-0.34</u>	0.18	0.56
Rb	*	*	*	<u>-1.17</u>	*	*	-10.11	1.25	-1.47	<u>-0.23</u>	<u>0.00</u>	0.34	0.55
Sb	*	*	*	<u>0.02</u>	*	*	0.71	-10.38	*	<u>-0.33</u>	*	*	*
Sc	*	*	*	<u>12.06</u>	*	*	-5.01	140.66	20.21	<u>-0.63</u>	*	0.59	-0.80
Sm	*	*	*	<u>0.00</u>	*	*	-4.47	*	*	<u>-0.01</u>	0.49	0.19	0.86
Sr	1.92	*	*	<u>0.65</u>	*	*	-5.12	-1.53	-3.51	<u>0.91</u>	<u>0.31</u>	1.10	1.80
Ta	*	*	*	<u>-0.05</u>	*	*	*	*	67.94	<u>0.15</u>	<u>1.93</u>	<u>0.22</u>	*
Tb	*	*	*	<u>-0.16</u>	*	*	-10.02	*	*	<u>0.18</u>	<u>-0.17</u>	0.15	0.94
Th	*	*	*	<u>-0.07</u>	*	*	0.64	33.24	*	<u>-0.11</u>	<u>0.29</u>	<u>0.13</u>	0.56
Tl	*	*	*	<u>-6.79</u>	*	*	-1.67	-3.77	1.07	<u>0.64</u>	*	*	<u>1.02</u>
Tm	*	*	*	<u>-0.07</u>	*	*	-0.90	*	*	<u>1.68</u>	<u>0.41</u>	<u>0.12</u>	0.57
U	*	*	*	<u>0.00</u>	*	*	0.58	-7.73	2.32	<u>-0.19</u>	<u>0.75</u>	<u>0.21</u>	0.34
V	9.55	*	*	<u>0.45</u>	*	<u>0.44</u>	3.85	4.52	-0.47	<u>-0.11</u>	1.70	<u>0.00</u>	<u>-0.67</u>
Y	*	*	*	<u>0.53</u>	*	*	-0.37	-2.93	0.00	<u>-0.27</u>	<u>-0.27</u>	<u>0.82</u>	<u>-0.55</u>
Yb	*	*	*	<u>0.02</u>	*	*	2.06	*	*	<u>-0.50</u>	<u>0.07</u>	<u>0.14</u>	0.97
Zn	1.84	*	*	<u>0.56</u>	*	<u>-0.86</u>	-2.77	0.06	-2.03	<u>0.16</u>	*	<u>-0.62</u>	0.05
Zr	-11.91	*	*	<u>-0.18</u>	*	<u>-1.21</u>	-11.86	4.93	3.50	<u>0.74</u>	<u>-0.34</u>	<u>0.31</u>	<u>-0.99</u>

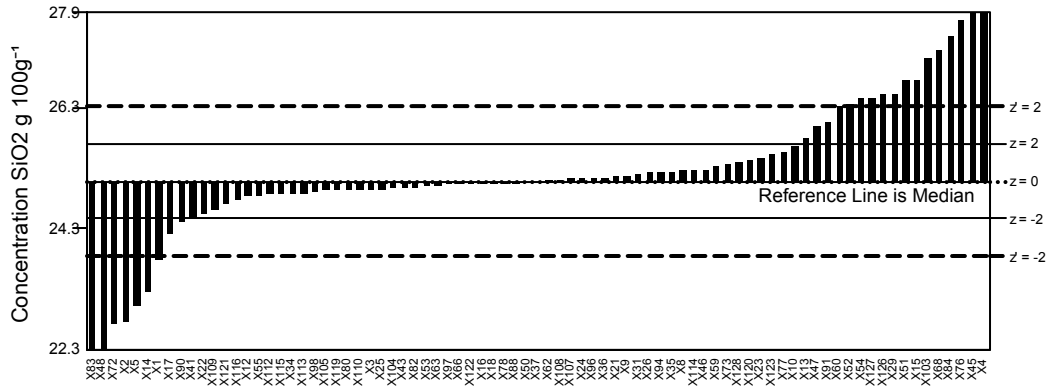
Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - Entries in italics are derived from Provisional Values.

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

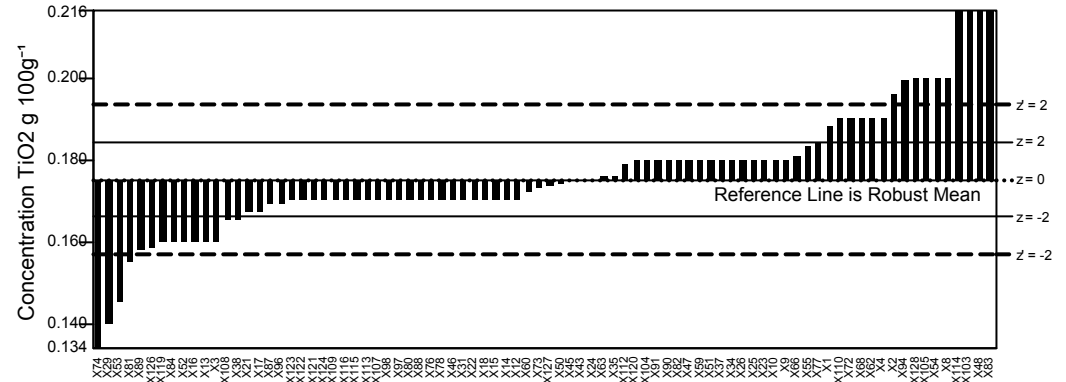
Lab Code	X121	X122	X123	X124	X126	X127	X128
SiO2	<u>-0.63</u>	<u>-0.06</u>	<u>0.74</u>	*	<u>2.34</u>	<u>4.49</u>	<u>1.07</u>
TiO2	<u>-0.56</u>	<u>-0.56</u>	<u>-0.56</u>	<u>-0.56</u>	<u>-1.85</u>	<u>-0.32</u>	<u>5.46</u>
Al2O3	<u>-0.69</u>	<u>0.00</u>	<u>0.62</u>	<u>-1.69</u>	<u>0.21</u>	<u>4.39</u>	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

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

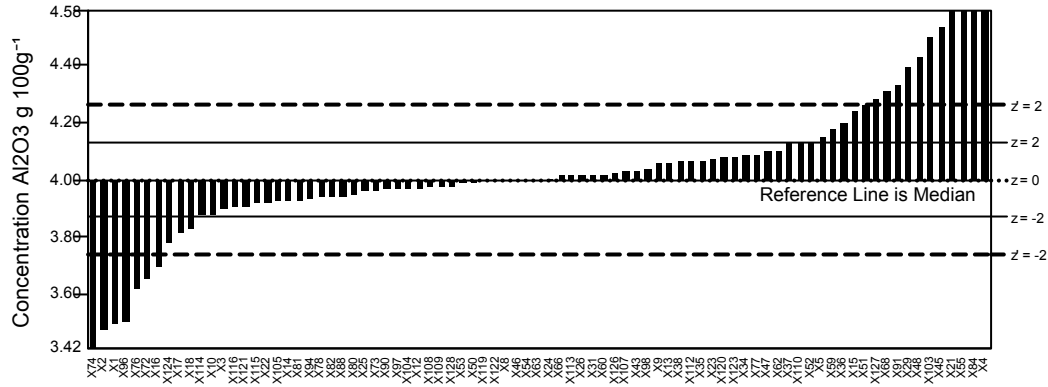
GeoPT40A - Barchart for SiO₂



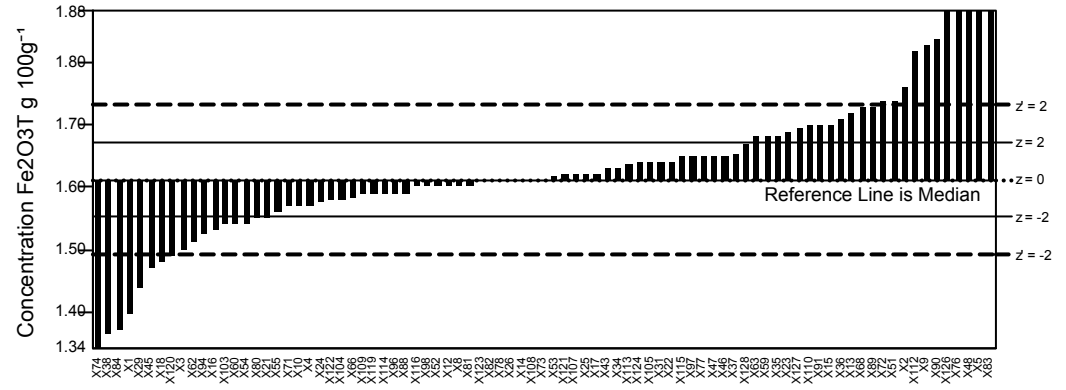
GeoPT40A - Barchart for TiO₂



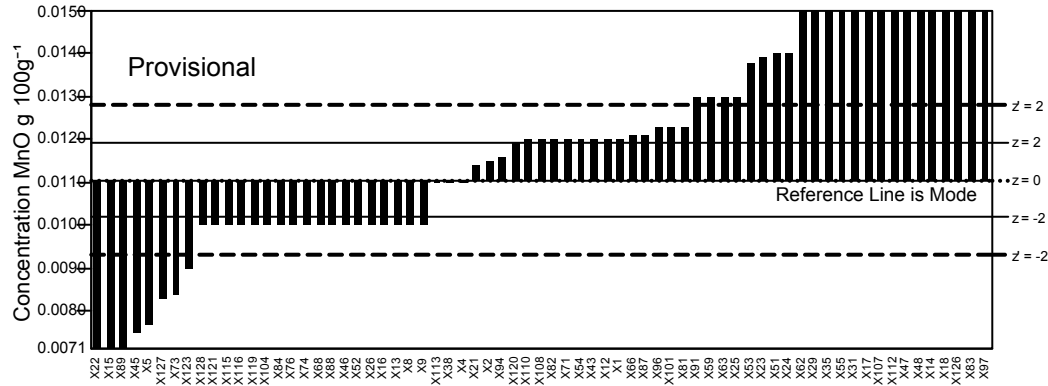
GeoPT40A - Barchart for Al₂O₃



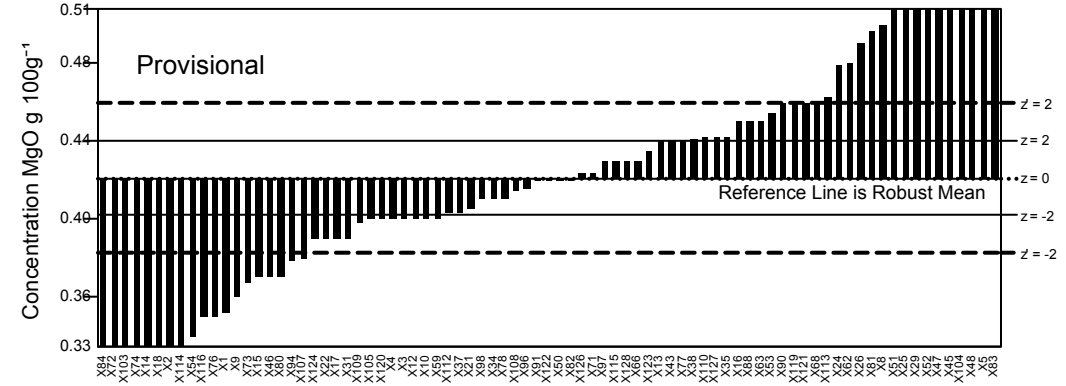
GeoPT40A - Barchart for Fe₂O₃T



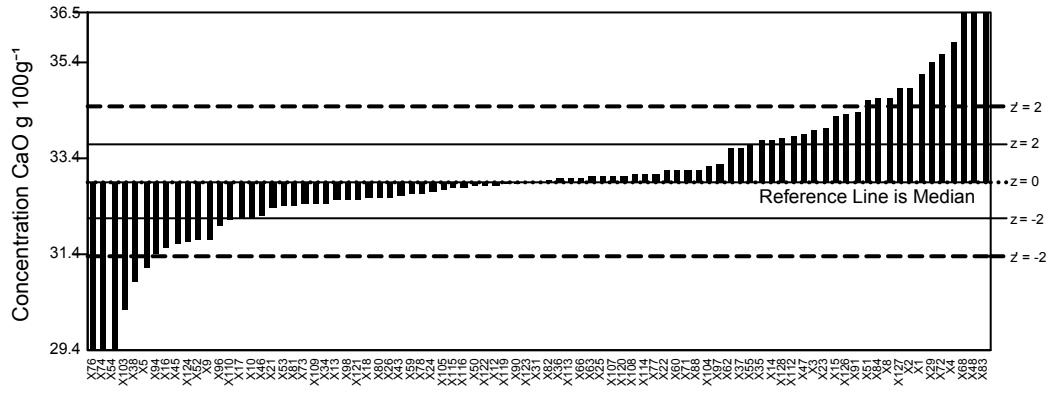
GeoPT40A - Barchart for MnO



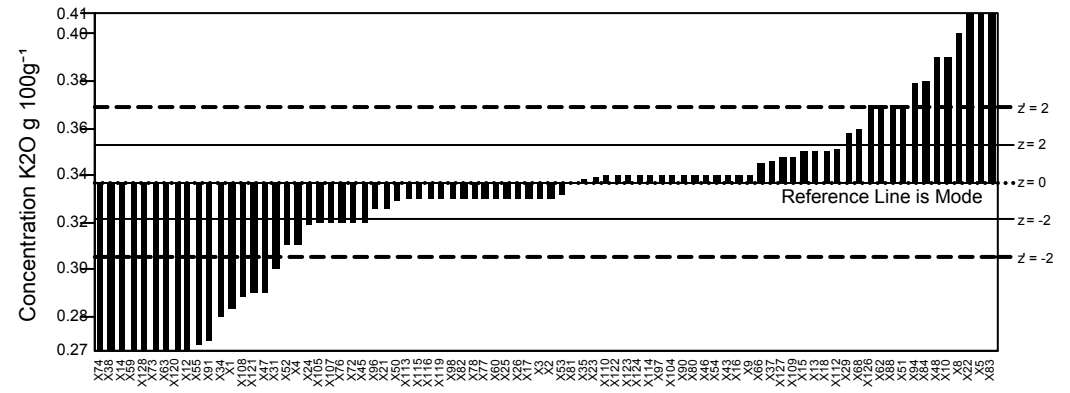
GeoPT40A - Barchart for MgO



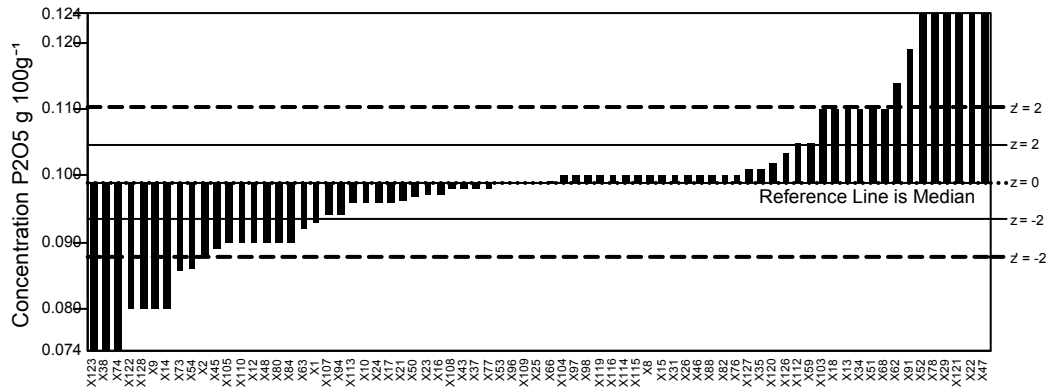
GeoPT40A - Barchart for CaO



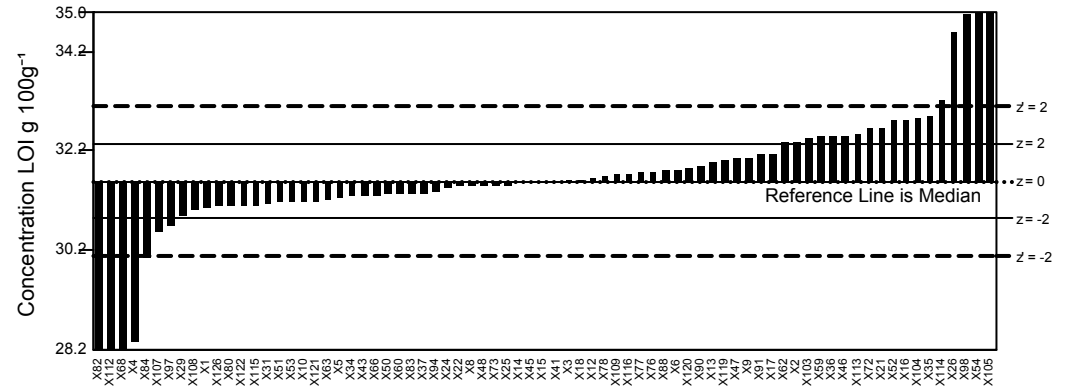
GeoPT40A - Barchart for K2O



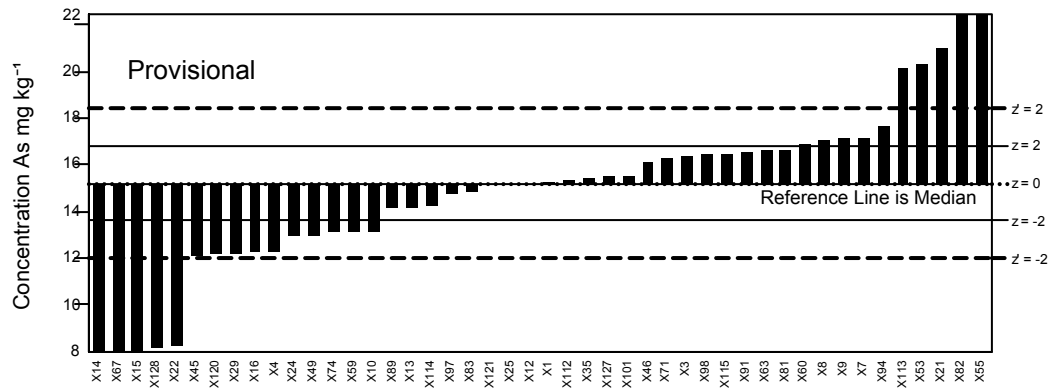
GeoPT40A - Barchart for P2O5



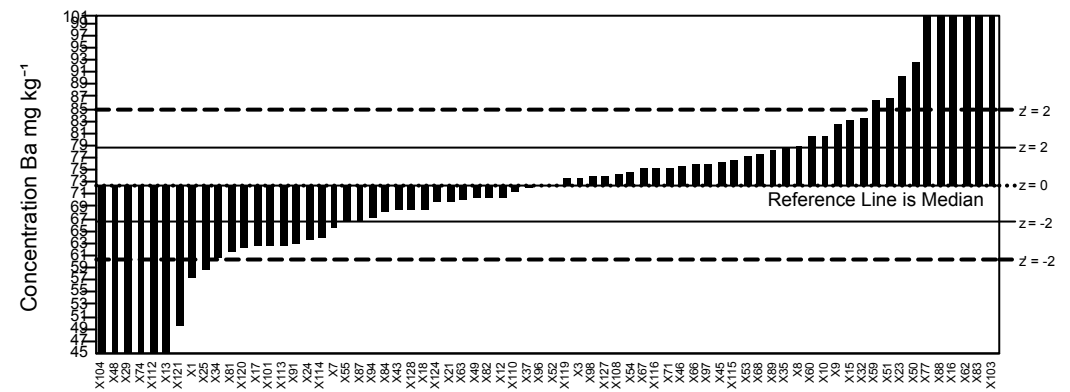
GeoPT40A - Barchart for LOI



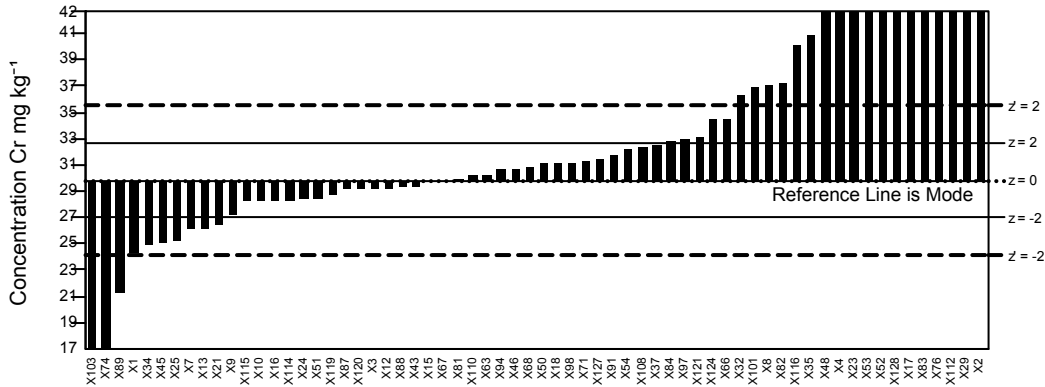
GeoPT40A - Barchart for As



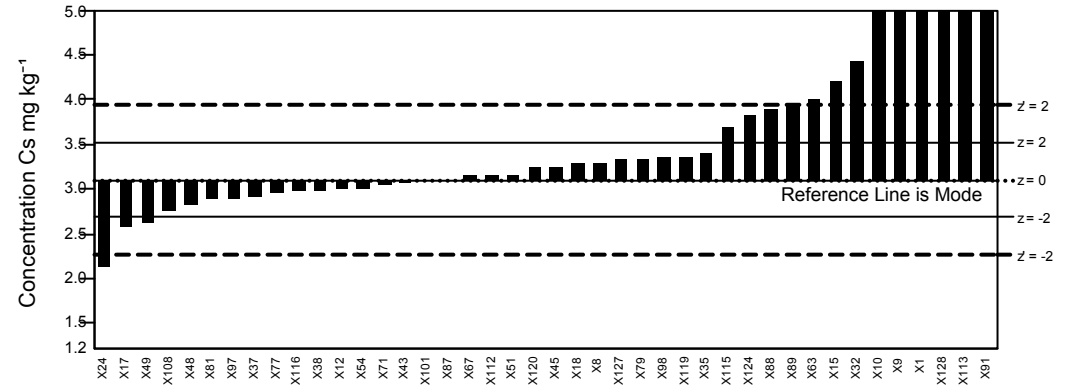
GeoPT40A - Barchart for Ba



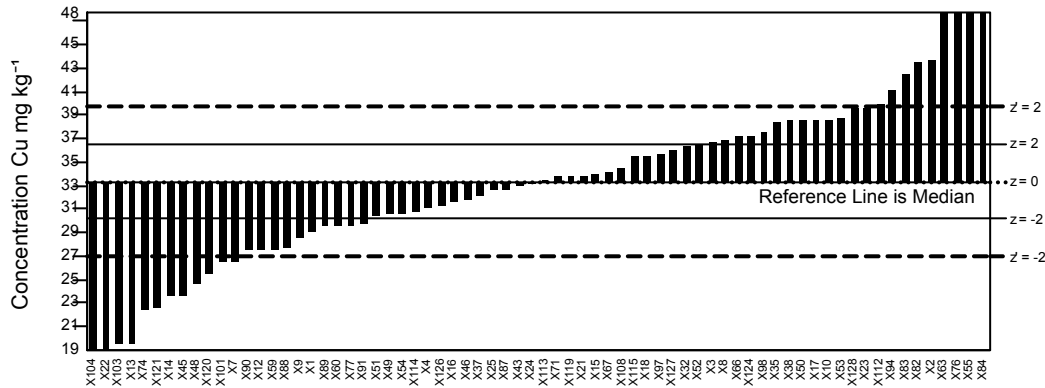
GeoPT40A - Barchart for Cr



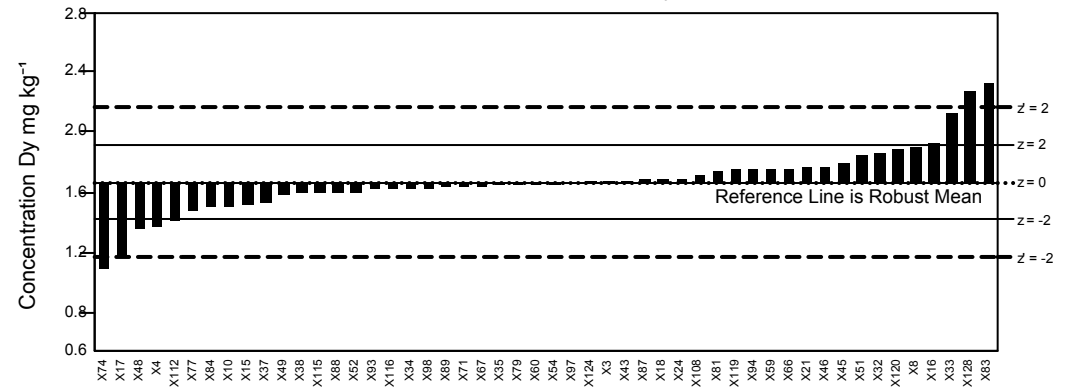
GeoPT40A - Barchart for Cs



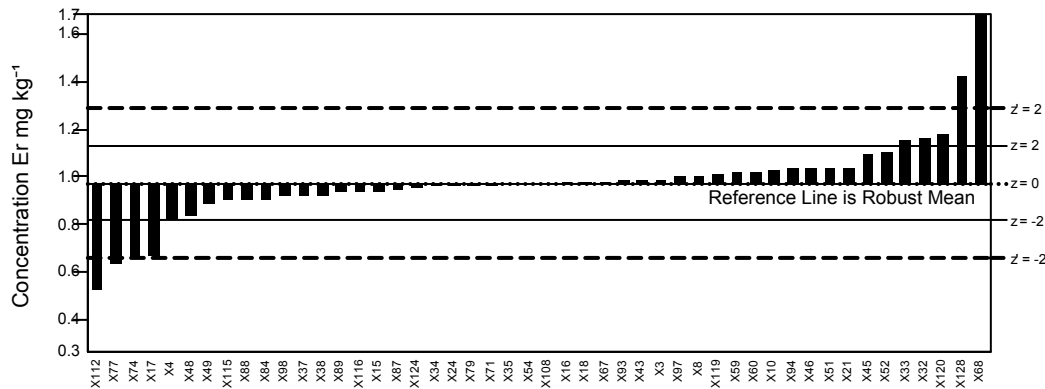
GeoPT40A - Barchart for Cu



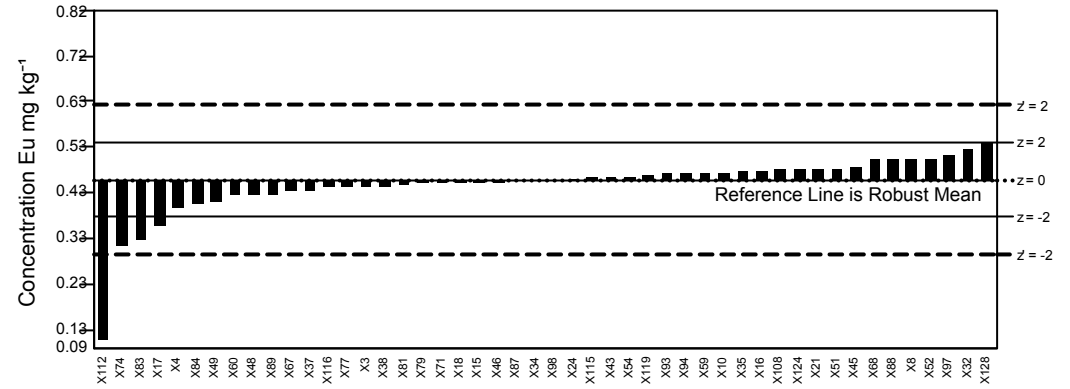
GeoPT40A - Barchart for Dy



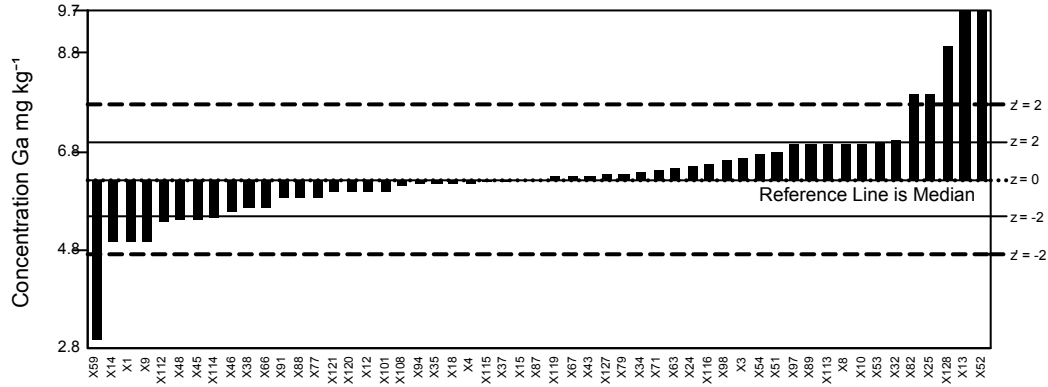
GeoPT40A - Barchart for Er



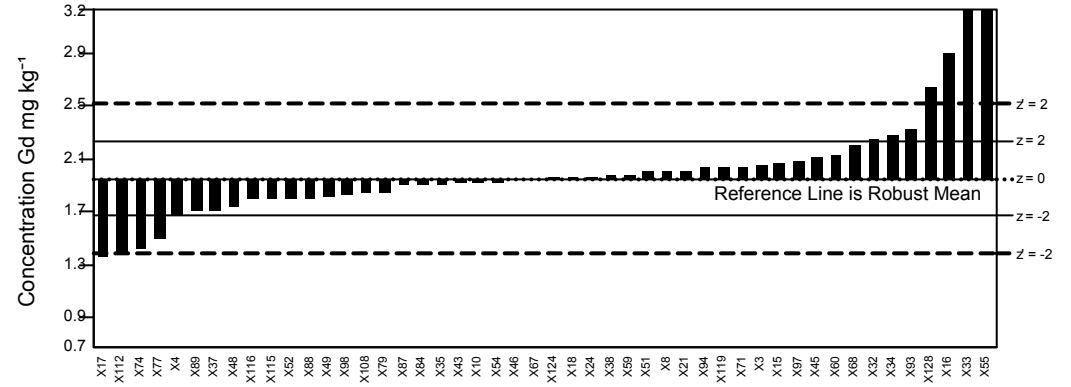
GeoPT40A - Barchart for Eu



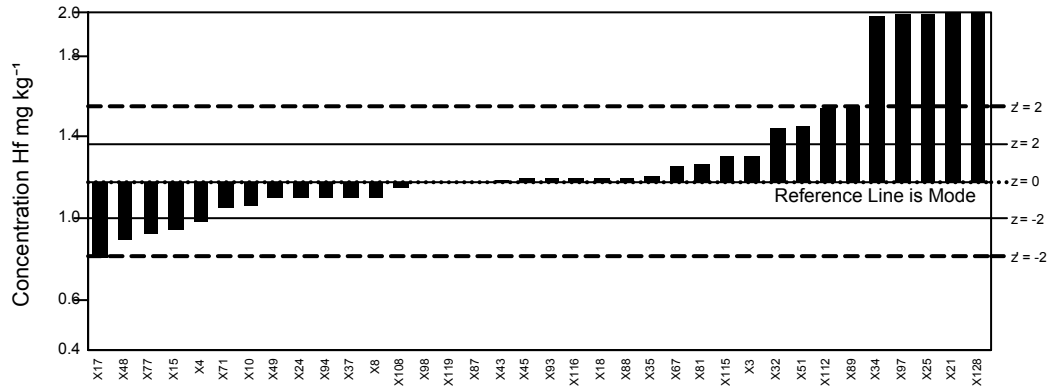
GeoPT40A - Barchart for Ga



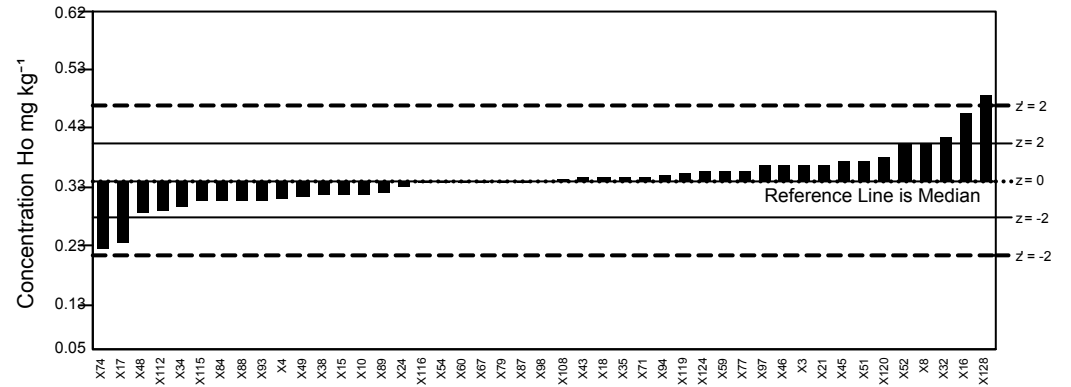
GeoPT40A - Barchart for Gd



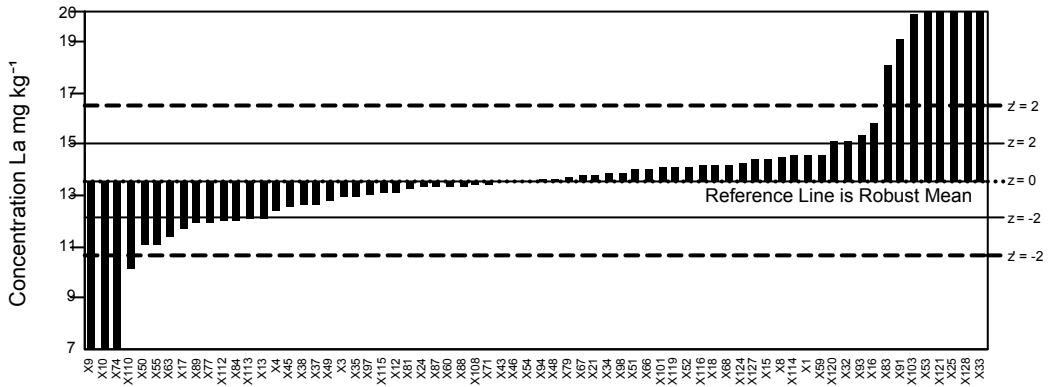
GeoPT40A - Barchart for Hf



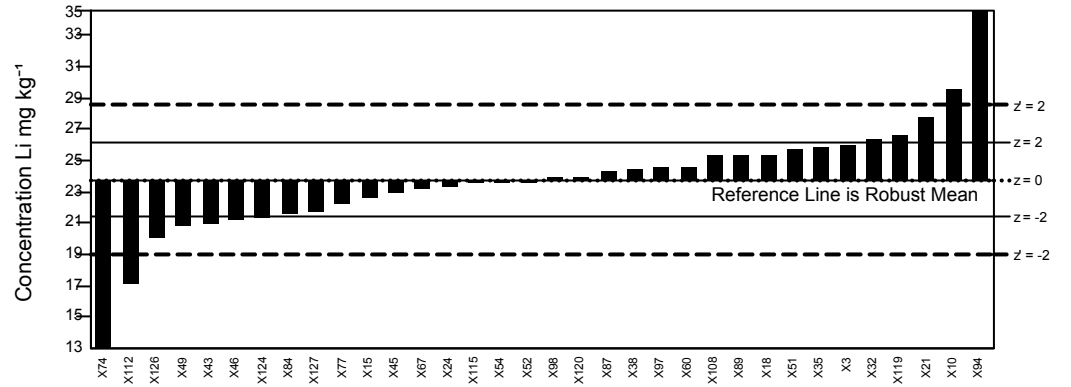
GeoPT40A - Barchart for Ho



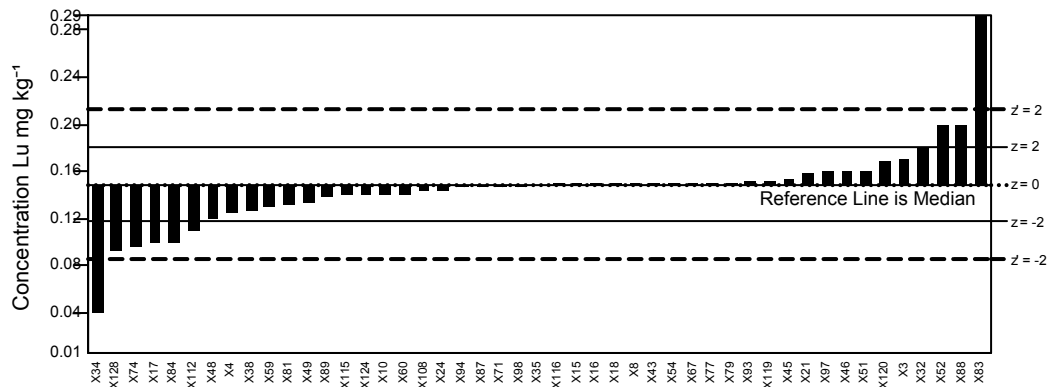
GeoPT40A - Barchart for La



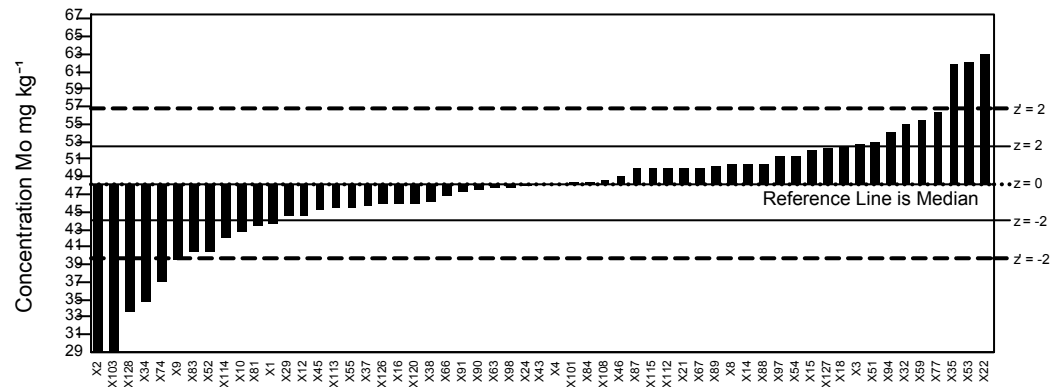
GeoPT40A - Barchart for Li



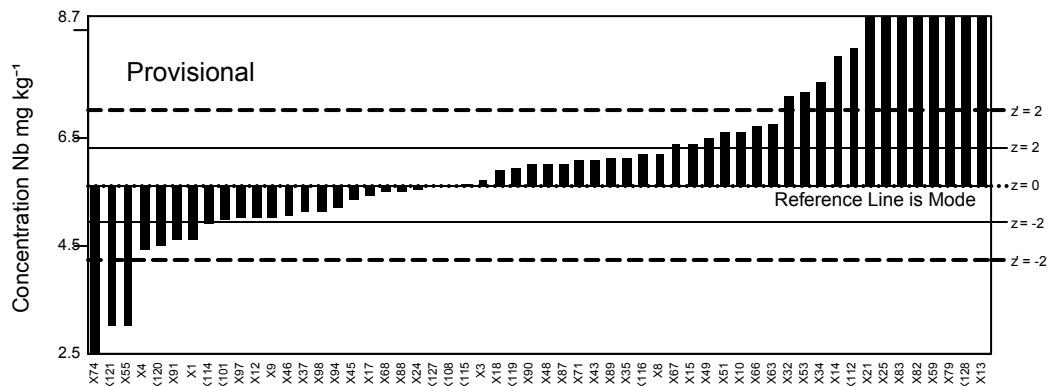
GeoPT40A - Barchart for Lu



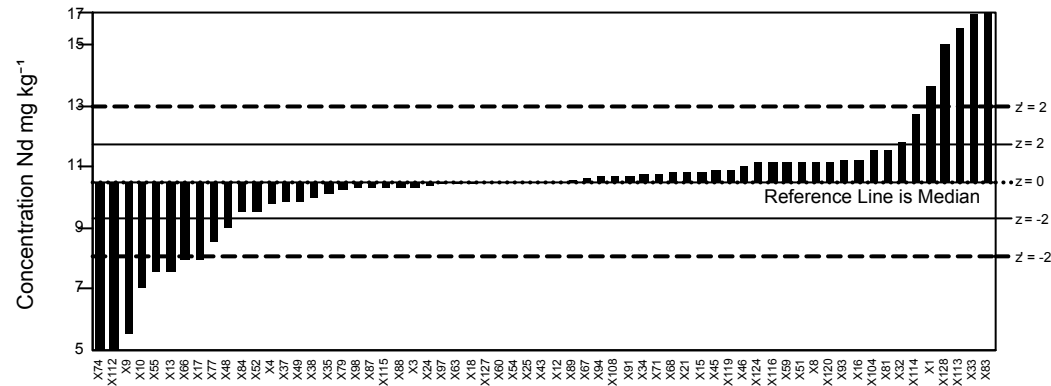
GeoPT40A - Barchart for Mo



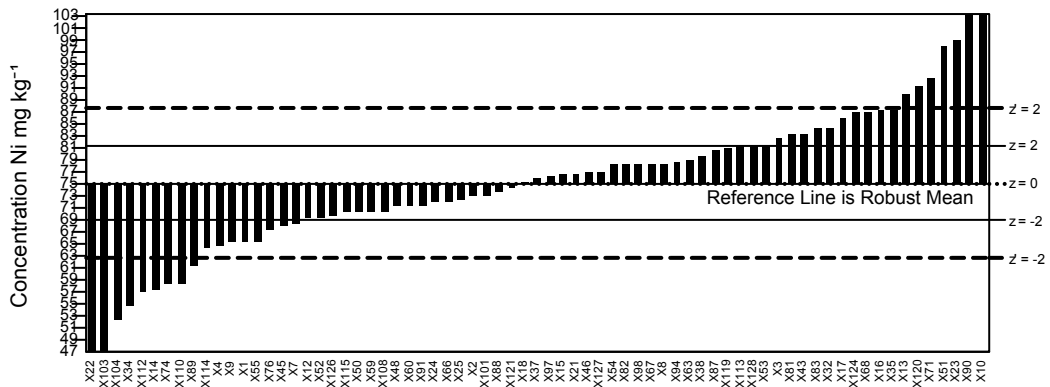
GeoPT40A - Barchart for Nb



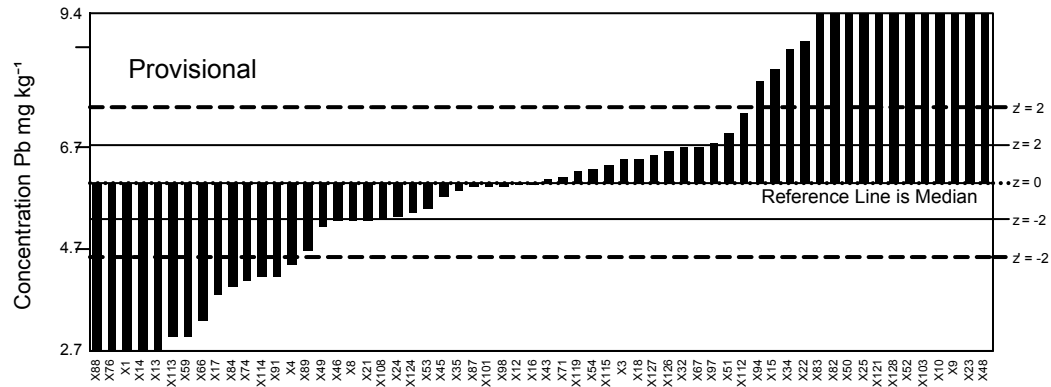
GeoPT40A - Barchart for Nd



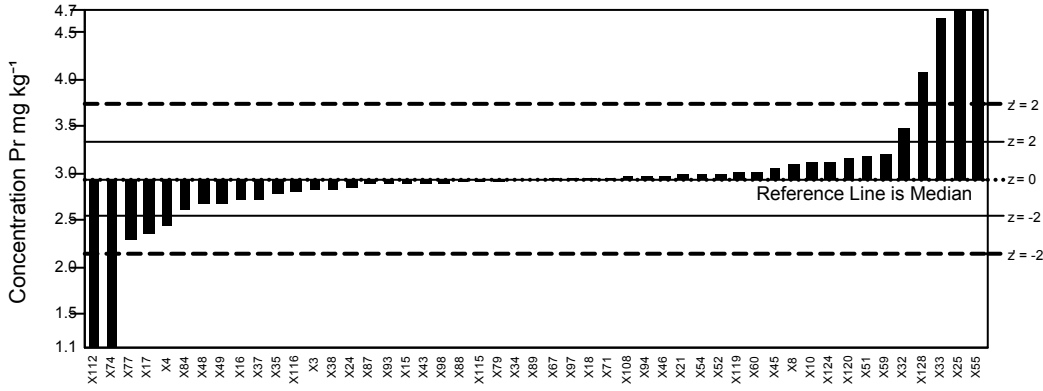
GeoPT40A - Barchart for Ni



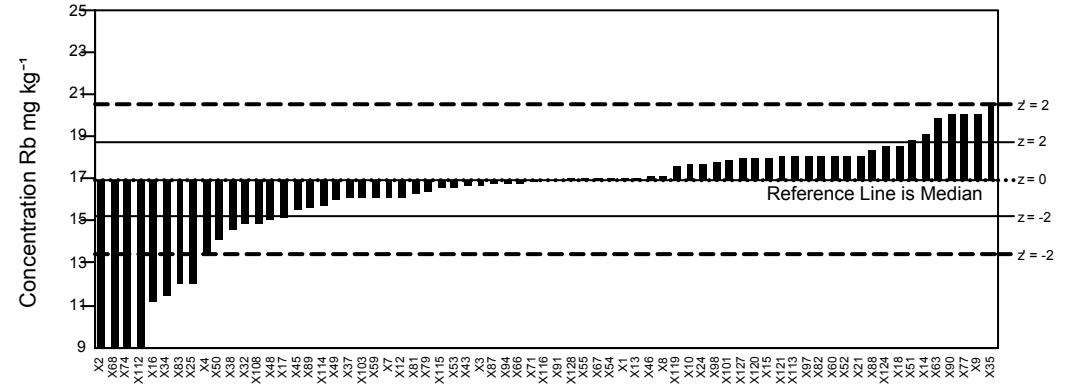
GeoPT40A - Barchart for Pb



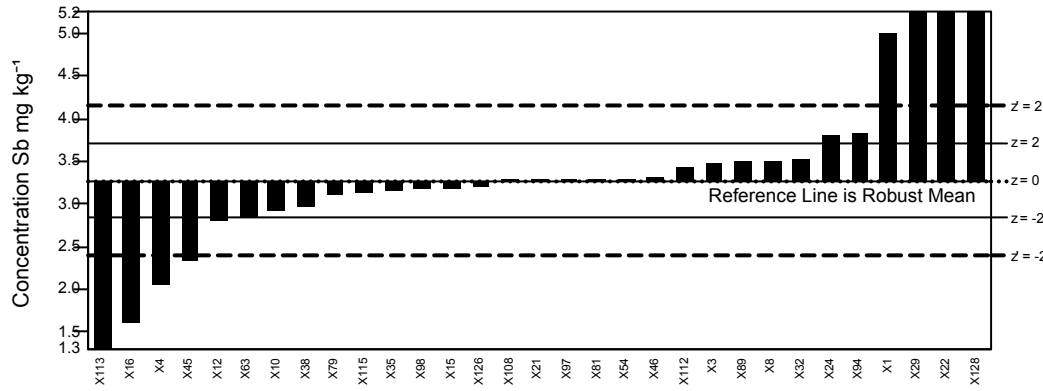
GeoPT40A - Barchart for Pr



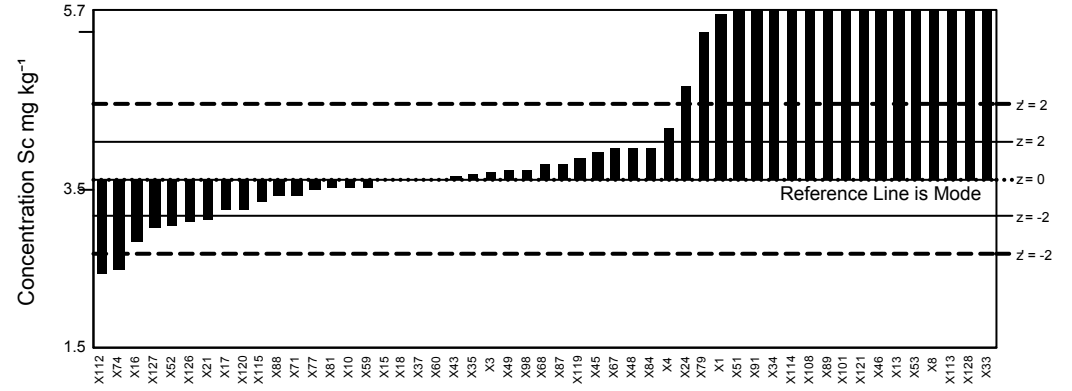
GeoPT40A - Barchart for Rb



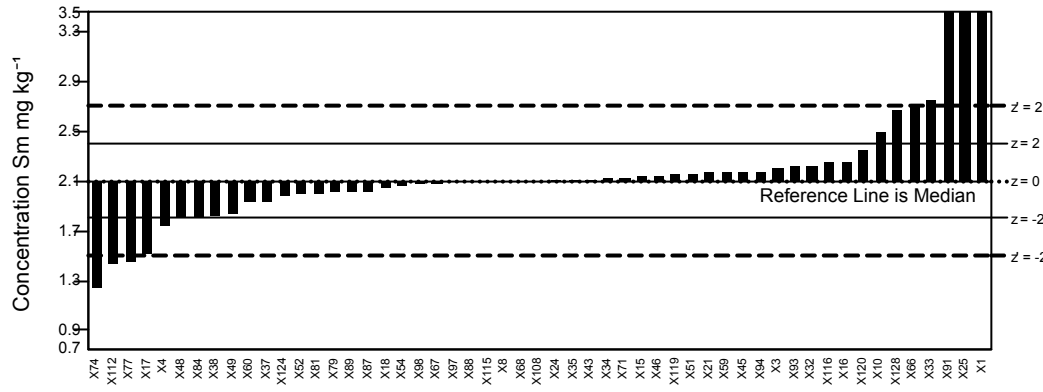
GeoPT40A - Barchart for Sb



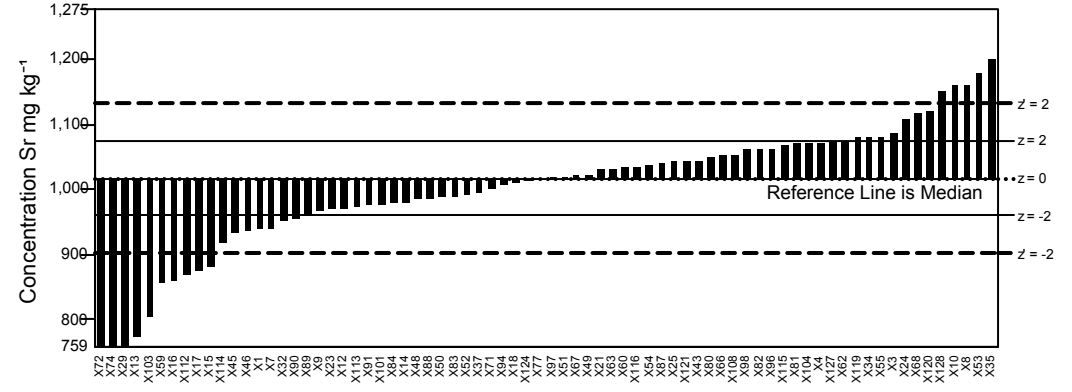
GeoPT40A - Barchart for Sc



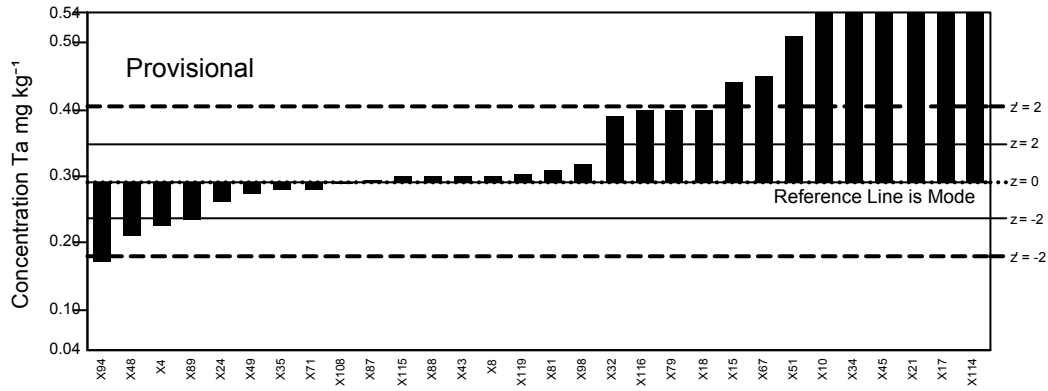
GeoPT40A - Barchart for Sm



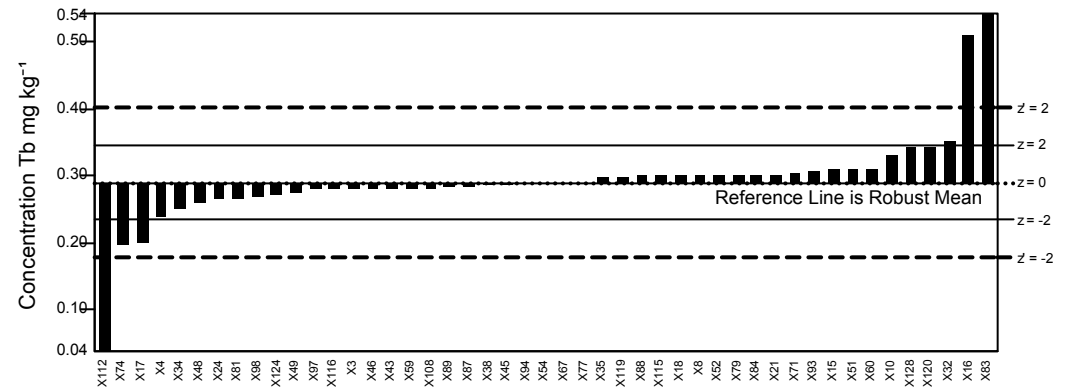
GeoPT40A - Barchart for Sr



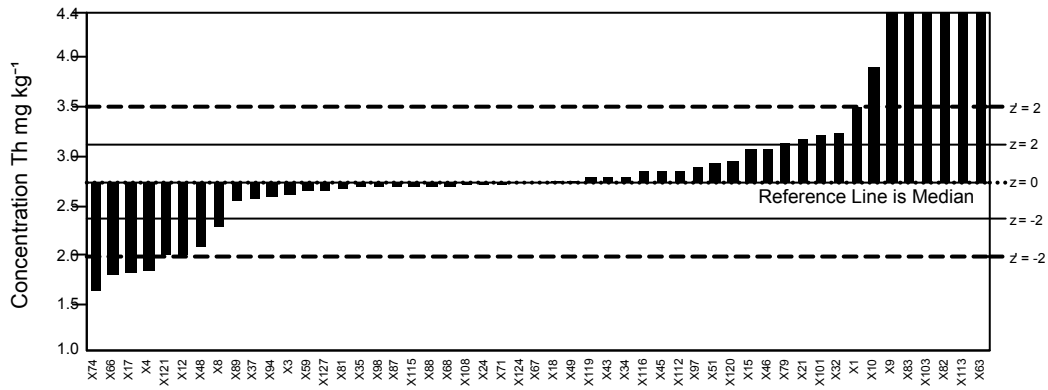
GeoPT40A - Barchart for Ta



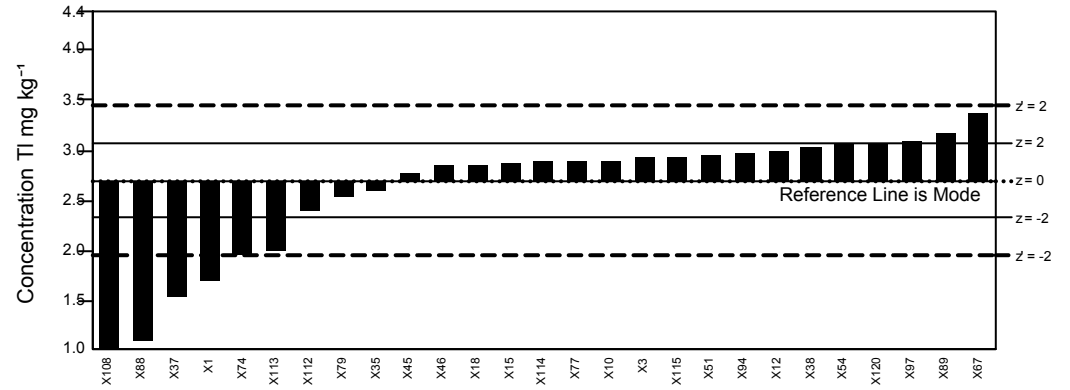
GeoPT40A - Barchart for Tb



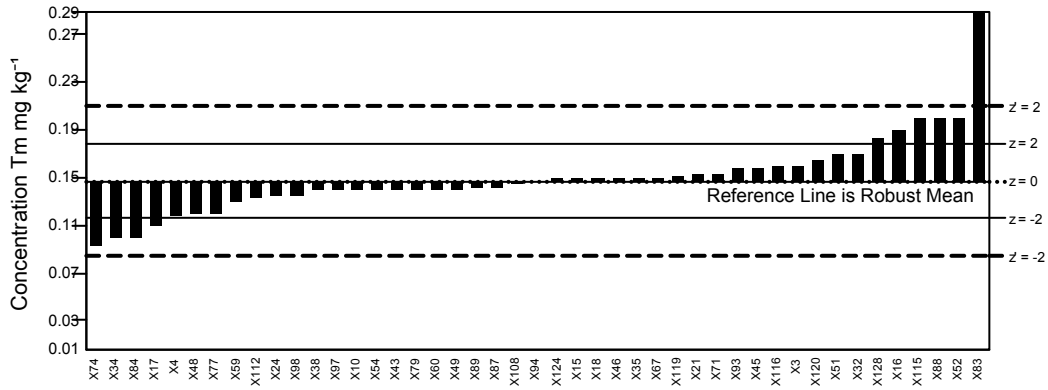
GeoPT40A - Barchart for Th



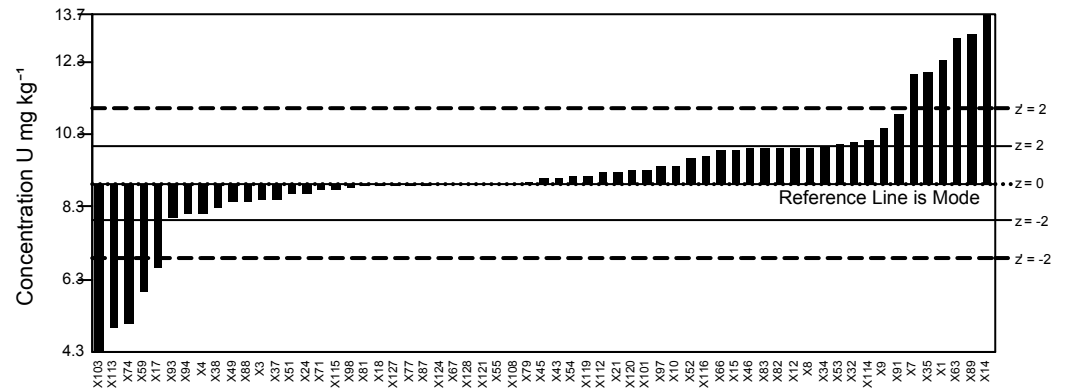
GeoPT40A - Barchart for Tl



GeoPT40A - Barchart for Tm



GeoPT40A - Barchart for U



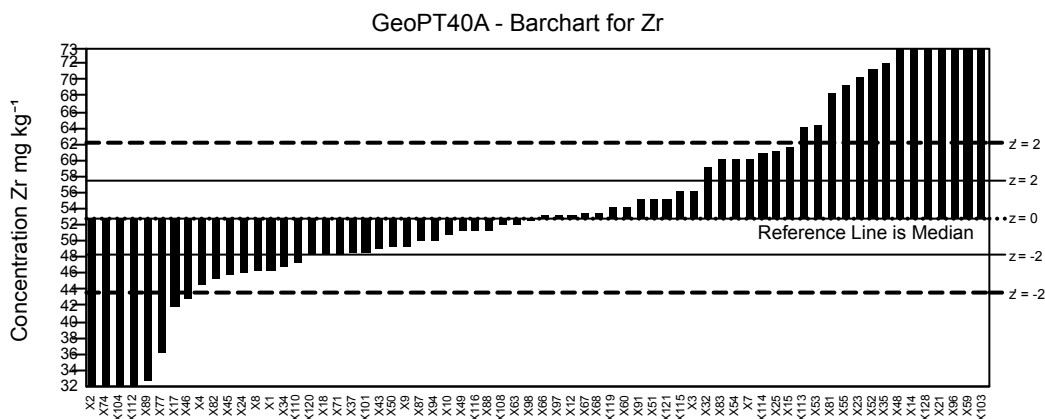
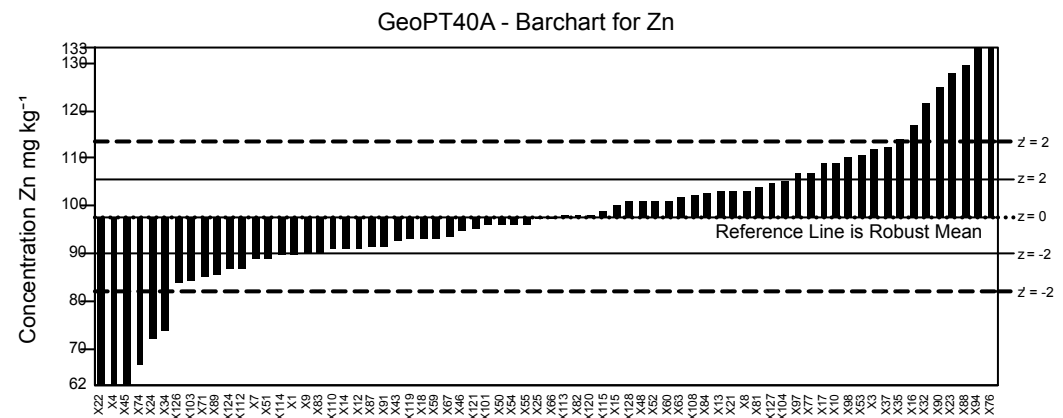
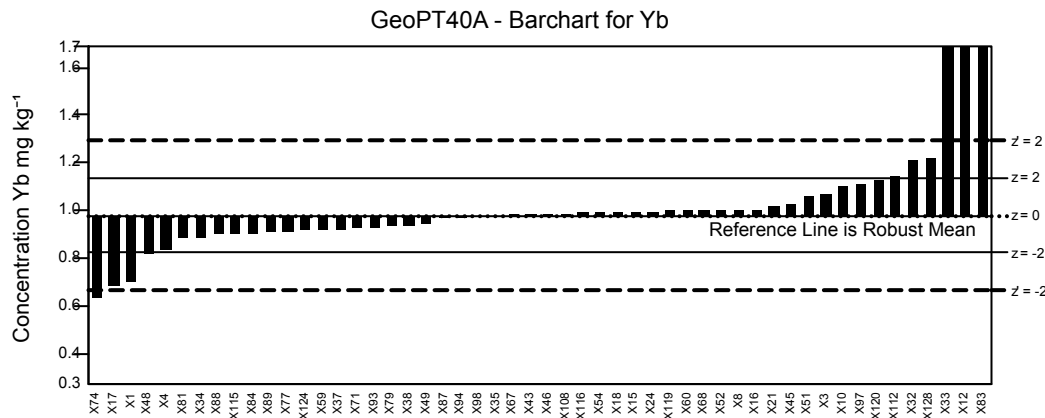
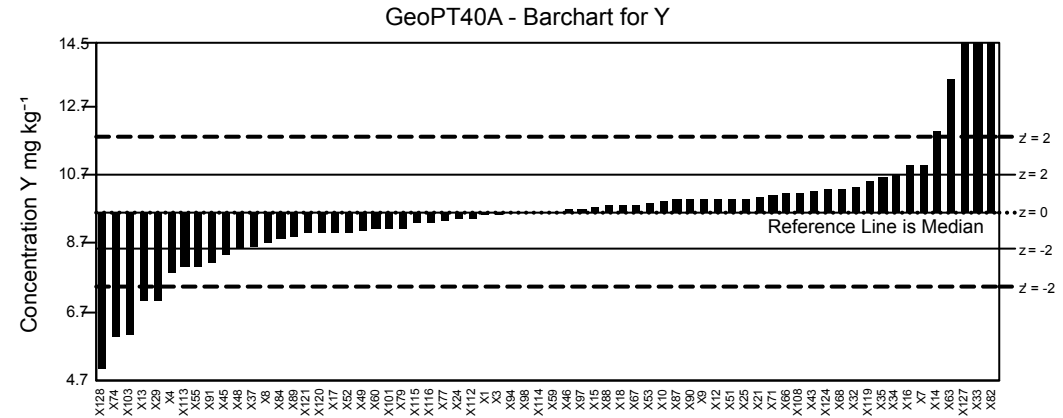
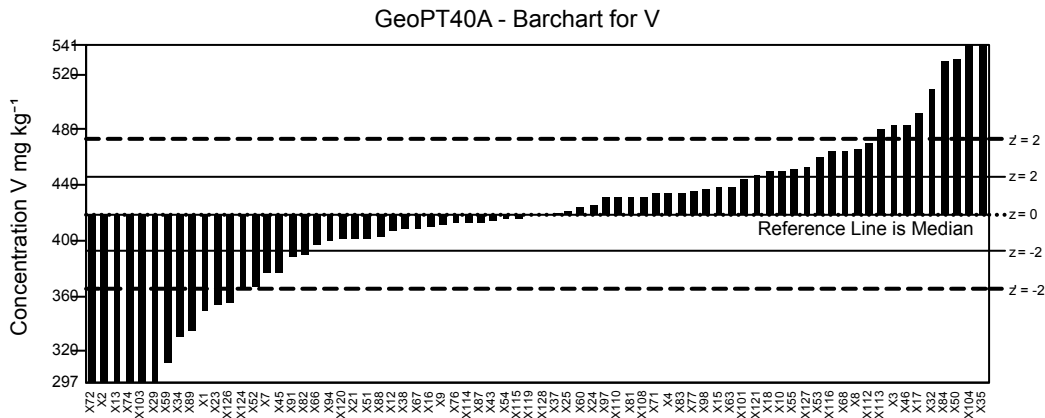
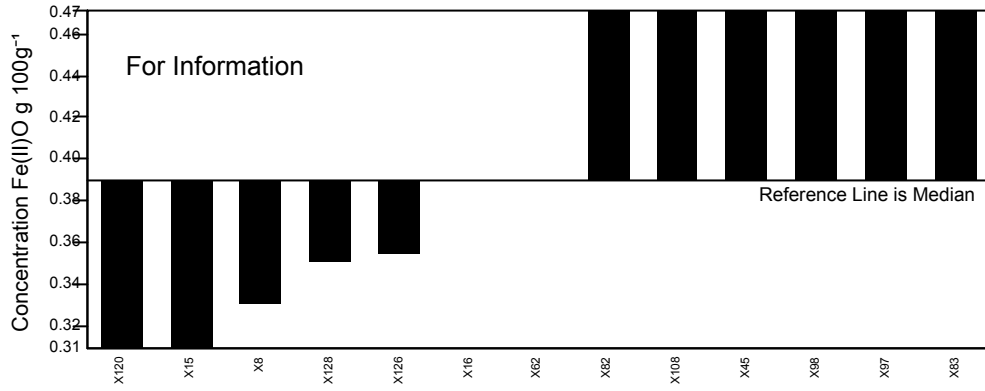
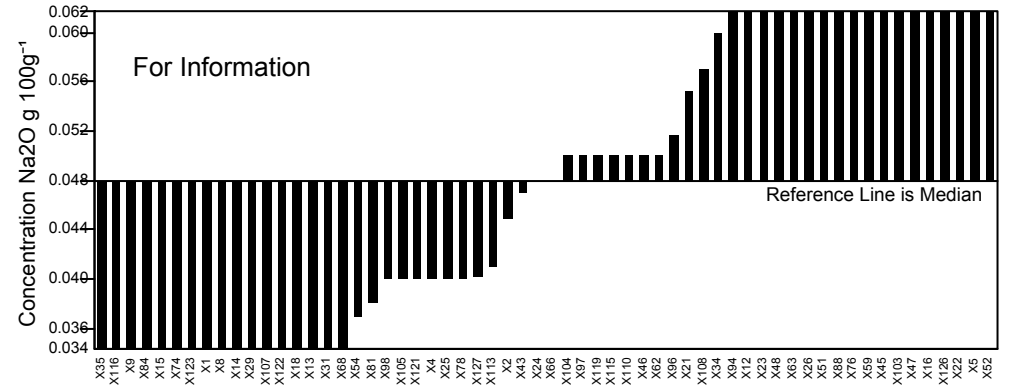


Figure 1: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for $-2 < z < 2$ for pure geochemistry labs (solid lines) and $-2 < z' < 2$ for applied geochemistry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

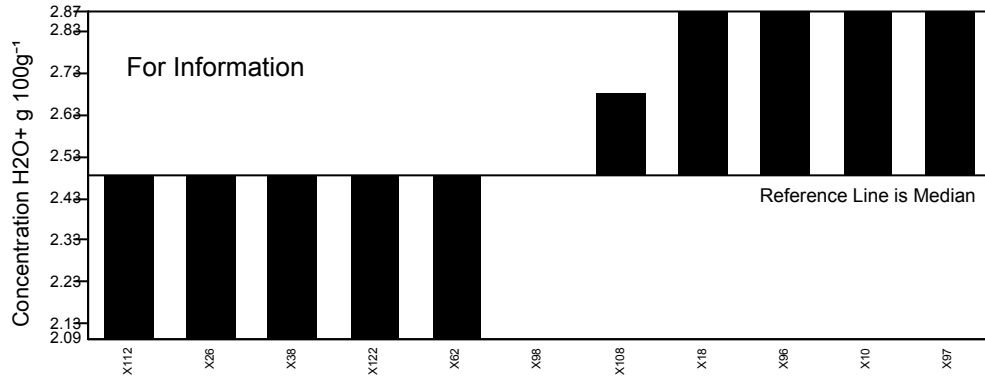
GeoPT40A - Barchart for Fe(II)O



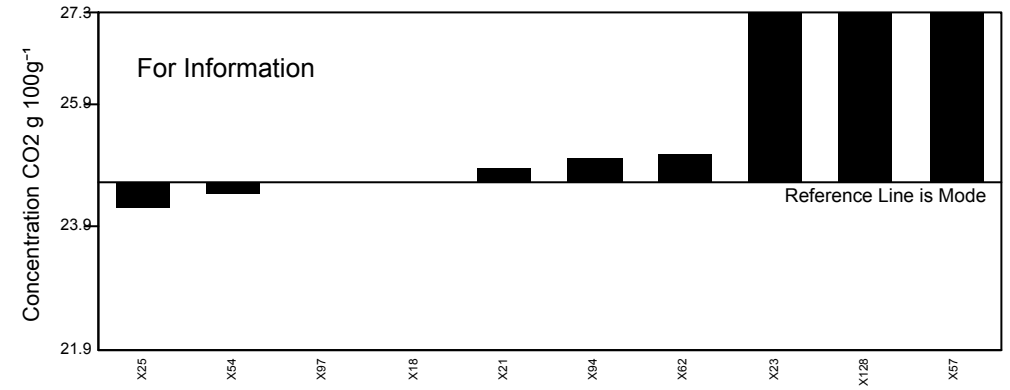
GeoPT40A - Barchart for Na2O



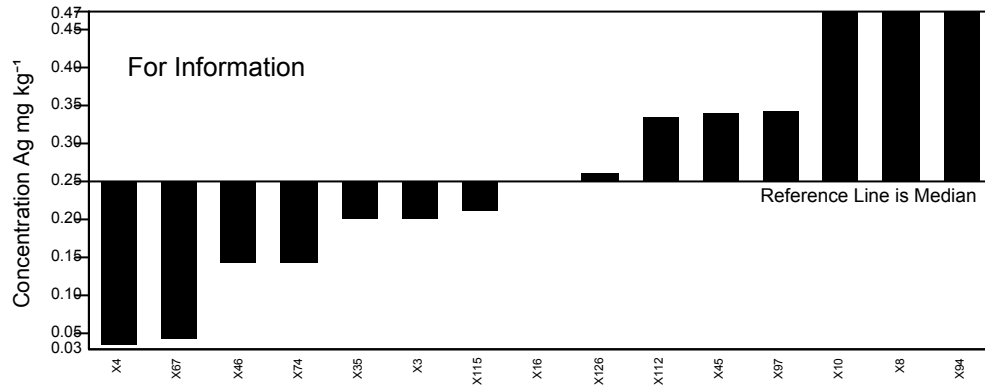
GeoPT40A - Barchart for H2O+



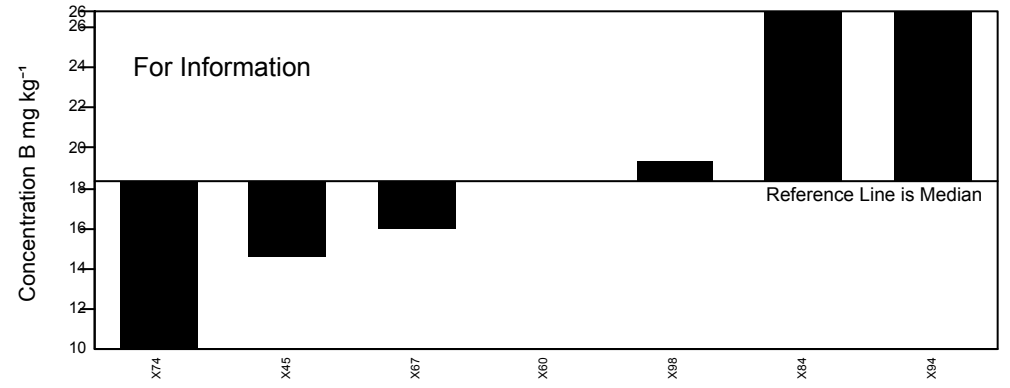
GeoPT40A - Barchart for CO2

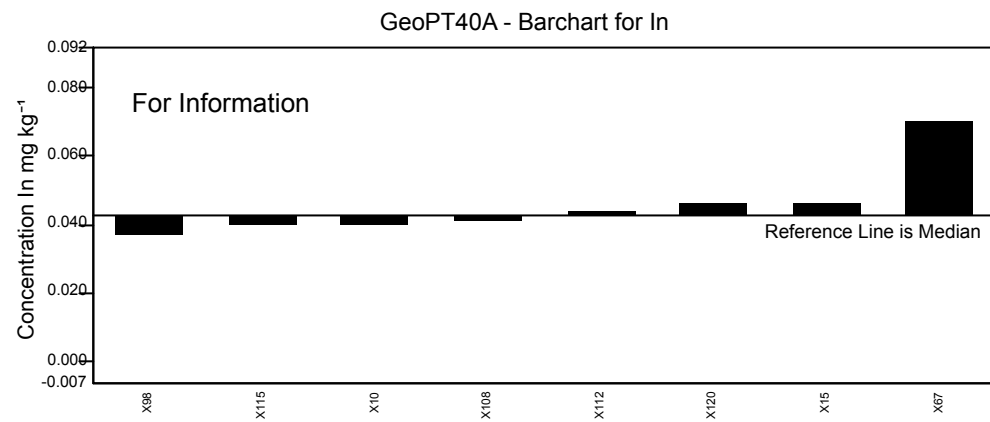
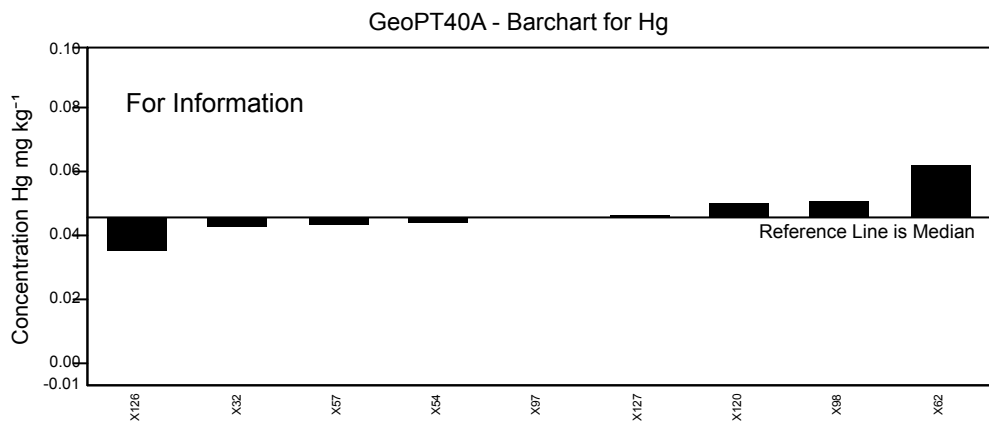
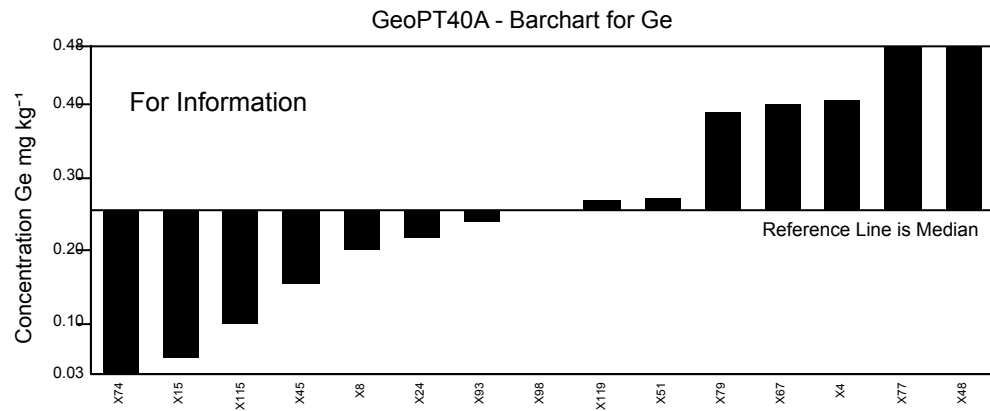
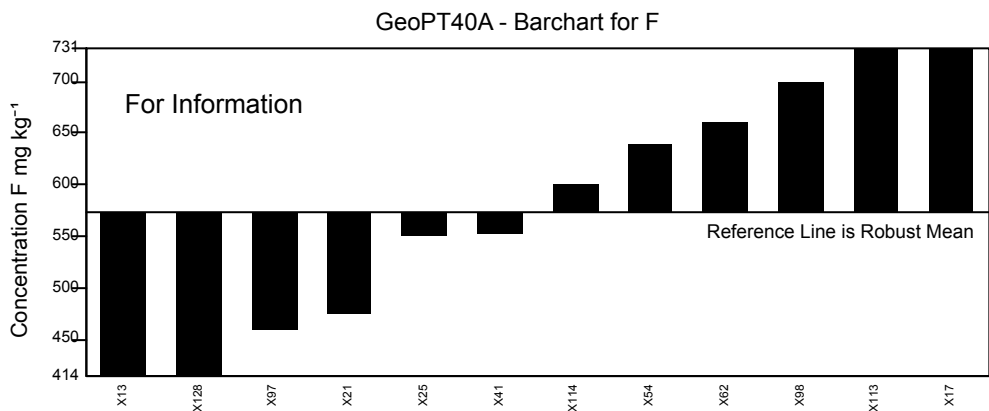
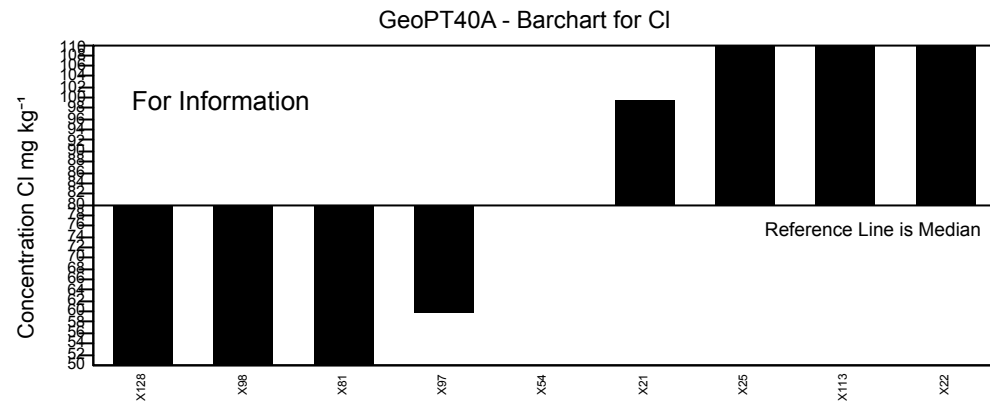
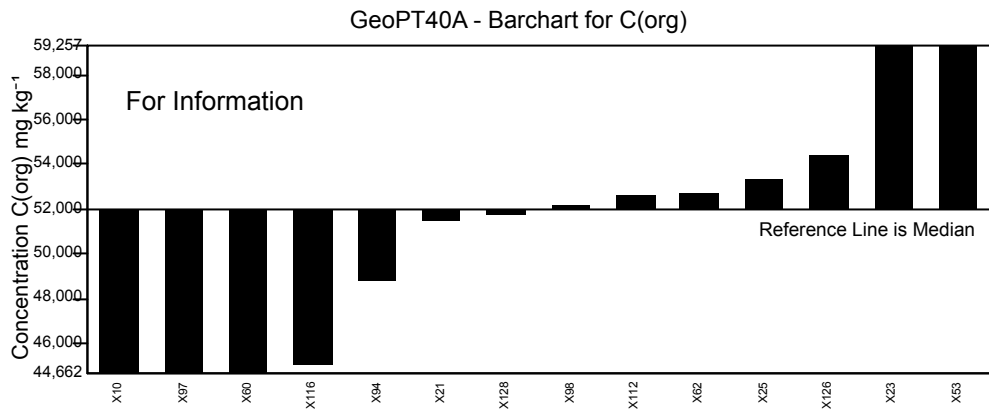


GeoPT40A - Barchart for Ag



GeoPT40A - Barchart for B





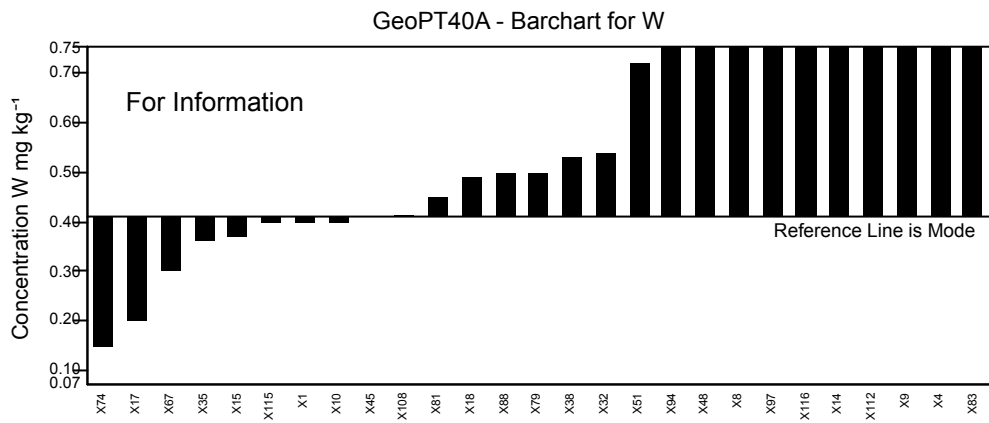
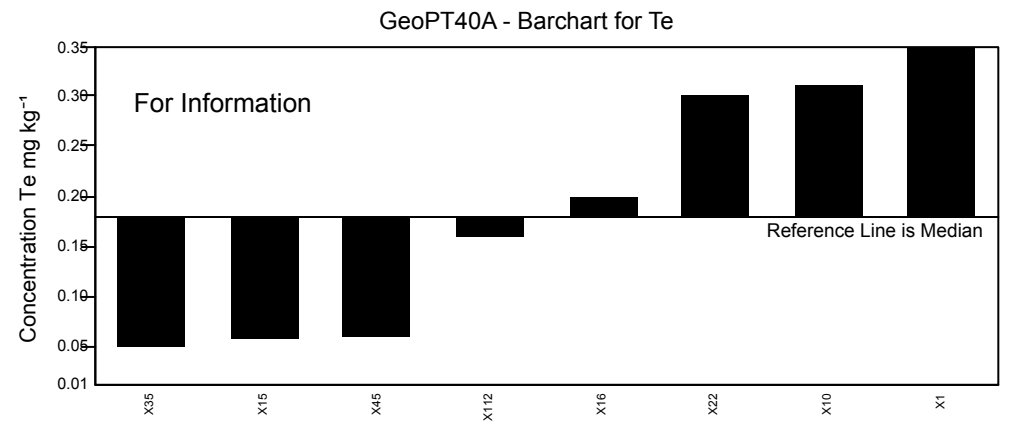
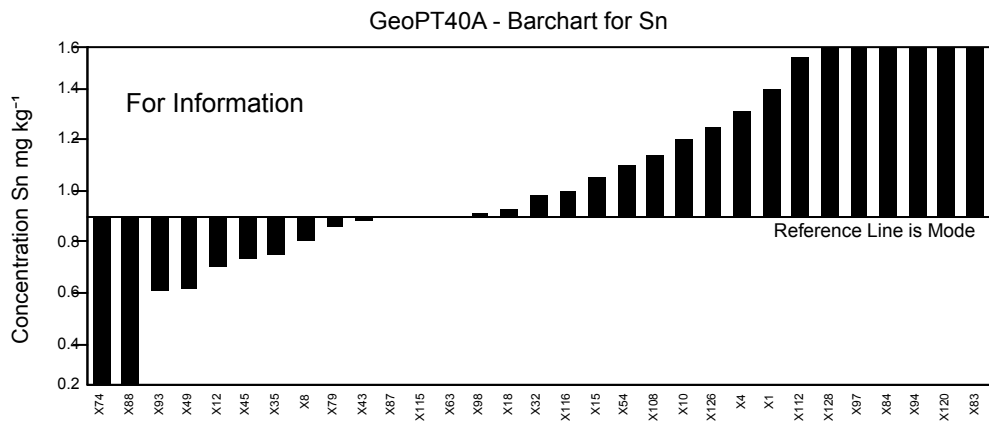
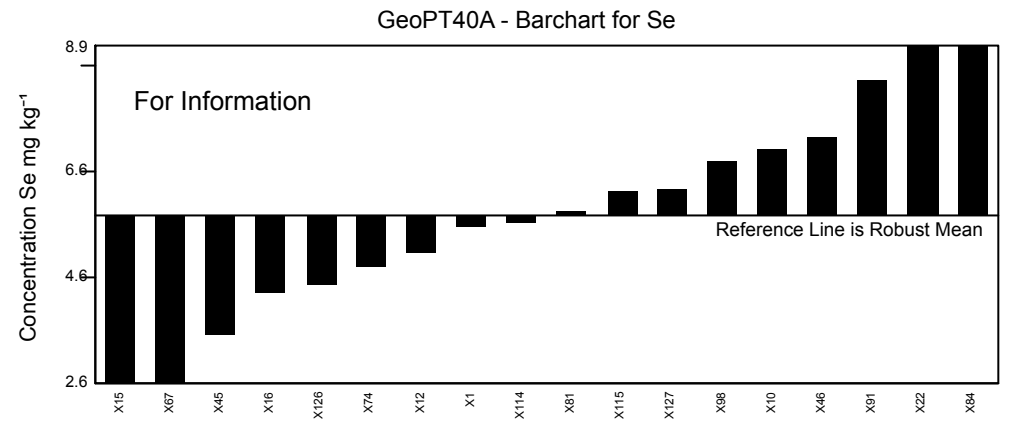
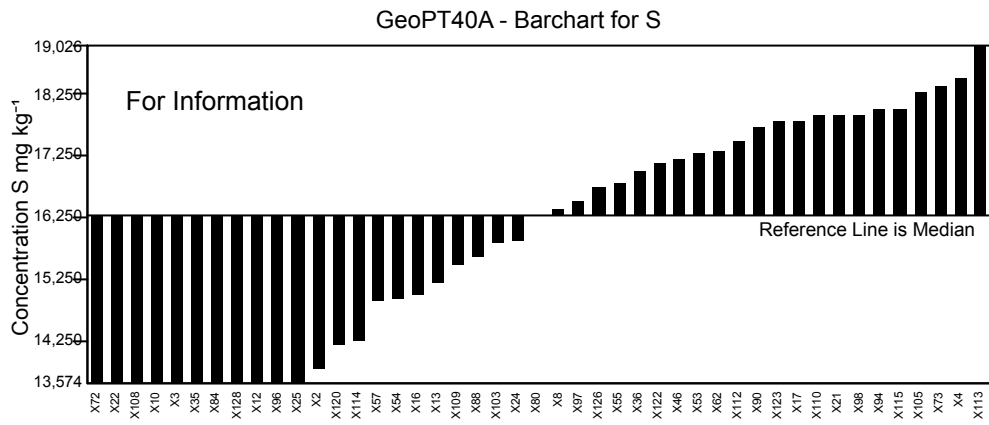


Figure 2: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Data distribution charts provided for information only for elements for which values could not be assigned.

Multiple Z-Score Chart for GeoPT40A

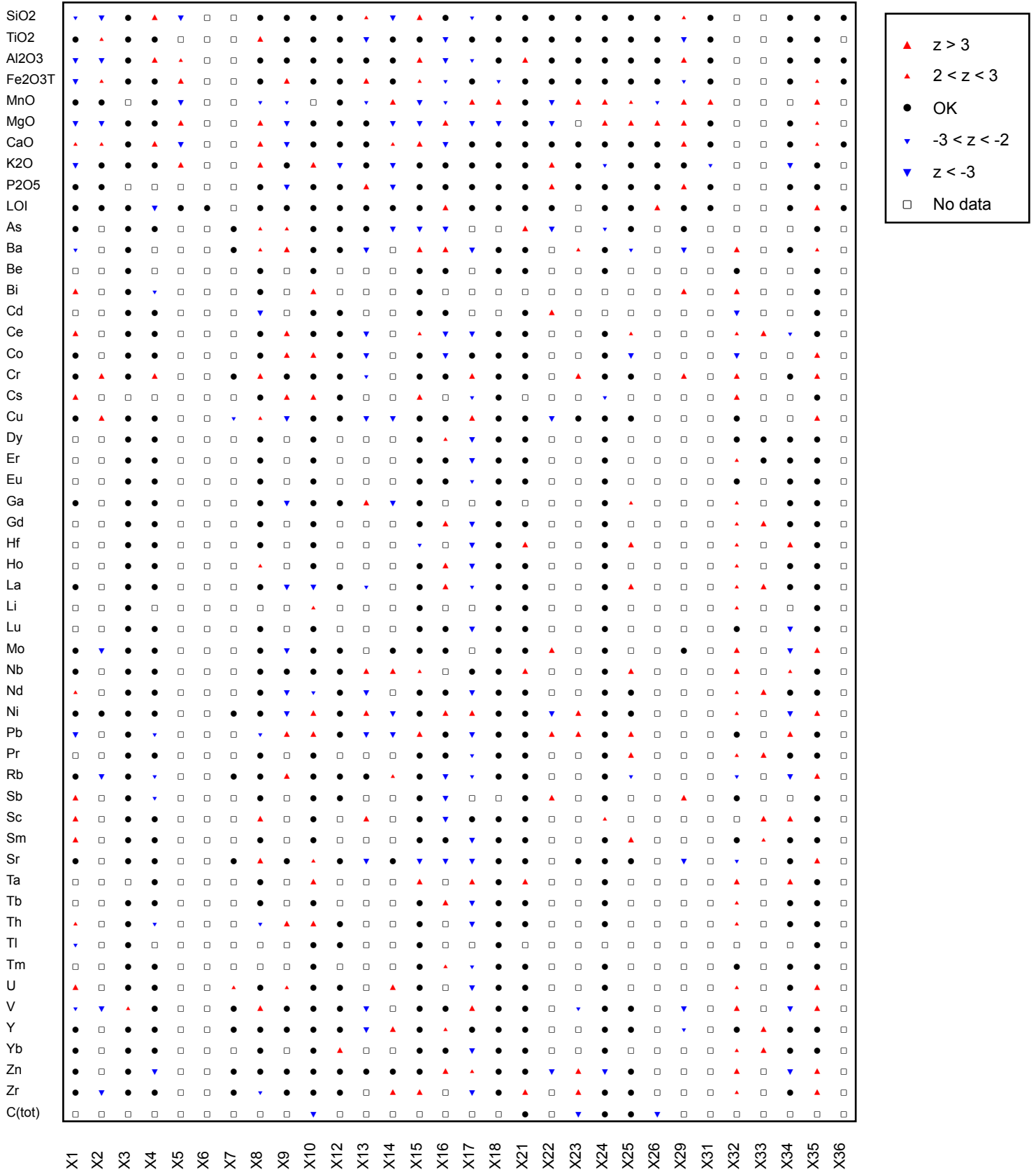


Figure 3: GeoPT40A - Calcareous organic-rich shale, ShTX-1. Multiple z-score charts for laboratories participating in the GeoPT40A round. Symbols indicate whether or not an elemental result complies with the $-2 < z < +2$ criteria (see key).

Multiple Z-Score Chart for GeoPT40A

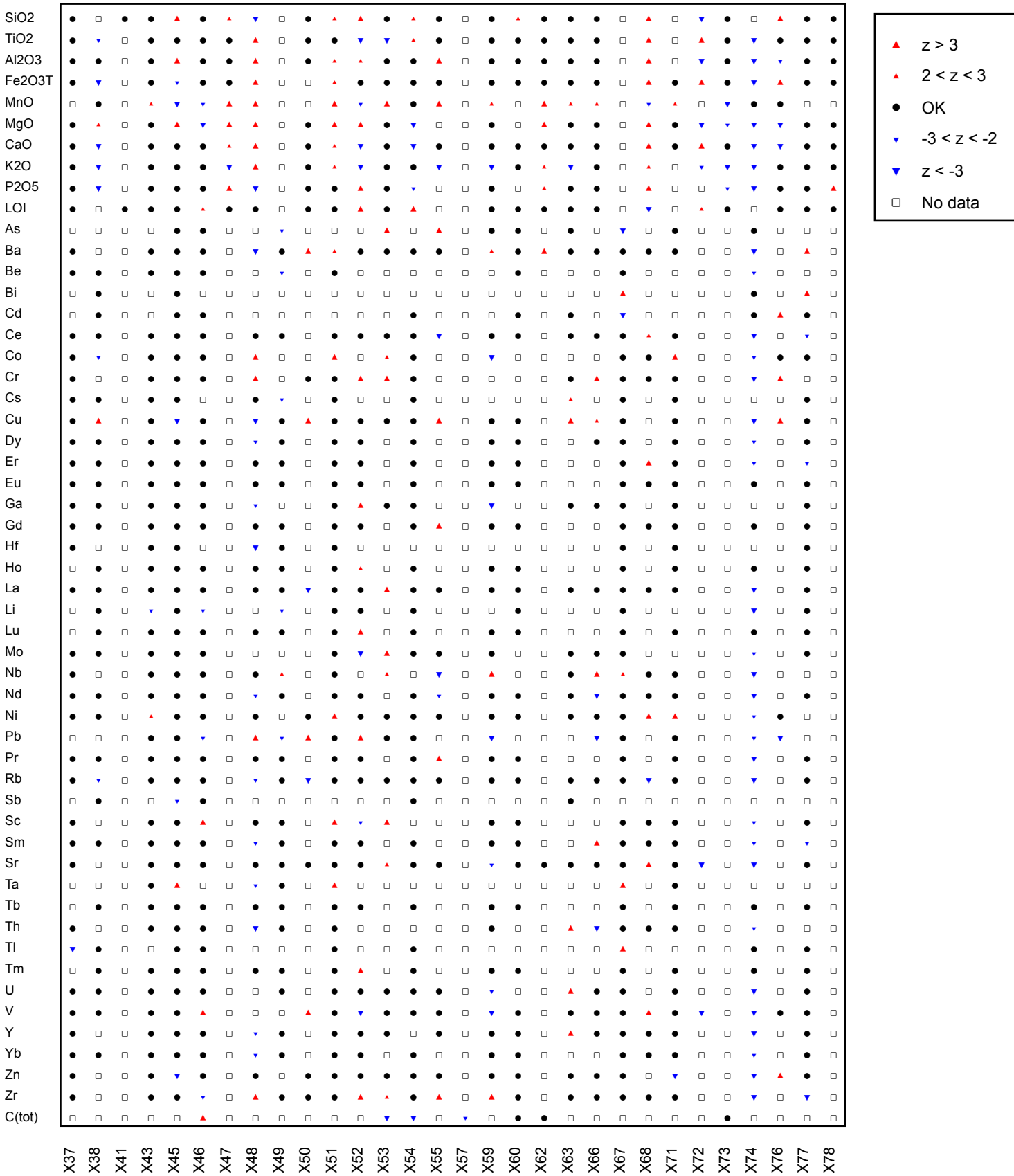


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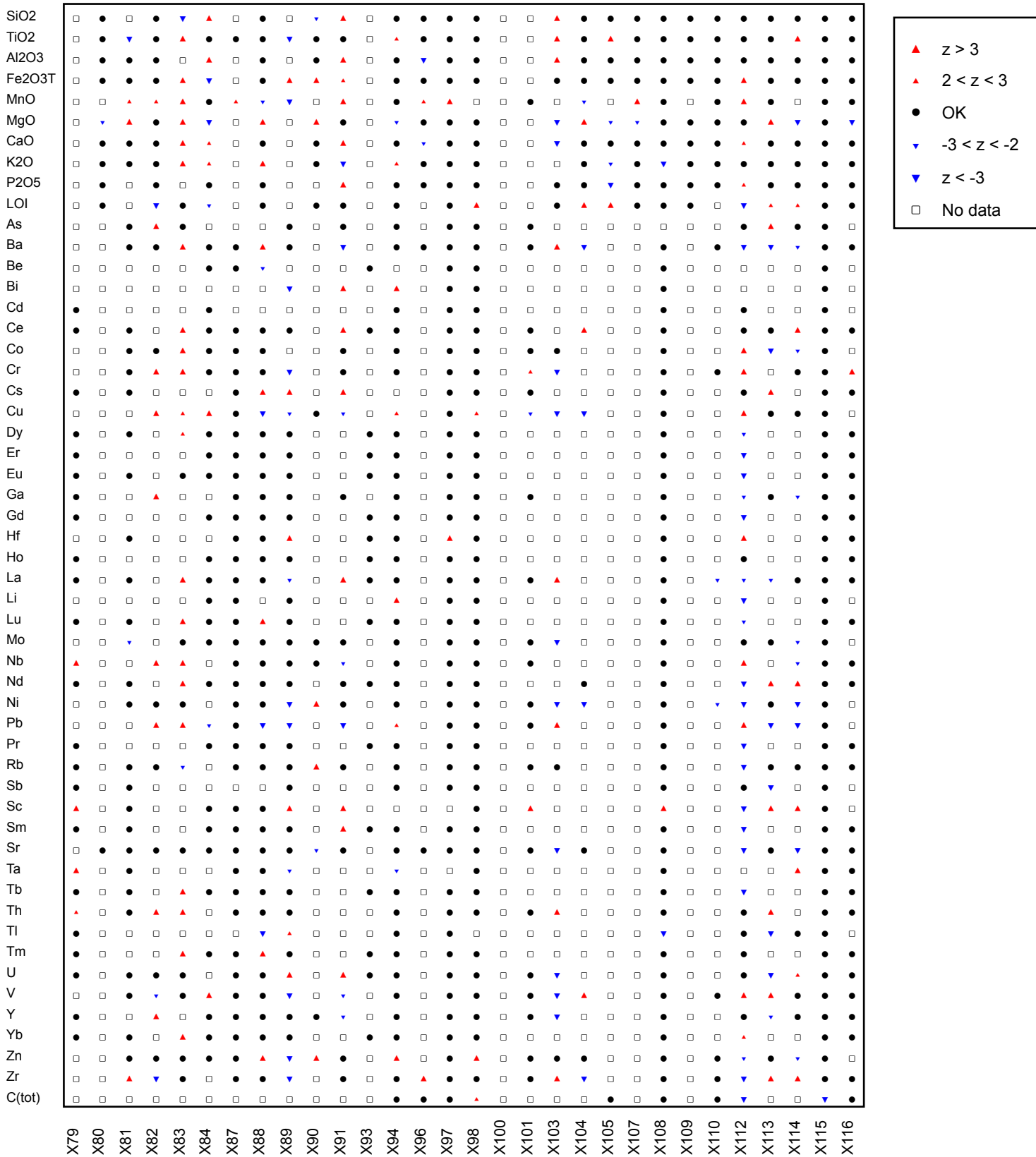


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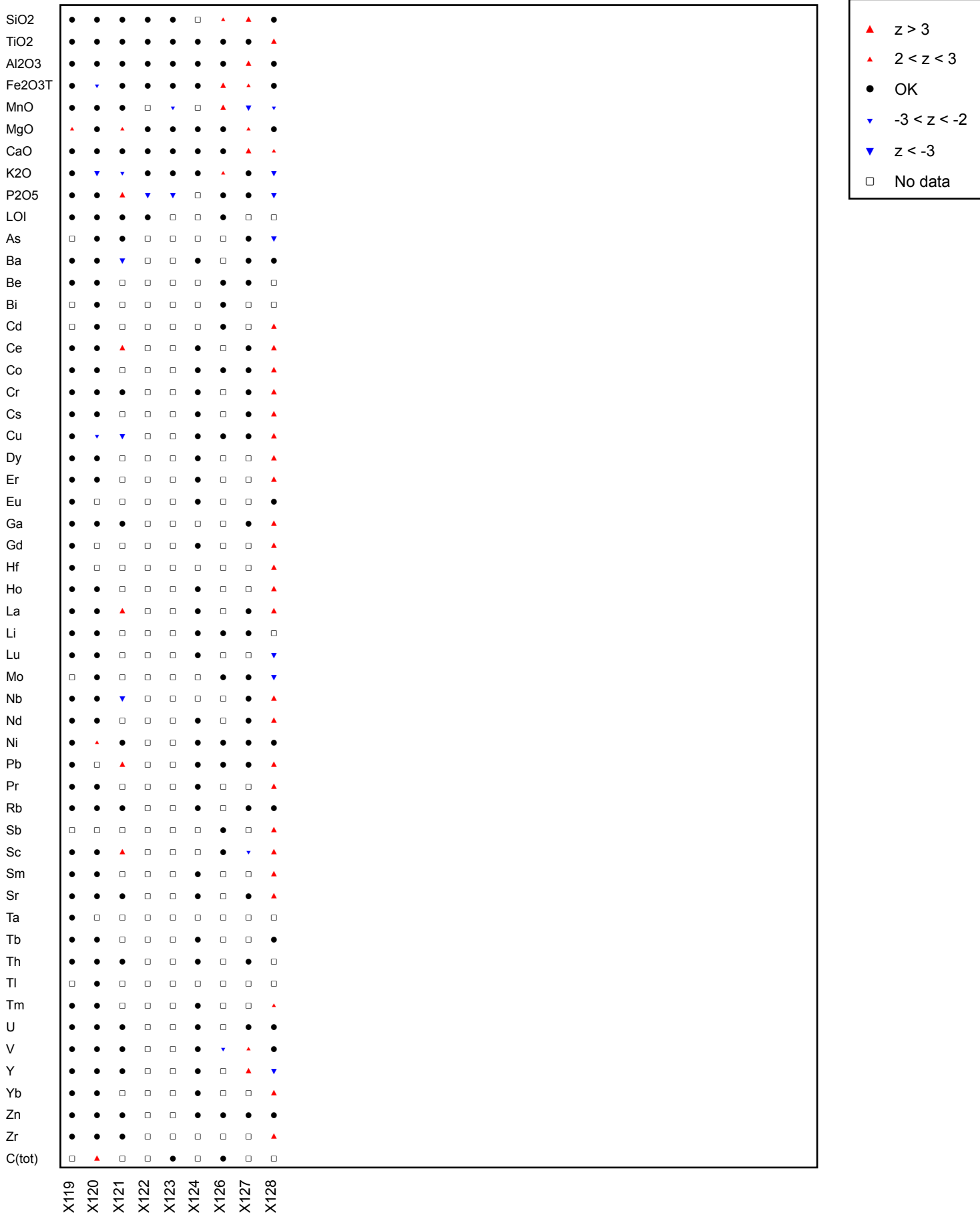


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