Bahnhofstraße 14 // D-37181 Hardegsen // T +49 (0)5505 94098-0
Geschäftsführer: Ralf Klaus Blecher // Amtsgericht Göttingen HRB 130263
www.crb-gmbh.de // labor@crb-gmbh.de

Analyse Service GmbH

GeoPT 39a, England - MNS-1, Syenite

Veranstalter: International Association of Geoanalysts and Geostandards Newsletter - GeoPT39a
Ringversuchsmaterial: MNS-1, Syenite
RV geschlossen: 2016 – 7
Literatur: Report - GeoPT39a Proficiency Testing Round 39a (Laborcode CRB = V33)

Hauptelemente [MA%]

	CRB	RV	1sRV	Z-Score
Na_2O	6,850	6,980	0,104	-0,620
MgO	0,250	0,230	0,006	1,450
Al_2O_3	22,480	22,530	0,282	-0,090
SiO_2	51,470	51,890	0,573	-0,360
P_2O5	0,034	0,040	0,015	-2,000
K_2O	9,090	9,124	0,131	0,130
CaO	2,280	2,275	0,040	-0,060
TiO_2	0,346	0,346	0,008	0,000
Fe_2O_3tot	2,660	2,632	0,046	0,310
MnO	0,124	0,139	0,004	-2,000
L.O.I.	3,320	3,280	0,050	0,360
C-tot. *	0,230	0,310	0,040	---

Spurenelemente [µg/g]

	CRB	RV	1sRV	Z-Score
Ba	447,00	420,00	13,50	1,00
Ce	286,00	293,80	10,00	-0,39
Cl *	2100,00	1773,00	425,00	---
Cr	48,00	42,80	1,90	1,35
F *	4050,00	3903,00	477,00	---
Ga	22,00	22,00	1,10	0,02
Hf	12,00	10,10	0,60	1,67
La	160,00	162,90	6,00	-0,21
Nd	84,00	89,40	3,60	-0,74
Pb	110,00	115,00	4,50	-0,56
Pr	31,00	28,90	1,40	-0,74
Rb	182,00	192,40	7,00	-0,75
Sm	16,00	11,40	0,60	3,65
Sr	1698,00	1714,00	44,70	-0,18
Th	39,00	60,40	2,60	-4,11
U	9,00	13,00	0,70	-2,85
V	23,00	27,30	1,30	-1,62
Y	28,00	25,00	1,20	1,21
Zn	91,00	96,90	3,90	-0,76
Zr	547,00	589,30	18,10	-1,17

Legende

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

Geo*PT*39A — AN INTERNATIONAL PROFICIENCY TEST FOR ANALYTICAL GEOCHEMISTRY LABORATORIES — REPORT ON ROUND 39A (Nepheline syenite, MNS-1) / July 2016

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

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

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

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

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

*Keywords: proficiency testing, quality assurance, Geo*PT*, Geo*PT*39A, round 39, MNS-1, nepheline syenite*

Abstract

Results are presented for Geo*PT*39A, the supplementary test material supplied in round thirty-nine of the International Association of Geoanalysts' Proficiency Testing programme for analytical geochemistry laboratories. The test material distributed in this round was a nepheline syenite, MNS-1, supplied by the Central Geological Laboratory, Mongolia. In fact this sample is a certified reference material, the nepheline syenite LNS (also listed as CGL 006). In this report, the data contributed from 102 laboratories are listed, together with an assessment of consensus values, consequent *z*-scores and charts to show the distribution of contributed results and the overall performance of participating laboratories.

Introduction

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

Steering Committee for Round 39A: P.C. Webb (results coordinator), M. Thompson (statistical advisor), P.J. Potts and C.J.B. Gowing (analytical advisors).

Timetable for Round 39A:

Distribution of sample: March 2016.

Results submission deadline: 10th June 2016.

Release of report: July 2016

Test Material details

Geo*PT*39A: The nepheline syenite test material, MNS-1, is in fact, the certified reference material (CRM) known as nepheline syenite LNS (also listed as CGL 006), obtained from the Central Geological Laboratory, Mongolia. Supplied in 100g portions, it was repackaged at BGS Keyworth, whereby portions were combined in pairs and divided 8 ways to provide 140 packets of test material. The test material had been evaluated for homogeneity by the originator, and characterized as a CRM in accordance with the accreditation requirements of the Mongolian National Agency for Metrology and Standardisation. As a result, the sample was considered suitable for use in this proficiency test.

Submission of results

3597 results were submitted for Geo*PT*39A (MNS-1) by 102 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, 3 laboratories reported 13 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 13 values were excluded from consideration.

Assigned values

Although this sample is an established reference material, certified for 29 measurands (which, in principle, could be used as assigned values), it was decided that for consistency, the robust statistical procedures, as employed in earlier rounds of Geo*PT*, would be used to derive assigned mass fraction values [X_a] for this test sample. These procedures routinely provide the best available estimates of the true composition of test materials in the Geo*PT* programme. Values were assigned on the basis that: i) sufficient laboratories had contributed data for an element, and ii) visual assessment gave confidence that the results distribution, outliers aside, was symmetrically disposed. Part of this assessment involved examining a bar chart of contributed data for each element to judge the distribution of results (as presented in Figures 1 and 2).

In view of there being evidence of bias in particular results for some measurands in the companion syenite test material, SyMP-1 (see Geo*PT*39 report), datasets were examined for evidence of multimodal distributions and unusual dispersion. For MNS-1 there were no comparable problems with Co or Ni, which have in this test material very low mass fractions, close to the detection limits for XRF analysis. However, it was found that for Zn there was a clear analytical bias involving XRF powder pellet measurements, reminiscent of the bias that affects Ni in SyMP-1. This bias is illustrated in Figure 0.1, where 29 XRF values specifically from powder pellets are below 93 mg/kg yet

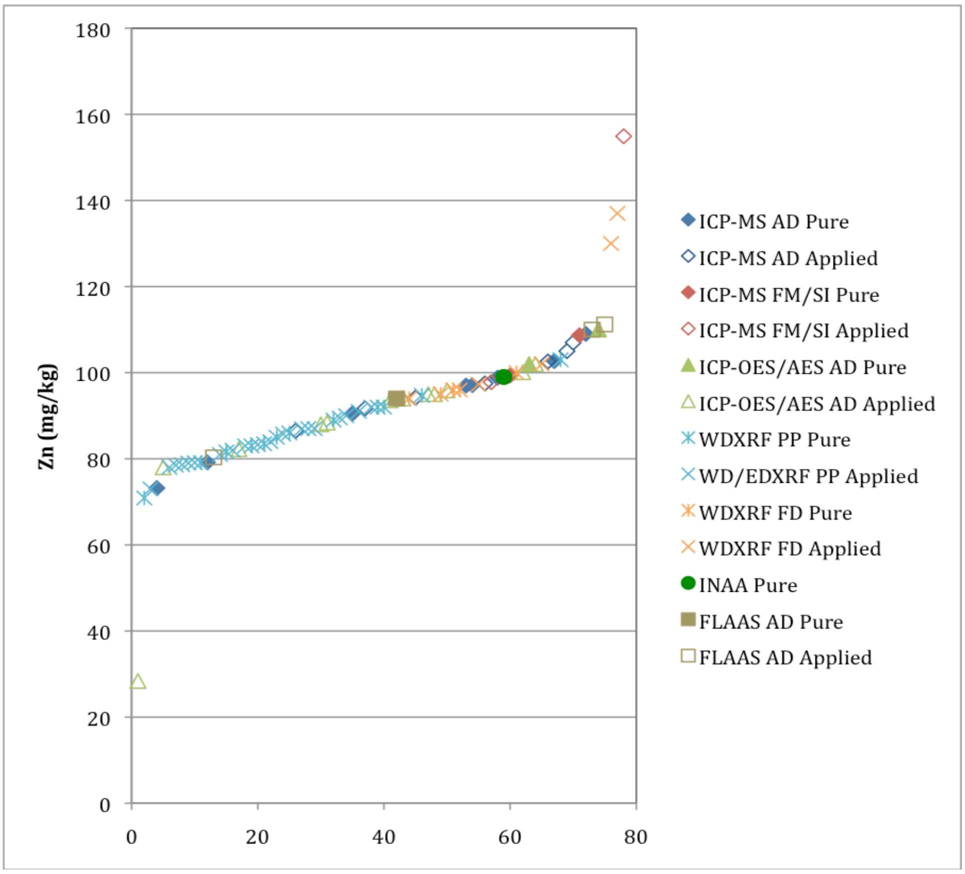


Figure 0.1 Ordered Zn results distinguished by analytical procedure. See Appendix 2 for explanation of the key.

only two exceed that mass fraction. In contrast, measurements by a range of other analytical procedures including ICP-MS (acid digestion and fusion) and XRF fusion, provide just 11 values below 93 mg/kg but 36 above. On account of this bias in the XRF powder pellet data for Zn, the decision was taken to omit these data when estimating the consensus value for Zn, which was then based on the 47 remaining values. We speculate that this underestimate in the XRF powder pellet measurements could be due to Zn being present within sphalerite grains, where the absorption correction applied to characteristic Zn X-rays calculated on the basis of the average matrix composition would significantly underestimate the attenuation of Zn X-rays within those grains. No similar distribution of data had been noted for Zn in SyMP-1, although there was a similar mass fraction of Zn present in that test sample (see Geo*PT*39 report, Table 2).

Table 2 lists assigned and provisional values for 11 major components and 41 trace elements in Geo*PT*39A (MNS-1). Bar charts for the 52 elements/components of Geo*PT*39A that were judged to have satisfactory distributions such that consensus values could be designated as assigned or provisional values are shown in Figure 1. These are: SiO_2, TiO_2, Al_2O_3, Fe_2O_3T, MnO, MgO*, CaO, Na_2O, K_2O, P_2O_5*, LOI, As, Ba, Be, Bi, Ce, Co, Cr*, Cs, Dy, Er, Eu, Ga, Gd*, Hf, Hg*, Ho, La, Li, Lu, Mo*, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sm, Sn*, Sr, Ta, Tb, Th, Tl*, Tm, U, V, W*, Y, Yb, Zn* and Zr. Of these, provisional values were given to the 10 marked '*'. The designation of provisional status was made because either i) a relatively small number of measurements 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, or iv) the dataset was reduced after the exclusion of data judged to be biased.

In 12 cases the robust mean was used to define the consensus value, but in 34 cases the median value was preferred. In 6 cases a mode was judged to provide the most satisfactory consensus value, three of which (Co, Ce, Ta) were suitable for the value to be assigned, the others being given provisional status (see Table 2). As for Geo*PT*39, the procedure used to determine the mode involved the estimation of the mass fraction that corresponds to the maximum value of the kernel density distribution for the dataset in order to obtain a consensus value that represents the most coherent part of the data distribution.

Bar charts for the 15 elements/components: Fe(II)O, H_2O^+, Ag, B, Br, C(tot), Cd, Cl, Cu, F, Ge, Ni, S, Sc and Te are plotted in Figure 2 for information only, as the quantity of data was insufficient, the distribution too highly skewed or too variable for the reliable determination of a consensus.

Z-score analysis

As in previous rounds, laboratories were invited to choose one of two performance standards against which their analytical results would be judged:

Data quality 1 for laboratories working to a 'pure geochemistry' standard of performance, where analytical results are designed for geochemical research and where care is taken to provide data of high precision and accuracy, sometimes at the expense of a reduced sample throughput rate. For Geo*PT*39A, 1442 results of data quality 1 were submitted.

Data quality 2 for laboratories working to an 'applied geochemistry' standard of performance, where, although precision and accuracy are still important, the main objective is to provide results on large numbers of samples collected, for example, as part of geochemical mapping projects or geochemical exploration programmes. For Geo*PT*39A, 2155 results of data quality 2 were submitted.

The target standard deviation (H_a) for each element assessed was calculated from a modified form of the Horwitz function as follows:

$$H_a = k.X_a^{0.8495}$$

where X_a is the mass fraction of the element expressed as a *fraction*; the factor k = 0.01 for pure geochemistry labs and k = 0.02 for applied geochemistry labs.

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

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

where X is the contributed result, X_a is the assigned value and H_a is the target standard deviation (all as mass fractions).

Z-score results for contributors to Geo*PT*39A are listed in Table 3. Results designated as data quality 1 are shown in bold: results of data quality 2 are shown underlined. Where *z*-scores are derived from provisional values, they 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 $-3<z<3$, it would be advisable for the contributing laboratory to examine its procedures, and if necessary, take action to ensure that determinations are not subject to unsuspected analytical bias.

Overall performance

A summary of the overall performance of individual laboratories 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 the Geo*PT*40 round, the test sample for which will be distributed during September 2016.

Acknowledgements

The authors thank Liz Lomas for much-valued assistance in distributing this sample and the Central Geological Laboratory, Mongolia for co-operation in the provision of 35 jars of the nepheline syenite CRM, designated LNS (CGL 006).

Appendix 1

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix 2. Explanation of key to Figure 0.1.

Analytical technique
ICP-MS — Inductively coupled plasma – mass spectrometry
ICP-OES/AES — Inductively coupled plasma – optical emission spectrometry
WD(ED)XRF — Wavelength dispersive (energy dispersive) X-ray fluorescence spectrometry
INAA — Instrumental neutron activation analysis
FLAAS — Flame atomic absorption spectrometry
Other — Unspecified

Sample preparation
AD — Acid digestion including special digestion
FM — Fusion of material before digestion or of residual material after digestion in combination and sintering
PP — Powder pellet
FD — Fusion disc

Fitness for purpose
Pure — Quality 1 data
Applied — Quality 2 data

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V2	V3	V4	V5	V6	V8	V9	V11	V12	V13	V14	V15	V17
SiO2	g 100g^{-1}	**52.39**	51.86	**51.39**	**50.9**	53.7	52.95	51.71	51.67	51.73		**52.05**	**51.1**	51.66
TiO2	g 100g^{-1}	**0.33**	0.33	**0.3**	**0.347**	0.37	0.35	0.347	0.34	0.35		**0.35**	**0.33**	0.34
Al2O3	g 100g^{-1}	**22.34**	22.48	**22.08**	**22.65**	21.9	22.89	22.6	22.46	22.37		**22.82**	**22.95**	22.38
Fe2O3T	g 100g^{-1}	**2.18**	2.66	**2.59**	**2.731**	2.88	2.54	2.59	2.6	2.61		**2.65**	**2.93**	2.61
Fe(II)O	g 100g^{-1}	**0.52**											**0.81**	
MnO	g 100g^{-1}	**0.13**	0.14	**0.14**	**0.14**	0.15	0.126	0.141	0.14	0.14		**0.14**	**0.145**	0.14
MgO	g 100g^{-1}	**0.21**	0.27	**0.22**	**0.21**	0.31	0.233	0.205	0.26	0.21		**0.24**	**0.33**	0.25
CaO	g 100g^{-1}	**2.04**	2.18	**2.25**	**2.18**	2.46	2.35	2.27	2.26	2.26		**2.27**	**2.34**	2.26
Na2O	g 100g^{-1}	**6.91**	6.99	**6.85**	**6.8**	6.8	7.26	6.95	6.98	6.92		**6.77**	**6.56**	7
K2O	g 100g^{-1}	**9.13**	9.02	**8.94**	**9.207**	8.76	8.91	9.04	9.08	9.28		**9.11**	**9.3**	9.15
P2O5	g 100g^{-1}	**0.043**	0.035	**0.03**	**0.042**	0.06	0.04	0.04		0.04		**0.038**	**0.029**	0.03
H2O+	g 100g^{-1}											**0.31**		0.2
CO2	g 100g^{-1}						1.26							1.25
LOI	g 100g^{-1}	**3.32**	3.35	3.47		3.1	3.47		3.15	3.23		**3.13**	**3.35**	3.3
Ag	mg kg^{-1}												**0.6**	
As	mg kg^{-1}	**28.8**		**19.4**	**21.1**		27.98		24.2			**20.5**		
Au	mg kg^{-1}													
B	mg kg^{-1}													
Ba	mg kg^{-1}	**414**	427	**402**	**437**	345	420		474	388	**435**	**400**	**416**	
Be	mg kg^{-1}	**11.3**	9.37			7.7	8.62		8.37		**9.14**	**10.3**	**8.1**	
Bi	mg kg^{-1}	**1.38**							0.99		**1.16**			
Br	mg kg^{-1}			**2**										
C(org)	mg kg^{-1}													0.02
C(tot)	mg kg^{-1}						3770							0.34
Cd	mg kg^{-1}	**0.65**										**0.5**	**0.18**	
Ce	mg kg^{-1}	**282**	266	**264.8**	**282.7**	293.1	248		306		**311**	**314**	**287**	
Cl	mg kg^{-1}			1137			2113							
Co	mg kg^{-1}	**1.49**	1.64		**1.533**	2.1	1.53		1.5		**1.6**	**1.26**	**1.4**	
Cr	mg kg^{-1}	**45**	40.9	**38.8**	**43.53**	45.4	26.1		33	32	**44.6**	**44**	**48.7**	
Cs	mg kg^{-1}	**12.4**	11.2		**12.13**	11.6			12.9		**12.7**	**11.1**		
Cu	mg kg^{-1}	**1.51**	4.1	**7.2**	**6.3**	6.2	3.55		3.6		**4.17**	**13**	**16.1**	
Dy	mg kg^{-1}	**3.86**	4.35		**4.04**	4.1	4.1		4.45		**4.51**	**4.23**	**5.41**	
Er	mg kg^{-1}	**1.94**	2.17		**1.783**	2.1	2.15		2.33		**2.32**	**2.55**	**2.07**	
Eu	mg kg^{-1}	**2.27**	2.47		**2.433**	2.5	2.45		2.59		**2.78**	**2.42**	**2.54**	
F	mg kg^{-1}			7571			4140							
Ga	mg kg^{-1}	**21.5**	23.2	**20.3**	**23.7**	19.9			22.8	20	**23.4**	**24**		
Gd	mg kg^{-1}	**7.09**	8.1		**6.4**	8.5	7.33		6.9		**6.24**	**6.33**	**7.07**	
Ge	mg kg^{-1}		1.21	**1.8**										
Hf	mg kg^{-1}		10.2		**5.743**	9.5	10.4		10.8		**10.7**	**7.08**		
Hg	mg kg^{-1}				**0.48**									
Ho	mg kg^{-1}	**0.7**	0.75		**0.627**	0.8	0.73		0.8		**0.81**	**0.765**	**0.74**	
I	mg kg^{-1}													
In	mg kg^{-1}													
La	mg kg^{-1}	**159**	150	**145.7**	**161**	161	154		174.5		**171**	**165**	**146.9**	
Li	mg kg^{-1}	**59.6**	58.7		**55.87**		58.4		58.8		**57.6**	**51**	**52**	
Lu	mg kg^{-1}	**0.28**	0.32		**0.267**	0.3	0.3		0.3		**0.34**	**0.319**	**0.295**	
Mo	mg kg^{-1}			**4.4**	**3.607**	3.7	3.55		4.18		**4.12**		**5**	
Nb	mg kg^{-1}	**45.5**	44.3	**39.4**	**33.9**	42.7	46.01		41.9		**47.7**	**35**		
Nd	mg kg^{-1}	**86**	90.3	**81.7**	**83.97**	88.7	82.9		96.3		**96.6**	**89.2**	**79.8**	
Ni	mg kg^{-1}		2.34	**3.5**		3.6	3.02				**3.26**		**3.4**	
Pb	mg kg^{-1}	**105**	122	**102.7**	**125.3**	70.1	105		124	109	**133**	**128**	**109**	
Pd	mg kg^{-1}													
Pr	mg kg^{-1}	**28.4**	28.6		**27.87**	26.9	25.8		29.5		**31.8**	**28.2**	**26.14**	
Rb	mg kg^{-1}	**221**	174	**189.1**	**186**	182.1	186		199.5		**196**	**187**		
Re	mg kg^{-1}													
S	mg kg^{-1}			1120			1613		0.18				**1730**	
Sb	mg kg^{-1}	**2.75**					3.05		2.91					
Sc	mg kg^{-1}	**0.73**	0.98			0.3					**0.45**			
Se	mg kg^{-1}												**1.04**	
Sm	mg kg^{-1}	**10.7**	11.1	**11**	**10.47**	11.1	10.9		12		**12.1**	**11.24**	**11.39**	
Sn	mg kg^{-1}	**1.6**				0.7					**1.65**			
Sr	mg kg^{-1}	**1740**	1706	**1596.500**	**1756.700**	1357	1724		1725	1765	**1821**	**1641**	**1537**	
Ta	mg kg^{-1}		1.94	**3**		1.7	3.4		1.9		**2.09**	**1.02**		
Tb	mg kg^{-1}	**0.78**	0.88		**0.76**	0.9	0.85		0.87		**0.87**	**0.867**	**1.42**	
Te	mg kg^{-1}													
Th	mg kg^{-1}	**52.3**	60.2	**52.2**	**60.43**	61.2	62.18		63.2		**70.8**			
Tl	mg kg^{-1}	**1.84**			**2.18**	1.1			2.01		**2.49**	1.8		
Tm	mg kg^{-1}	**0.28**	0.31		**0.25**	0.3	0.298		0.32		**0.33**	**0.307**	**0.28**	
U	mg kg^{-1}	**11.2**	13.4	**16.6**	**13.2**	12.4	13.65		13.55		**14.1**	**12.5**		
V	mg kg^{-1}	**30.1**	29.4	**24.7**	**28.67**	29.2	26.5			27	**31**	**36**	**26.1**	
W	mg kg^{-1}	**6.2**		**3.4**		5.1								
Y	mg kg^{-1}	**27.5**	25.8	**26.2**		25.7	24.5		25.5		**27.9**	**23.95**	**23.8**	
Yb	mg kg^{-1}	**1.86**	2.1		**1.67**	2.1	1.98		2.31		**2.21**	**2.09**	**1.8**	
Zn	mg kg^{-1}	**102**	91.7	**70.9**	**98.83**	154.9	95.9		105	88	**97.1**	**96**	**110**	
Zr	mg kg^{-1}	**597**	631	**578.8**	**287**	571.1	584		672	624	**645**	**565**	**579**	

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

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V18	V19	V20	V21	V23	V24	V25	V27	V28	V29	V30	V31	V32
SiO2	$g\ 100g^{-1}$	52	51.28	**51.72**	53.11		**52.21**	52.1	51.3		**53.91**	51.4		52.17
TiO2	$g\ 100g^{-1}$	0.35	0.34	**0.35**	0.28		**0.34**	0.35	0.347	0.36	**0.31**	0.339		0.31
Al2O3	$g\ 100g^{-1}$	22.2	22.26	**22.66**	22.4		**22.06**		22		**21.09**	22.3		22.72
Fe2O3T	$g\ 100g^{-1}$	2.61	2.67	**2.61**	1.78		**2.715**	2.63	2.47	3.05	**2.33**	2.61		2.53
Fe(II)O	$g\ 100g^{-1}$													
MnO	$g\ 100g^{-1}$	0.14	0.13	**0.13**	0.1		**0.141**	0.13	0.133	0.14	**0.12**	0.136		0.13
MgO	$g\ 100g^{-1}$	0.07	0.24	**0.29**	0.27		**0.143**	0.44	0.397	0.37	**0.01**	0.171		
CaO	$g\ 100g^{-1}$	2.29	2.28	**2.2**	2.13		**2.265**	2.09	2.91	2.73	**2.58**	2.24		2.08
Na2O	$g\ 100g^{-1}$	7.23	6.8	**6.89**	7.3		**6.804**	6.63	7.33	7.56	**7.59**	6.76		6.45
K2O	$g\ 100g^{-1}$	9.21	9.17	**9.09**	9.28		**8.942**		9.35	10.3	**8.54**	9.02		9.37
P2O5	$g\ 100g^{-1}$	0.039	0.05	**0.04**	0.04		**0.029**	0.06			**0.04**	0.038		0.02
H2O+	$g\ 100g^{-1}$	13		**0.32**										
CO2	$g\ 100g^{-1}$												**2.528**	
LOI	$g\ 100g^{-1}$	3.27	3.16	**3.48**	1.28		**3.39**	2.91	3.32		**3.21**	3.2		3.37
Ag	$mg\ kg^{-1}$	0.6									**0.13**			
As	$mg\ kg^{-1}$	27	25								**26.2**	21.4		
Au	$mg\ kg^{-1}$													
B	$mg\ kg^{-1}$													
Ba	$mg\ kg^{-1}$	341	438		678		**456**	390		428	**420**	430		347
Be	$mg\ kg^{-1}$	8.5			8.27		**9.02**				**7.9**	8.5		6.82
Bi	$mg\ kg^{-1}$	2.62												
Br	$mg\ kg^{-1}$													
C(org)	$mg\ kg^{-1}$													
C(tot)	$mg\ kg^{-1}$	3200		**0.31**								2840	**6900**	
Cd	$mg\ kg^{-1}$	0.27				0.1					**0.2**			
Ce	$mg\ kg^{-1}$	313	310		293.5	298	**307.2**			206	**265**	289		298.450
Cl	$mg\ kg^{-1}$	1610										1596		
Co	$mg\ kg^{-1}$	2			27		**1.51**			1.28	**5.2**			
Cr	$mg\ kg^{-1}$	24	44		26		**34.56**			36.1	**74.4**	38.8		
Cs	$mg\ kg^{-1}$	11.9				13.6	**15.01**			11.6	**12.6**	11.8		
Cu	$mg\ kg^{-1}$	14.4			2		**1.49**			4.23	**7.7**			
Dy	$mg\ kg^{-1}$	4.64			4.55	4.2	**4.22**			3.65	**4.1**	3.84		4.25
Er	$mg\ kg^{-1}$	2.4			2.03	2.1	**2.09**			1.82	**2**	1.8		2.29
Eu	$mg\ kg^{-1}$	3.06			2.57	2.7	**2.56**			2.19	**2.4**	2.62		2.66
F	$mg\ kg^{-1}$	4400										4484		
Ga	$mg\ kg^{-1}$	25.3	22		28	34.6	**21.43**				**33**	19.4		26
Gd	$mg\ kg^{-1}$	9.17			7.56	4.8	**5.63**			6.6	**6.8**	6.33		10.66
Ge	$mg\ kg^{-1}$	0.3			1.02	2.5					**5.9**			0.94
Hf	$mg\ kg^{-1}$	7.21			9.89		**9.33**				**5.2**	9.47		7.24
Hg	$mg\ kg^{-1}$												**0.768**	
Ho	$mg\ kg^{-1}$	1.07			0.73	0.8	**0.76**				**0.73**	0.747		0.69
I	$mg\ kg^{-1}$													
In	$mg\ kg^{-1}$	0.07												
La	$mg\ kg^{-1}$	198	201		168.1	165	**172.3**			112	**147**	163		162.550
Li	$mg\ kg^{-1}$	55					**69.15**			58.7				
Lu	$mg\ kg^{-1}$	0.56			0.33	0.3	**0.3**			0.25	**0.23**	0.29		0.33
Mo	$mg\ kg^{-1}$	2.44			4.59		**5.28**				**10**	3.42		
Nb	$mg\ kg^{-1}$	45.4	35		33	40.3	**48.5**				**47.1**	42.4		43
Nd	$mg\ kg^{-1}$				90.52	95.9	**94.2**			77.3	**84.5**	85.7		92.63
Ni	$mg\ kg^{-1}$	3.9	2		7		**1.91**			1.78	**72.6**			11
Pb	$mg\ kg^{-1}$	88.6	121		71		**92**			97.1	**139**	114		120
Pd	$mg\ kg^{-1}$													
Pr	$mg\ kg^{-1}$	30.2			29.85	31.1	**30.62**			24	**27.2**	26.4		27.59
Rb	$mg\ kg^{-1}$	150	200		213	184	**184.9**	160		199	**227**	184		164
Re	$mg\ kg^{-1}$													
S	$mg\ kg^{-1}$	900										579	**600**	
Sb	$mg\ kg^{-1}$	4.52				3.6					**4.7**	2.5		
Sc	$mg\ kg^{-1}$	0.6			4	7	**0.69**				**9.6**			
Se	$mg\ kg^{-1}$										**1**			
Sm	$mg\ kg^{-1}$	11.9			11.1	11.9	**11.47**			9.93	**10.7**	12		11.65
Sn	$mg\ kg^{-1}$	1.8				2.4					**2.2**	2.2		1.75
Sr	$mg\ kg^{-1}$	1320	1756		1657		**1772**	1600		1774	**2172**	1686		1672
Ta	$mg\ kg^{-1}$	3.16			1.44	2.4	**2.3**				**2.3**	1.79		5.19
Tb	$mg\ kg^{-1}$	1.34			1.02	1.2	**0.81**			0.67	**0.8**	0.805		1.09
Te	$mg\ kg^{-1}$	0.61												
Th	$mg\ kg^{-1}$	62.7	61		13	65.9	**63.8**			55.1	**54**	60.2		70
Tl	$mg\ kg^{-1}$	1.5									**1.1**			
Tm	$mg\ kg^{-1}$	0.52			0.32	0.3				0.26	**0.31**	0.289		0.34
U	$mg\ kg^{-1}$	8.2	13		12.84	13	**14.05**			11.1	**12.7**	12.2		11.82
V	$mg\ kg^{-1}$	29	23		25		**28.26**			25	**27**	12.2		23
W	$mg\ kg^{-1}$	7.7			6.28	6.8						5.73		
Y	$mg\ kg^{-1}$	27.2	24		25	24.2	**27.62**			18.2	**78**	18.7		33
Yb	$mg\ kg^{-1}$	2.5			2.07	2.8	**2.12**			1.75	**2.1**	1.77		2.1
Zn	$mg\ kg^{-1}$	107	82		81		**102.7**			94.2	**92**	78.6		90
Zr	$mg\ kg^{-1}$	283	556		554		**579**	560			**782**	569		566

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

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V33	V34	V36	V37	V38	V40	V41	V42	V44	V46	V49	V50	V51
SiO2	g 100g^{-1}	51.47		52.22	51.609	52.379	44.4	33.8	**51.38**	53.25	51.9	51.93	**51.56**	**52.59**
TiO2	g 100g^{-1}	0.346		0.36	0.34	0.352	0.35	4.42	**0.35**	0.33	0.35	0.32	**0.35**	**0.35**
Al2O3	g 100g^{-1}	22.48		23.67	22.21	23.258	23.4	8.7	**22.3**	23.13	22.61	22.53	**22.13**	**22.71**
Fe2O3T	g 100g^{-1}	2.66		2.93	2.594	2.746	2.01	9.33	**2.66**	2.68	2.69	2.55	**2.88**	**2.65**
Fe(II)O	g 100g^{-1}											1.1		
MnO	g 100g^{-1}	0.124		0.13	0.115	0.145	0.1	0.73	**0.14**	0.13	0.15	0.13		**0.14**
MgO	g 100g^{-1}	0.25		0.03	0.15	0.25	0.12		**0.26**	0.33	0.13	0.26	**0.27**	**0.25**
CaO	g 100g^{-1}	2.28		2.33	2.273	2.331	3.35	3.89	**2.25**	2.78	2.22	2.3	**2.34**	**2.31**
Na2O	g 100g^{-1}	6.85		7.99	7.154	7.052	6.95		**6.67**	7.98	7.33	6.86	**7**	**7.14**
K2O	g 100g^{-1}	9.09		9.76	9.141	9.375	8.27	25.1	**9.11**	8.25	9.39	9.15	**8.93**	**9.04**
P2O5	g 100g^{-1}	0.034		0.05	0.039		0.03	1.25	**0.04**	0.04	0.02	0.04		**0.16**
H2O+	g 100g^{-1}											2		
CO2	g 100g^{-1}											1.09		
LOI	g 100g^{-1}	3.32			3.39	3.053	3.24		**3.28**		3.6	3.21	**3.09**	**3.41**
Ag	mg kg^{-1}							0.77	**0.26**					
As	mg kg^{-1}							22	**27**		21	19.8	24	
Au	mg kg^{-1}													
B	mg kg^{-1}										124			
Ba	mg kg^{-1}	447			422.9	634	369	317.870	**434**	481	499	424.7	**417**	**398**
Be	mg kg^{-1}								**9.35**	8.63	1.63	7.1		
Bi	mg kg^{-1}								2.6			0.9		
Br	mg kg^{-1}	8							3.25					
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}	2239				2866						3370		
Cd	mg kg^{-1}	6						2.4				0.25		
Ce	mg kg^{-1}	286	**229.9**		285.9		246		**295**	296.240	280	296	**323**	
Cl	mg kg^{-1}	2100					1206	1138				1892		
Co	mg kg^{-1}								**1.4**	5		1.5		
Cr	mg kg^{-1}	48			40.5		42	144	**50.7**	29	37	42	71	**50**
Cs	mg kg^{-1}							45.53				13.1		
Cu	mg kg^{-1}	2					4	2.09	**3.43**	11	5	4.38		
Dy	mg kg^{-1}		**3.96**						**4.39**	4.07	3.99	4		
Er	mg kg^{-1}		**1.73**						**2.26**	2.33	2.17	2.17		
Eu	mg kg^{-1}		**2.29**						**2.68**	3.3	2.41	2.71		
F	mg kg^{-1}	4050												
Ga	mg kg^{-1}	22					22		20.9	24		20		**20**
Gd	mg kg^{-1}		**7.17**						**8.23**	9.13	9.52	6.4		
Ge	mg kg^{-1}									0.82	6	1		
Hf	mg kg^{-1}	12							11.1	11.56		11		**12**
Hg	mg kg^{-1}									0.665		0.61		
Ho	mg kg^{-1}		**0.66**						**0.79**	0.79	0.7	0.81		
I	mg kg^{-1}	1												
In	mg kg^{-1}													
La	mg kg^{-1}	160	**124.6**		163.7		153		**169**	180.240	159.1	172	**167**	
Li	mg kg^{-1}								**45.1**		40	56		
Lu	mg kg^{-1}		**0.26**						**0.33**	0.32	0.29	0.32		
Mo	mg kg^{-1}	3						1.32	**4.15**	3.79	4	5		
Nb	mg kg^{-1}	33			37.9		42	5.62	39.8	26	56	43	**38**	**38**
Nd	mg kg^{-1}	84			122.2				**95.5**	92.62	84	92.4		
Ni	mg kg^{-1}	7							**2.66**	6	21	8		
Pb	mg kg^{-1}	110			108.4		58	19.44	113	121		104.2	**116**	**108**
Pd	mg kg^{-1}							2.81						
Pr	mg kg^{-1}	31	**20.92**		29.2				**30.2**	28.55	24.12	31.2		
Rb	mg kg^{-1}	182			198.8		186	204	186	171		194	**198**	**199**
Re	mg kg^{-1}													
S	mg kg^{-1}	1661			1444	1878	905	498			1400	1540		
Sb	mg kg^{-1}	9						17.7	**2.66**			2.7		
Sc	mg kg^{-1}	10								5	0.3			
Se	mg kg^{-1}								**6.05**					
Sm	mg kg^{-1}	16	**8.51**						**12**	11.38	10.6	11.62		
Sn	mg kg^{-1}						5	6.47	1.9	1.42	10	4		
Sr	mg kg^{-1}	1698			1759		1692	12.76	1693	1657	675	1737	**1681**	**1762**
Ta	mg kg^{-1}	7							2.1	1.72		1.9		
Tb	mg kg^{-1}		**1.04**						**0.89**	1.05	0.9	0.89		
Te	mg kg^{-1}							53						
Th	mg kg^{-1}	39			59.1		36	3.67	**71.2**	63	67.9	63.5		**58**
Tl	mg kg^{-1}							496.410	**2.21**			2.2		
Tm	mg kg^{-1}		**0.24**						**0.32**	0.33	0.3	0.33		
U	mg kg^{-1}	9			6.1		10	2.71	**14.4**	11.88		13.8		**13**
V	mg kg^{-1}	23						184	21.8	23	11	31	23	**29**
W	mg kg^{-1}							126	5.4	6.51	39	7		
Y	mg kg^{-1}	28	**28.14**		24.9		29	15	23.9	25	19	24.8	26	**23**
Yb	mg kg^{-1}		**1.58**						**2.12**	2.21	1.96	2.07		
Zn	mg kg^{-1}	91			89.5		83	80.33	**73.2**	87	28.4	88.4	**92**	**96**
Zr	mg kg^{-1}	547			577.8	753	551	68.62	544	619		579	**551**	**636**

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

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V52	V53	V54	V57	V58	V59	V60	V61	V63	V66	V67	V68	V70
SiO2	g 100g^{-1}	52.01		51.24	52.19	52.27		51.787	51.27	52.4	51.61	52.44	51.871	52.623
TiO2	g 100g^{-1}	0.346		0.361	0.37	0.29		0.343	0.35	0.327	0.35	0.359	0.362	0.177
Al2O3	g 100g^{-1}	22.62		22.38	22.32	22.11		22.589	22.75	22.1	22.72	23.22	22.674	20.9
Fe2O3T	g 100g^{-1}	2.66		2.625	2.745	2.5		2.616	2.76	2.59	2.63	2.735	2.749	2.25
Fe(II)O	g 100g^{-1}			0.821										
MnO	g 100g^{-1}	0.143		0.133	0.125	0.12		0.138	0.14	0.134	0.14	0.135	0.145	0.094
MgO	g 100g^{-1}	0.27		0.22	0.265	0.25		0.308	0.22	0.235	0.27	0.199	0.234	0.128
CaO	g 100g^{-1}	2.299		2.233	2.4	2.34		2.283	2.2	2.28	2.3	2.336	2.22	2.53
Na2O	g 100g^{-1}	6.68		7.002	7.145	7.39		7.023	7.13	6.78	6.61	7.02	6.892	7.01
K2O	g 100g^{-1}	8.718		9.22	9.44	9.08		9.087	9.02	8.97	8.82	9.05	9.69	9.11
P2O5	g 100g^{-1}	0.032		0.039	0.028	0.03		0.035	0.02	0.027		0.042	0.04	0.035
H2O+	g 100g^{-1}			2.429										
CO2	g 100g^{-1}			1.142										
LOI	g 100g^{-1}	3.3		3.52	3.09	3.08		3.325	3.33	3.2	3.15	2.2	3.12	3.658
Ag	mg kg^{-1}											0.27		
As	mg kg^{-1}	22.3			22.2			20.921	20.8			22		
Au	mg kg^{-1}													
B	mg kg^{-1}											24		
Ba	mg kg^{-1}	415	416	435	408.5	438	418.850	407.485	405	432		326	414	515
Be	mg kg^{-1}		7.79					9.704		8.83		9.41		
Bi	mg kg^{-1}				1.1			0.873						
Br	mg kg^{-1}				2.5									
C(org)	mg kg^{-1}			449								680		
C(tot)	mg kg^{-1}			3569	2900									
Cd	mg kg^{-1}				0.9			0.061	4					0.043
Ce	mg kg^{-1}	288	230		282.7	300	311.550	294.432	278	290		317.890		
Cl	mg kg^{-1}													2210
Co	mg kg^{-1}				1.9			1.571	2	0.99		1.75	2.6	0.947
Cr	mg kg^{-1}	42.5			44.8	42		43.520	40	20.4		48	54	31.27
Cs	mg kg^{-1}	12	11.88		32.1		12.92	12.269	22	12.1		12		
Cu	mg kg^{-1}	22	2.4		6.3	10		3.651	5	3.6		4.23	4	8.598
Dy	mg kg^{-1}		3			3.7	4.38	4.230		4.38		4.15		
Er	mg kg^{-1}		1.56			2.3	2.29	2.090		2.17		2.16		
Eu	mg kg^{-1}		1.8			2.4	2.6	2.722		2.76		2.53		
F	mg kg^{-1}			3976								3400		
Ga	mg kg^{-1}	22.8			19.9	21	23.44	21.747	21			23.63		
Gd	mg kg^{-1}		4.76			7	9.81	6.567		7.89		6.61		
Ge	mg kg^{-1}									1.32		1.19		
Hf	mg kg^{-1}		10.4		9		11.26	9.875	6	10.7		12.77		
Hg	mg kg^{-1}	0.502		0.561	0.68							0.544		
Ho	mg kg^{-1}		0.54			0.9	0.8	0.771		0.88		0.76		
I	mg kg^{-1}													
In	mg kg^{-1}													
La	mg kg^{-1}	160	126		159.6	173	169.680	167.065	163	166		149.510		
Li	mg kg^{-1}		51.6			57		53.621				54		43.71
Lu	mg kg^{-1}		0.252			0.3	0.34	0.327		0.44		0.34		
Mo	mg kg^{-1}				3.8			4.594	4	5.39		5.32	9	
Nb	mg kg^{-1}	40.8	38.9		37.6	51	41.93	46.312	38	39.8		49.81	52.8	
Nd	mg kg^{-1}	84	66.6		76.6	89	92.95	89.310	81	91.7		95.4		
Ni	mg kg^{-1}				1.8	43		1.911	3	2		4.68	7	
Pb	mg kg^{-1}	115	103		104.7			114.307	118	152		120	146	127
Pd	mg kg^{-1}													
Pr	mg kg^{-1}		21.2			27	29.85	29.894		28		29.83		
Rb	mg kg^{-1}	182	194		188.4	196	196.4	216.949	200	721		194	218	221
Re	mg kg^{-1}													
S	mg kg^{-1}				170			0.169		1700				1830
Sb	mg kg^{-1}	2.1			5.3			2.662	7			2.79		
Sc	mg kg^{-1}		4.75				4		5	0.8				
Se	mg kg^{-1}													
Sm	mg kg^{-1}	16.7	7.7		10.7	14	11.81	11.593	9	11.6		12.44		
Sn	mg kg^{-1}	0.98			2.9		1.52	1.360	11			1.74		
Sr	mg kg^{-1}	1684	1530	1537	1678.200	1738	1874.560	1934.925	1737	1730		1755	1718	1890
Ta	mg kg^{-1}		1.768		2.3		2.23	1.988	3			2.07		
Tb	mg kg^{-1}		0.683			0.8	1.19	0.818		1.11		0.82		
Te	mg kg^{-1}				0.6			0.041	5					
Th	mg kg^{-1}	68	56		57.2	51	64.63	62.150	61	57.1		54	55	
Tl	mg kg^{-1}							1.789		1.09		0.24		
Tm	mg kg^{-1}		0.236			1	0.35	0.321		0.44		0.32		
U	mg kg^{-1}	15	11.76		18.2	12	14.33	13.456	15.7	11.9		14		
V	mg kg^{-1}	32.3			17.5	30		27.353	26	26		24	26	64.59
W	mg kg^{-1}				6.1		5.98	6.500	12	5		6.56		
Y	mg kg^{-1}	27.5	18.5		25.2	26	24.78	26.265	26	23.8		15	32	
Yb	mg kg^{-1}		1.6		1.2	2	2.14	2.116		2.29		2.24		
Zn	mg kg^{-1}	97.3			78.5	94		94.746	85	93.6		110	84	111.2
Zr	mg kg^{-1}	610	647		565.4	594	634.250	650.662	589	567		626	666	515

Bold entries are Data Quality 1 - <u>Underlined entries</u> are Data Quality 2

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V71	V72	V73	V74	V75	V76	V77	V78	V80	V82	V83	V84	V85
SiO2	$g\ 100g^{-1}$	51.7	52.36	**51.57**	50.7	51.81	50.26	51.55	**51**	52.54	**51.61**		52.96	53.307
TiO2	$g\ 100g^{-1}$	0.31	0.36	**0.35**	0.255	0.35	0.338	0.344	**0.33**	0.25	**0.35**		0.351	0.348
Al2O3	$g\ 100g^{-1}$	22.4	22.64	**22.02**	22.3	22.51	21.87	22.5	**22.35**	23.55	**23.36**		24.1	23.003
Fe2O3T	$g\ 100g^{-1}$	2.56	2.67	**2.65**	2.19	2.67	2.73	2.654	**2.522**	2.12	**2.67**		2.435	2.696
Fe(II)O	$g\ 100g^{-1}$	1.04	1.02	**1.3**									1.175	
MnO	$g\ 100g^{-1}$	0.134	0.14	**0.14**	0.13	0.15	0.141	0.133	**0.14**	0.13	**0.13**		0.131	0.143
MgO	$g\ 100g^{-1}$	0.38	0.22	**0.22**		0.27	0.233	0.227	**0.26**	0.36	**0.2**		0.379	0.219
CaO	$g\ 100g^{-1}$	2.29	2.32	**2.28**	2.24	2.28	2.13	2.264	**2.22**	2.12	**2.22**		2.262	2.405
Na2O	$g\ 100g^{-1}$	7.4	6.98	**7.06**		6.96	7.05	7.031	**7.04**	8.07	**6.94**		6.907	7.078
K2O	$g\ 100g^{-1}$	9.4	9.16	**9.07**	8.66	9.05	8.9	9.253	**9.46**	9.66	**9.06**		9.162	9.363
P2O5	$g\ 100g^{-1}$		0.04	**0.03**	0.087	0.041	0.04	0.032	**0.04**	0.06	**0.04**			0.036
H2O+	$g\ 100g^{-1}$		1.73	**2.02**										
CO2	$g\ 100g^{-1}$			**1.36**										
LOI	$g\ 100g^{-1}$	3.15	3.06			2.98		3.296	**3.23**	3.16	3.36		1.3	3.2
Ag	$mg\ kg^{-1}$		0.1			0.14							0.173	
As	$mg\ kg^{-1}$		20.2	34		24.7			**22.9**			25.7	22.94	
Au	$mg\ kg^{-1}$					0.002								
B	$mg\ kg^{-1}$	46	48			85								
Ba	$mg\ kg^{-1}$	420	428	**412**	370	427	429	415	**354.2**			409.4	349.4	438.2
Be	$mg\ kg^{-1}$	8.6	8.4			9							9.421	8.6
Bi	$mg\ kg^{-1}$		1.16	2		1.05							0.943	
Br	$mg\ kg^{-1}$											1.9		
C(org)	$mg\ kg^{-1}$													
C(tot)	$mg\ kg^{-1}$	0.22				0.34	3258						3081	
Cd	$mg\ kg^{-1}$		0.098		2.7	0.19							0.152	
Ce	$mg\ kg^{-1}$	280	300	**277**	249	286	298		**262.3**			278	246	292.460
Cl	$mg\ kg^{-1}$			980										
Co	$mg\ kg^{-1}$		1.58	**3**	194	1.7						2	1.353	1.48
Cr	$mg\ kg^{-1}$	43	41.3	**65**	196	27	48	79	**36**			44.6	35.9	39.78
Cs	$mg\ kg^{-1}$		12.9	**17**		13.1			**19**			12.8	11.44	12.05
Cu	$mg\ kg^{-1}$		5.77	**4**	55.2	4			**6.7**				3.245	
Dy	$mg\ kg^{-1}$		4.76			4.3							3.403	3.95
Er	$mg\ kg^{-1}$		2.34			2.1							1.7	2.13
Eu	$mg\ kg^{-1}$		2.55		6.5	2.8							2.101	2.48
F	$mg\ kg^{-1}$			3594										
Ga	$mg\ kg^{-1}$		21.6	**23**	14.1	23			**21.3**			21.4	24.37	23.16
Gd	$mg\ kg^{-1}$		8.3		30.5	6.2							9.622	7.41
Ge	$mg\ kg^{-1}$		1			0.8							1.661	
Hf	$mg\ kg^{-1}$	10	10.5	**16**		9.9							7.641	9.59
Hg	$mg\ kg^{-1}$		0.65			0.7								
Ho	$mg\ kg^{-1}$		0.88			0.8							0.609	0.73
I	$mg\ kg^{-1}$				2.4									
In	$mg\ kg^{-1}$					0.02							0.017	
La	$mg\ kg^{-1}$	162	170	**161**	136	175.6	168		**153.3**			172.8	145.2	160.230
Li	$mg\ kg^{-1}$	53	50.9			56.2							49.47	
Lu	$mg\ kg^{-1}$		0.33			0.3							0.268	0.3
Mo	$mg\ kg^{-1}$		4.76	**2**		4.6						5.03	4.207	4.2
Nb	$mg\ kg^{-1}$	40	40.9	**44**	30	44			**37.6**			42.16	37.59	36.19
Nd	$mg\ kg^{-1}$		91.2	**80**	71.1	101.4							83.54	87.83
Ni	$mg\ kg^{-1}$		3.66	**7**		2.7						3.7	1.848	
Pb	$mg\ kg^{-1}$	114	115	**124**	147	122.5			**110.2**			122.9	120.480	112.190
Pd	$mg\ kg^{-1}$													
Pr	$mg\ kg^{-1}$		31.8		12.5	30.8							25.71	28.3
Rb	$mg\ kg^{-1}$	191	212	**191**	186	198			**183.1**			190.940	154.5	181.010
Re	$mg\ kg^{-1}$					0.003							0.005	
S	$mg\ kg^{-1}$			488		1700	1350			0.11			1205	1307.700
Sb	$mg\ kg^{-1}$		2.18			2.91			**4.2**				2.773	
Sc	$mg\ kg^{-1}$		0.32	**3**									4.477	
Se	$mg\ kg^{-1}$												1.611	
Sm	$mg\ kg^{-1}$		11.8			12.3							9.247	10.89
Sn	$mg\ kg^{-1}$		1.28	**4**		1.6							1.328	1.31
Sr	$mg\ kg^{-1}$	1751	1520	**1716**	1670	1792		1621	**1690.900**	0.4		1679.080	1602.100	1798.900
Ta	$mg\ kg^{-1}$		1.87	**1**		1.8							1.856	1.75
Tb	$mg\ kg^{-1}$		1.07			0.9							0.809	0.86
Te	$mg\ kg^{-1}$												0.084	
Th	$mg\ kg^{-1}$		61.4	**52**	51.5	62			**63.4**			58.8	52.21	57.85
Tl	$mg\ kg^{-1}$		2			2.1							1.868	0.63
Tm	$mg\ kg^{-1}$		0.34			0.3							0.267	0.29
U	$mg\ kg^{-1}$		11.9	**10**	16.6	13.4			**18.9**			11.9	12.3	12.66
V	$mg\ kg^{-1}$		30.5	**31**		26.5	29		**21**			22.9	24.54	37.4
W	$mg\ kg^{-1}$		4.85	**1**		7							5.34	
Y	$mg\ kg^{-1}$	25	24.9	**15**	22.1	25	23		**22**			23.32	22.12	22.84
Yb	$mg\ kg^{-1}$		2.06			2.1							1.745	2.02
Zn	$mg\ kg^{-1}$		97.5	**89**	87	94	102	137	**79.1**			85.75	86.51	100.1
Zr	$mg\ kg^{-1}$	568	693	**596**	569	636	648	601	**536**	0.12		568.8	536.440	622.1

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

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V86	V87	V89	V90	V92	V93	V94	V95	V96	V97	V98	V99	V100
SiO2	g 100g^{-1}	52.61	52.35	51.677	52.56	52.43	52.08	52.57		51.398	52.47	51.64	52.62	
TiO2	g 100g^{-1}	0.35	0.33	0.348	0.340	0.34	0.34	0.335	0.396	0.335	0.362	0.332	0.35	
Al2O3	g 100g^{-1}	22.93	22.57	22.433	23.018	22.56	22.32	22.82		22.73	23.53	22.5	22.71	21.9
Fe2O3T	g 100g^{-1}	2.4	2.54	2.637	2.585	2.57	2.67	2.82		2.82	2.725	2.63	2.65	2.69
Fe(II)O	g 100g^{-1}												1.13	
MnO	g 100g^{-1}	0.14	0.136	0.14	0.142	0.13	0.141	0.137		0.16	0.142	0.139	0.14	0.144
MgO	g 100g^{-1}	0.2	0.22	0.217	0.232	0.25	0.01	0.26		0.21	0.243	0.215	0.31	0.24
CaO	g 100g^{-1}	2.38	2.16	2.303	2.353	2.23	2.36	2.249		2.127	2.449	2.25	2.3	2.31
Na2O	g 100g^{-1}	6.82	6.77	6.89	7.047	7.05	7.13	7.84		7.47	7.321	7.02	6.93	7.12
K2O	g 100g^{-1}	9.06	9.28	9.077	9.384	8.97	9.42	9.342		9.292	9.327	9.22	9.25	9.47
P2O5	g 100g^{-1}	0.02	0.033	0.04	0.048	0.04	0.034	0.027		0.01	0.034		0.04	
H2O+	g 100g^{-1}													
CO2	g 100g^{-1}													
LOI	g 100g^{-1}	2.69	3.26	3.328	2.08	3.44	3.28			3.32		3.24	3.42	
Ag	mg kg^{-1}							0.186					0.35	
As	mg kg^{-1}							23.38		45			22.13	
Au	mg kg^{-1}													
B	mg kg^{-1}	40.3						52.9						
Ba	mg kg^{-1}	438		391.4	416.050		5198	54.08	423		424.3	448	431.4	425
Be	mg kg^{-1}	8.43			7.77			8.078					8.83	
Bi	mg kg^{-1}				1.09			1.086					0.94	1.2
Br	mg kg^{-1}													
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}		3270	3307										
Cd	mg kg^{-1}	0.12						0.256					0.27	
Ce	mg kg^{-1}	306		275.8	217.750		399	289.030	306				301.6	296
Cl	mg kg^{-1}			1639									1884	
Co	mg kg^{-1}	1.75		2.126	1.04		17	1.54	1.75				2.01	1.7
Cr	mg kg^{-1}	64.6		37.42	43.8		233	38.5	36.5				48.86	
Cs	mg kg^{-1}	14.1			12.2		20	8.57	12.9				12.58	12.2
Cu	mg kg^{-1}	3.41			6.2		109	3.62	5.24	6			5.12	4.5
Dy	mg kg^{-1}	4.27		3.817	4.09			4.245	4.14				4.26	4.2
Er	mg kg^{-1}	2.26		1.942	2.2			2.115	2.11				2.13	2.1
Eu	mg kg^{-1}	2.59		2.325	2.43			2.522	2.54				2.71	2.6
F	mg kg^{-1}			3809									3611	
Ga	mg kg^{-1}	23.3		22	27.1		23	19.51		26			21.67	23
Gd	mg kg^{-1}	10.1		6.467	7.04			6.271	6.71				6.82	7.6
Ge	mg kg^{-1}	1.25					1.5						0.95	
Hf	mg kg^{-1}	11.1		9.007	11.18		31	8.13	9.03				10.72	
Hg	mg kg^{-1}													
Ho	mg kg^{-1}	0.75		0.7	0.7			0.792	0.778				0.77	0.78
I	mg kg^{-1}													
In	mg kg^{-1}													
La	mg kg^{-1}	172		156.1	149.110		237	162.084	170				171.1	163
Li	mg kg^{-1}	58.1		53.13	51.79			57.62	65.1					55
Lu	mg kg^{-1}	0.31		0.288	0.3			0.33	0.322				0.31	0.31
Mo	mg kg^{-1}	3.52			3.67		29	4.06	5.14	8			4.72	4.3
Nb	mg kg^{-1}	49		41.84	35.5		22	39.454	47.2	39			41.33	42
Nd	mg kg^{-1}	105		84.48	82.29		191	89.41	98.9				102.6	90
Ni	mg kg^{-1}	3.4			1.55		158	1.69	2.48	1			7.14	2.4
Pb	mg kg^{-1}	130		141	115.570		231	126.980	124	126			123.6	141
Pd	mg kg^{-1}													
Pr	mg kg^{-1}	32.8		26.85	25.15			29.022	29.7				29.14	29.2
Rb	mg kg^{-1}	201		190	193.2		652	179.9	207	196		279	196.1	191
Re	mg kg^{-1}													
S	mg kg^{-1}		1910	1692				1932				1660	1802	
Sb	mg kg^{-1}				2.73			2.711	2.96				3.08	2.8
Sc	mg kg^{-1}	1		5.678					0.534					
Se	mg kg^{-1}							0.22						
Sm	mg kg^{-1}	11.9		10.6	10.06		40	11.381	11.5				11.42	11.4
Sn	mg kg^{-1}				1.65			1.78	4.41				1.76	1.6
Sr	mg kg^{-1}	1783	2250	1608	1693.100		760	1696.820	1930	1701	1814	1805	1788	1750
Ta	mg kg^{-1}	2.43		1.808	1.83			2.61	1.97				1.77	
Tb	mg kg^{-1}	1.02		0.740	0.91			0.828	0.832				0.85	0.82
Te	mg kg^{-1}													0.04
Th	mg kg^{-1}	68.8		55.29	48.9		123	54.57	65.3	70			63.81	63
Tl	mg kg^{-1}							1.496	2.56					2.4
Tm	mg kg^{-1}	0.32		0.274	0.29			0.31						0.31
U	mg kg^{-1}	14.5		10.82	13.2		12	12.556	13.8	21			13.45	15
V	mg kg^{-1}	30.2		26.19	37.05		168	27.2	30.9				28.02	29
W	mg kg^{-1}				6.86			6.962		8			6.8	
Y	mg kg^{-1}	26.6		23.5	23.68		49	23.68	32.4	36			24.01	
Yb	mg kg^{-1}	2.1		1.923	2.08			2.168	2.17				2.17	2.1
Zn	mg kg^{-1}	90.5		83.5	81.6		103	97.8	109	83			99.35	95
Zr	mg kg^{-1}	636		554	604.080		889	413.7	598	622	677.8	592	616.8	

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

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V101	V102	V103	V104	V105	V106	V107	V108	V109	V111	V113	V114	V115
SiO2	g 100g^{-1}	**51.38**	51.8	52.09	50.92	50.42		**51.7**	53.4	51.916			52.12	51.94
TiO2	g 100g^{-1}	**0.35**	0.36	0.34	0.33	0.32		**0.34**	0.289	0.337	**0.354**		0.33	0.344
Al2O3	g 100g^{-1}	**22.48**	22.5	22.81	22.34	22.82		**22.48**	20.9	22.687			22.44	22.96
Fe2O3T	g 100g^{-1}	**2.62**	2.66	2.72	2.55	2.66		**2.67**	2.3	2.641		**2.62**	2.52	2.61
Fe(II)O	g 100g^{-1}	**0.85**								0.942				
MnO	g 100g^{-1}	**0.135**	0.14	0.139	0.13	0.14		**0.139**	0.121	0.139	**0.142**	**0.141**	0.135	0.14
MgO	g 100g^{-1}	**0.22**	0.24	0.216	0.19	0.15		**0.21**	0.254	0.227		**0.259**	0.231	0.2
CaO	g 100g^{-1}	**2.27**	2.28	2.2	2.2	2.05		**2.26**	2.71	2.277		**2.43**	2.19	2.24
Na2O	g 100g^{-1}	**7.01**	6.94	6.64	7.34	6.89		**6.89**	7.58	6.858			6.97	6.68
K2O	g 100g^{-1}	**9.07**	9.15	8.32	9.08	9.08		**9.08**	8.6	9.129			9.03	8.67
P2O5	g 100g^{-1}	**0.04**	0.04		0.03	0.04		**0.034**	0.050	0.037			0.037	0.033
H2O+	g 100g^{-1}									0.356				
CO2	g 100g^{-1}													
LOI	g 100g^{-1}	**3.21**	3.38	3.36	3.28	3.06	3.47	**3.38**	2.8	2.956			3.49	3.4
Ag	mg kg^{-1}						1.525							
As	mg kg^{-1}	**24**		24	19.2	26	32.507					**23.83**		
Au	mg kg^{-1}													
B	mg kg^{-1}					108								
Ba	mg kg^{-1}	**402**		440	419	178	378.6	**426**	402	435.580	**434**	**458.7**		474
Be	mg kg^{-1}					8	6.853			8.835	**9.19**			
Bi	mg kg^{-1}									1.07	**1.14**			
Br	mg kg^{-1}				2.6									
C(org)	mg kg^{-1}													
C(tot)	mg kg^{-1}									3344				
Cd	mg kg^{-1}									0.2				
Ce	mg kg^{-1}	**318**			289.5		218.829	**298.830**		268.680	**308**	**320.7**		302
Cl	mg kg^{-1}				1000				2110					
Co	mg kg^{-1}				2.4	4	3.322			1.66	**1.6**	**1.463**		1.61
Cr	mg kg^{-1}	**35**		47	41.3	25	24.207	**44**	64	43.2	**43.9**	**40.93**		57
Cs	mg kg^{-1}				10.7			**12.74**		12.907	**12.7**	**13.34**		12.2
Cu	mg kg^{-1}				4.4	5	6.999	**5**		3.9	**4.13**	**4.25**		38
Dy	mg kg^{-1}						4.457	**4.59**		4.175	**4.49**	**4.12**		3.67
Er	mg kg^{-1}						2.344	**2.17**		2.071	**2.33**	**1.991**		
Eu	mg kg^{-1}						3.267	**2.79**		2.462	**2.77**	**2.53**		
F	mg kg^{-1}				3000				1930					
Ga	mg kg^{-1}	**20**		20	21.5		21.211	**5**	11	21.894	**23.2**	**24.45**		20
Gd	mg kg^{-1}						14.647	**6.75**		6.066	**6.19**	**8.63**		
Ge	mg kg^{-1}													1.18
Hf	mg kg^{-1}			16	13.3		13.171	**10.16**		9.69	**10.8**	**9.03**		8.18
Hg	mg kg^{-1}						0.317							
Ho	mg kg^{-1}						0.835	**0.83**		0.732	**0.82**	**0.756**		0.68
I	mg kg^{-1}													
In	mg kg^{-1}									0.015				
La	mg kg^{-1}	**183**			174.6		158.619	**168.4**		145.653	**170**	**177.6**		162
Li	mg kg^{-1}			58.2		57				55.47	**57.5**			46.65
Lu	mg kg^{-1}						0.213	**0.33**		0.311	**0.34**	**0.325**		
Mo	mg kg^{-1}				4.2	9	1.949			4.756	**4.12**			
Nb	mg kg^{-1}	**41**		38	39.3		96.59	**40.74**	36	42.956	**47.5**	**46.2**		36
Nd	mg kg^{-1}	**91**			75.5		85.543	**92.36**		85.694	**96.7**	**93.41**		117
Ni	mg kg^{-1}				2.5	4	0.606	**4**		2.41	**3.23**	**2.97**		
Pb	mg kg^{-1}	**114**		111	118	101	88.347	**121.120**	117	119.390	**131**	**111.6**		109
Pd	mg kg^{-1}													
Pr	mg kg^{-1}						32.594	**30.12**		27.177	**31.6**	**30.69**		
Rb	mg kg^{-1}	**182**		189	190.1		146.635	**192.7**	175	194.290	**196**	**197.2**		189
Re	mg kg^{-1}													
S	mg kg^{-1}				1200				1780	1131				
Sb	mg kg^{-1}				2.45		2.008			2.853				
Sc	mg kg^{-1}				1.5			**0.4**			**0.44**	**1.528**		
Se	mg kg^{-1}													
Sm	mg kg^{-1}				8.4		12.924	**12.04**		11.049	**12.1**	**11.57**		
Sn	mg kg^{-1}				0.98		0.841			1.79	**1.64**			
Sr	mg kg^{-1}	**1729**		1694	1718.900	1814	191.780	**1757**	1690	1713.830	**1812**	**1729.800**		1533
Ta	mg kg^{-1}						4.455	**1.81**		1.920	**2.07**	**1.98**		
Tb	mg kg^{-1}						1.154	**0.9**		0.781	**0.87**	**1.074**		0.96
Te	mg kg^{-1}													
Th	mg kg^{-1}	**61**		54	62.7		57.572	**63.27**	41	59.645	**70.6**	**67.42**		66
Tl	mg kg^{-1}				1.2					1.947	**2.53**			
Tm	mg kg^{-1}						0.299	**0.32**		0.305	**0.34**	**0.324**		
U	mg kg^{-1}	**14**		18	12.8		15.105	**13.04**		13.427	**14.2**	**13.75**		19
V	mg kg^{-1}	**26**		21	22.8	30	25.76	**33**		28.84	**30.9**	**26.67**		36
W	mg kg^{-1}				7.2	11				6.639				
Y	mg kg^{-1}	**23**		26	24.5	20	23.386	**25.92**		25.415	**27.9**	**26.91**		
Yb	mg kg^{-1}						2.115	**2.04**		2.024	**2.22**	**2.05**		
Zn	mg kg^{-1}	**94**		79	83.3	78	82.233	**100**	92	102.6	**97**	**79.18**		102
Zr	mg kg^{-1}	**611**		583	568.3			**603**	694	589.3	**650**	**579.1**		563

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

Table 1 - GeoPT39A Contributed data for Nepheline syenite, MNS-1. 10/06/2016

Lab Code		V116	V117	V118	V119	V120	V121	V122	V123	V124	V125	V126	-	-
SiO2	$g\,100g^{-1}$	51.62	**51.98**	51.91	51.11	**51.51**	51.516	**51.41**	52.355	51.87		**51.43**		
TiO2	$g\,100g^{-1}$	0.33	**0.35**	0.41	0.352	**0.345**	0.35	**0.319**	0.31	0.35	**0.300**	**0.35**		
Al2O3	$g\,100g^{-1}$	22.56	**22.71**	22.94	22.78	**22.59**	22.937	**22.12**	22.46	22.16	**22.466**	**22.08**		
Fe2O3T	$g\,100g^{-1}$	2.59	**2.68**	2.57	2.68	**2.64**	2.638	**2.599**	2.53	2.9	**2.588**	**2.69**		
Fe(II)O	$g\,100g^{-1}$											**0.88**		
MnO	$g\,100g^{-1}$	0.13	**0.174**	0.125	0.137	**0.134**	0.136	**0.135**	0.11	0.13	**0.14**	**0.139**		
MgO	$g\,100g^{-1}$	0.2	**0.06**	0.2	0.15	**0.22**	0.242	**0.234**	0.23	0.24	0.381	**0.223**		
CaO	$g\,100g^{-1}$	2.2	**2.33**	2.25	2.27	**2.27**	2.338	**2.135**	2.11	2.68	**2.309**	**2.302**		
Na2O	$g\,100g^{-1}$	7.19	**6.98**	6.84	7.14	**6.94**	6.938	**6.776**	6.975	6.85	**6.983**	**6.9**		
K2O	$g\,100g^{-1}$	9.05	**9.69**	8.86	9.2	**9.12**	9.119	**9.083**	9.015	8.13	**8.794**	**9.1**		
P2O5	$g\,100g^{-1}$	0.04	**0.04**	0.039	0.042	**0.039**	0.039	**0.033**	0.04	0.038				
H2O+	$g\,100g^{-1}$											**1.85**		
CO2	$g\,100g^{-1}$													
LOI	$g\,100g^{-1}$	3.33	**3.3**	3.01		**3.4**	3.364	**3.34**	3.21	3		**3.59**		
Ag	$mg\,kg^{-1}$													
As	$mg\,kg^{-1}$		**22**	20.55	23			**19**			**22.1**	**24.218**		
Au	$mg\,kg^{-1}$													
B	$mg\,kg^{-1}$											**47**		
Ba	$mg\,kg^{-1}$	393		400	381	**417**	477	**393**	456	425	**450**	**423.182**		
Be	$mg\,kg^{-1}$			9.62					5.78	9.5		**8.155**		
Bi	$mg\,kg^{-1}$			0.845					0.72			**1.069**		
Br	$mg\,kg^{-1}$				5			**6**			**2.2**			
C(org)	$mg\,kg^{-1}$											**218**		
C(tot)	$mg\,kg^{-1}$											**3222**		
Cd	$mg\,kg^{-1}$											**0.228**		
Ce	$mg\,kg^{-1}$	291	**100**	267	202.5	**273**		**278**	299.260	293	**303**	**295.068**		
Cl	$mg\,kg^{-1}$							**2410**			**1940**	**1855**		
Co	$mg\,kg^{-1}$			2.89			1		2	1.59	**1.5**	**1.457**		
Cr	$mg\,kg^{-1}$	35		39.9	36	**43**	25	**50**	35.28	43	**43.6**	**46.094**		
Cs	$mg\,kg^{-1}$			11.88					9.63	14	**12.9**	**11.947**		
Cu	$mg\,kg^{-1}$			3.17	12		10	**7**	5	3				
Dy	$mg\,kg^{-1}$			3.81	3.72				3.86	4.28	**4.9**	**4.301**		
Er	$mg\,kg^{-1}$			3.03	2				2.28	2.05		**2.054**		
Eu	$mg\,kg^{-1}$			3.08	2.06				3.28	2.5	**2.52**	**2.580**		
F	$mg\,kg^{-1}$						4510	**4102**				**4481**		
Ga	$mg\,kg^{-1}$			23.43	21	**21**	20	**20**	22	21.5		**23.174**		
Gd	$mg\,kg^{-1}$	20		13.72	6.08			**8**	9.07	7.56		**7.168**		
Ge	$mg\,kg^{-1}$							**3**	0.93			**1.361**		
Hf	$mg\,kg^{-1}$				7		6	**17**	9.1	9.96	**10.1**	**10.137**		
Hg	$mg\,kg^{-1}$													
Ho	$mg\,kg^{-1}$			0.687	0.67				0.75	0.75		**0.770**		
I	$mg\,kg^{-1}$													
In	$mg\,kg^{-1}$			0.017					0.02					
La	$mg\,kg^{-1}$	99	**60**	150	95.3	**134**		**153**	178.580	168	**165.7**	**158.091**		
Li	$mg\,kg^{-1}$			59.57			56			61		**54**		
Lu	$mg\,kg^{-1}$			0.361	0.26				0.29	0.33	**0.27**	**0.315**		
Mo	$mg\,kg^{-1}$			4.17					3.09	4.9		**4.116**		
Nb	$mg\,kg^{-1}$			37.6	35	**40**		**39**	30	30		**37.124**		
Nd	$mg\,kg^{-1}$			83.5	63.4	**87**		**83**	92.92	96	**92**	**89.959**		
Ni	$mg\,kg^{-1}$	54		3.17	4		4	**9**	4	2.8				
Pb	$mg\,kg^{-1}$	117		105.5	118	**115**	41	**115**	115	110		**117.536**		
Pd	$mg\,kg^{-1}$													
Pr	$mg\,kg^{-1}$			26.46	19.7				28.83	29.6		**29.034**		
Rb	$mg\,kg^{-1}$	226		194	181	**208**		**196**	175	195	**186**	**182.307**		
Re	$mg\,kg^{-1}$													
S	$mg\,kg^{-1}$							**1206**				**1779**		
Sb	$mg\,kg^{-1}$								1.49		**2.8**	**2.817**		
Sc	$mg\,kg^{-1}$			3.08	1				1.5	0.78	**0.185**			
Se	$mg\,kg^{-1}$											**0.04**		
Sm	$mg\,kg^{-1}$			10.2	8.59				11.02	11.3	**11.1**	**11.585**		
Sn	$mg\,kg^{-1}$								1.34	1.8		**2.075**		
Sr	$mg\,kg^{-1}$	2865	**200**	1704	1588	**1781**	1860	**1566**	1672	1470	**1820**	**1789.599**		
Ta	$mg\,kg^{-1}$								0.58		**1.66**	**1.990**		
Tb	$mg\,kg^{-1}$			1.354	0.71				1.11	0.93	**0.78**	**0.824**		
Te	$mg\,kg^{-1}$								0.2					
Th	$mg\,kg^{-1}$			58.8	39.11	**60**		**61**	60	65	**63.9**	**59.902**		
Tl	$mg\,kg^{-1}$			1.834					1.74	1.89				
Tm	$mg\,kg^{-1}$			0.342	0.26				0.3	0.31		**0.290**		
U	$mg\,kg^{-1}$			11.52	8	**20**		**7**	9.71	13.4	**12.6**	**13.418**		
V	$mg\,kg^{-1}$	33		22.27	22	**24**		**26**	19	31	**29**	**26.207**		
W	$mg\,kg^{-1}$								5.02	8.3	**6.2**	**6.745**		
Y	$mg\,kg^{-1}$	38		27.67	18.3	**27**	22	**31**	22	25.8		**25.384**		
Yb	$mg\,kg^{-1}$			2.3	1.66				1.94	2.06	**1.94**	**2.079**		
Zn	$mg\,kg^{-1}$	130		79.1	87	**86**	95	**95**	78	73	**99**	**108.693**		
Zr	$mg\,kg^{-1}$	649		583	614	**602**	607	**551**	580	560	**610**	**631.977**		

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

Table 2 - GeoPT39A Assigned values and statistical summary for Nepheline syenite, MNS-1.

	Assigned Value	Uncertainty of assigned value	Horwitz Target Value	Uncertainty/ Target	Number of reported results	Robust Mean of results	Robust SD of results	Median of results	Status of consensus value	Type of consensus value
	X_a	sdm	H_a	sdm/H_a	n					
	g 100g⁻¹	g 100g⁻¹	g 100g⁻¹			g 100g⁻¹	g 100g⁻¹	g 100g⁻¹		
SiO2	51.89	0.06609	0.5727	0.1154	88	51.89	0.62	51.86	Assigned	Robust Mean
TiO2	0.346	0.0009661	0.008118	0.119	92	0.3421	0.01561	0.346	Assigned	Median
Al2O3	22.53	0.04106	0.282	0.1456	89	22.53	0.3874	22.5	Assigned	Robust Mean
Fe2O3T	2.632	0.0105	0.0455	0.2308	92	2.632	0.1007	2.638	Assigned	Robust Mean
MnO	0.139	0.0006183	0.003741	0.1653	92	0.1363	0.007199	0.139	Assigned	Median
MgO	0.2331	0.005001	0.005805	0.8614	89	0.2331	0.04718	0.233	Provisional	Robust Mean
CaO	2.275	0.008517	0.04021	0.2118	92	2.279	0.09365	2.275	Assigned	Median
Na2O	6.98	0.02043	0.1042	0.1961	89	7	0.229	6.98	Assigned	Median
K2O	9.124	0.02425	0.1308	0.1854	90	9.124	0.2301	9.105	Assigned	Robust Mean
P2O5	0.03966	0.0004631	0.001289	0.3592	78	0.03748	0.006773	0.039	Provisional	Mode
LOI	3.28	0.01931	0.05486	0.3519	78	3.25	0.1808	3.28	Assigned	Median
	mg kg⁻¹	mg kg⁻¹	mg kg⁻¹			mg kg⁻¹	mg kg⁻¹	mg kg⁻¹		
As	22.94	0.4492	1.145	0.3923	41	23.3	2.963	22.94	Assigned	Median
Ba	420	2.895	13.53	0.2139	85	419.2	31.6	420	Assigned	Median
Be	8.6	0.1401	0.4976	0.2815	39	8.554	0.867	8.6	Assigned	Median
Bi	1.086	0.03688	0.08579	0.4299	21	1.095	0.207	1.086	Assigned	Median
Ce	293.8	1.686	9.991	0.1688	73	287.2	22.45	290	Assigned	Mode
Co	1.559	0.04039	0.1167	0.3462	52	1.801	0.564	1.625	Assigned	Mode
Cr	42.75	0.9422	1.943	0.4849	76	42.13	9.285	42.75	Provisional	Median
Cs	12.59	0.1319	0.6878	0.1917	48	12.62	1.144	12.59	Assigned	Median
Dy	4.2	0.03945	0.2707	0.1457	51	4.166	0.3142	4.2	Assigned	Median
Er	2.13	0.02753	0.152	0.1811	49	2.136	0.1749	2.13	Assigned	Median
Eu	2.55	0.02699	0.1772	0.1523	51	2.571	0.2109	2.55	Assigned	Median
Ga	21.95	0.26	1.103	0.2358	64	22.05	2.006	21.95	Assigned	Median
Gd	7.129	0.1777	0.4243	0.4189	52	7.535	1.537	7.129	Provisional	Median
Hf	10.1	0.2179	0.5704	0.382	53	10.01	2.059	10.1	Assigned	Median
Hg	0.61	0.03129	0.05256	0.5954	11	0.5991	0.1129	0.61	Provisional	Median
Ho	0.7574	0.008739	0.06317	0.1384	49	0.7574	0.06117	0.76	Assigned	Robust Mean
La	162.6	1.484	6.043	0.2455	73	161.7	12.87	162.6	Assigned	Median
Li	55.94	0.665	2.442	0.2724	38	55.29	4.171	55.94	Assigned	Median
Lu	0.3068	0.004252	0.02932	0.145	50	0.3068	0.03006	0.31	Assigned	Robust Mean
Mo	4.2	0.1211	0.2707	0.4474	47	4.311	0.9243	4.2	Provisional	Median
Nb	40.52	0.6558	1.857	0.3532	72	40.52	5.565	40.15	Assigned	Robust Mean
Nd	89.36	1.009	3.635	0.2777	62	88.95	7.7	89.36	Assigned	Median
Pb	115	1.284	4.504	0.2851	75	115.5	12.46	115	Assigned	Median
Pr	28.93	0.3572	1.394	0.2562	52	28.52	2.498	28.93	Assigned	Median
Rb	192.4	1.487	6.974	0.2133	77	192.4	13.05	192.7	Assigned	Robust Mean
Sb	2.8	0.06657	0.1918	0.3471	31	3.064	0.8718	2.8	Assigned	Median
Sm	11.39	0.1002	0.6317	0.1585	57	11.31	0.8986	11.39	Assigned	Median
Sn	1.642	0.07781	0.1219	0.6386	37	1.913	0.8105	1.75	Provisional	Mode
Sr	1714	9.246	44.69	0.2069	87	1702	116.2	1714	Assigned	Median
Ta	1.883	0.04871	0.1369	0.3558	43	2.055	0.4577	1.97	Assigned	Mode
Tb	0.87	0.01453	0.07106	0.2045	51	0.9093	0.15	0.87	Assigned	Median
Th	60.43	0.739	2.607	0.2834	71	59.86	6.807	60.43	Assigned	Median
Tl	1.868	0.09758	0.136	0.7175	27	1.834	0.5666	1.868	Provisional	Median
Tm	0.31	0.00435	0.02957	0.1471	46	0.3078	0.02911	0.31	Assigned	Median
U	13.03	0.2393	0.7083	0.3378	69	13.03	1.987	13.04	Assigned	Robust Mean
V	27.3	0.5367	1.328	0.4042	70	27.3	4.49	27	Assigned	Robust Mean
W	6.56	0.1652	0.3953	0.4178	33	6.548	1.338	6.56	Provisional	Median
Y	25.02	0.3487	1.233	0.2828	75	25.02	3.019	25	Assigned	Robust Mean
Yb	2.08	0.01868	0.149	0.1254	51	2.05	0.1794	2.08	Assigned	Median
Zn	96.9	1.381	3.894	0.3546	78	91.92	11.16	92	Provisional	Mode
Zr	589.3	4.893	18.05	0.2711	81	594.4	46.33	589.3	Assigned	Median

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

Lab Code	V2	V3	V4	V5	V6	V8	V9	V11	V12	V13	V14	V15	V17
SiO2	0.88	-0.02	-0.86	-1.72	1.58	0.93	-0.15	-0.19	-0.14	*	0.29	-1.37	-0.20
TiO2	-1.97	-0.99	-5.67	0.09	1.48	0.25	0.06	-0.37	0.25	*	0.49	-1.97	-0.37
Al2O3	-0.67	-0.09	-1.59	0.43	-1.12	0.64	0.13	-0.12	-0.28	*	1.03	1.49	-0.26
Fe2O3T	-9.93	0.31	-0.92	2.18	2.73	-1.01	-0.46	-0.35	-0.24	*	0.40	6.55	-0.24
MnO	-2.41	0.13	0.27	0.27	1.47	-1.74	0.27	0.13	0.13	*	0.27	1.60	0.13
MgO	-3.99	3.17	-2.26	-3.99	6.62	-0.01	-2.42	2.31	-1.99	*	1.18	16.68	1.45
CaO	-5.85	-1.18	-0.62	-2.37	2.30	0.93	-0.06	-0.19	-0.19	*	-0.13	1.61	-0.19
Na2O	-0.67	0.05	-1.25	-1.73	-0.86	1.34	-0.14	0.00	-0.29	*	-2.02	-4.03	0.10
K2O	0.05	-0.40	-1.41	0.63	-1.39	-0.82	-0.32	-0.17	0.60	*	-0.11	1.35	0.10
P2O5	2.59	-1.81	-7.49	1.66	7.89	0.13	0.13	*	0.13	*	-1.29	-8.27	-3.75
LOI	0.73	0.64	1.73	*	-1.64	1.73	*	-1.18	-0.46	*	-2.73	1.28	0.18
As	5.12	*	-3.09	-1.61	*	2.20	*	0.55	*	*	-2.13	*	*
Ba	-0.44	0.26	-1.33	1.26	-2.77	0.00	*	1.99	-1.18	1.11	-1.48	-0.30	*
Be	5.43	0.77	*	*	-0.90	0.02	*	-0.23	*	1.09	3.42	-1.00	*
Bi	3.43	*	*	*	*	*	*	-0.56	*	0.86	*	*	*
Ce	-1.18	-1.39	-2.90	-1.11	-0.04	-2.29	*	0.61	*	1.72	2.02	-0.68	*
Co	-0.59	0.35	*	-0.23	2.32	-0.13	*	-0.25	*	0.35	-2.57	-1.37	*
Cr	1.16	-0.48	-2.03	0.40	0.68	-4.28	*	-2.51	-2.77	0.95	0.64	3.06	*
Cs	-0.28	-1.01	*	-0.67	-0.72	*	*	0.23	*	0.16	-2.17	*	*
Dy	-1.26	0.28	*	-0.59	-0.18	-0.18	*	0.46	*	1.15	0.11	4.47	*
Er	-1.25	0.13	*	-2.28	-0.10	0.07	*	0.66	*	1.25	2.76	-0.39	*
Eu	-1.58	-0.23	*	-0.66	-0.14	-0.28	*	0.11	*	1.30	-0.73	-0.06	*
Ga	-0.41	0.57	-1.49	1.59	-0.93	*	*	0.39	-0.88	1.32	1.86	*	*
Gd	-0.09	1.14	*	-1.72	1.62	0.24	*	-0.27	*	-2.09	-1.88	-0.14	*
Hf	*	0.09	*	-7.64	-0.53	0.26	*	0.61	*	1.05	-5.29	*	*
Hg	*	*	*	-2.47	*	*	*	*	*	*	*	*	*
Ho	-0.91	-0.06	*	-2.07	0.34	-0.22	*	0.34	*	0.83	0.12	-0.28	*
La	-0.59	-1.04	-2.79	-0.26	-0.13	-0.71	*	0.99	*	1.40	0.41	-2.59	*
Li	1.50	0.57	*	-0.03	*	0.50	*	0.59	*	0.68	-2.02	-1.61	*
Lu	-0.92	0.22	*	-1.37	-0.12	-0.12	*	-0.12	*	1.13	0.41	-0.40	*
Mo	*	*	0.74	-2.19	-0.92	-1.20	*	-0.04	*	-0.30	*	2.96	*
Nb	2.68	1.02	-0.60	-3.57	0.59	1.48	*	0.37	*	3.87	-2.97	*	*
Nd	-0.92	0.13	-2.11	-1.48	-0.09	-0.89	*	0.95	*	1.99	-0.04	-2.63	*
Pb	-2.22	0.78	-2.73	2.29	-4.98	-1.11	*	1.00	-0.67	4.00	2.89	-1.33	*
Pr	-0.38	-0.12	*	-0.76	-0.73	-1.12	*	0.21	*	2.06	-0.52	-2.00	*
Rb	4.10	-1.32	-0.48	-0.92	-0.74	-0.46	*	0.51	*	0.51	-0.78	*	*
Sb	-0.26	*	*	*	*	0.65	*	0.29	*	*	*	*	*
Sm	-1.09	-0.23	-0.62	-1.46	-0.23	-0.39	*	0.48	*	1.12	-0.24	0.00	*
Sn	-0.34	*	*	*	-3.86	*	*	*	*	0.07	*	*	*
Sr	0.59	-0.09	-2.63	0.96	-3.99	0.11	*	0.12	0.57	2.40	-1.63	-3.96	*
Ta	*	0.21	8.16	*	-0.67	5.54	*	0.06	*	1.51	-6.30	*	*
Tb	-1.27	0.07	*	-1.55	0.21	-0.14	*	0.00	*	0.00	-0.04	7.74	*
Th	-3.12	-0.04	-3.16	0.00	0.15	0.34	*	0.53	*	3.98	*	*	*
Tl	-0.21	*	*	2.29	-2.82	*	*	0.52	*	4.57	-0.25	*	*
Tm	-1.01	0.00	*	-2.03	-0.17	-0.20	*	0.17	*	0.68	-0.10	-1.01	*
U	-2.59	0.26	5.04	0.24	-0.45	0.44	*	0.37	*	1.51	-0.75	*	*
V	2.11	0.79	-1.96	1.03	0.71	-0.30	*	*	-0.11	2.78	6.55	-0.91	*
W	-0.91	*	-7.99	*	-1.85	*	*	*	*	*	*	*	*
Y	2.01	0.32	0.96	*	0.28	-0.21	*	0.19	*	2.33	-0.87	-0.99	*
Yb	-1.48	0.07	*	-2.75	0.07	-0.34	*	0.77	*	0.87	0.07	-1.88	*
Zn	1.31	-0.67	-6.68	0.50	7.45	-0.13	*	1.04	-1.14	0.05	-0.23	3.36	*
Zr	0.43	1.16	-0.58	-16.75	-0.50	-0.15	*	2.29	0.96	3.09	-1.35	-0.57	*

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

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

Lab Code	V18	V19	V20	V21	V23	V24	V25	V27	V28	V29	V30	V31	V32
SiO2	0.10	-0.53	**-0.29**	1.07	*	**0.57**	0.19	-0.51	*	**3.54**	-0.42	*	0.25
TiO2	0.25	-0.37	**0.49**	-4.06	*	**-0.74**	0.25	0.06	0.86	**-4.43**	-0.43	*	-2.22
Al2O3	-0.58	-0.48	**0.46**	-0.23	*	**-1.66**	*	-0.94	*	**-5.11**	-0.41	*	0.34
Fe2O3T	-0.24	0.42	**-0.48**	-9.36	*	**1.83**	-0.02	-1.78	4.60	**-6.63**	-0.24	*	-1.12
MnO	0.13	-1.20	**-2.41**	-5.21	*	**0.53**	-1.20	-0.80	0.13	**-5.08**	-0.40	*	-1.20
MgO	*-14.05*	*0.59*	***9.79***	*3.17*	*	***-15.53***	*17.82*	*14.11*	*11.79*	***-38.44***	*-5.35*	*	*
CaO	0.19	0.06	**-1.87**	-1.80	*	**-0.25**	-2.30	7.90	5.66	**7.58**	-0.44	*	-2.43
Na2O	1.20	-0.86	**-0.86**	1.54	*	**-1.69**	-1.68	1.68	2.78	**5.85**	-1.06	*	-2.54
K2O	0.33	0.18	**-0.26**	0.60	*	**-1.39**	*	0.86	4.49	**-4.46**	-0.40	*	0.94
P2O5	*-0.26*	*4.01*	***0.26***	*0.13*	*	***-8.27***	*7.89*	*	*	***0.26***	*-0.64*	*	*-7.62*
LOI	-0.09	-1.09	**3.65**	-18.23	*	**2.01**	-3.37	0.36	*	**-1.28**	-0.73	*	0.82
As	1.77	0.90	*	*	*	*	*	*	*	**2.85**	-0.67	*	*
Ba	-2.92	0.66	*	9.53	*	**2.66**	-1.11	*	0.30	**0.00**	0.37	*	-2.70
Be	-0.10	*	*	-0.33	*	**0.84**	*	*	*	**-1.41**	-0.10	*	-1.79
Bi	8.94	*	*	*	*	*	*	*	*	*	*	*	*
Ce	0.96	0.81	*	-0.02	0.21	**1.34**	*	*	-4.39	**-2.88**	-0.24	*	0.23
Co	1.89	*	*	109.04	*	**-0.42**	*	*	-1.20	**31.21**	*	*	*
Cr	*-4.82*	*0.32*	*	*-4.31*	*	***-4.22***	*	*	*-1.71*	***16.29***	*-1.02*	*	*
Cs	-0.50	*	*	*	0.73	**3.52**	*	*	-0.72	**0.01**	-0.57	*	*
Dy	0.81	*	*	0.65	0.00	**0.07**	*	*	-1.02	**-0.37**	-0.67	*	0.09
Er	0.89	*	*	-0.33	-0.10	**-0.26**	*	*	-1.02	**-0.86**	-1.09	*	0.53
Eu	1.44	*	*	0.06	0.42	**0.06**	*	*	-1.02	**-0.85**	0.20	*	0.31
Ga	1.52	0.02	*	2.74	5.74	**-0.47**	*	*	*	**10.02**	-1.15	*	1.84
Gd	*2.41*	*	*	*0.51*	*-2.74*	***-3.53***	*	*	*-0.62*	***-0.77***	*-0.94*	*	*4.16*
Hf	-2.53	*	*	-0.18	*	**-1.35**	*	*	*	**-8.59**	-0.55	*	-2.51
Hg	*	*	*	*	*	*	*	*	*	*	*	***3.01***	*
Ho	2.47	*	*	-0.22	0.34	**0.04**	*	*	*	**-0.43**	-0.08	*	-0.53
La	2.93	3.18	*	0.46	0.20	**1.61**	*	*	-4.18	**-2.57**	0.04	*	0.00
Li	-0.19	*	*	*	*	**5.41**	*	*	0.57	*	*	*	*
Lu	4.32	*	*	0.39	-0.12	**-0.23**	*	*	-0.97	**-2.62**	-0.29	*	0.39
Mo	*-3.25*	*	*	*0.72*	*	***3.99***	*	*	*	***21.43***	*-1.44*	*	*
Nb	1.31	-1.49	*	-2.03	-0.06	**4.30**	*	*	*	**3.54**	0.51	*	0.67
Nd	*	*	*	0.16	0.90	**1.33**	*	*	-1.66	**-1.34**	-0.50	*	0.45
Pb	-2.93	0.67	*	-4.88	*	**-5.11**	*	*	-1.99	**5.33**	-0.11	*	0.56
Pr	0.46	*	*	0.33	0.78	**1.21**	*	*	-1.77	**-1.24**	-0.91	*	-0.48
Rb	-3.04	0.54	*	1.47	-0.60	**-1.08**	-2.33	*	0.47	**4.96**	-0.60	*	-2.04
Sb	4.48	*	*	*	2.09	*	*	*	*	**9.91**	-0.78	*	*
Sm	0.40	*	*	-0.23	0.40	**0.13**	*	*	-1.16	**-1.09**	0.48	*	0.21
Sn	*0.65*	*	*	*	*3.11*	*	*	*	*	***4.58***	*2.29*	*	*0.45*
Sr	-4.41	0.47	*	-0.64	*	**1.30**	-1.27	*	0.67	**10.25**	-0.31	*	-0.47
Ta	4.67	*	*	-1.62	1.89	**3.05**	*	*	*	**3.05**	-0.34	*	12.08
Tb	3.31	*	*	1.06	2.32	**-0.84**	*	*	-1.41	**-0.99**	-0.46	*	1.55
Th	0.44	0.11	*	-9.10	1.05	**1.29**	*	*	-1.02	**-2.47**	-0.04	*	1.84
Tl	*-1.35*	*	*	*	*	*	*	*	*	***-5.65***	*	*	*
Tm	3.55	*	*	0.17	-0.17	*	*	*	-0.85	**0.00**	-0.36	*	0.51
U	-3.41	-0.02	*	-0.14	-0.02	**1.44**	*	*	-1.36	**-0.47**	-0.59	*	-0.86
V	0.64	-1.62	*	-0.87	*	**0.72**	*	*	-0.87	**-0.23**	-5.69	*	-1.62
W	*1.44*	*	*	*-0.35*	*0.30*	*	*	*	*	*	*-1.05*	*	*
Y	0.88	-0.41	*	-0.01	-0.33	**2.11**	*	*	-2.77	**42.98**	-2.56	*	3.24
Yb	1.41	*	*	-0.03	2.42	**0.27**	*	*	-1.11	**0.13**	-1.04	*	0.07
Zn	*1.30*	*-1.91*	*	*-2.04*	*	***1.49***	*	*	*-0.35*	***-1.26***	*-2.35*	*	*-0.89*
Zr	-8.49	-0.92	*	-0.98	*	**-0.57**	-0.81	*	*	**10.68**	-0.56	*	-0.65

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

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

Lab Code	V33	V34	V36	V37	V38	V40	V41	V42	V44	V46	V49	V50	V51
SiO2	-0.36	*	0.29	-0.24	0.43	-6.53	-15.79	**-0.88**	1.19	0.01	0.04	**-0.57**	**1.23**
TiO2	0.00	*	0.86	-0.37	0.37	0.25	250.91	**0.49**	-0.99	0.25	-1.60	**0.49**	**0.49**
Al2O3	-0.09	*	2.02	-0.57	1.29	1.54	-24.52	**-0.81**	1.07	0.14	0.00	**-1.42**	**0.64**
Fe2O3T	0.31	*	3.28	-0.42	1.26	-6.83	73.60	**0.62**	0.53	0.64	-0.90	**5.45**	**0.40**
MnO	-2.00	*	-1.20	-3.25	0.80	-5.21	78.98	**0.27**	-1.20	1.47	-1.20	*	**0.27**
MgO	*1.45*	*	*-17.50*	*-7.16*	*1.45*	*-9.74*	*	***4.63***	*8.34*	*-8.88*	*2.31*	***6.35***	***2.90***
CaO	0.06	*	0.68	-0.03	0.70	13.37	20.08	**-0.62**	6.28	-0.69	0.31	**1.61**	**0.87**
Na2O	-0.62	*	4.85	0.83	0.35	-0.14	*	**-2.97**	4.80	1.68	-0.58	**0.19**	**1.54**
K2O	-0.13	*	2.43	0.07	0.96	-3.26	61.06	**-0.11**	-3.34	1.02	0.10	**-1.48**	**-0.64**
P2O5	*-2.20*	*	*4.01*	*-0.26*	*	*-3.75*	*469.40*	***0.26***	*0.13*	*-7.62*	*0.13*	*	***93.34***
LOI	0.36	*	*	1.00	-2.07	-0.36	*	**0.00**	*	2.92	-0.64	**-3.46**	**2.37**
As	*	*	*	*	*	*	-0.41	**3.55**	*	-0.85	-1.37	0.46	*
Ba	1.00	*	*	0.11	7.91	-1.88	-3.77	**1.03**	2.25	2.92	0.17	**-0.22**	**-1.63**
Be	*	*	*	*	*	*	*	**1.51**	0.03	-7.00	-1.51	*	*
Bi	*	*	*	*	*	*	*	8.82	*	*	-1.08	*	*
Ce	-0.39	**-6.40**	*	-0.40	*	-2.39	*	**0.12**	0.12	-0.69	0.11	**2.92**	*
Co	*	*	*	*	*	*	*	**-1.37**	14.75	*	-0.25	*	*
Cr	*1.35*	*	*	*-0.58*	*	*-0.19*	*26.05*	***4.09***	*-3.54*	*-1.48*	*-0.19*	*7.27*	***3.73***
Cs	*	*	*	*	*	*	23.95	*	*	*	0.37	*	*
Dy	*	**-0.89**	*	*	*	*	*	**0.70**	-0.24	-0.39	-0.37	*	*
Er	*	**-2.63**	*	*	*	*	*	**0.86**	0.66	0.13	0.13	*	*
Eu	*	**-1.47**	*	*	*	*	*	**0.73**	2.12	-0.40	0.45	*	*
Ga	0.02	*	*	*	*	0.02	*	-0.47	0.93	*	-0.88	*	**-1.77**
Gd	*	***0.10***	*	*	*	*	*	***2.60***	*2.36*	*2.82*	*-0.86*	*	*
Hf	1.67	*	*	*	*	*	*	0.88	1.28	*	0.79	*	**3.33**
Hg	*	*	*	*	*	*	*	*	*0.52*	*	*0.00*	*	*
Ho	*	**-1.54**	*	*	*	*	*	**0.52**	0.26	-0.45	0.42	*	*
La	-0.21	**-6.28**	*	0.10	*	-0.79	*	**1.07**	1.46	-0.29	0.78	**0.74**	*
Li	*	*	*	*	*	*	*	**-4.44**	*	-3.26	0.01	*	*
Lu	*	**-1.60**	*	*	*	*	*	**0.79**	0.22	-0.29	0.22	*	*
Mo	*-2.22*	*	*	*	*	*	*-5.32*	***-0.18***	*-0.76*	*-0.37*	*1.48*	*	*
Nb	-2.03	*	*	-0.71	*	0.40	-9.40	-0.19	-3.91	4.17	0.67	**-1.36**	**-1.36**
Nd	-0.74	*	*	4.52	*	*	*	**1.69**	0.45	-0.74	0.42	*	*
Pb	-0.56	*	*	-0.73	*	-6.33	-10.61	-0.22	0.67	*	-1.20	**0.22**	**-1.55**
Pr	0.74	**-5.74**	*	0.10	*	*	*	**0.91**	-0.13	-1.72	0.82	*	*
Rb	-0.75	*	*	0.46	*	-0.46	0.83	-0.46	-1.54	*	0.11	**0.80**	**0.94**
Sb	16.16	*	*	*	*	*	38.84	**-0.73**	*	*	-0.26	*	*
Sm	3.65	**-4.56**	*	*	*	*	*	**0.97**	-0.01	-0.63	0.18	*	*
Sn	*	*	*	*	*	*13.78*	*19.81*	*1.06*	*-0.91*	*34.30*	*9.68*	*	*
Sr	-0.18	*	*	0.51	*	-0.24	-19.03	-0.23	-0.64	-11.62	0.26	**-0.73**	**1.08**
Ta	18.69	*	*	*	*	*	*	0.79	-0.59	*	0.06	*	*
Tb	*	**2.39**	*	*	*	*	*	**0.28**	1.27	0.21	0.14	*	*
Th	-4.11	*	*	-0.26	*	-4.69	-10.89	**4.13**	0.49	1.43	0.59	*	**-0.93**
Tl	*	*	*	*	*	*	*1818.19*	***2.51***	*	*	*1.22*	*	*
Tm	*	**-2.37**	*	*	*	*	*	**0.34**	0.34	-0.17	0.34	*	*
U	-2.85	*	*	-4.89	*	-2.14	-7.29	**1.93**	-0.81	*	0.54	*	**-0.05**
V	-1.62	*	*	*	*	*	59.01	-2.07	-1.62	-6.14	1.39	-1.62	**1.28**
W	*	*	*	*	*	*	*151.06*	*-1.47*	*-0.06*	*41.03*	*0.56*	*	*
Y	1.21	**2.53**	*	-0.05	*	1.61	-4.06	-0.45	-0.01	-2.44	-0.09	0.40	**-1.64**
Yb	*	**-3.36**	*	*	*	*	*	**0.27**	0.44	-0.40	-0.03	*	*
Zn	*-0.76*	*	*	*-0.95*	*	*-1.79*	*-2.13*	***-6.09***	*-1.27*	*-8.80*	*-1.09*	***-1.26***	***-0.23***
Zr	-1.17	*	*	-0.32	4.54	-1.06	-14.43	-1.26	0.82	*	-0.29	**-2.12**	**2.59**

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

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

Lab Code	V52	V53	V54	V57	V58	V59	V60	V61	V63	V66	V67	V68	V70
SiO2	0.11	*	**-1.13**	0.27	**0.67**	*	**-0.17**	**-1.07**	0.45	-0.24	**0.97**	-0.01	0.64
TiO2	0.00	*	**1.85**	1.48	**-6.90**	*	**-0.38**	**0.49**	-1.17	0.25	**1.60**	0.99	-10.41
Al2O3	0.16	*	**-0.53**	-0.37	**-1.49**	*	**0.21**	**0.78**	-0.76	0.34	**2.45**	0.26	-2.89
Fe2O3T	0.31	*	**-0.15**	1.24	**-2.90**	*	**-0.35**	**2.82**	-0.46	-0.02	**2.27**	1.29	-4.20
MnO	0.53	*	**-1.55**	-1.87	**-5.08**	*	**-0.15**	**0.27**	-0.67	0.13	-0.53	0.80	-6.07
MgO	*3.17*	*	***-2.26***	*2.74*	***2.90***	*	***12.86***	***-2.26***	*0.16*	*3.17*	*-2.94*	*0.07*	*-9.06*
CaO	0.30	*	**-1.05**	1.55	**1.61**	*	**0.21**	**-1.87**	0.06	0.31	0.76	-0.69	3.17
Na2O	-1.44	*	**0.21**	0.79	**3.93**	*	**0.41**	**1.44**	-0.96	-1.78	**0.38**	-0.42	0.14
K2O	-1.55	*	**0.73**	1.21	**-0.34**	*	**-0.28**	**-0.79**	-0.59	-1.16	**-0.57**	2.16	-0.05
P2O5	*-2.97*	*	***-0.82***	*-4.52*	***-7.49***	*	***-3.61***	***-15.25***	*-4.91*	*	***1.82***	*0.13*	*-1.96*
LOI	0.18	*	**4.37**	-1.73	**-3.65**	*	**0.82**	**0.91**	-0.73	-1.18	-9.84	-1.46	3.45
As	-0.28	*	*	-0.32	*	*	**-1.76**	**-1.87**	*	*	-0.41	*	*
Ba	-0.18	**-0.30**	0.55	-0.42	**1.33**	**-0.08**	**-0.92**	**-1.11**	0.44	*	-3.47	-0.22	3.51
Be	*	**-1.63**	*	*	*	*	**2.22**	*	0.23	*	0.81	*	*
Bi	*	*	*	0.08	*	*	**-2.48**	*	*	*	*	*	*
Ce	-0.29	**-6.39**	*	-0.56	**0.62**	**1.78**	**0.06**	**-1.58**	-0.19	*	1.21	*	*
Co	*	*	*	1.46	*	*	**0.10**	**3.78**	-2.44	*	0.82	4.46	-2.62
Cr	*-0.06*	*	*	*0.53*	***-0.39***	*	***0.40***	***-1.42***	*-5.75*	*	*1.35*	*2.89*	*-2.95*
Cs	-0.43	**-1.03**	*	14.18	*	**0.48**	**-0.47**	**13.68**	-0.36	*	**-0.86**	*	*
Dy	*	**-4.43**	*	*	**-1.85**	**0.67**	**0.11**	*	0.33	*	-0.09	*	*
Er	*	**-3.75**	*	*	**1.12**	**1.05**	**-0.26**	*	0.13	*	0.10	*	*
Eu	*	**-4.23**	*	*	**-0.85**	**0.28**	**0.97**	*	0.59	*	-0.06	*	*
Ga	0.39	*	*	-0.93	**-0.86**	**1.35**	**-0.18**	**-0.86**	*	*	0.76	*	*
Gd	*	***-5.58***	*	*	***-0.30***	***6.32***	***-1.32***	*	*0.90*	*	*-0.61*	*	*
Hf	*	**0.53**	*	-0.96	*	**2.03**	**-0.40**	**-7.19**	0.53	*	2.34	*	*
Hg	*-1.03*	*	***-0.93***	*0.67*	*	*	*	*	*	*	*-0.63*	*	*
Ho	*	**-3.44**	*	*	**2.26**	**0.67**	**0.22**	*	0.97	*	0.02	*	*
La	-0.21	**-6.05**	*	-0.24	**1.73**	**1.18**	**0.75**	**0.07**	0.29	*	-1.08	*	*
Li	*	**-1.78**	*	*	**0.44**	*	**-0.95**	*	*	*	-0.40	*	-2.50
Lu	*	**-1.87**	*	*	**-0.23**	**1.13**	**0.67**	*	2.27	*	0.57	*	*
Mo	*	*	*	*-0.74*	*	*	***1.46***	***-0.74***	*2.20*	*	*2.07*	*8.87*	*
Nb	0.07	**-0.87**	*	-0.79	**5.64**	**0.76**	**3.12**	**-1.36**	-0.19	*	2.50	3.31	*
Nd	-0.74	**-6.26**	*	-1.76	**-0.10**	**0.99**	**-0.01**	**-2.30**	0.32	*	0.83	*	*
Pb	0.00	**-2.66**	*	-1.14	*	*	**-0.15**	**0.67**	4.11	*	0.56	3.44	1.33
Pr	*	**-5.54**	*	*	**-1.38**	**0.66**	**0.69**	*	-0.33	*	0.32	*	*
Rb	-0.75	**0.22**	*	-0.29	**0.51**	**0.57**	**3.52**	**1.09**	37.89	*	0.11	1.83	2.05
Sb	-1.82	*	*	6.52	*	*	**-0.72**	**21.90**	*	*	-0.03	*	*
Sm	4.20	**-5.84**	*	-0.55	**4.13**	**0.66**	**0.32**	**-3.78**	0.17	*	0.83	*	*
Sn	*-2.71*	*	*	*5.16*	*	***-1.00***	***-2.31***	***76.80***	*	*	*0.40*	*	*
Sr	-0.33	**-4.11**	**-3.96**	-0.40	**0.54**	**3.60**	**4.95**	**0.52**	0.18	*	0.46	0.05	1.97
Ta	*	**-0.84**	*	1.52	*	**2.54**	**0.77**	**8.16**	*	*	0.68	*	*
Tb	*	**-2.63**	*	*	**-0.99**	**4.50**	**-0.73**	*	1.69	*	-0.35	*	*
Th	1.45	**-1.70**	*	-0.62	**-3.62**	**1.61**	**0.66**	**0.22**	-0.64	*	-1.23	-1.04	*
Tl	*	*	*	*	*	*	***-0.58***	*	*-2.86*	*	*-5.99*	*	*
Tm	*	**-2.50**	*	*	**23.33**	**1.35**	**0.38**	*	2.20	*	0.17	*	*
U	1.39	**-1.80**	*	3.65	**-1.46**	**1.83**	**0.60**	**3.77**	-0.80	*	0.68	*	*
V	1.88	*	*	-3.69	**2.03**	*	**0.04**	**-0.98**	-0.49	*	-1.24	-0.49	14.04
W	*	*	*	*-0.58*	*	***-1.47***	***-0.15***	***13.76***	*-1.97*	*	*0.00*	*	*
Y	1.01	**-5.29**	*	0.07	**0.79**	**-0.20**	**1.01**	**0.79**	-0.50	*	-4.06	2.83	*
Yb	*	**-3.22**	*	-2.95	**-0.54**	**0.40**	**0.24**	*	0.70	*	0.54	*	*
Zn	*0.05*	*	*	*-2.36*	***-0.75***	*	***-0.55***	***-3.06***	*-0.42*	*	*1.68*	*-1.66*	*1.84*
Zr	0.57	**3.20**	*	-0.66	**0.26**	**2.49**	**3.40**	**-0.02**	-0.62	*	1.02	2.13	-2.06

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

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

Lab Code	V71	V72	V73	V74	V75	V76	V77	V78	V80	V82	V83	V84	V85
SiO2	-0.16	0.41	**-0.55**	-1.03	-0.07	-1.42	-0.29	**-1.55**	0.57	**-0.48**	*	0.94	1.24
TiO2	-2.22	0.86	**0.49**	-5.60	0.25	-0.49	-0.12	**-1.97**	-5.91	**0.49**	*	0.32	0.12
Al2O3	-0.23	0.20	**-1.81**	-0.41	-0.03	-1.17	-0.05	**-0.64**	1.81	**2.95**	*	2.79	0.84
Fe2O3T	-0.79	0.42	**0.40**	-4.85	0.42	1.08	0.24	**-2.41**	-5.62	**0.84**	*	-2.16	0.71
MnO	-0.67	0.13	**0.27**	-1.20	1.47	0.27	-0.80	**0.27**	-1.20	**-2.41**	*	-1.14	0.53
MgO	*12.65*	*-1.13*	***-2.26***	*	*3.17*	*-0.01*	*-0.53*	***4.63***	*10.93*	***-5.71***	*	*12.52*	*-1.22*
CaO	0.19	0.56	**0.12**	-0.44	0.06	-1.80	-0.14	**-1.37**	-1.93	**-1.37**	*	-0.16	1.62
Na2O	2.02	0.00	**0.77**	*	-0.10	0.34	0.24	**0.58**	5.23	**-0.38**	*	-0.35	0.47
K2O	1.06	0.14	**-0.41**	-1.77	-0.28	-0.86	0.49	**2.57**	2.05	**-0.49**	*	0.15	0.91
P2O5	*	*0.13*	***-7.49***	*18.51*	*0.52*	*0.13*	*-2.97*	***0.26***	*7.89*	***0.26***	*	*	*-1.42*
LOI	-1.18	-2.01	*	*	-2.73	*	0.15	**-0.91**	-1.09	0.73	*	-18.05	-0.73
As	*	-1.20	4.83	*	0.77	*	*	**-0.03**	*	*	1.21	0.00	*
Ba	0.00	0.30	**-0.59**	-1.85	0.26	0.33	-0.18	**-4.86**	*	*	-0.39	-2.61	0.67
Be	0.00	-0.20	*	*	0.40	*	*	*	*	*	*	0.83	0.00
Bi	*	0.43	5.33	*	-0.21	*	*	*	*	*	*	-0.83	*
Ce	-0.69	0.31	**-1.68**	-2.24	-0.39	0.21	*	**-3.15**	*	*	-0.79	-2.39	-0.07
Co	*	0.09	**12.35**	824.85	0.60	*	*	*	*	*	1.89	-0.88	-0.34
Cr	*0.06*	*-0.37*	***11.45***	*39.44*	*-4.05*	*1.35*	*9.33*	***-3.47***	*	*	*0.48*	*-1.76*	*-0.76*
Cs	*	0.23	**6.41**	*	0.37	*	*	**9.32**	*	*	0.15	-0.84	-0.39
Dy	*	1.03	*	*	0.18	*	*	*	*	*	*	-1.47	-0.46
Er	*	0.69	*	*	-0.10	*	*	*	*	*	*	-1.41	0.00
Eu	*	0.00	*	11.15	0.71	*	*	*	*	*	*	-1.27	-0.20
Ga	*	-0.16	**0.95**	-3.56	0.48	*	*	**-0.59**	*	*	-0.25	1.10	0.55
Gd	*	*1.38*	*	*27.54*	*-1.09*	*	*	*	*	*	*	*2.94*	*0.33*
Hf	-0.09	0.35	**10.34**	*	-0.18	*	*	*	*	*	*	-2.16	-0.45
Hg	*	*0.38*	*	*	*0.86*	*	*	*	*	*	*	*	*
Ho	*	0.97	*	*	0.34	*	*	*	*	*	*	-1.17	-0.22
La	-0.05	0.62	**-0.26**	-2.20	1.08	0.45	*	**-1.53**	*	*	0.85	-1.44	-0.19
Li	-0.60	-1.03	*	*	0.05	*	*	*	*	*	*	-1.32	*
Lu	*	0.39	*	*	-0.12	*	*	*	*	*	*	-0.66	-0.12
Mo	*	*1.03*	***-8.13***	*	*0.74*	*	*	*	*	*	*1.53*	*0.01*	*0.00*
Nb	-0.14	0.10	**1.87**	-2.83	0.94	*	*	**-1.57**	*	*	0.44	-0.79	-1.17
Nd	*	0.25	**-2.58**	-2.51	1.66	*	*	*	*	*	*	-0.80	-0.21
Pb	-0.11	0.00	**2.00**	3.55	0.83	*	*	**-1.07**	*	*	0.88	0.61	-0.31
Pr	*	1.03	*	-5.89	0.67	*	*	*	*	*	*	-1.15	-0.22
Rb	-0.10	1.40	**-0.21**	-0.46	0.40	*	*	**-1.34**	*	*	-0.11	-2.72	-0.82
Sb	*	-1.62	*	*	0.29	*	*	**7.30**	*	*	*	-0.07	*
Sm	*	0.32	*	*	0.72	*	*	*	*	*	*	-1.70	-0.40
Sn	*	*-1.48*	***19.35***	*	*-0.17*	*	*	*	*	*	*	*-1.29*	*-1.36*
Sr	0.42	-2.17	**0.05**	-0.49	0.87	*	-1.04	**-0.51**	-19.17	*	-0.39	-1.25	0.95
Ta	*	-0.05	**-6.45**	*	-0.30	*	*	*	*	*	*	-0.10	-0.48
Tb	*	1.41	*	*	0.21	*	*	*	*	*	*	-0.43	-0.07
Th	*	0.19	**-3.23**	-1.71	0.30	*	*	**1.14**	*	*	-0.31	-1.58	-0.49
Tl	*	*0.49*	*	*	*0.85*	*	*	*	*	*	*	*0.00*	*-4.55*
Tm	*	0.51	*	*	-0.17	*	*	*	*	*	*	-0.73	-0.34
U	*	-0.80	**-4.28**	2.52	0.26	*	*	**8.28**	*	*	-0.80	-0.52	-0.26
V	*	1.20	**2.78**	*	-0.30	0.64	*	**-4.75**	*	*	-1.66	-1.04	3.80
W	*	*-2.16*	***-14.06***	*	*0.56*	*	*	*	*	*	*	*-1.54*	*
Y	-0.01	-0.05	**-8.13**	-1.19	-0.01	-0.82	*	**-2.45**	*	*	-0.69	-1.18	-0.88
Yb	*	-0.07	*	*	0.07	*	*	*	*	*	*	-1.12	-0.20
Zn	*	*0.08*	***-2.03***	*-1.27*	*-0.37*	*0.65*	*5.15*	***-4.57***	*	*	*-1.43*	*-1.33*	*0.41*
Zr	-0.59	2.87	**0.37**	-0.56	1.29	1.63	0.32	**-2.95**	-16.32	*	-0.57	-1.46	0.91

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

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

Lab Code	V86	V87	V89	V90	V92	V93	V94	V95	V96	V97	V98	V99	V100
SiO2	1.27	0.81	-0.36	1.18	0.48	0.34	0.60	*	-0.85	1.02	-0.21	1.28	*
TiO2	0.49	-1.97	0.25	-0.80	-0.37	-0.74	-0.68	6.16	-1.35	1.95	-0.86	0.49	*
Al2O3	1.42	0.14	-0.34	1.73	0.05	-0.74	0.52	*	0.71	3.55	-0.05	0.64	-1.12
Fe2O3T	-5.09	-2.02	0.11	-1.03	-0.68	0.84	2.07	*	4.14	2.05	-0.02	0.40	0.64
MnO	0.27	-0.80	0.27	0.80	-1.20	0.53	-0.27	*	5.61	0.78	0.00	0.27	0.67
MgO	-5.71	-2.26	-2.78	-0.20	1.45	-38.44	2.31	*	-3.99	1.71	-1.56	13.24	0.59
CaO	2.61	-2.86	0.69	1.94	-0.56	2.11	-0.32	*	-3.68	4.33	-0.31	0.62	0.43
Na2O	-1.54	-2.02	-0.86	0.64	0.34	1.44	4.13	*	4.70	3.27	0.19	-0.48	0.67
K2O	-0.49	1.19	-0.36	1.99	-0.59	2.26	0.83	*	1.28	1.55	0.37	0.96	1.32
P2O5	-15.25	-5.17	0.26	6.24	0.13	-4.39	-4.91	*	-23.01	-4.78	*	0.26	*
LOI	-10.75	-0.36	0.87	-21.87	1.46	0.00	*	*	0.73	*	-0.36	2.55	*
As	*	*	*	*	*	*	0.19	*	19.27	*	*	-0.71	*
Ba	1.33	*	-2.11	-0.29	*	353.02	-13.52	0.22	*	0.32	1.03	0.84	0.18
Be	-0.34	*	*	-1.67	*	*	-0.52	*	*	*	*	0.46	*
Bi	*	*	*	0.05	*	*	0.00	*	*	*	*	-1.70	0.66
Ce	1.22	*	-1.80	-7.61	*	10.53	-0.24	1.22	*	*	*	0.78	0.11
Co	1.63	*	4.86	-4.45	*	132.37	-0.08	1.63	*	*	*	3.86	0.60
Cr	11.25	*	-2.74	0.54	*	97.91	-1.09	-3.22	*	*	*	3.14	*
Cs	2.20	*	*	-0.57	*	10.77	-2.92	0.45	*	*	*	-0.01	-0.28
Dy	0.26	*	-1.41	-0.41	*	*	0.08	-0.22	*	*	*	0.22	0.00
Er	0.86	*	-1.24	0.46	*	*	-0.05	-0.13	*	*	*	0.00	-0.10
Eu	0.23	*	-1.27	-0.68	*	*	-0.08	-0.06	*	*	*	0.90	0.14
Ga	1.23	*	0.05	4.67	*	0.95	-1.10	*	3.68	*	*	-0.25	0.48
Gd	7.00	*	-1.56	-0.21	*	*	-1.01	-0.99	*	*	*	-0.73	0.56
Hf	1.75	*	-1.92	1.89	*	36.64	-1.73	-1.88	*	*	*	1.09	*
Hg	*	*	*	*	*	*	*	*	*	*	*	*	*
Ho	-0.12	*	-0.91	-0.91	*	*	0.27	0.33	*	*	*	0.20	0.18
La	1.56	*	-1.07	-2.22	*	12.32	-0.04	1.23	*	*	*	1.41	0.04
Li	0.89	*	-1.15	-1.70	*	*	0.35	3.75	*	*	*	*	-0.19
Lu	0.11	*	-0.64	-0.23	*	*	0.39	0.52	*	*	*	0.11	0.05
Mo	-2.51	*	*	-1.96	*	91.62	-0.26	3.47	14.04	*	*	1.92	0.18
Nb	4.57	*	0.71	-2.70	*	-9.98	-0.29	3.60	-0.82	*	*	0.44	0.40
Nd	4.30	*	-1.34	-1.95	*	27.96	0.01	2.62	*	*	*	3.64	0.09
Pb	3.33	*	5.77	0.13	*	25.76	1.33	2.00	2.44	*	*	1.91	2.89
Pr	2.78	*	-1.49	-2.71	*	*	0.03	0.56	*	*	*	0.15	0.10
Rb	1.23	*	-0.35	0.11	*	65.90	-0.90	2.09	0.51	*	6.21	0.53	-0.10
Sb	*	*	*	-0.36	*	*	-0.23	0.83	*	*	*	1.46	0.00
Sm	0.81	*	-1.25	-2.11	*	45.29	-0.01	0.17	*	*	*	0.05	0.01
Sn	*	*	*	0.07	*	*	0.57	22.72	*	*	*	0.97	-0.17
Sr	1.55	12.00	-2.37	-0.46	*	-21.34	-0.19	4.84	-0.29	2.24	1.02	1.66	0.40
Ta	4.00	*	-0.55	-0.38	*	*	2.66	0.64	*	*	*	-0.82	*
Tb	2.11	*	-1.83	0.56	*	*	-0.30	-0.53	*	*	*	-0.28	-0.35
Th	3.21	*	-1.97	-4.42	*	24.00	-1.12	1.87	3.67	*	*	1.30	0.49
Tl	*	*	*	*	*	*	-1.37	5.09	*	*	*	*	1.96
Tm	0.34	*	-1.23	-0.68	*	*	0.00	*	*	*	*	*	0.00
U	2.07	*	-3.12	0.24	*	-1.46	-0.34	1.08	11.25	*	*	0.59	1.39
V	2.18	*	-0.84	7.34	*	105.97	-0.04	2.71	*	*	*	0.54	0.64
W	*	*	*	0.76	*	*	0.51	*	3.64	*	*	0.61	*
Y	1.28	*	-1.23	-1.09	*	19.45	-0.54	5.99	8.91	*	*	-0.82	*
Yb	0.13	*	-1.05	0.00	*	*	0.30	0.60	*	*	*	0.60	0.07
Zn	-1.64	*	-3.44	-3.93	*	1.57	0.12	3.11	-3.57	*	*	0.63	-0.24
Zr	2.59	*	-1.96	0.82	*	16.61	-4.87	0.48	1.81	4.90	0.07	1.52	*

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

Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

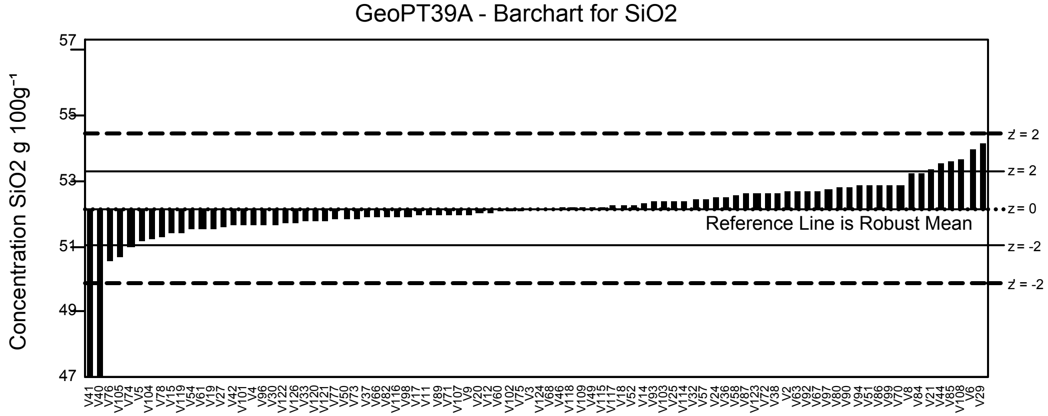
Lab Code	V101	V102	V103	V104	V105	V106	V107	V108	V109	V111	V113	V114	V115
SiO2	-0.88	-0.07	0.18	-0.84	-1.28	*	-0.32	1.32	0.03	*	*	0.20	0.05
TiO2	0.49	0.86	-0.37	-0.99	-1.60	*	-0.74	-3.51	-0.53	0.99	*	-0.99	-0.12
Al2O3	-0.18	-0.05	0.50	-0.34	0.52	*	-0.18	-2.89	0.28	*	*	-0.16	0.76
Fe2O3T	-0.26	0.31	0.97	-0.90	0.31	*	0.84	-3.65	0.10	*	-0.26	-1.23	-0.24
MnO	-1.07	0.13	0.00	-1.20	0.13	*	0.00	-2.41	0.03	0.80	0.53	-0.53	0.13
MgO	-2.26	0.59	-1.48	-3.72	-7.16	*	-3.99	1.80	-0.49	*	4.45	-0.18	-2.85
CaO	-0.13	0.06	-0.93	-0.93	-2.80	*	-0.38	5.41	0.03	*	3.85	-1.06	-0.44
Na2O	0.29	-0.19	-1.63	1.73	-0.43	*	-0.86	2.88	-0.59	*	*	-0.05	-1.44
K2O	-0.41	0.10	-3.07	-0.17	-0.17	*	-0.34	-2.00	0.02	*	*	-0.36	-1.73
P2O5	0.26	0.13	*	-3.75	0.13	*	-4.39	4.05	-1.19	*	*	-1.03	-2.58
LOI	-1.28	0.91	0.73	0.00	-2.01	1.73	1.82	-4.37	-2.95	*	*	1.91	1.09
As	0.93	*	0.46	-1.63	1.34	4.18	*	*	*	*	0.78	*	*
Ba	-1.33	*	0.74	-0.04	-8.94	-1.53	0.44	-0.66	0.58	1.03	2.86	*	1.99
Be	*	*	*	*	-0.60	-1.76	*	*	0.24	1.19	*	*	*
Bi	*	*	*	*	*	*	*	*	-0.09	0.63	*	*	*
Ce	2.42	*	*	-0.22	*	-3.75	0.50	*	-1.26	1.42	2.69	*	0.41
Co	*	*	*	3.60	10.46	7.56	*	*	0.43	0.35	-0.83	*	0.22
Cr	-3.99	*	1.09	-0.37	-4.57	-4.77	0.64	5.47	0.12	0.59	-0.94	*	3.67
Cs	*	*	*	-1.37	*	*	0.22	*	0.23	0.16	1.09	*	-0.28
Dy	*	*	*	*	*	0.47	1.44	*	-0.05	1.07	-0.30	*	-0.98
Er	*	*	*	*	*	0.70	0.26	*	-0.20	1.32	-0.91	*	*
Eu	*	*	*	*	*	2.02	1.35	*	-0.25	1.24	-0.11	*	*
Ga	-1.77	*	-0.88	-0.20	*	-0.33	-15.37	-4.96	-0.02	1.14	2.27	*	-0.88
Gd	*	*	*	*	*	8.86	-0.89	*	-1.25	-2.21	3.54	*	*
Hf	*	*	5.17	2.81	*	2.69	0.11	*	-0.36	1.23	-1.88	*	-1.68
Hg	*	*	*	*	*	-2.78	*	*	*	*	*	*	*
Ho	*	*	*	*	*	0.61	1.15	*	-0.20	0.99	-0.02	*	-0.61
La	3.38	*	*	1.00	*	-0.33	0.97	*	-1.40	1.23	2.49	*	-0.05
Li	*	*	0.46	*	0.22	*	*	*	-0.10	0.64	*	*	-1.90
Lu	*	*	*	*	*	-1.60	0.79	*	0.06	1.13	0.62	*	*
Mo	*	*	*	0.00	8.87	-4.16	*	*	1.03	-0.30	*	*	*
Nb	0.26	*	-0.68	-0.33	*	15.10	0.12	-1.22	0.66	3.76	3.06	*	-1.22
Nd	0.45	*	*	-1.91	*	-0.53	0.83	*	-0.50	2.02	1.11	*	3.80
Pb	-0.22	*	-0.44	0.33	-1.55	-2.96	1.36	0.22	0.49	3.55	-0.75	*	-0.67
Pr	*	*	*	*	*	1.32	0.86	*	-0.63	1.92	1.27	*	*
Rb	-1.50	*	-0.25	-0.17	*	-3.28	0.04	-1.25	0.13	0.51	0.68	*	-0.25
Sb	*	*	*	-0.91	*	-2.06	*	*	0.14	*	*	*	*
Sm	*	*	*	-2.37	*	1.21	1.03	*	-0.27	1.12	0.28	*	*
Sn	*	*	*	-2.71	*	-3.28	*	*	0.61	-0.01	*	*	*
Sr	0.34	*	-0.22	0.06	1.12	-17.03	0.97	-0.27	0.00	2.20	0.36	*	-2.02
Ta	*	*	*	*	*	9.39	-0.53	*	0.14	1.37	0.71	*	*
Tb	*	*	*	*	*	2.00	0.42	*	-0.62	0.00	2.87	*	0.63
Th	0.22	*	-1.23	0.44	*	-0.55	1.09	-3.73	-0.15	3.90	2.68	*	1.07
Tl	*	*	*	-2.46	*	*	*	*	0.29	4.87	*	*	*
Tm	*	*	*	*	*	-0.19	0.34	*	-0.09	1.01	0.47	*	*
U	1.37	*	3.51	-0.16	*	1.46	0.01	*	0.28	1.65	1.01	*	4.21
V	-0.98	*	-2.37	-1.70	1.02	-0.58	4.29	*	0.58	2.71	-0.48	*	3.27
W	*	*	*	0.81	5.62	*	*	*	0.10	*	*	*	*
Y	-1.64	*	0.40	-0.21	-2.04	-0.66	0.73	*	0.16	2.33	1.53	*	*
Yb	*	*	*	*	*	0.12	-0.27	*	-0.19	0.94	-0.20	*	*
Zn	-0.75	*	-2.30	-1.75	-2.43	-1.88	0.80	-0.63	0.73	0.03	-4.55	*	0.65
Zr	1.20	*	-0.17	-0.58	*	*	0.76	2.90	0.00	3.36	-0.57	*	-0.73

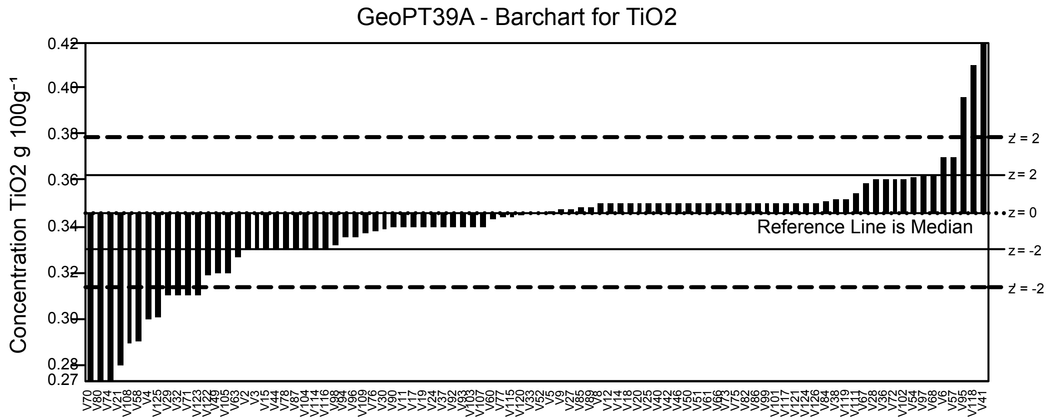
Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

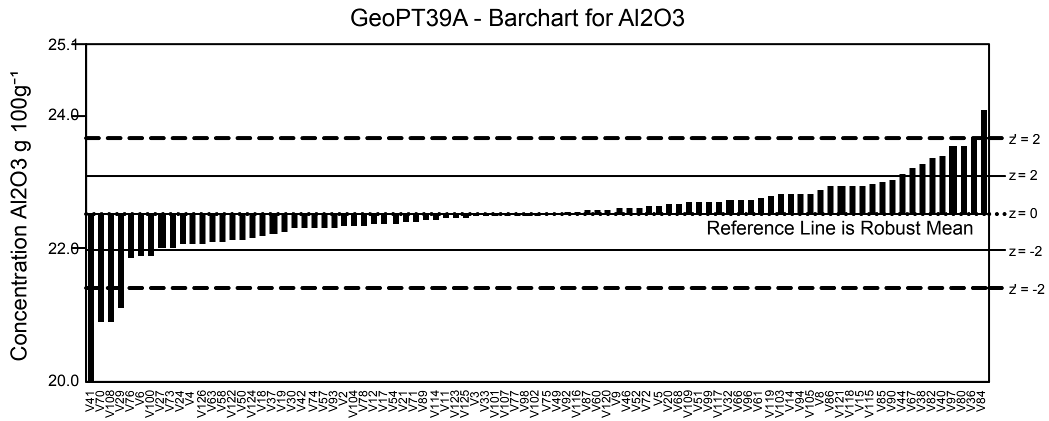
Table 3 - GeoPT39A Z-scores for Nepheline syenite, MNS-1. 10/06/2016

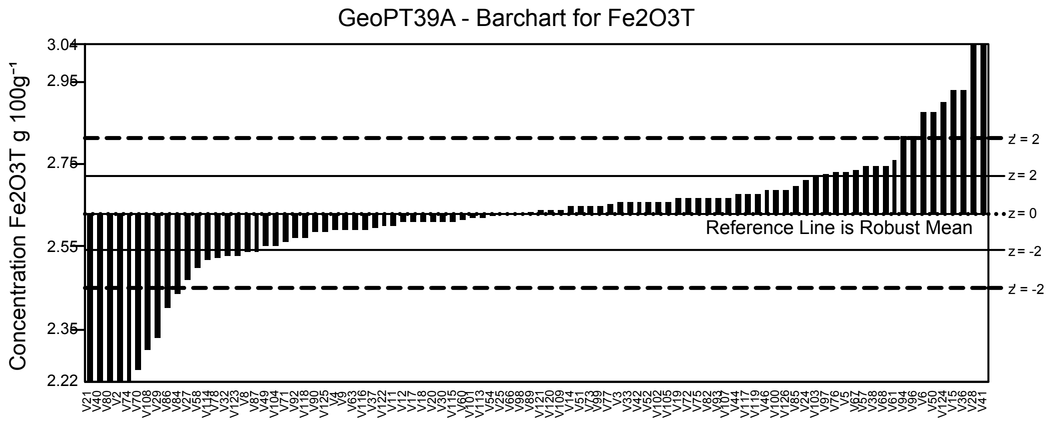
Lab Code	V116	V117	V118	V119	V120	V121	V122	V123	V124	V125	V126
SiO2	-0.23	**0.17**	0.02	-0.68	**-0.66**	-0.32	**-0.83**	0.41	-0.01	*	**-0.79**
TiO2	-0.99	**0.49**	3.94	0.37	**-0.12**	0.25	**-3.33**	-2.22	0.25	**-5.63**	**0.49**
Al2O3	0.05	**0.64**	0.73	0.44	**0.21**	0.72	**-1.45**	-0.12	-0.66	**-0.22**	**-1.59**
Fe2O3T	-0.46	**1.06**	-0.68	0.53	**0.18**	0.07	**-0.72**	-1.12	2.95	**-0.96**	**1.28**
MnO	-1.20	**9.36**	-1.87	-0.27	**-1.34**	-0.40	**-1.07**	-3.88	-1.20	**0.27**	**0.00**
MgO	*-2.85*	***-29.83***	*-2.85*	*-7.16*	***-2.26***	*0.76*	***0.15***	*-0.27*	*0.59*	*12.73*	***-1.75***
CaO	-0.93	**1.37**	-0.31	-0.06	**-0.13**	0.78	**-3.48**	-2.05	5.04	**0.84**	**0.67**
Na2O	1.01	**0.00**	-0.67	0.77	**-0.38**	-0.20	**-1.96**	-0.02	-0.62	**0.03**	**-0.77**
K2O	-0.28	**4.33**	-1.01	0.29	**-0.03**	-0.02	**-0.31**	-0.42	-3.80	**-2.52**	**-0.18**
P2O5	*0.13*	***0.26***	*-0.26*	*0.91*	***-0.51***	*-0.26*	***-5.17***	*0.13*	*-0.64*	*	*
LOI	0.46	**0.36**	-2.46	*	**2.19**	0.77	**1.09**	-0.64	-2.55	*	**5.65**
As	*	**-0.82**	-1.04	0.03	*	*	**-3.44**	*	*	**-0.73**	**1.12**
Ba	-1.00	*	-0.74	-1.44	**-0.22**	2.11	**-1.99**	1.33	0.18	**2.22**	**0.24**
Be	*	*	1.02	*	*	*	*	-2.83	0.90	*	**-0.89**
Bi	*	*	-1.40	*	*	*	*	-2.13	*	*	**-0.20**
Ce	-0.14	**-19.40**	-1.34	-4.57	**-2.08**	*	**-1.58**	0.27	-0.04	**0.92**	**0.13**
Co	*	*	5.70	*	*	-2.40	*	1.89	0.13	**-0.51**	**-0.88**
Cr	*-1.99*	*	*-0.73*	*-1.74*	***0.13***	*-4.57*	***3.73***	*-1.92*	*0.06*	***0.44***	***1.72***
Cs	*	*	-0.52	*	*	*	*	-2.15	1.02	**0.45**	**-0.93**
Dy	*	*	-0.72	-0.89	*	*	*	-0.63	0.15	**2.59**	**0.37**
Er	*	*	2.96	-0.43	*	*	*	0.49	-0.26	*	**-0.50**
Eu	*	*	1.50	-1.38	*	*	*	2.06	-0.14	**-0.17**	**0.17**
Ga	*	*	0.67	-0.43	**-0.86**	-0.88	**-1.77**	0.02	-0.20	*	**1.11**
Gd	*15.17*	*	*7.77*	*-1.24*	*	*	***2.05***	*2.29*	*0.51*	*	***0.09***
Hf	*	*	*	-2.72	*	-3.59	**12.10**	-0.88	-0.12	**0.00**	**0.06**
Hg	*	*	*	*	*	*	*	*	*	*	*
Ho	*	*	-0.56	-0.69	*	*	*	-0.06	-0.06	*	**0.20**
La	-5.26	**-16.97**	-1.04	-5.56	**-4.72**	*	**-1.58**	1.33	0.45	**0.52**	**-0.74**
Li	*	*	0.74	*	*	0.01	*	*	1.04	*	**-0.79**
Lu	*	*	0.92	-0.80	*	*	*	-0.29	0.39	**-1.26**	**0.28**
Mo	*	*	*-0.06*	*	*	*	*	*-2.05*	*1.29*	*	***-0.31***
Nb	*	*	-0.79	-1.49	**-0.28**	*	**-0.82**	-2.83	-2.83	*	**-1.83**
Nd	*	*	-0.81	-3.57	**-0.65**	*	**-1.75**	0.49	0.91	**0.73**	**0.16**
Pb	0.22	*	-1.05	0.33	**0.00**	-8.22	**0.00**	0.00	-0.56	*	**0.56**
Pr	*	*	-0.88	-3.31	*	*	*	-0.03	0.24	*	**0.08**
Rb	2.41	*	0.11	-0.82	**2.23**	*	**0.51**	-1.25	0.18	**-0.92**	**-1.45**
Sb	*	*	*	*	*	*	*	-3.41	*	**0.00**	**0.09**
Sm	*	*	-0.94	-2.22	*	*	*	-0.29	-0.07	**-0.46**	**0.31**
Sn	*	*	*	*	*	*	*	*-1.24*	*0.65*	*	***3.56***
Sr	12.88	**-33.87**	-0.11	-1.41	**1.50**	1.64	**-3.31**	-0.47	-2.73	**2.38**	**1.70**
Ta	*	*	*	*	*	*	*	-4.76	*	**-1.63**	**0.79**
Tb	*	*	3.41	-1.13	*	*	*	1.69	0.42	**-1.27**	**-0.64**
Th	*	*	-0.31	-4.09	**-0.16**	*	**0.22**	-0.08	0.88	**1.33**	**-0.20**
Tl	*	*	*-0.13*	*	*	*	*	*-0.47*	*0.08*	*	*
Tm	*	*	0.54	-0.85	*	*	*	-0.17	0.00	*	**-0.67**
U	*	*	-1.07	-3.55	**9.84**	*	**-8.52**	-2.35	0.26	**-0.61**	**0.54**
V	2.14	*	-1.90	-2.00	**-2.49**	*	**-0.98**	-3.13	1.39	**1.28**	**-0.83**
W	*	*	*	*	*	*	*	*-1.95*	*2.20*	***-0.91***	***0.47***
Y	5.26	*	1.07	-2.73	**1.60**	-1.23	**4.85**	-1.23	0.32	*	**0.29**
Yb	*	*	0.74	-1.41	*	*	*	-0.47	-0.07	**-0.94**	**-0.01**
Zn	*4.25*	*	*-2.29*	*-1.27*	***-2.80***	*-0.24*	***-0.49***	*-2.43*	*-3.07*	***0.54***	***3.03***
Zr	1.65	*	-0.17	0.68	**0.70**	0.49	**-2.12**	-0.26	-0.81	**1.15**	**2.36**

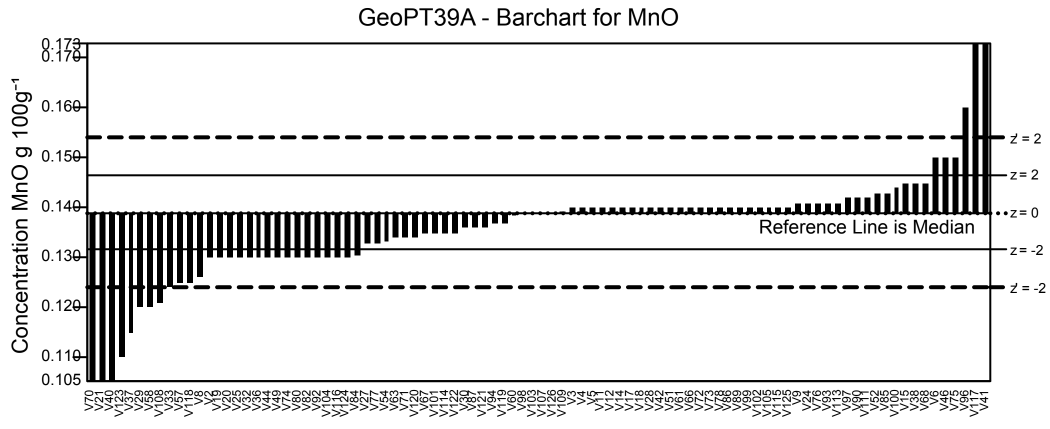
Bold entries are Data Quality 1 - Underlined entries are Data Quality 2 - *Entries in italics* are derived from Provisional Values.

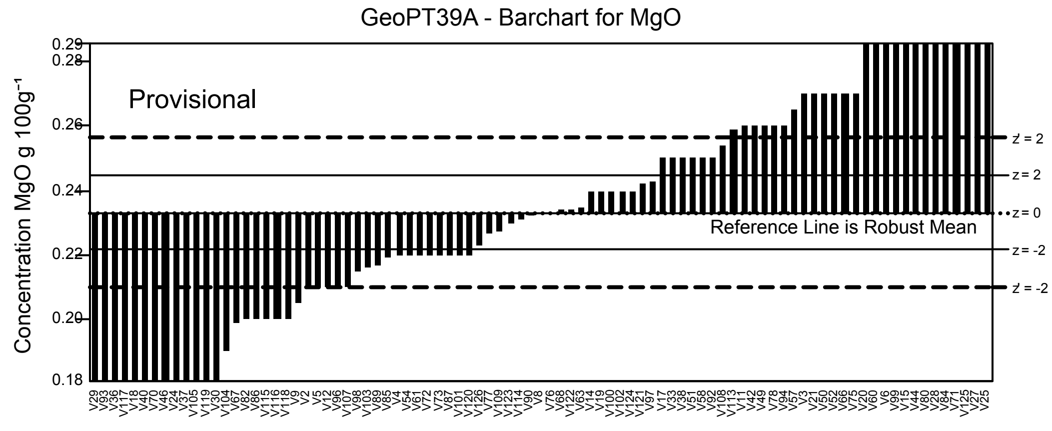

GeoPT39A - Barchart for SiO2
Concentration SiO2 g 100g⁻¹
Reference Line is Robust Mean

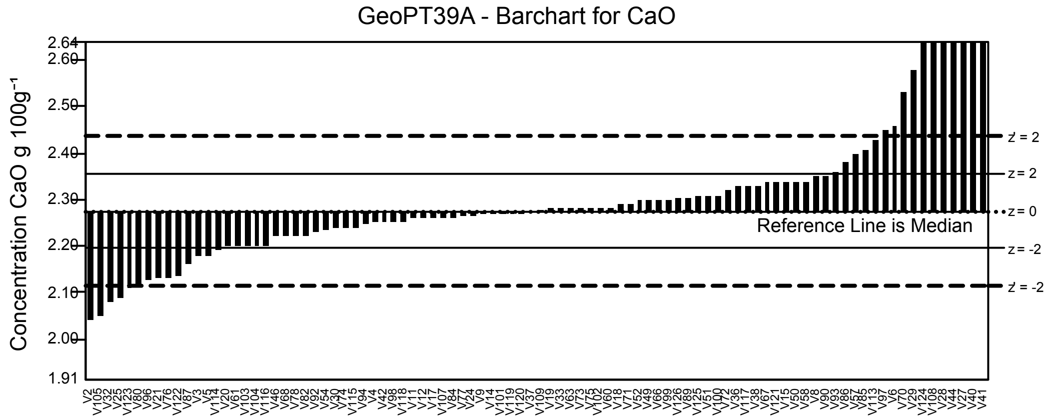

GeoPT39A - Barchart for TiO2
Concentration TiO2 g 100g⁻¹
Reference Line is Median

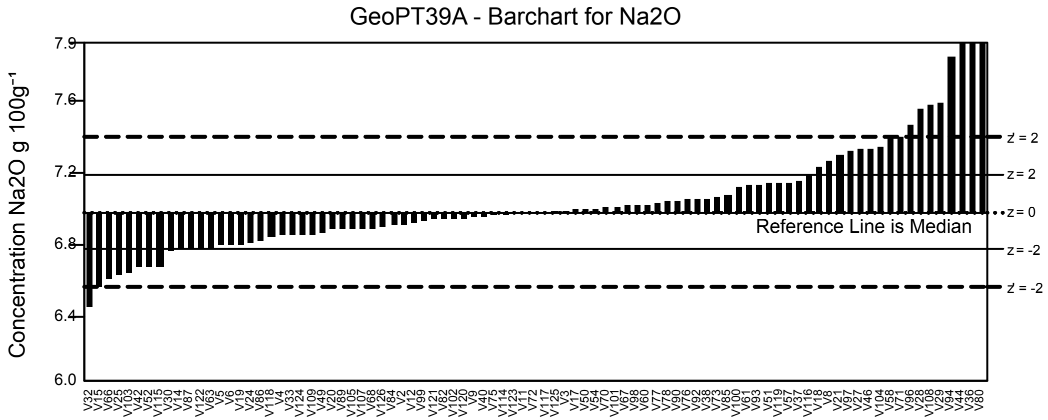

GeoPT39A - Barchart for Al2O3
Concentration Al2O3 g 100g⁻¹
Reference Line is Robust Mean

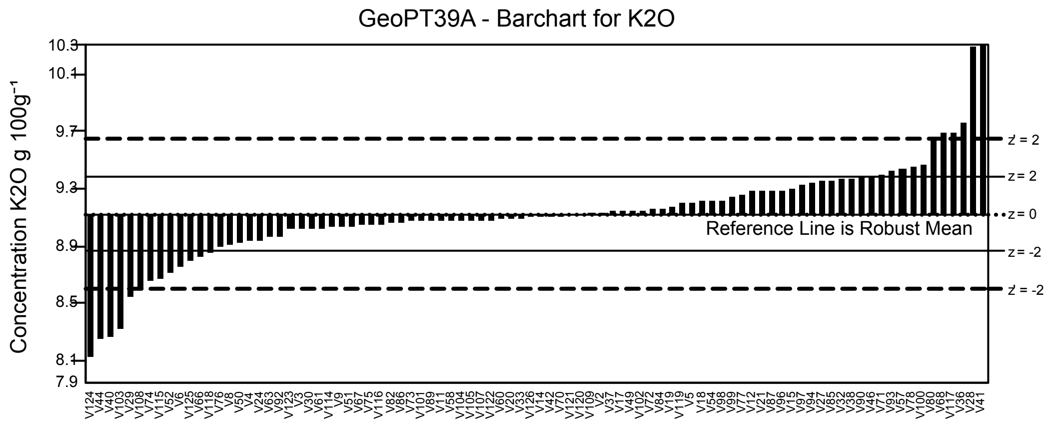

GeoPT39A - Barchart for Fe2O3T
Concentration Fe2O3T g 100g⁻¹
Reference Line is Robust Mean

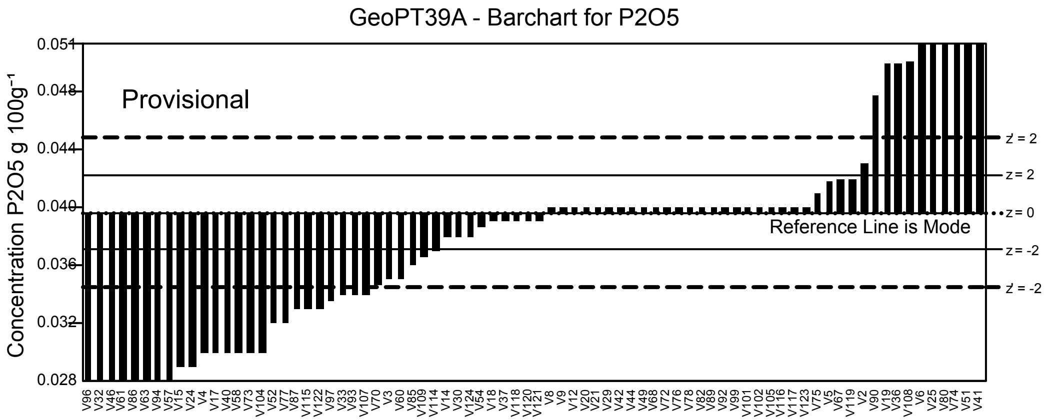

GeoPT39A - Barchart for MnO
Concentration MnO g 100g⁻¹
Reference Line is Median

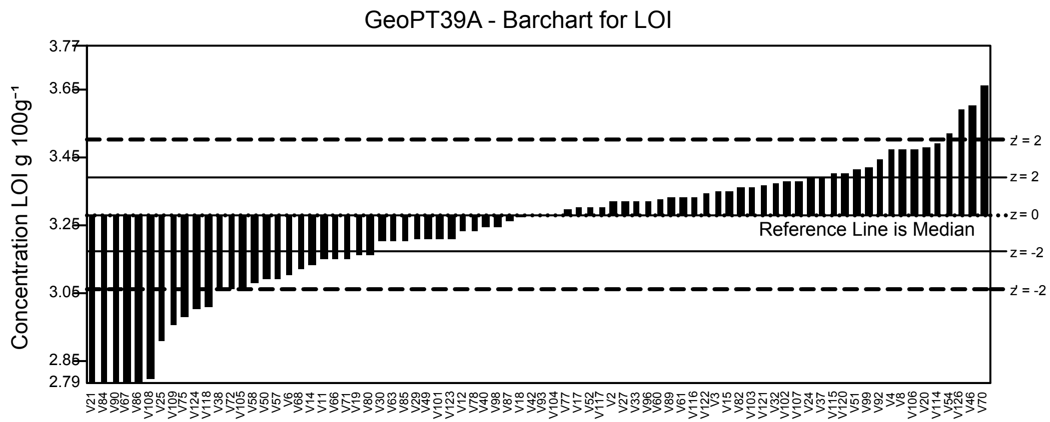

GeoPT39A - Barchart for MgO
Provisional
Concentration MgO g 100g⁻¹
Reference Line is Robust Mean

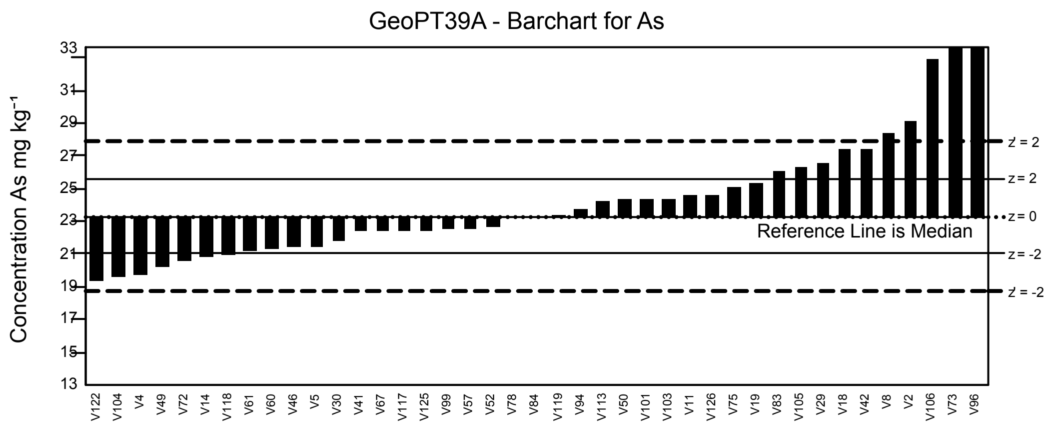

GeoPT39A - Barchart for CaO
Concentration CaO g 100g⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2

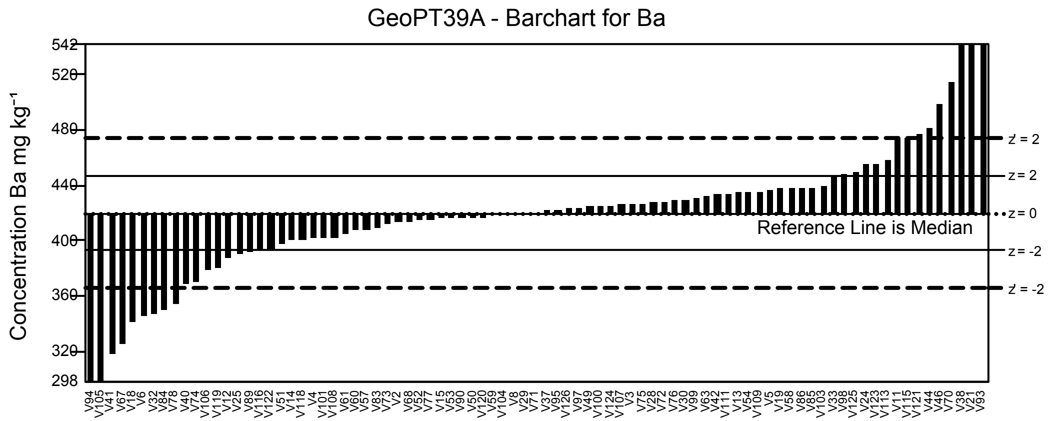

GeoPT39A - Barchart for Na2O
Concentration Na2O g 100g⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2

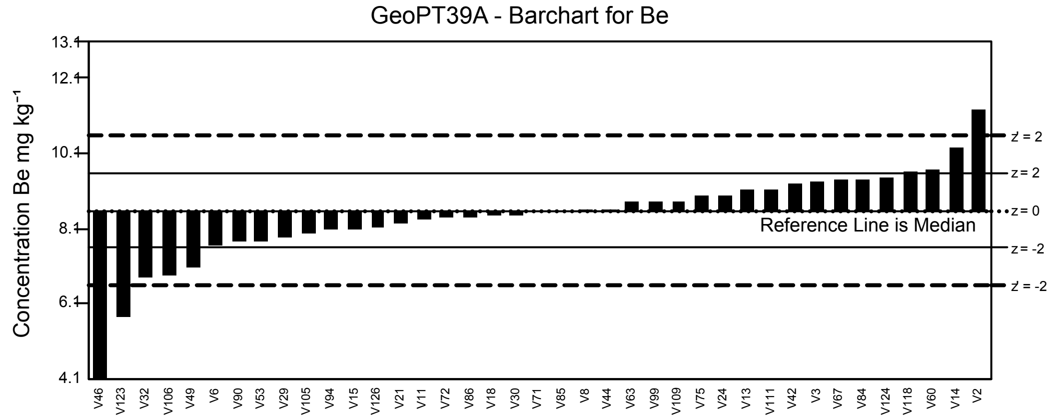

GeoPT39A - Barchart for K2O
Concentration K2O g 100g⁻¹
Reference Line is Robust Mean
z' = 2
z = 2
z = 0
z = -2
z' = -2

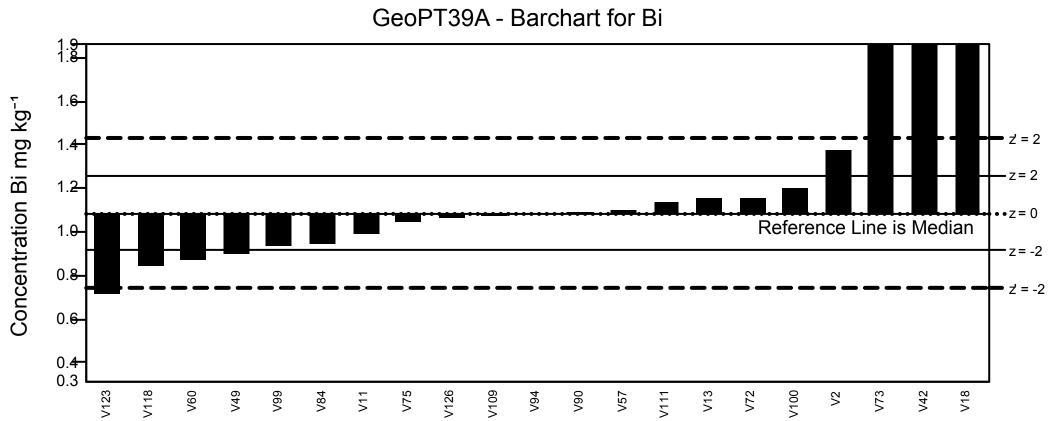

GeoPT39A - Barchart for P2O5
Concentration P2O5 g 100g⁻¹
Provisional
Reference Line is Mode
z' = 2
z = 2
z = 0
z = -2
z' = -2

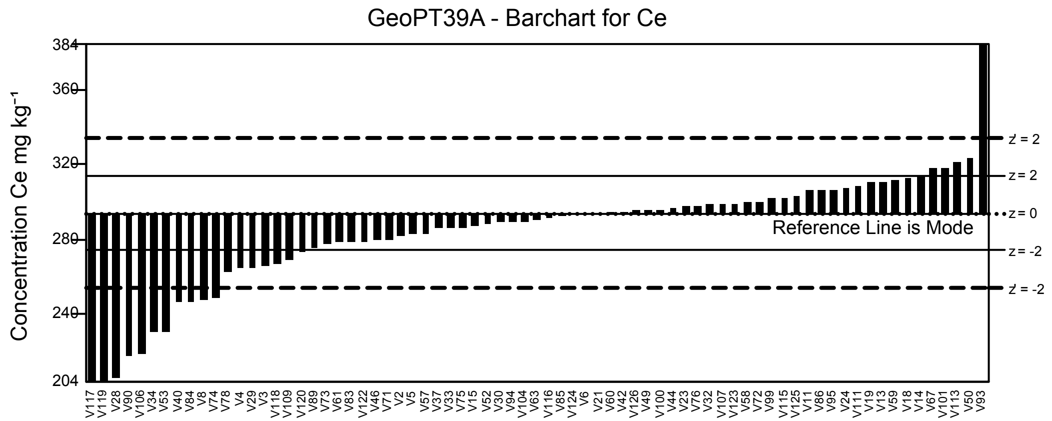

GeoPT39A - Barchart for LOI
Concentration LOI g 100g⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2

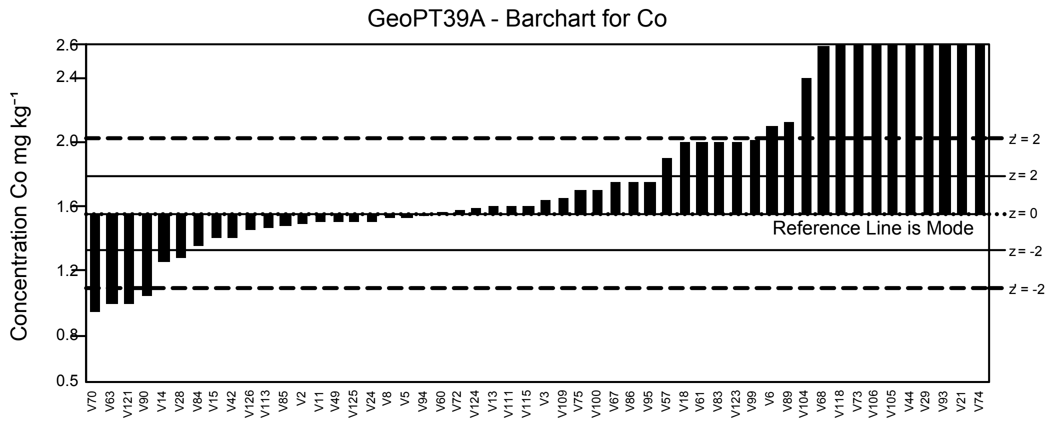

GeoPT39A - Barchart for As
Concentration As mg kg⁻¹
Reference Line is Median
z' = 2
z = 2
z = 0
z = -2
z' = -2

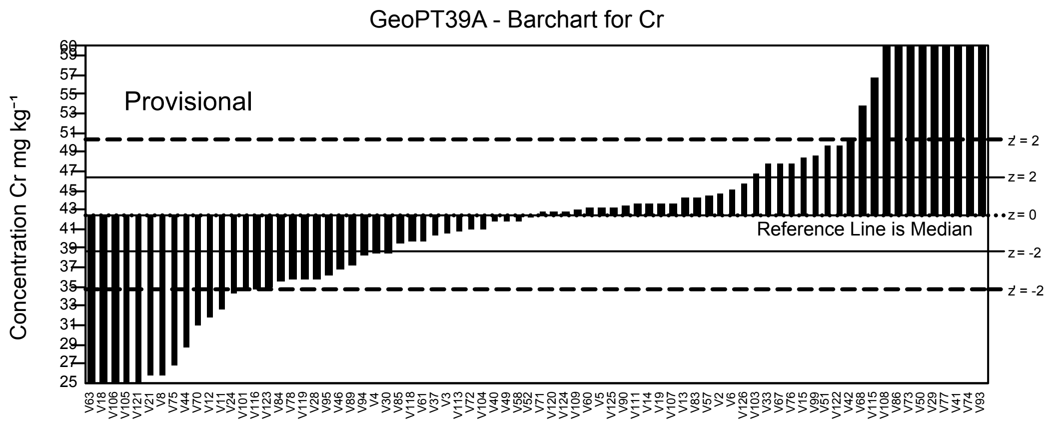

GeoPT39A - Barchart for Ba
Concentration Ba mg kg⁻¹
Reference Line is Median


GeoPT39A - Barchart for Be
Concentration Be mg kg⁻¹
Reference Line is Median

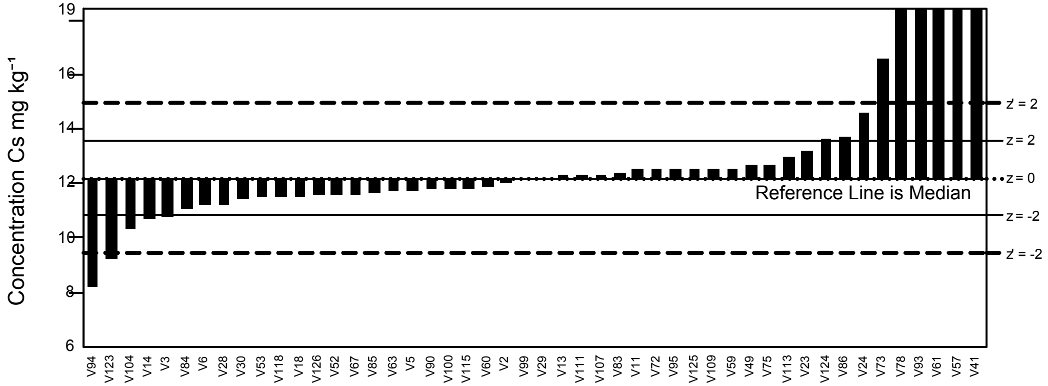

GeoPT39A - Barchart for Bi
Concentration Bi mg kg⁻¹
Reference Line is Median


GeoPT39A - Barchart for Ce
Concentration Ce mg kg⁻¹
Reference Line is Mode

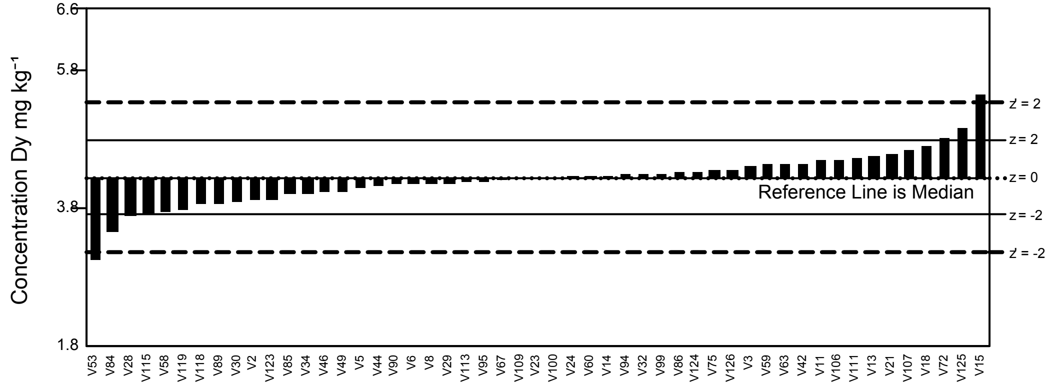

GeoPT39A - Barchart for Co
Concentration Co mg kg⁻¹
Reference Line is Mode


GeoPT39A - Barchart for Cr
Provisional
Concentration Cr mg kg⁻¹
Reference Line is Median

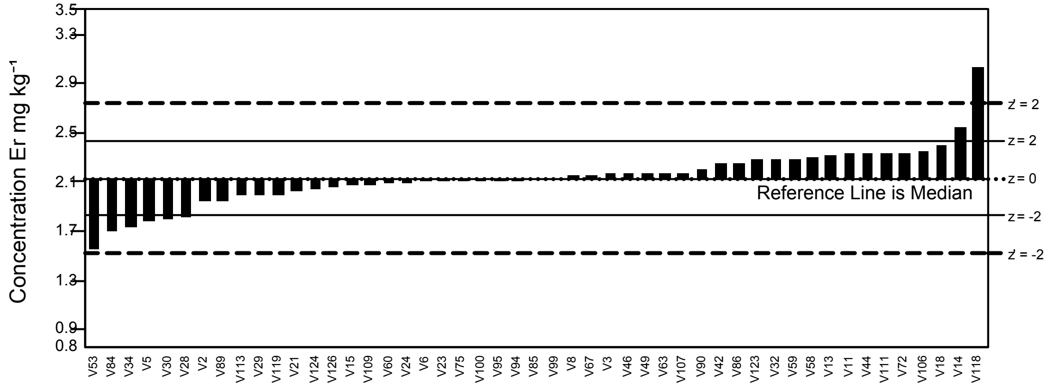
GeoPT39A - Barchart for Cs



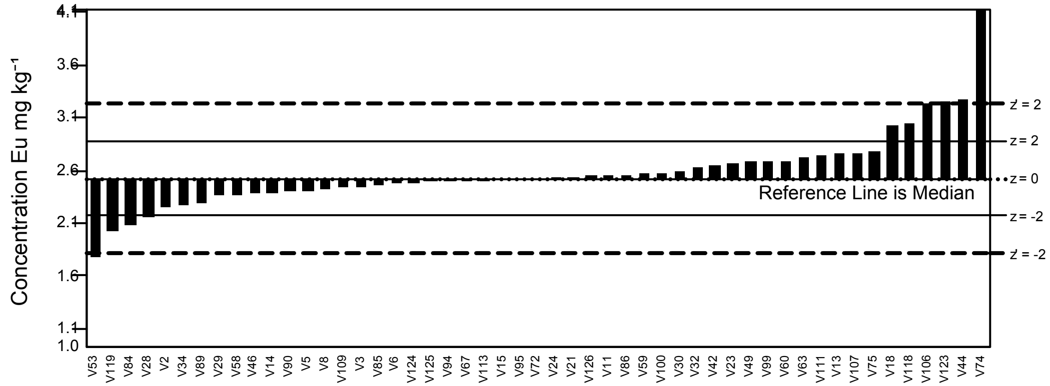
GeoPT39A - Barchart for Dy



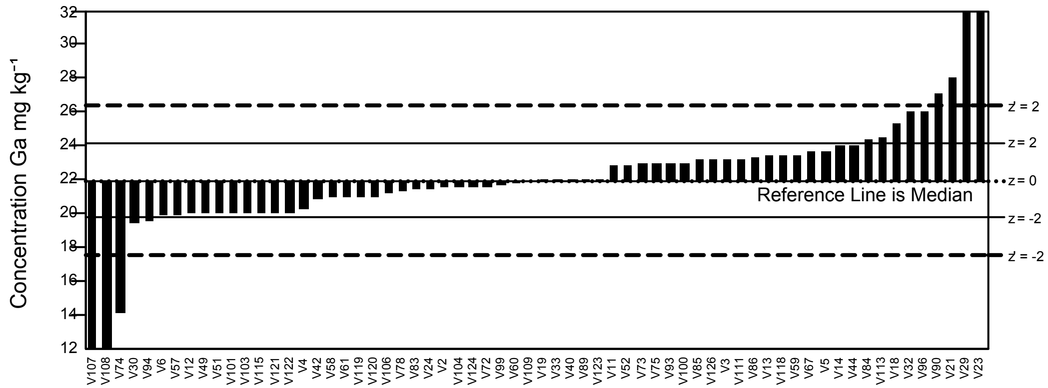
GeoPT39A - Barchart for Er



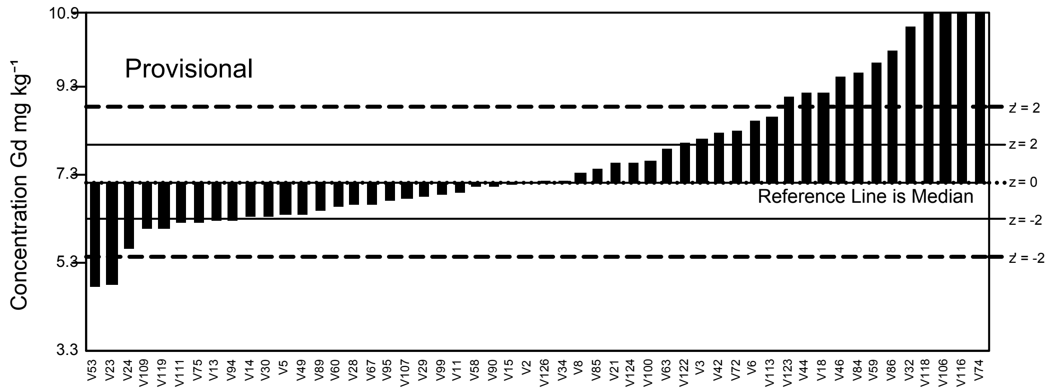
GeoPT39A - Barchart for Eu



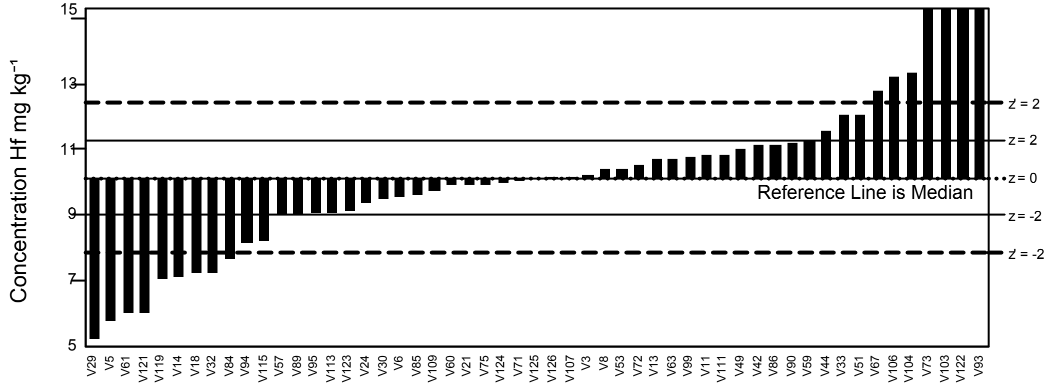
GeoPT39A - Barchart for Ga



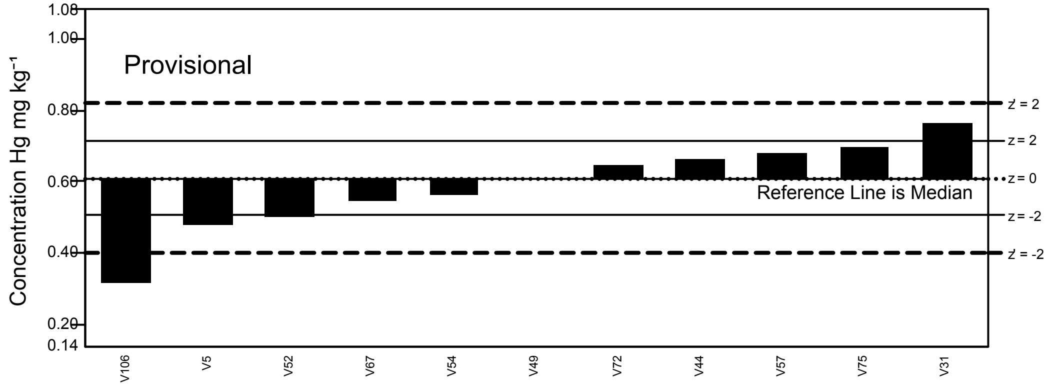
GeoPT39A - Barchart for Gd



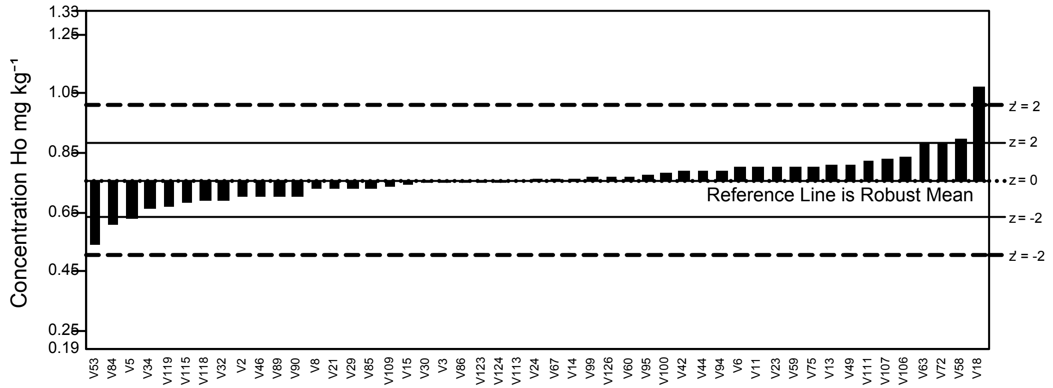
GeoPT39A - Barchart for Hf



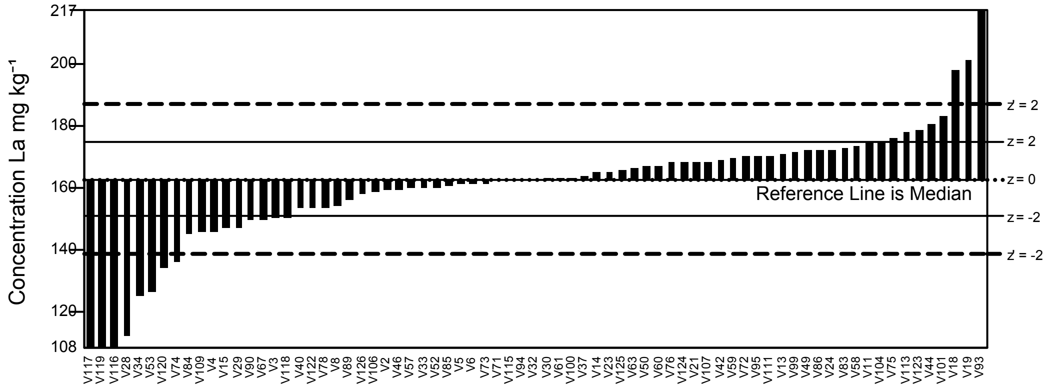
GeoPT39A - Barchart for Hg



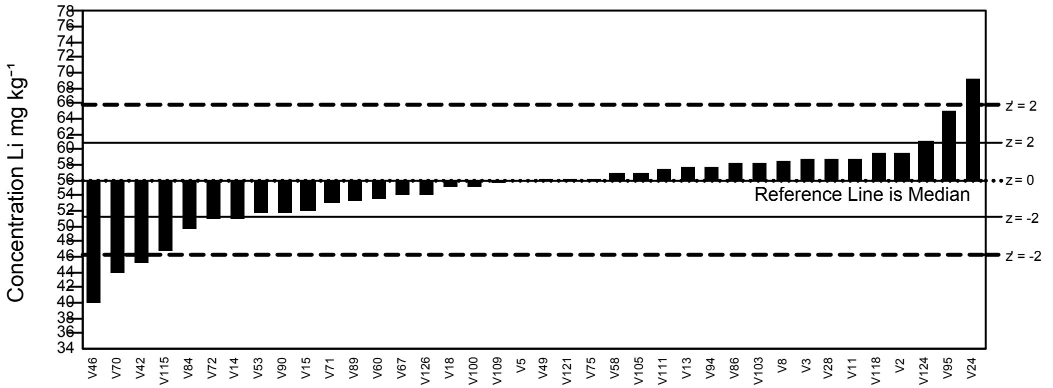
GeoPT39A - Barchart for Ho



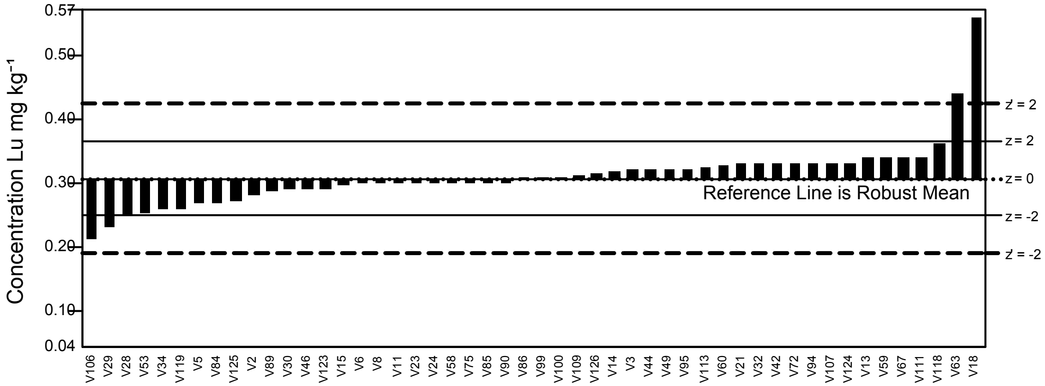
GeoPT39A - Barchart for La



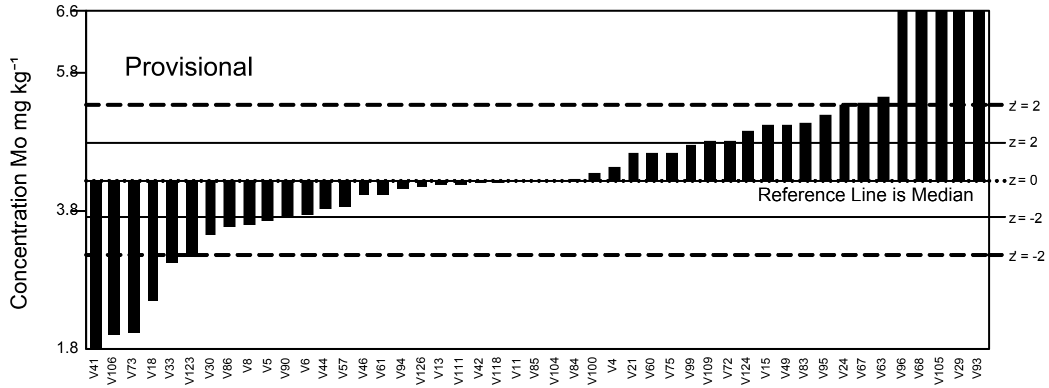
GeoPT39A - Barchart for Li



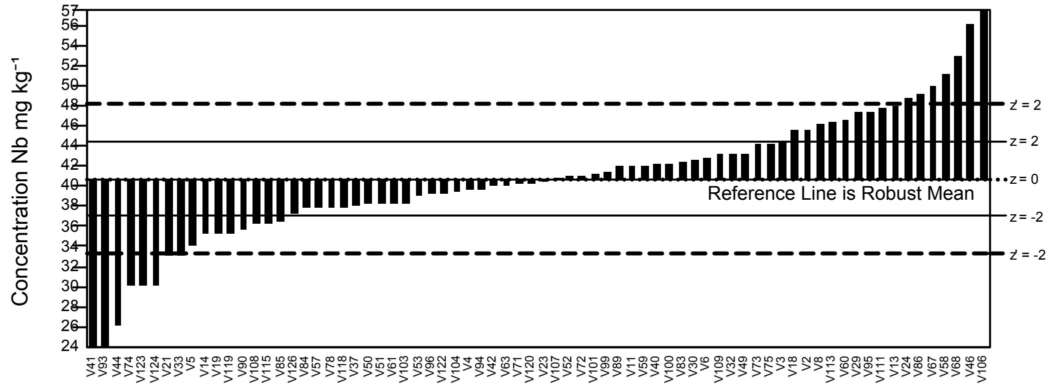
GeoPT39A - Barchart for Lu



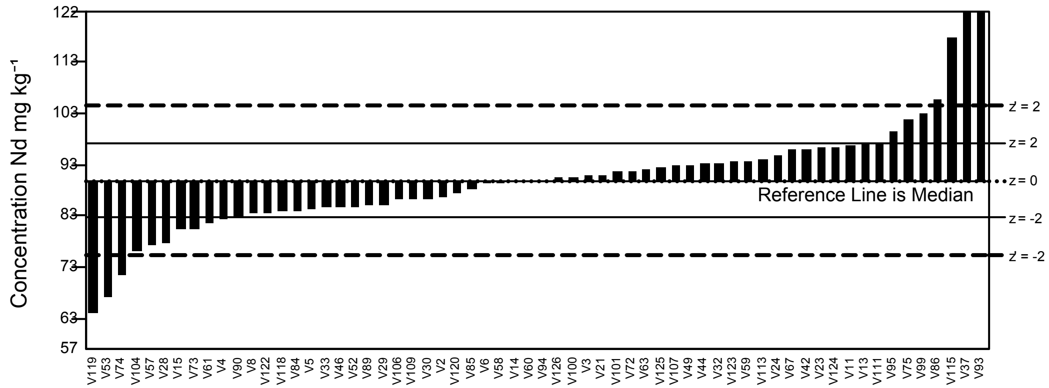
GeoPT39A - Barchart for Mo



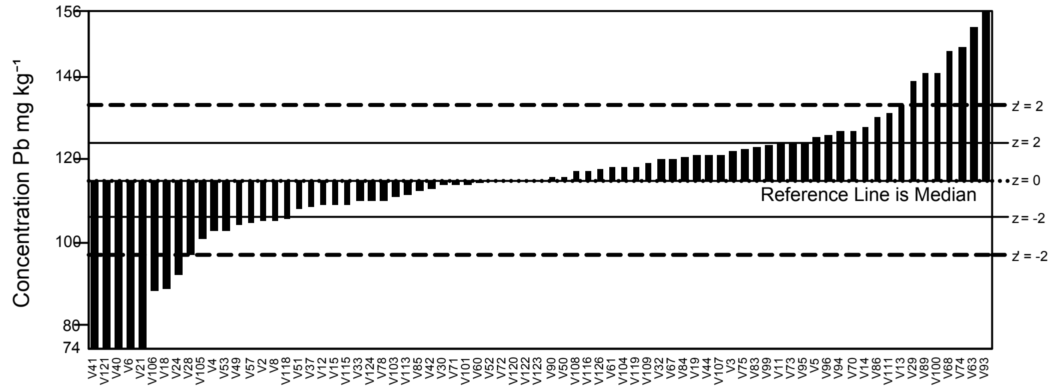
GeoPT39A - Barchart for Nb



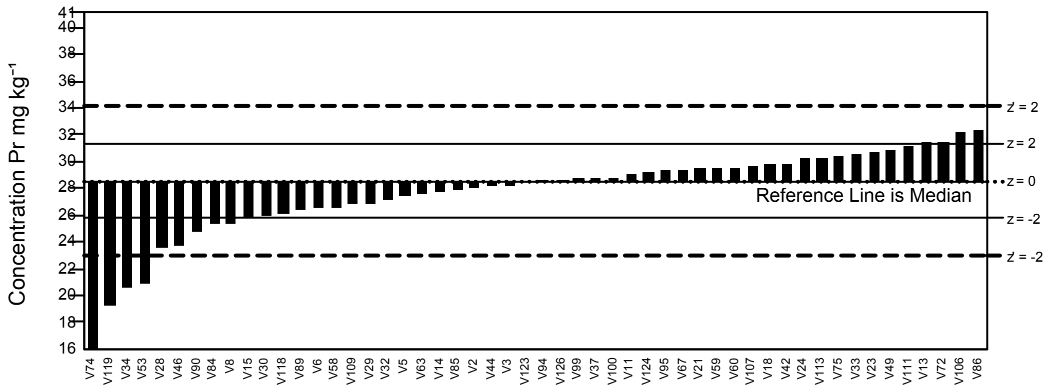
GeoPT39A - Barchart for Nd



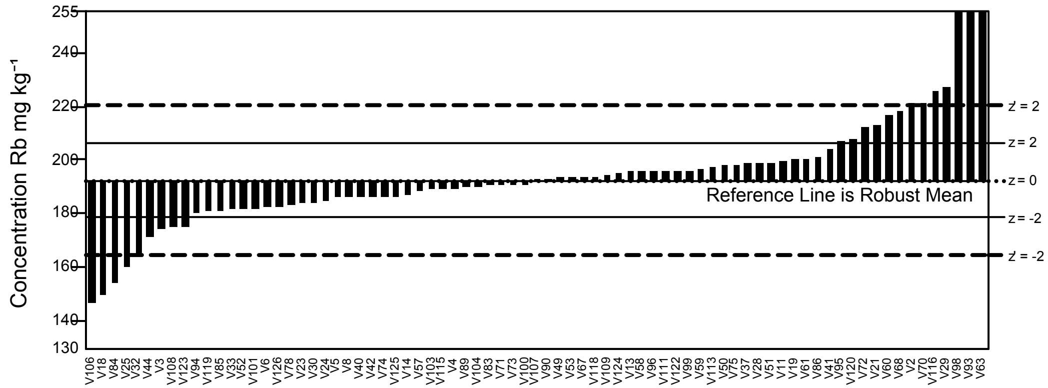
GeoPT39A - Barchart for Pb



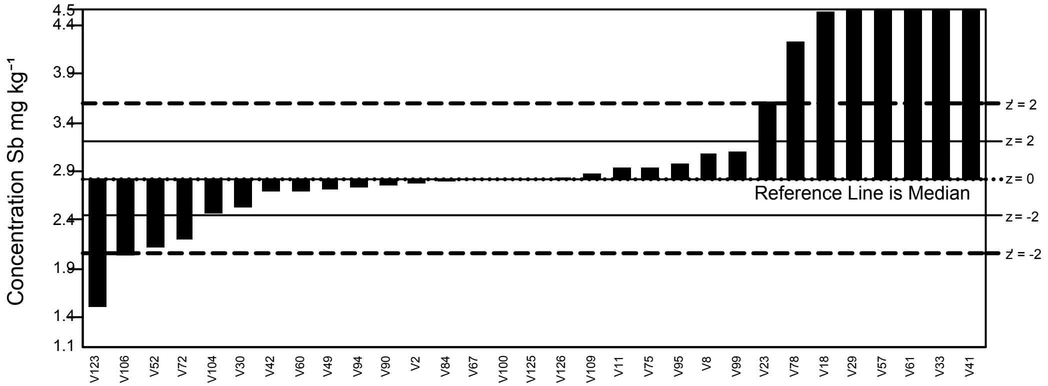
GeoPT39A - Barchart for Pr



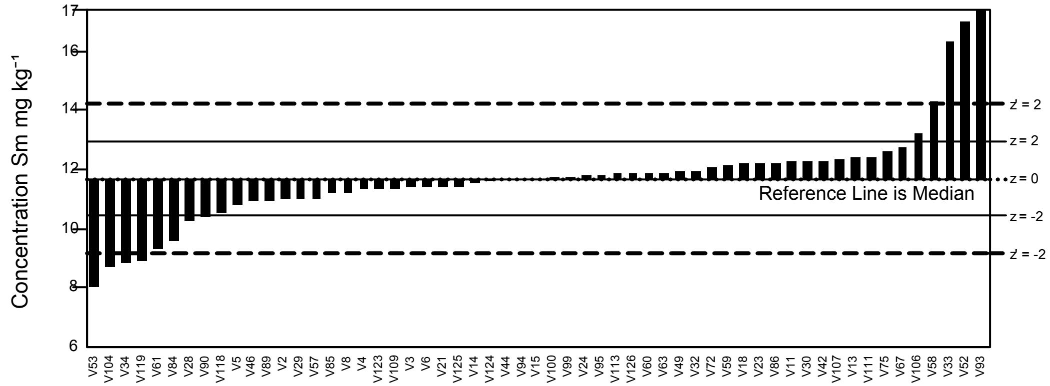
GeoPT39A - Barchart for Rb



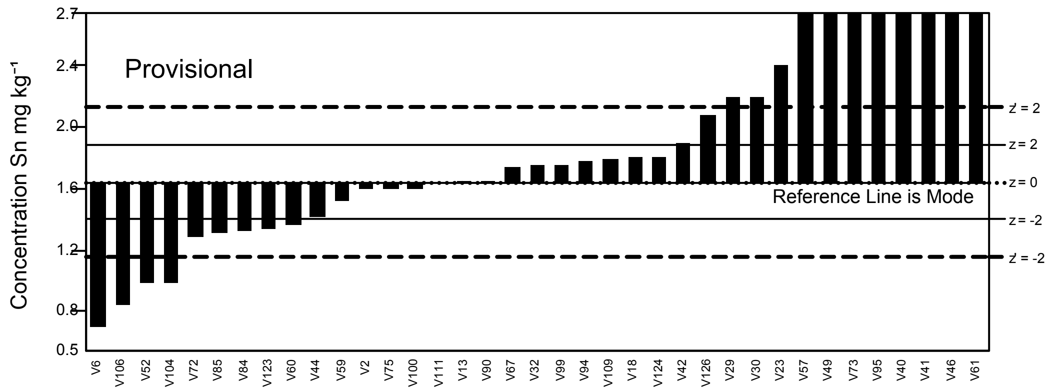
GeoPT39A - Barchart for Sb



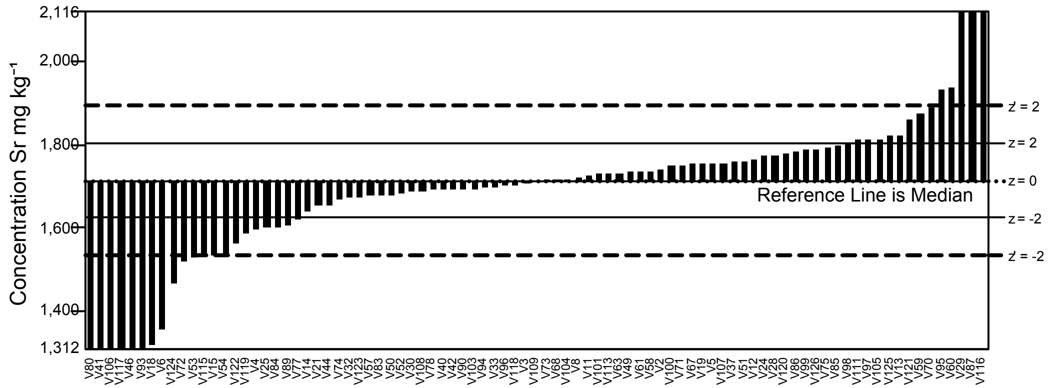
GeoPT39A - Barchart for Sm



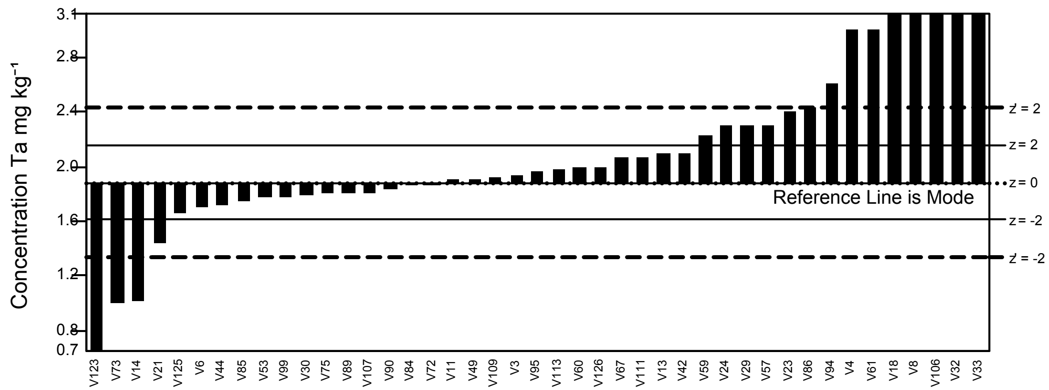
GeoPT39A - Barchart for Sn



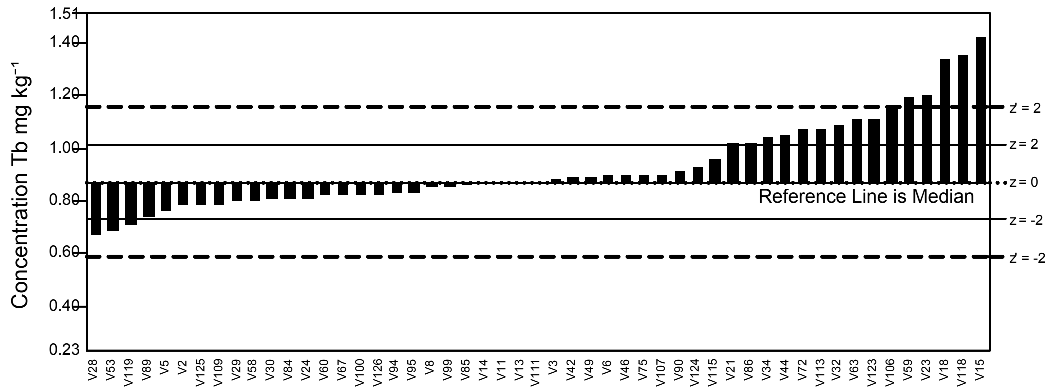
GeoPT39A - Barchart for Sr



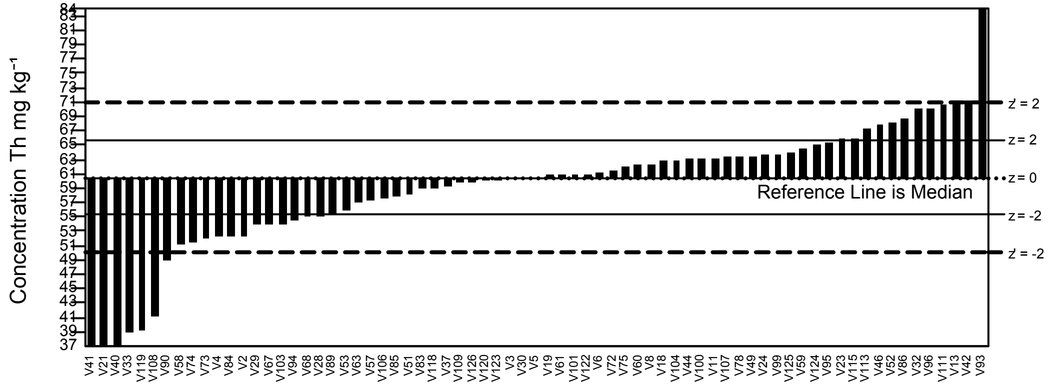
GeoPT39A - Barchart for Ta



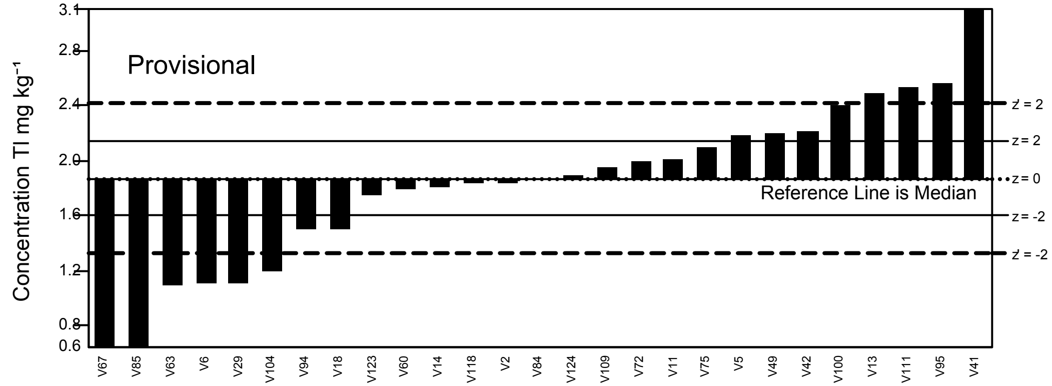
GeoPT39A - Barchart for Tb



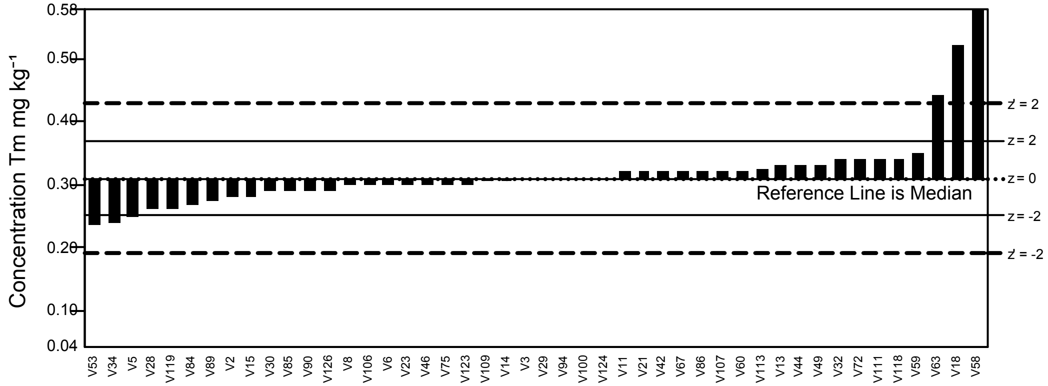
GeoPT39A - Barchart for Th



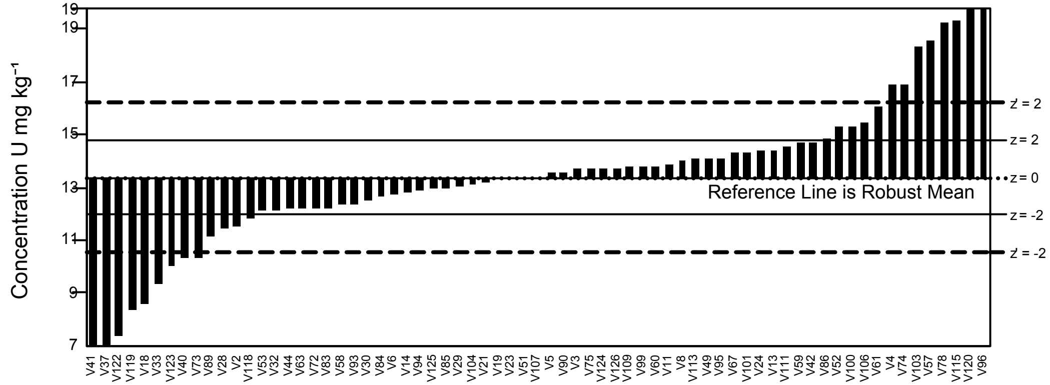
GeoPT39A - Barchart for Tl



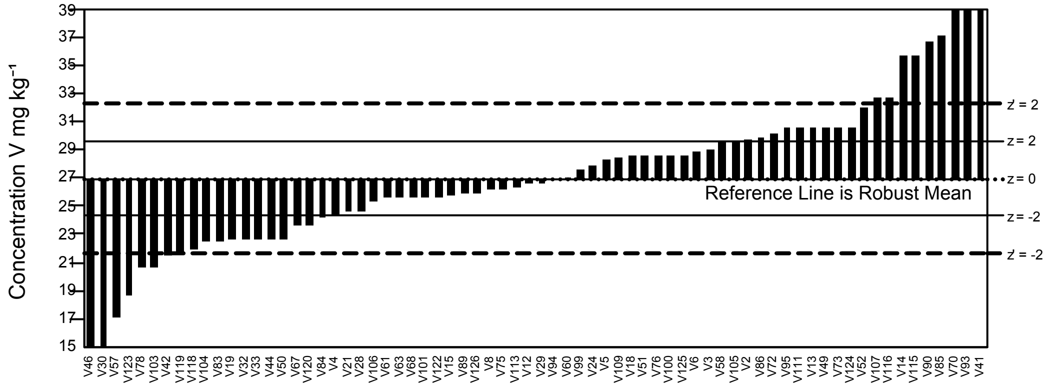
GeoPT39A - Barchart for Tm



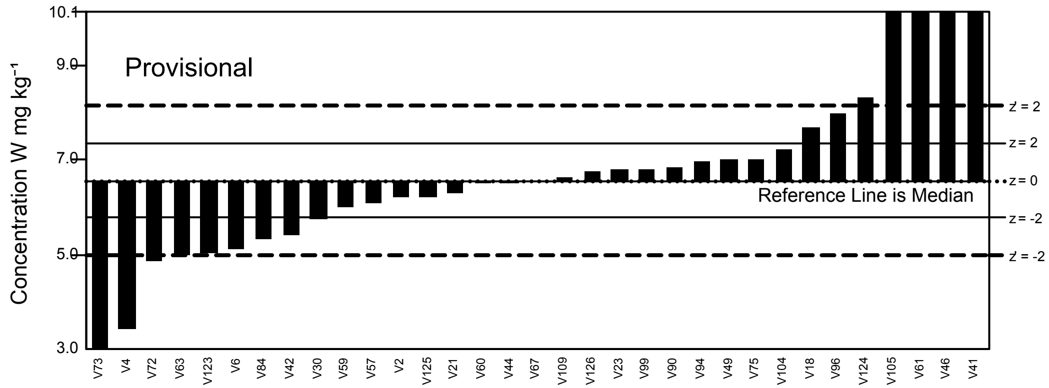
GeoPT39A - Barchart for U

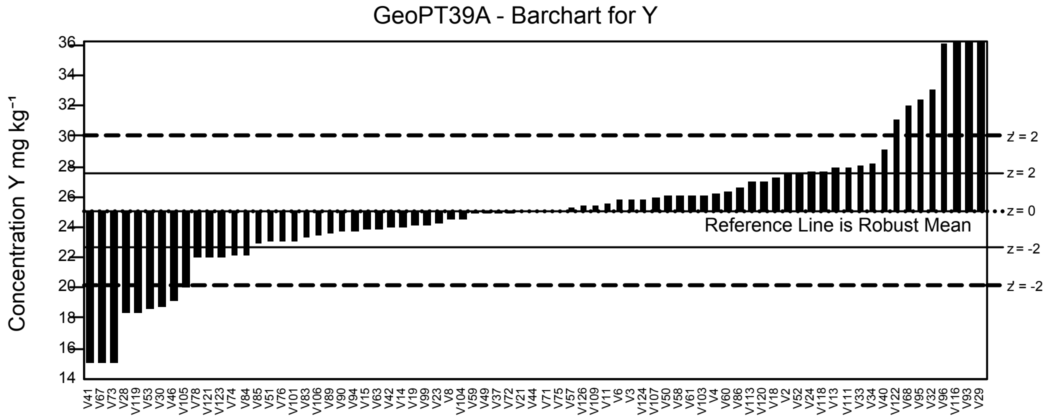


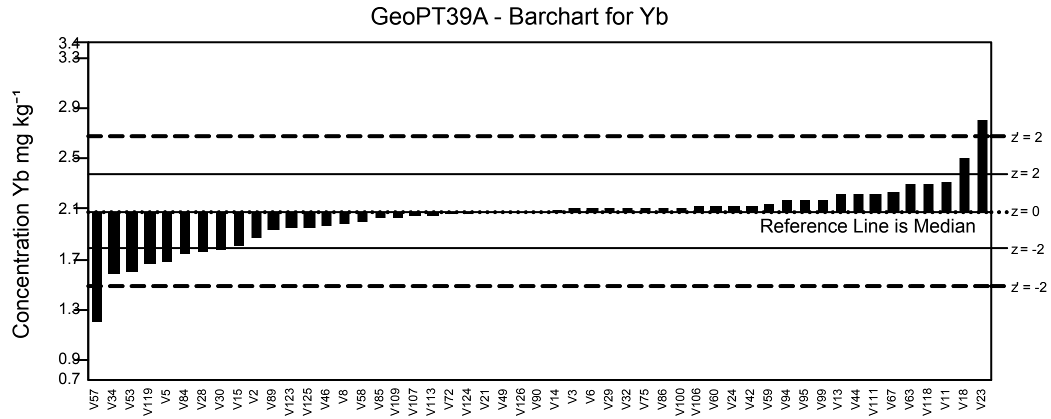
GeoPT39A - Barchart for V

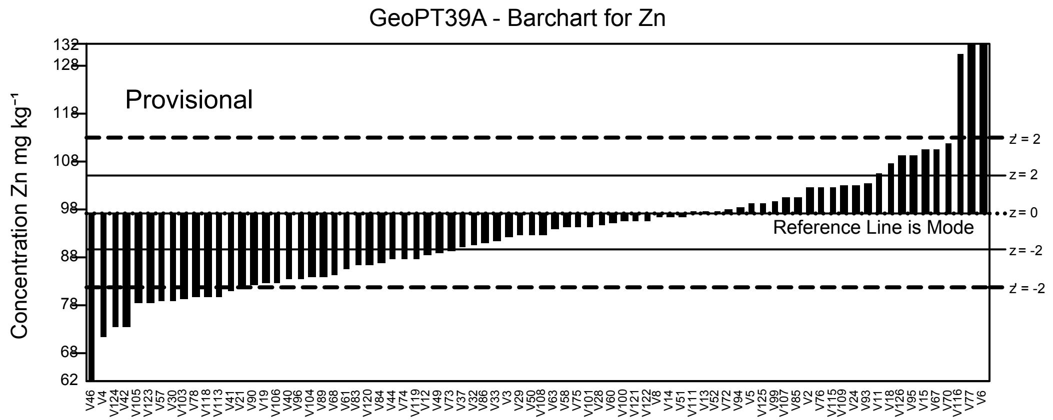


GeoPT39A - Barchart for W









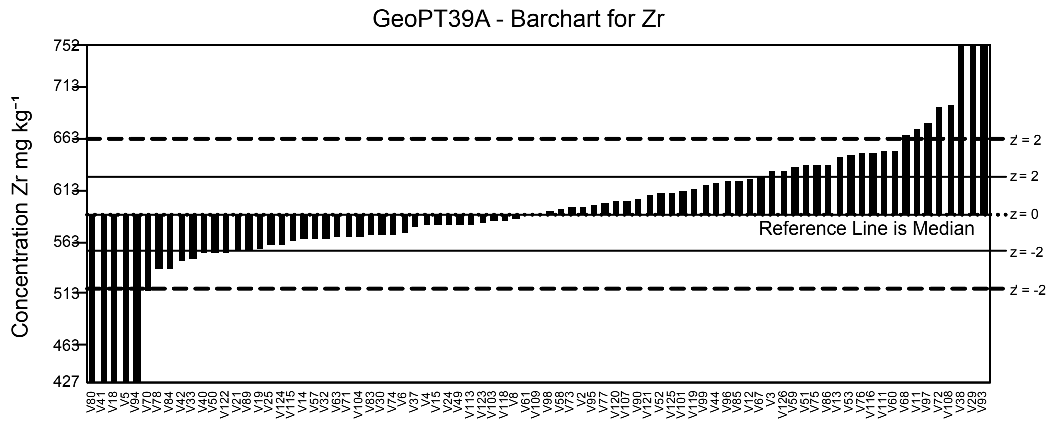
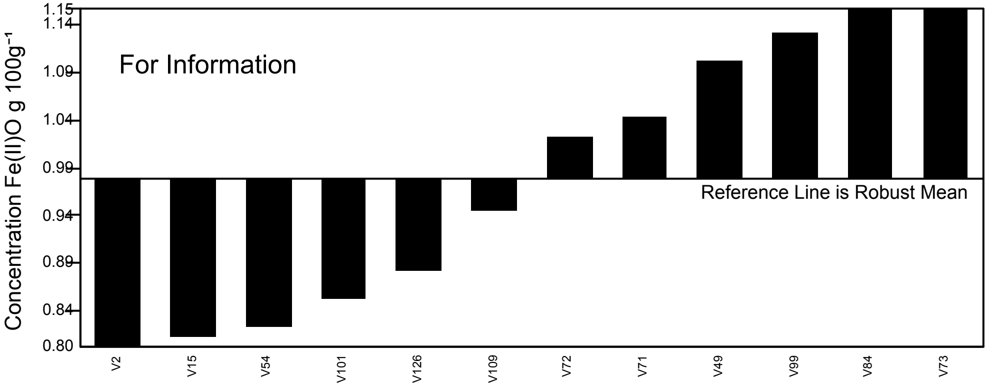
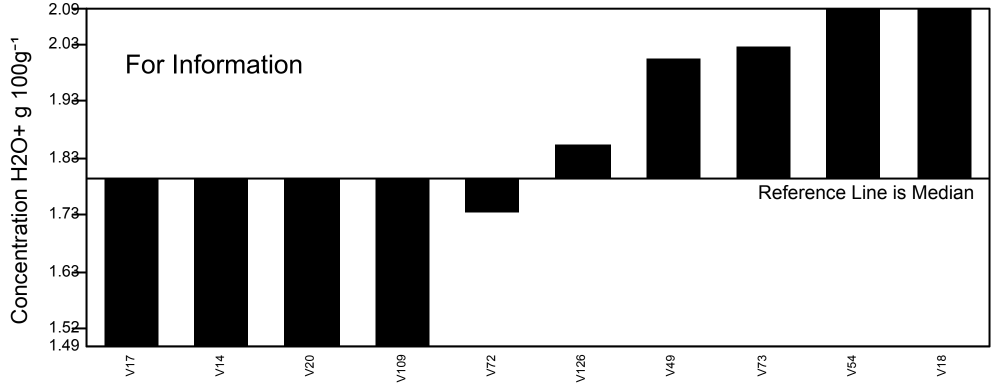


Figure 1: GeoPT39A - Nepheline syenite, MNS-1. Data distribution charts for elements for which values were assigned or provisional values given for guidance. Horizontal lines show the limits for -2<z<2 for pure geochemistry labs (solid lines) and -2<z'<2 for applied geochemistry labs (pecked lines).

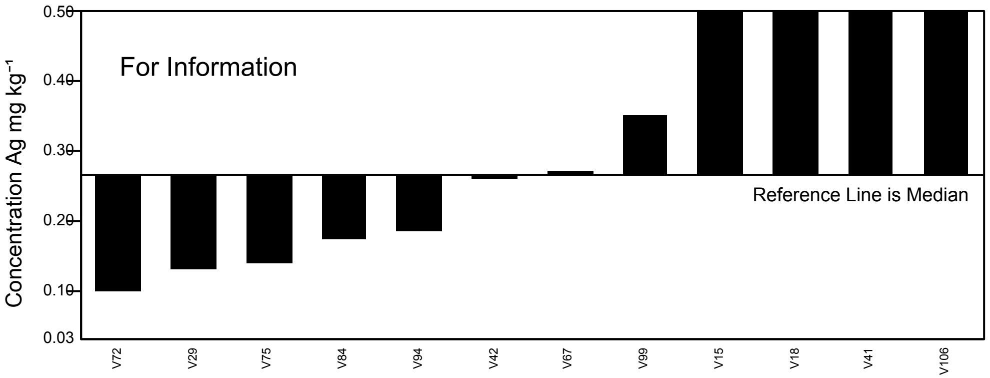
GeoPT39A - Barchart for Fe(II)O



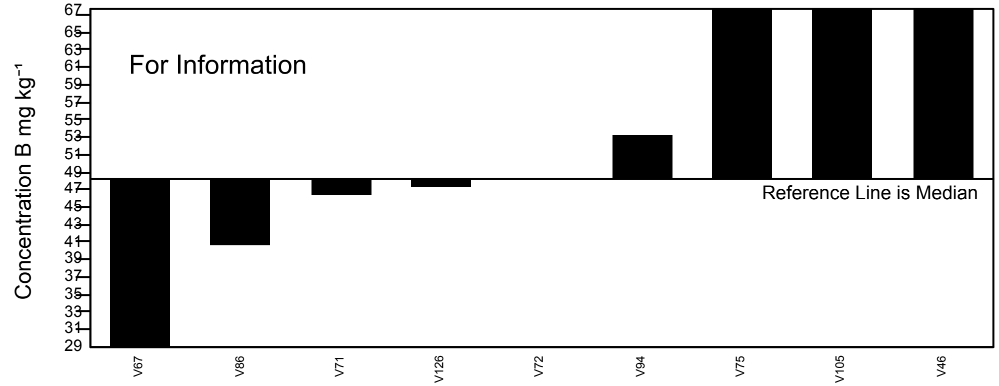
GeoPT39A - Barchart for H2O+



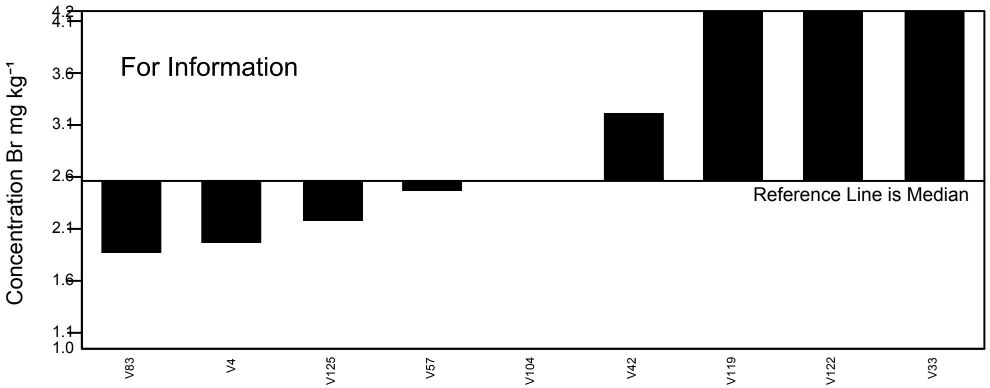
GeoPT39A - Barchart for Ag



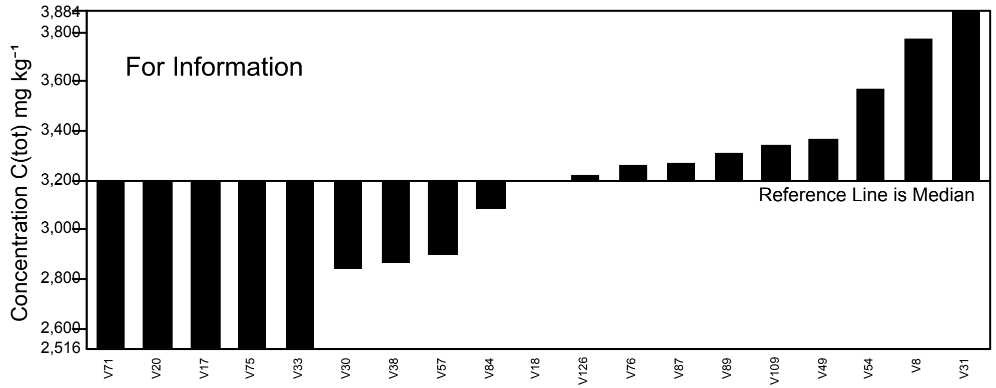
GeoPT39A - Barchart for B



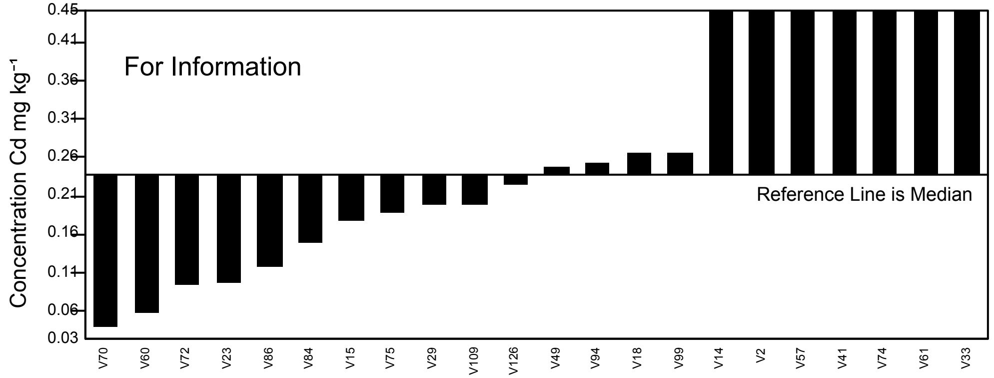
GeoPT39A - Barchart for Br



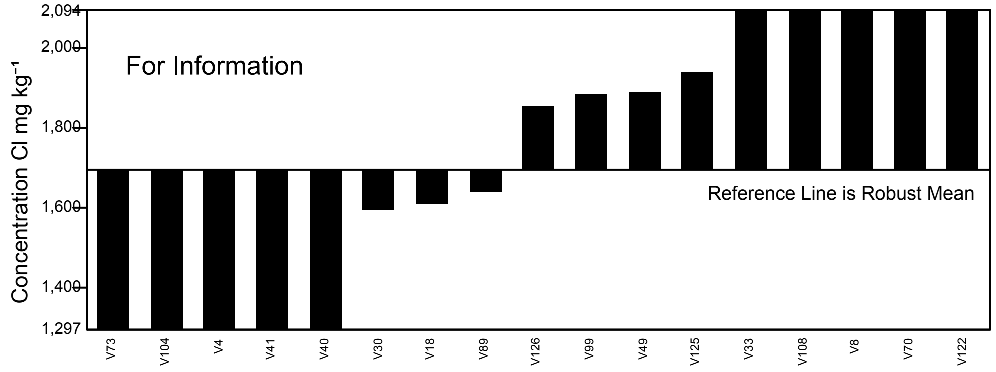
GeoPT39A - Barchart for C(tot)



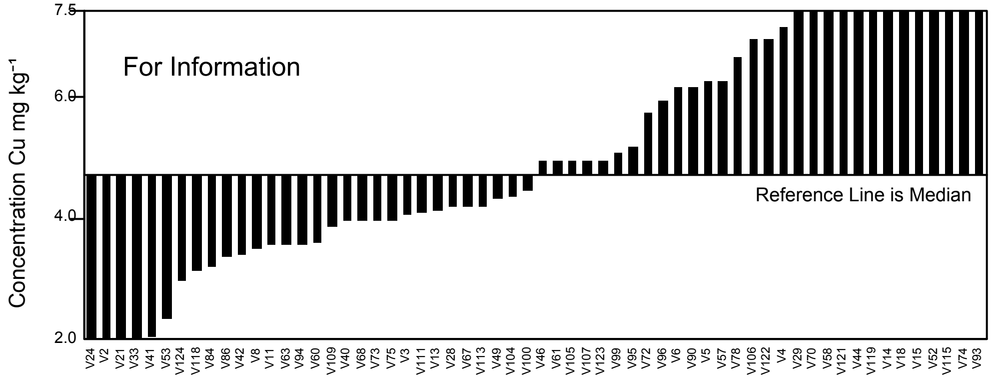
GeoPT39A - Barchart for Cd



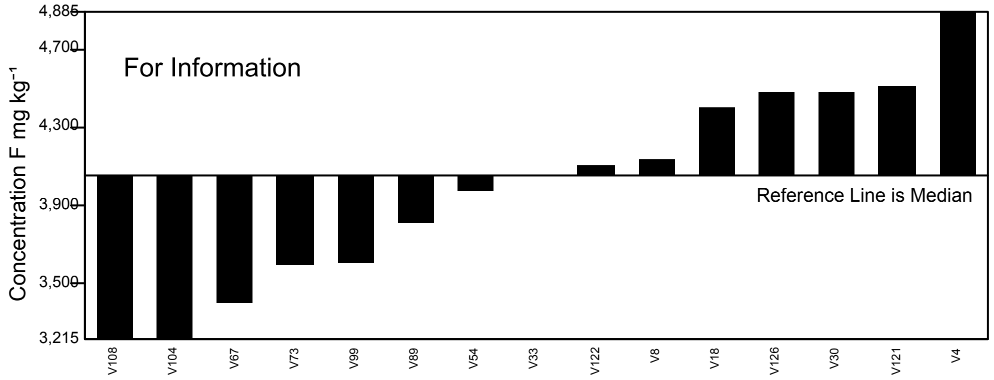
GeoPT39A - Barchart for Cl



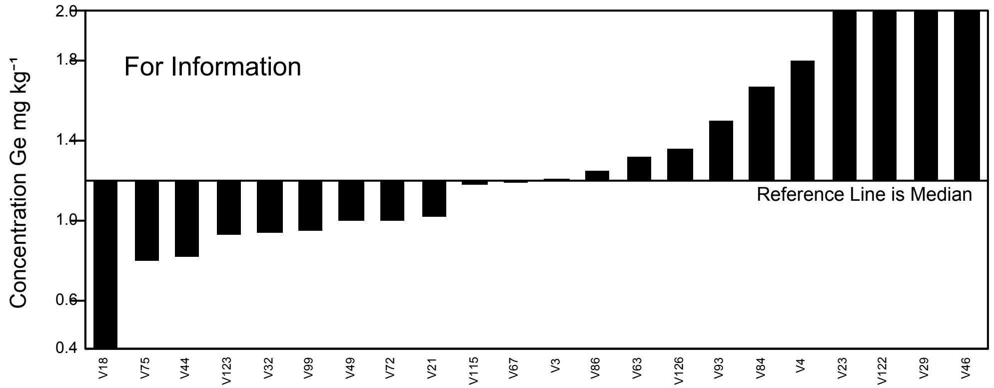
GeoPT39A - Barchart for Cu



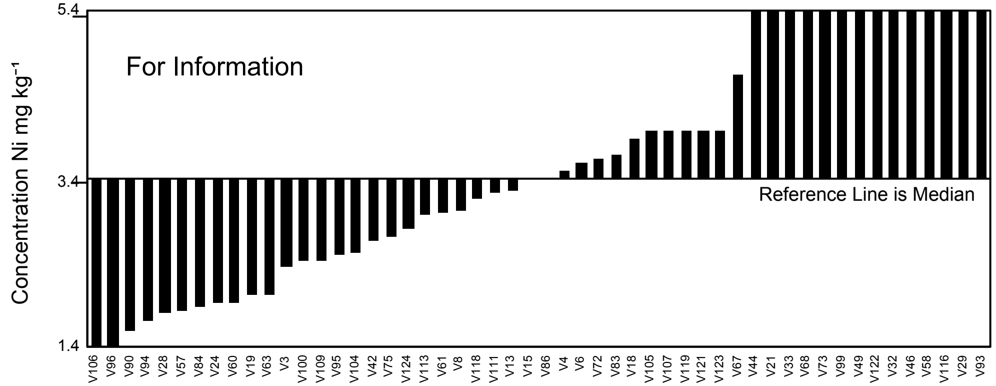
GeoPT39A - Barchart for F

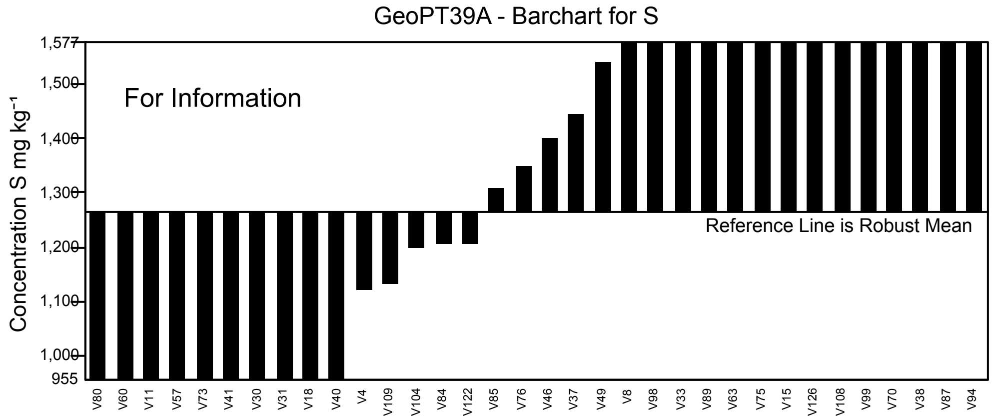


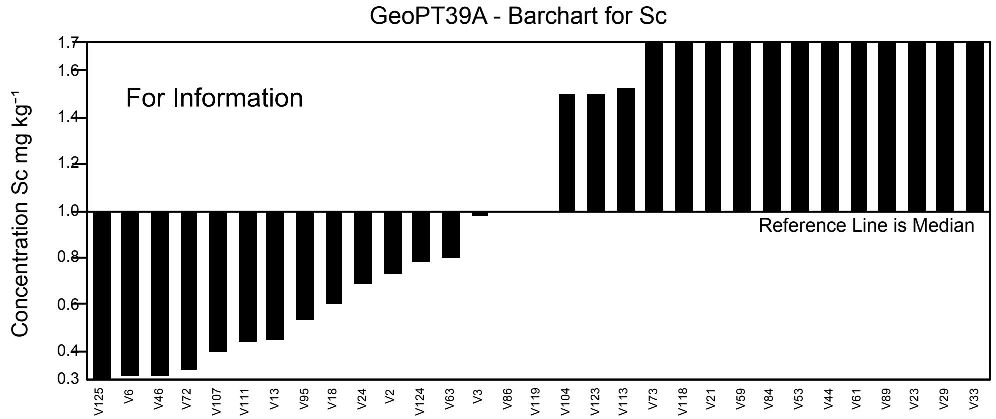
GeoPT39A - Barchart for Ge



GeoPT39A - Barchart for Ni







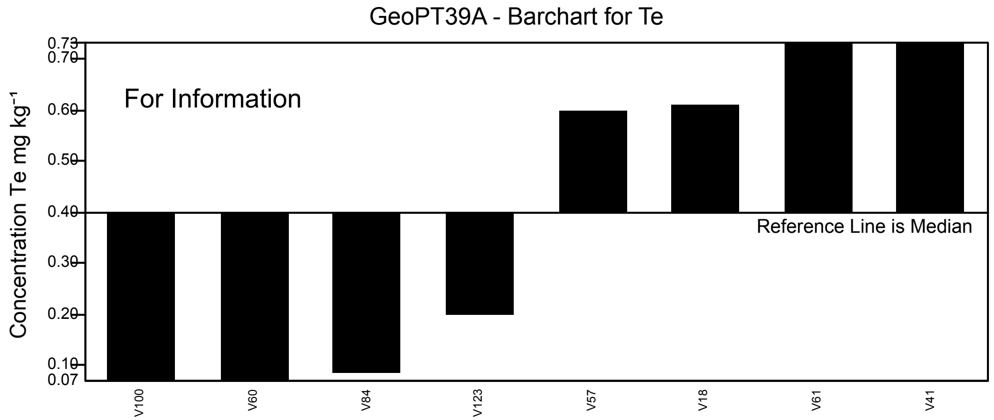


Figure 2: GeoPT39A - Nepheline syenite, MNS-1. Data distribution charts provided for information only for elements for which values could not be assigned.

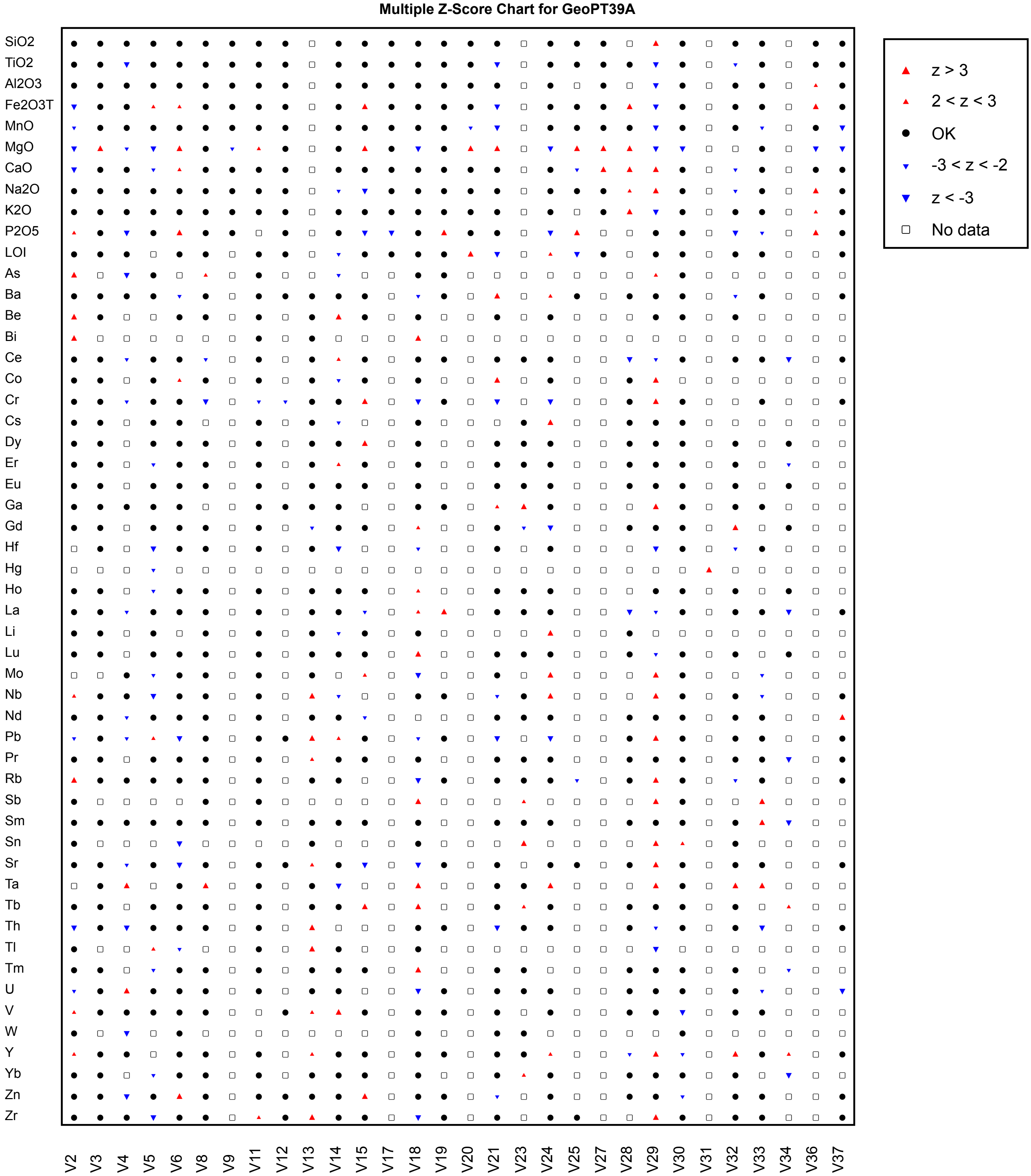


Figure 3: GeoPT39A - Nepheline syenite, MNS-1. Multiple z-score charts for laboratories participating in the GeoPT39 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

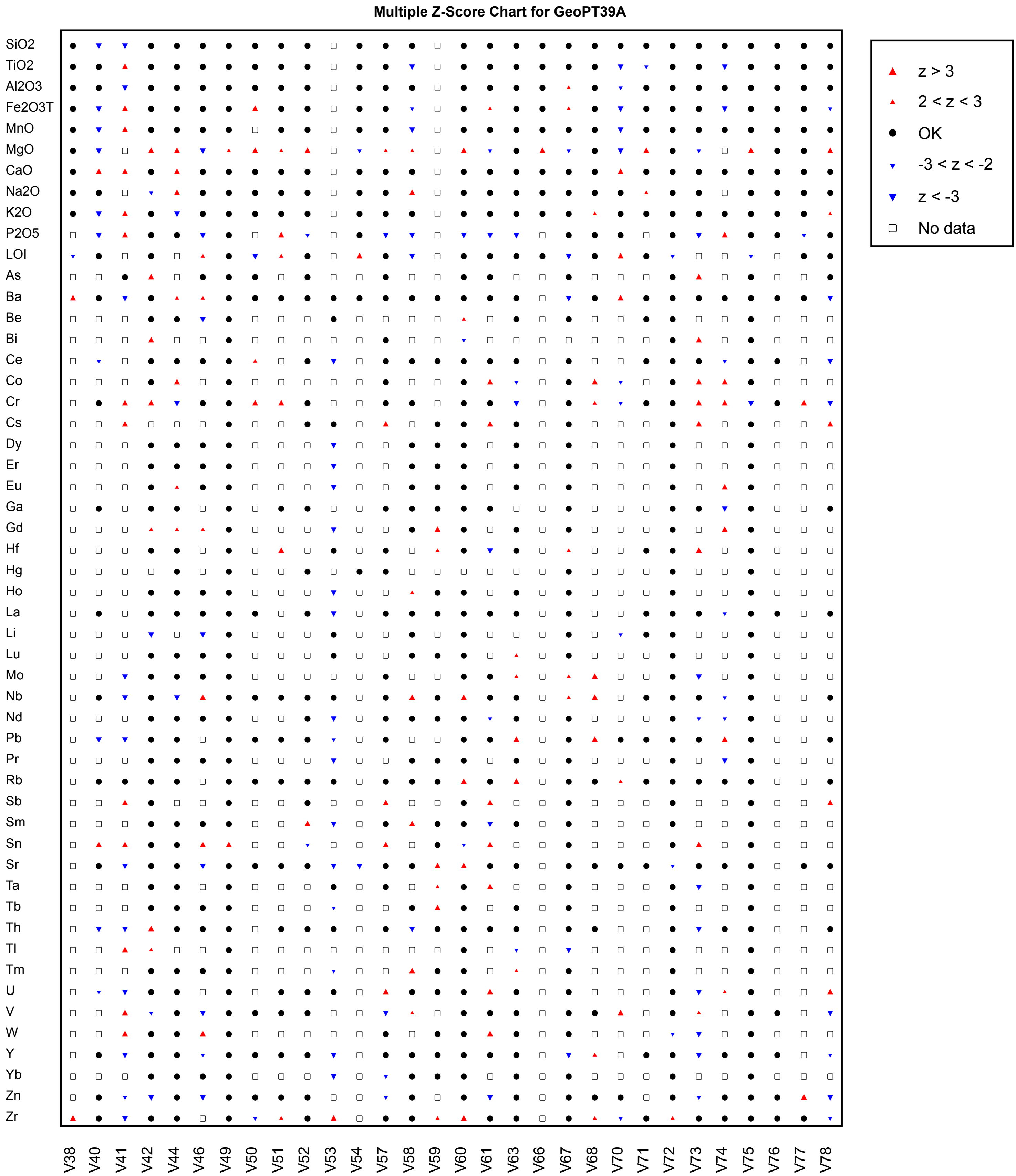


Figure 3: GeoPT39A - Nepheline syenite, MNS-1. Multiple z-score charts for laboratories participating in the GeoPT39 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

Multiple Z-Score Chart for GeoPT39A

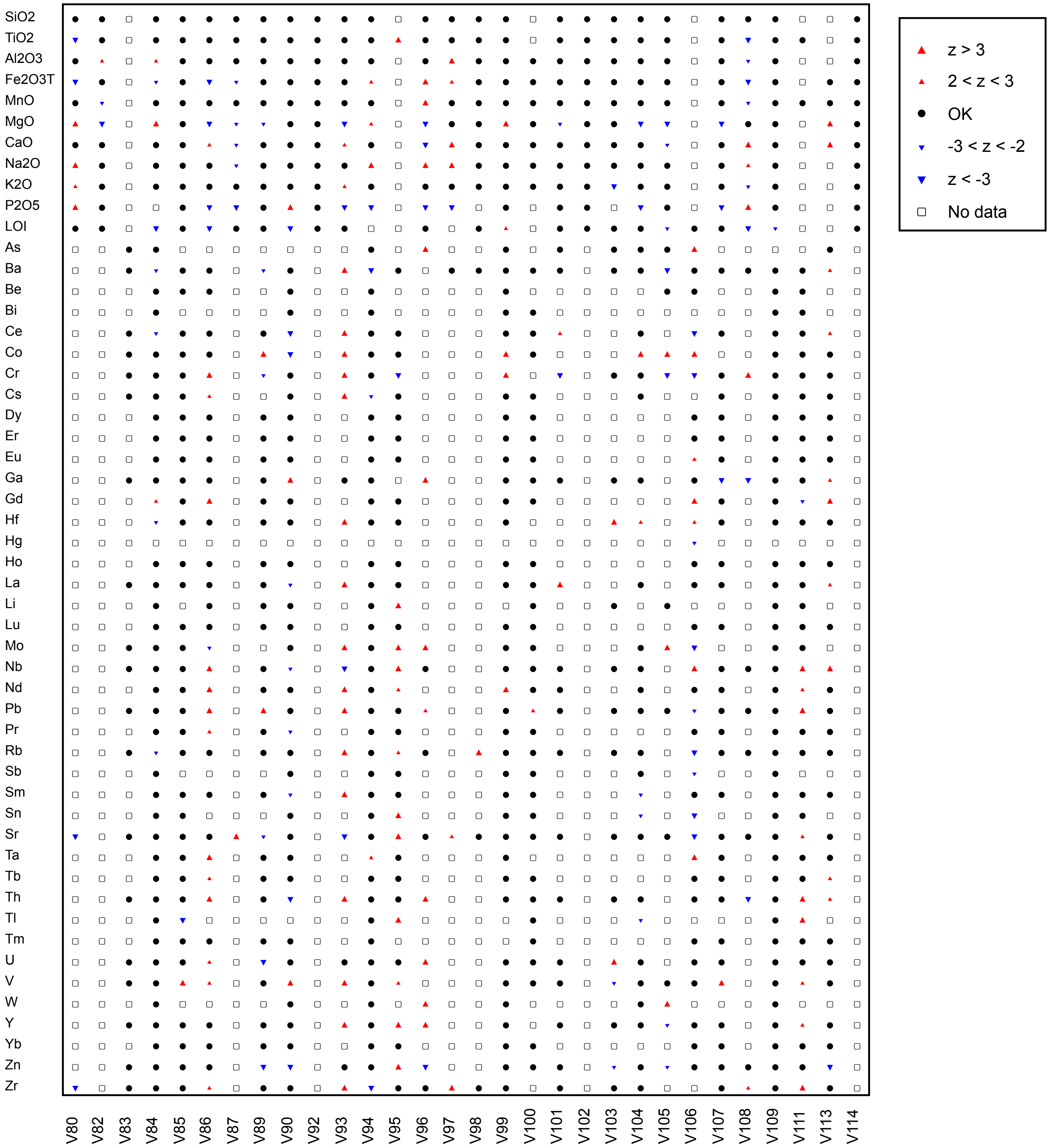


Figure 3: GeoPT39A - Nepheline syenite, MNS-1. Multiple z-score charts for laboratories participating in the GeoPT39 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).

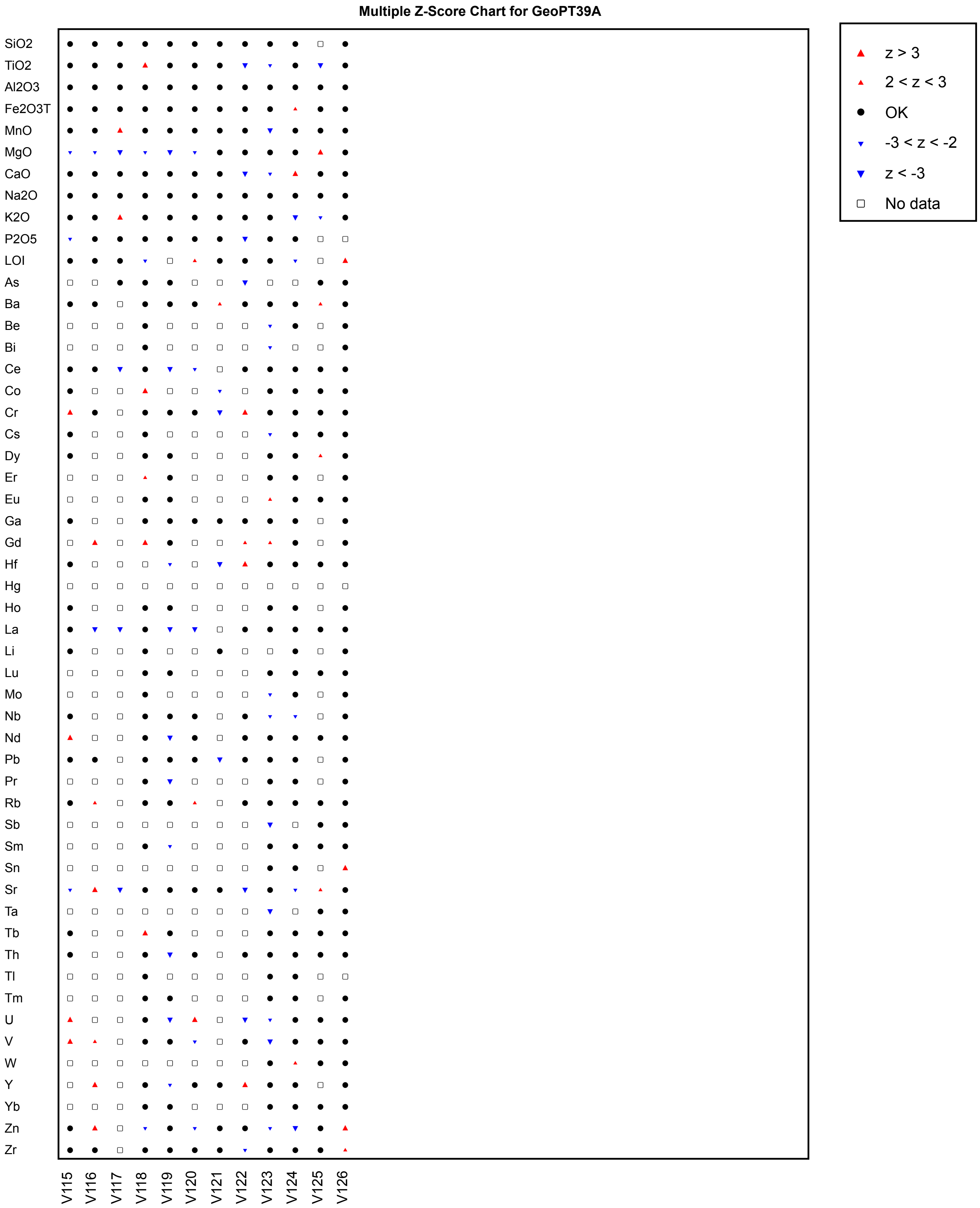


Figure 3: GeoPT39A - Nepheline syenite, MNS-1. Multiple z-score charts for laboratories participating in the GeoPT39 A round. Symbols indicate whether or not an elemental result complies with the -2<z<+2 criteria (see key).