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National Geochemical Survey of Australia: Data Quality Assessment

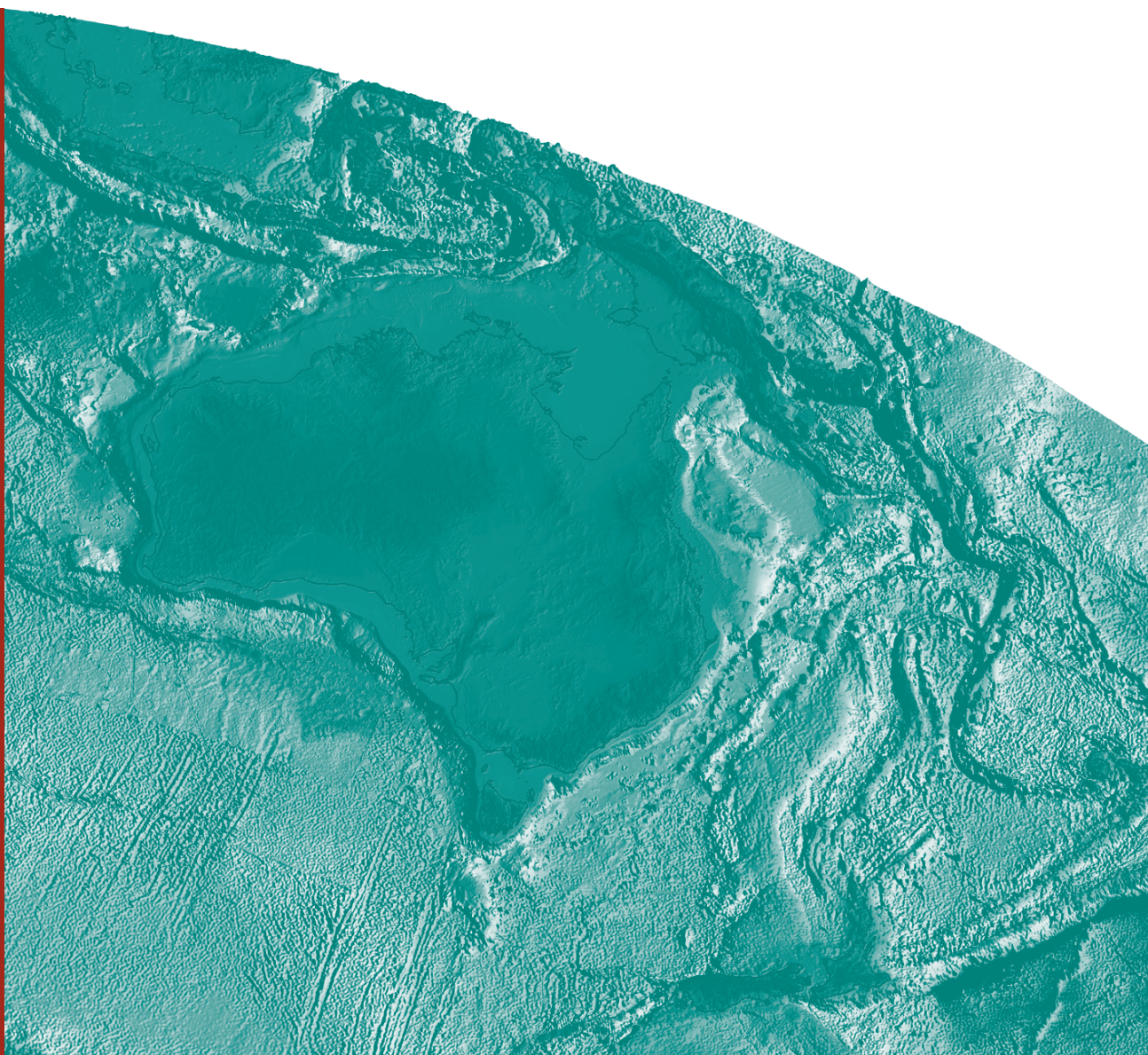
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Patrice de Caritat, Michelle Cooper

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National Geochemical Survey of Australia: Data Quality Assessment

Volume 1

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RECORD 2011/21

by

Patrice de Caritat¹, Michelle Cooper¹



Australian Government
Geoscience Australia

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Executive Summary

The National Geochemical Survey of Australia (NGSA) project has collected samples from 1315 sites located in 1186 catchments (~10 % of which were sampled in duplicate) covering over 80 % of Australia, in a collaborative venture between Geoscience Australia and the geoscience agencies of all States and the Northern Territory. At each site, two depth intervals were sampled and two grain size fractions were separated, giving 5260 samples to be analysed.

Samples were analysed for:

1. Total content of multiple elements, analysed by x-ray fluorescence (XRF) and inductively coupled plasma-mass spectrometry (ICP-MS)
2. Aqua Regia soluble content of multiple elements, including low-level gold (Au), analysed by ICP-MS
3. Aqua Regia soluble content of selenium (Se), analysed by ICP-MS
4. ligand extractable content of multiple elements, analysed by ICP-MS
5. fluoride (F) after alkaline fusion, analysed by ion specific electrode (ISE)
6. platinum group elements (PGEs) after fire assay, analysed by ICP-MS
7. pH, electrical conductivity (EC) and particle size distribution of bulk samples

Several quality control measures were taken during the project. These included:

- Central provision of sampling equipment and sample bags to all field teams
- Randomised sample identification scheme so that samples were presented to the laboratories in a sequence unrelated to the order in which they were collected (as much as practically feasible)
- Prevention of contamination in the field and in the laboratory
- Prevention of sample mix-up in the field and in the laboratory
- Field duplicates: every 10th site, a field duplicate sample was collected to help quantify total (sampling + analytical) precision (not identified as such to the laboratory)
- Certified Reference Materials (CRMs) TILL-1, TILL-2 (Natural Resources Canada) were run with every batch on GA's XRF & ICP-MS to help quantify analytical precision and bias
- Laboratory duplicates (splits), Internal Project Standards (MRIS, WRIS, ORIS, MRIS2, WRIS2), exchanged project standards (GEMAS-Ap, GEMAS-Gr from EuroGeoSurveys; SoNE-1 from United States Geological Survey; BraSol from Brazil), and international CRMs (TILL-1, TILL-3, LKSD-1, STSD-3 from Natural Resources Canada) were covertly inserted in the analytical suites for in-house and external analyses to help quantify analytical precision and bias (not identified as such to the laboratory)
- Internal Project Standard (GRIS) for pH 1:5, EC 1:5 and grain size measurements (not identified as such to the laboratory)

In addition to the above measures, the analytical laboratories applied their own QA/QC procedures, including running CRMs and/or internal standards, replicating digests and/or analysis, and analysis of blanks.

The present report uses some of the above data to quantitatively assess the quality of the NGSA data, which allows a quality statement to be made about the NGSA data.

List of Abbreviations Used

BOS	Bottom Outlet Sediment (60-80 cm depth, on average)
CRM	Certified Reference Material
EC	Electrical Conductivity (in $\mu\text{S}/\text{cm}$)
FA	Fire Assay
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
IPS	Internal Project Standard
IQR	Inter-Quartile Range
ISE	Ion Specific Electrode
LLD	Lower Limit of Detection
LOI_C	Loss on Ignition (Calculated from XRF data)
LPSA	Laser Particle Size Analyser
MMI TM	Mobile Metal Ion TM
NGSA	National Geochemical Survey of Australia
PGE	Platinum Group Element
QA	Quality Assessment
QC	Quality Control
RSD	Relative Standard Deviation
SD	Standard Deviation
TOS	Top Outlet Sediment (0-10 cm depth)
ULD	Upper Limit of Detection
XRF	X-Ray Fluorescence

Introduction

A 5-year Onshore Energy Security Program (OESP) was announced in 2006 to enable Geoscience Australia to deliver high quality pre-competitive geoscience information relating to onshore energy prospectivity (Johnson, 2006). The National Geochemical Survey of Australia (NGSA), which is part of this programme (Baldwin, 2007), collected transported regolith (sediment) samples from across the Australian continent and determined their inorganic chemical composition. The NGSA provides the only nation-wide, internally consistent geochemical dataset with state-of-the-art detection limits. It aimed to:

- Help calibrate and ground-truth the airborne radiometrics coverage of Australia (including addressing mother-daughter disequilibrium in the uranium-decay chain);
- Fill gaps in the existing airborne radiometric and geochemical coverages of Australia with quality data;
- Permit multi-element characterisation and ranking of radiometric anomalies (*e.g.*, differentiation of uranium signatures from ‘hot’ granites, black shales or palaeochannels); and
- Provide fundamental data to enable first-order characterisation of geothermal hot-spots.

As such, the NGSA project (<http://www.ga.gov.au/energy/projects/national-geochemical-survey.html>) supports and adds value to a number of other OESP projects, particularly the Australia-Wide Airborne Geophysical Survey project (<http://www.ga.gov.au/energy/projects/awags.html>; Minty *et al.*, 2009a) and the Geothermal Energy project (<http://www.ga.gov.au/energy/projects/geothermal-energy.html>). Additionally, the NGSA results will have wider applications in mineral exploration for other commodities and natural resource management.

At its completion in June 2011, the NGSA delivered:

- A geochemical dataset that is national in scope, internally consistent and acquired through the application of state-of-the-art methods and instrumentation;
- A web-delivered geochemical atlas of Australia for some 68 elements showing for the first time what the concentrations of these elements are in surface materials and how they vary spatially; and
- Reports and papers documenting the project in detail and drawing implications on energy resource prospectivity and other applications.

Samples were collected from 1186 catchments (or 1315 sites, including duplicates), which together cover over 6.174 million km² or ~81% of Australia at the average sample density of 1 site per 5200 km² (statistics based on equal area projection). Approximately 200 catchments in South Australia and Western Australia could not be sampled during this project due to access limitations. Collaboration with State and Northern Territory geoscience agencies was critical for the completion of the project, particularly regarding the sampling phase.

Sampling procedures were reported in Lech *et al.* (2007) and field data was compiled in Cooper *et al.* (2010). Sample preparation protocols were documented in Caritat *et al.* (2009) and sample analysis methods were detailed in Caritat *et al.* (2010). The compilation of NGSA maps was presented in the Geochemical Atlas of Australia (Caritat & Cooper, 2011). In the present report, which should be used in the context of the above mentioned reports, we present an assessment of the quality of the geochemical data generated by the NGSA project.

Background to the Project

The NGSA project aimed to provide pre-competitive data and knowledge to support exploration for energy resources in Australia. In particular, it improved existing knowledge of the concentrations and distributions of energy-related elements such as uranium (U) and thorium (Th) at the national scale.

The project was underpinned by a series of pilot geochemical surveys carried out in the previous four years by Geoscience Australia and the Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME) to test robust and cost-effective protocols for sample collection, preparation and analysis. Examples of these are the Riverina (Caritat *et al.*, 2005; Caritat *et al.*, 2007), the Gawler (Caritat *et al.*, 2008a) and the Thomson (Caritat & Lech, 2007; Lech and Caritat, 2007) pilot geochemical surveys. Selected results from these pilot projects were summarised in Caritat *et al.* (2008b).

The current national project, briefly described below, was conducted in collaboration with all the State and the Northern Territory geoscience agencies.

RATIONALE

The national geochemical survey was initiated because of the absence of a complete geochemical coverage for Australia and because such a data layer is an important complement to national-scale geological and geophysical datasets (Caritat *et al.*, 2008c).

The distribution of geochemical data available at the commencement of the survey through the national repository (OZCHEM database) is shown in Figure 1. The map shows that there are vast areas of the country (>60 %) that lack any geochemical information. Where geochemical data are available in the public domain, they may often not be internally comparable as a result of:

- Inconsistent sampling material (*e.g.*, rocks of various types and/or degree of alteration, mineralisation or weathering);
- Inconsistent sample preparation methods (*e.g.*, total analyses *versus* partial digests with weak acids);
- Differences in instrumentation used and between laboratories, leading to variable lower limits of detection between datasets (*e.g.*, older *versus* state-of-the-art instruments);
- Lack of metadata on data quality (*e.g.*, instrument calibration, bias, precision, sample type description, replicates, etc.); and
- Variable suite of elements analysed (*e.g.*, sometimes a very limited suite such as gold (Au) only or Au + copper (Cu)).

Although a significantly improved nation-wide, levelled coverage of airborne gamma-ray spectrometric (radiometric) data (Minty *et al.*, 2009a,b) became available (Figure 2) during the course of the NGSA project, field calibration of radiogenic elements potassium (K), uranium (U) or thorium (Th) is perhaps not as systematic as is desirable and the question of disequilibrium in the radiogenic decay chain is poorly constrained as a result. It is hoped the NGSA data, in combination with the new radiometric coverage, will yield insights into this problem.

Some regional geochemical surveys have been carried out in parts of Australia (*e.g.* Morris *et al.*, 1998; Cornelius *et al.*, 2008; the pilot geochemical surveys mentioned above), but no national coverage exists. The modern concept of regional geochemical surveys was first developed in the 1960s, and it has since proven to be a reliable tool for mineral exploration at various scales (Garrett *et al.*, 2008; Smith & Reimann, 2008).

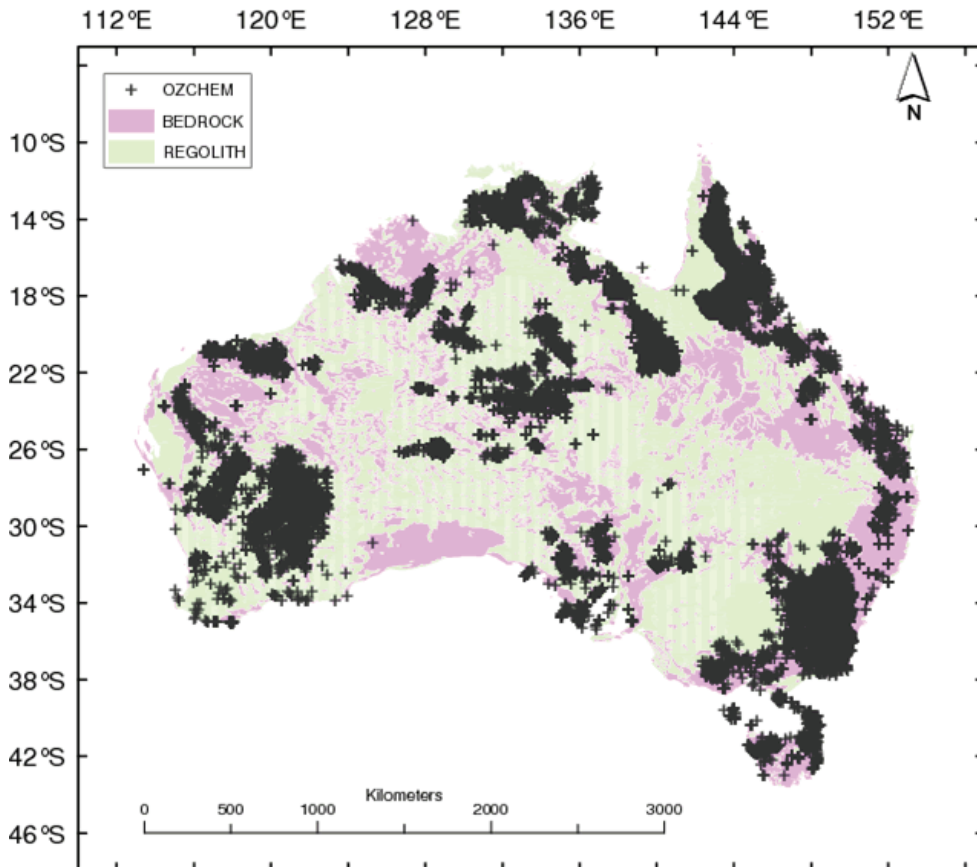


Figure 1. Distribution of whole rock geochemical data in Australia (plus signs) extracted from the OZCHEM national database as at June 2006, overlain on bedrock and regolith coverage.

OBJECTIVES

The objectives of the NGSA project were to:

- Collect transported regolith samples at the outlet of large catchments covering >90 % of Australia using an ultra low sampling density approach;
- Prepare and analyse the samples to extract the maximum amount of geochemical information (60+ elements/parameters) using internally consistent, state-of-the-art techniques;
- Populate the national geochemical database with the resulting new data; and
- Compile an atlas of geochemical maps (this document) for use by the mineral exploration industry to identify areas of interest in terms of energy-related resources and other mineral commodities, which can then be the focus of targeted exploration efforts.

STRATEGY

The sampling method was adapted to Australian landscape and climate conditions (*e.g.*, importance of aeolian landforms in some areas, climate ranging from tropical to arid). It was fine-tuned and field-tested during the Riverina, Gawler and Thomson pilot projects (*e.g.*, see Caritat *et al.*, 2008b). The cost of a national survey was minimised by applying an ultra low sampling density approach (generally accepted to mean between 1 site/1000 km² and 1 site/10,000 km²).

The strategy adopted for the national geochemical survey is briefly described below.



Figure 2. Ternary image (K-red, eU-blue, eTh-green) of Australia derived from the new levelled National Radioelement Database (Minty *et al.*, 2009b)

Sampling medium

Catchment outlet sediments (similar to floodplain sediments in most cases) were sampled at two depths (0-10 cm below the surface as well as at a depth of between ~60 and 80 cm on average). The term ‘catchment outlet sediment’ is deliberately chosen because it is more general than ‘floodplain sediment’ to allow for those cases where aeolian influence is important in the regolith formation process.

Sampling sites

Initially 1385 catchments covering 91% (or about 7 million km²) of Australia across all States and Territories were targeted for sampling (Figure 3). Five catchments were assigned a second sampling site (*i.e.*, target site) due to their size and topography so in total, it was expected that 1529 samples (1390 catchments + 10 % of which are sampled in duplicate) would be collected. Most catchments were sampled near their outlet, while those exhibiting internal or poorly defined drainage were sampled at, or as close as possible to, their lowest point. Lech *et al.* (2007) give details of the method for determining sampling sites. Catchments smaller than 1000 km² (mostly coastal) and small islands were not included in the survey. The resulting distribution of catchment outlet sites targeted for sampling is shown in Figure 4 and translates to an average sampling density of around 1 site/5500 km².

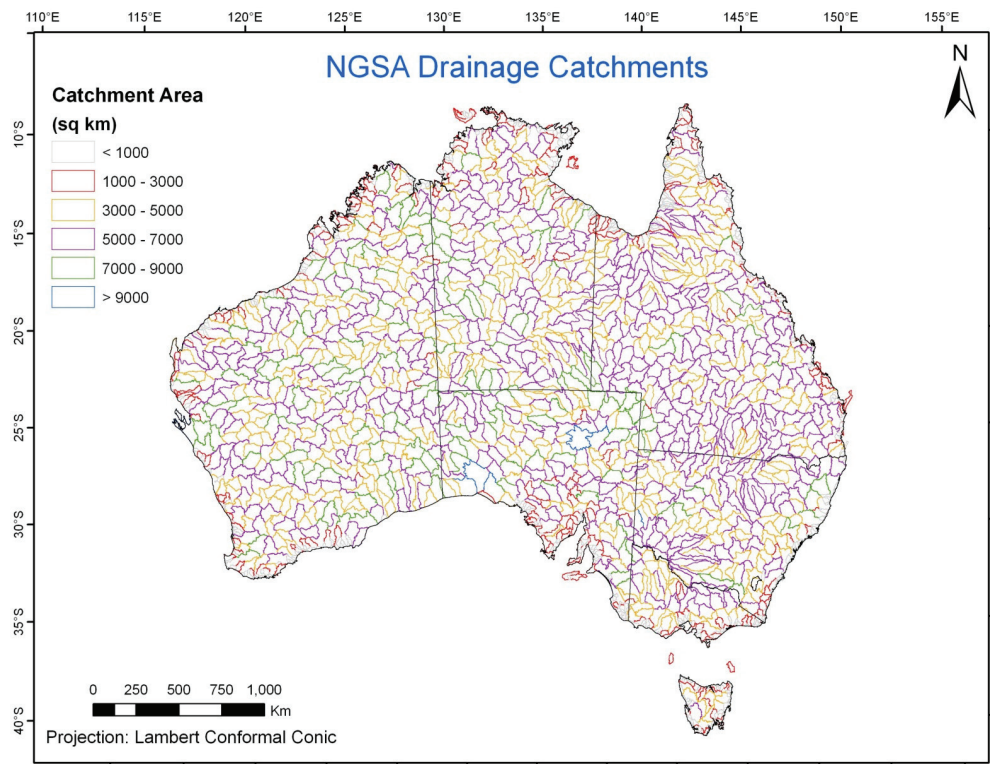


Figure 3. Distribution of catchments for the National Geochemical Survey of Australia.

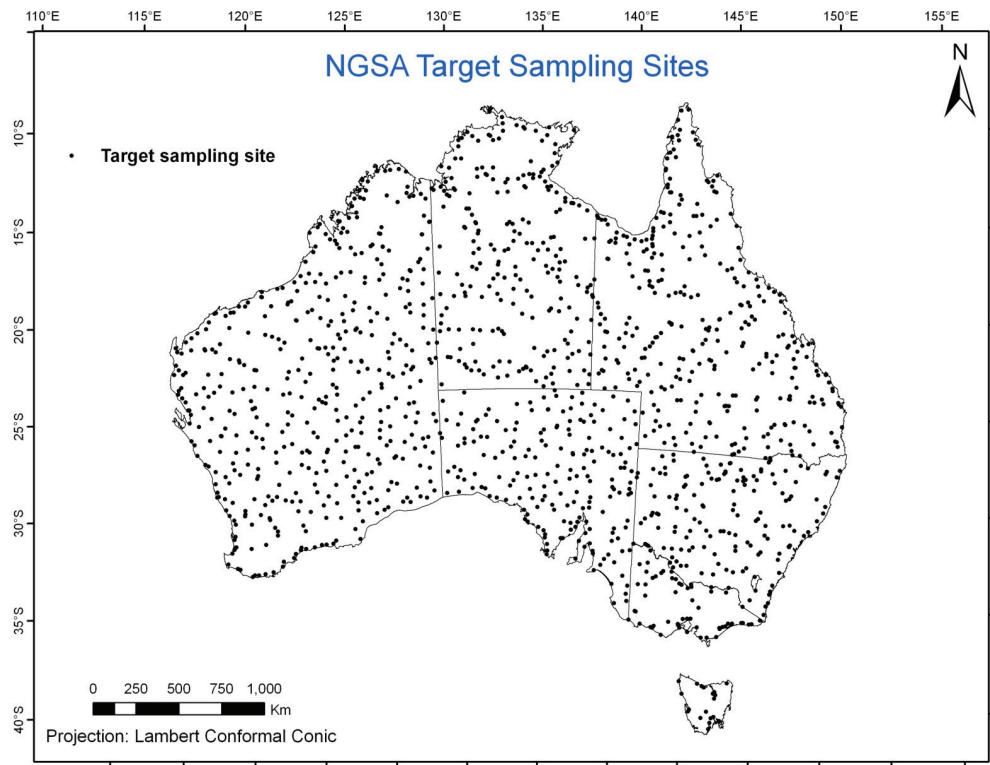


Figure 4. Distribution of initial target sampling sites for the National Geochemical Survey of Australia.

Sample collection

A detailed Field Manual was compiled (Lech *et al.*, 2007) and all sampling equipment and consumables were centrally purchased. Despite best efforts to access all target sites, only 1186 catchments could be sampled before the deadline for field work was reached. Of these 1186 catchments, 123 were sampled in duplicate (on average ~200 m away from the original site) for quality control purposes, and six of the largest catchments were sampled at two widely separated locations (on average 69 km apart), yielding a total of 1315 sampled sites (Figure 5). At each site, a Top Outlet Sediment (TOS) sample was collected from 0-10 cm (below the root zone, if applicable), and a Bottom Outlet Sediment (BOS) sample was collected from a depth of (on average) between 60 and 80 cm. To reduce natural soil heterogeneity, every sample collected was a composite either from a shallow soil pit (TOS) or from at least three auger holes or, rarely, a pit (BOS) at a given site (see Lech *et al.*, 2007, for more information). An average of 9 kg of sediment was collected per sample.

Sample collection was carried out by the State and Northern Territory geoscience agencies following a hands-on, in-field training period with the Geoscience Australia NGS team. At each locality a detailed site description, field pH, and dry (if possible) and moist Munsell® soil colours were recorded and several digital photographs were taken (Cooper *et al.*, 2010). All information was recorded digitally to facilitate subsequent uploading into databases.

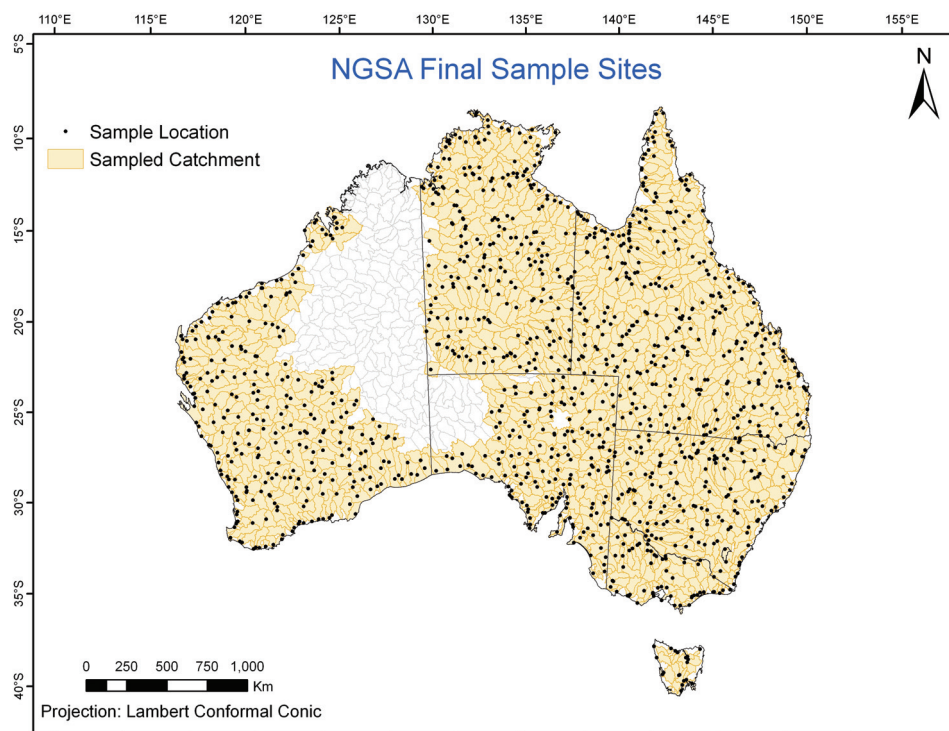


Figure 5. Final distribution of catchments sampled for the National Geochemical Survey of Australia (1186 catchments, or 86 %, completed).

Sample preparation

All samples were sent to Geoscience Australia for processing, where they were air-dried and homogenised. A bulk split (~50 %) of each sample was archived for future investigations. The remainder was riffle split and dry sieved to <2 mm and <75 µm fractions. The <2 mm fraction was mechanically ground for some analyses, while the finer fraction was not. The sample preparation protocols were discussed in detail in the NGS Sample Preparation Manual (Caritat *et al.*, 2009).

Sample analysis

The analysis philosophy from the outset was to apply a multi-element approach on two grain-size fractions prepared by at least two digestion methods, in order to maximise the amount of geochemical information extracted from the samples. Sample analysis was carried out for 68 elements (Total element content) using X-ray fluorescence (XRF) and (reaction cell) inductively coupled plasma-mass spectrometry (ICP-MS) at Geoscience Australia. The ICP-MS analyses were carried out on a total digest (HF + HNO₃) of fragments of the XRF beads (Pyke, 2000). Additional parameters recorded at Geoscience Australia were pH 1:5 (soil:water), electrical conductivity (EC) 1:5 (soil:water), and laser particle size analysis (LPSA). Analyses for selected elements not available at Geoscience Australia (*e.g.*, Au, fluorine (F), selenium (Se), and platinum group elements (PGEs)) were undertaken externally. Additional digests/analyses (*e.g.*, after Aqua Regia digestion, ligand-based extractions, near visible-infrared spectroscopy) were also carried out externally. The Mobile Metal Ion analysis (MMI™) was made possible through collaboration with SGS Minerals Services. Details of the sample analysis protocols are discussed in the NGSA Analytical Methods Manual (Caritat *et al.*, 2010).

Quality assessment/quality control

Sample numbers were randomised to minimise regional bias, help separate false from true anomalies and obtain meaningful estimates of the variance of duplicates. Field duplicates, analytical duplicates, internal standards and certified reference materials were introduced at regular intervals in the analytical streams. Care was also taken throughout the project to minimise contamination, cross-contamination and mislabelling risks. A quantitative assessment of the quality of the NGSA data is presented in this report.

Data analysis

National-scale geochemical maps were produced and released as a Geochemical Atlas (Caritat & Cooper, 2011) and a web-based map collection (www.ga.gov.au/ngsa). Reports providing preliminary interpretations and including graphical and statistical analysis will be prepared separately and released via Geoscience Australia's website.

Timeline

Following planning in the first half of 2007, fieldwork, including initial training, began in mid-2007 and concluded in late 2009. Figure 5 shows the final distribution of catchments actually sampled for NGSA at the end of fieldwork (December 2009). Sample preparation started in early 2008 and concluded in December 2009. Sample analysis started late 2008 and finished in late 2010. Data analysis and reporting took place in 2010 and early 2011. The project concluded in late June 2011, with a dataset and product release at the Association of Mining and Exploration Companies (AMEC) convention in Perth, 28-30 June 2011.

Data Quality Assessment

It is important to document in as much detail as possible what quality assessment and quality control (QA/QC) measures were applied to any geochemical project so that users can decide whether a particular application of the results is appropriate or not. A number of quality control measures were embedded in the NGSA project from its conception onward (Lech *et al.*, 2007; Caritat *et al.*, 2008b, 2009, 2010; Cooper *et al.*, 2010). These included:

- Central provision of sampling equipment and sample bags to all field teams
- Randomised sample identification (Figure 6) scheme so that samples were presented to the laboratories in a sequence unrelated to the order in which they were collected (as much as practically feasible)
- Prevention of contamination in the field and in the laboratory
- Prevention of sample mix-up in the field and in the laboratory
- Field duplicates: every 10th site, a field duplicate sample was collected (Figure 7) to help quantify overall precision (sampling error (*i.e.*, natural variability) + sample preparation error + analytical error) (not identified as such to the laboratory)
- Certified Reference Materials (CRMs) TILL-1, TILL-2 (from Natural Resources Canada: <http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/till-1-4-eng.htm>) were run with every batch on GA's XRF & ICP-MS to help quantify analytical precision and bias
- Laboratory duplicates (splits), Internal Project Standards (MRIS, WRIS, ORIS, MRIS2, WRIS2; see below), exchanged project standards (GEMAS-Ap, GEMAS-Gr from EuroGeoSurveys (Reimann *et al.*, 2009); SoNE-1 from United States Geological Survey (Smith *et al.*, 2009); BraSol from Brazil: <http://tu-freiberg.de/ioez/brasol/index.en.html>), and international CRMs (TILL-1, TILL-3, LKSD-1, STSD-3 from Natural Resources Canada: <http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/till-1-4-eng.htm>, <http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/lksd-1-eng.htm>, <http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/stsd-1-eng.htm>) were covertly inserted in the analytical suites for in-house and external analyses to help quantify analytical precision and bias (not identified as such to the laboratory)
- Internal Project Standard (GRIS; see below) for pH 1:5, EC 1:5 and grain size measurements

NGSA Sample location coloured by SampleID

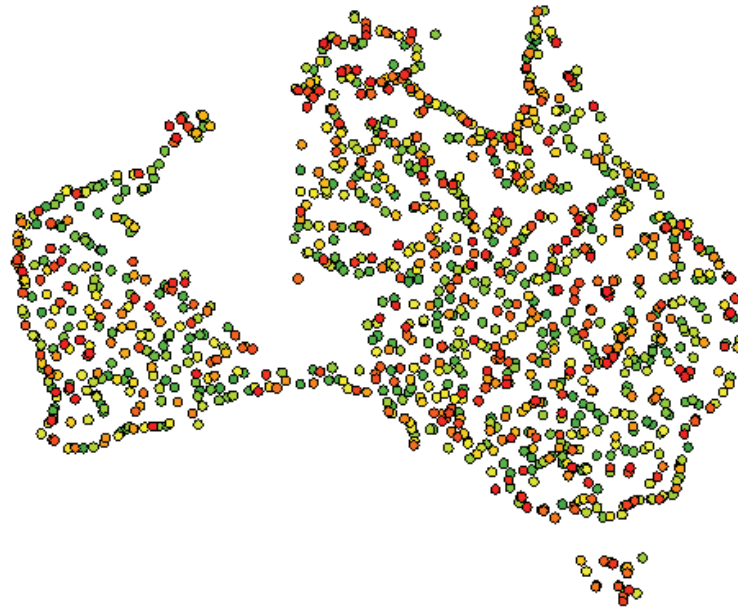


Figure 6. Map illustrating the randomisation effect with low sample identification numbers in green and high numbers in red.

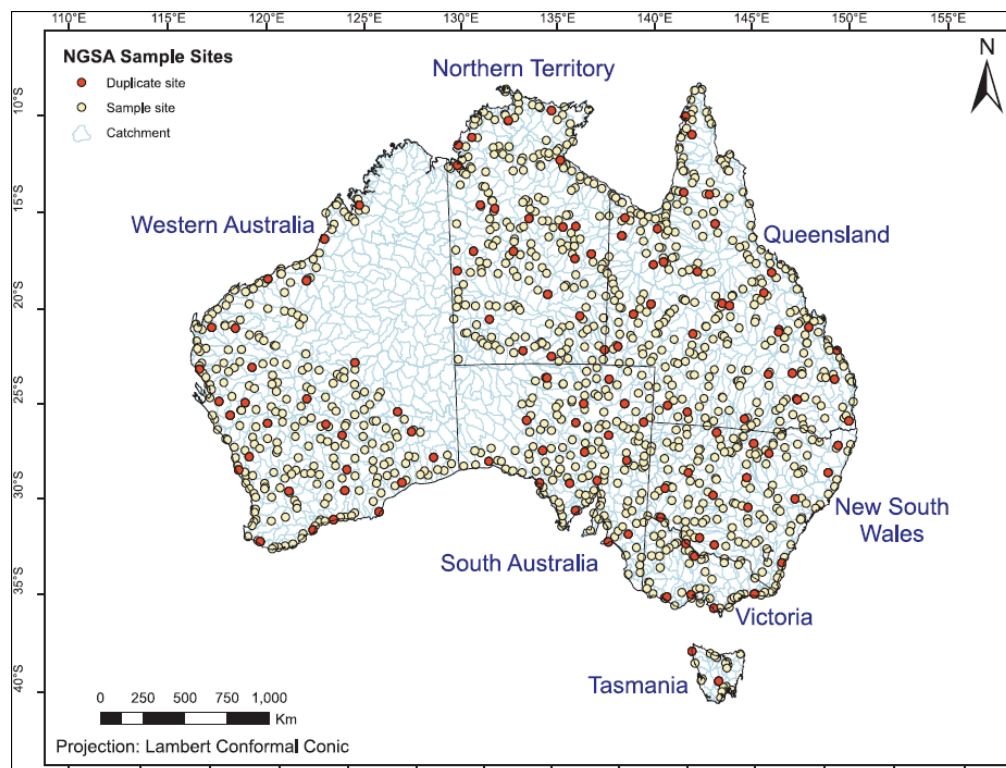


Figure 7. Map illustrating the location of 'normal' sampling sites (yellow) and Field Duplicate sites (red) at every 10th targeted catchment (blue polygons). Source: Caritat et al. (2011).

In addition to the above measures, the analytical laboratories applied their own QA/QC procedures, including running CRMs and/or internal standards, replicating digests and/or analysis, and analysis of blanks.

The present report uses results from some of the above quality control measures to quantitatively assess the quality of the NGSA data. Where several CRMs were run, we selected for the purposes of defining precision and bias, the CRM that: (1) had a matrix close to the NGSA samples; (2) was run at a high frequency throughout the analytical program; and (3) has Recommended Values for a large number of elements/parameters.

INTERNAL PROJECT STANDARDS

A number of Internal Project Standards (IPs) were used in the quality control program of this project. These Standards are essentially large samples from the project area that are exactly similar to normal samples (collected in same type of landform and setting, using same equipment, etc.), except that rather than being limited to the normal 2 bags of material collected (~9 kg on average), they are larger. The intention is to have enough material to insert at regular intervals in the various analytical streams submitted to the laboratories. The advantage of IPs is that they have a texture (grain size make up) and composition (mineralogical and chemical) that are similar to the project samples, as opposed to CRMs, which can be texturally and/or compositionally very different to the project samples.

The Internal Project Standards used in NGSA are as follows

1. **ORIS:** Ovens River Internal Standard. Collected 13/3/2007 on a floodplain of the Ovens River near Tarrowingee, Victoria (Longitude: 146.456°E; Latitude: 36.414°S) from 0-20 cm depth
2. **GRIS:** Gilbert River Internal Standard. Collected 4/10/2007 on a floodplain of the Gilbert-Einasleigh River near Strathmore Station, Queensland (Longitude: 142.501°E; Latitude: 17.819°S) from 60-78 cm depth
3. **WRIS:** Werribee River Internal Standard. Collected 7/3/2008 on a floodplain of the Werribee River near Bacchus Marsh, Victoria (Longitude: 144.399°E; Latitude: 37.681°S) from 0-20 cm depth
4. **MRIS:** Murrumbidgee River Internal Standard. Collected 8/3/2008 on a floodplain of the Murrumbidgee River near Gundagai, New South Wales (Longitude: 148.102°E; Latitude: 35.072°S) from 0-10 cm depth.

These samples were dried, homogenised, sieved to <2 mm and, in the cases of ORIS, WRIS and MRIS, also milled, as per methods described in the sample preparation manual (see Caritat *et al.*, 2009). The GRIS IPS was used only for the analyses of pH 1:5, EC 1:5 and Laser Grain Size Analysis, and was therefore sieved to <2 mm but *not* milled. Where an IPS name is suffixed by '2', it means that another split of the homogenised <2 mm fraction was milled when the first batch was running out.

METHODS

The purpose of this report is to provide the users of NGSA data with the means to judge whether an analysis is fit-for-purpose for the intended application. As such, the most important types of error to document are precision and bias (Figure 8), which together define accuracy (Clesceri *et al.*, 1989).

Precision is a measure of the closeness with which multiple analyses of a given sample agree with each other (Greenberg *et al.*, 1992). Precision of NGSA data was assessed by replicate analyses or by repeated analyses of a stable standard. This methodology will be used here to assess both analytical precision (by comparing results of repeated analyses of a stable standard) and the more general overall precision, which includes sampling, sample preparation and analytical errors (by comparing results of field duplicates).

To assess *analytical precision*, the standard deviation (SD) from a series of repeat analyses of a stable standard is used. To obtain the relative standard deviation (RSD, in %) the SD is divided by the average result of the repeat analyses. To assess *overall precision* based on field duplicates, the average absolute differences between pairs ($\bar{R}$) divided by 1.128 to obtain a SD is used. Again, to obtain an RSD (in %) the SD is divided by the average result of the duplicate analyses. These procedures conform to the methodology described in Greenberg *et al.* (1992). For NGSA, 123 field duplicate sites were sampled (multiplied by 4 samples, giving up to 492 sample pairs) on average 200 m away from the original sampling site.

Bias is a measure of systematic error (Greenberg *et al.*, 1992). *Bias* of NGSA data was assessed by dividing the average of a large number of laboratory results of CRMs with the recommended values. Bias is expressed as a percentage, where 100% means perfect match between laboratory results and recommended values (no bias). It must be noted here that the bias is CRM specific, and running the same test against a different CRM may well yield a different bias; data in Appendices 14, 16, 18, 20, 22, 24 and 26 show results obtained against several CRMs.

All compositional data from the NGSA project is reported in mg/kg units (equivalent to parts per million, ppm) for consistency and ease of comparison.

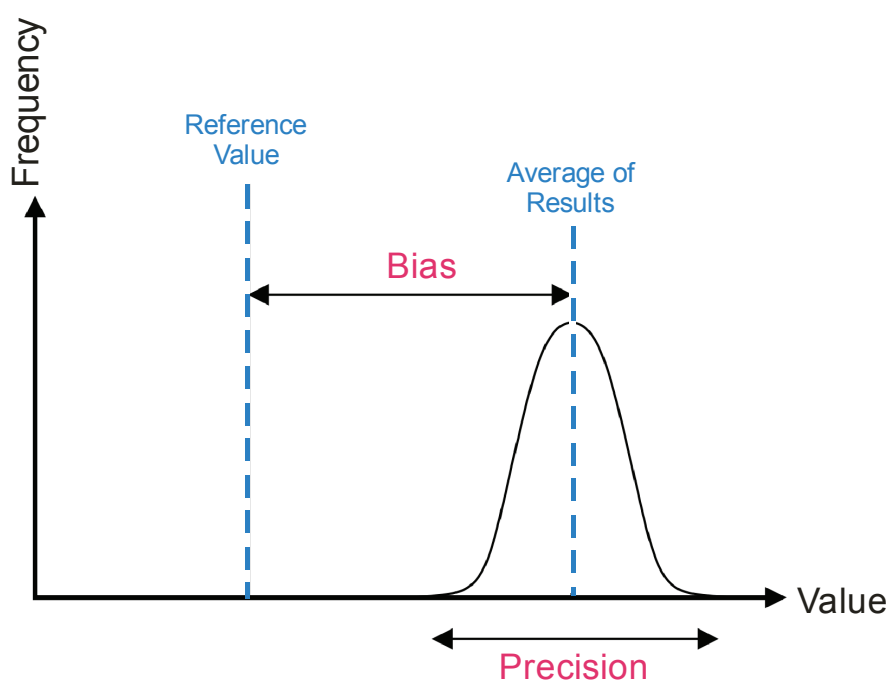


Figure 8. Graphical illustration of the concepts of precision and bias.

Because different elements are intrinsically more or less difficult to analyse, it is not satisfactory to have an arbitrary precision cut-off, say 10%, below which data is considered to be of acceptable quality and above which data is considered to be of poorer quality. Therefore, use was made of precision requirements determined by an international Geochemical Proficiency Test (GeoPT) project. Here precision requirement results from the analysis of a loess sample (GeoPT13; Potts *et al.*, 2003) were used for all elements available, and those from the analysis of a calcareous sandstone sample (GeoPT17; Potts *et al.*, 2005) were used for the additional elements Ge and Zr. Note that the more stringent ‘pure geochemistry’ requirement is used here, as opposed to the twice larger ‘applied geochemistry’ requirement (Potts *et al.*, 2003, 2005). Some precision requirements are marked as

‘provisional’ in Potts *et al.* (2003, 2005). Values for $2H_a/X_a$, where H_a is the target standard deviation and X_a is the assigned concentration value as a fraction (of unity), are quoted in this report as *GeoPT precision requirements* to represent the ‘satisfactory’ range of 2 z-scores (see Potts *et al.*, 2003).

Note that for the purposes of the present quality assessment, data reported as below the Lower Limit of Detection (LLD), also called ‘censored data,’ was given a value of 1/2 LLD, as per standard practice (Reimann *et al.*, 2008). Consideration of precision and bias of various analytical methods is then used to determine ‘preferred’ methods, where an element is analysed by more than one method.

Analytical methods used in the NGSa project are described in Caritat *et al.* (2010).

TOTAL ELEMENT CONTENT

Multi-element analysis by x-ray fluorescence

Table 1 shows the precision and bias obtained for the fused bead x-ray fluorescence (XRF) analysis. *Analytical precision* (RSD (CRM)) is based on 98 repeat runs of the Canadian Certified Reference Materials Project (CCRMP) standard Till-1 (<http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/till-1-4-eng.htm>) over the period of analysis at Geoscience Australia (September 2008 to May 2010). The time series (X-plots) obtained for Till-1 (N = 98) are shown in Appendix 1. *Bias* is the comparison of the obtained average value and the Recommended Value, expressed as a percentage (see above). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 490 pairs), as described above, and shown as RSD (FD). Where a large proportion of results are below the Lower Limit of Detection (<LLD), the meaning of the results is compromised (because of the comparison of either a value at or above LLD with one arbitrarily set to 1/2 LLD; or of two values arbitrarily set to 1/2 LLD). These case are highlighted in coloured font.

Table 1. Summary data quality assessment for Total analysis by XRF; CRM is Till-1 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	GeoPT [^]	Bias	RSD (FD)
LOI	%	0	7.2	10%	7.3	3%	99%	21%
Al ₂ O ₃	%	0.005	13.641	1%	13.7	3%	100%	11%
CaO	%	0.002	2.667	1%	2.72	3%	98%	30%
Cl	mg/kg	10	212	24%	N/A	N/A	N/A	56%
Cu	mg/kg	10	46	9%	47	11%	98%	27%
F	mg/kg	50	80	189%	N/A	N/A	N/A	36%
Fe ₂ O ₃	%	0.005	6.928	1%	6.82	4%	102%	11%
K ₂ O	%	0.005	2.134	1%	2.22	4%	96%	8%
MgO	%	0.01	2.14	1%	2.15	3%	100%	18%
MnO	%	0.005	0.189	1%	0.18	6%	105%	19%
Na ₂ O	%	0.01	2.77	1%	2.71	4%	102%	16%
Ni	mg/kg	10	22	22%	24	9%	92%	34%
P ₂ O ₅	%	0.005	0.218	1%	0.22	6%	99%	17%
Rb	mg/kg	10	49	4%	44	9%	111%	8%
S	mg/kg	10	240	11%	<500	N/A	N/A	54%
SiO ₂	%	0.01	61.06	1%	60.9	2%	100%	4%
Sr	mg/kg	10	289	2%	291	7%	99%	15%
TiO ₂	%	0.005	0.977	1%	0.98	5%	100%	11%
Zn	mg/kg	10	94	4%	98	9%	96%	19%
Zr#	mg/kg	10	495	1%	502	7%	99%	24%

[^]: GeoPT precision requirement from loess (GeoPT13), unless otherwise indicated (see text)

#: GeoPT precision requirement from calcareous sandstone (GeoPT17)

Note: text colour indicates proportion of values <LLD: black ≤ 25%, blue > 25%,

orange > 50%, red > 75%, bold red = 100%

Multi-element analysis by inductively coupled mass spectrometry

Table 2 shows the precision and bias obtained for fused bead digestion by HCl and HNO₃ followed by inductively coupled-mass spectrometry (ICP-MS) analysis. *Analytical precision* (RSD (CRM)) is based on 360 repeat runs of the Canadian Certified Reference Materials Project (CCRMP) standard Till-1 (<http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/till-1-4-eng.htm>) over the period of analysis at Geoscience Australia (March 2009 to June 2010). The time series (X-plots) obtained for Till-1 (N = 360) are shown in Appendix 2. *Bias* is the comparison of the obtained average value and the Recommended Value, expressed as a percentage (see above). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 484 pairs), as mentioned above, and shown as RSD (FD).

Table 2. Summary data quality assessment for Total analysis by ICP-MS; CRM is Till-1 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	GeoPT [^]	Bias	RSD (FD)
Ag	mg/kg	0.03	0.25	43%	N/A	N/A	N/A	78%
As	mg/kg	0.4	16.6	6%	18	12%	92%	31%
Ba	mg/kg	0.5	717.7	2%	702	7%	102%	11%
Be	mg/kg	1.1	1.7	28%	2.4	16%	71%	31%
Bi	mg/kg	0.02	2.01	9%	<5	22%	N/A	34%
Cd	mg/kg	0.1	0.3	56%	N/A	N/A	N/A	75%
Ce	mg/kg	0.03	68.95	2%	71	9%	97%	16%
Co	mg/kg	0.1	18.0	3%	18	12%	100%	14%
Cr	mg/kg	0.5	65.2	4%	65	8%	100%	12%
Cs	mg/kg	0.1	1.0	7%	1	14%	103%	14%
Cu	mg/kg	0.2	45.4	4%	47	11%	97%	18%
Dy	mg/kg	0.1	5.8	4%	N/A	13%	N/A	13%
Er	mg/kg	0.03	3.56	3%	3.6	14%	99%	12%
Eu	mg/kg	0.03	1.51	5%	1.3	16%	116%	16%
Ga	mg/kg	0.1	17.4	5%	N/A	12%	N/A	15%
Gd	mg/kg	0.03	5.76	3%	N/A	13%	N/A	14%
Ge*#	mg/kg	0.04	0.56	17%	N/A	16%	N/A	17%
Hf*	mg/kg	0.04	12.83	4%	13	11%	99%	23%
Ho	mg/kg	0.02	1.21	4%	N/A	18%	N/A	14%
La	mg/kg	0.1	27.6	3%	28	10%	99%	15%
Lu	mg/kg	0.02	0.53	10%	0.6	18%	88%	19%
Mo*	mg/kg	0.3	0.9	35%	2	15%	46%	33%
Nb	mg/kg	0.03	10.92	3%	10	12%	109%	13%
Nd	mg/kg	0.1	28.6	3%	26	10%	110%	16%
Ni	mg/kg	0.5	24.9	11%	24	9%	104%	22%
Pb	mg/kg	0.1	22.2	4%	22	11%	101%	14%
Pr	mg/kg	0.02	6.98	2%	N/A	12%	N/A	16%
Rb	mg/kg	0.2	43.8	4%	44	9%	99%	11%
Sb	mg/kg	0.4	9.4	9%	7.8	17%	120%	57%
Sc*	mg/kg	0.3	12.9	9%	13	12%	100%	16%
Sm	mg/kg	0.04	6.34	4%	5.9	12%	107%	16%
Sn	mg/kg	0.2	1.7	18%	N/A	N/A	N/A	45%
Sr	mg/kg	0.2	308.9	4%	291	7%	106%	17%
Ta*	mg/kg	0.02	0.68	35%	0.7	16%	97%	25%
Tb	mg/kg	0.02	1.00	7%	1.1	17%	91%	17%
Th	mg/kg	0.02	5.55	7%	5.6	12%	99%	16%
U	mg/kg	0.02	2.06	5%	2.2	14%	94%	15%
V*	mg/kg	0.1	105.3	3%	99	9%	106%	11%
W*	mg/kg	0.1	1.0	37%	<1	15%	N/A	24%
Y	mg/kg	0.05	37.01	5%	38	10%	97%	14%
Yb	mg/kg	0.04	3.71	3%	3.9	14%	95%	13%
Zn	mg/kg	0.9	98.0	4%	98	9%	100%	17%
Zr#	mg/kg	0.2	512.2	3%	502	7%	102%	24%

[^]: GeoPT precision requirement from loess (GeoPT13), unless otherwise indicated (see text)

*: 'Provisional' GeoPT precision requirement

#: GeoPT precision requirement from calcareous sandstone (GeoPT17)

Note: text colour indicates proportion of values <LLD: black ≤ 25%, blue > 25%,

orange > 50%, red > 75%, bold red = 100%

AQUA REGIA SOLUBLE ELEMENT CONTENT

Gold analysis by inductively coupled plasma-mass spectrometry

Quality assessment for Au analysis after Aqua Regia digestion is discussed in the next section together with all other elements analysed by the same technique in the laboratory.

Multi-element analysis by inductively coupled plasma-mass spectrometry

Table 3 shows the precision and bias obtained for the Aqua Regia digestion inductively coupled-mass spectrometry (ICP-MS) analysis. *Analytical precision* (RSD (CRM)) is based on 4 repeat runs of the Canadian Certified Reference Materials Project (CCRMP) standard Till-1 (<http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/till-1-4-eng.htm>) over the period of analysis (October 2009 to September 2010). The time series (X-plots) obtained for Till-1 (N = 4) are shown in Appendix 3. Because of the limited extent of this series, the time series (X-plots) obtained for IPS WRIS (N = 39) are shown in Appendix 4. *Bias* is the comparison of the obtained average value and the Recommended Value, expressed as a percentage (see above). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 486 pairs), as mentioned above, and shown as RSD (FD).

Table 3. Summary data quality assessment for Aqua Regia digest analysis by ICP-MS; CRM is Till-1 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	GeoPT [^]	Bias	RSD (FD)
Ag	mg/kg	0.002	0.207	12%	0.2	N/A	103%	78%
Al	mg/kg	100	14225	12%	N/A	N/A	N/A	33%
As	mg/kg	0.1	15.6	9%	13	12%	120%	30%
Au	mg/kg	0.0001	0.0149	33%	N/A	N/A	N/A	84%
B	mg/kg	1	1	71%	N/A	N/A	N/A	61%
Ba	mg/kg	0.5	81.9	8%	84	7%	97%	27%
Be	mg/kg	0.1	0.6	24%	N/A	N/A	N/A	29%
Bi	mg/kg	0.02	1.99	6%	<3	22%	N/A	29%
Ca	mg/kg	100	4625	22%	N/A	N/A	N/A	43%
Cd	mg/kg	0.01	0.28	49%	<0.2	N/A	N/A	75%
Ce	mg/kg	0.01	57.98	27%	N/A	N/A	N/A	27%
Co	mg/kg	0.1	12.4	12%	12	12%	103%	23%
Cr	mg/kg	0.5	32.7	18%	30	8%	109%	28%
Cs	mg/kg	0.02	0.58	27%	N/A	N/A	N/A	35%
Cu	mg/kg	0.01	51.13	20%	48	11%	107%	37%
Dy	mg/kg	0.1	2.9	17%	N/A	N/A	N/A	20%
Er	mg/kg	0.1	1.4	21%	N/A	N/A	N/A	19%
Eu	mg/kg	0.1	0.8	18%	N/A	N/A	N/A	22%
Fe	mg/kg	100	37075	12%	31000	4%	120%	25%
Ga	mg/kg	0.02	6.10	16%	N/A	N/A	N/A	30%
Gd	mg/kg	0.1	3.6	26%	N/A	N/A	N/A	23%
Ge*#	mg/kg	0.1	<0.1	0%	N/A	N/A	N/A	24%
Hf*	mg/kg	0.1	<0.1	0%	N/A	N/A	N/A	38%
Hg	mg/kg	0.01	0.10	49%	0.092	N/A	103%	70%
Ho	mg/kg	0.1	0.6	10%	N/A	N/A	N/A	24%
In	mg/kg	0.02	0.04	50%	N/A	N/A	N/A	40%
K	mg/kg	100	700	33%	N/A	N/A	N/A	31%
La	mg/kg	0.5	21.8	23%	N/A	N/A	N/A	25%
Li	mg/kg	0.1	11.2	12%	N/A	N/A	N/A	39%
Lu	mg/kg	0.1	0.2	46%	N/A	N/A	N/A	34%
Mg	mg/kg	100	5200	19%	N/A	N/A	N/A	27%
Mn	mg/kg	1	1183	13%	950	6%	125%	29%
Mo*	mg/kg	0.01	0.70	12%	<2	15%	N/A	59%
Na	mg/kg	10	968	112%	N/A	N/A	N/A	60%
Nb	mg/kg	0.1	1.6	8%	N/A	N/A	N/A	39%
Nd	mg/kg	0.02	20.15	29%	N/A	N/A	N/A	24%
Ni	mg/kg	0.1	18.8	11%	18	9%	104%	38%
Pb	mg/kg	0.01	14.00	9%	12	11%	117%	33%
Pr	mg/kg	0.1	5.4	33%	N/A	N/A	N/A	25%
Rb	mg/kg	0.1	5.7	33%	N/A	N/A	N/A	30%
Re	mg/kg	0.001	0.001	95%	N/A	N/A	N/A	90%
Sb	mg/kg	0.02	6.77	12%	N/A	N/A	N/A	64%
Sc*	mg/kg	0.1	5.5	22%	N/A	N/A	N/A	30%
Se	mg/kg	0.1	0.5	80%	N/A	N/A	N/A	70%
Sm	mg/kg	0.1	4.2	26%	N/A	N/A	N/A	22%
Sn	mg/kg	0.05	1.12	12%	N/A	N/A	N/A	42%
Sr	mg/kg	0.5	12.5	34%	N/A	N/A	N/A	35%
Ta*	mg/kg	0.05	<0.05	0%	N/A	N/A	N/A	0%
Tb	mg/kg	0.1	0.5	18%	N/A	N/A	N/A	23%
Te	mg/kg	0.02	0.04	50%	N/A	N/A	N/A	71%
Th	mg/kg	0.1	2.9	21%	N/A	N/A	N/A	25%
Tl	mg/kg	0.02	0.11	27%	N/A	N/A	N/A	31%
Tm	mg/kg	0.1	0.2	0%	N/A	N/A	N/A	31%
U	mg/kg	0.1	0.9	14%	N/A	N/A	N/A	45%
V*	mg/kg	1	57	14%	48	9%	119%	18%
W*	mg/kg	0.1	0.2	46%	N/A	N/A	N/A	62%
Y	mg/kg	0.01	13.97	30%	N/A	N/A	N/A	20%
Yb	mg/kg	0.1	1.3	23%	N/A	N/A	N/A	19%
Zn	mg/kg	0.1	70.7	3%	70	9%	101%	42%
Zr#	mg/kg	0.1	1.0	46%	N/A	N/A	N/A	36%

[^]: GeoPT precision requirement from loess (GeoPT13), unless otherwise indicated (see text)

*: 'Provisional' GeoPT precision requirement

#: GeoPT precision requirement from calcareous sandstone (GeoPT17)

Note: text colour indicates proportion of values <LLD: black ≤ 25%, blue > 25%, orange > 50%, red > 75%, bold red = 100%

Selenium analysis by inductively coupled plasma-mass spectrometry

Table 4 shows the precision and bias obtained for the Aqua Regia digestion inductively coupled-mass spectrometry (ICP-MS) analysis for Se determination. *Analytical precision* (RSD (CRM)) is based on 8 repeat runs of the United States Geological Survey in-house, non-certified Reference Material Soil of Nebraska-1 (SoNE-1) (Smith *et al.*, 2009) over the period of analysis (February 2009 to April 2010). It must be noted that the Se concentration for SoNE-1 is a Total content value, not an Aqua Regia content; therefore a low bias is expected here. The time series (X-plot) obtained for SoNE-1 (N = 8) is shown in Appendix 5. Because of the limited extent of this series, the time series (X-plot) obtained for Certified Reference Material OREAS-97.01 (N = 214) is shown in Appendix 6. OREAS-97.01 is a 1:100 (CRM:quartz) dilution of CRM OREAS-97 run by the laboratory; this standard was not run in a 'blind' fashion by the laboratory. *Bias* is the comparison of the obtained average value and the Recommended Value, expressed as a percentage (see above). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 492 pairs), as mentioned above, and shown as RSD (FD).

Table 4. Summary data quality assessment for Aqua Regia digest analysis of Se by ICP-MS; CRM is SoNE-1 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	GeoPT [^]	Bias	RSD (FD)
Se	mg/kg	0.01	0.325	17%	0.49	N/A	66%	32%

[^]: GeoPT precision requirement from loess (GeoPT13), unless otherwise indicated (see text)

Note: the Recommended Value for Se in SoNE-1 is for Total analysis

LIGAND-BASED EXTRACTION ELEMENT CONTENT

Multi-element analysis by inductively coupled plasma-mass spectrometry

Table 5 shows the precision and bias obtained for MMITM digestion inductively coupled-mass spectrometry (ICP-MS) analysis. *Analytical precision* (RSD (CRM)) is based on 22 repeat runs of the MMITM laboratory standard SRM-18 over the period of analysis at the external laboratory (February to March 2010); this standard was not run in a 'blind' fashion by the laboratory. The time series (X-plots) obtained for SRM-18 are shown in Appendix 7. *Bias* is the comparison of the obtained average value and the Recommended Value (obtained from the laboratory), expressed as a percentage (see above). The laboratory reported 'expected values' with an 'expected standard deviation' and a 'tolerance limit (%)' for SRM-18; in consultation with the laboratory, we decided to use the 'expected values' as Recommended Value (after conversion to mg/kg units where needed) and the 'tolerance limit (%)' as RSD (CRM). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 123 pairs), as mentioned above, and shown as RSD (FD).

Table 5. Summary data quality assessment for Mobile Metal Ion™ digest analysis by ICP-MS; CRM is SRM-18 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	Tolerance [^]	Bias	RSD (FD)
Ag	mg/kg	0.001	0.022	9%	0.024	31%	93%	90%
Al	mg/kg	1	23	5%	25	30%	92%	63%
As	mg/kg	0.01	<0.01	63%	0.01	270%	91%	41%
Au	mg/kg	0.0001	0.0095	5%	0.0102	22%	93%	55%
Ba	mg/kg	0.01	0.16	7%	0.16	36%	101%	36%
Bi	mg/kg	0.001	<0.001	0%	<0.0025	N/A	N/A	90%
Ca	mg/kg	10	172	8%	173	34%	100%	31%
Cd	mg/kg	0.001	0.065	6%	0.069	24%	94%	55%
Ce	mg/kg	0.005	0.017	23%	0.018	89%	91%	55%
Co	mg/kg	0.005	0.067	13%	0.068	38%	99%	47%
Cr	mg/kg	0.001	0.034	6%	0.036	27%	94%	79%
Cs	mg/kg	0.0005	0.0616	7%	N/A	N/A	N/A	46%
Cu	mg/kg	0.01	0.69	10%	0.70	24%	98%	30%
Dy	mg/kg	0.001	0.002	27%	0.003	120%	97%	43%
Er	mg/kg	0.0005	0.0010	30%	0.0009	159%	107%	41%
Eu	mg/kg	0.0005	0.0009	27%	0.0008	176%	112%	37%
Fe	mg/kg	1	2	37%	3	120%	73%	50%
Ga	mg/kg	0.001	0.005	38%	N/A	N/A	N/A	41%
Gd	mg/kg	0.001	0.004	23%	0.003	94%	107%	43%
Hg	mg/kg	0.001	0.003	23%	N/A	N/A	N/A	14%
K	mg/kg	0.1	24.6	4%	N/A	N/A	N/A	36%
La	mg/kg	0.001	0.005	18%	0.005	68%	99%	62%
Li	mg/kg	0.005	<0.005	0%	<0.0125	N/A	N/A	49%
Mg	mg/kg	1	94	4%	100	23%	94%	39%
Mn	mg/kg	0.005	0.470	6%	0.450	23%	104%	43%
Mo	mg/kg	0.005	0.036	11%	0.036	55%	100%	57%
Nb	mg/kg	0.0005	<0.0005	65%	0.0002	645%	N/A	97%
Nd	mg/kg	0.001	0.014	15%	0.014	38%	97%	52%
Ni	mg/kg	0.005	0.514	6%	0.540	22%	95%	36%
P	mg/kg	0.1	0.7	21%	N/A	N/A	N/A	36%
Pb	mg/kg	0.01	0.17	7%	0.18	34%	97%	75%
Pd	mg/kg	0.001	0.014	11%	0.014	38%	99%	55%
Pr	mg/kg	0.001	0.003	26%	0.003	116%	100%	52%
Pt	mg/kg	0.001	0.006	14%	0.006	61%	92%	0%
Rb	mg/kg	0.00025	0.16600	6%	0.17500	27%	95%	33%
Sb	mg/kg	0.001	<0.001	0%	0.0002	1270%	N/A	37%
Sc	mg/kg	0.005	<0.005	0%	0.004	311%	N/A	50%
Se	mg/kg	0.002	0.007	85%	N/A	N/A	N/A	115%
Sm	mg/kg	0.001	0.004	20%	0.004	89%	101%	43%
Sn	mg/kg	0.001	<0.001	0%	0.0003	853%	N/A	21%
Sr	mg/kg	0.01	1.23	6%	1.20	22%	103%	31%
Ta	mg/kg	0.001	<0.001	0%	<0.0025	N/A	N/A	19%
Tb	mg/kg	0.001	<0.001	0%	0.0005	520%	N/A	41%
Te	mg/kg	0.01	<0.01	0%	<0.025	N/A	N/A	0%
Th	mg/kg	0.0005	0.0131	8%	0.0130	30%	101%	58%
Ti	mg/kg	0.003	0.006	25%	0.005	187%	130%	88%
Tl	mg/kg	0.0005	<0.0005	0%	0.0003	437%	N/A	36%
U	mg/kg	0.001	0.017	9%	0.017	35%	101%	44%
V	mg/kg	0.001	0.053	7%	N/A	N/A	N/A	85%
W	mg/kg	0.001	<0.001	0%	0.0001	2520%	N/A	25%
Y	mg/kg	0.005	0.013	15%	0.014	111%	96%	41%
Yb	mg/kg	0.001	<0.001	N/A	0.0005	520%	N/A	36%
Zn	mg/kg	0.02	0.59	4%	0.68	27%	87%	50%
Zr	mg/kg	0.005	0.013	19%	0.017	92%	77%	41%

[^]: Tolerance range about the Recommended Value quoted by laboratory

Note: text colour indicates proportion of values <DL: black ≤ 25%, blue > 25%, orange > 50%, red > 75%, bold red = 100%

ALKALINE FUSION ELEMENT CONTENT

Fluoride analysis by ion specific electrode

Table 6 shows the precision and bias obtained for alkaline fusion followed by ion specific electrode (ISE) analysis for F determination. *Analytical precision* (RSD (CRM)) is based on 4 repeat runs of the Canadian Certified Reference Materials Project (CCRMP) standard STSD-3 (<http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/std-1-eng.htm>) over the period of analysis at the external laboratory (March 2009 to June 2010). The time series (X-plot) obtained for STSD-3 is shown in Appendix 8. Because of the limited extent of this series, the time series (X-plot) obtained for IPS MRIS (N = 70) is shown in Appendix 9. *Bias* is the comparison of the obtained average value and the Recommended Value, expressed as a percentage (see above). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 492 pairs), as mentioned above, and shown as RSD (FD).

Table 6. Summary data quality assessment for alkaline fusion followed by ion specific electrode (ISE) analysis for F; CRM is STSD-3 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	GeoPT ^a	Bias	RSD (FD)
F	mg/kg	20	770	7%	850	N/A	91%	24%

^a: GeoPT precision requirement from loess (GeoPT13), unless otherwise indicated (see text)

Note: the Recommended Value for F in STSD-3 is for Total analysis

FIRE ASSAY ELEMENT CONTENT

Platinum group elements analysis by inductively coupled plasma-mass spectrometry

Table 7 shows the precision and bias obtained for Fire Assay (FA) followed by ICP-MS analysis for Au, Pd and Pt. *Analytical precision* (RSD (CRM)) is based on 4 repeat runs of the Canadian Certified Reference Materials Project (CCRMP) standard Till-1 (<http://www.nrcan.gc.ca/smm-mms/tect-tech/ccrmp/cer-cer/till-1-4-eng.htm>) over the period of analysis at the external laboratory (November 2008 to March 2010). The time series (X-plots) obtained for Till-1 are shown in Appendix 10. Because of the limited extent of this series, the time series (X-plots) obtained for IPS MRIS (N = 70) are shown in Appendix 11. *Bias* is the comparison of the obtained average value and the Recommended Value, expressed as a percentage (see above). *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 470 pairs), as mentioned above, and shown as RSD (FD).

Table 7. Summary data quality assessment for Fire Assay (FA) followed by ICP-MS analysis for Au, Pd and Pt; CRM is Till-1 (see text).

Parameter/ Element	Unit	LLD	Average	RSD (CRM)	Recommended Value	GeoPT [^]	Bias	RSD (FD)
Au	mg/kg	0.001	0.013	40%	0.013	N/A	102%	41%
Pd	mg/kg	0.001	0.001	38%		N/A		31%
Pt	mg/kg	0.0005	0.0004	51%		N/A		29%

[^]: GeoPT precision requirement from loess (GeoPT13), unless otherwise indicated (see text)

Note: the Recommended Value for Au in TILL-1 is for Total analysis

Note: text colour indicates proportion of values <LLD: black ≤ 25%, blue > 25%,
orange > 50%, red > 75%, bold red = 100%

BULK ANALYSES

Field pH

Table 8 shows the *overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, for field pH measurements based on the comparison of the field duplicates (N = 248 pairs) as RSD (FD). For further discussion on field pH data, the reader is referred to Caritat *et al.* (2011).

pH of 1:5 (soil:water) slurry

Table 8 shows the precision obtained for pH of 1:5 (soil:water) slurry analysis by pH Meter. *Analytical precision* (RSD (IPS)) is based on 72 repeat runs of the IPS GRIS (see above) over the period of analysis in the laboratory (October 2009 to May 2010). The time series (X-plots) obtained for GRIS are shown in Appendix 12. *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 246 pairs), as mentioned above, and shown as RSD (FD) in Table 8.

Electrical conductivity of 1:5 (soil:water) slurry

Table 8 shows the precision obtained for EC of 1:5 (soil:water) slurry analysis by Conductivity Meter. *Analytical precision* (RSD (IPS)) is based on 72 repeat runs of the IPS GRIS (see above) over the period of analysis in the laboratory (October 2009 to May 2010). The time series (X-plots) obtained for GRIS are shown in Appendix 12. *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 246 pairs), as mentioned above, and shown as RSD (FD) in Table 8.

Grain size by laser particle size analysis

Table 8 shows the precision obtained for grain size analysis by LPSA broken down into sand (2000-20 µm), silt (20-2 µm) and clay (<2 µm) classes following Northcote (1979) and McDonald *et al.* (1990). *Analytical precision* (RSD (IPS)) is based on 23 repeat runs of the IPS GRIS (see above) over the period of analysis in the laboratory (November 2009 to October 2010). The time series (X-plots) obtained for GRIS are shown in Appendix 12. *Overall precision*, including sampling error (*i.e.*, natural variability), sample preparation error and analytical error, is based on the comparison of the field duplicates (N = 245 pairs), as mentioned above, and shown as RSD (FD) in Table 8.

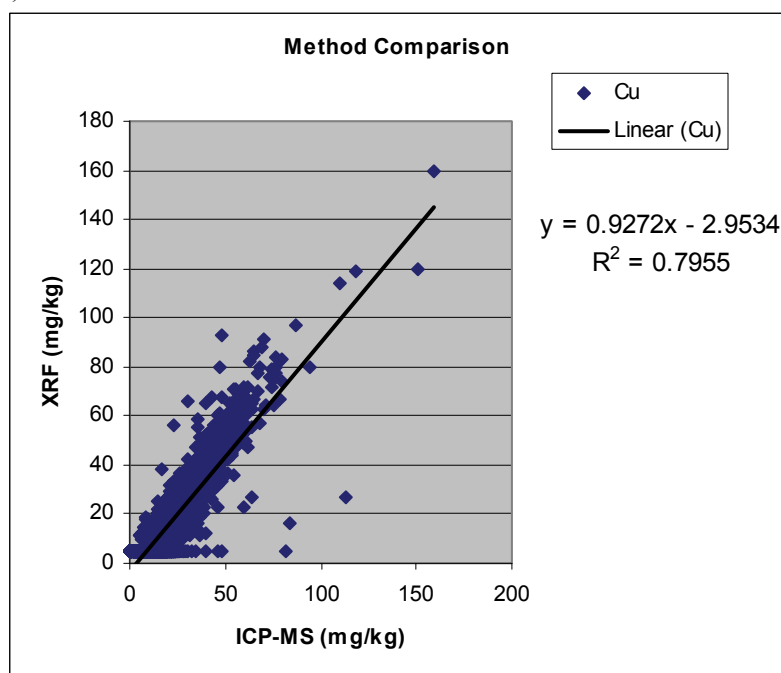
Table 8. Summary data quality assessment for bulk parameters analysis; IPS is GRIS (see text).

Parameter/ Element	Unit	LLD	Average	RSD (IPS)	RSD (FD)
Field pH	pH units	N/A	N/A	N/A	7%
pH 1:5	pH units	N/A	5.92	7%	6%
EC 1:5	uS/cm	N/A	11.54	22%	50%
Sand	%	N/A	64.76	3%	13%
Silt	%	N/A	30.03	5%	22%
Clay	%	N/A	5.17	7%	32%

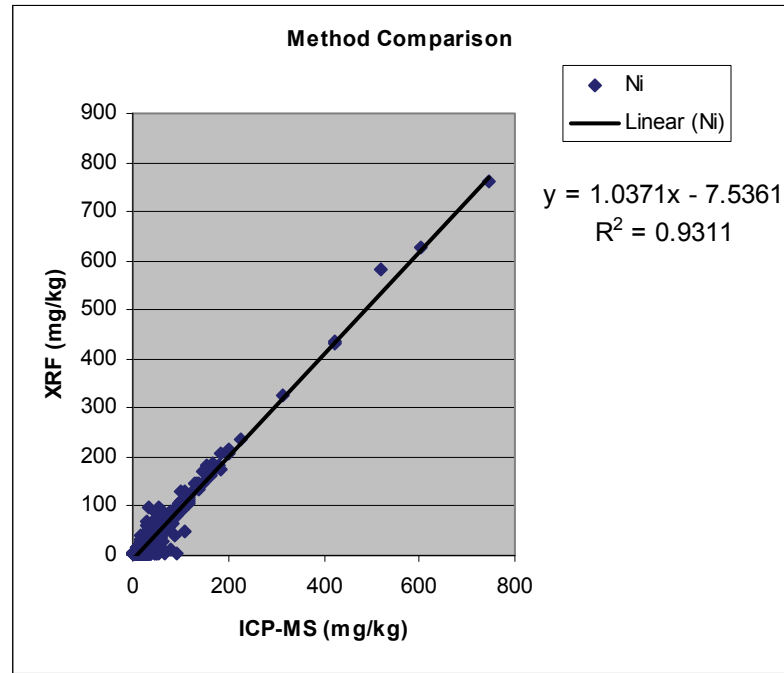
METHOD COMPARISON

A few elements were analysed by more than one method. The results from these analyses are presented in this section, before a rationale for selecting a preferred method is outlined in the next section (Figure 9). The results are presented graphically as a scatter diagram for each pair of methods, together with the least-square regression line and equation. Where values were returned as below the Lower Limit of Detection (<LLD), they were replaced by $\frac{1}{2}$ LLD, as is standard practice (Reimann *et al.*, 2008).

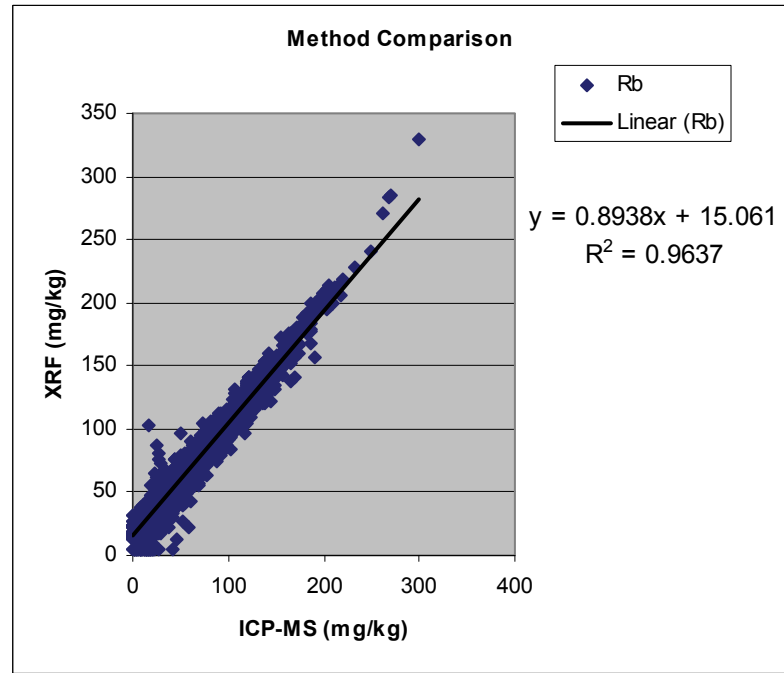
a)



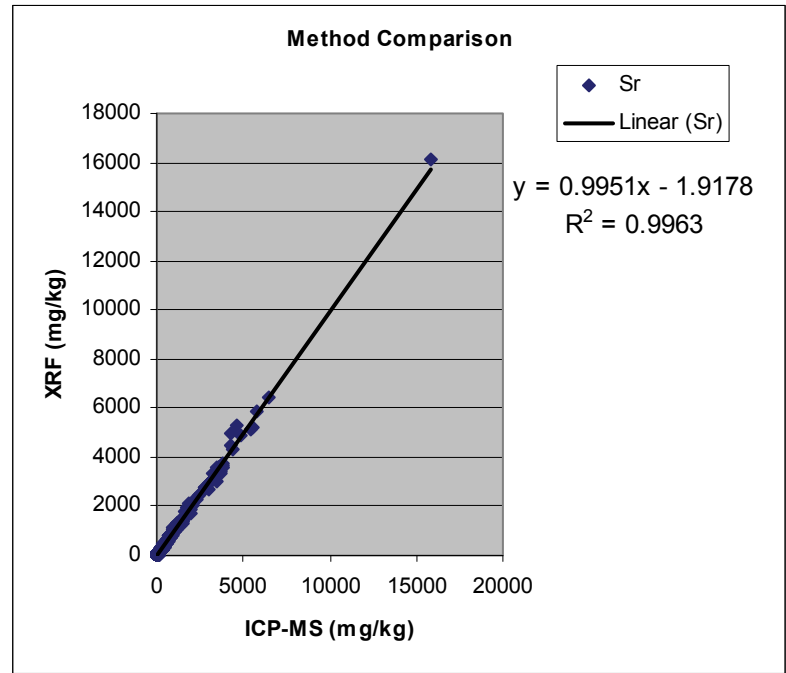
b)



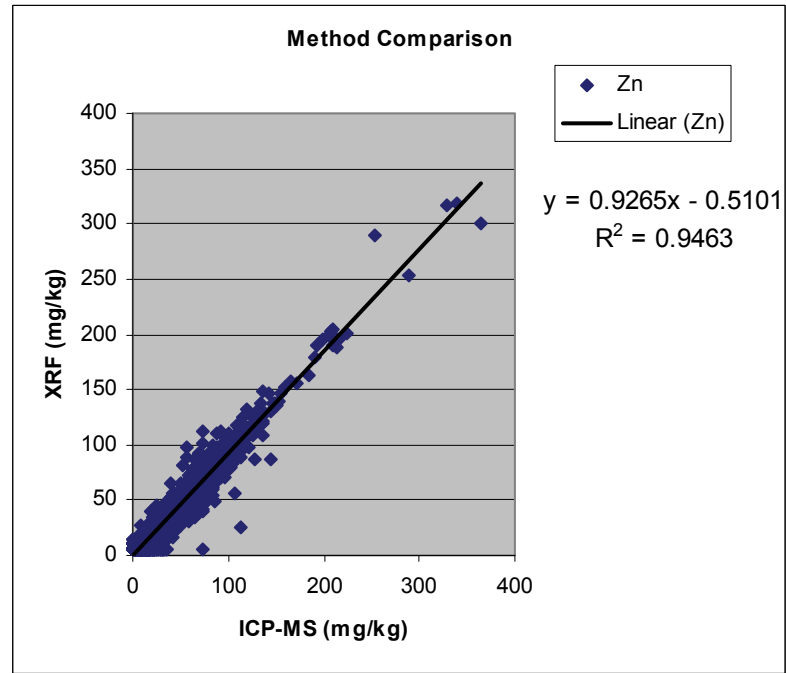
c)



d)



e)



f)

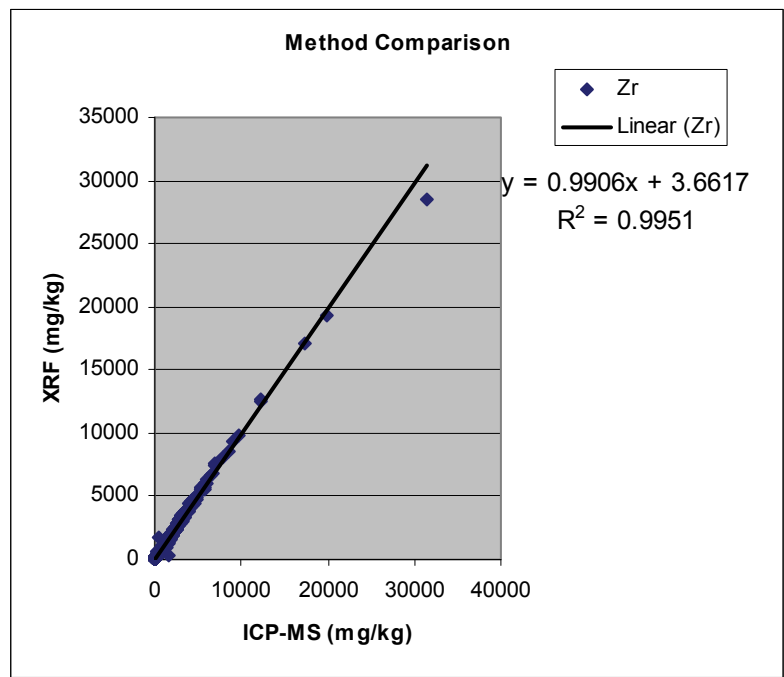


Figure 9. Scatterplots and least-square regression lines and equations for analyses obtained by XRF and Total digestion ICP-MS for Cu (a), Ni (b), Rb (c), Sr (d), Zn (e) and Zr (f).

SELECTION OF ANALYSES

One of the thrusts of the NGSA project is to provide not just Total element content information but also two additional digestion methods, which can yield complementary information on element residence and mobility in the regolith. These are (1) the Aqua Regia digestion, which is fairly strong but not Total (for instance, it does not dissolve most silicates, *e.g.*, see Chao (1984) and Reimann *et al.* (2001)), and (2) the MMITM extraction, which is weak (for instance, it dissolves adsorbed metals but leaves the substrate largely intact, *e.g.*, see Mann (2010)). For our purposes, the data obtained by Fire Assay for Au, Pd and Pt concentrations will be considered as Total element content. The same can be said for the data obtained by Ion Specific Electrode after Alkaline Fusion for F concentration.

Where an element was analysed by more than one method that can be considered equivalent in the sense that it yields the same type of information, for instance Total element content, a choice was made as to which method was preferred for the NGSA project, the atlas and the dataset for public release. This choice, which was mostly dictated by the adequacy, or otherwise, of the Lower Limit of Detection (Table 9) and the analytical and overall precisions of the method (Tables 1 to 8), is made explicit in Table 10. The results obtained by least preferred methods are not released as part of the NGSA data delivery.

Table 9. Overview of proportion of data found to be below the Lower Limit of Detection (LLD) for each element/method. Method groups are highlighted in green for Total, blue for Aqua Regia, and yellow for Mobile Metal Ion™.

Parameter/ Element	Total XRF	Total ICP-MS	FA AR-PGES	ISE-F	AR ICP-MS	AR-Se	MMI-ME ICP-MS*
LOI	0%						
Ag		99%			20%		10%
Al	0%				0%		3%
As		2%			3%		71%
Au			7%		13%		31%
B					62%		
Ba		0%			0%		0%
Be		29%			4%		
Bi		3%			2%		96%
Ca	0%				3%		0%
Cd		58%			18%		10%
Ce		0%			0%		6%
Cl	1%						
Co		0%			0%		0%
Cr		0%			0%		0%
Cs		0%			0%		0%
Cu	41%	1%			0%		0%
Dy		0%			1%		1%
Er		0%			3%		1%
Eu		1%			5%		5%
F	92%			0%			
Fe	0%				0%		12%
Ga		0%			0%		1%
Gd		0%			0%		1%
Ge		1%			82%		
Hf		0%			51%		
Hg					31%		93%
Ho		0%			10%		
In					49%		
K	0%				1%		0%
La		0%			0%		5%
Li					0%		34%
Lu		1%			54%		
Mg	2%				2%		0%
Mn	4%				0%		0%
Mo		12%			4%		38%
Na	1%				2%		
Nb		0%			32%		70%
Nd		0%			0%		1%
Ni	48%	0%			0%		0%
P	0%						7%
Pb		0%			0%		11%
Pd			52%				81%
Pr		0%			0%		12%
Pt			52%				100%
Rb	1%	0%			0%		0%
Re					54%		
S	0%						
Sb		65%			5%		94%
Sc		0%			1%		34%
Se					25%	2%	20%
Si	0%						
Sm		2%			0%		3%
Sn		2%			1%		96%
Sr	0%	0%			2%		0%
Ta		1%			100%		96%
Tb		1%			11%		20%
Te					36%		100%
Th		0%			0%		3%
Ti	0%						1%
Tl					4%		68%
Tm					37%		
U		0%			2%		0%
V		0%			0%		0%
W		3%			87%		87%
Y		0%			0%		2%
Yb		0%			4%		8%
Zn	15%	1%			2%		2%
Zr	0%	0%			0%		21%
Total	68	68	3	1	60	1	68

*: Only on TOS <2 mm samples

Note: text colour indicates proportion of values <LLD: black ≤ 25%, blue > 25%, orange > 50%, red > 75%, bold red = 100%

Table 10. List of elements analysed for in the NGSa project, together with the Lower Limit of Detection (LLD) of each method (in mg/kg). Where two or more methods give comparable results, e.g., a Total element content, the preferred method is shown in bold.

Parameter/ Element	Total XRF	Total ICP-MS	FA AR-PGES	ISE-F	AR ICP-MS	AR-Se	MM-ME ICP- MS*
LOI	0						
Ag		0.03		0.002	0.001		
Al	26			100	1		
As		0.4		0.1	0.01		
Au		0.001		0.0001	0.0001		
B				1			
Ba		0.5		0.5	0.01		
Be		1.1		0.1			
Bi		0.02		0.02	0.001		
Ca	14			100	10		
Cd		0.1		0.01	0.001		
Ce		0.03		0.01	0.005		
Cl	10						
Co		0.1		0.1	0.005		
Cr		0.5		0.5	0.001		
Cs		0.1		0.02	0.0005		
Cu	10	0.2		0.01	0.01		
Dy		0.1		0.1	0.001		
Er		0.03		0.1	0.0005		
Eu		0.03		0.1	0.0005		
F	50		20				
Fe	35			100	1		
Ga		0.1		0.02	0.001		
Gd		0.03		0.1	0.001		
Ge		0.04		0.1			
Hf		0.04		0.1			
Hg				0.01	0.001		
Ho		0.02		0.1			
In				0.02			
K	42			100	0.1		
La		0.1		0.5	0.001		
Li				0.1	0.005		
Lu		0.02		0.1			
Mg	60			100	1		
Mn	39			1	0.005		
Mo		0.3		0.01	0.005		
Na	74			10			
Nb		0.03		0.1	0.0005		
Nd		0.1		0.02	0.001		
Ni	10	0.5		0.1	0.005		
P	22				0.1		
Pb		0.1		0.01	0.01		
Pd		0.001			0.001		
Pr		0.02		0.1	0.001		
Pt		0.0005			0.001		
Rb	10	0.2		0.1	0.00025		
Re				0.001			
S	10						
Sb		0.4		0.02	0.001		
Sc		0.3		0.1	0.005		
Se				0.1	0.01	0.002	
Si	47						
Sm		0.04		0.1	0.001		
Sn		0.2		0.05	0.001		
Sr	10	0.2		0.5	0.01		
Ta		0.02		0.05	0.001		
Tb		0.02		0.1	0.001		
Te				0.02	0.01		
Th		0.02		0.1	0.0005		
Ti	30				0.003		
Tl				0.02	0.0005		
Tm				0.1			
U		0.02		0.1	0.001		
V		0.1		1	0.001		
W		0.1		0.1	0.001		
Y		0.05		0.01	0.005		
Yb		0.04		0.1	0.001		
Zn	10	0.9		0.1	0.02		
Zr	10	0.2		0.1	0.005		
Total	20	43	3	1	60	1	54

*: Only on TOS <2 mm samples

QUALITY STATEMENT

The geochemical data collected by the NGSA aims to be:

1. internally consistent,
2. applicable at scales ranging from ~1000 km to the whole continent, and
3. useful to evaluate the concentration levels and distributions of chemical elements in the surface and near-surface regolith of Australia.

There are clear limitations to this dataset, of which every user needs to be aware of, including its ultra-low density, a significant hole in the data coverage, and the sampling strategy deliberately avoiding areas of *in-situ* soil, fresh rock outcrop and active erosion.

Based on the above determinations of the data's analytical precision, overall precision (sampling, sample preparation and analytical errors), bias, method comparison and censored proportion, the preferred NGSA data, as defined in the previous section, is deemed fit-for-purpose (subject to limitations described above) for all elements, except for (Table 11):

- Total element concentrations of Cl and S determined by XRF, and of Ta and W determined by ICP-MS
- Aqua Regia soluble element concentrations of Ag, Cd, Na, Pr, Rb, Sr and Zr
- Mobile Metal Ion™ soluble element concentrations of Ag, Cd, Ce, Cr, La, Nd, Pb, Pr, Se, Th, Ti and V

The selected cut-off values on which the above determinations are based are 30% RSD on CRMs (where the average for the element in question is $>10 \times \text{LLD}$) and/or 50% RSD on Field Duplicates (see Tables 1 to 8). For Au, due to the common 'nugget effect', the cut-off value on RSD (CRM) was raised from 30 to 50%, and that on RSD (FD) from 50 to 100%.

The following elements were found to have high RSD (CRM) values ($>30\%$ for all elements except Au, which is 50%) but with the average too close to the LLD (*i.e.*, average $<10 \times \text{LLD}$) and/or Field Duplicates were strongly affected by censored values; their use may be fit-for-purpose, conditional to careful assessment:

- Total element concentrations of Ag, Cd, Mo and Sb determined by ICP-MS
- Total element concentrations of Pd and Pt determined by Fire Assay
- Aqua Regia soluble element concentrations of B, Hg, In, K, Lu, Re, Te and W
- Mobile Metal Ion™ soluble element concentrations of Al, As, Bi, Fe, Ga, Mo, Nb and Pd

Aqua Regia data for Ta, and MMI™ data for Pt were all $<\text{LLD}$, and are therefore not preferred elements/methods.

Total concentration data for Ag, Aqua Regia data for Ge and W, and MMI™ data for Bi, Hg, Pd, Sb, Sn, Ta and W had more than 75% censored data; these data are kept for the reason that samples with concentrations above LLD can still yield information of interest to some users.

Table 11. List of parameters/elements analysed for in the NGSA project, designated as fit-for-purpose (V), possibly fit-for-purpose (?), not fit-for-purpose (x) and not preferred (X) (see text).

Parameter/ Element	Total XRF	Total ICP-MS	FA AR-PGEs	ISE-F	AR ICP-MS	AR-Se	MMI-ME ICP- MS*	Field pH [^]	pH Meter [^]	Conductivity [^]	Laser particle size analysis [^]
Field pH								V			
pH 1:5									V		
EC 1:5										V	
Grain size											V
LOI	V										
Ag		?			x		x				
Al	V				V		?				
As		V			V		?				
Au			V		V		V				
B					?						
Ba		V			V		V				
Be		V			V						
Bi		V			V		?				
Ca	V				V		V				
Cd		?			x		x				
Ce		V			V		x				
Cl	x										
Co		V			V		V				
Cr		V			V		x				
Cs		V			V		V				
Cu	X	V			V		V				
Dy		V			V		V				
Er		V			V		V				
Eu		V			V		V				
F	X			V							
Fe	V				V		?				
Ga		V			V		?				
Gd		V			V		V				
Ge		V			V						
Hf		V			V						
Hg					?		V				
Ho		V			V						
In					?						
K	V				?		V				
La		V			V		x				
Li					V		V				
Lu		V			?						
Mg	V				V		V				
Mn	V				V		V				
Mo		?			V		?				
Na	V				x						
Nb		V			V		?				
Nd		V			V		x				
Ni	X	V			V		V				
P	V						V				
Pb		V			V		x				
Pd			?				?				
Pr		V			x		x				
Pt			?				X				
Rb	X	V			x		V				
Re					?						
S	x										
Sb		?			V		V				
Sc		V			V		V				
Se					X	V	x				
Si	V										
Sm		V			V		V				
Sn		V			V		V				
Sr	X	V			x		V				
Ta		x			X		V				
Tb		V			V		V				
Te					?		V				
Th		V			V		x				
Ti	V						x				
Tl					V		V				
Tm					V						
U		V			V		V				
V		V			V		x				
W		x			?		V				
Y		V			V		V				
Yb		V			V		V				
Zn	X	V			V		V				
Zr	X	V			x		V				
Total	20	43	3	1	60	1	54	1	1	1	1

*: Only on TOS <2 mm samples

^: Only on bulk samples (TOS and BOS)

Acknowledgments

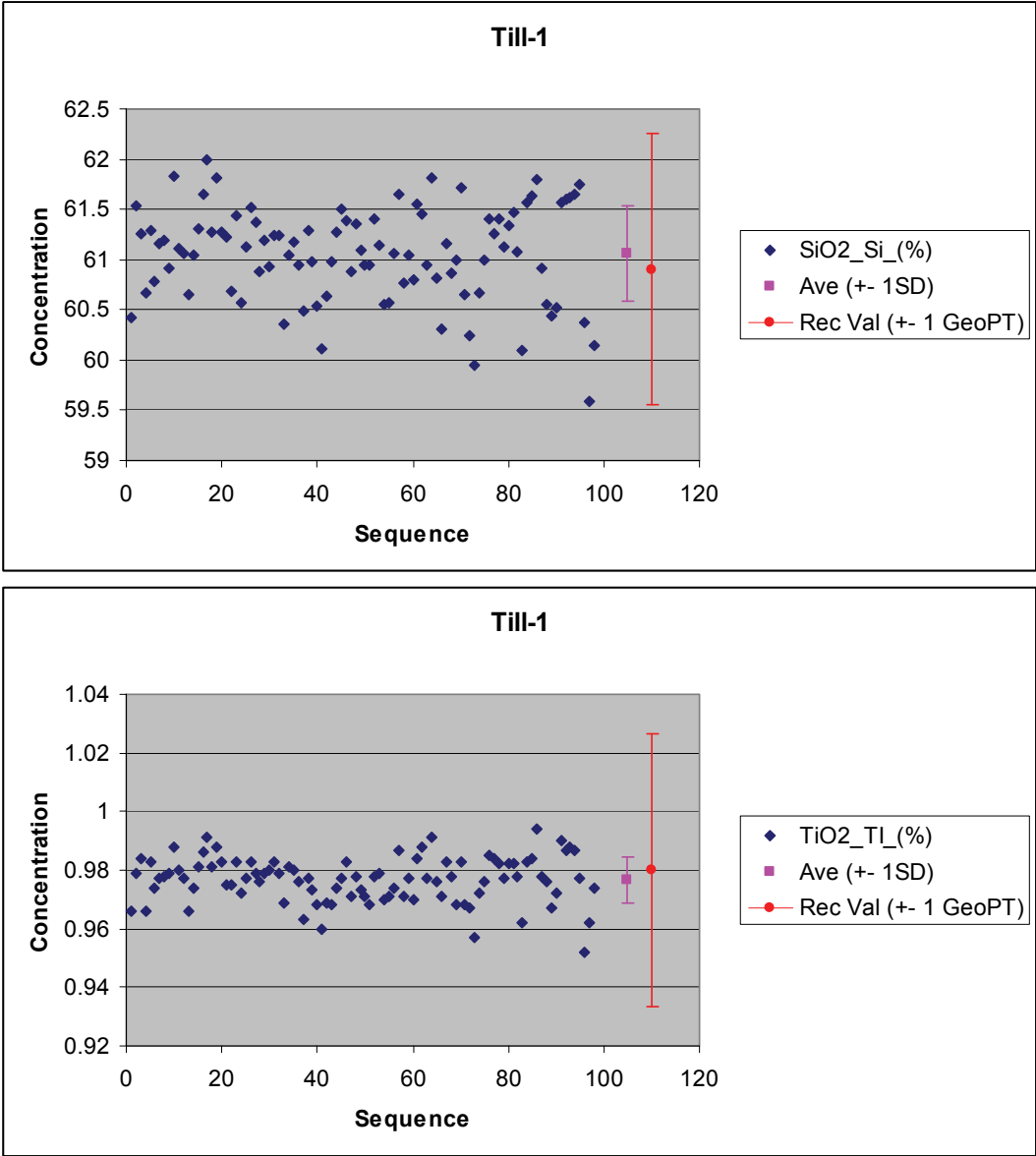
The authors are extremely grateful to the Australian government for funding the Onshore Energy Security Program, to the land owners for allowing access to the sampling sites, to the teams from the States and Northern Territory geoscience agencies for collecting the samples in the field, to Geoscience Australia staff for assisting with sample preparation and analysis, and to the external laboratories for performing the additional analyses.

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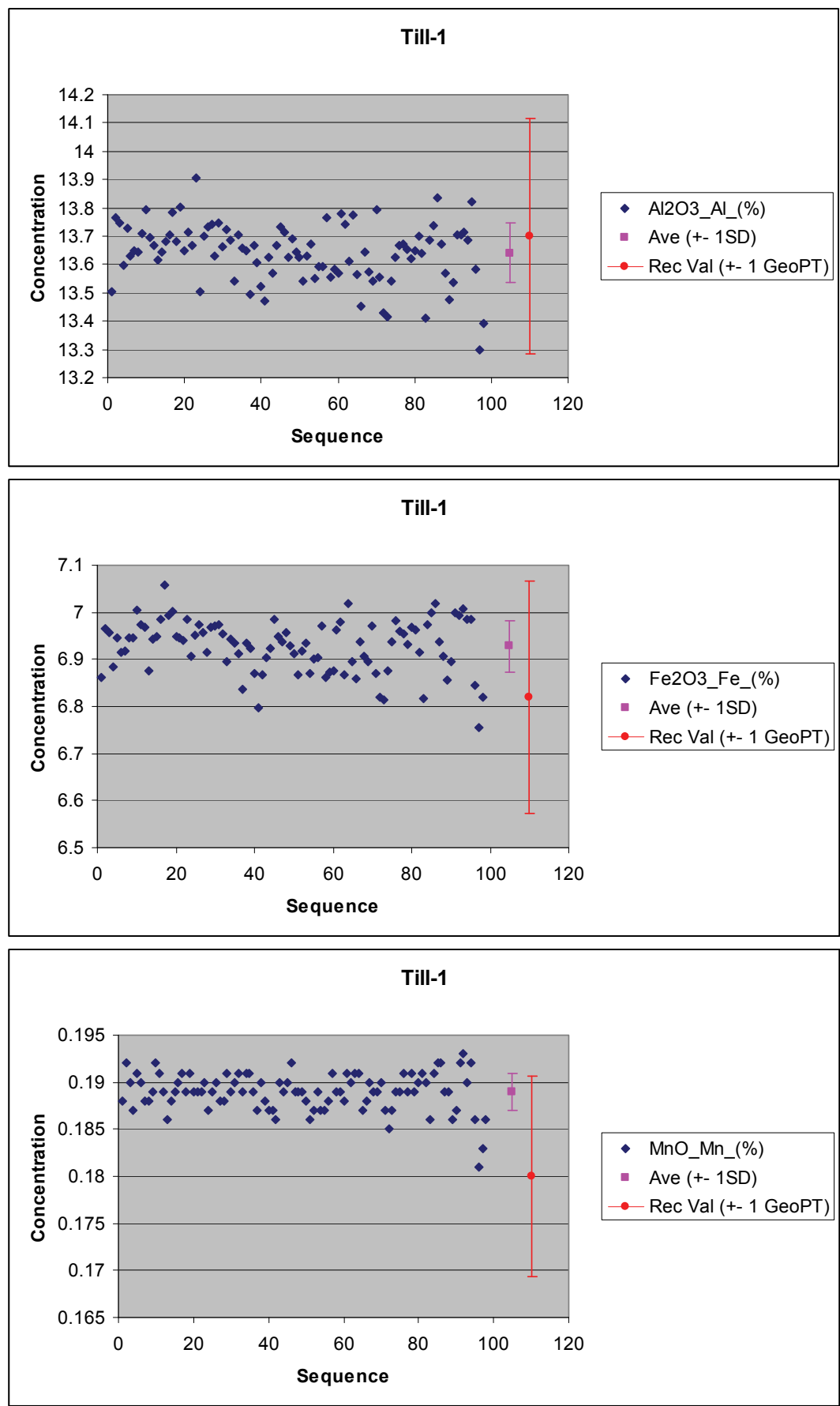
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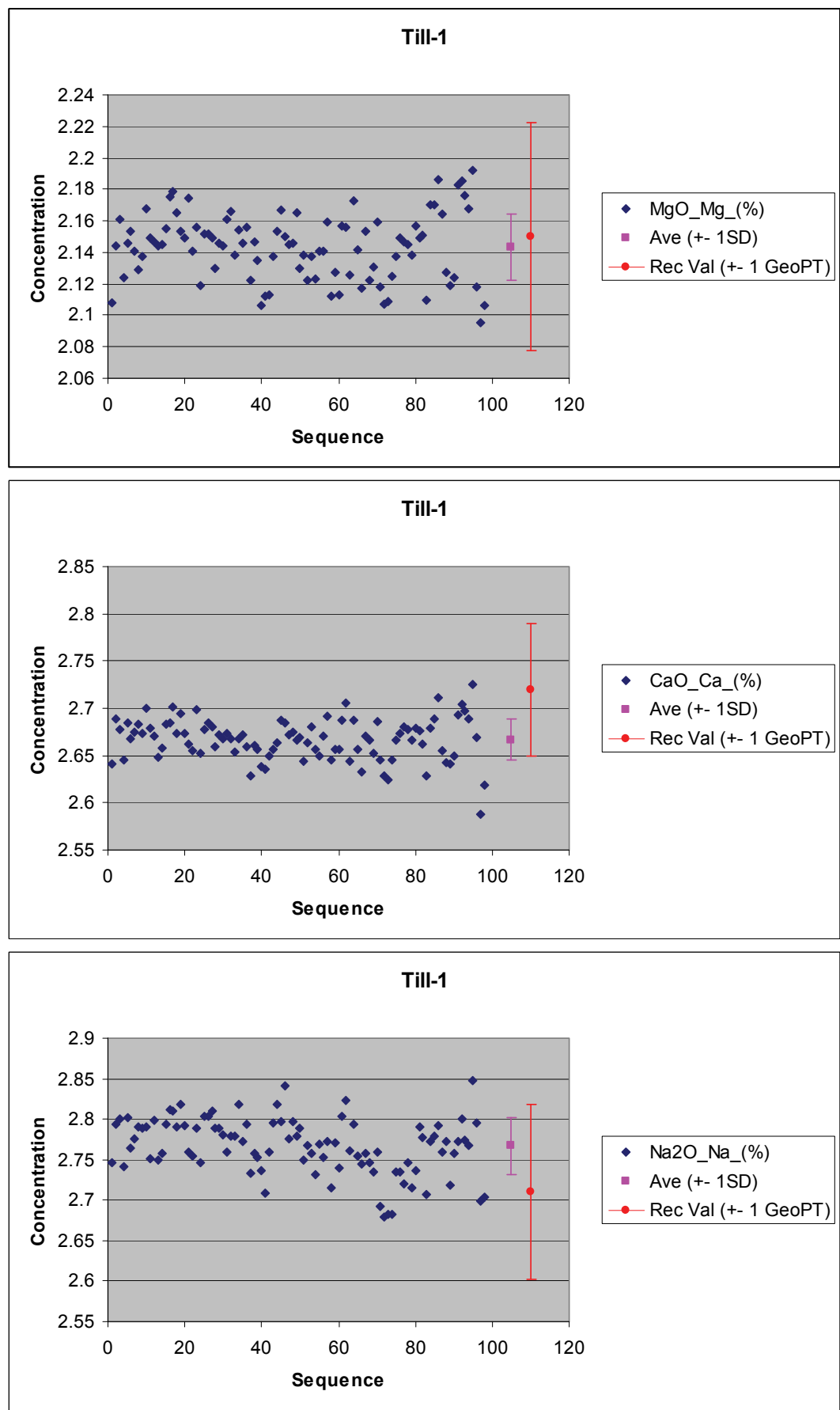
Appendix 1. X-plots for XRF analysis of Till-1



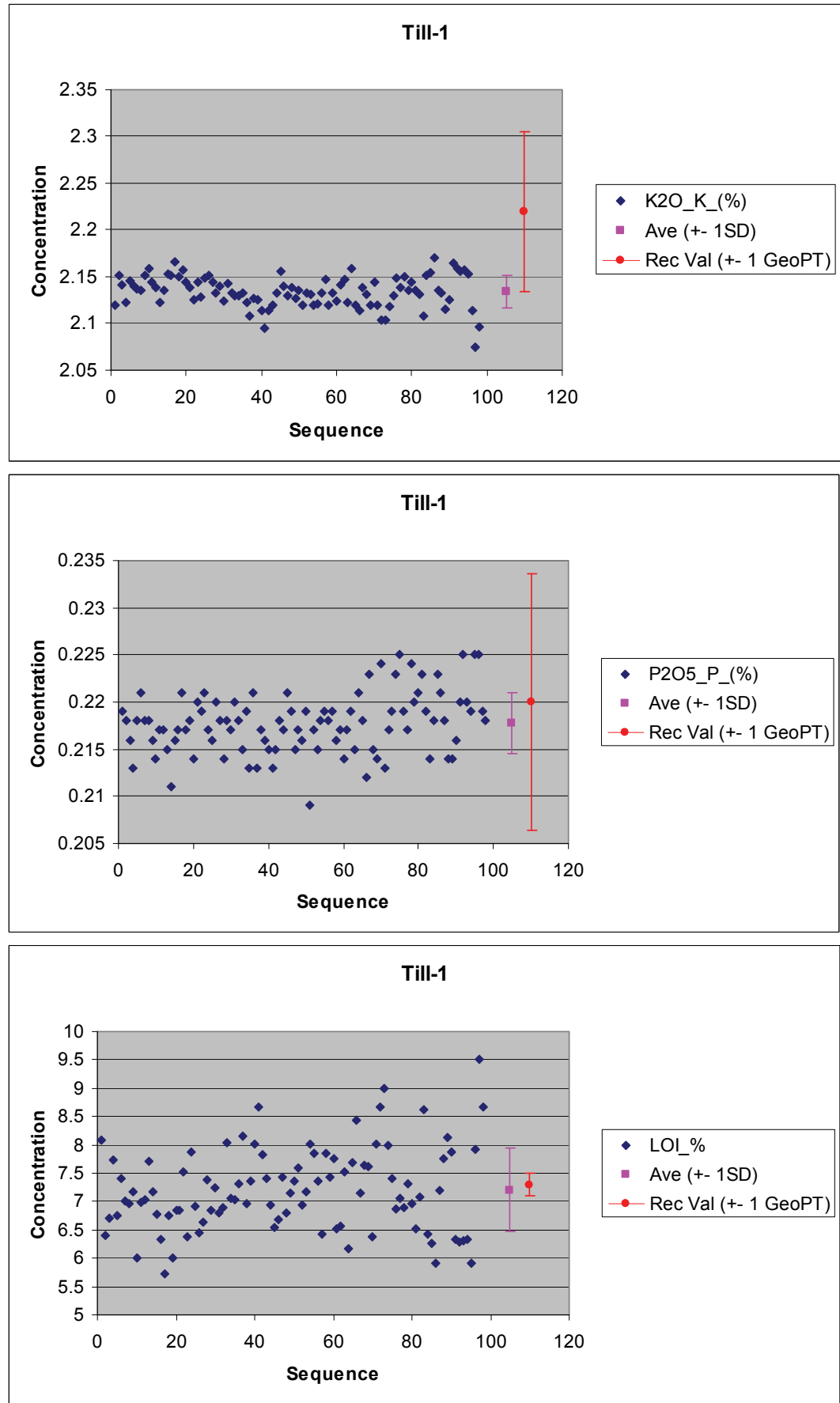
Appendix 1: X-plots for XRF analysis of Till-1



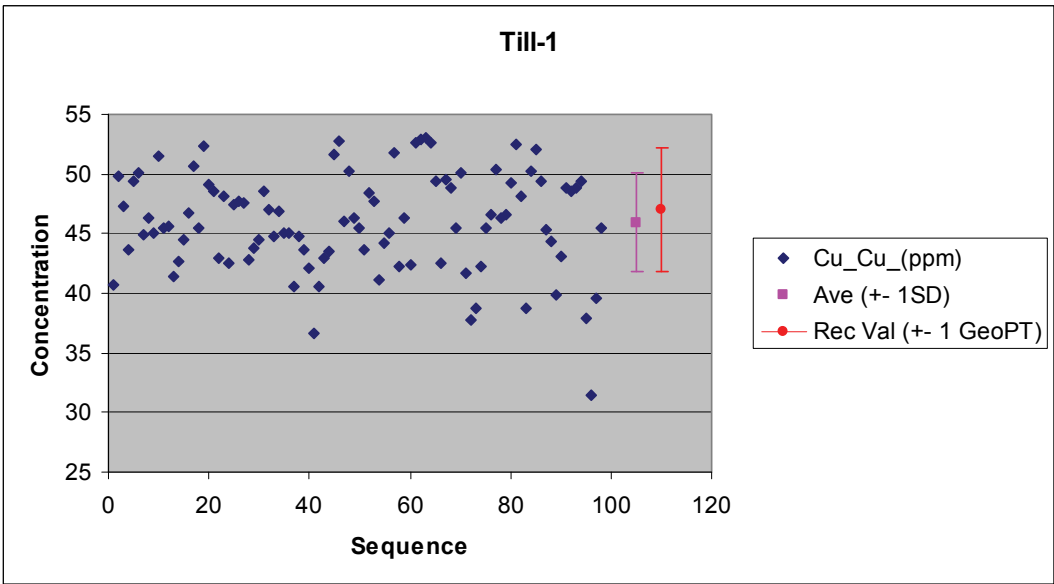
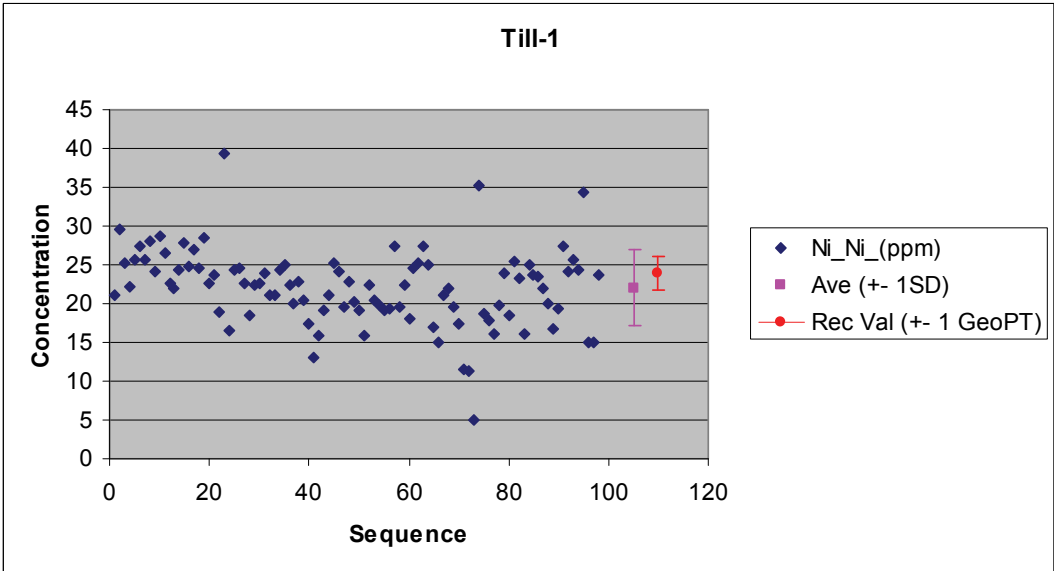
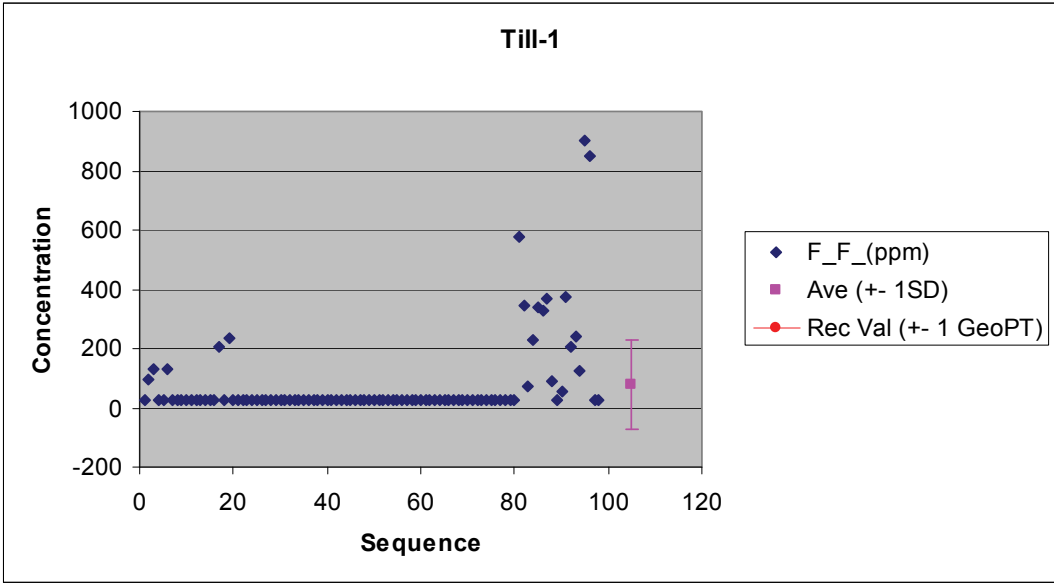
Appendix 1: X-plots for XRF analysis of Till-1



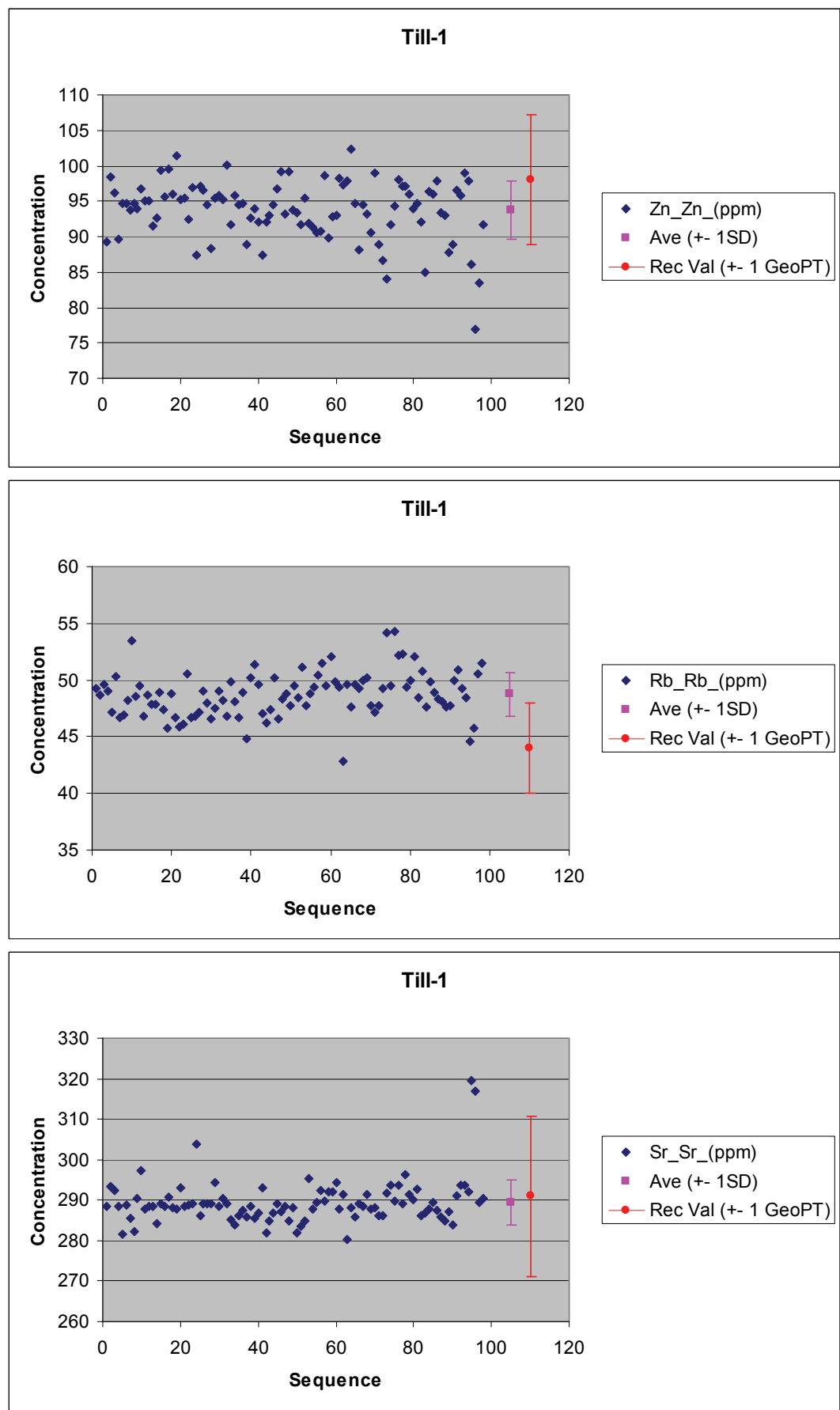
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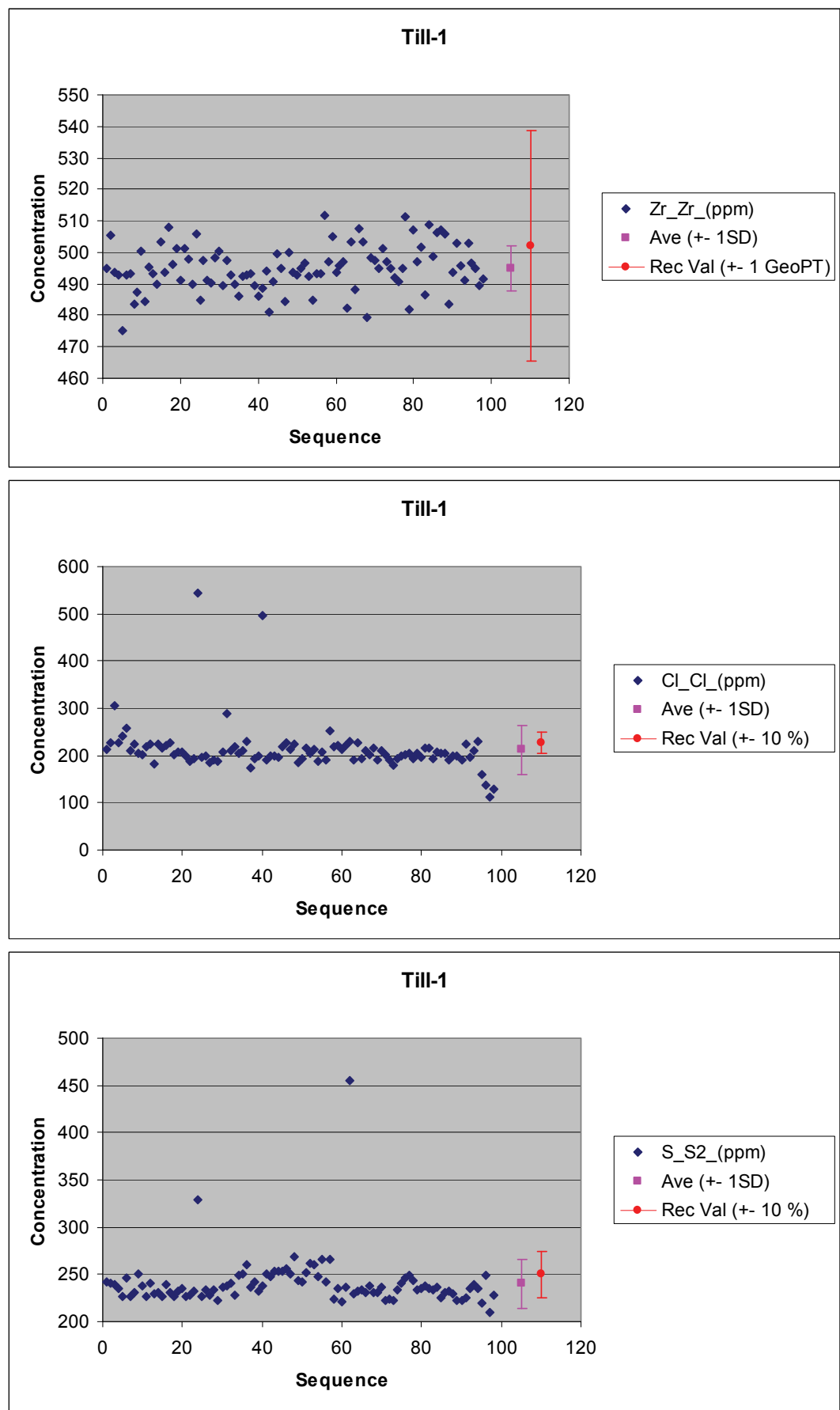
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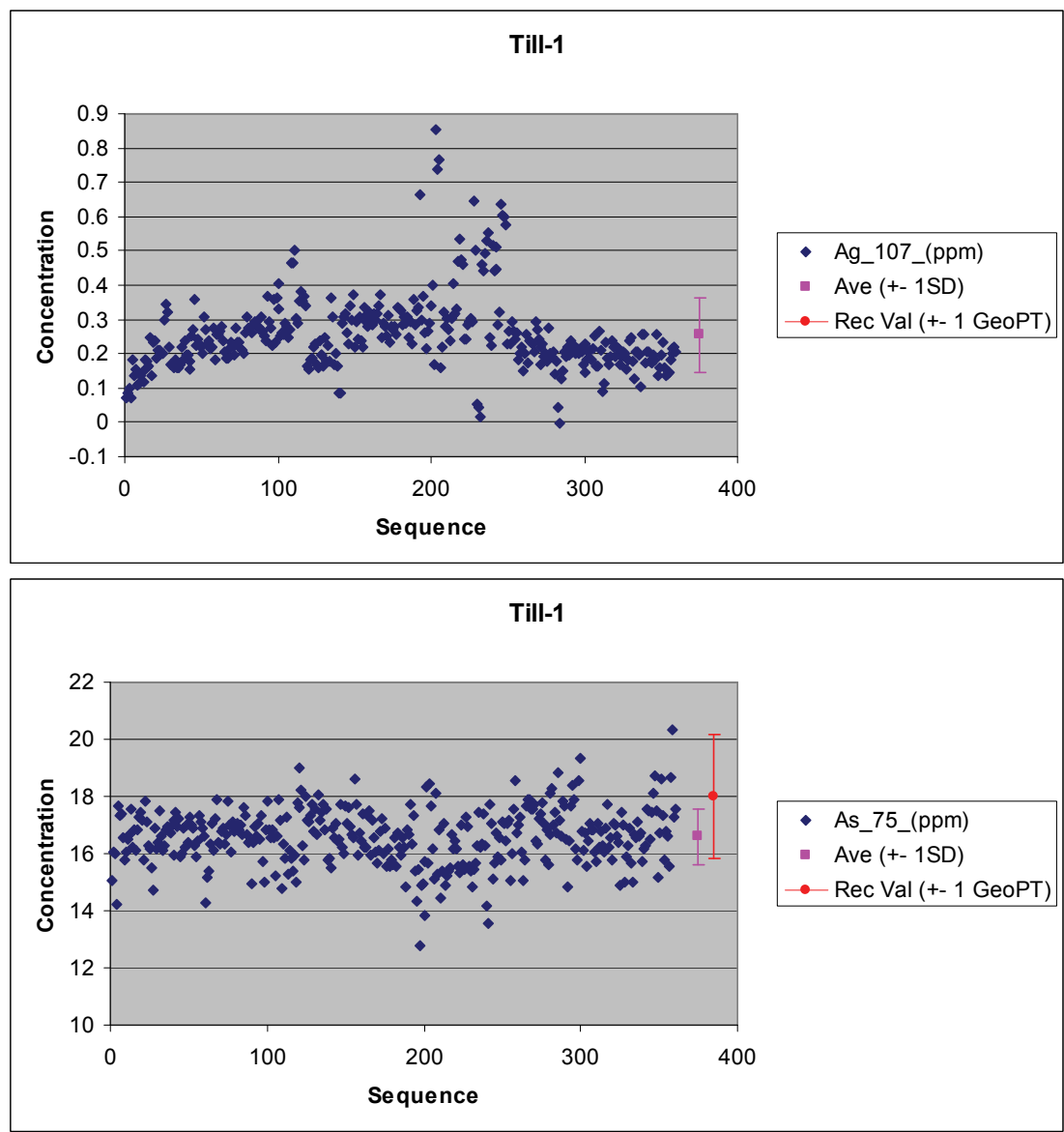
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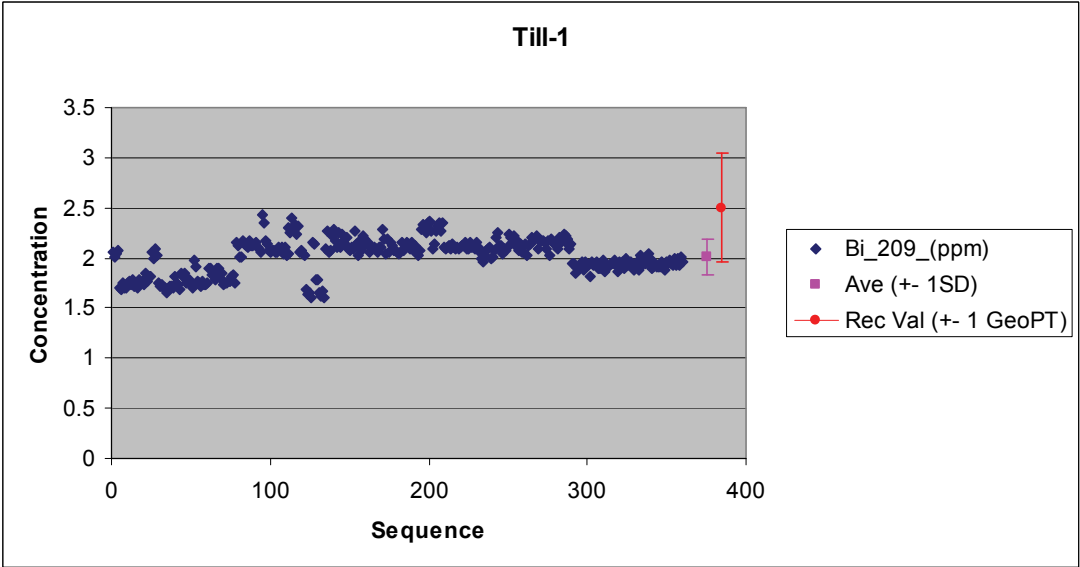
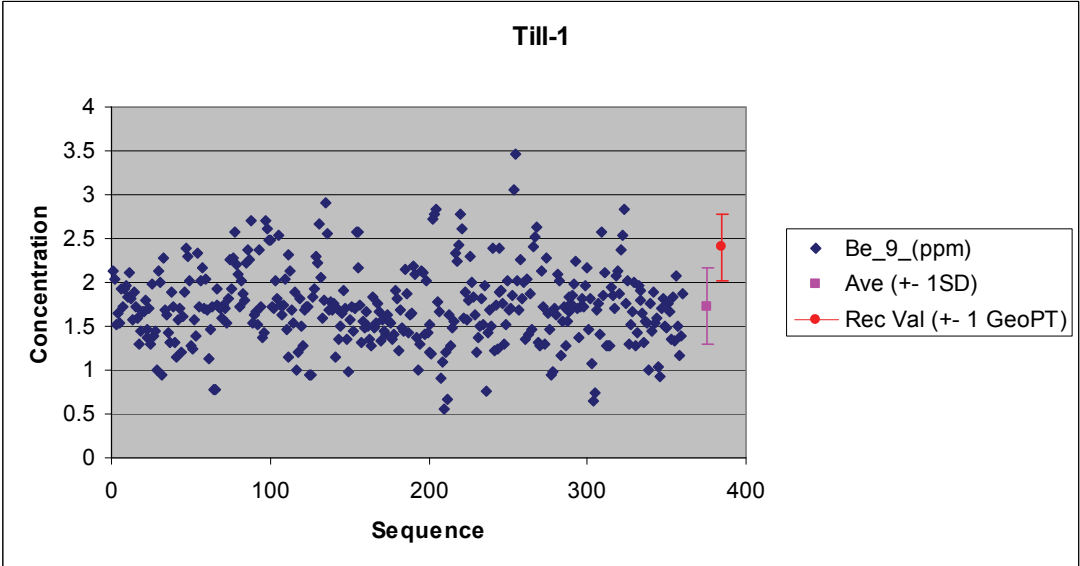
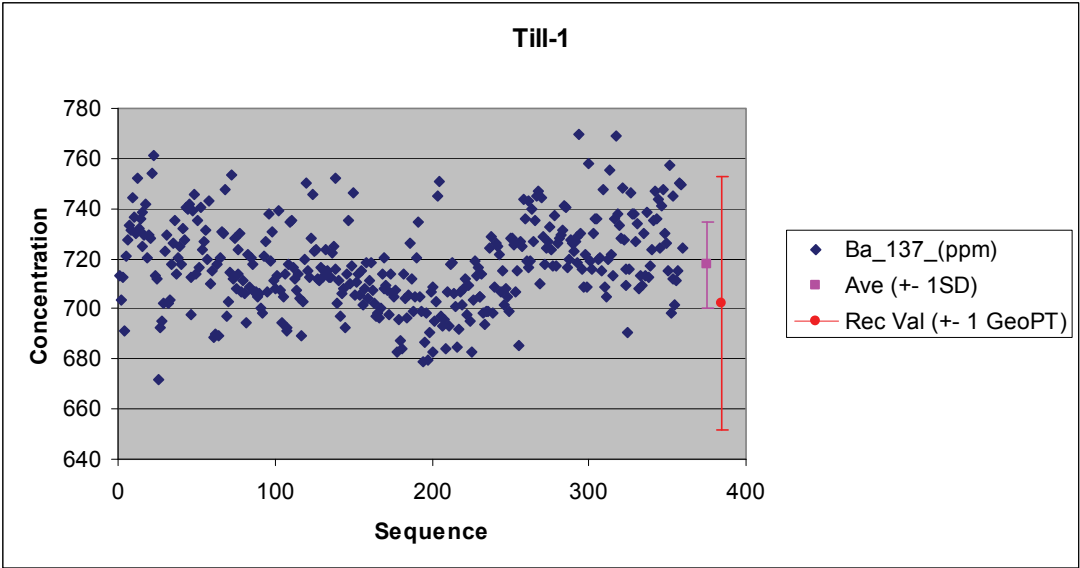
Appendix 1: X-plots for XRF analysis of Till-1



Appendix 2. X-plots for ICP-MS analysis of Till-1

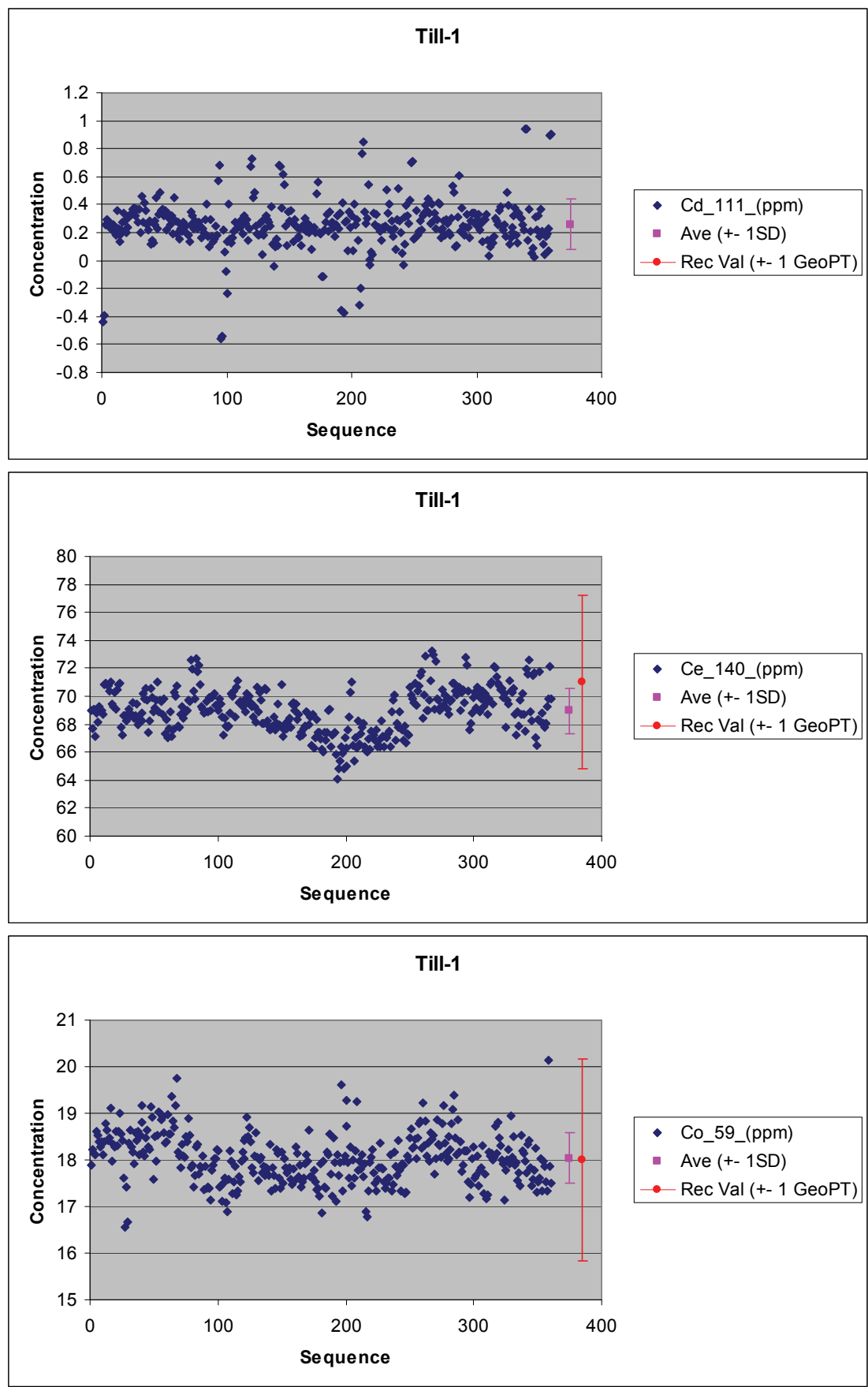


Appendix 2: X-plots for ICP-MS analysis of Till-1

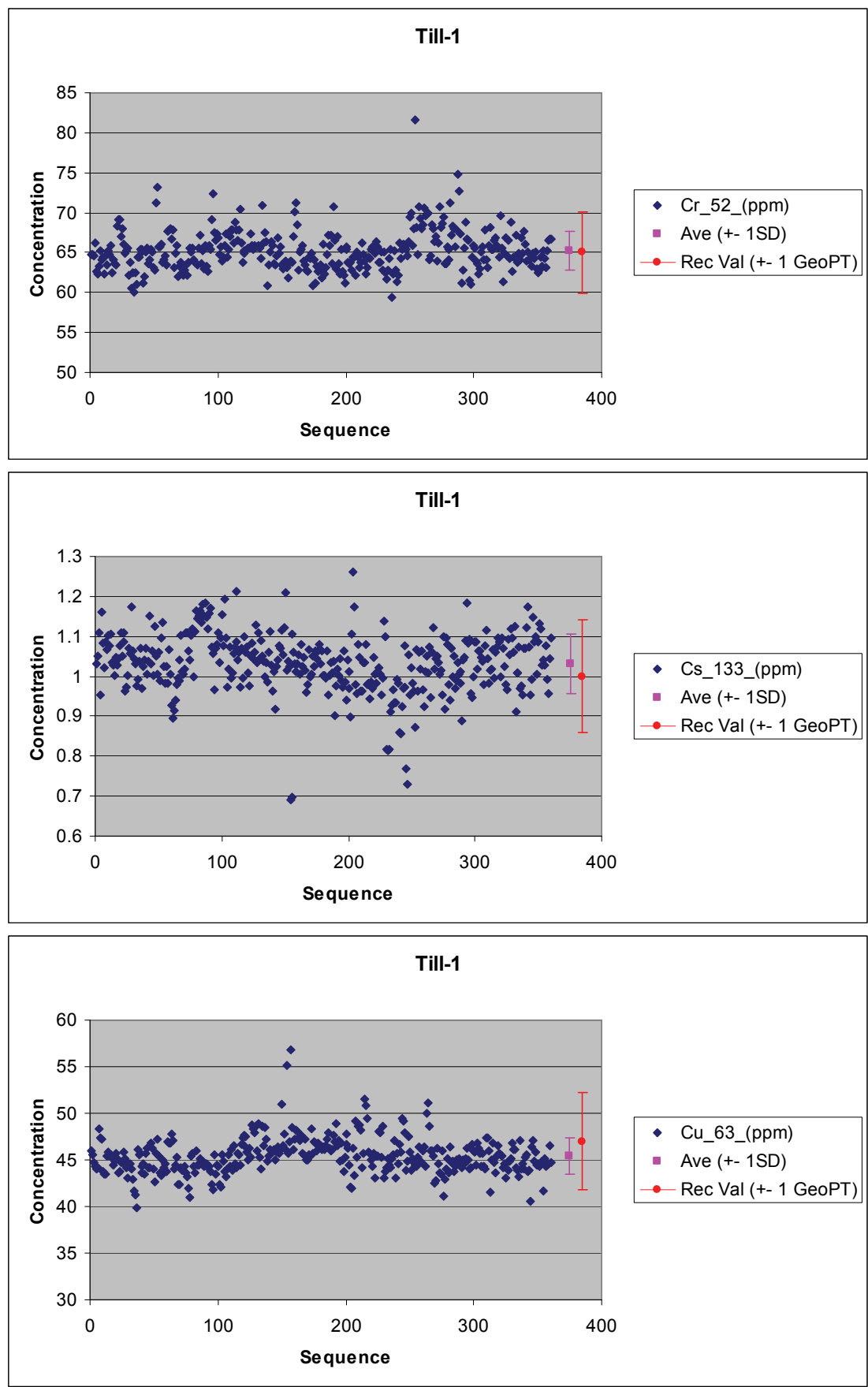


Note: Recommended value for Bi in Till-1 is <5 mg/kg, assumed here to = 2.5 mg/kg.

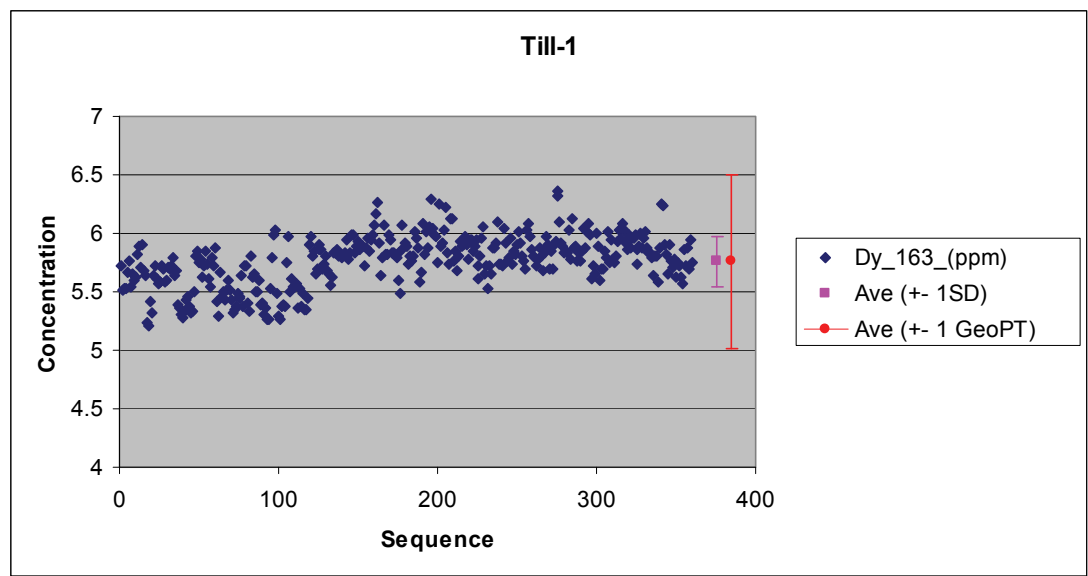
Appendix 2: X-plots for ICP-MS analysis of Till-1



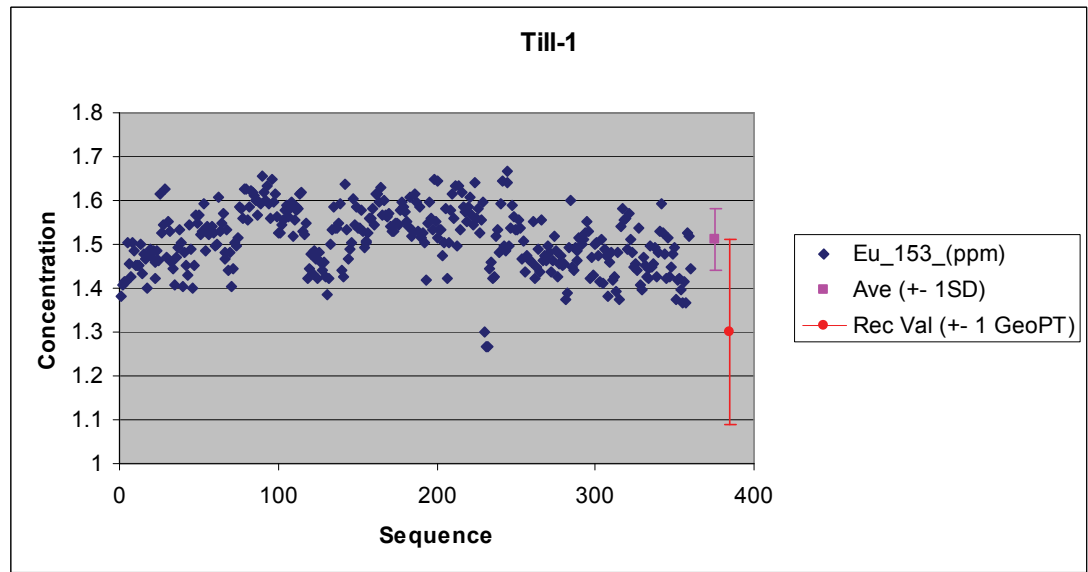
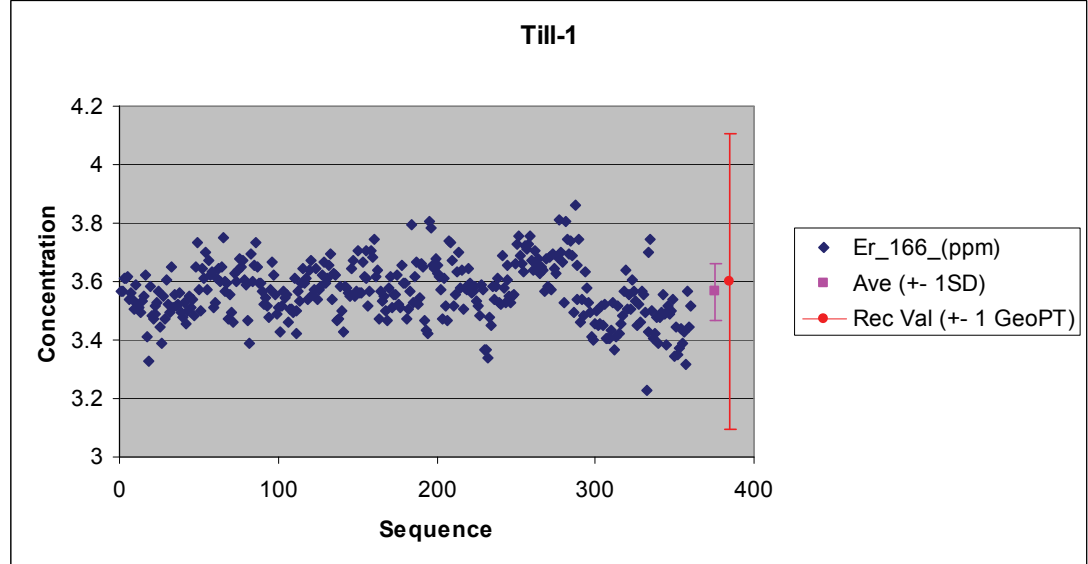
Appendix 2: X-plots for ICP-MS analysis of Till-1



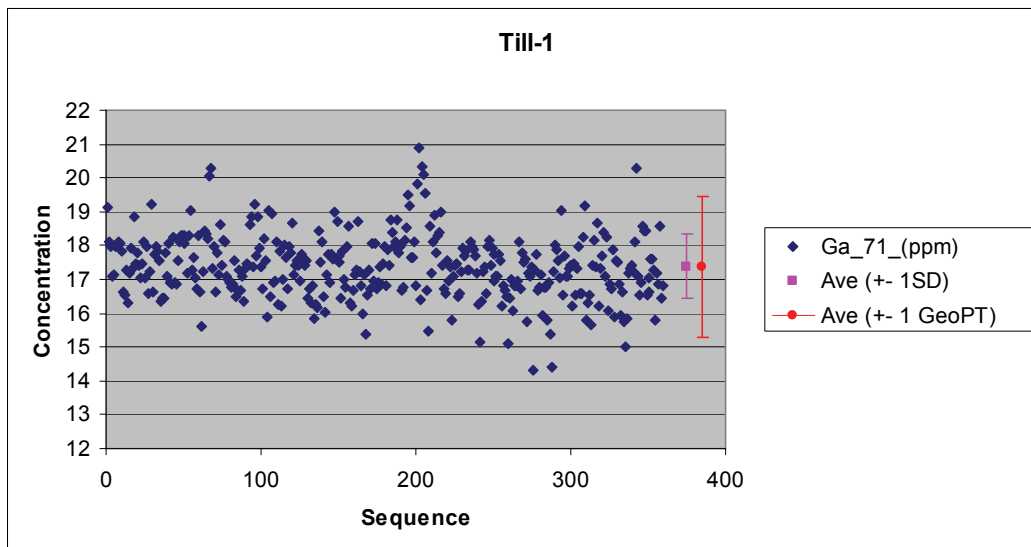
Appendix 2: X-plots for ICP-MS analysis of Till-1



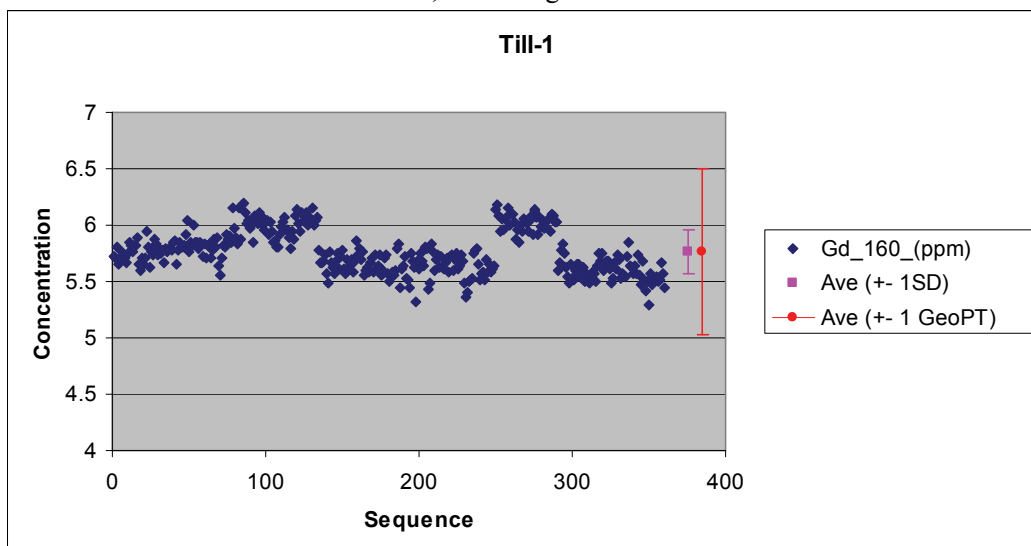
Note: No Recommended Value for Dy, so Average with GeoPT errors shown instead.



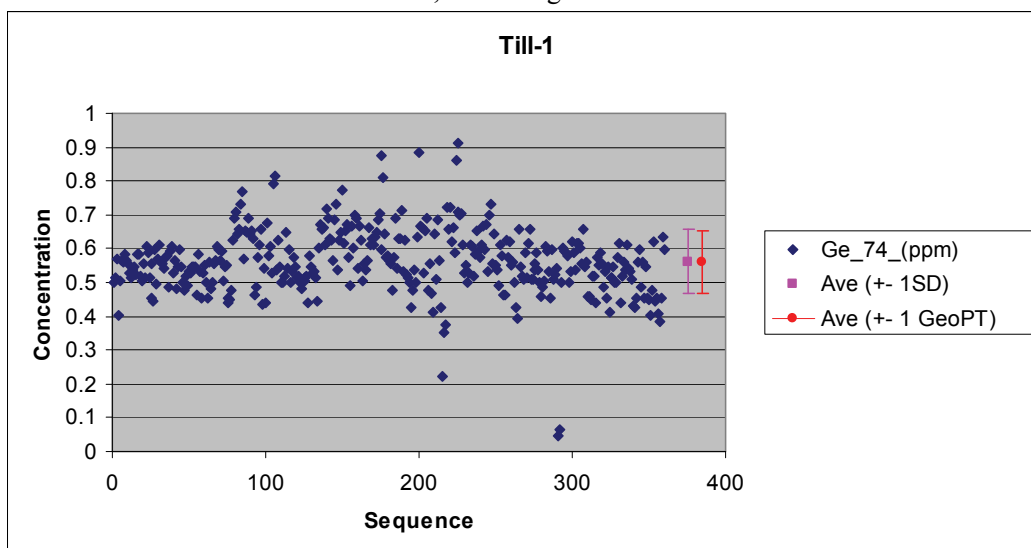
Appendix 2: X-plots for ICP-MS analysis of Till-1



Note: No Recommended Value for Ga, so Average with GeoPT errors shown instead.

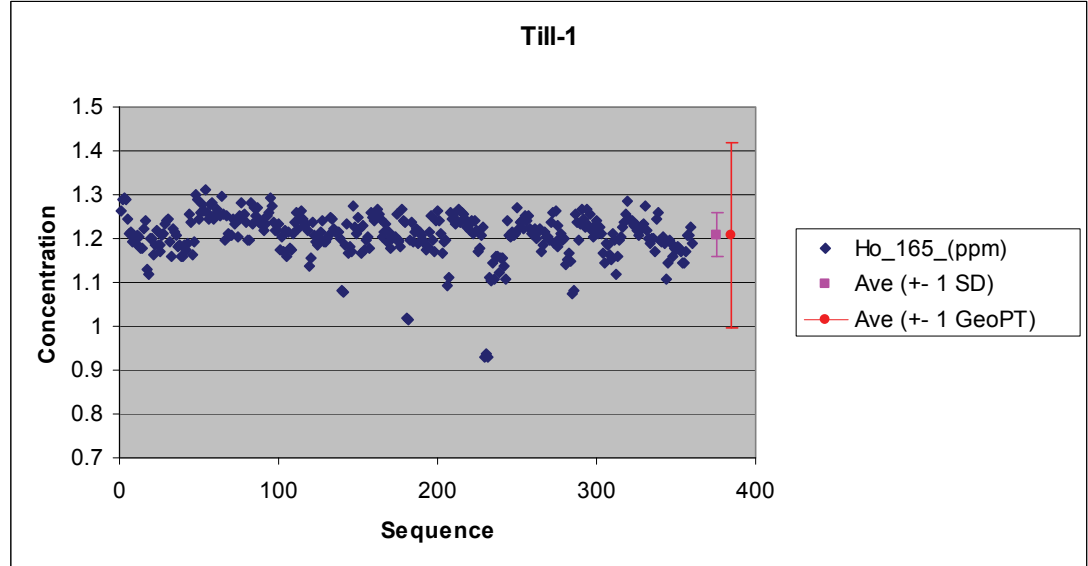
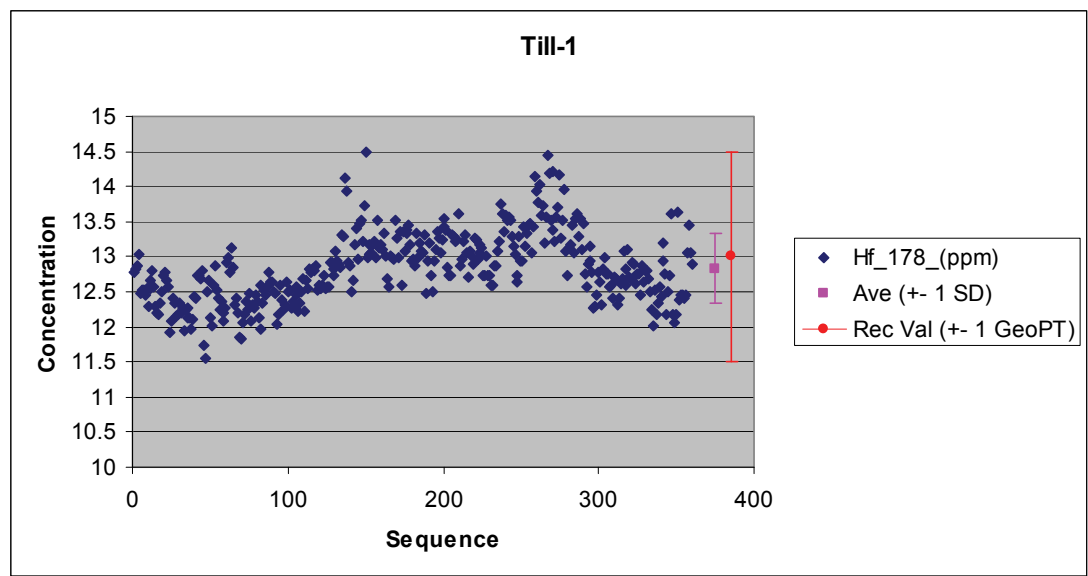


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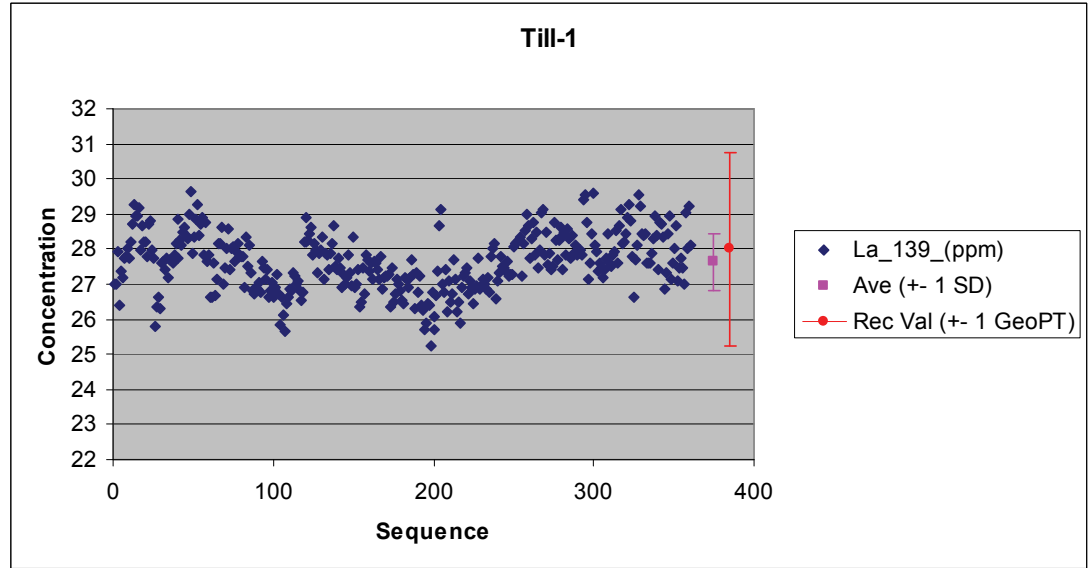


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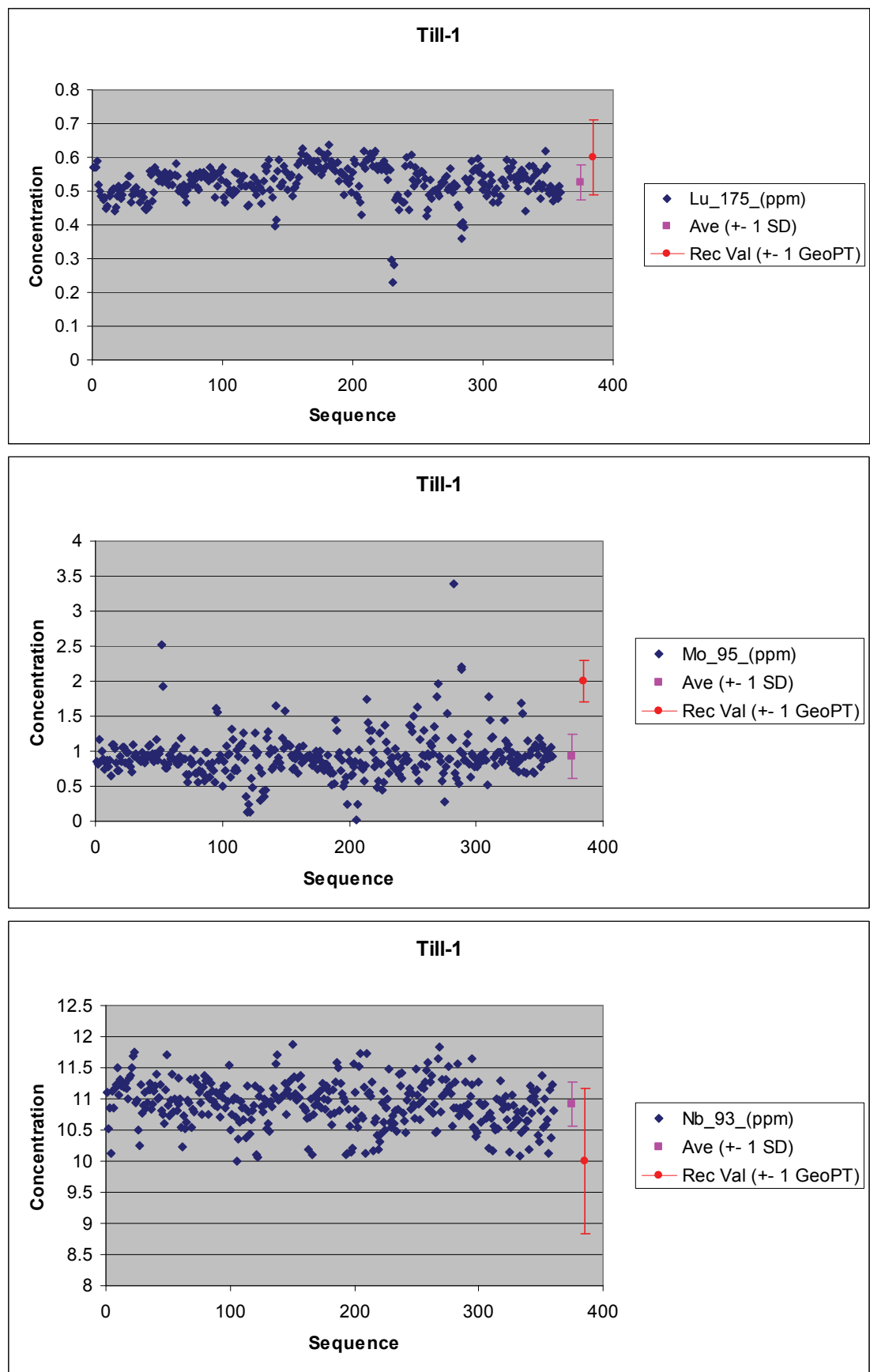
Appendix 2: X-plots for ICP-MS analysis of Till-1



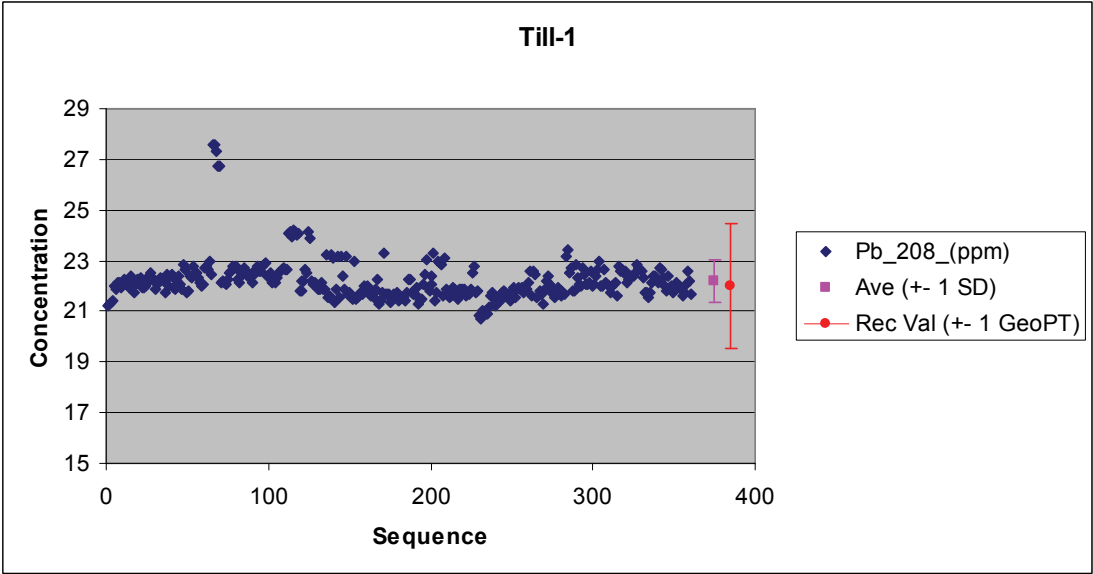
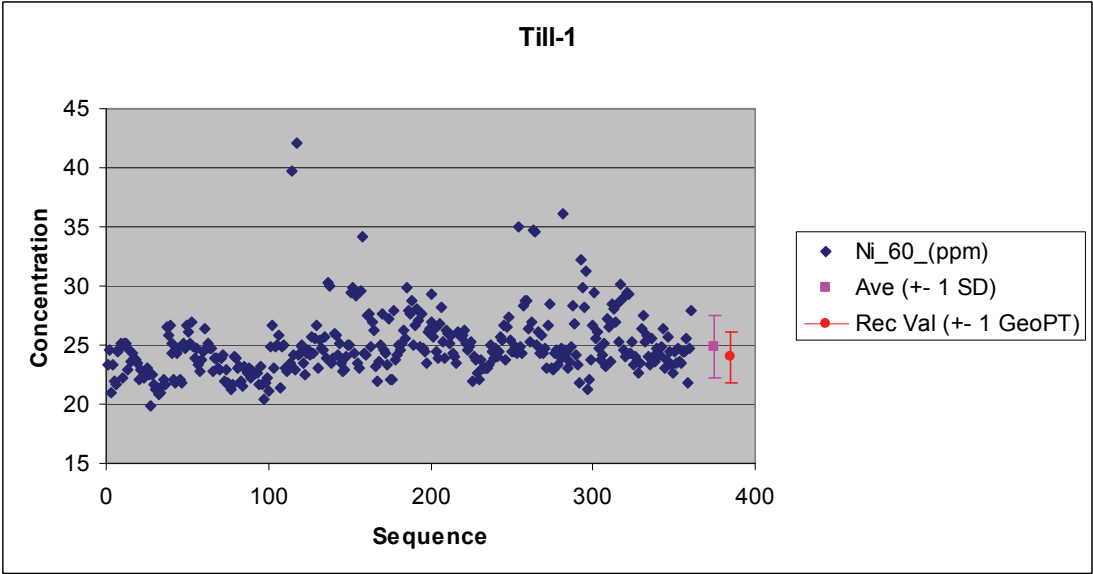
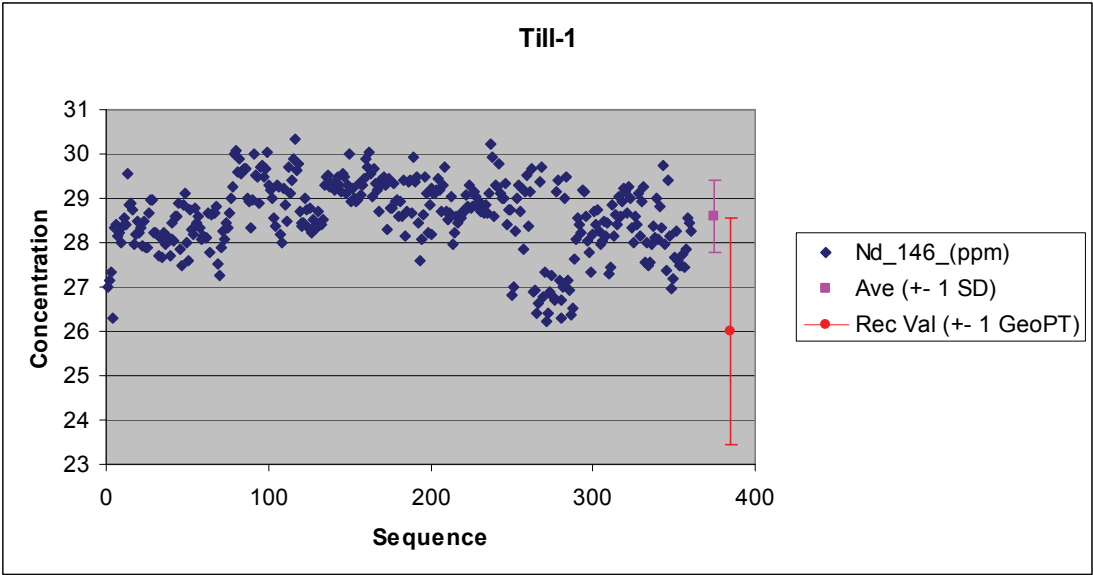
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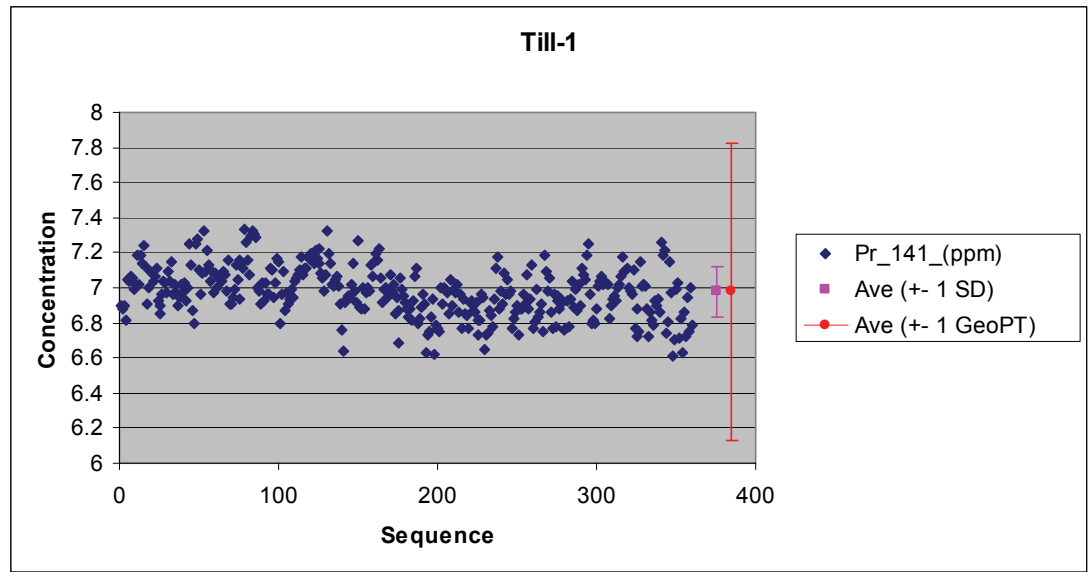
Appendix 2: X-plots for ICP-MS analysis of Till-1



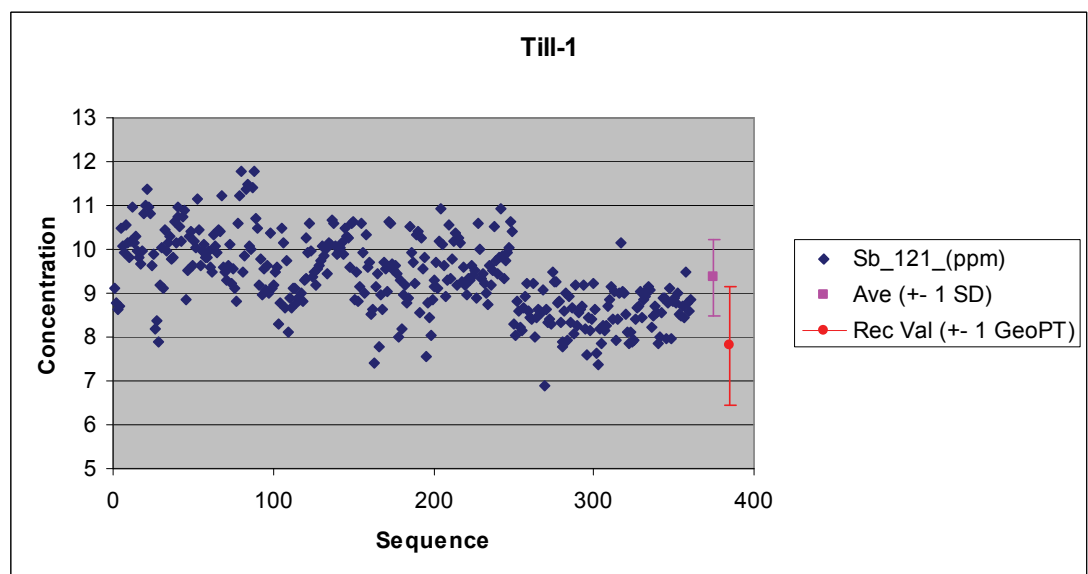
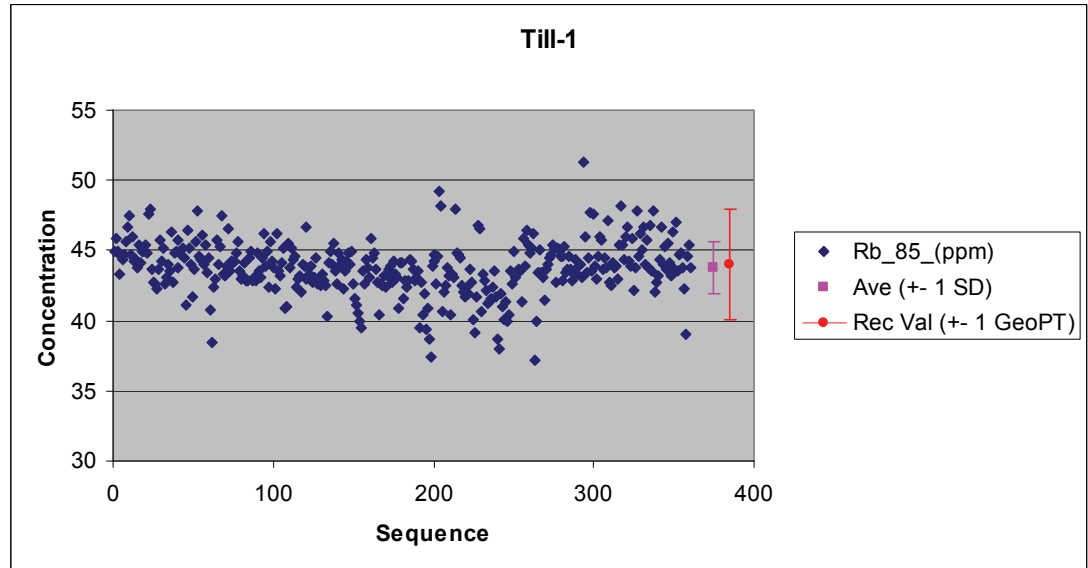
Appendix 2: X-plots for ICP-MS analysis of Till-1



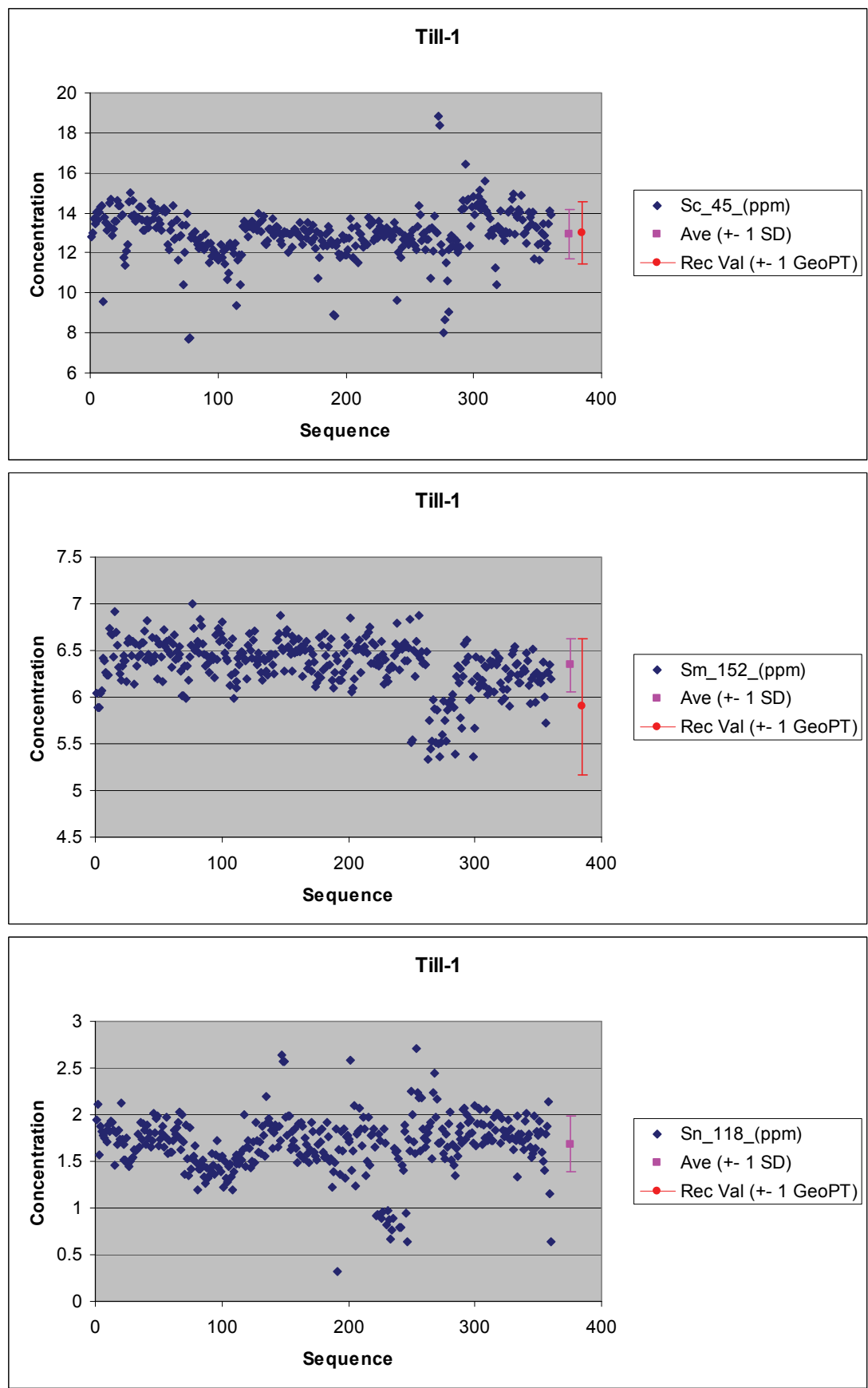
Appendix 2: X-plots for ICP-MS analysis of Till-1



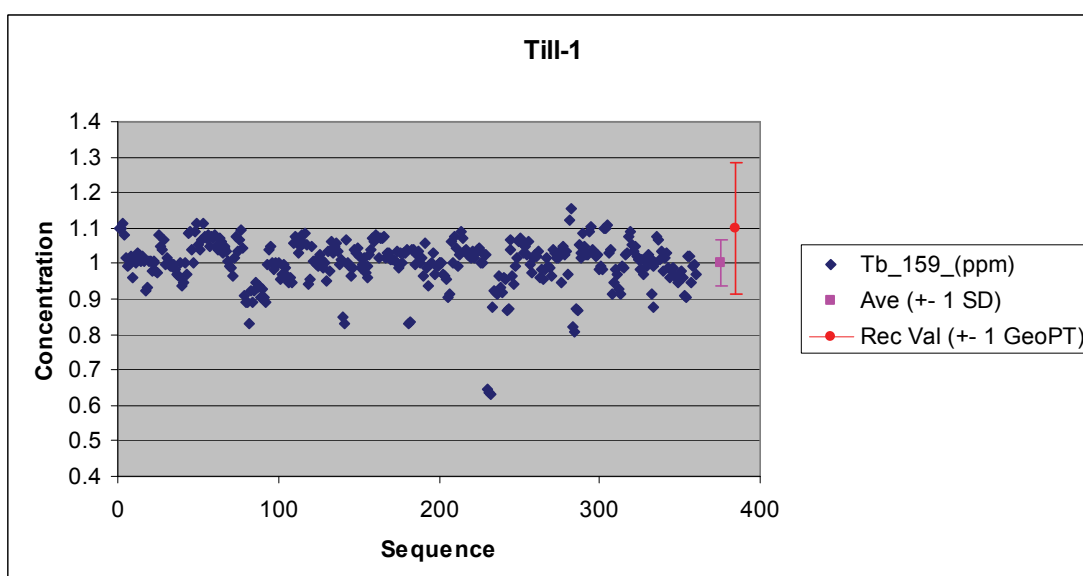
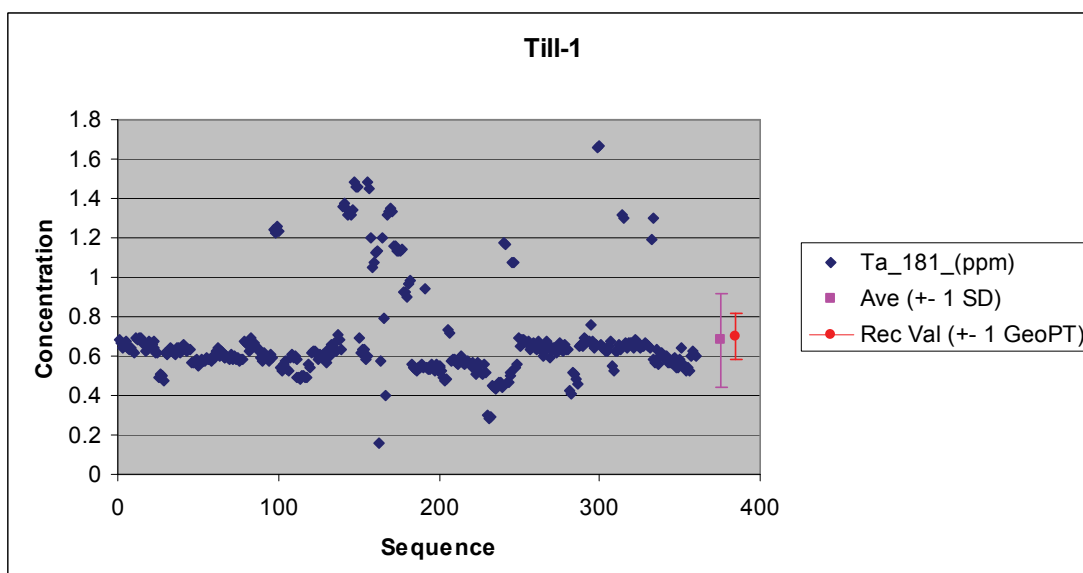
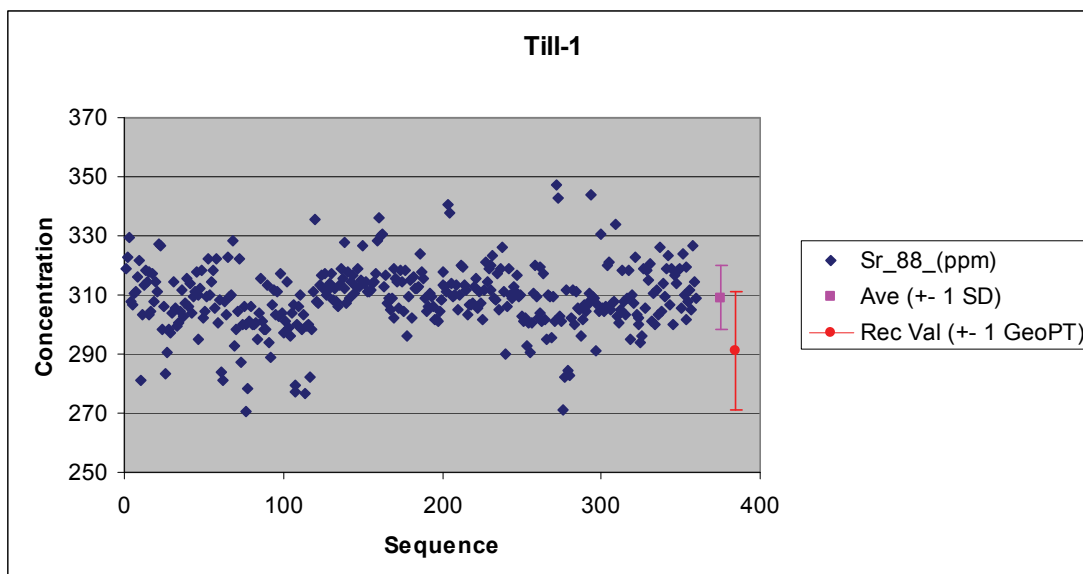
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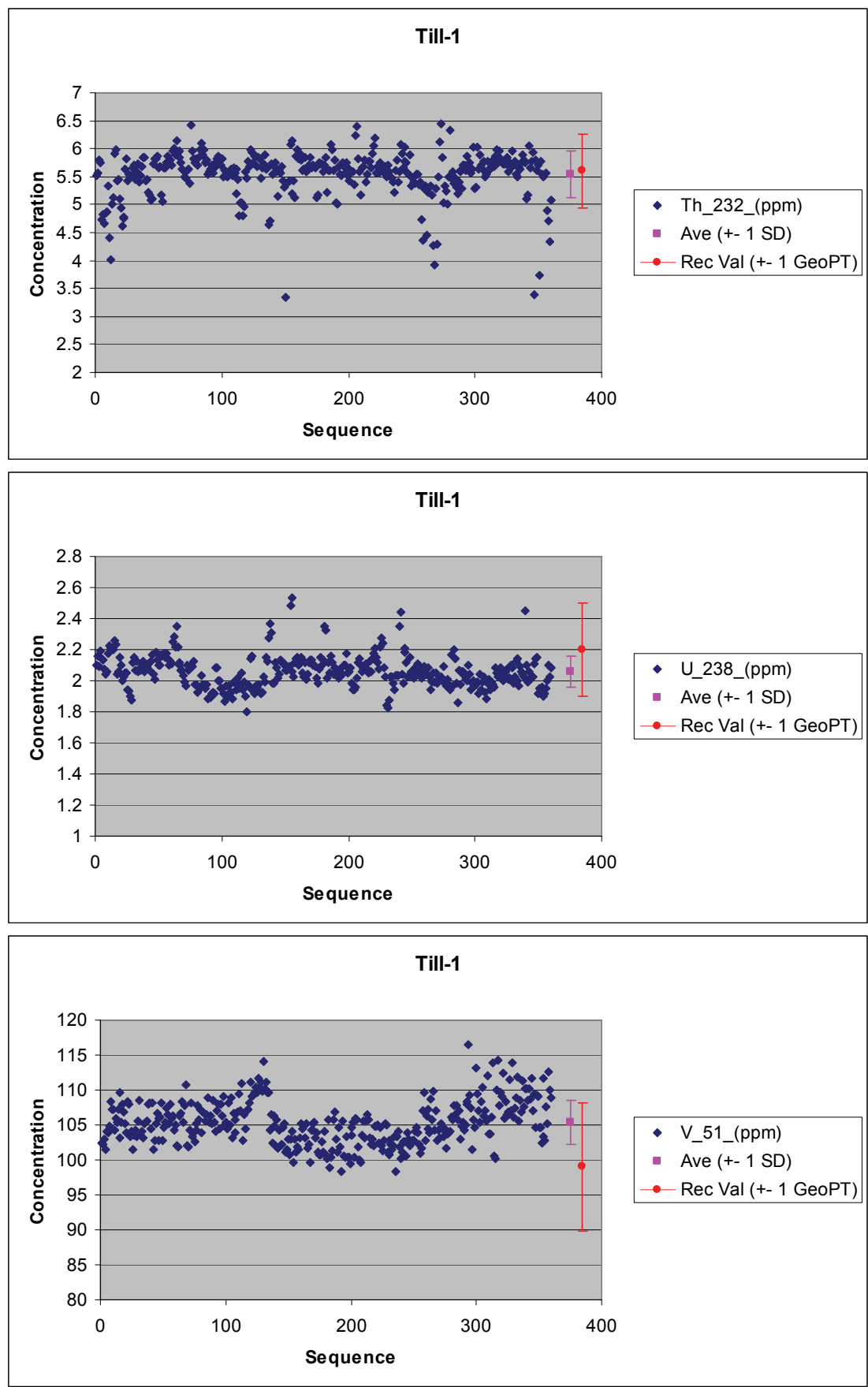
Appendix 2: X-plots for ICP-MS analysis of Till-1



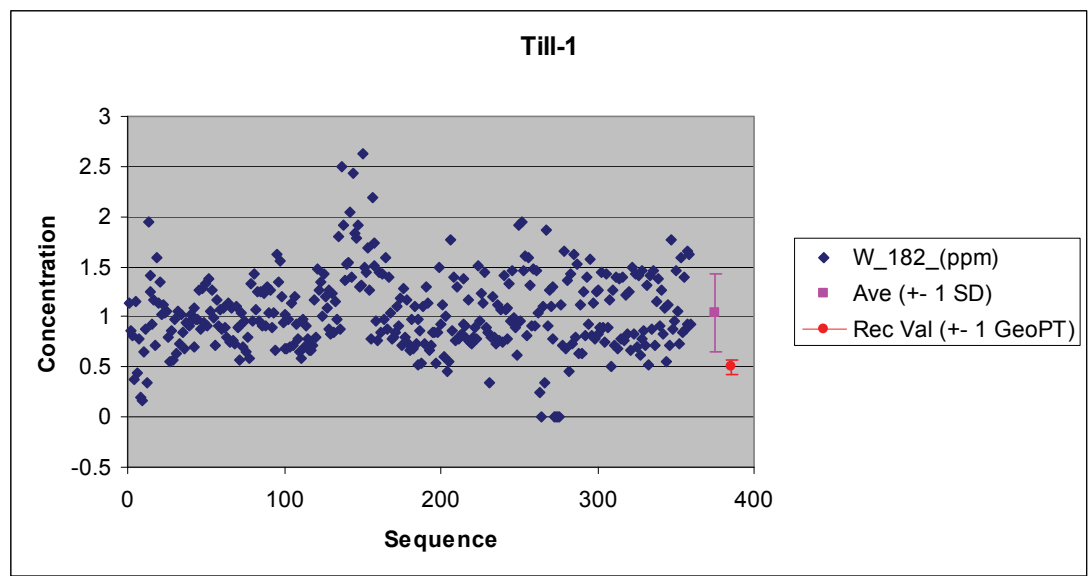
Appendix 2: X-plots for ICP-MS analysis of Till-1



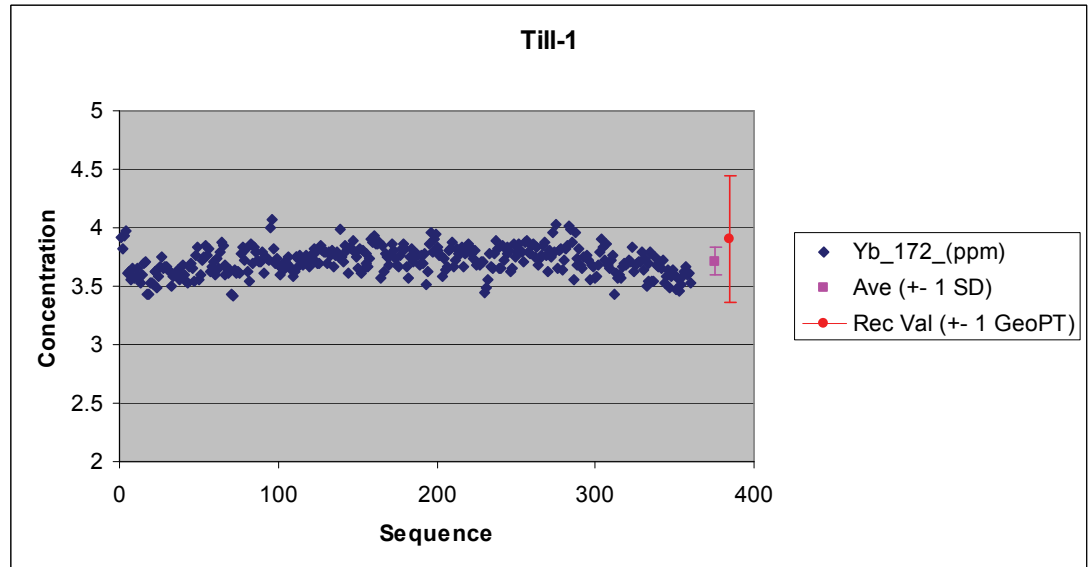
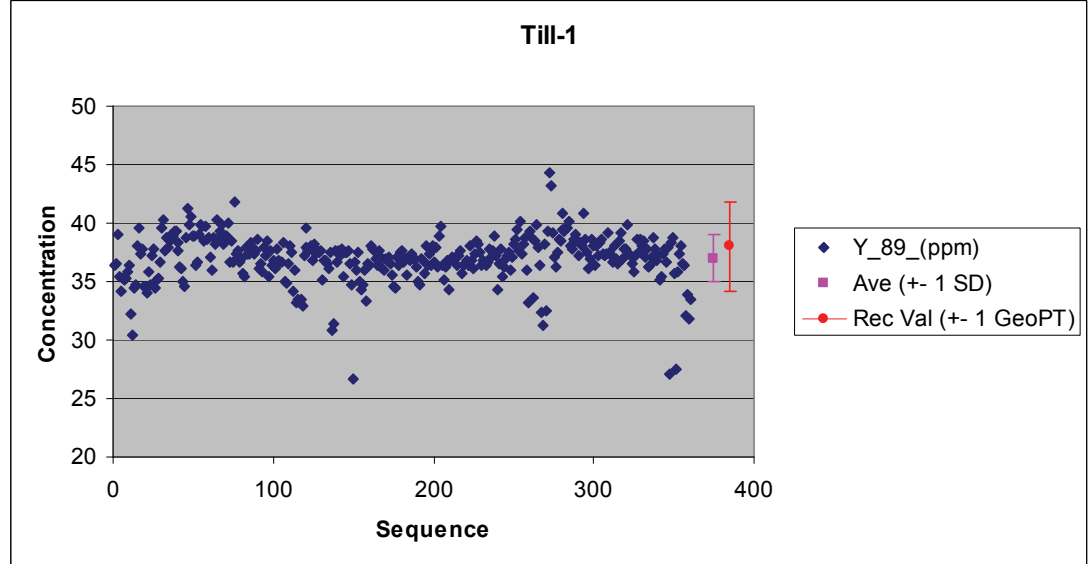
Appendix 2: X-plots for ICP-MS analysis of Till-1



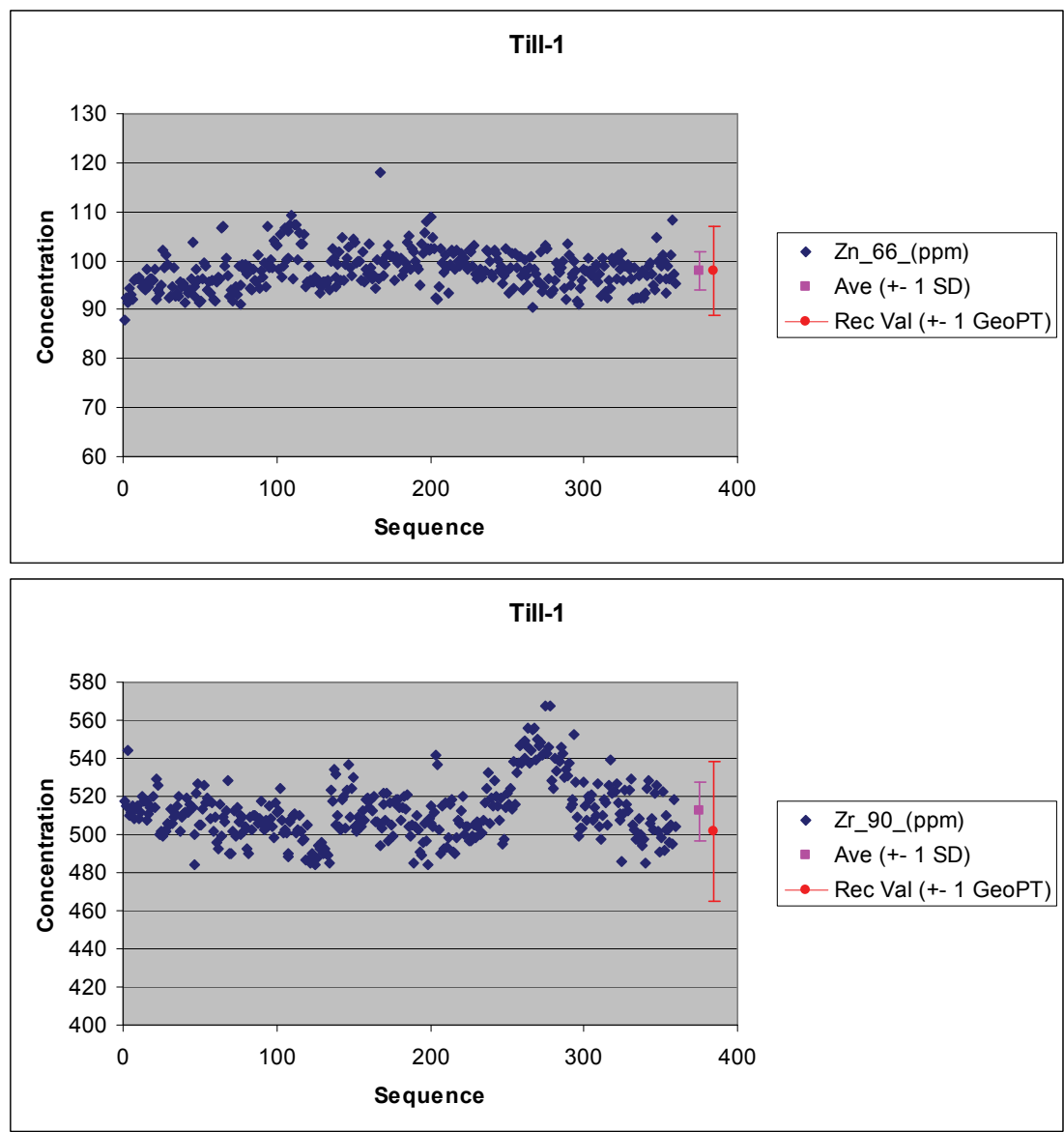
Appendix 2: X-plots for ICP-MS analysis of Till-1



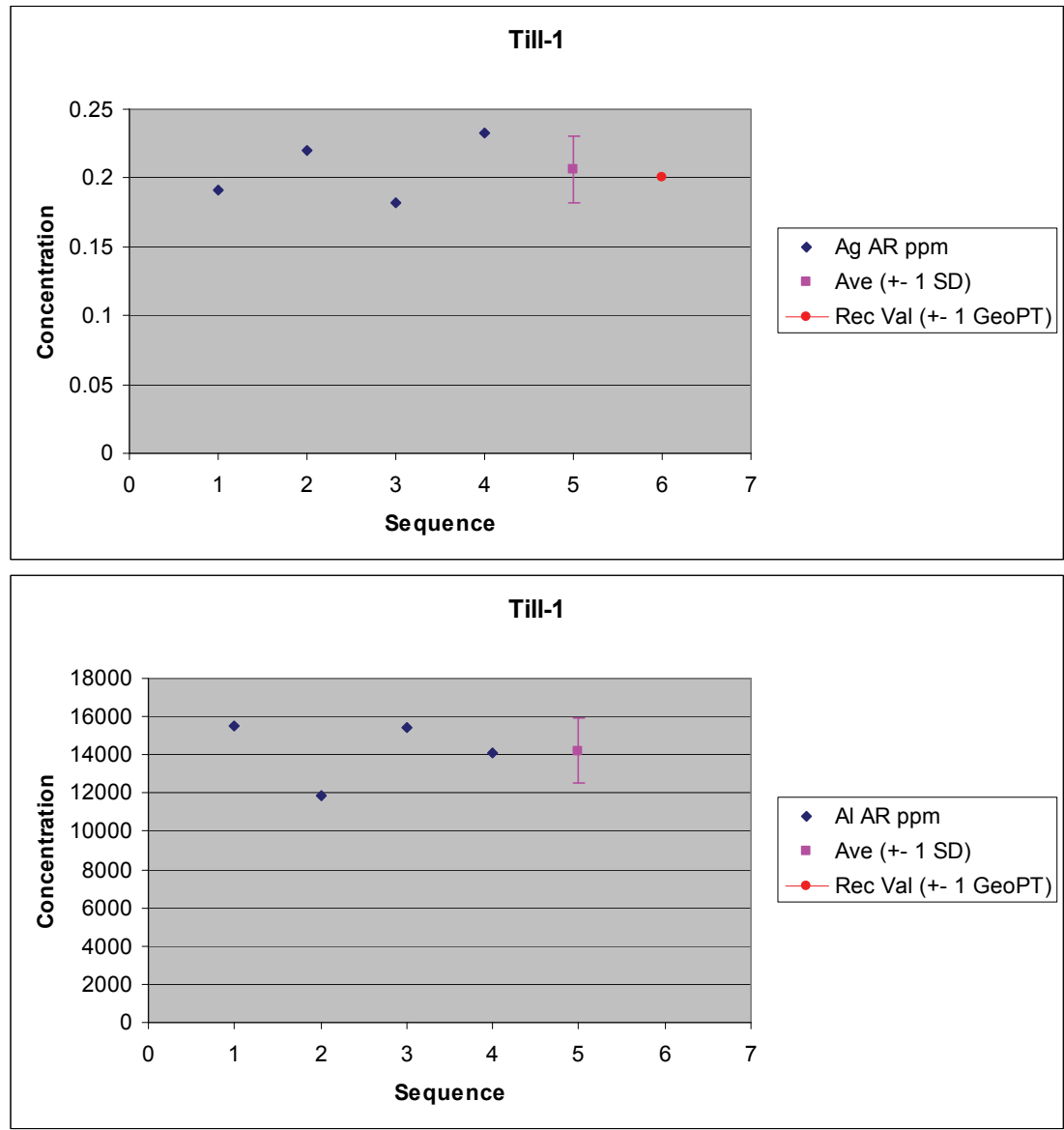
Note: Recommended value for W in Till-1 is <1 mg/kg, assumed here to = 0.5 mg/kg.



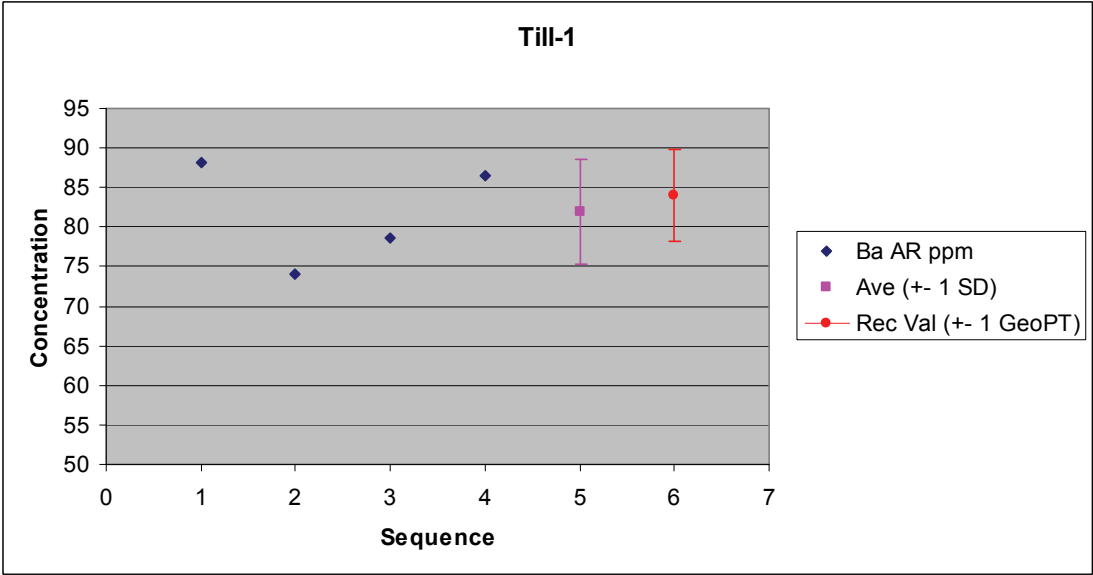
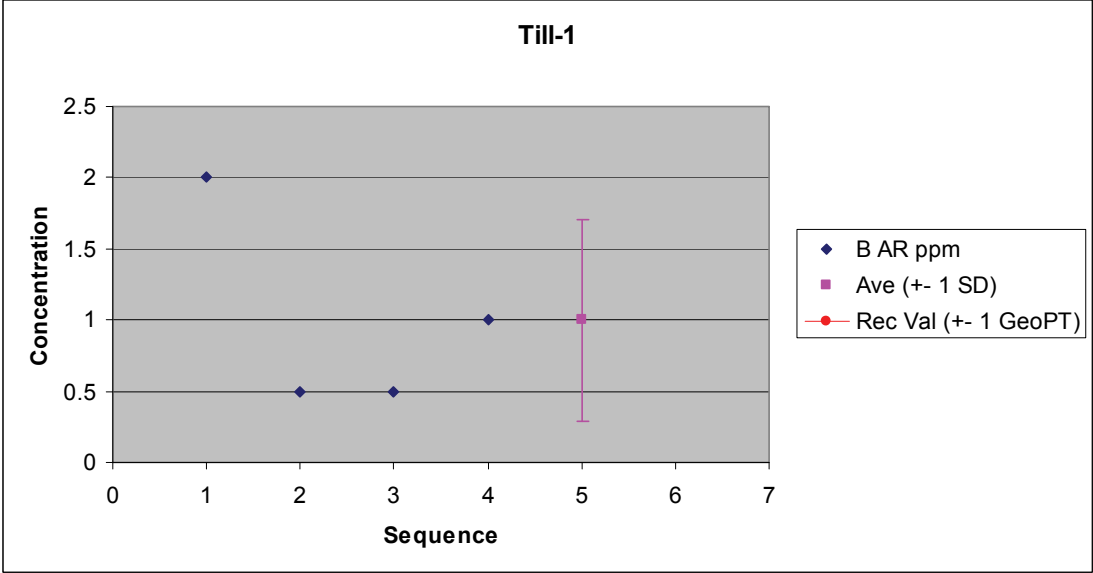
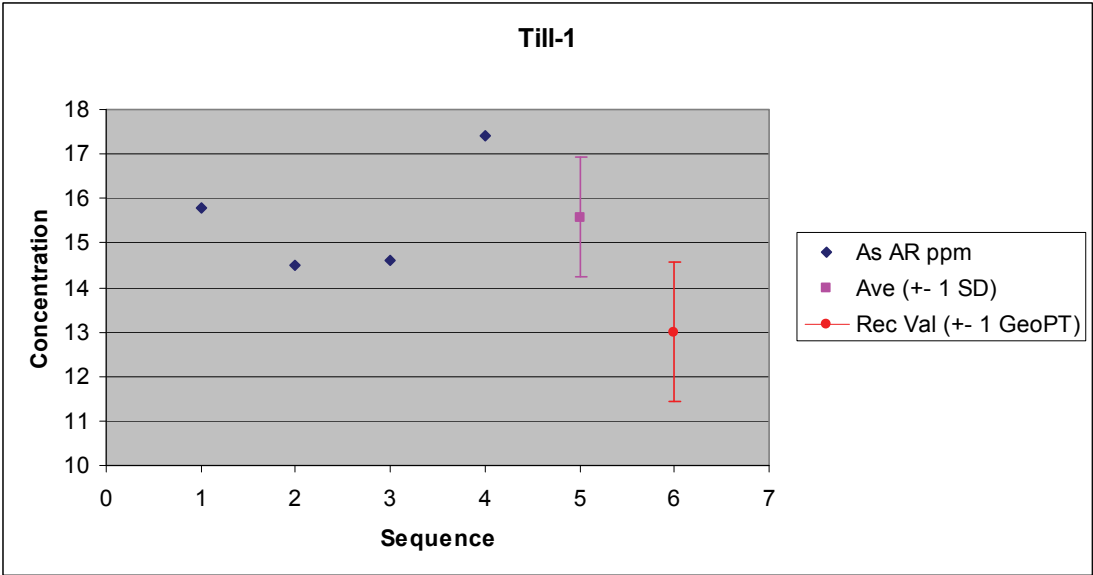
Appendix 2: X-plots for ICP-MS analysis of Till-1



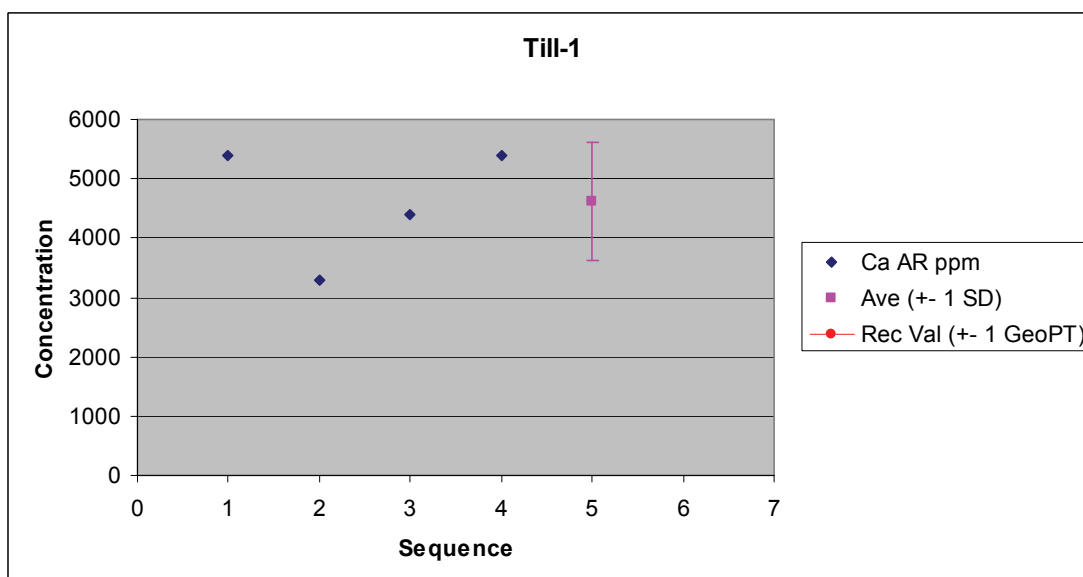
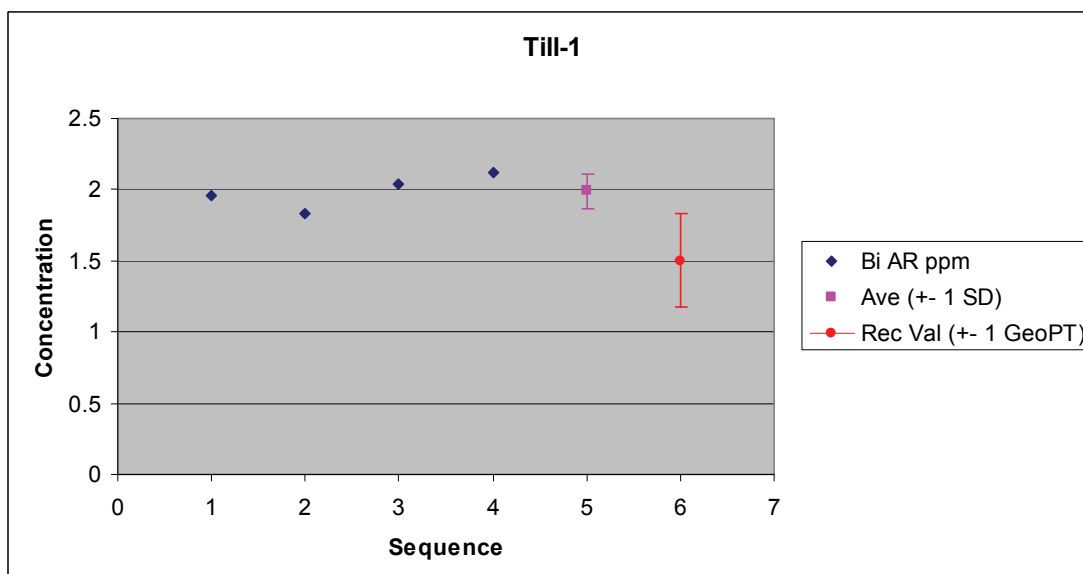
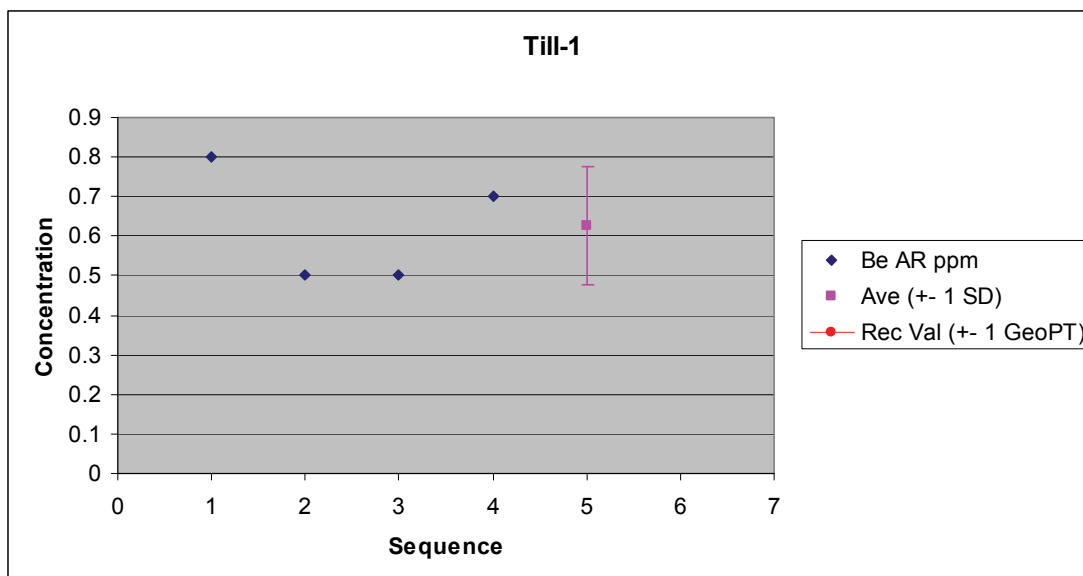
Appendix 3. X-plots for Aqua Regia analysis of Till-1



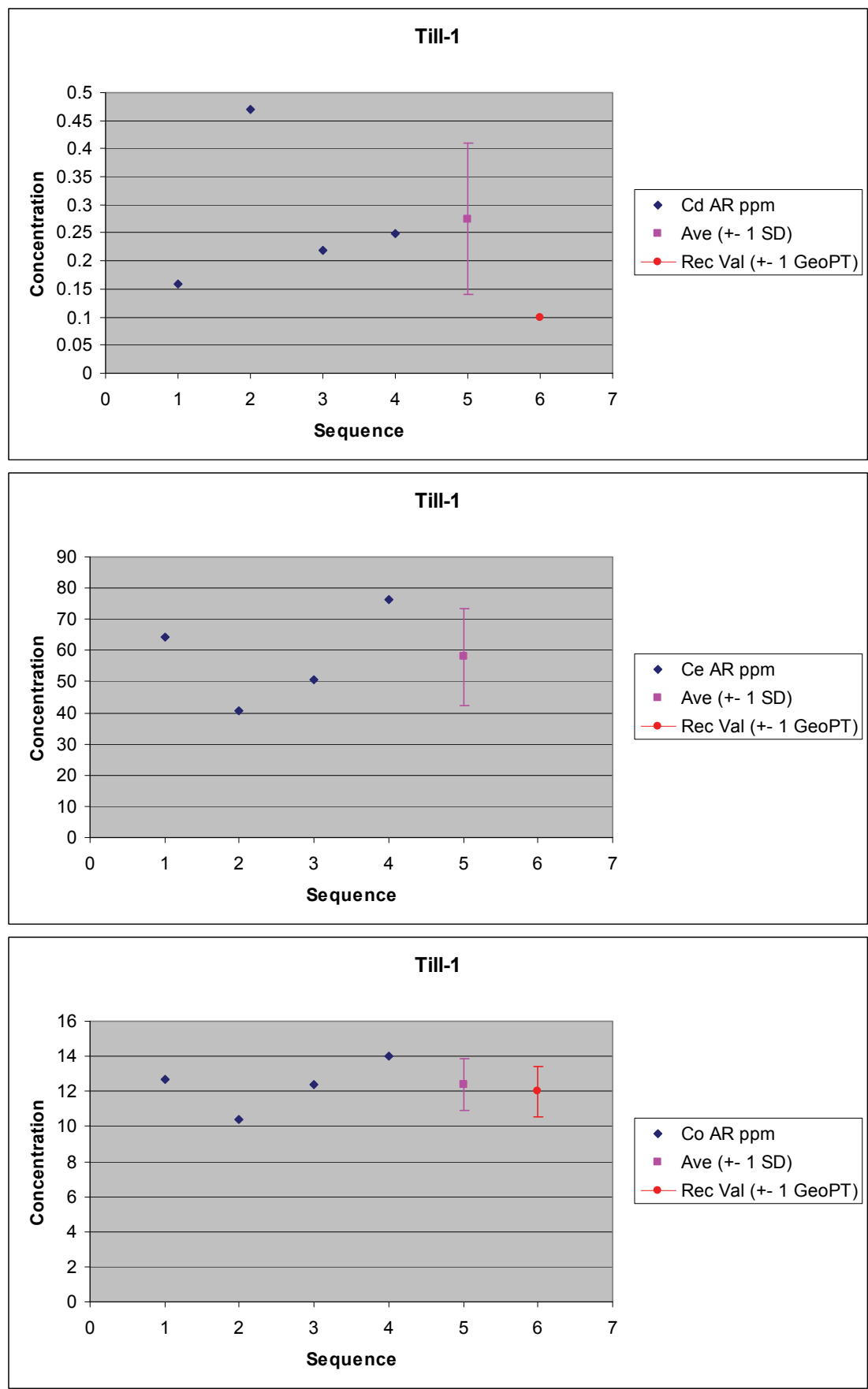
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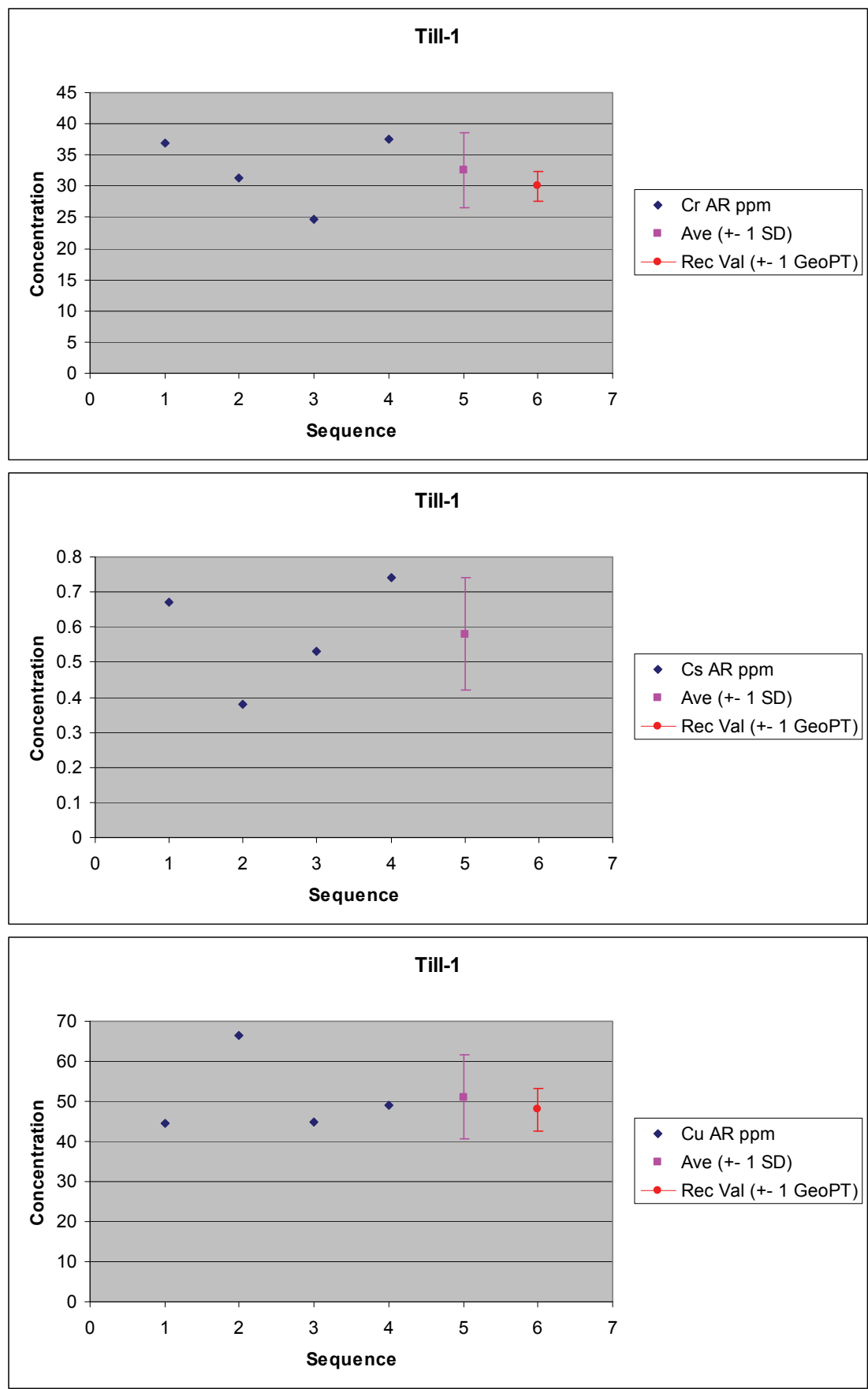
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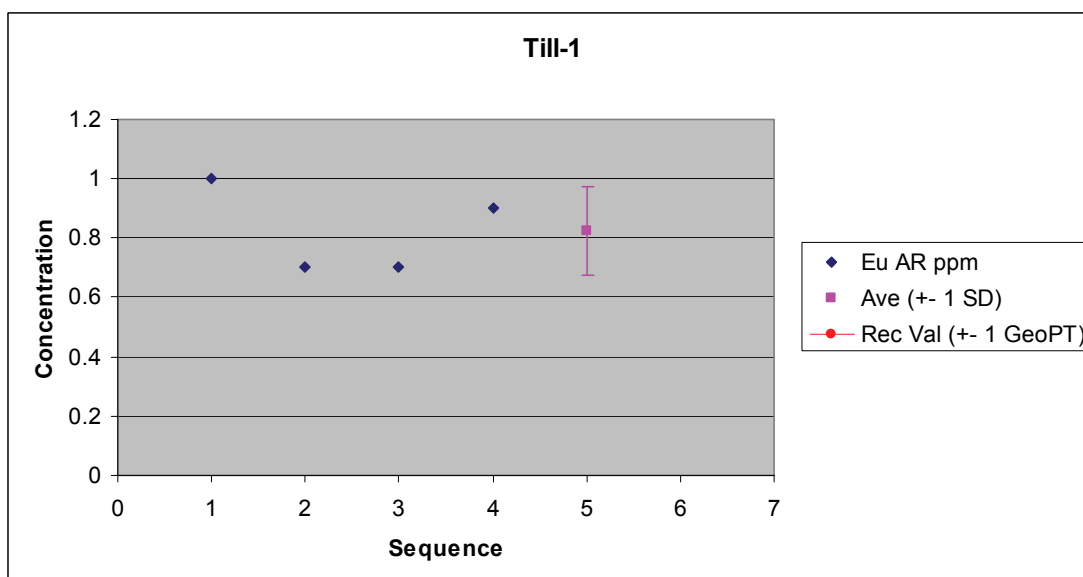
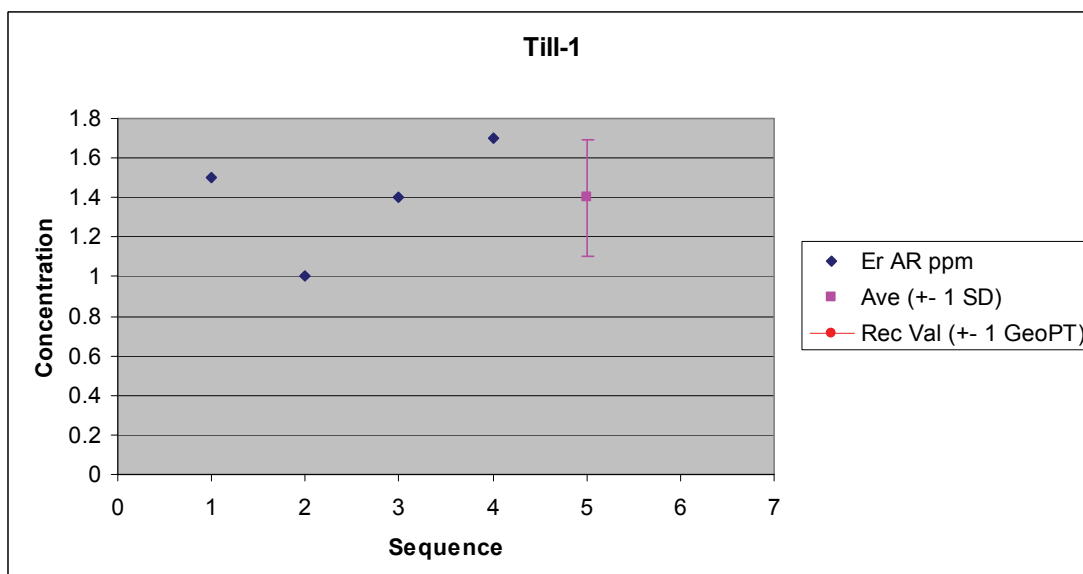
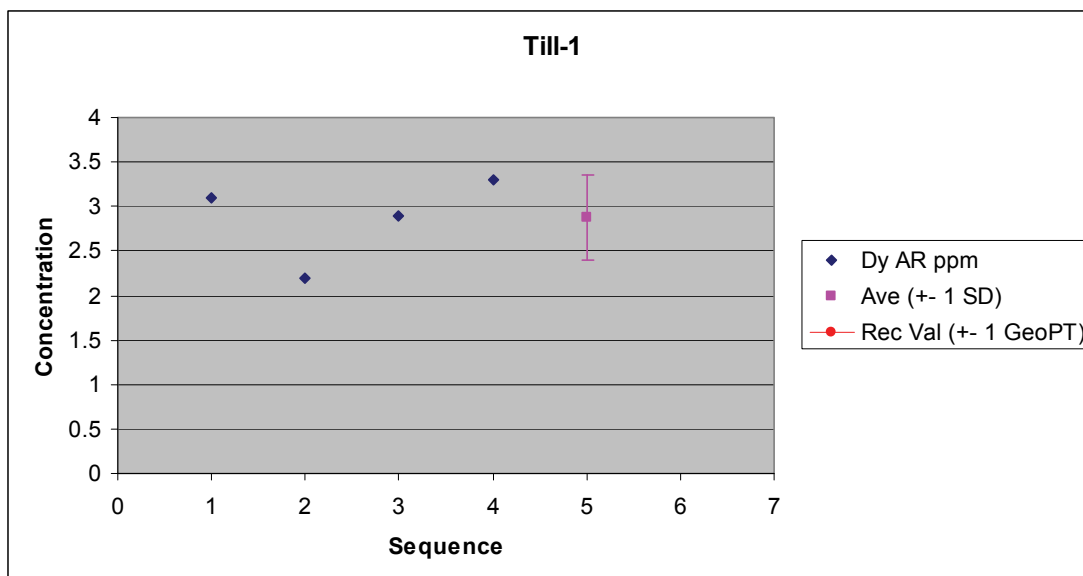
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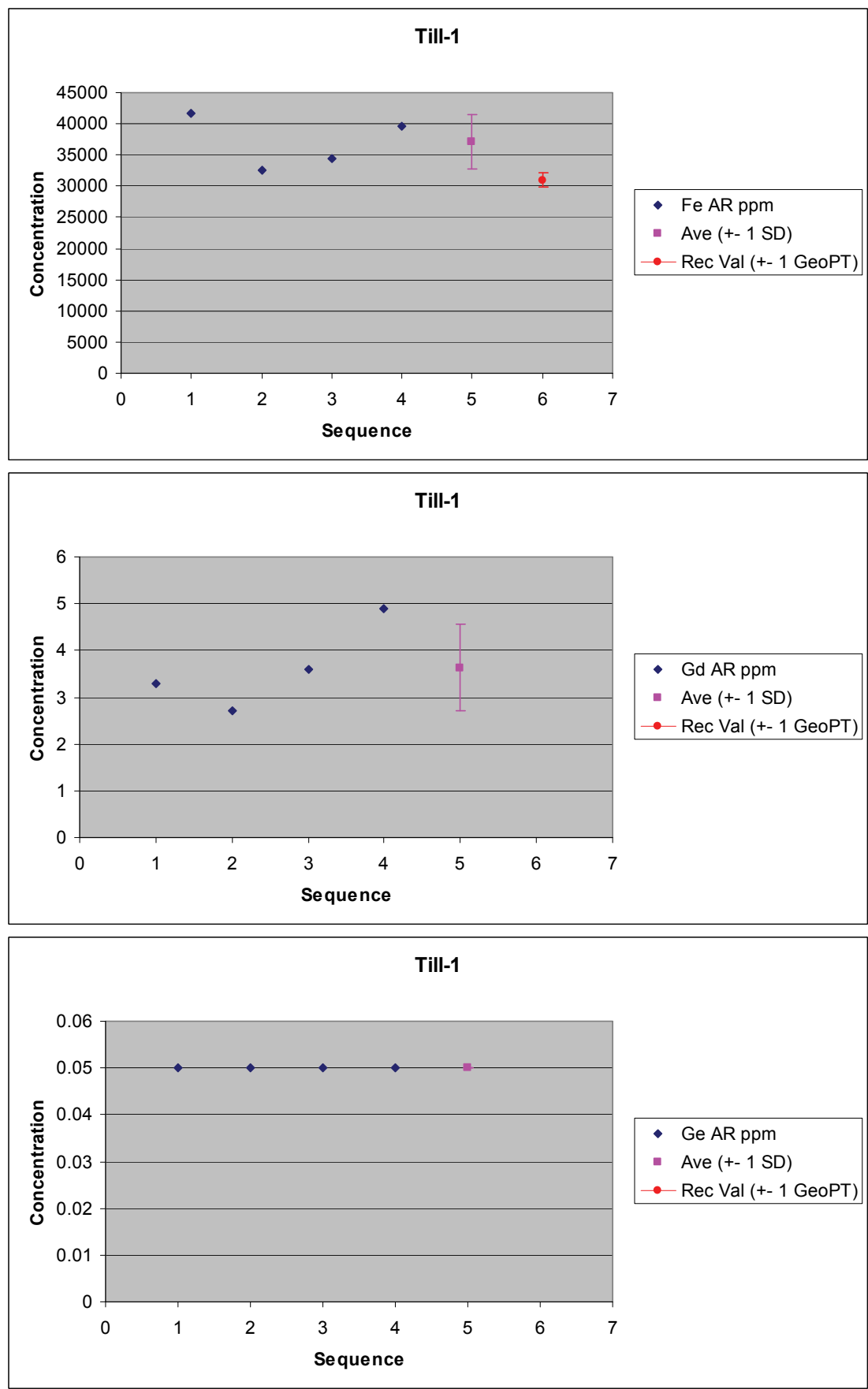
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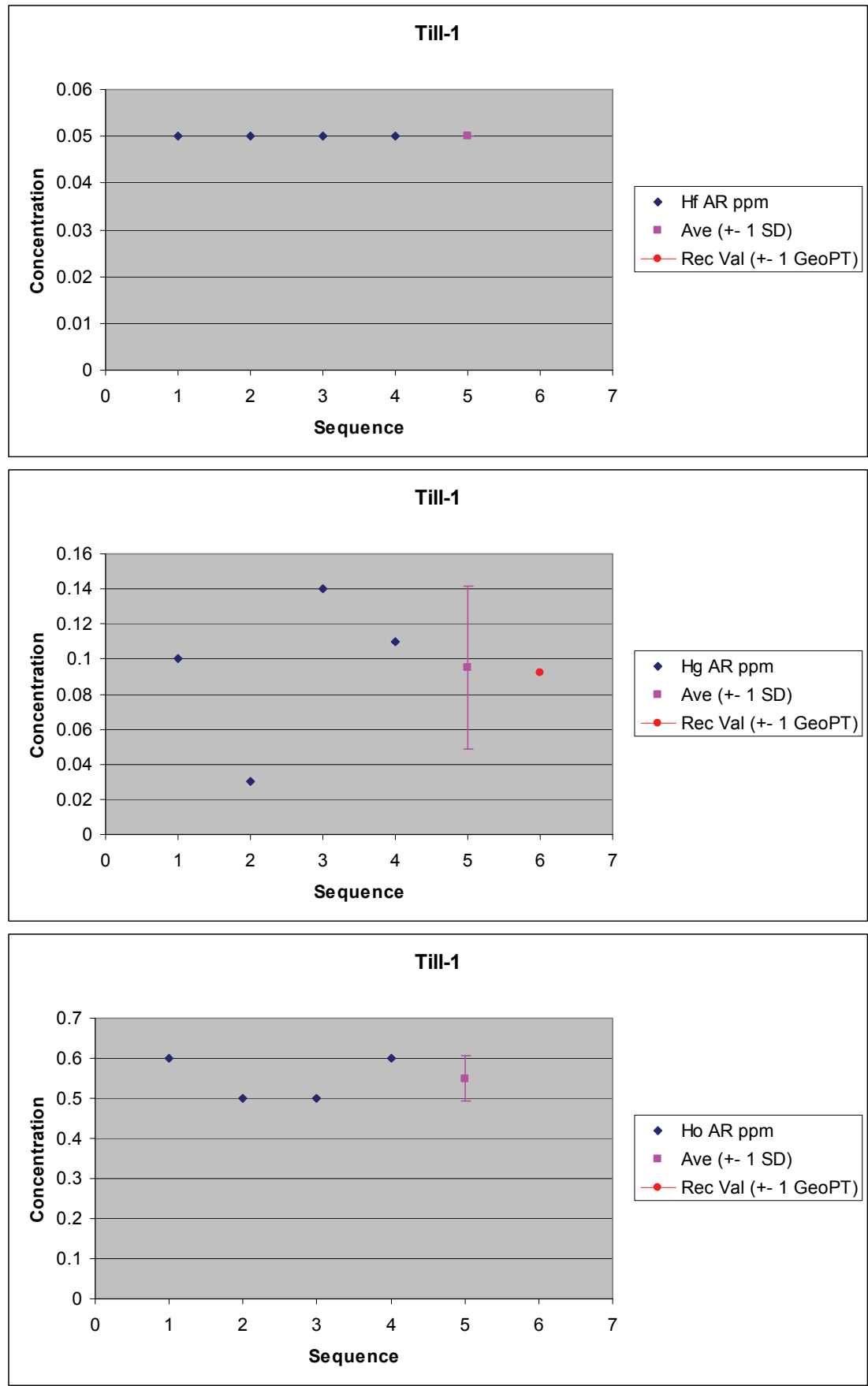
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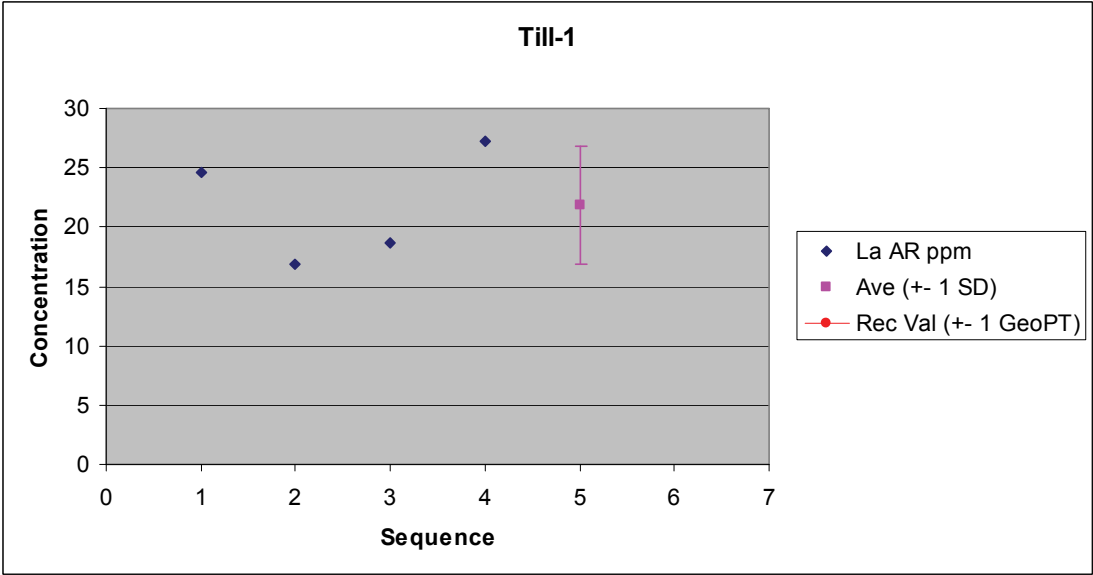
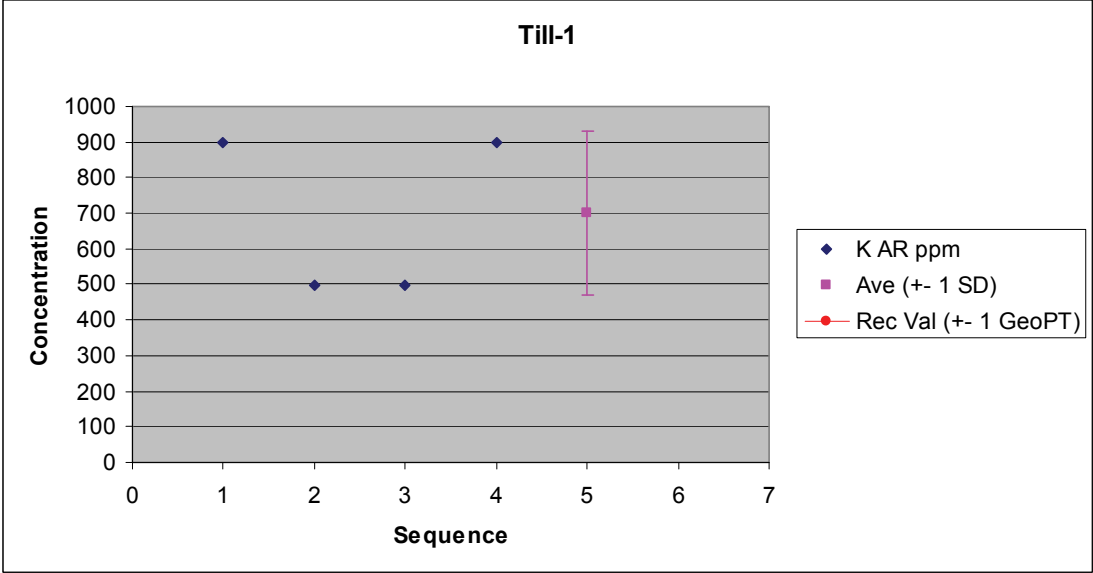
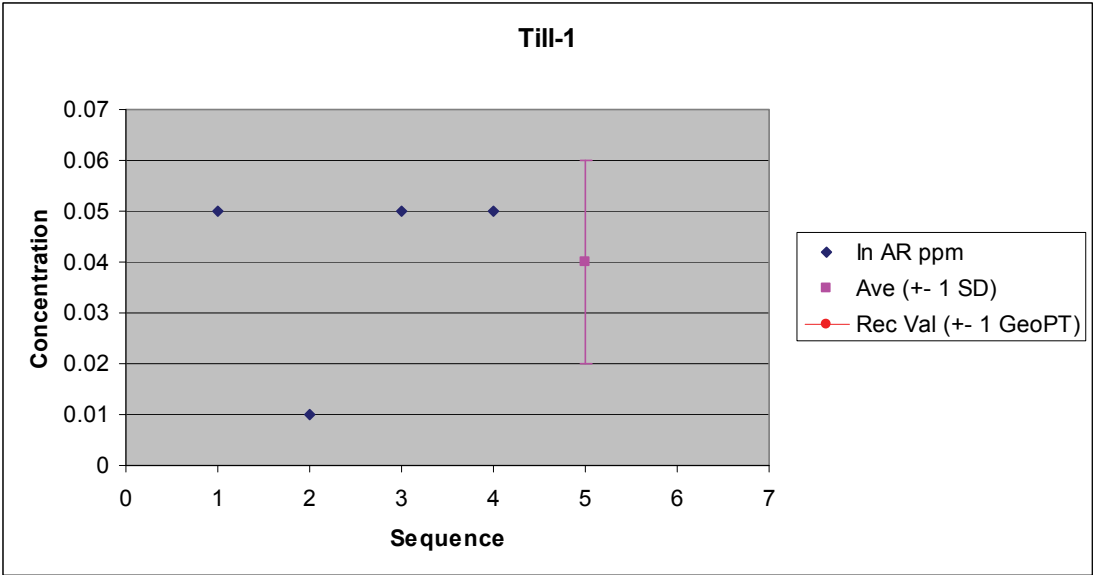
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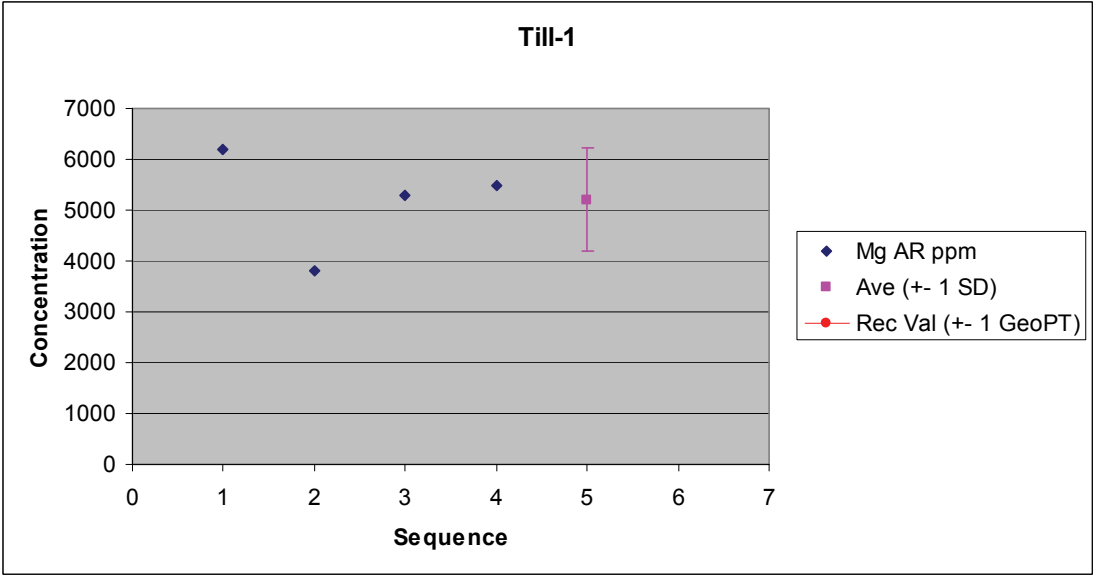
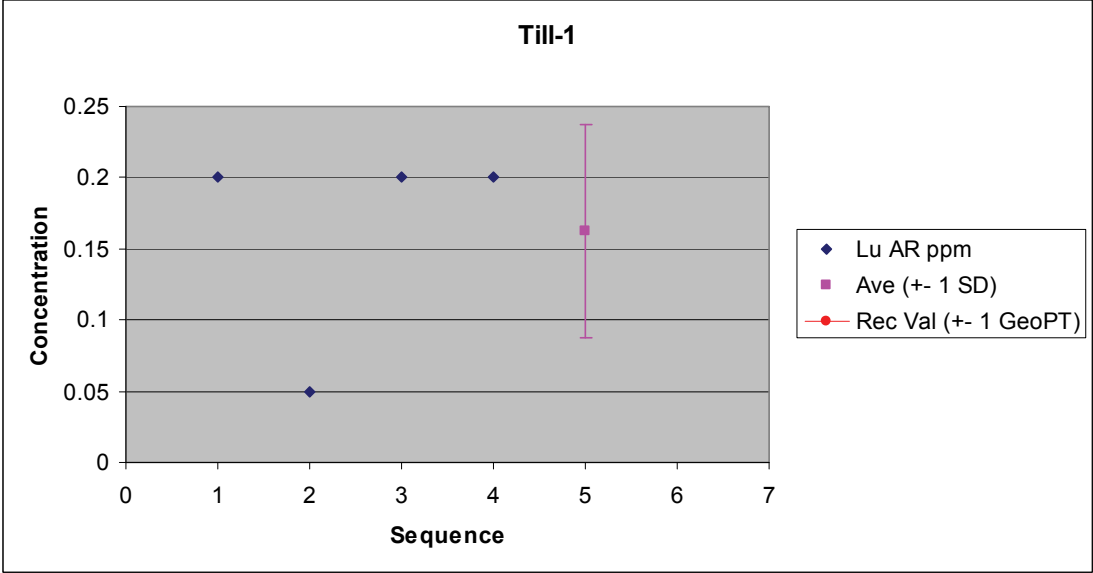
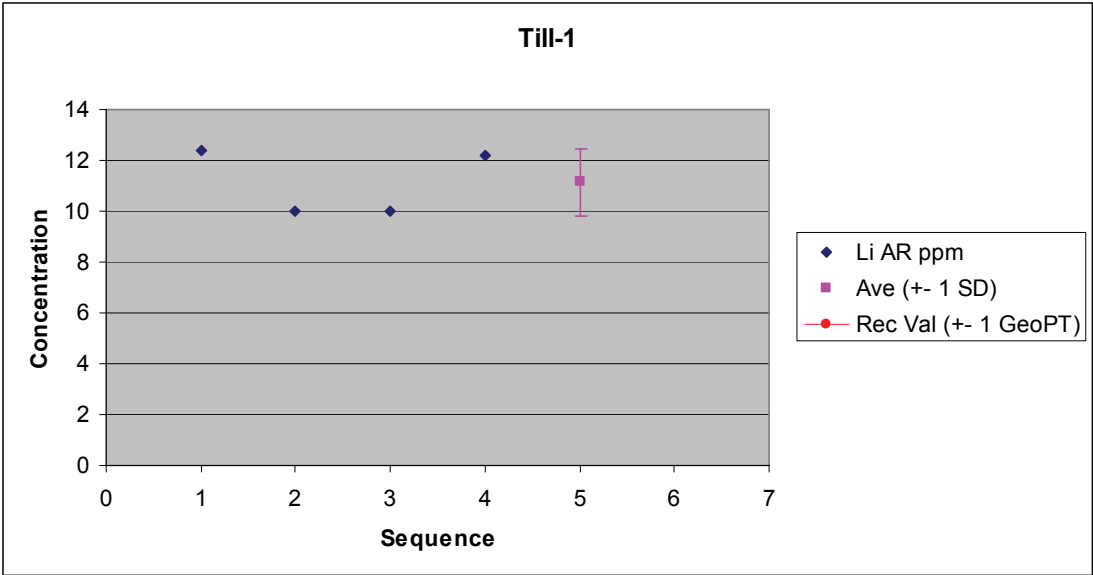
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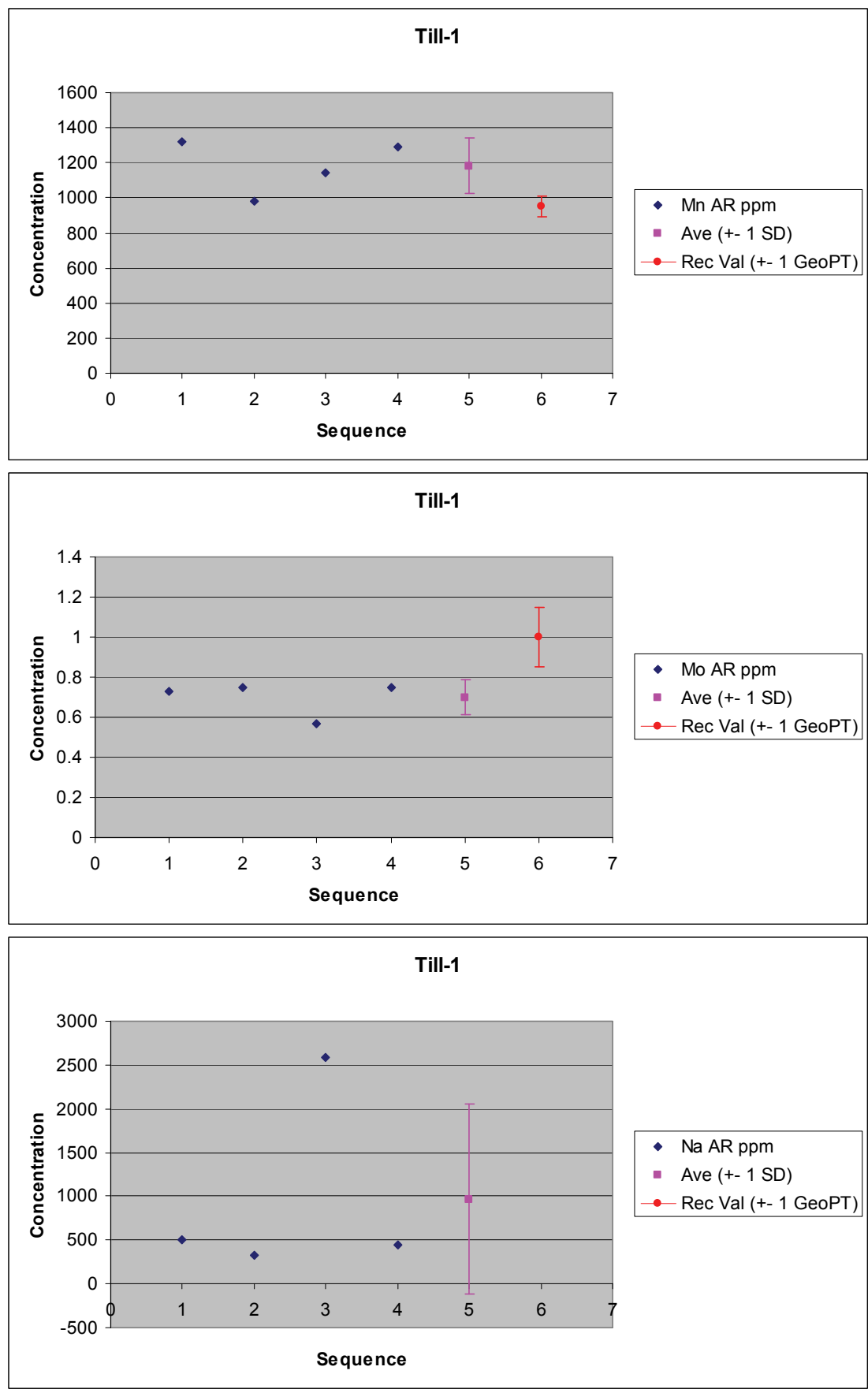
Appendix 3. X-plots for Aqua Regia analysis of Till-1



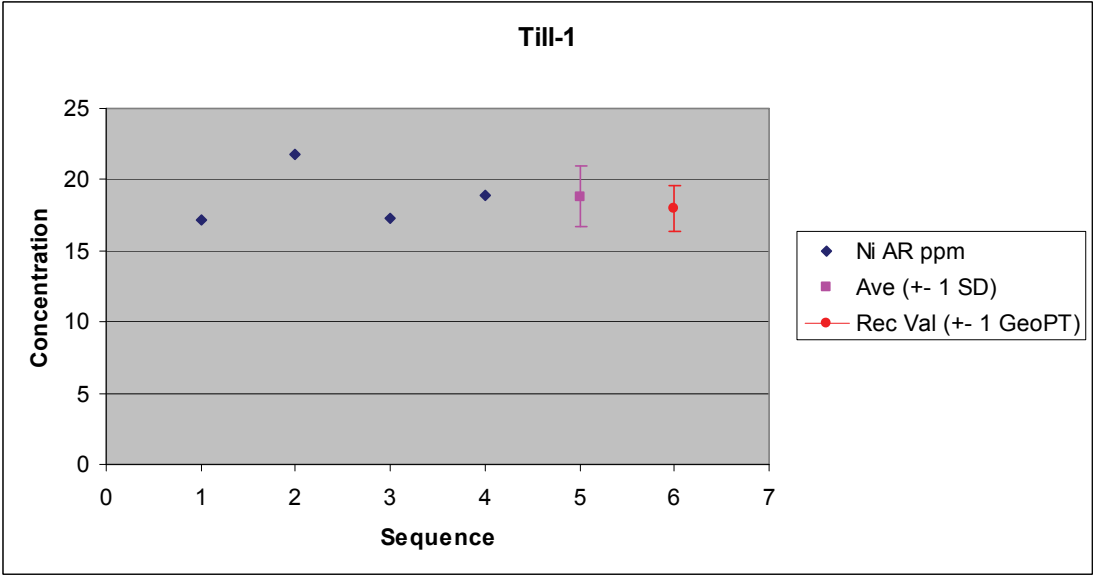
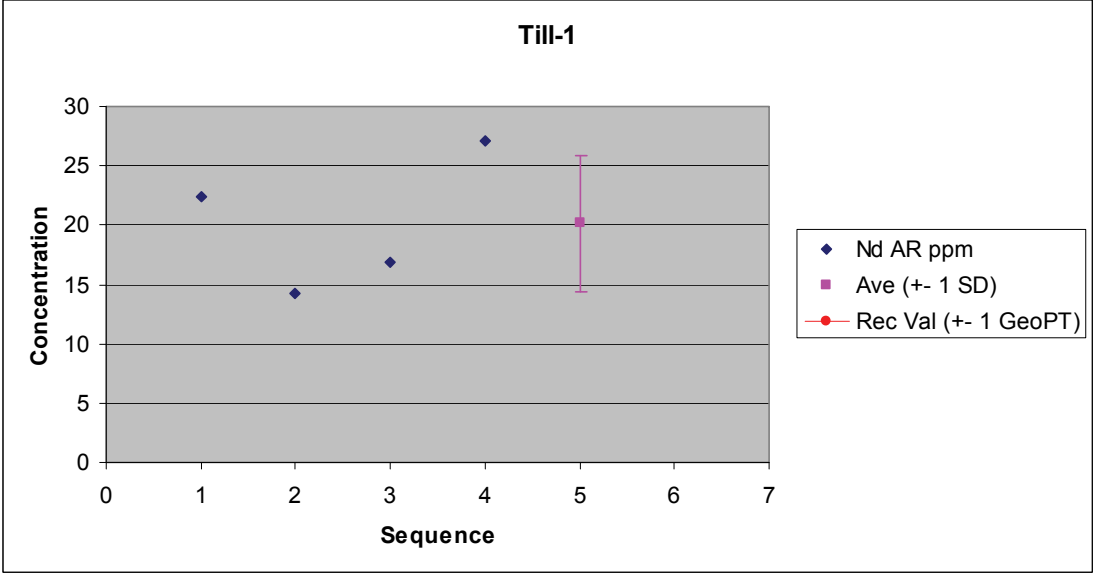
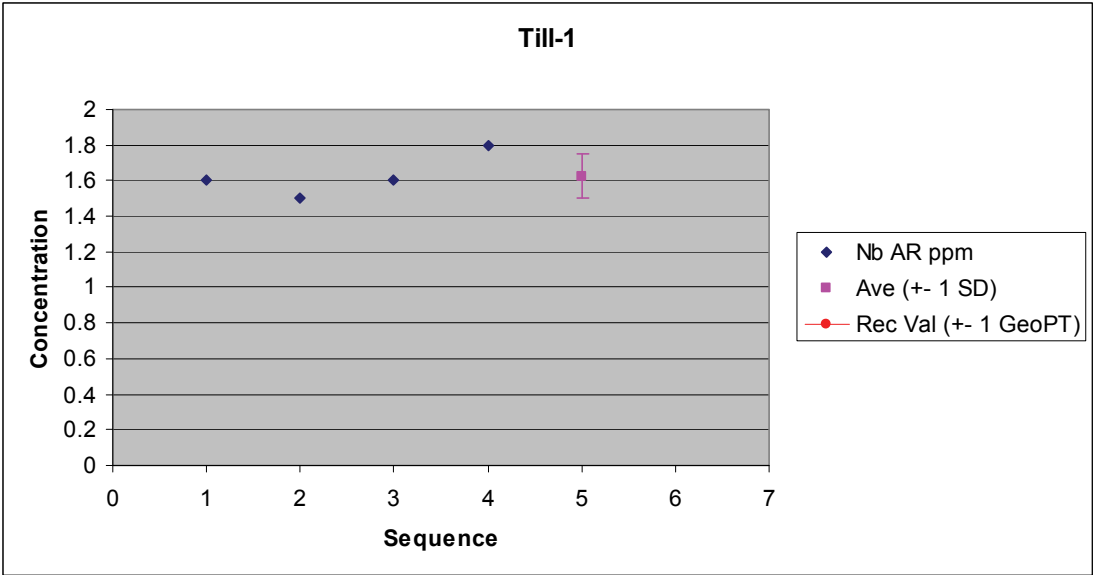
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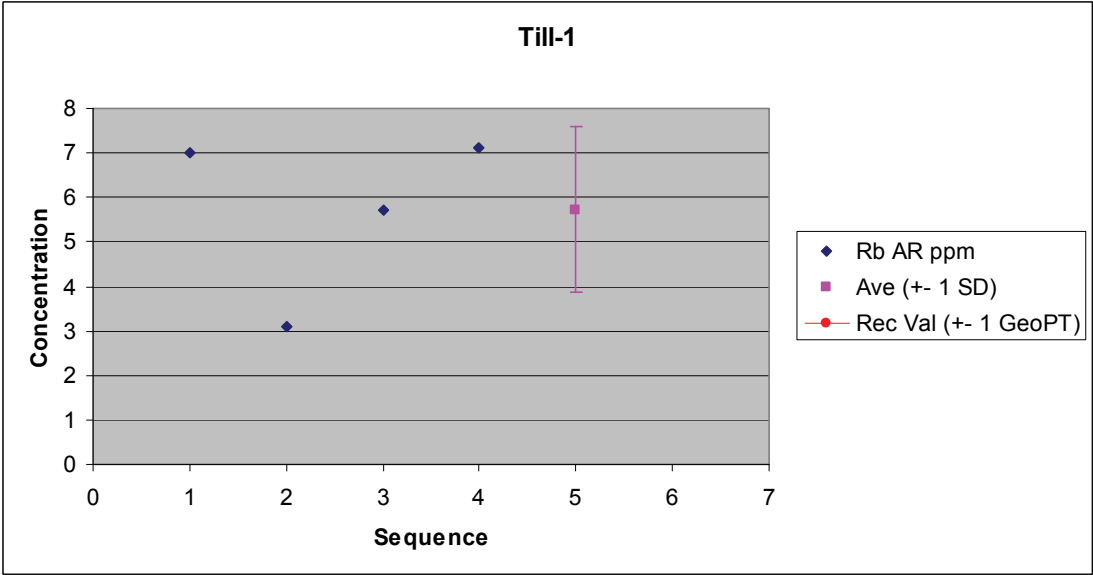
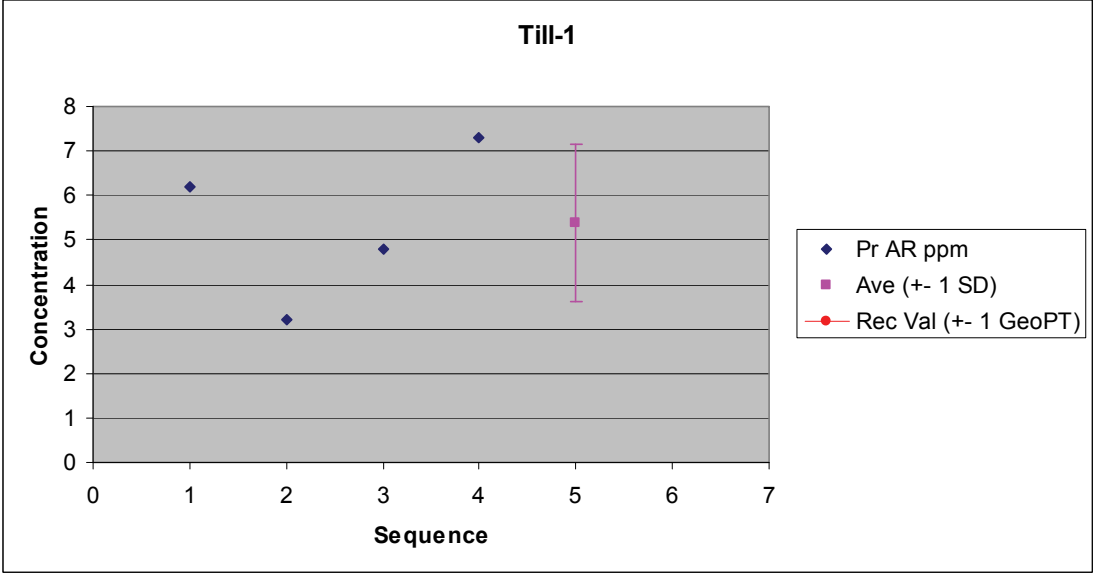
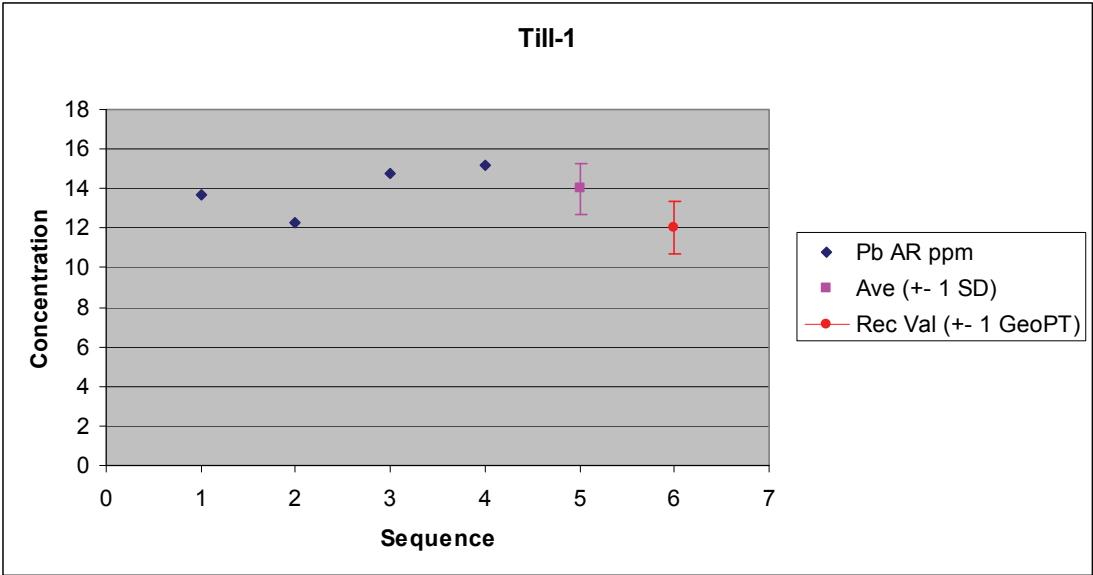
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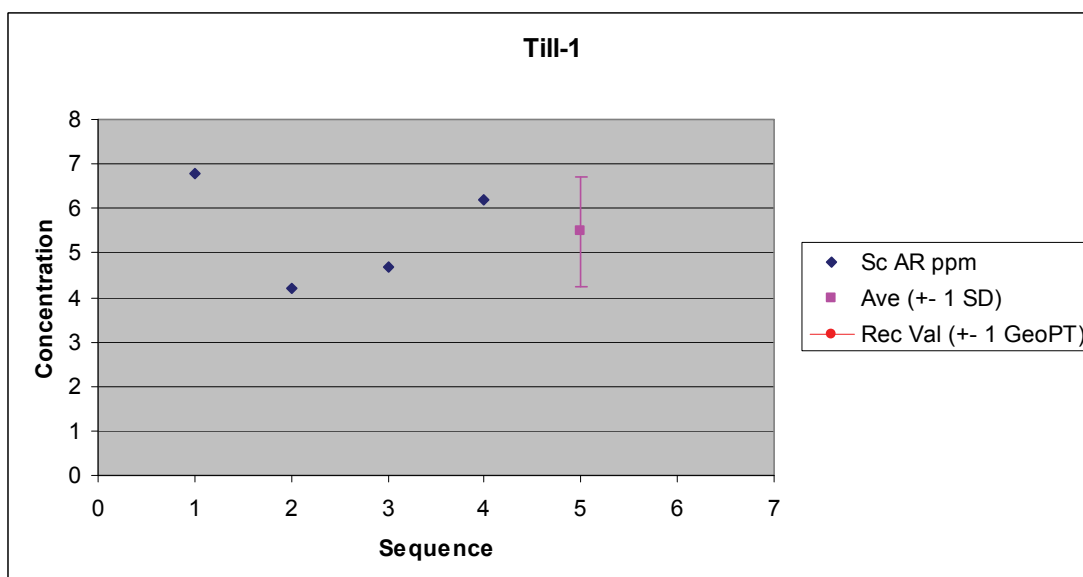
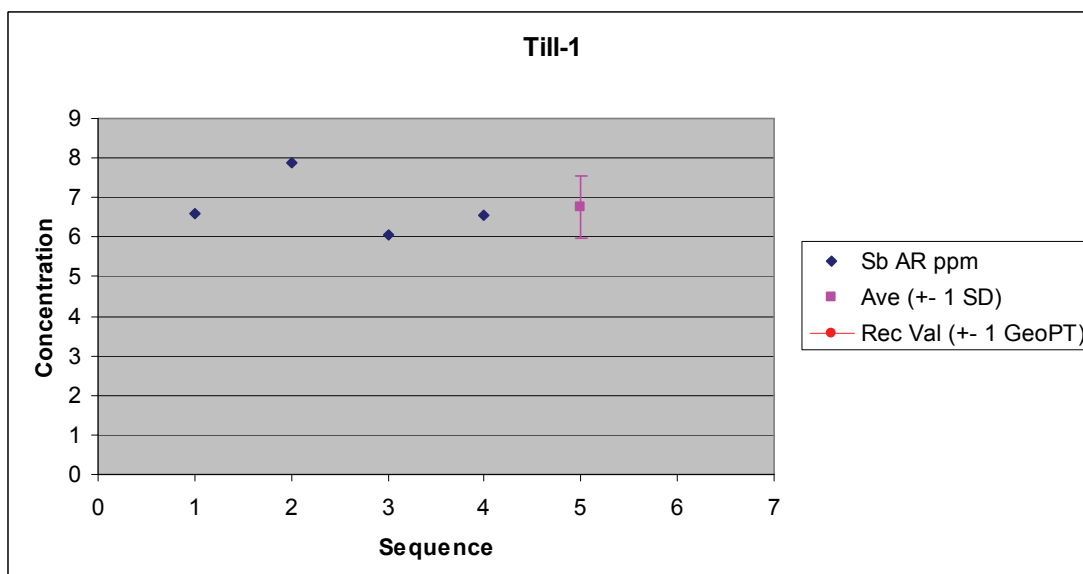
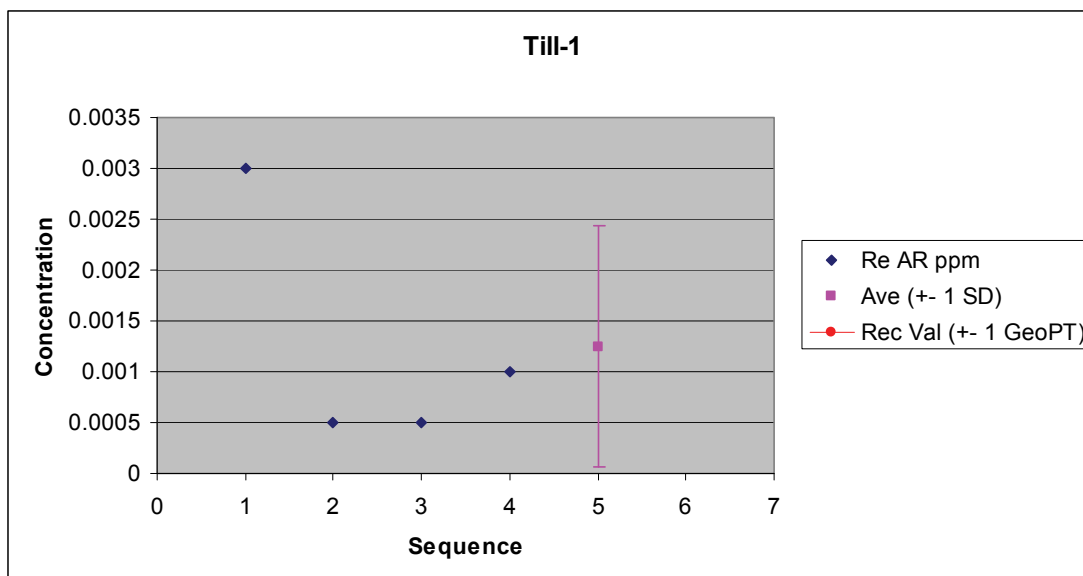
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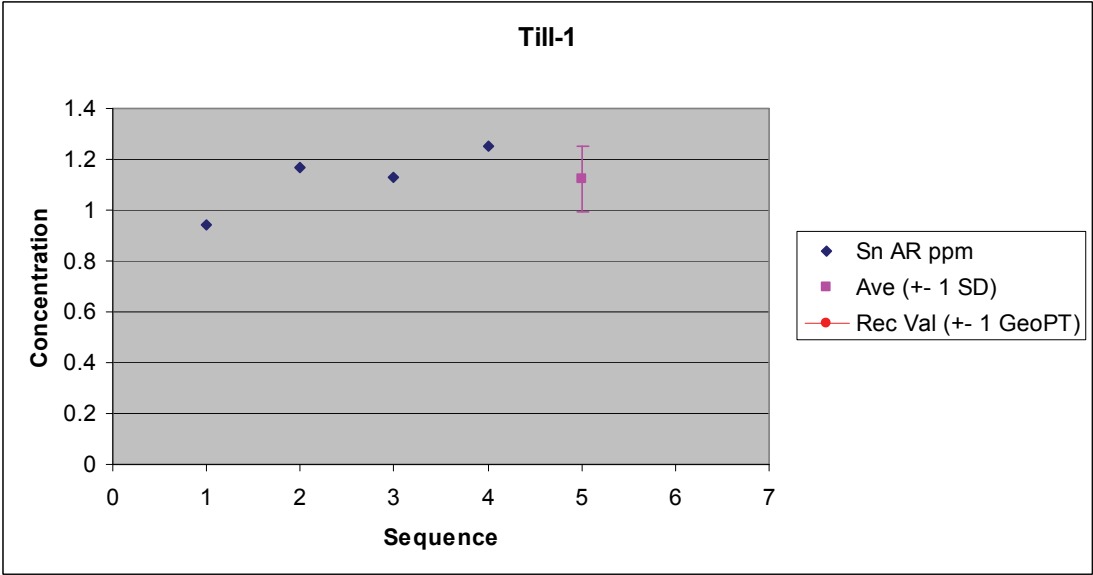
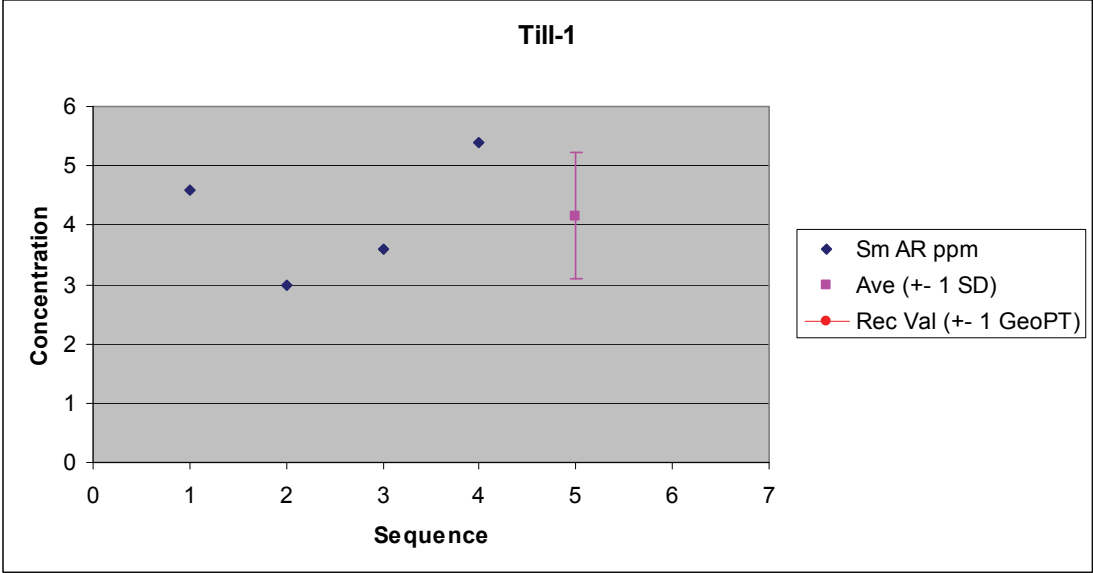
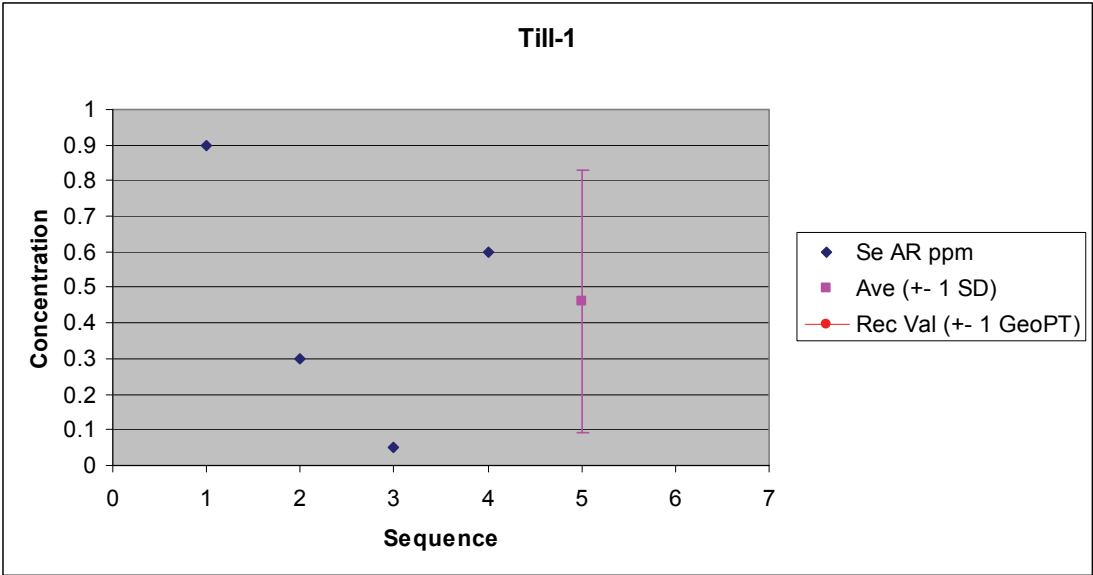
Appendix 3. X-plots for Aqua Regia analysis of Till-1



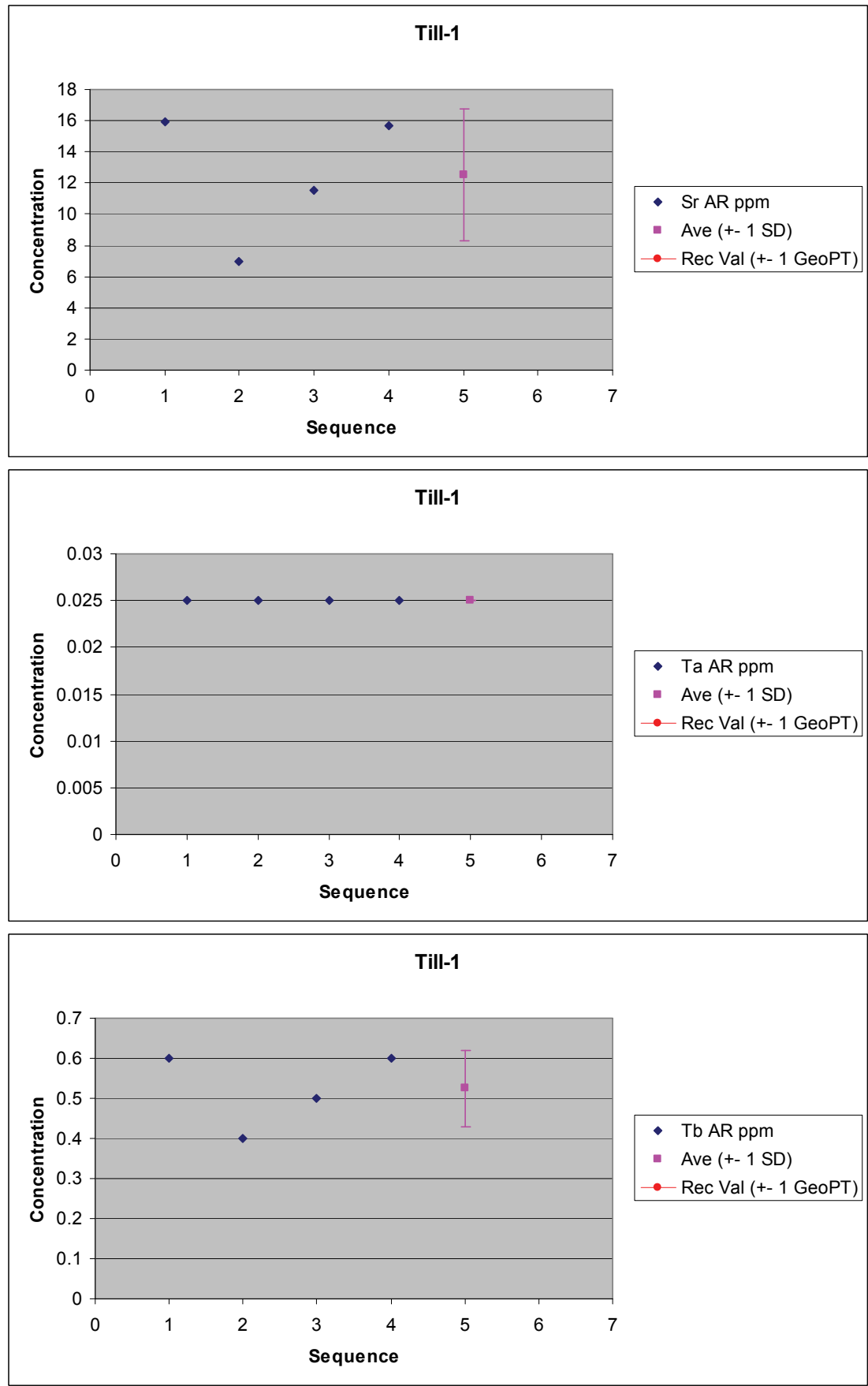
Appendix 3. X-plots for Aqua Regia analysis of Till-1



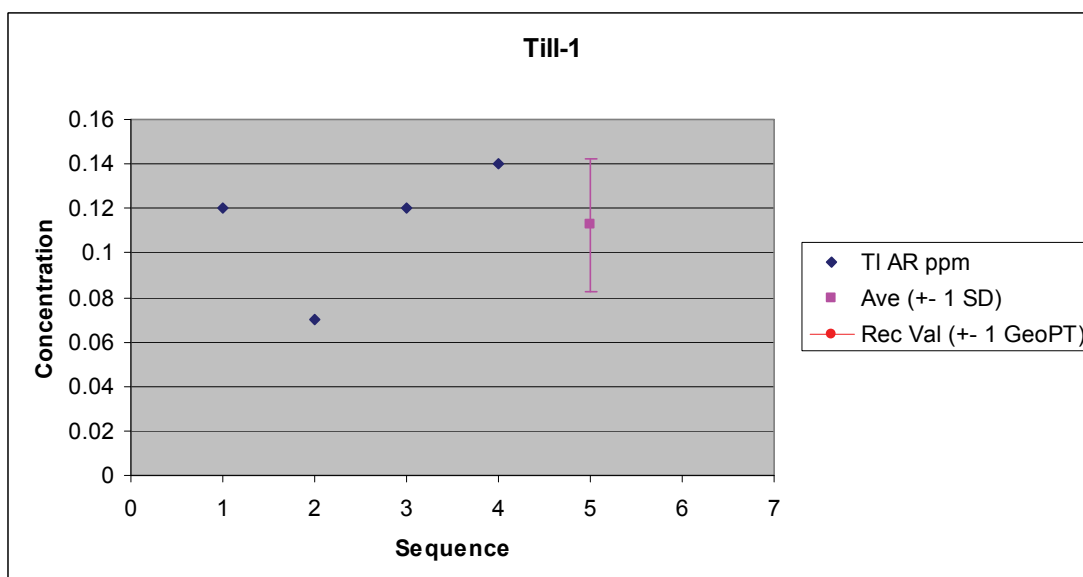
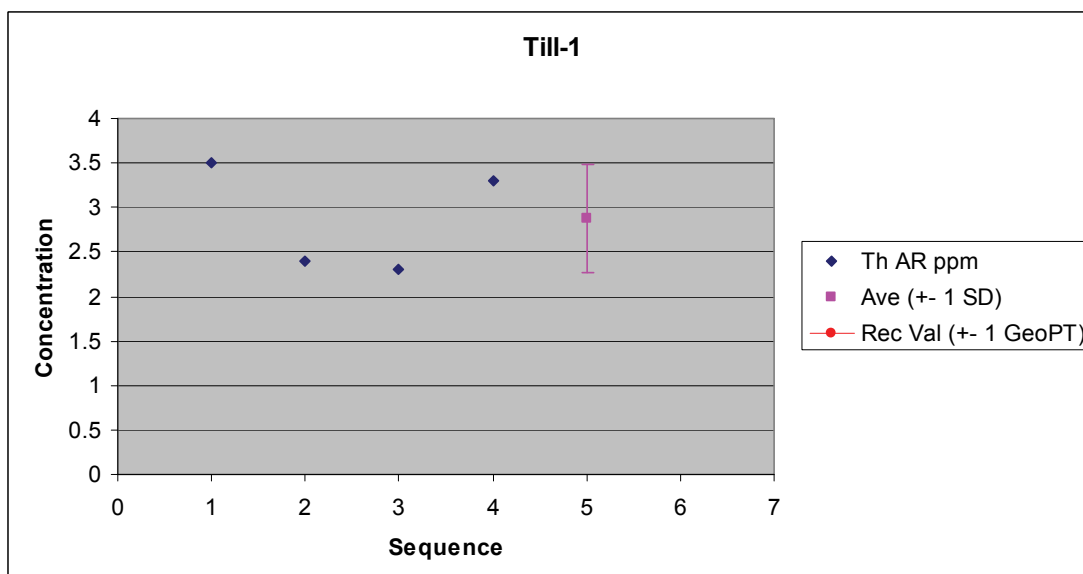
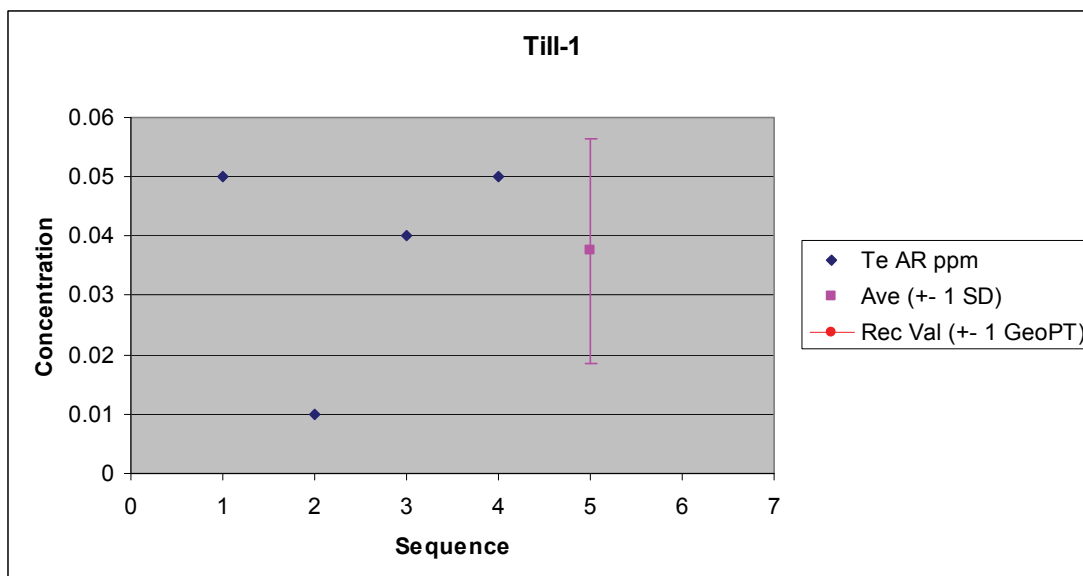
Appendix 3. X-plots for Aqua Regia analysis of Till-1



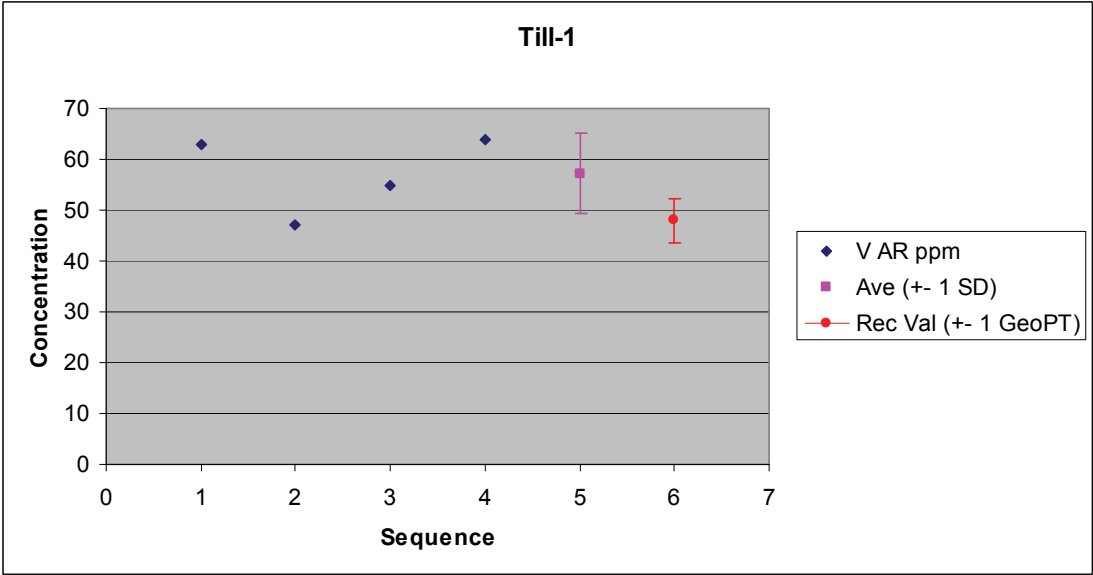
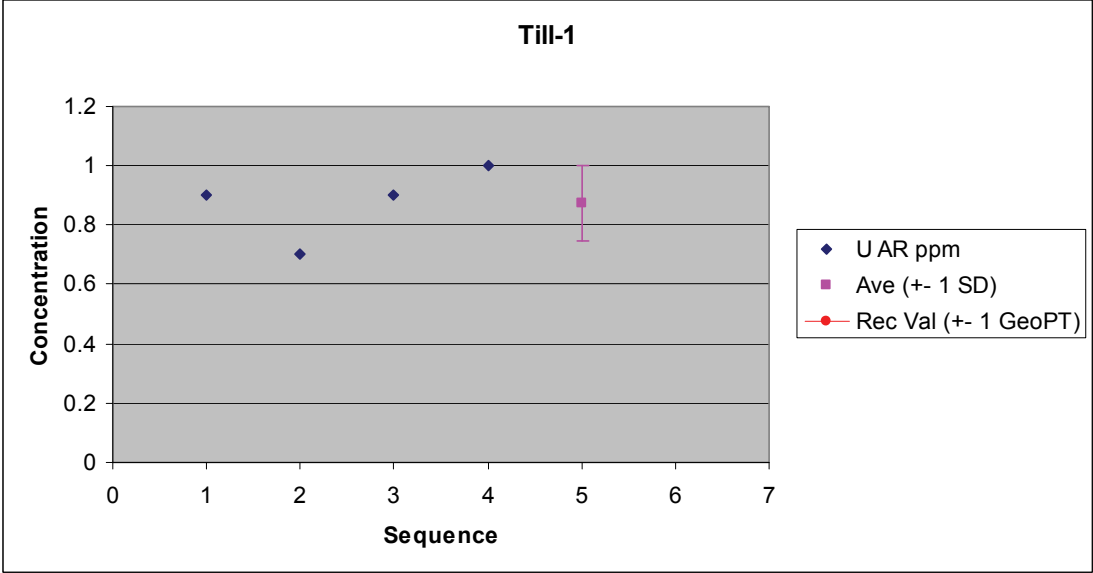
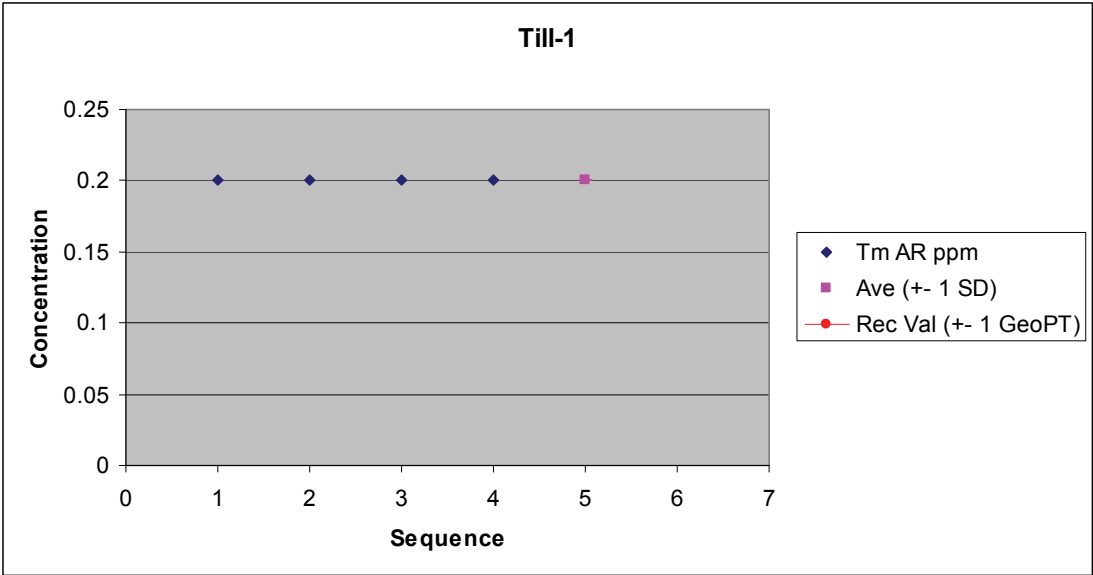
Appendix 3. X-plots for Aqua Regia analysis of Till-1



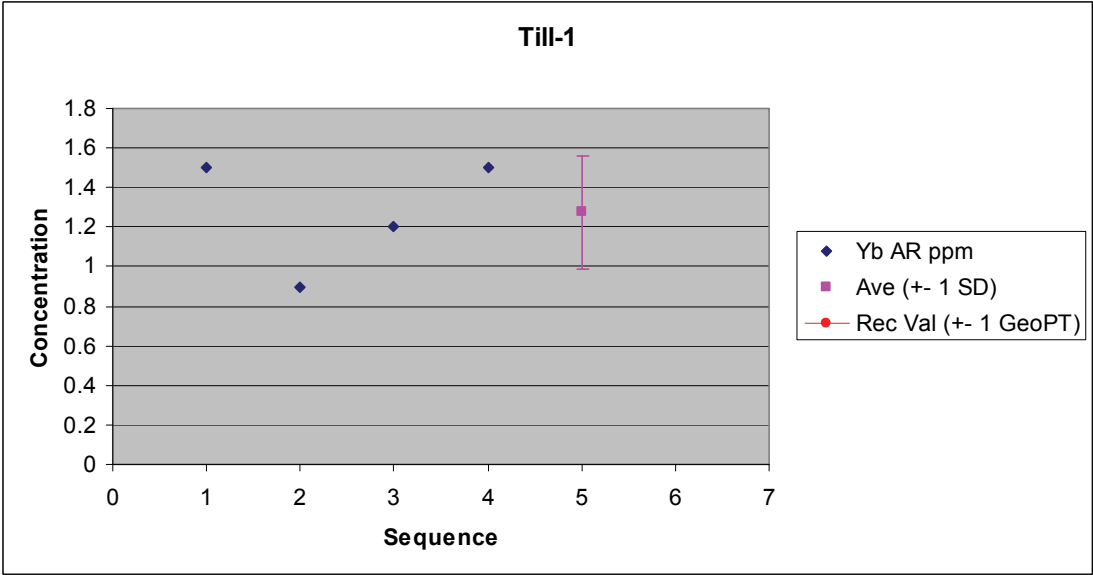
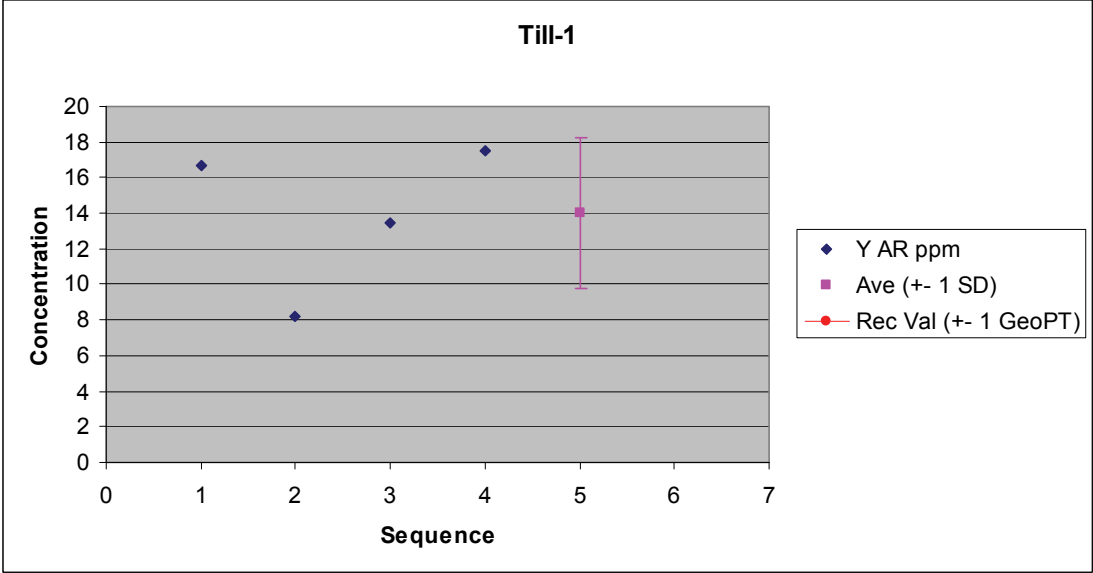
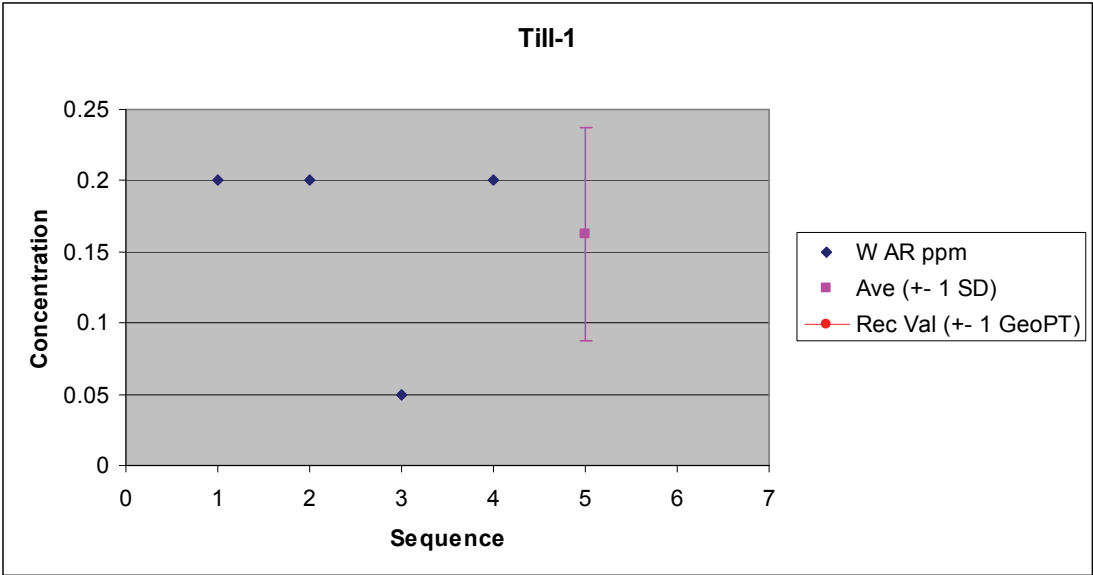
Appendix 3. X-plots for Aqua Regia analysis of Till-1



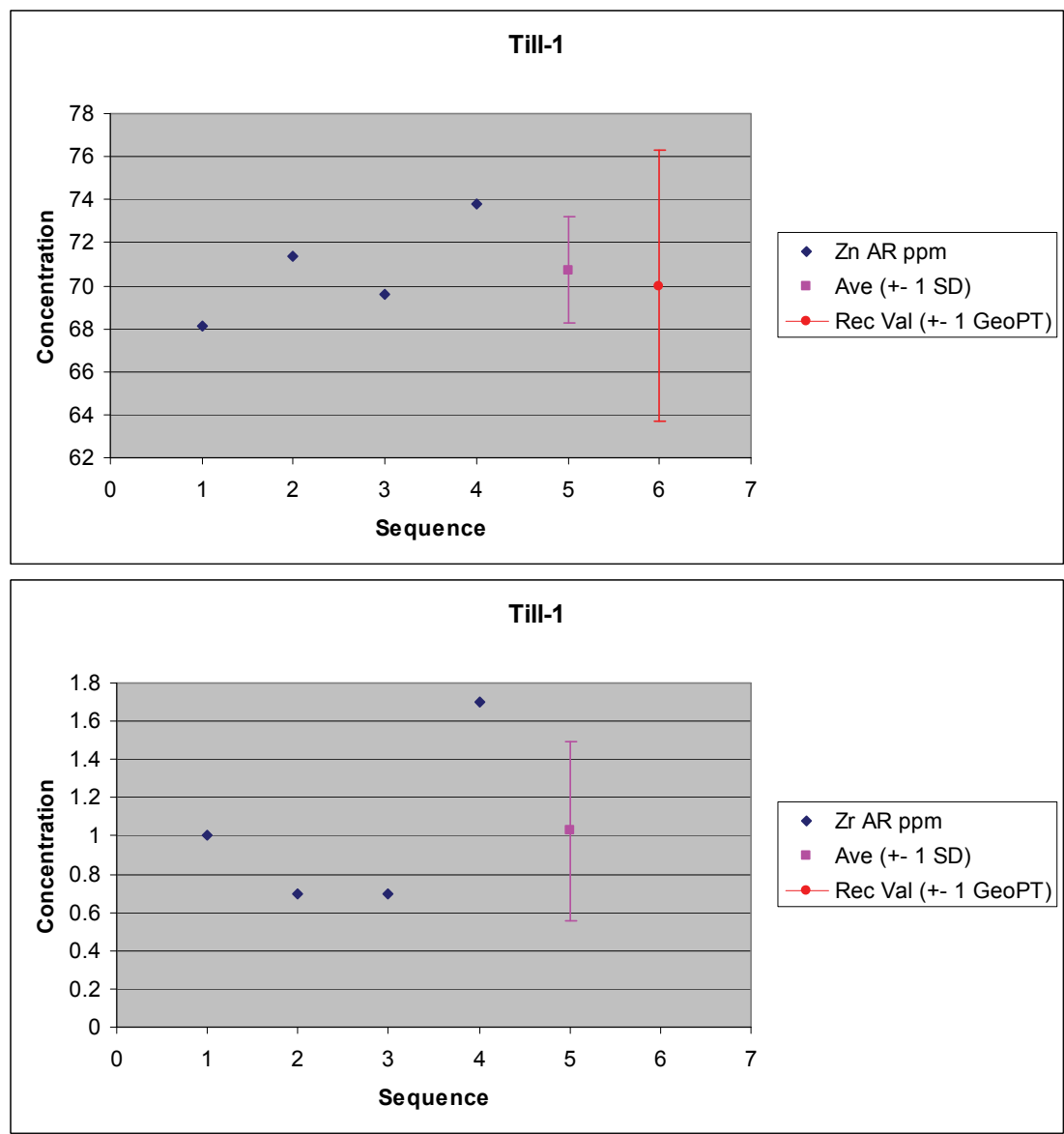
Appendix 3. X-plots for Aqua Regia analysis of Till-1



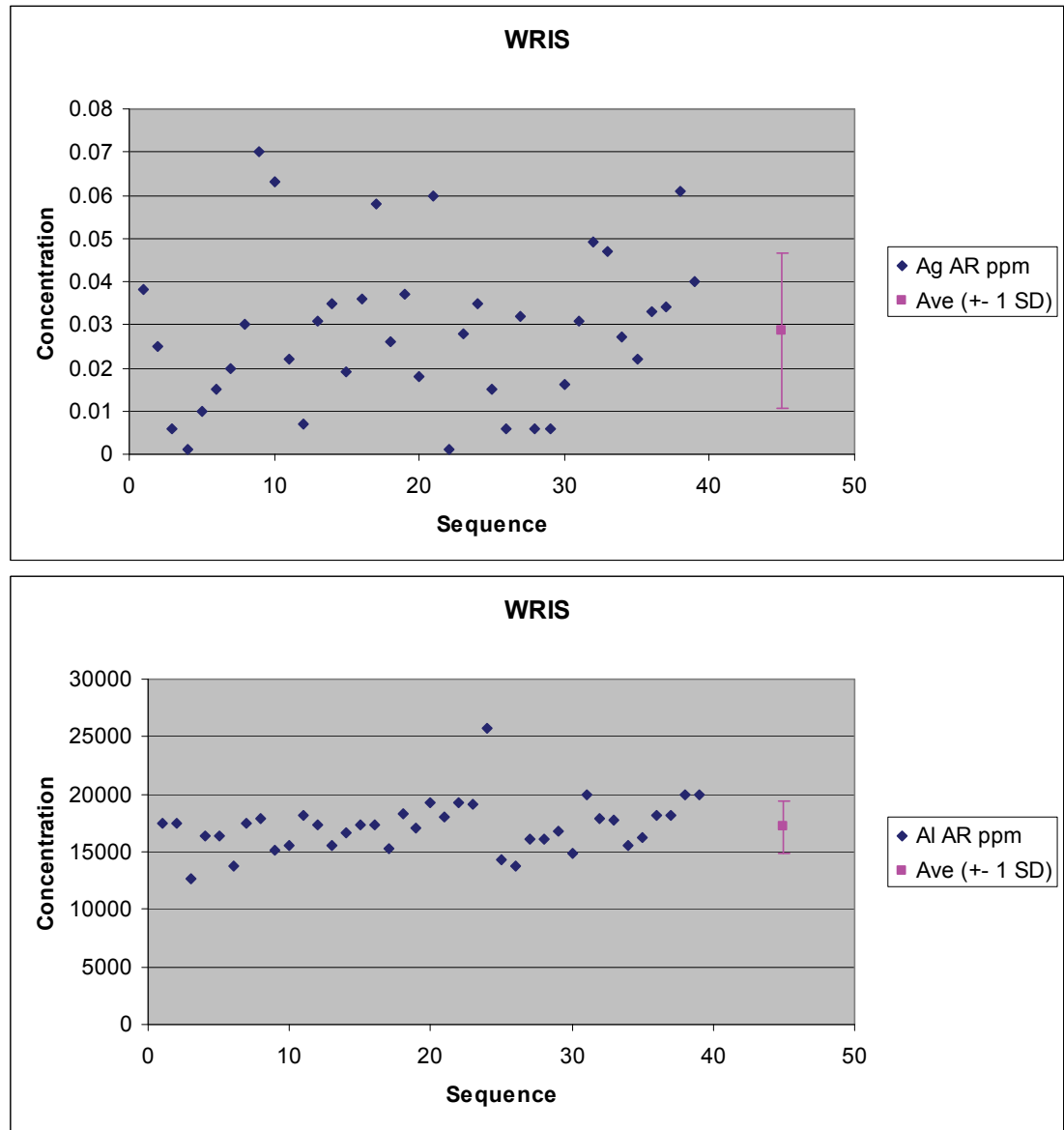
Appendix 3. X-plots for Aqua Regia analysis of Till-1



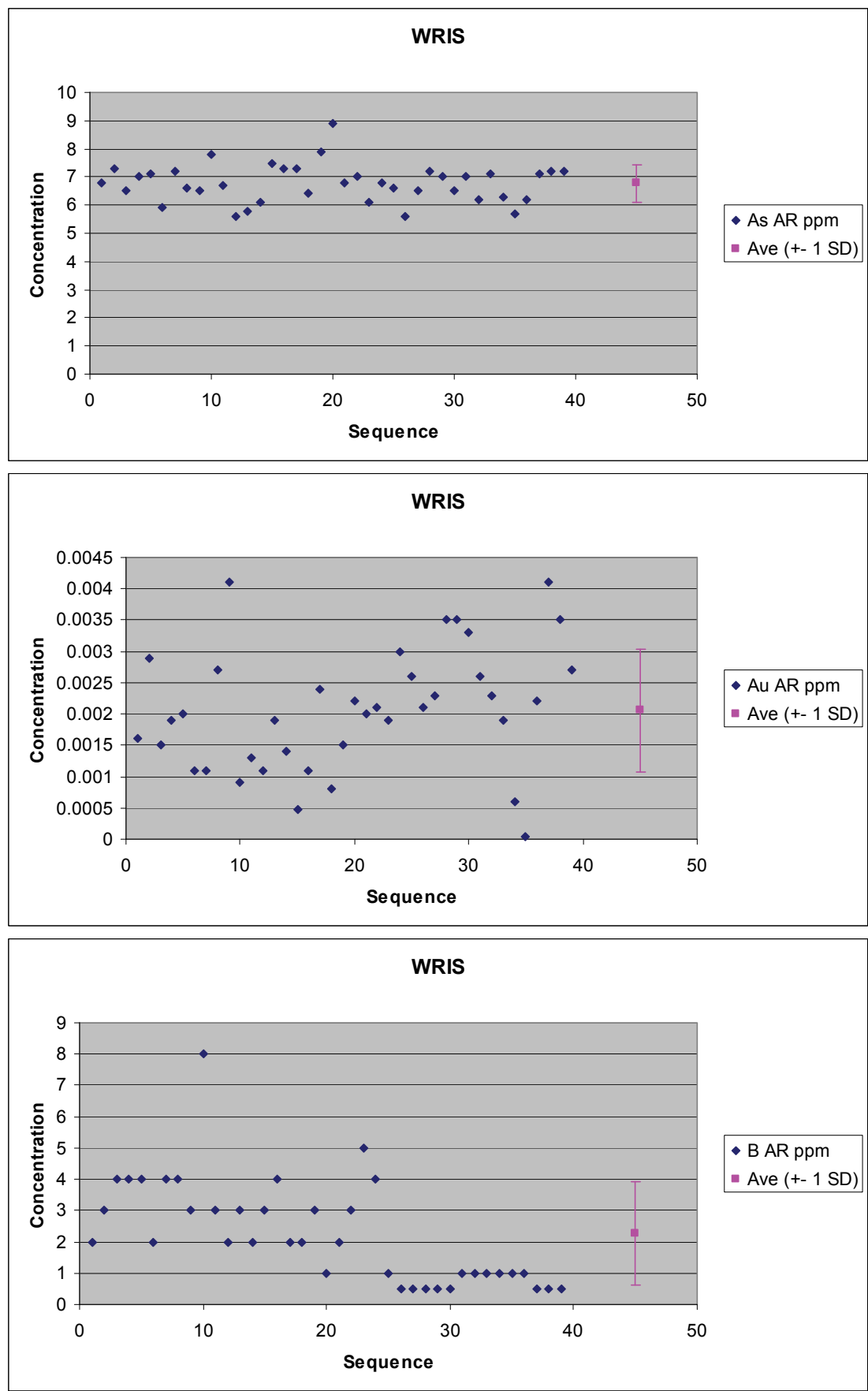
Appendix 3. X-plots for Aqua Regia analysis of Till-1



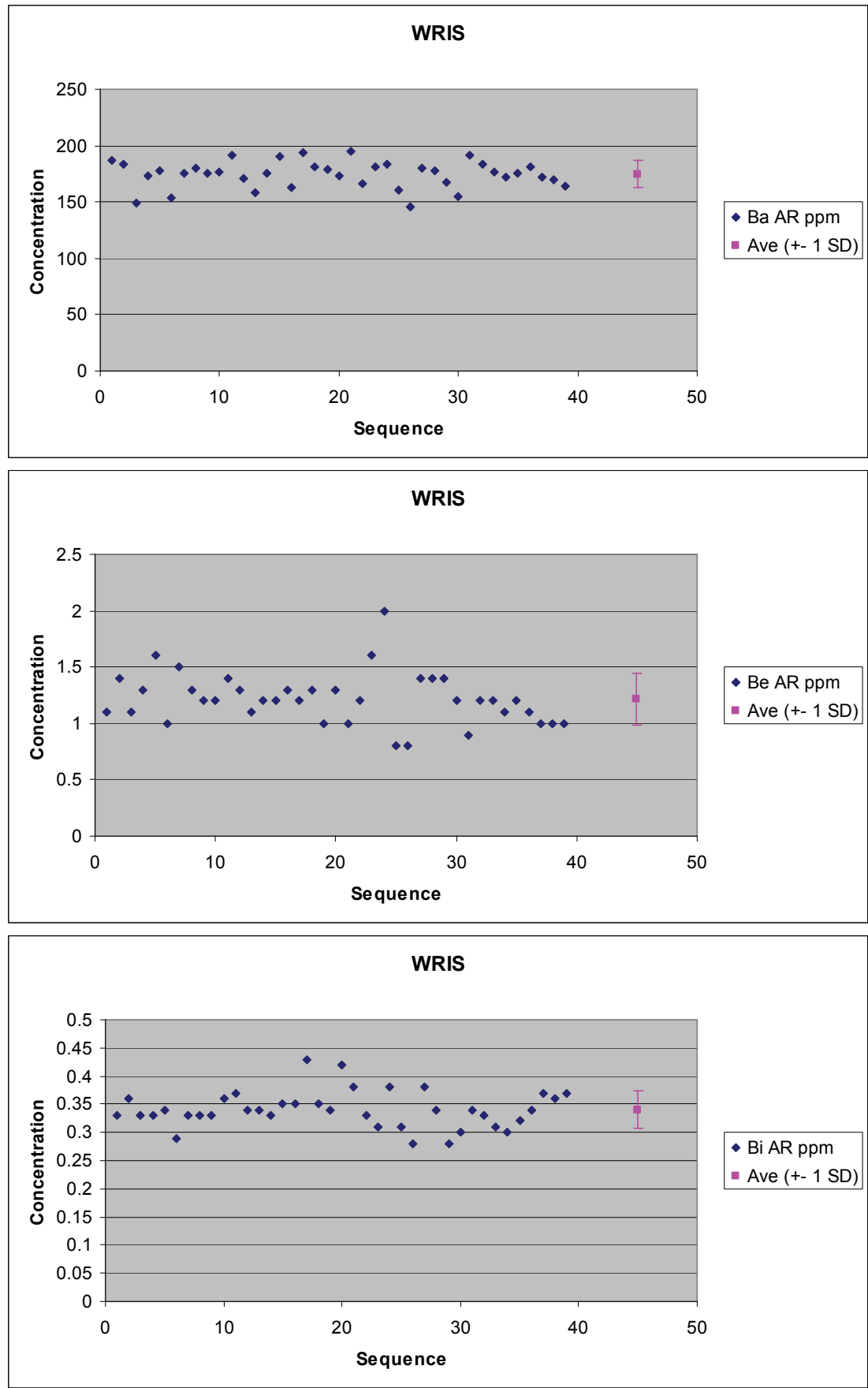
Appendix 4. X-plots for Aqua Regia analysis of IPS WRIS



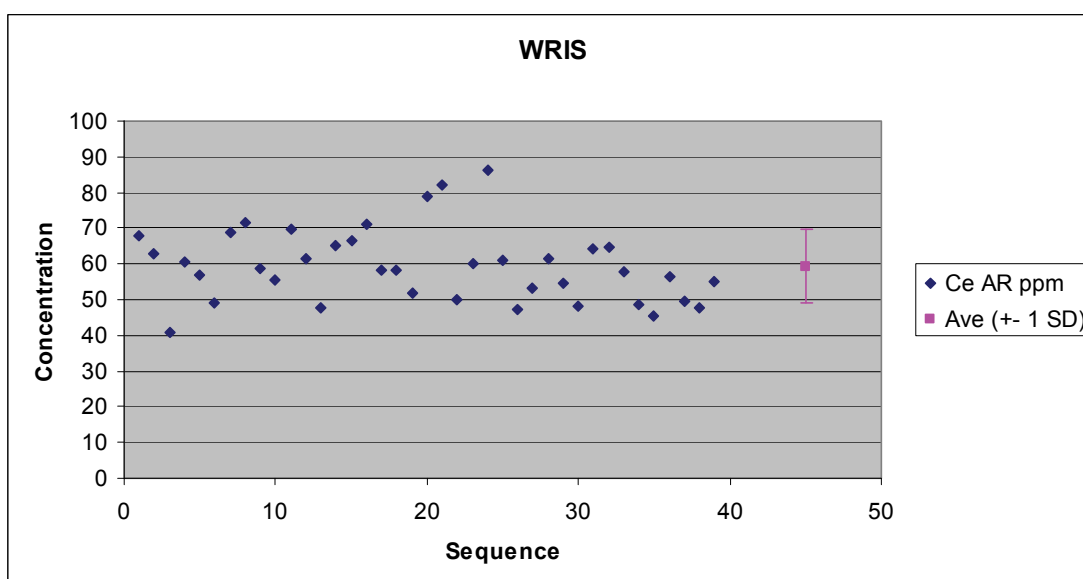
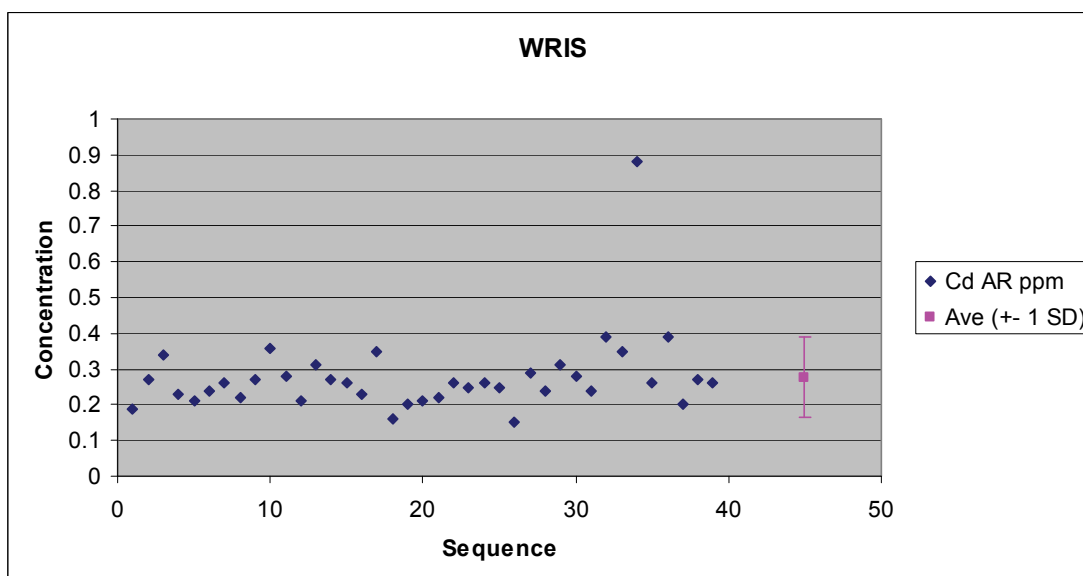
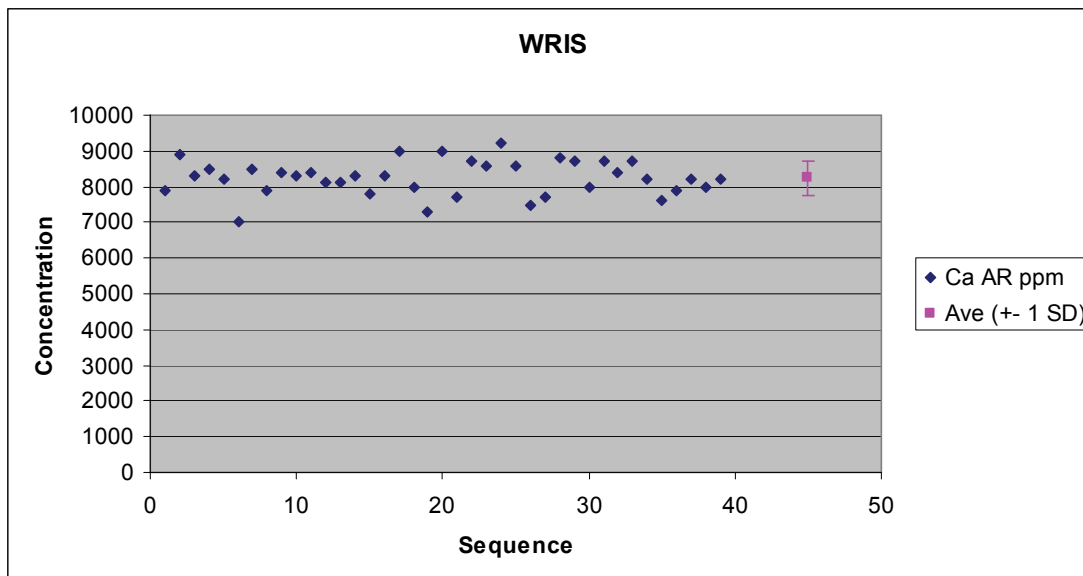
Appendix 4. X-plots for Aqua Regia analysis of WRIS



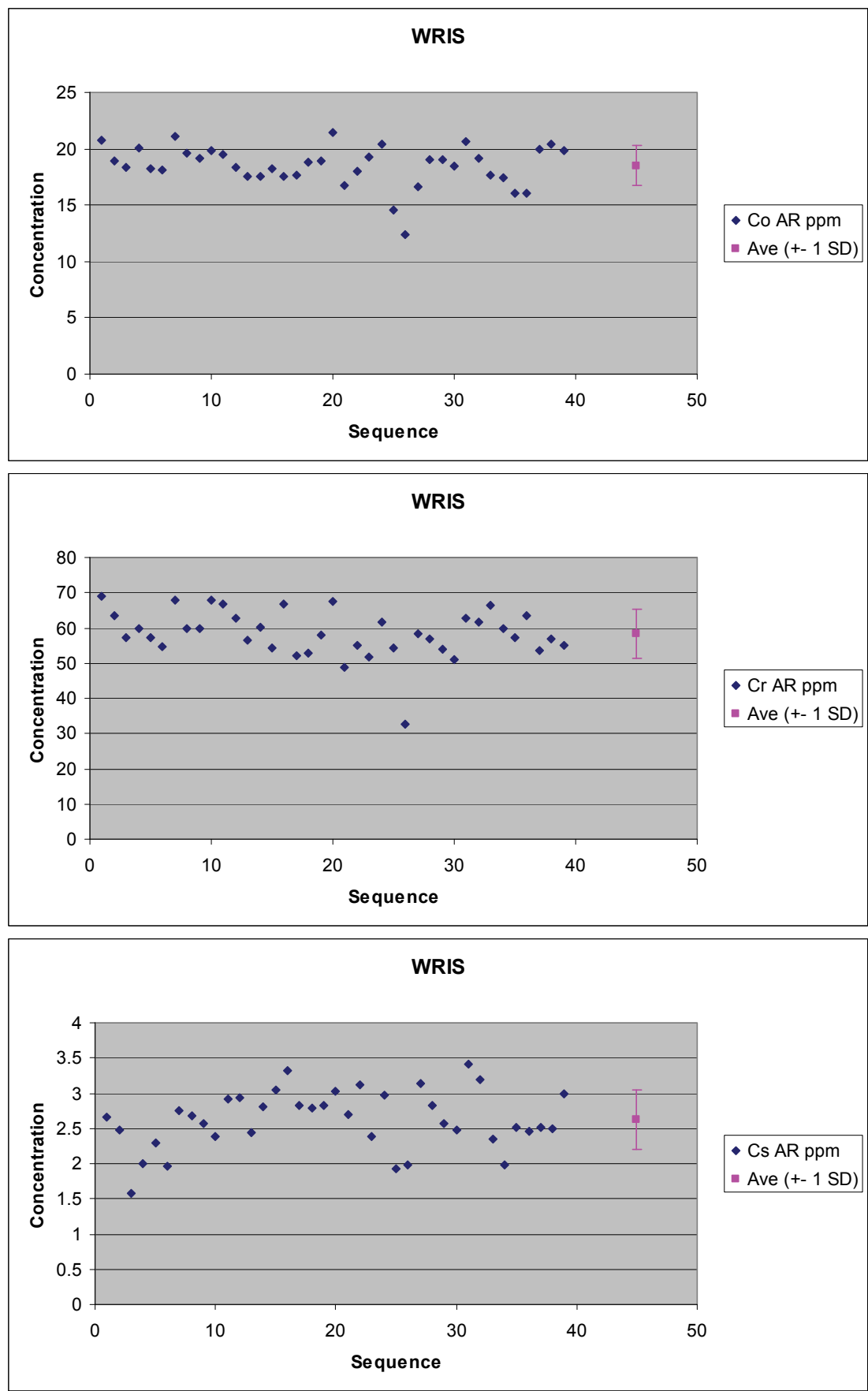
Appendix 4. X-plots for Aqua Regia analysis of WRIS



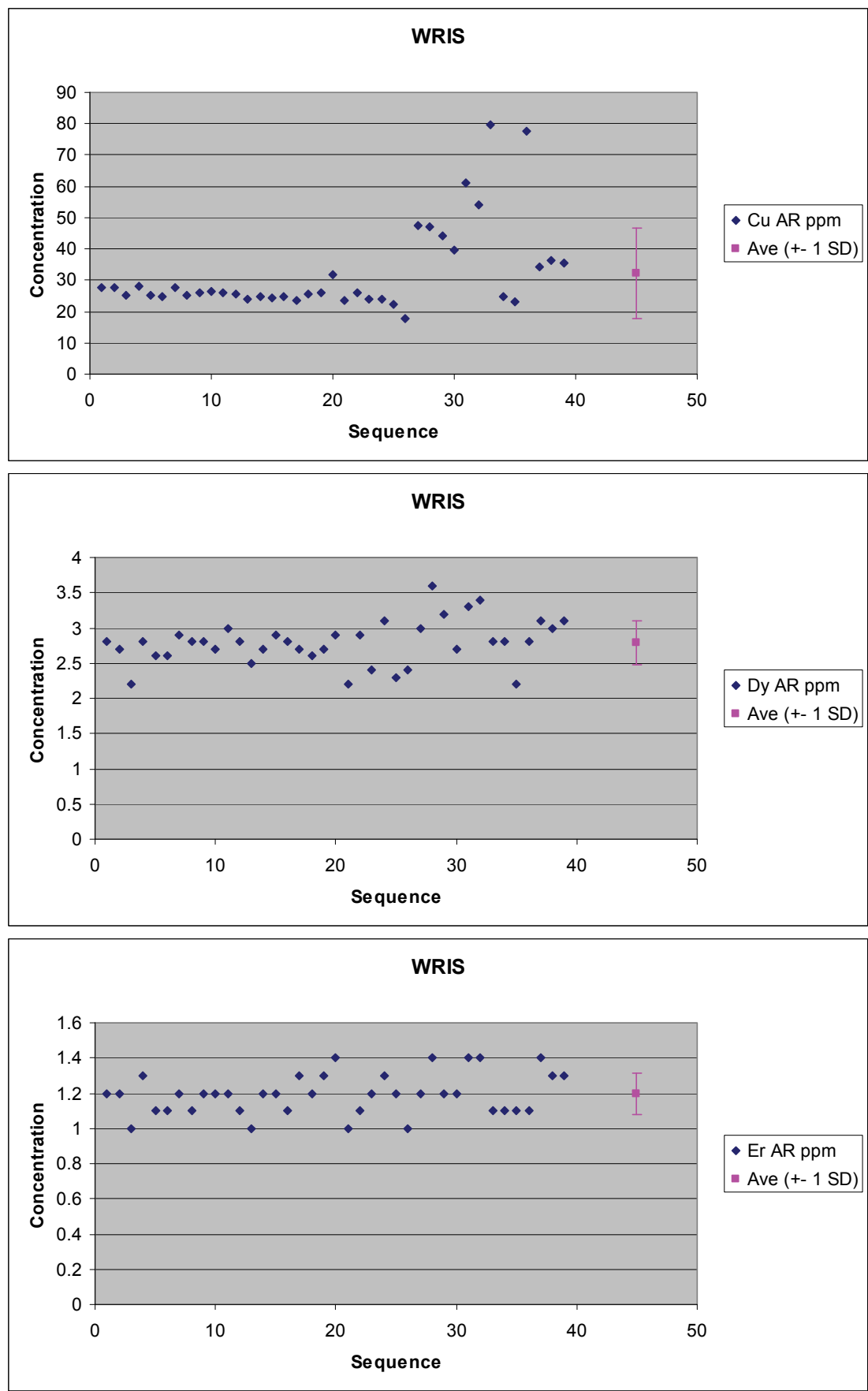
Appendix 4. X-plots for Aqua Regia analysis of WRIS



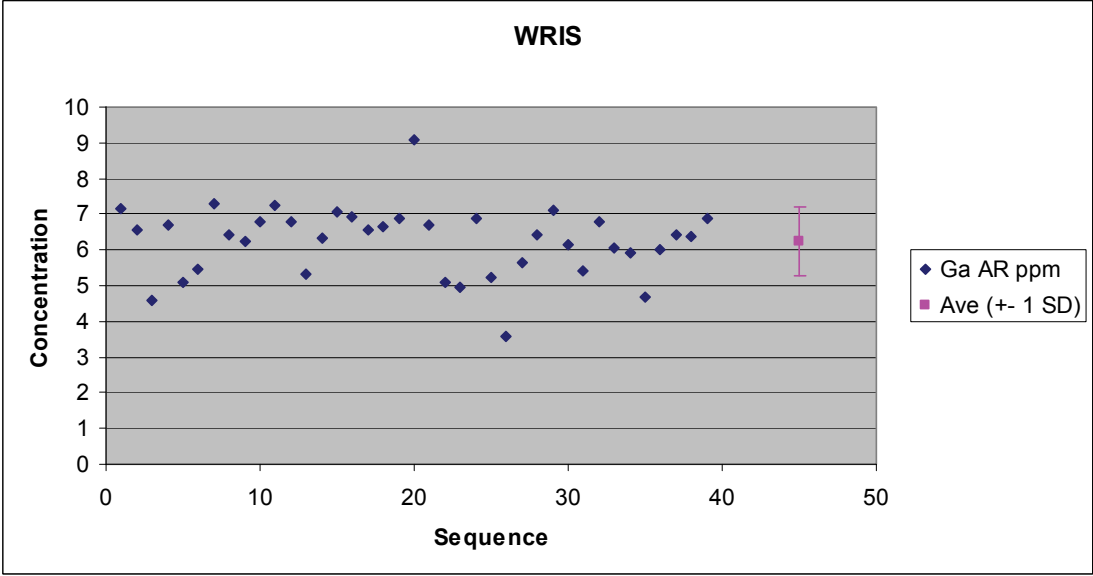
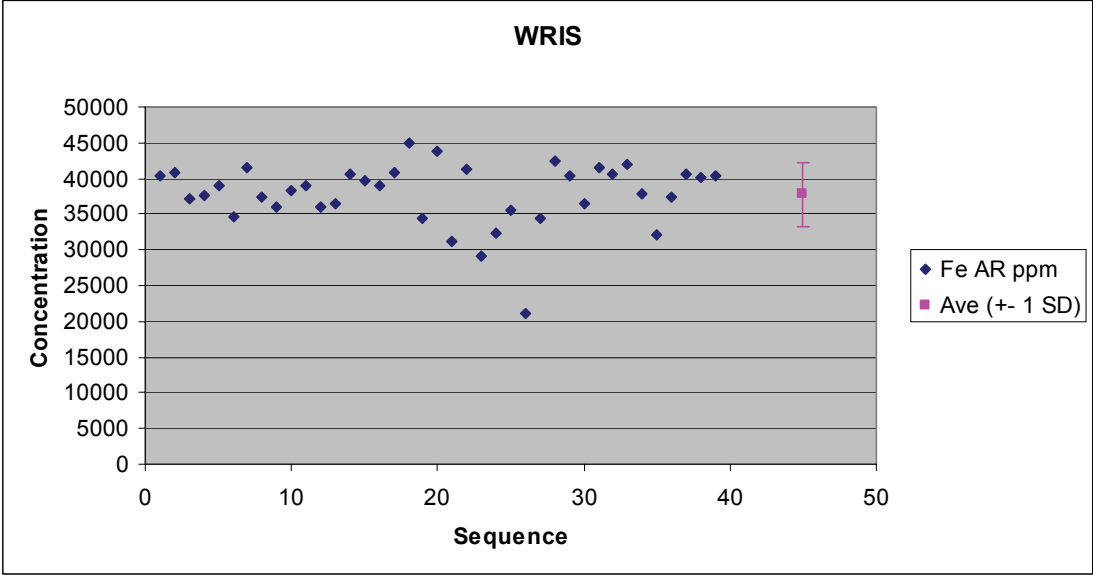
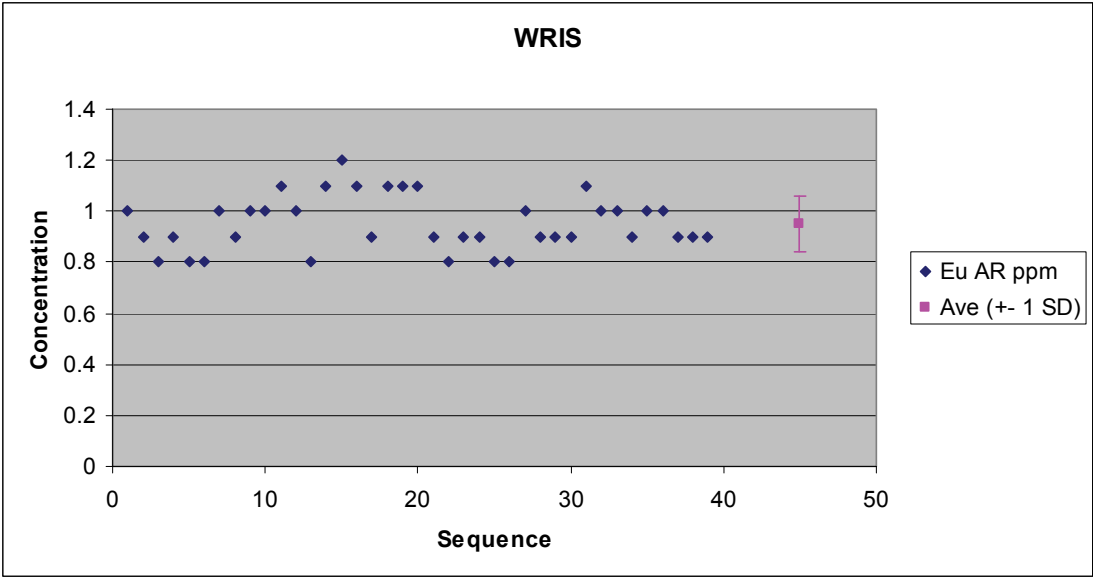
Appendix 4. X-plots for Aqua Regia analysis of WRIS



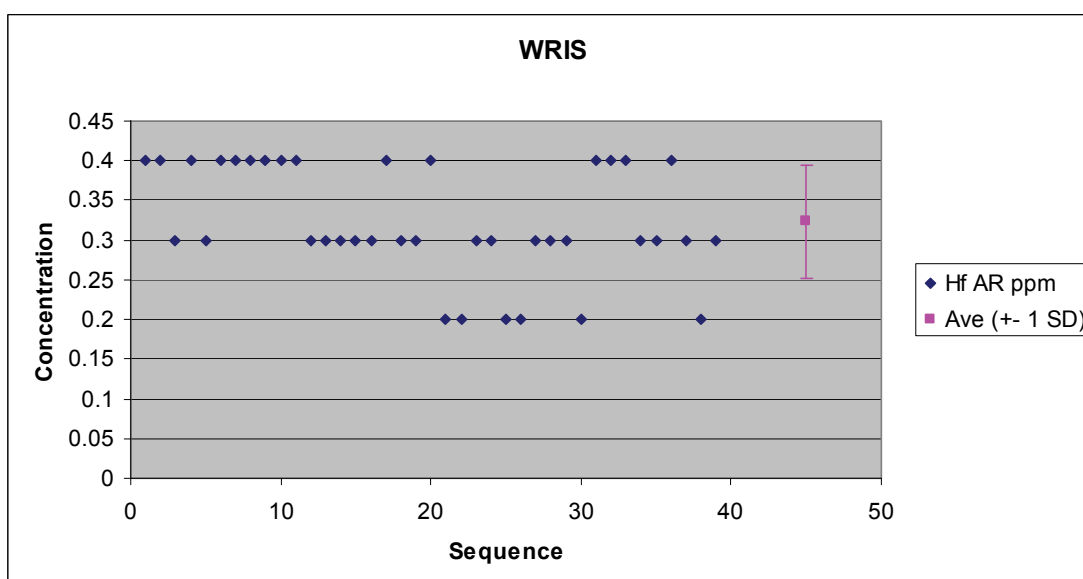
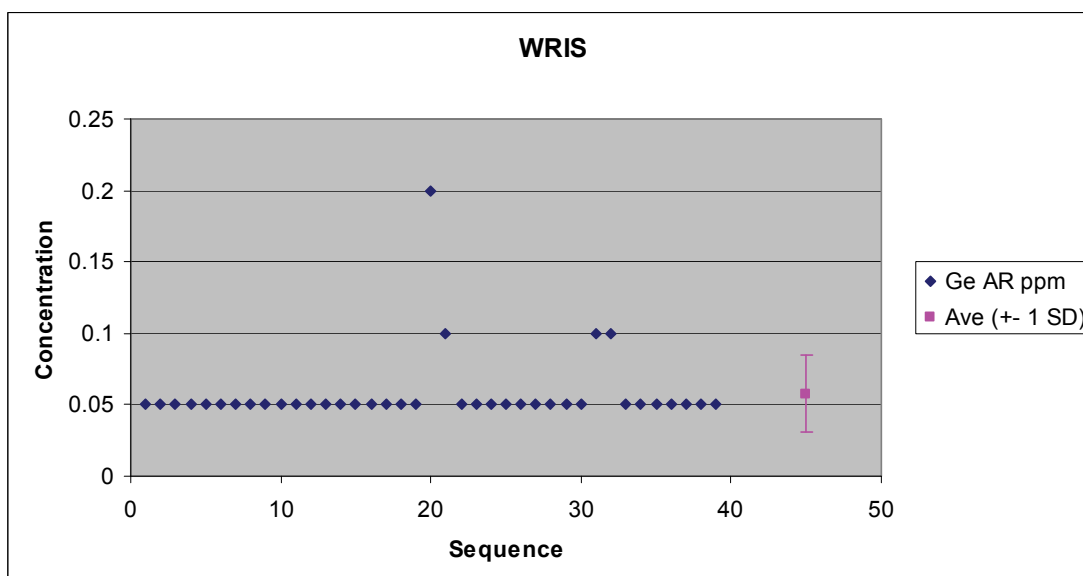
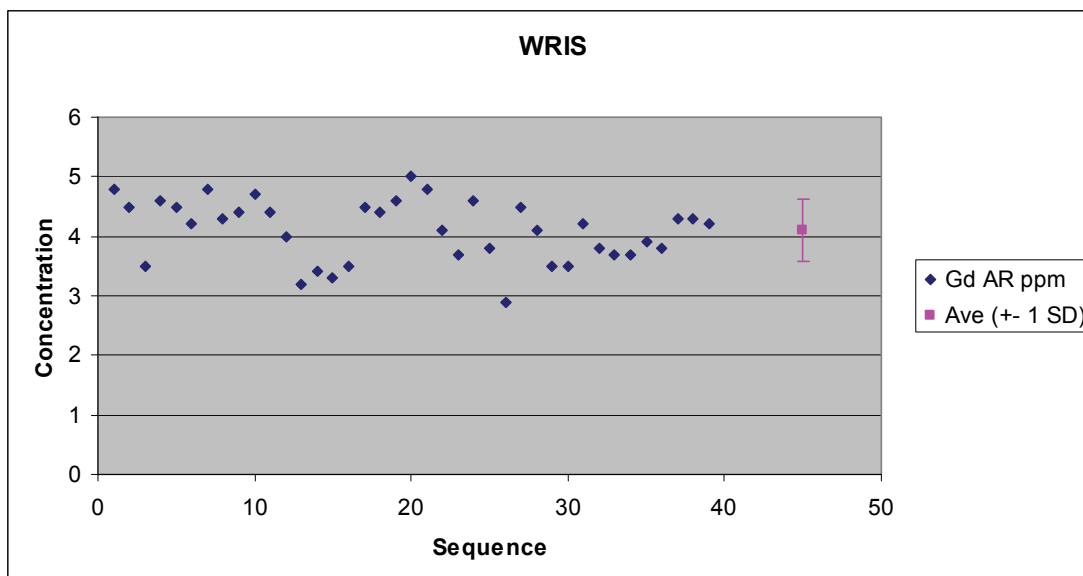
Appendix 4. X-plots for Aqua Regia analysis of WRIS



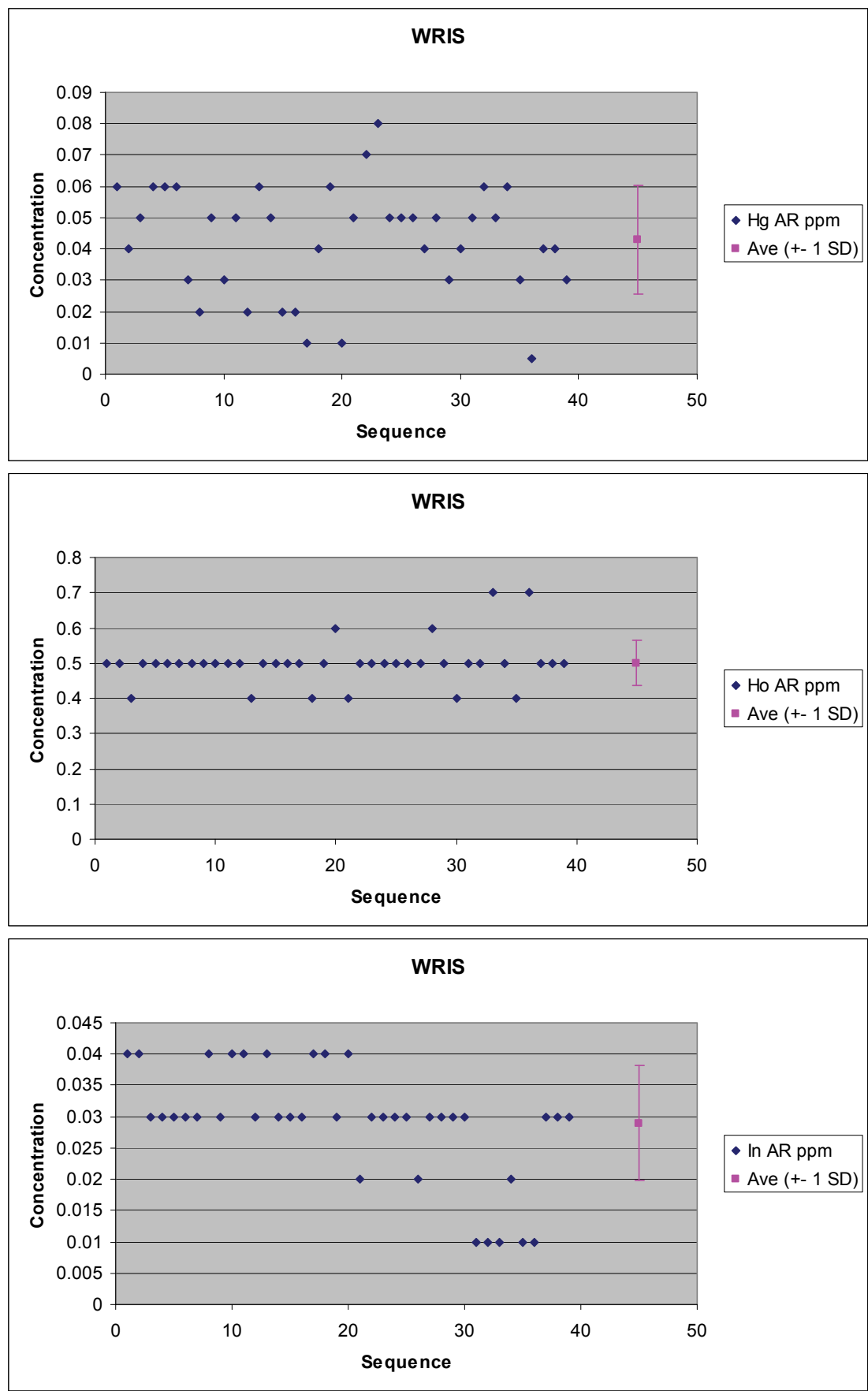
Appendix 4. X-plots for Aqua Regia analysis of WRIS



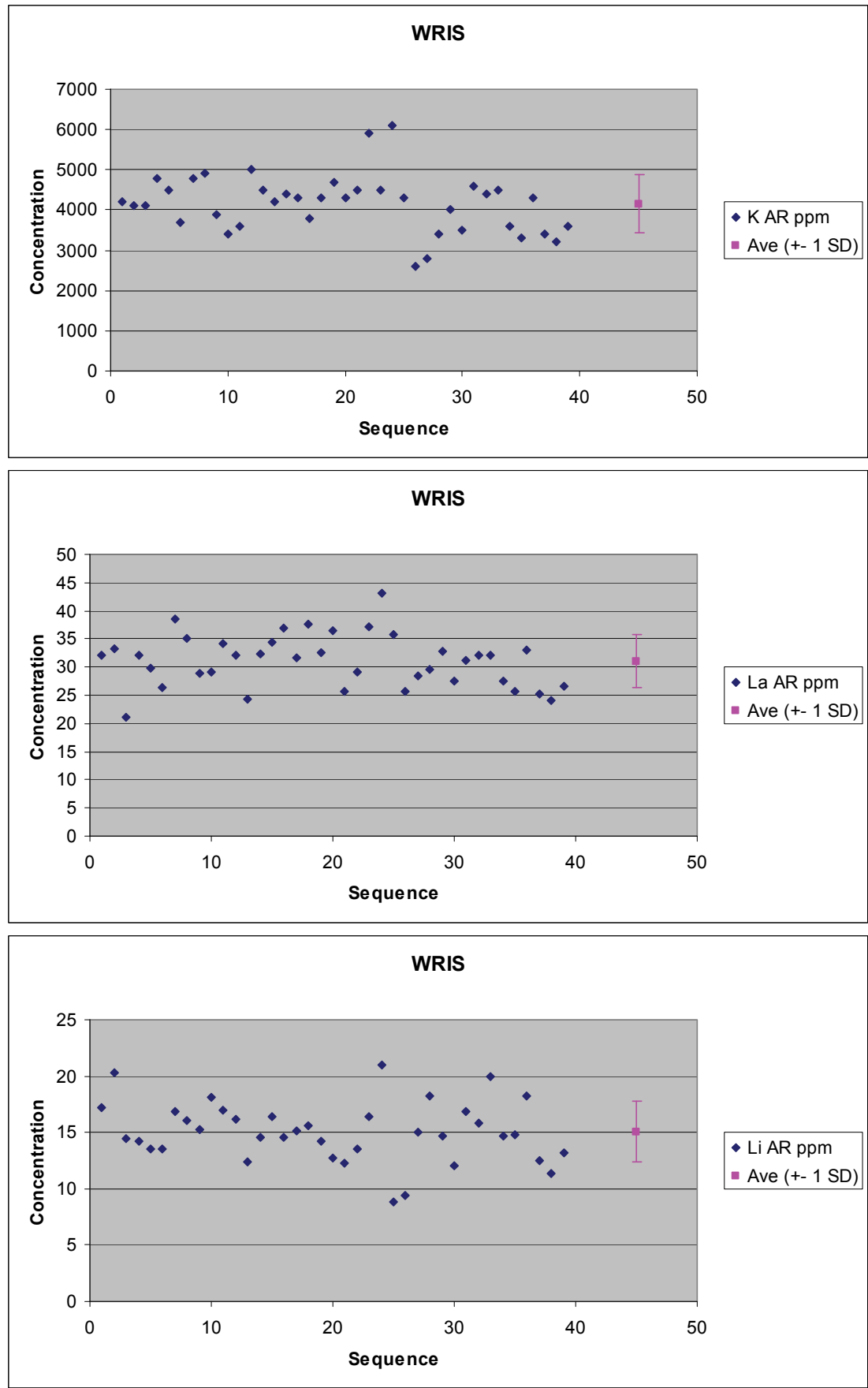
Appendix 4. X-plots for Aqua Regia analysis of WRIS



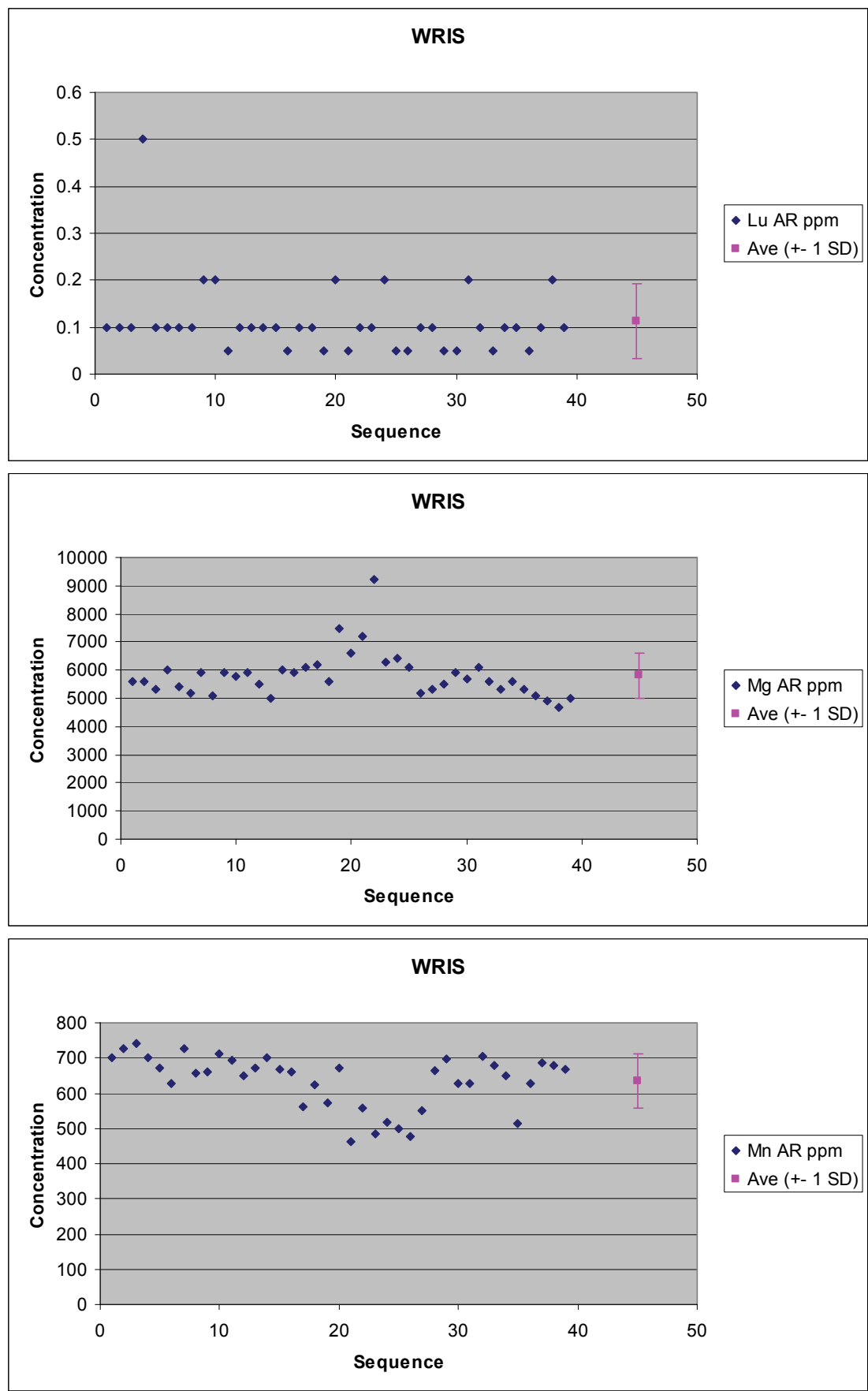
Appendix 4. X-plots for Aqua Regia analysis of WRIS



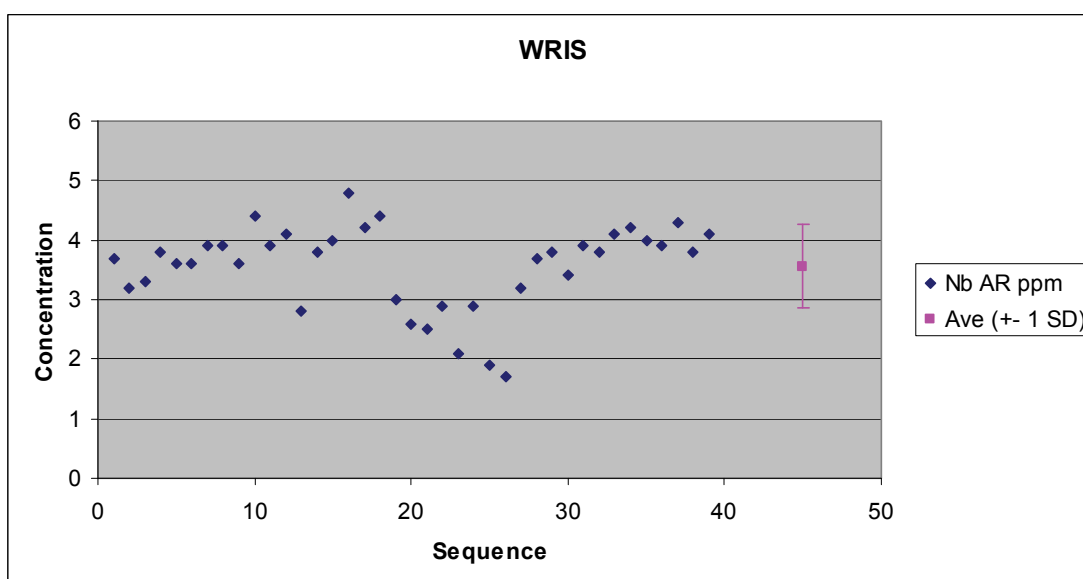
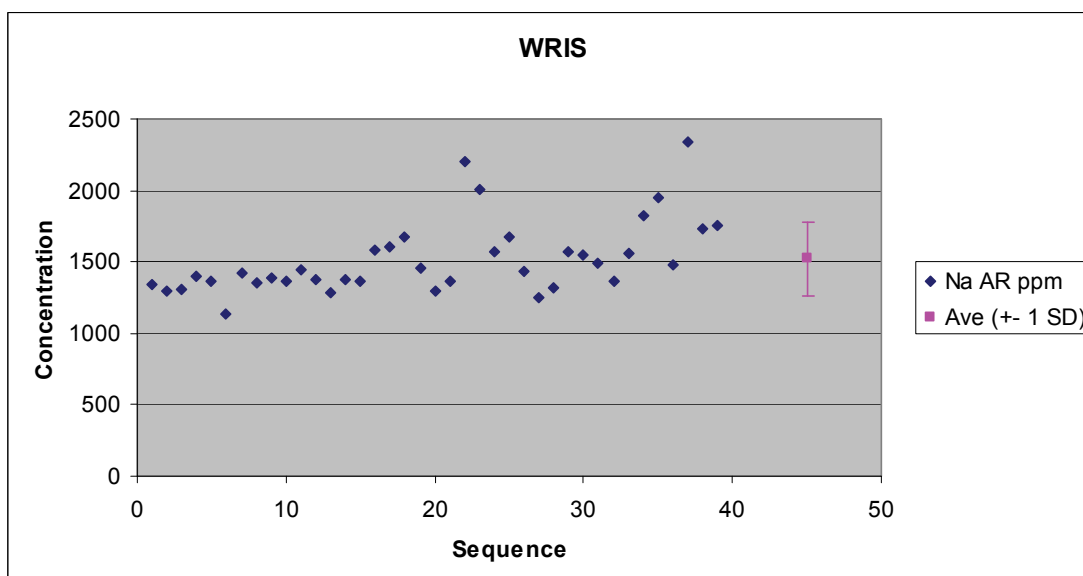
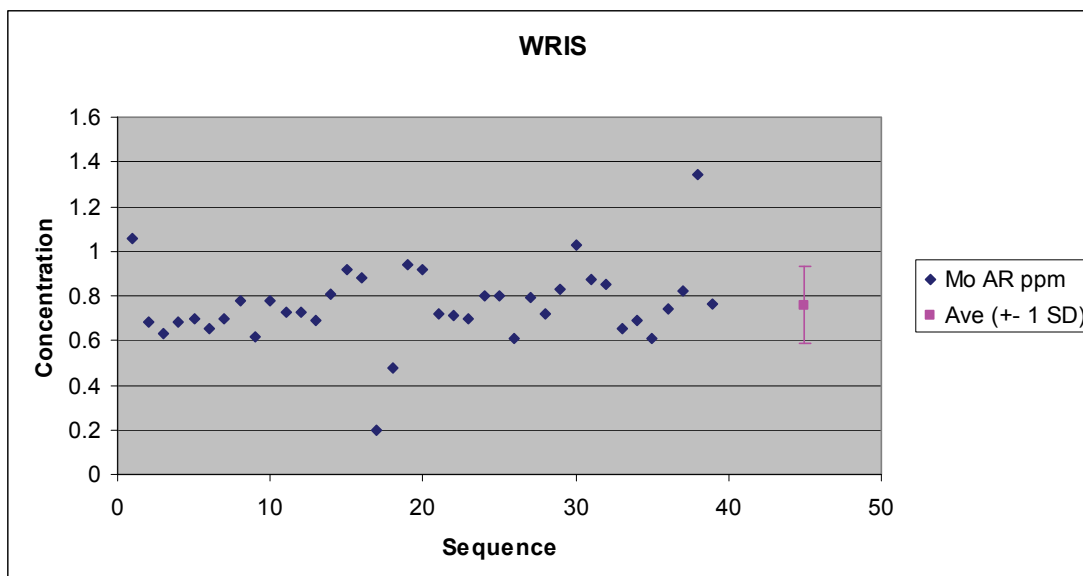
Appendix 4. X-plots for Aqua Regia analysis of WRIS



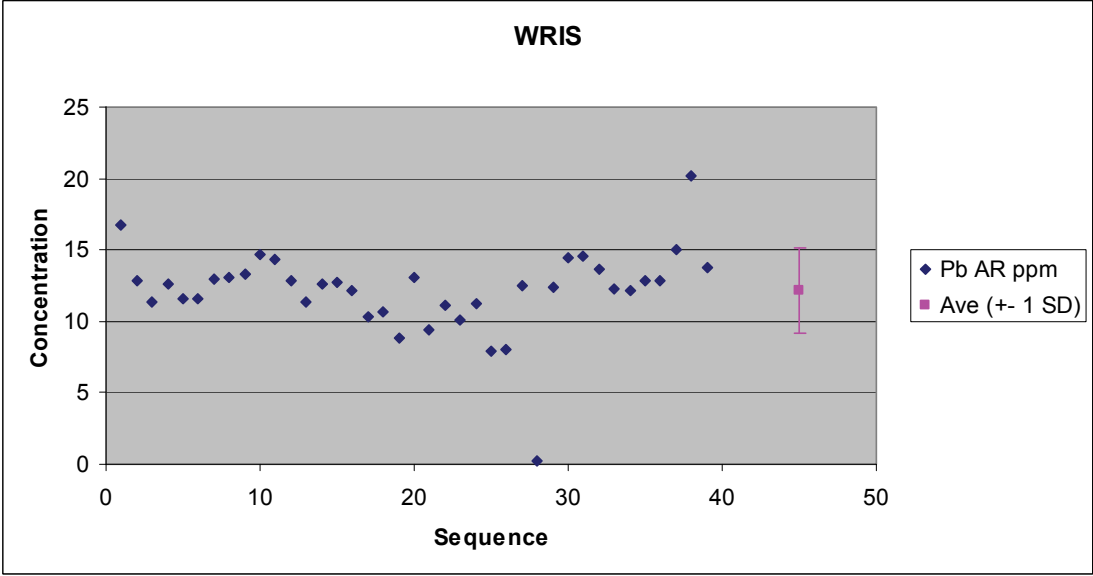
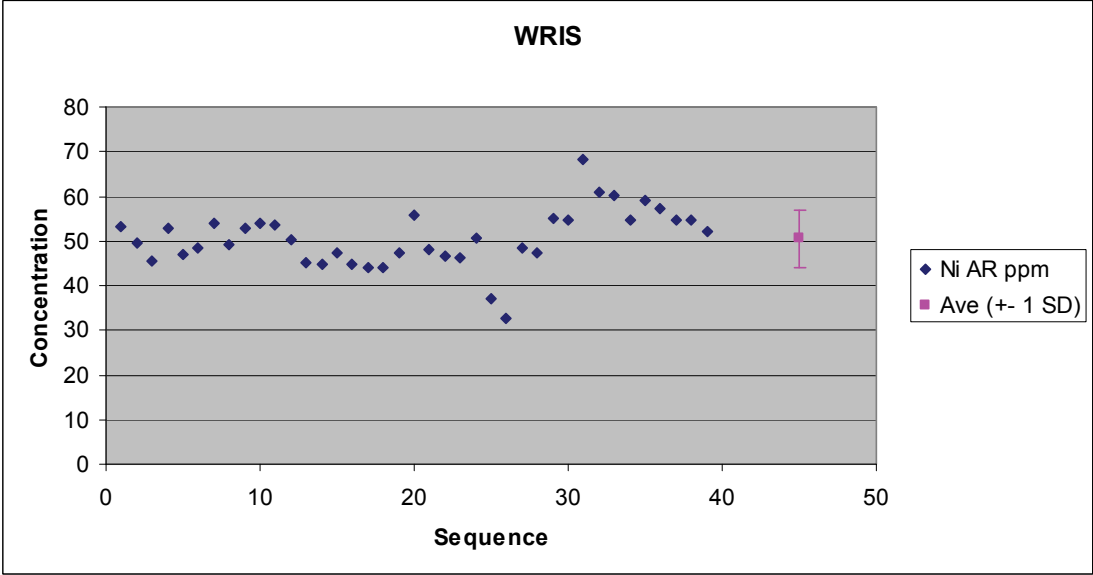
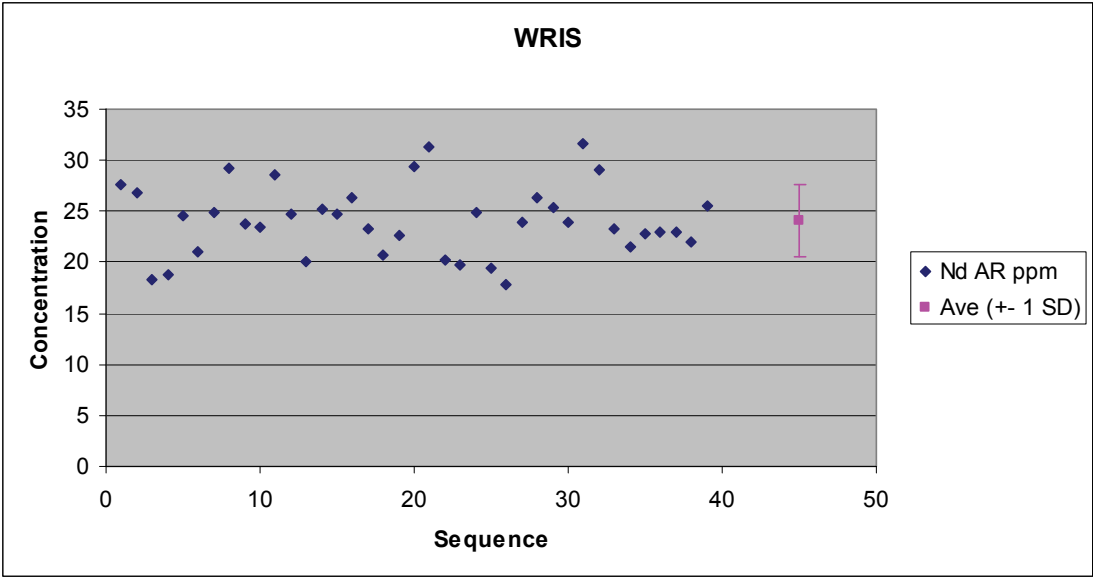
Appendix 4. X-plots for Aqua Regia analysis of WRIS



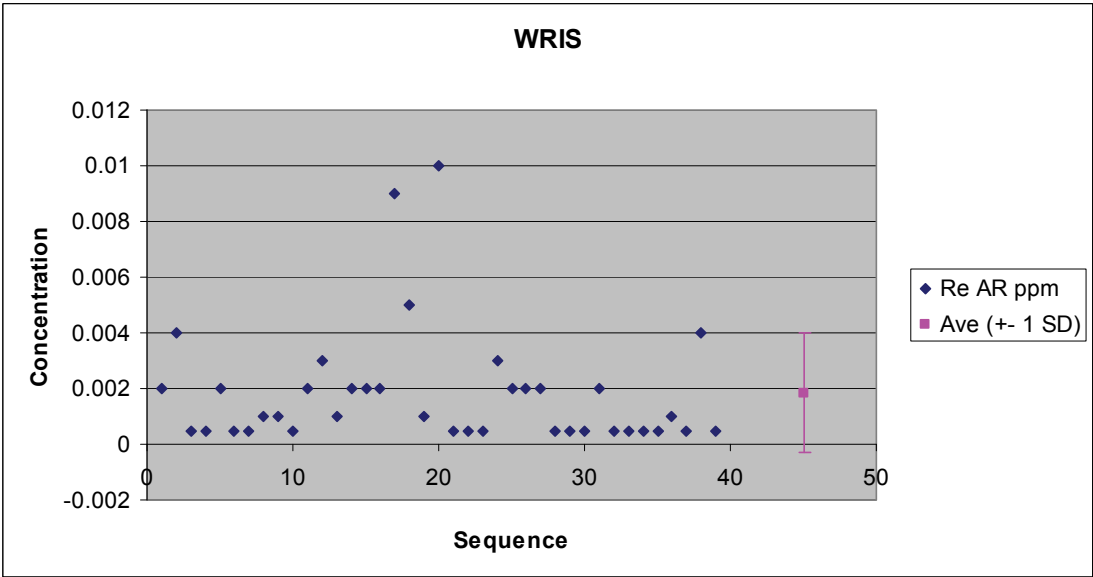
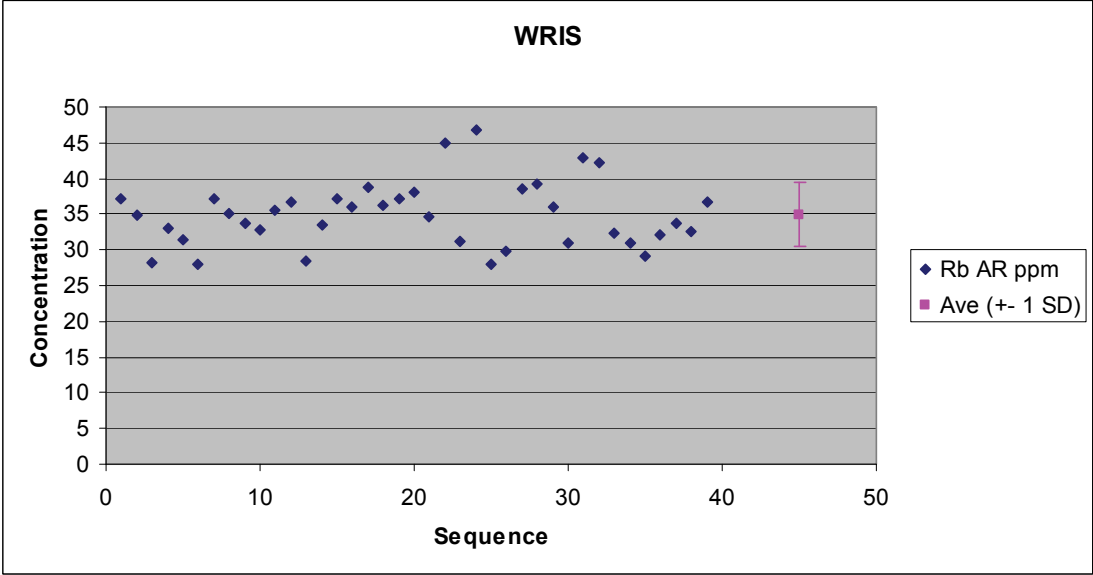
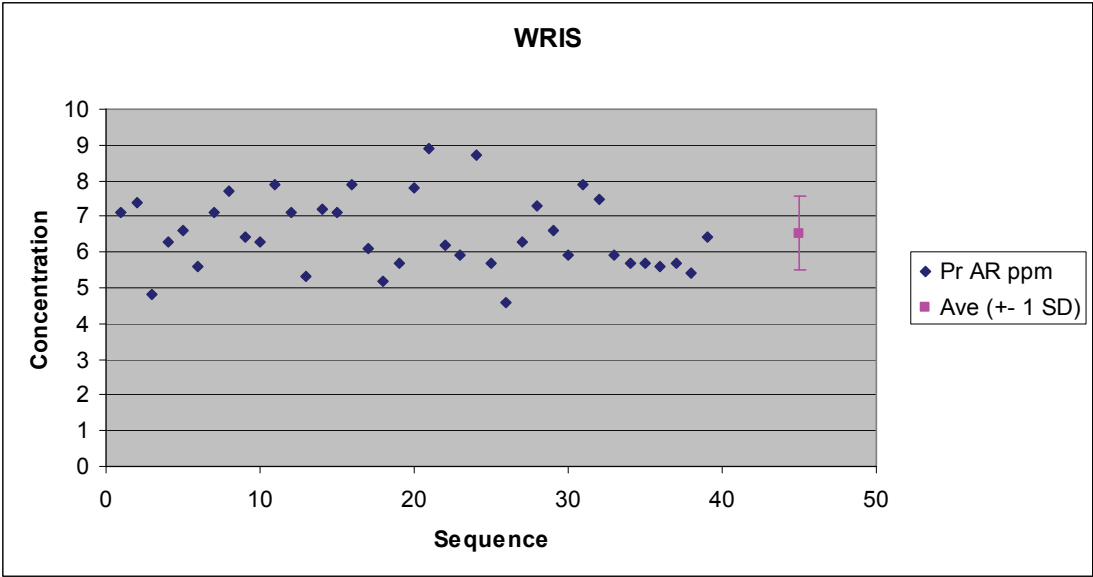
Appendix 4. X-plots for Aqua Regia analysis of WRIS



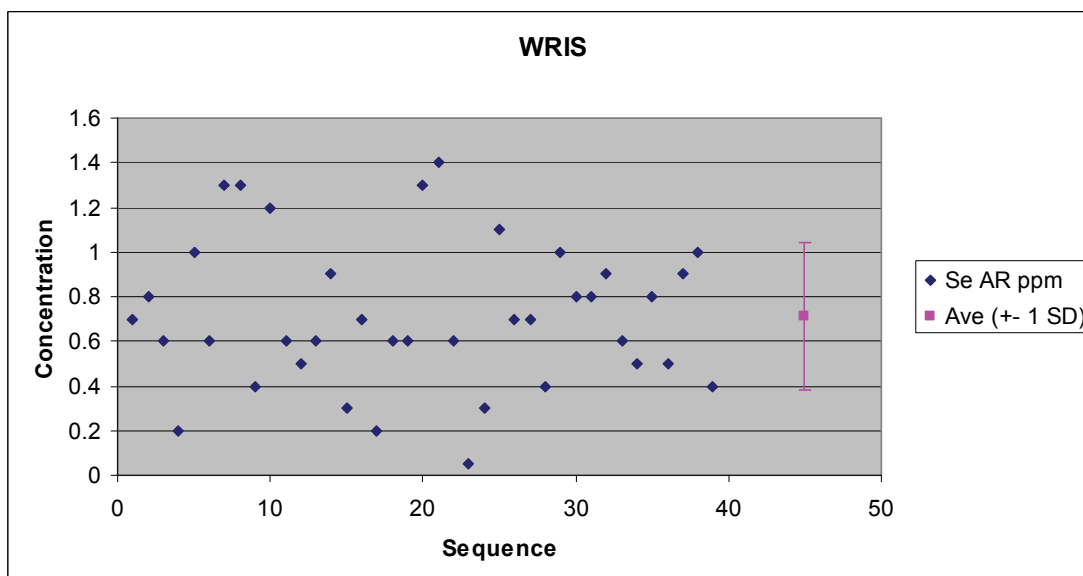
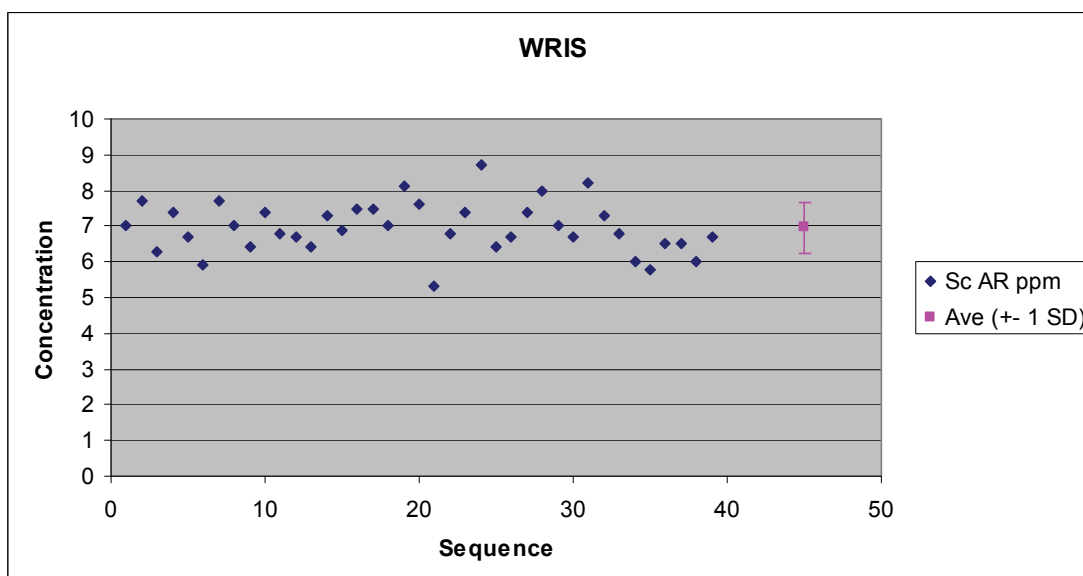
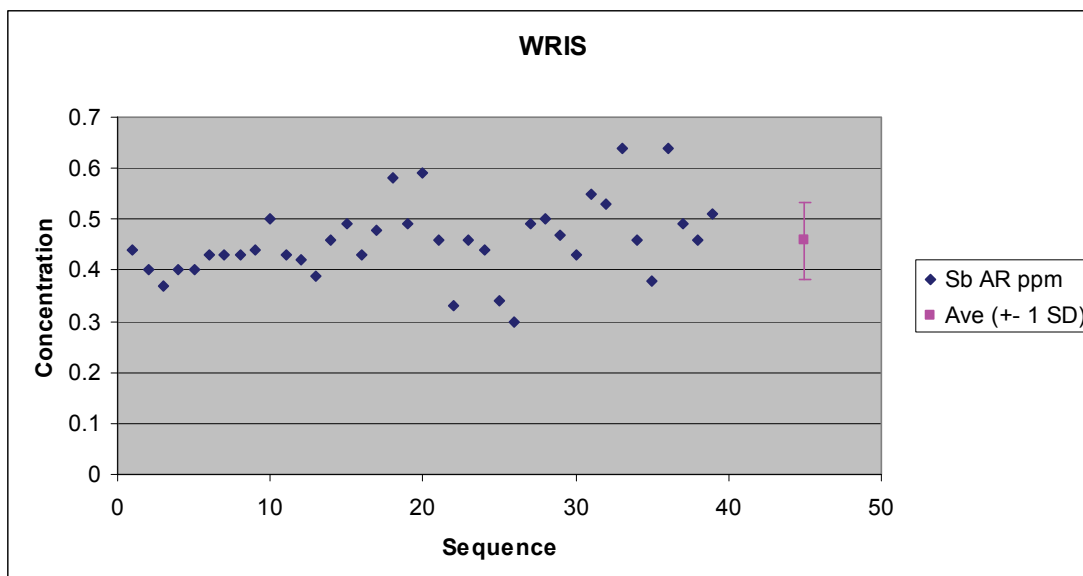
Appendix 4. X-plots for Aqua Regia analysis of WRIS



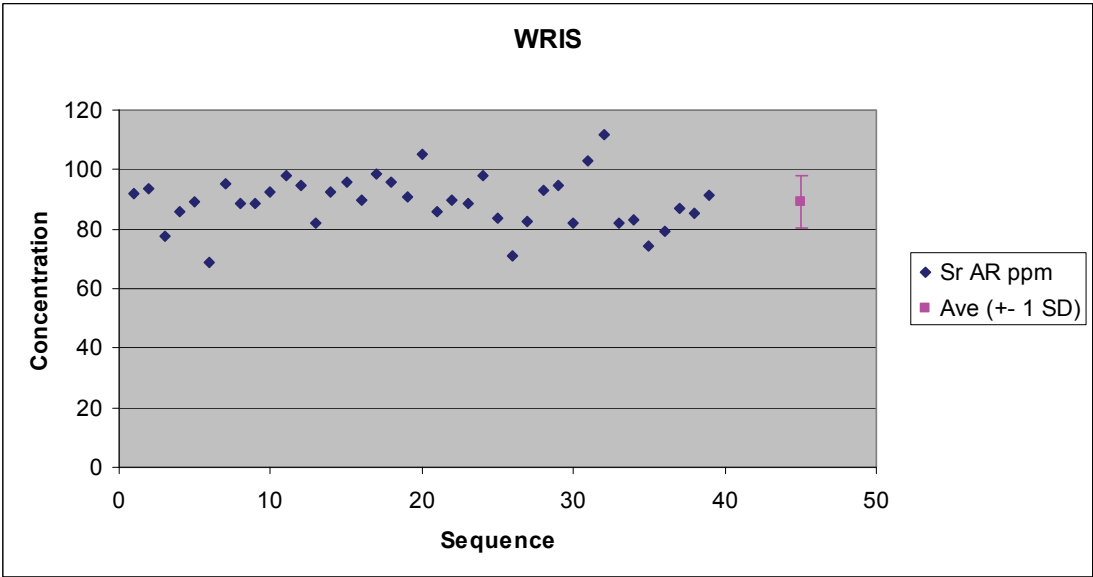
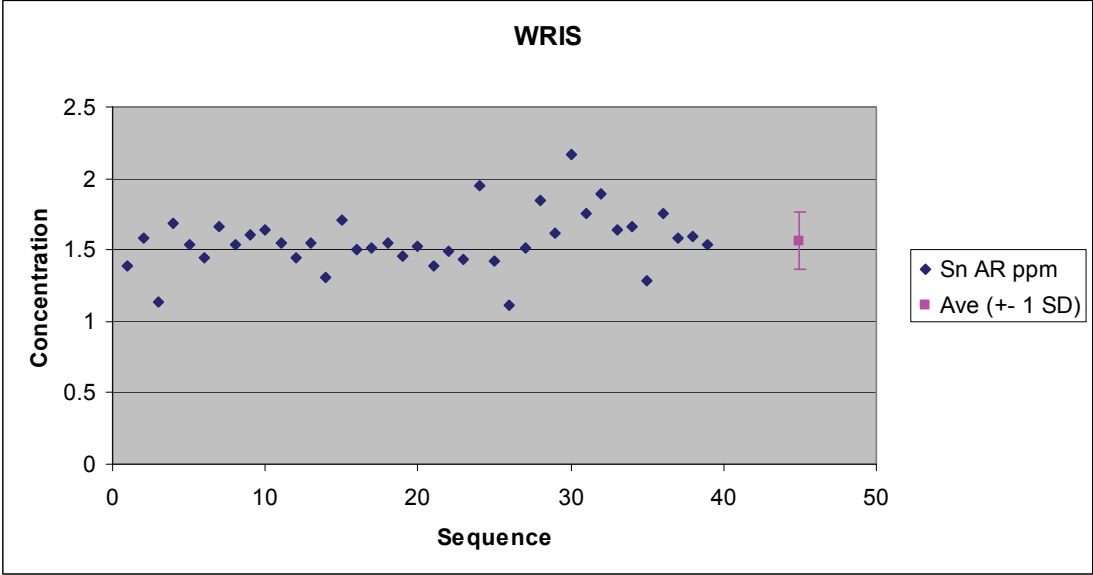
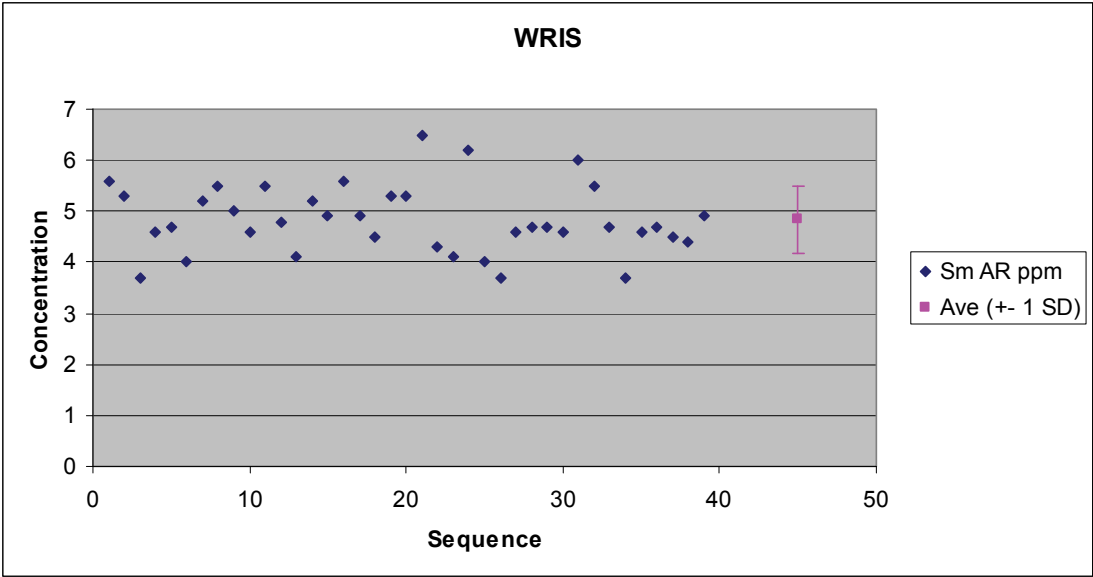
Appendix 4. X-plots for Aqua Regia analysis of WRIS



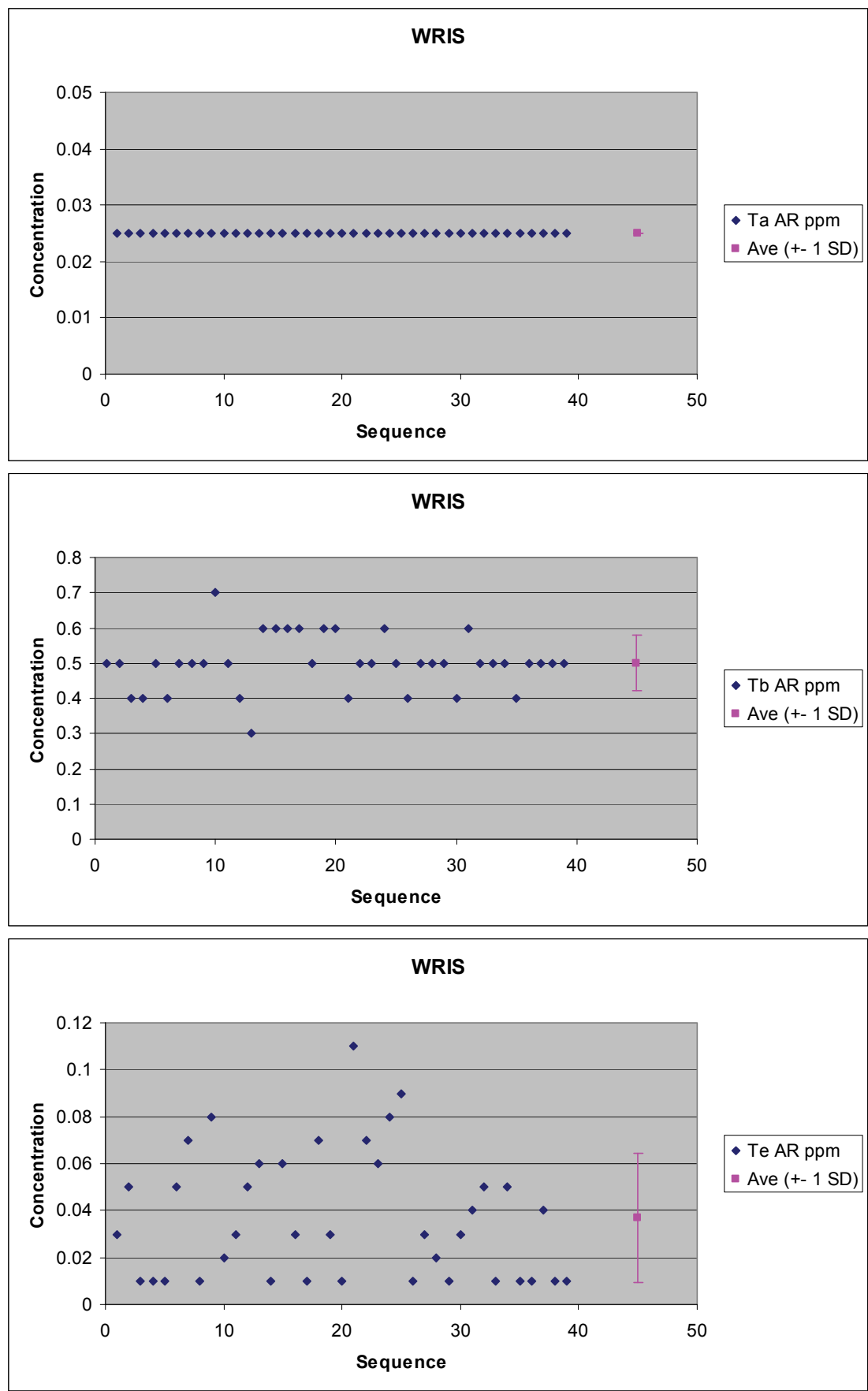
Appendix 4. X-plots for Aqua Regia analysis of WRIS



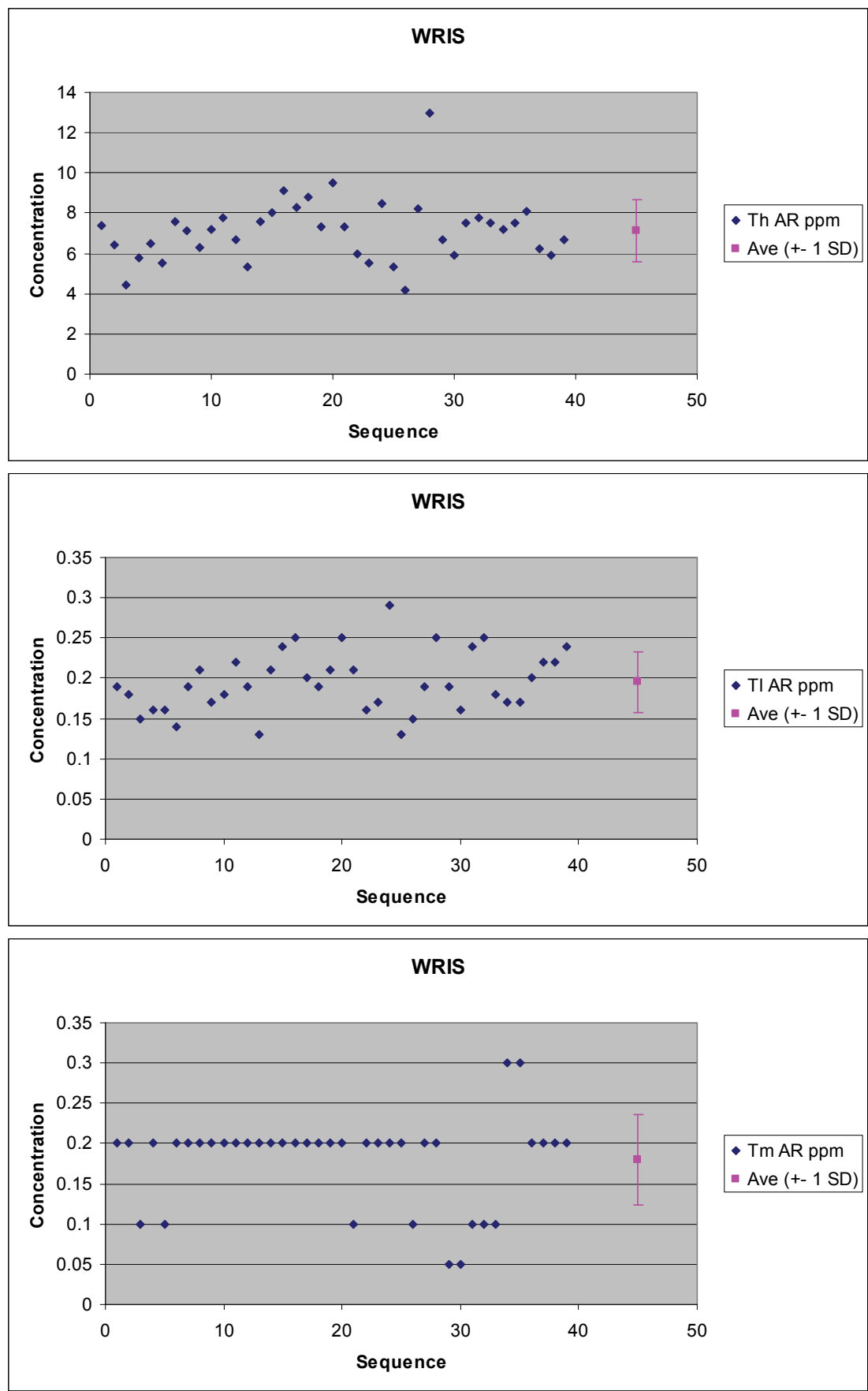
Appendix 4. X-plots for Aqua Regia analysis of WRIS



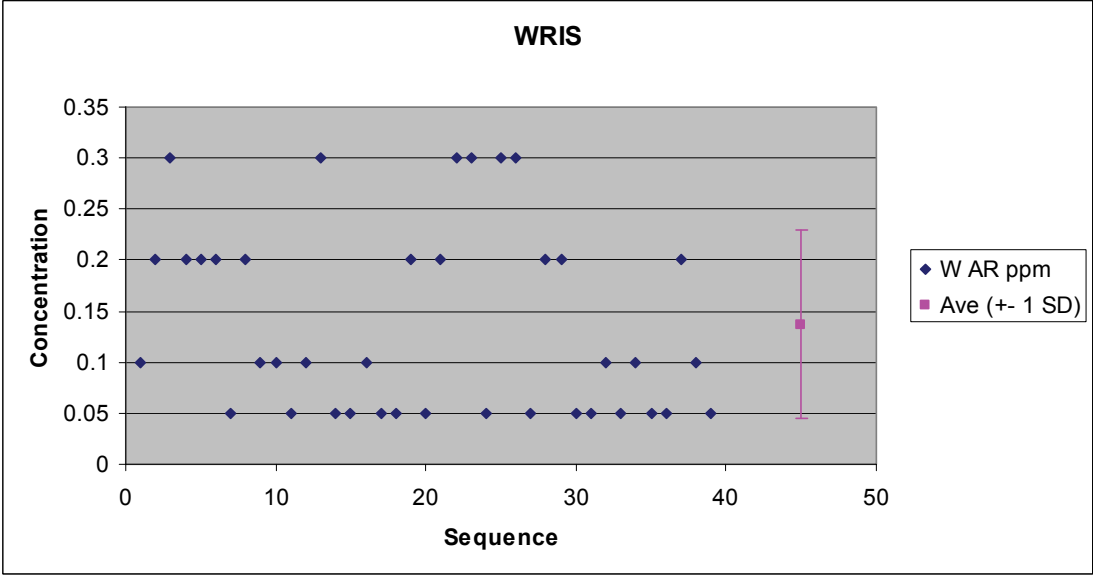
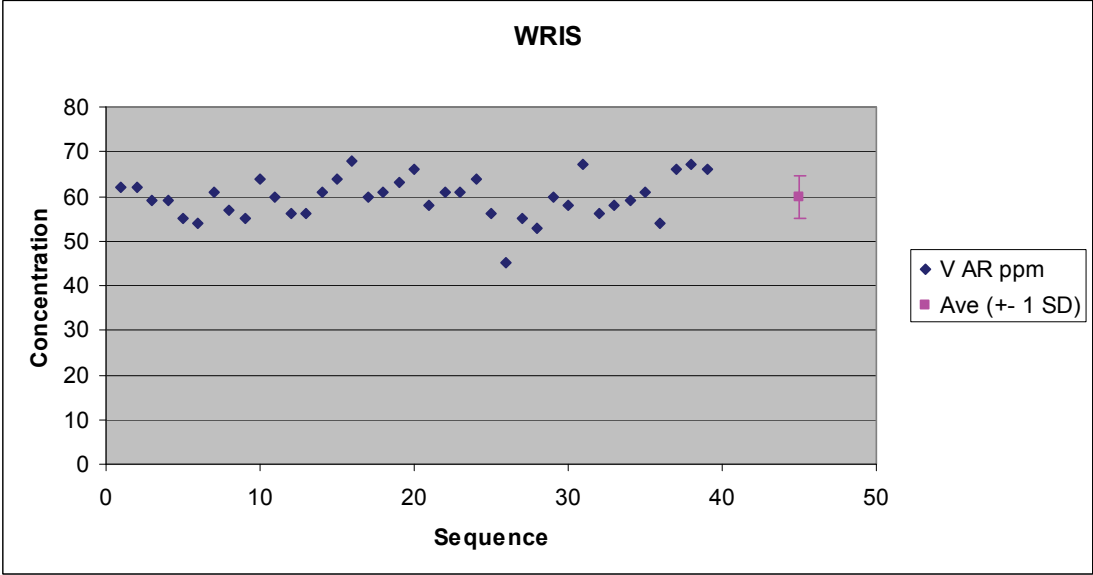
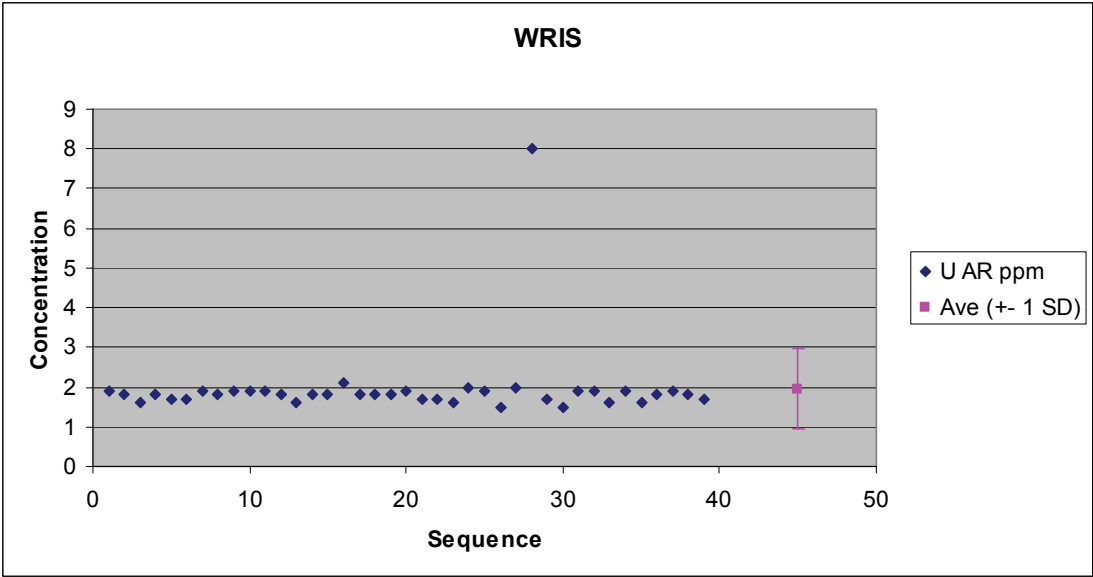
Appendix 4. X-plots for Aqua Regia analysis of WRIS



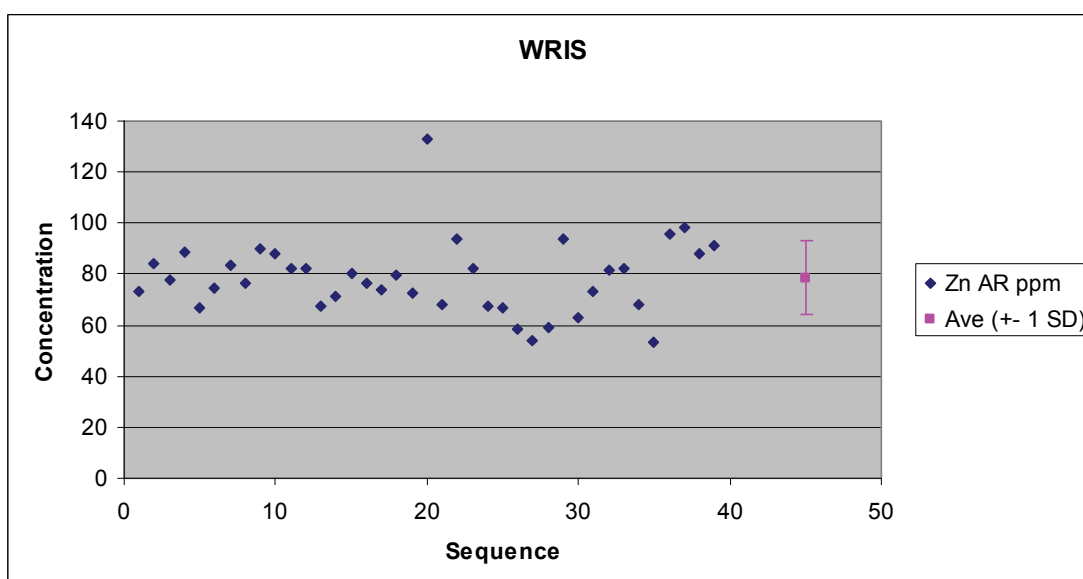
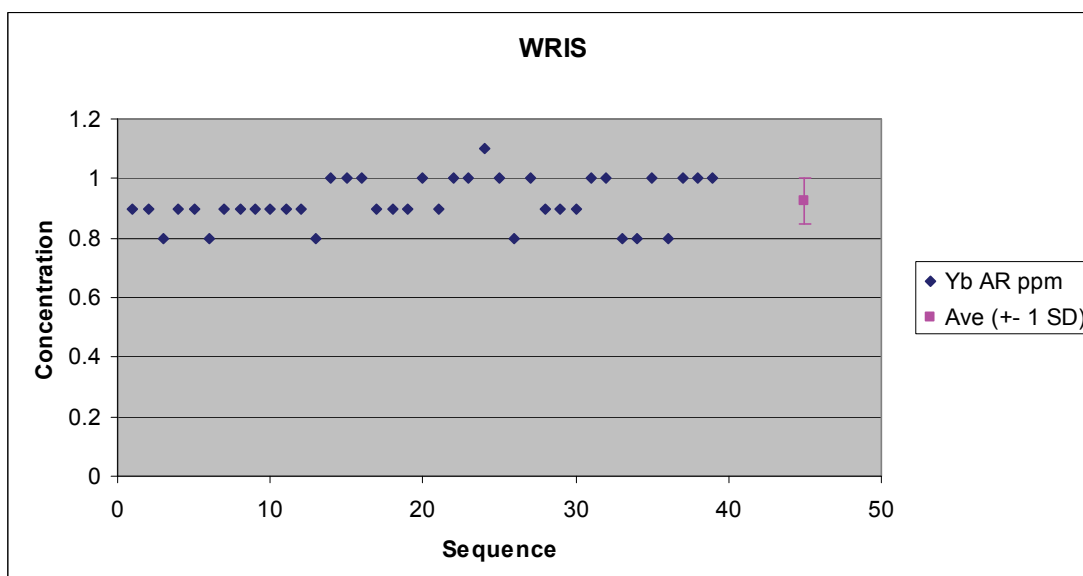
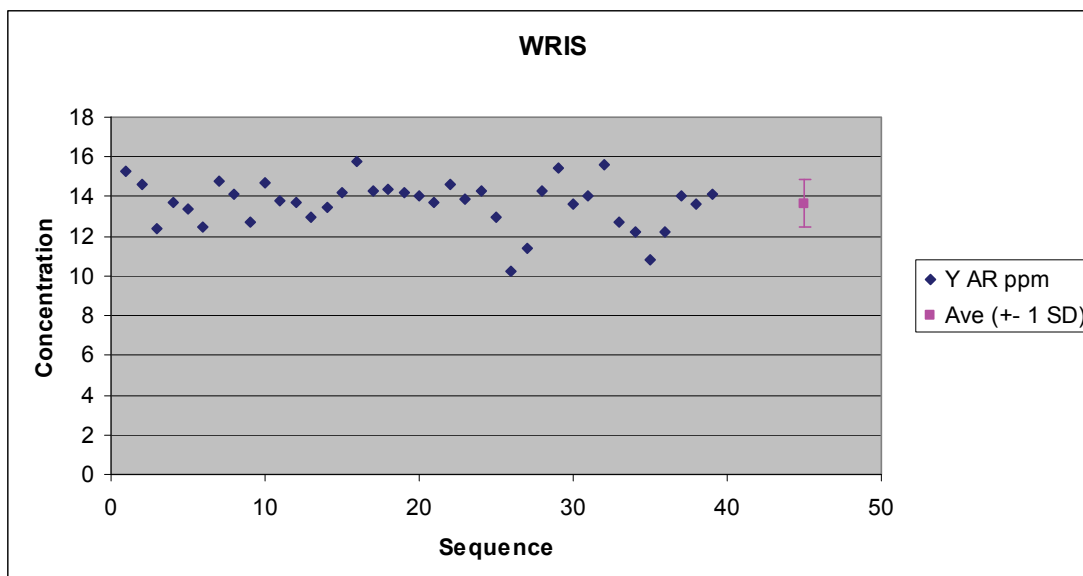
Appendix 4. X-plots for Aqua Regia analysis of WRIS

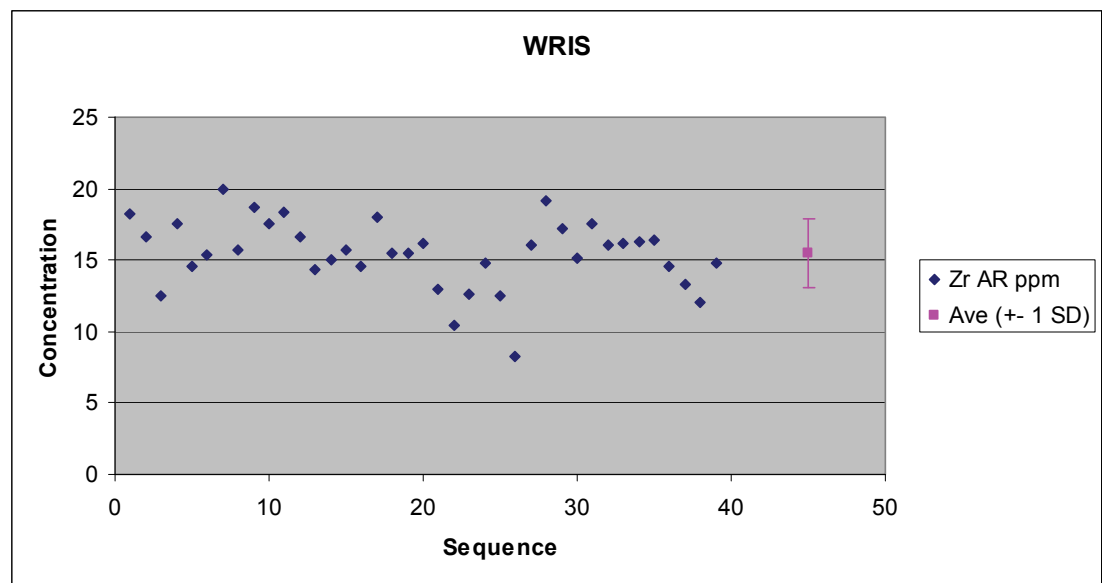


Appendix 4. X-plots for Aqua Regia analysis of WRIS

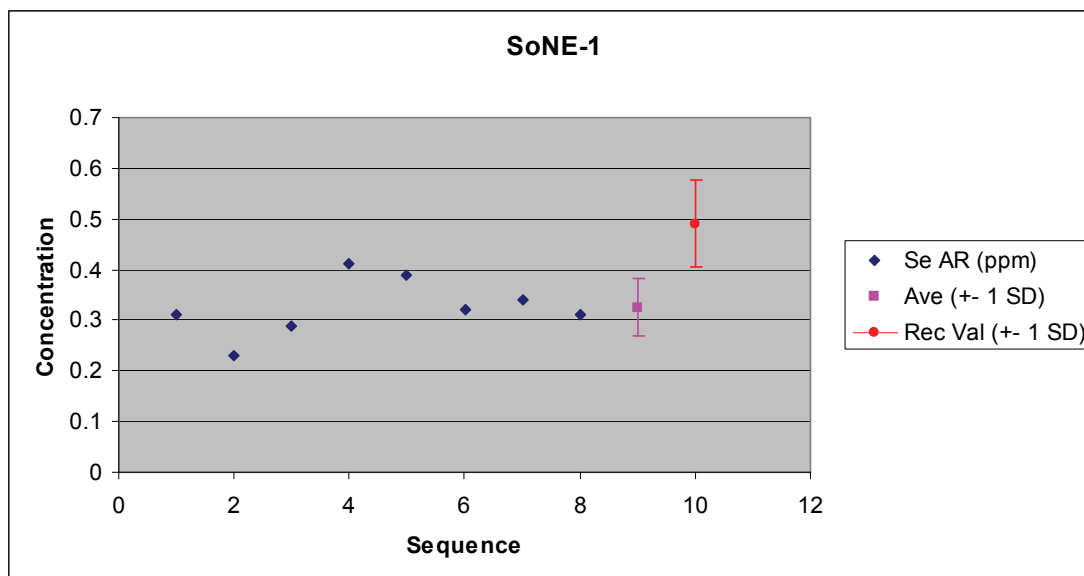


Appendix 4. X-plots for Aqua Regia analysis of WRIS



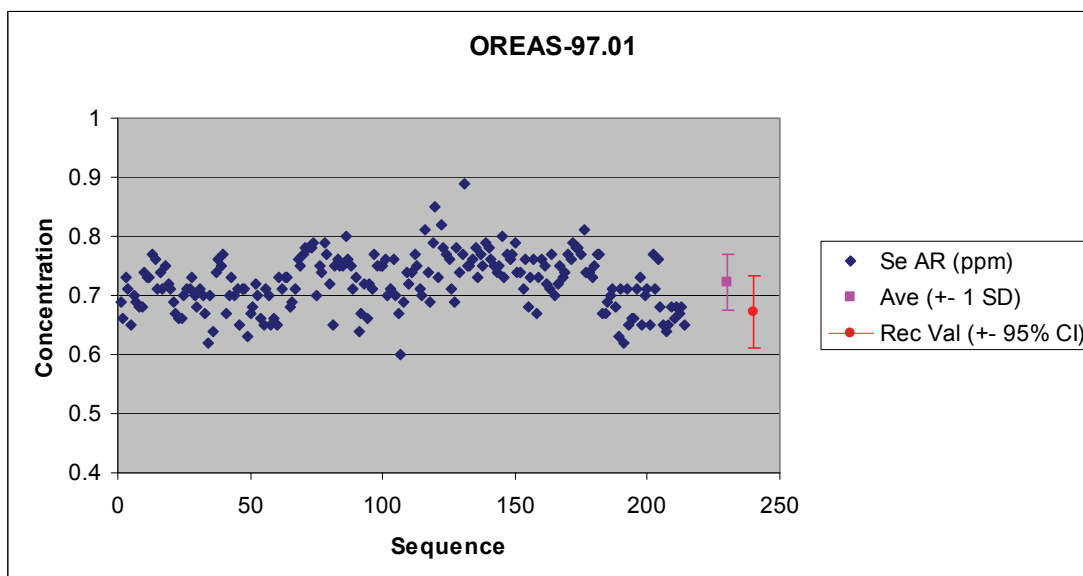


Appendix 5. X-plot for Aqua Regia analysis of SoNE-1



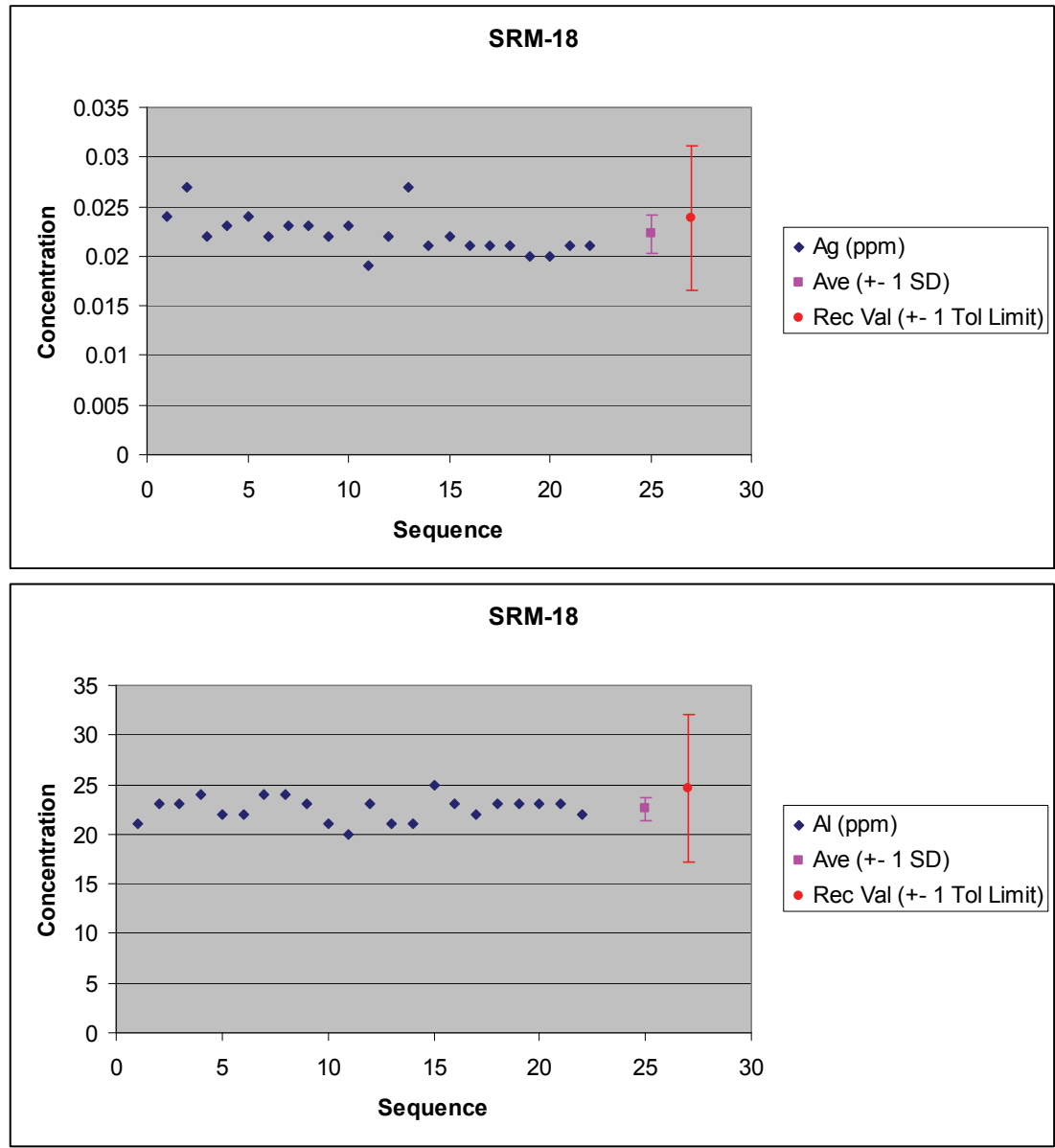
Note: The Recommended Value for SoNE-1 is a Total value, not Aqua Regia. The Recommended Value is shown with 1 SD error bars from the data (17%)

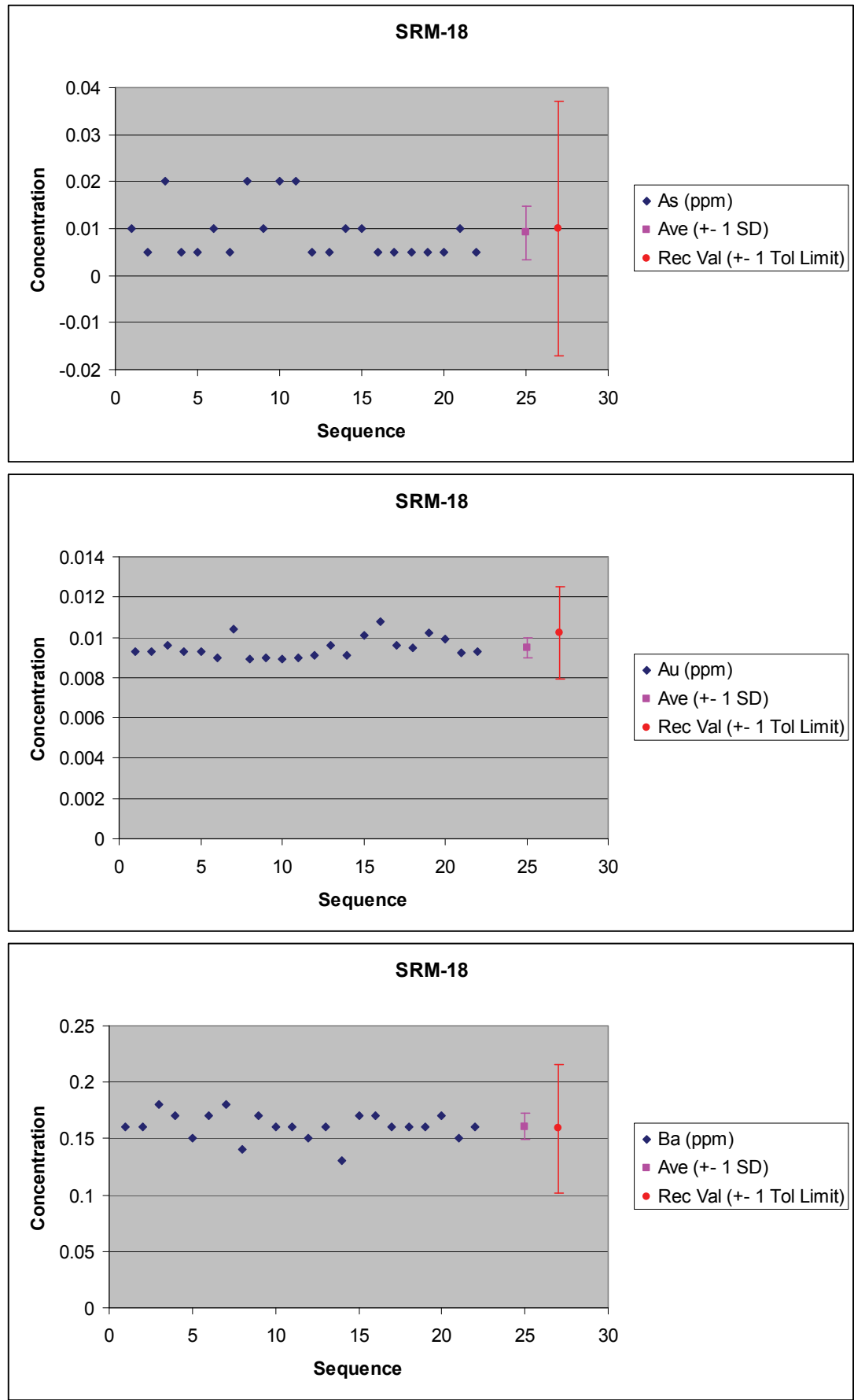
Appendix 6. X-plot for Aqua Regia analysis of Se standard OREAS-97.01



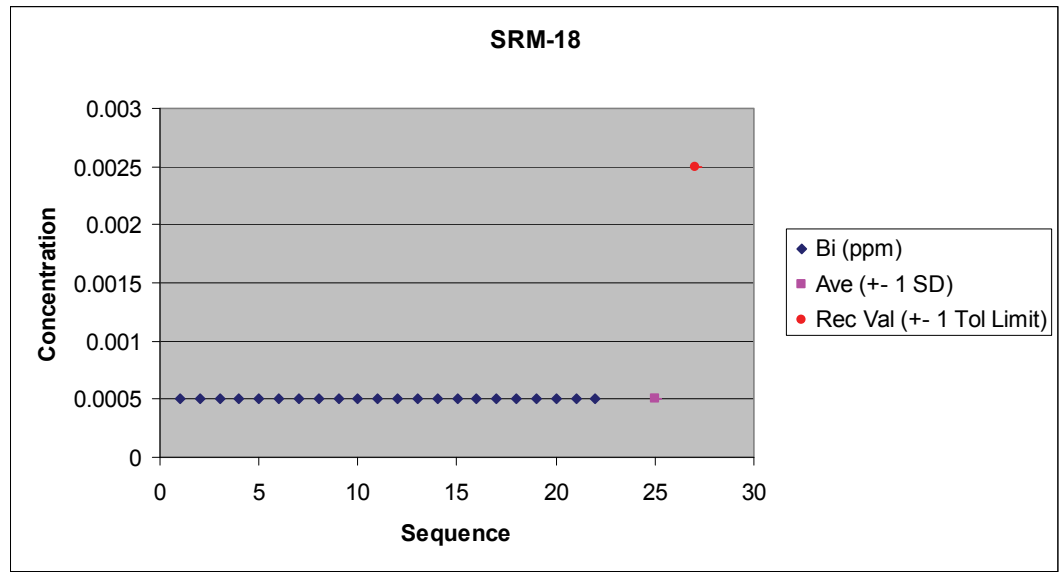
Note: This is standard OREAS-97 diluted 1:100 and run by the laboratory. The Recommended Value is shown with 95% Confidence Intervals (CI)

Appendix 7. X-plots for MMI™ analysis of SRM-18

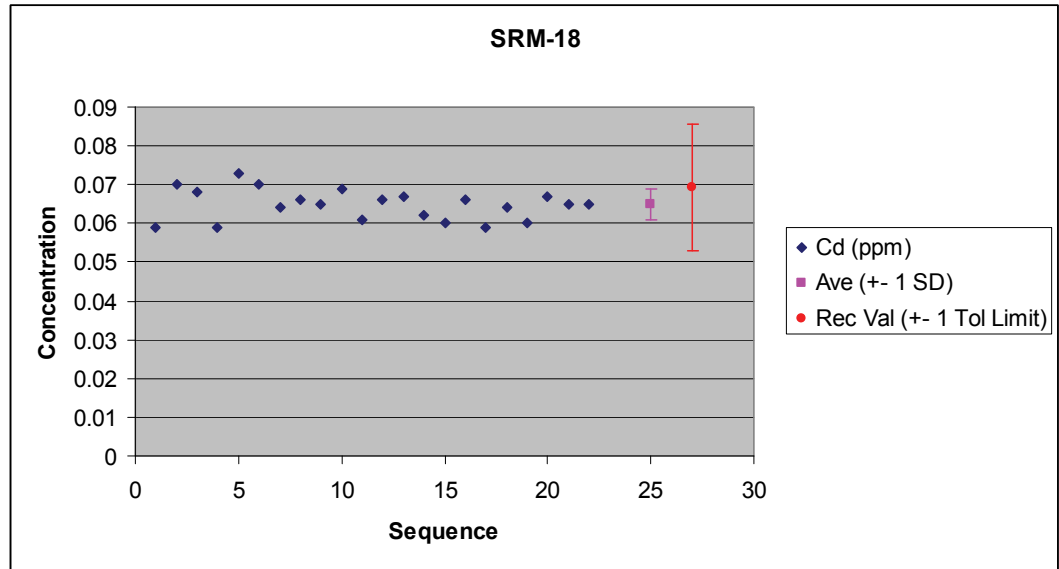
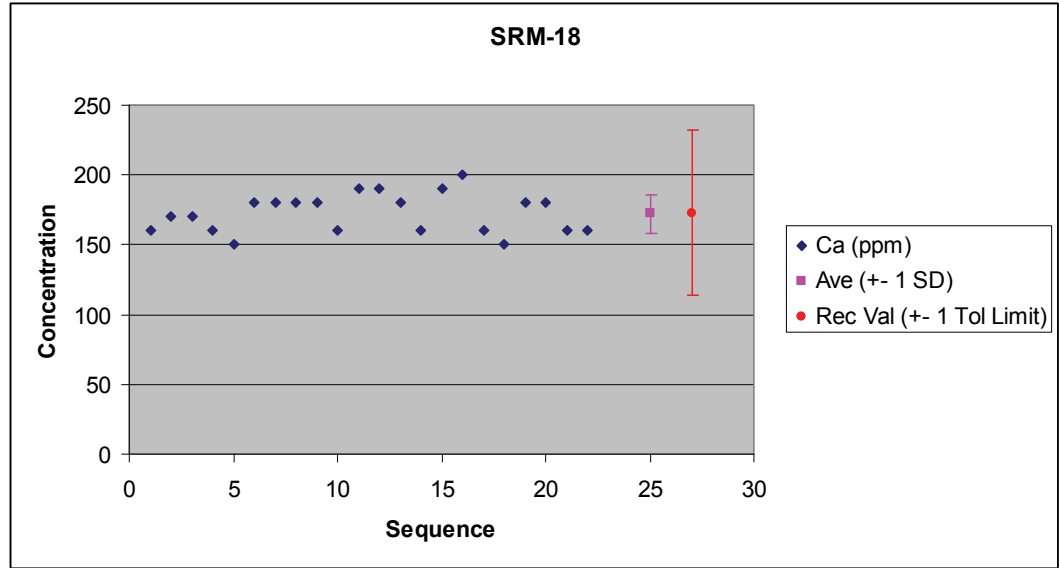


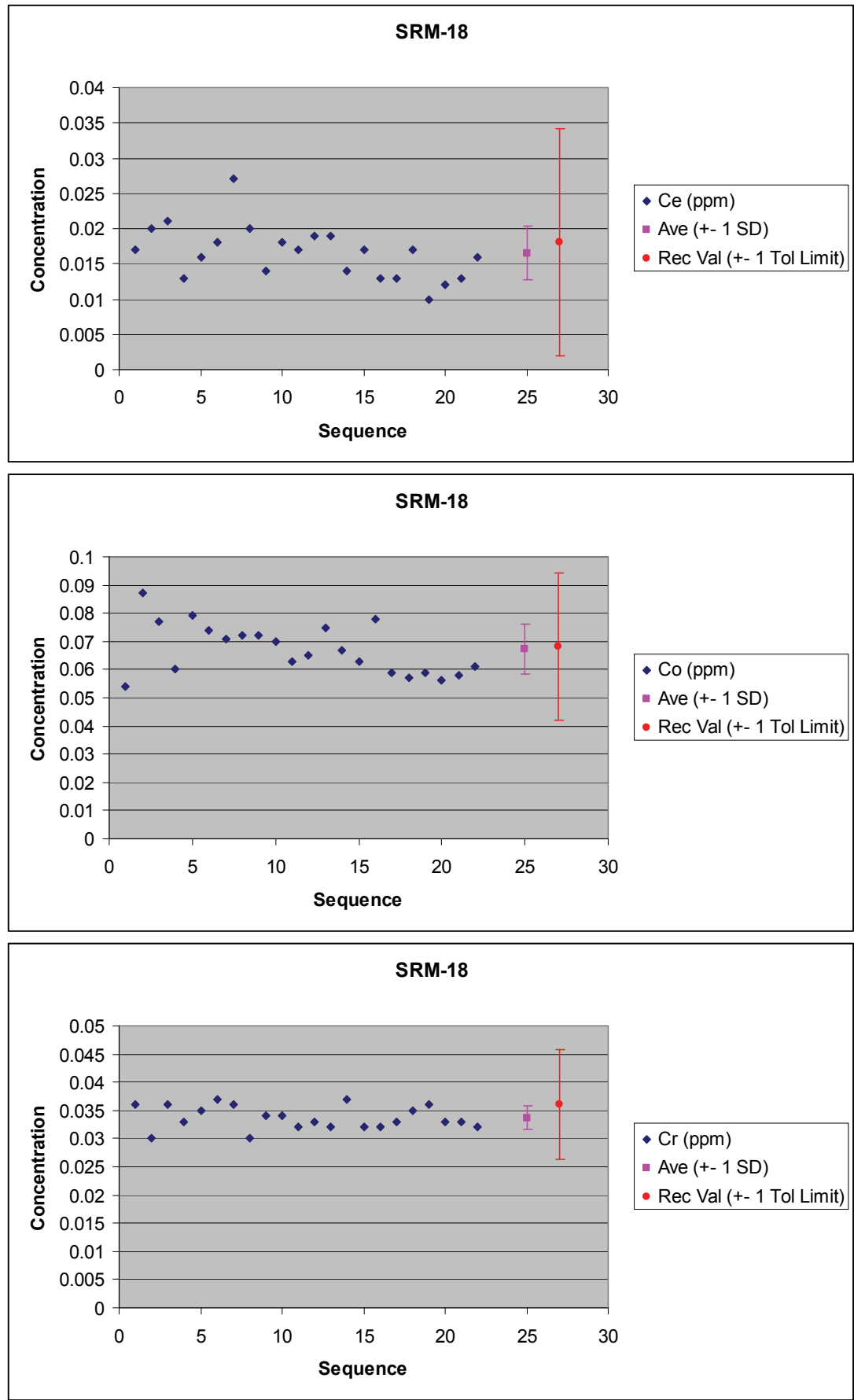


Appendix 7. X-plots for MMI™ analysis of SRM-18

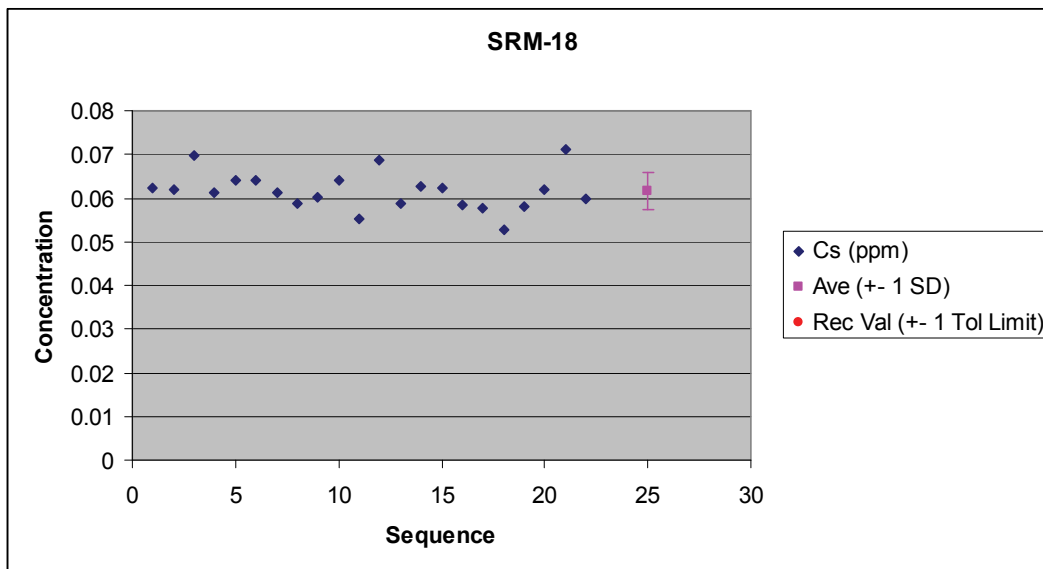


Note: For Bi, all values below 0.0025 ppm are deemed acceptable.

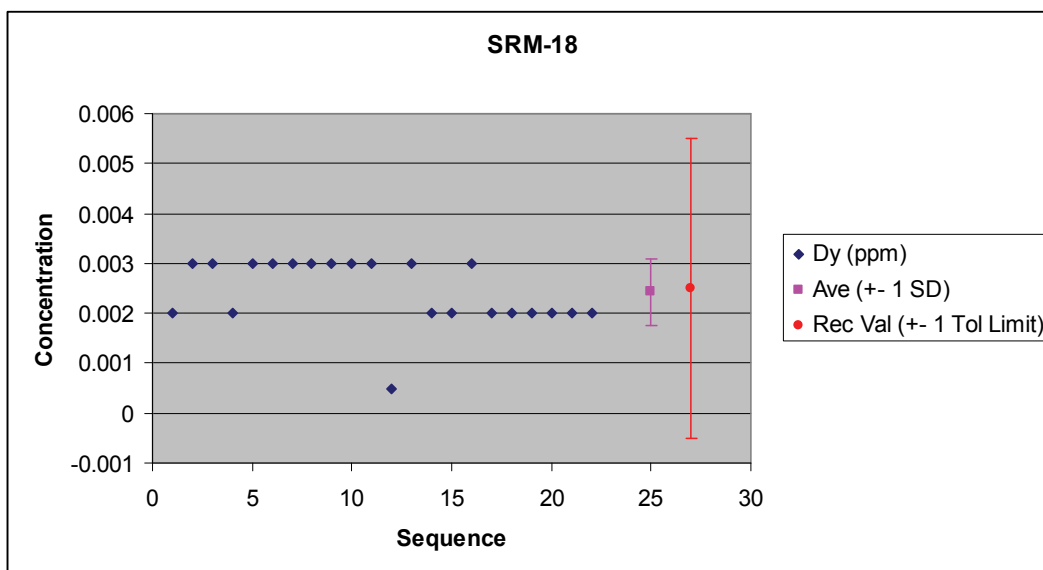
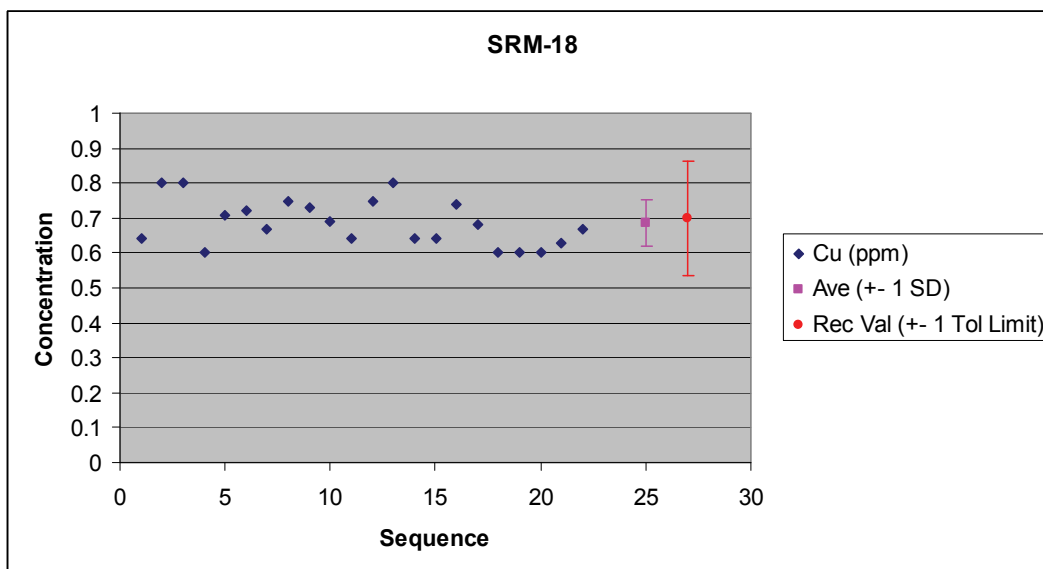




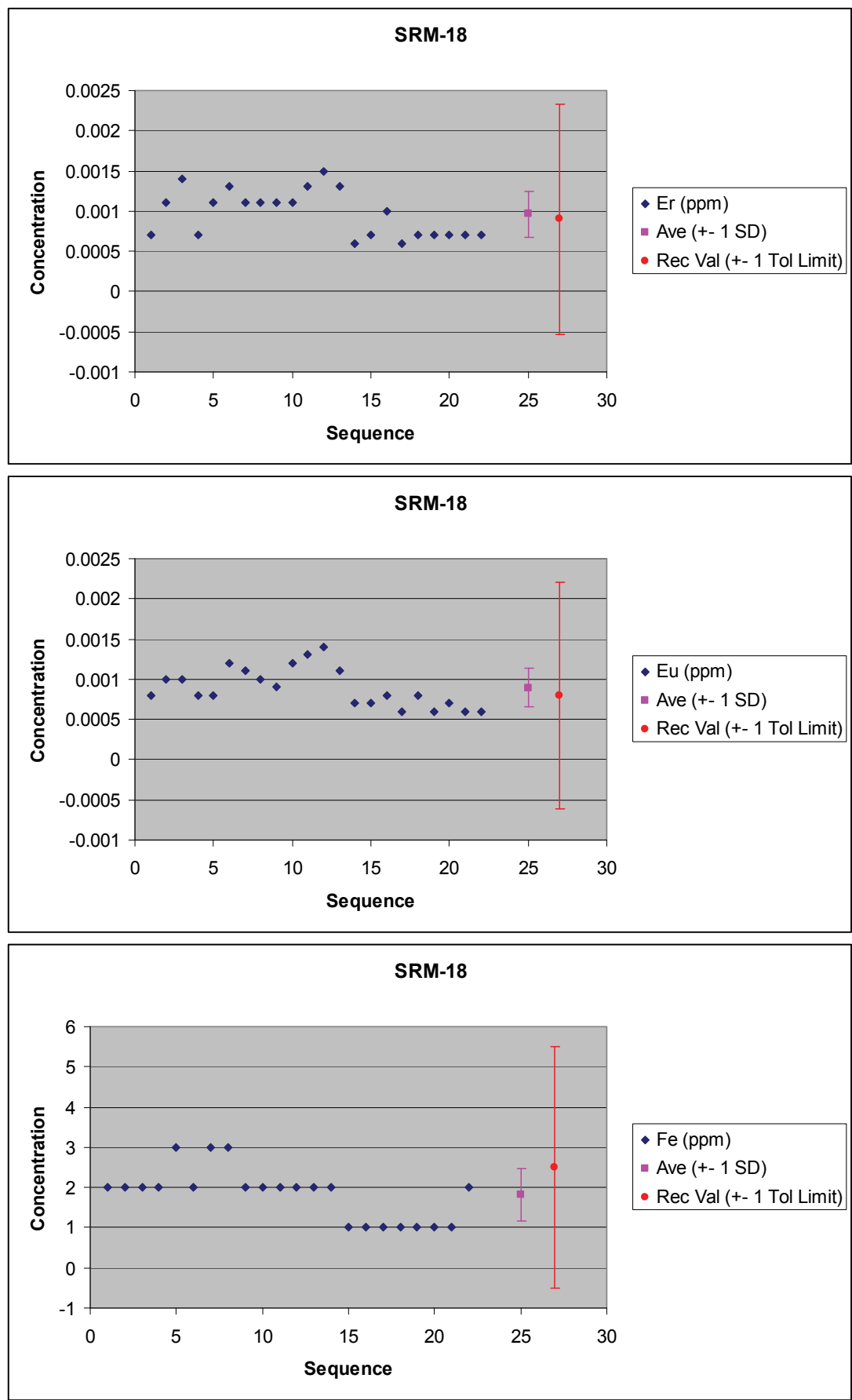
Appendix 7. X-plots for MMI™ analysis of SRM-18

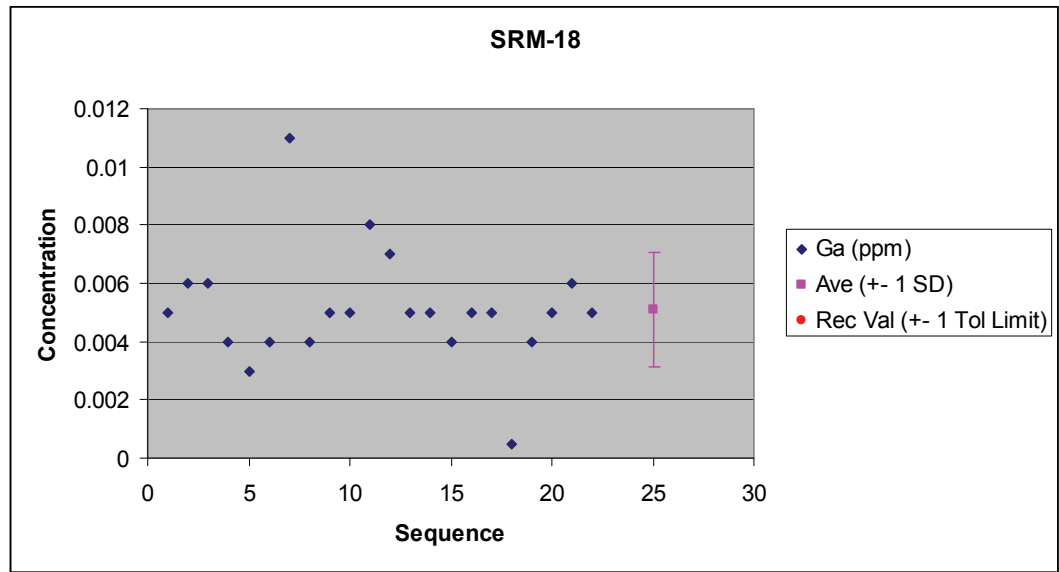


Note: No Recommended Value or Tolerance Limit for Cs.

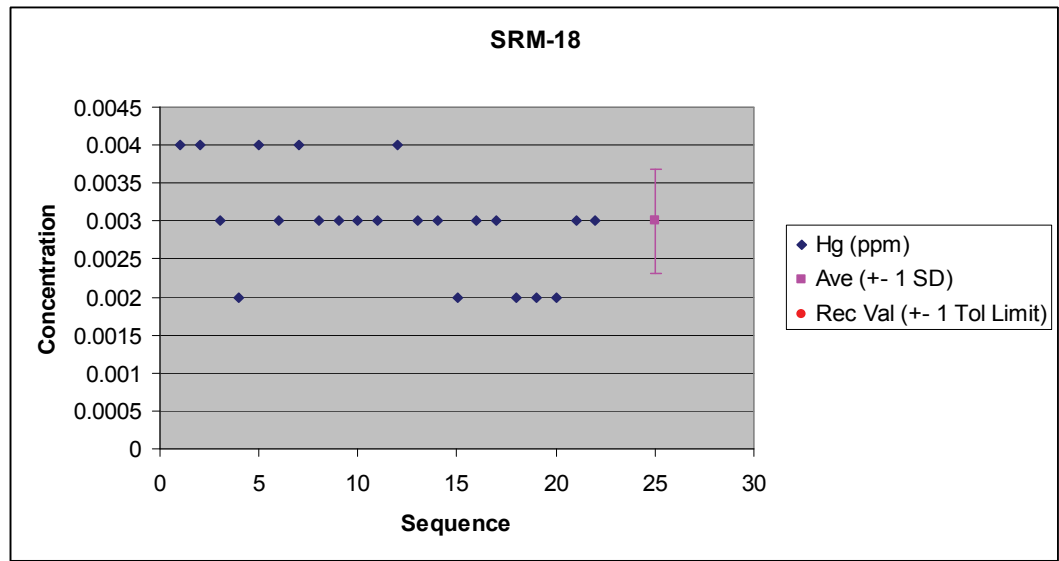
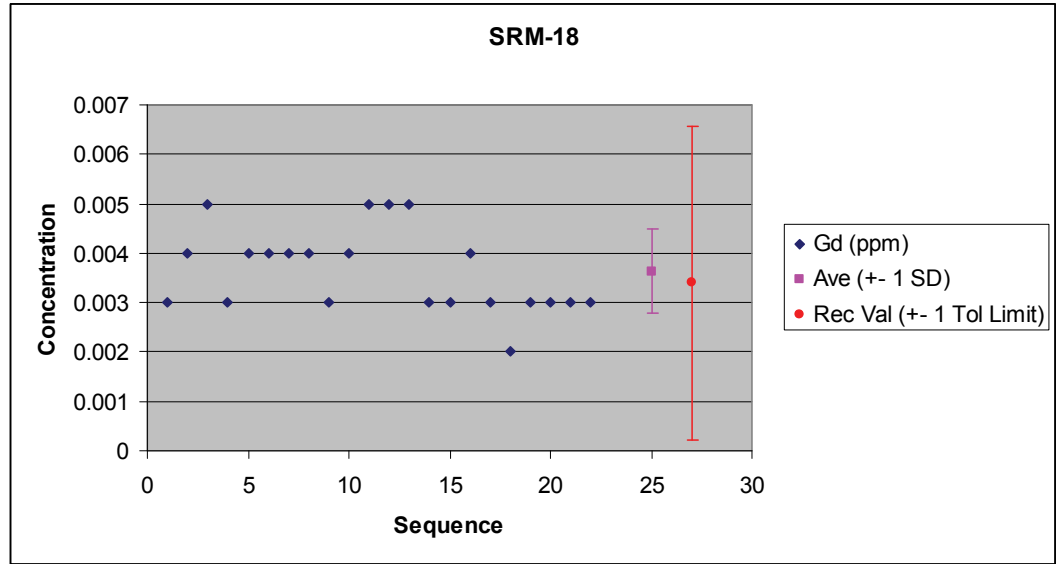


Appendix 7. X-plots for MMI™ analysis of SRM-18



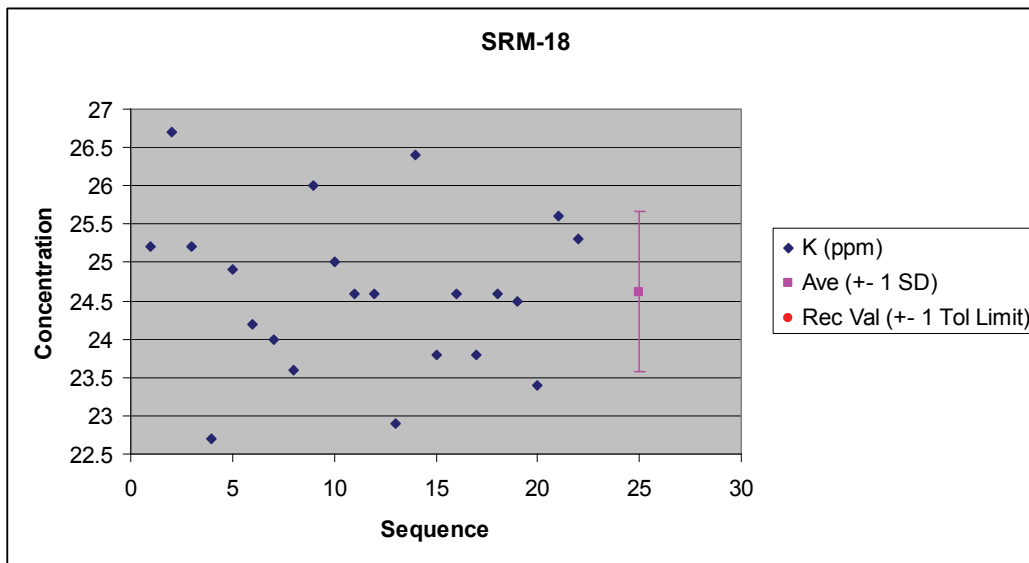


Note: No Recommended Value or Tolerance Limit for Ga.

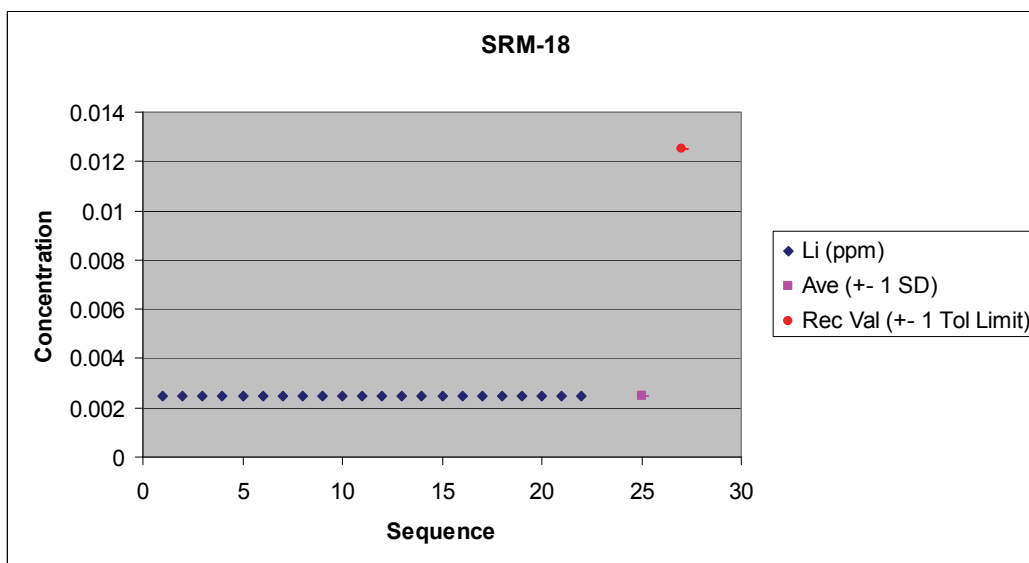
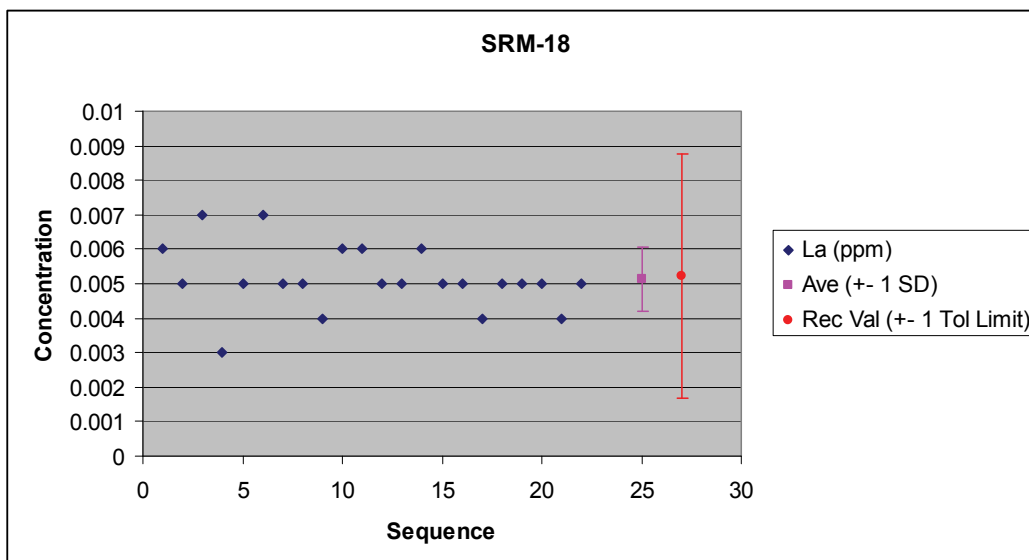


Note: No Recommended Value or Tolerance Limit for Hg.

Appendix 7. X-plots for MMI™ analysis of SRM-18

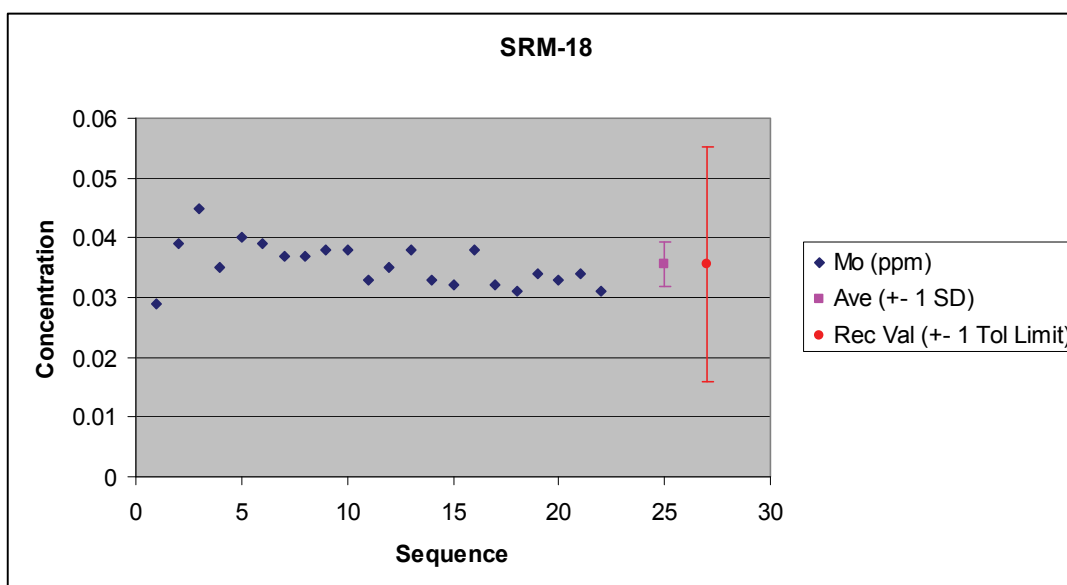
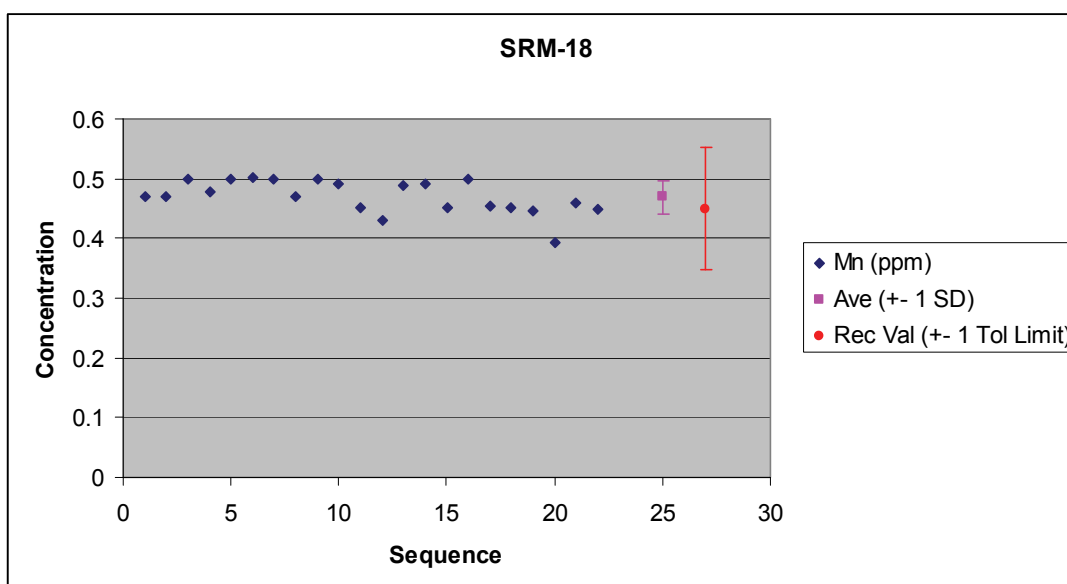
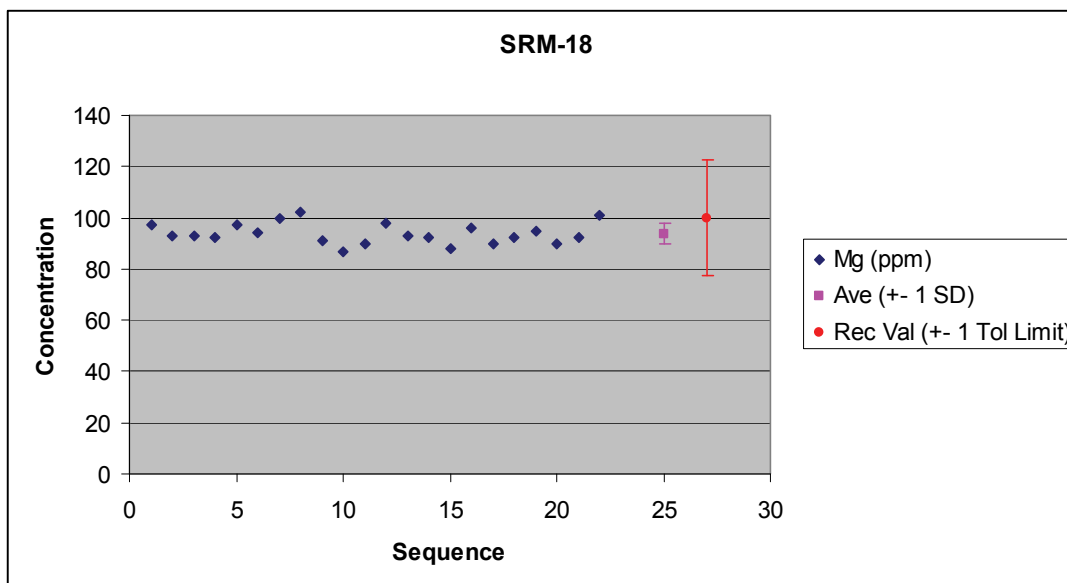


Note: No Recommended Value or Tolerance Limit for K.

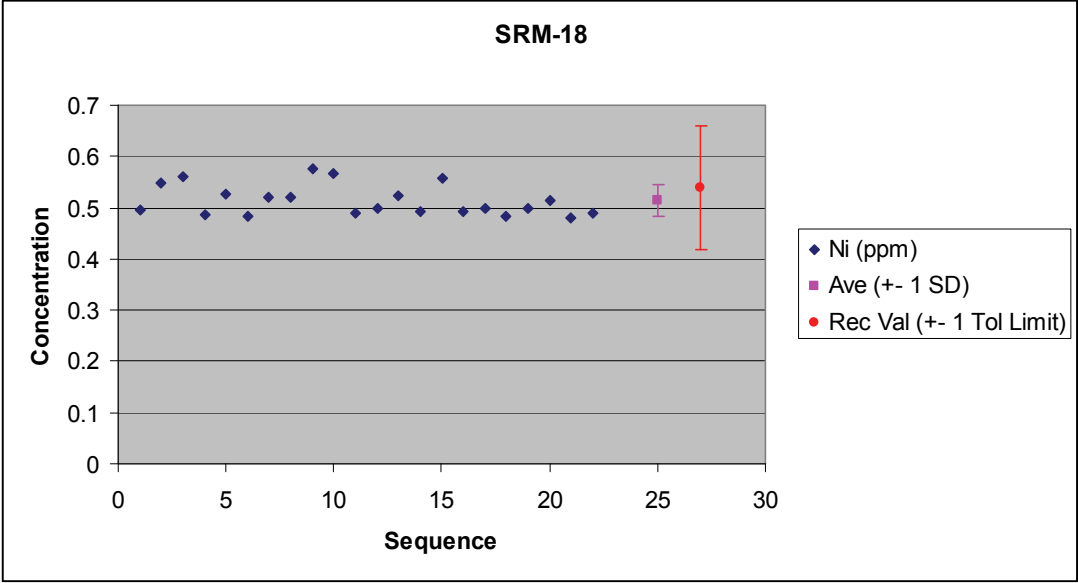
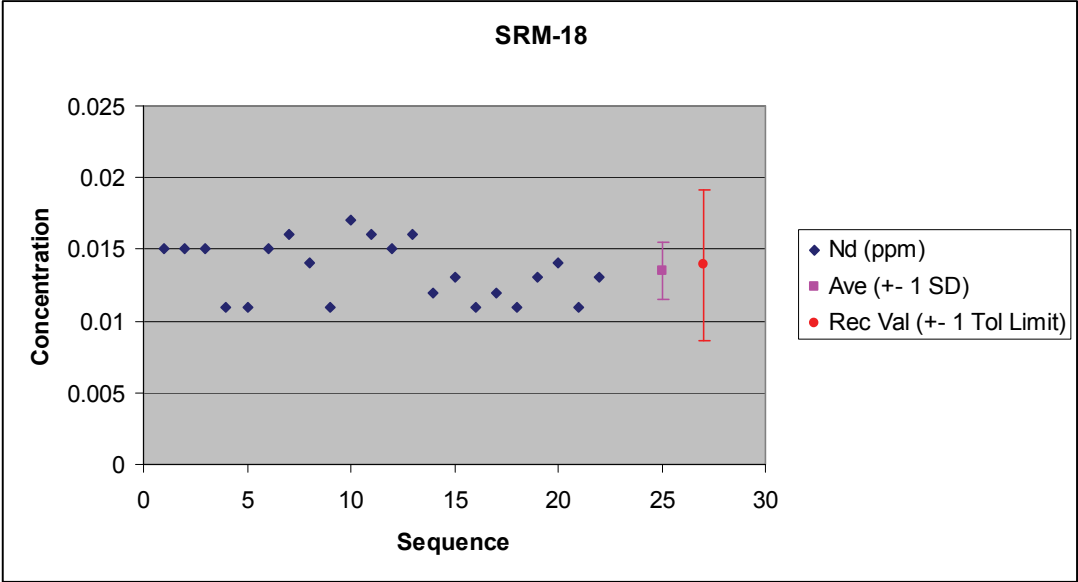
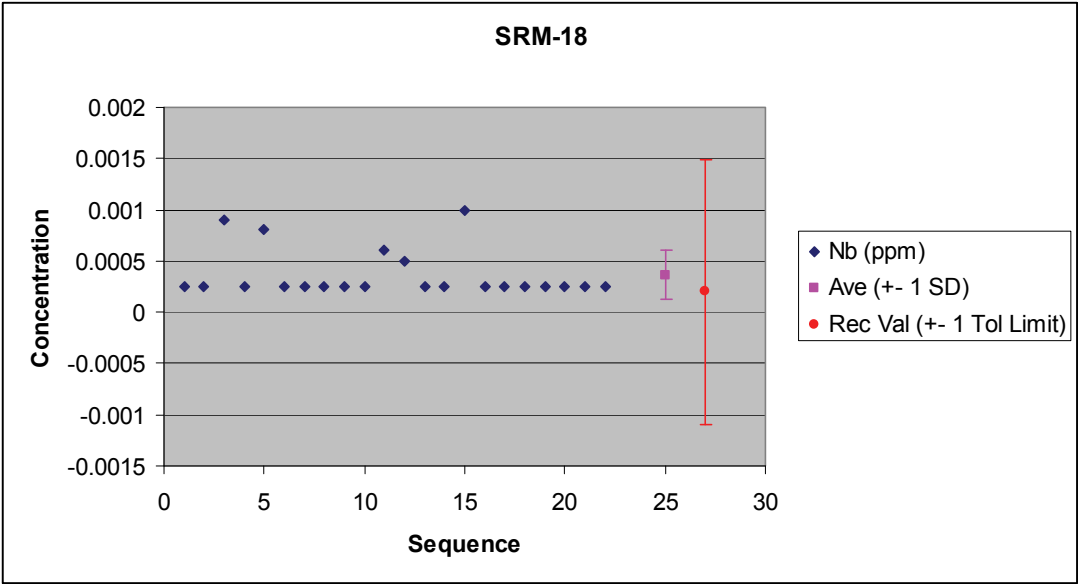


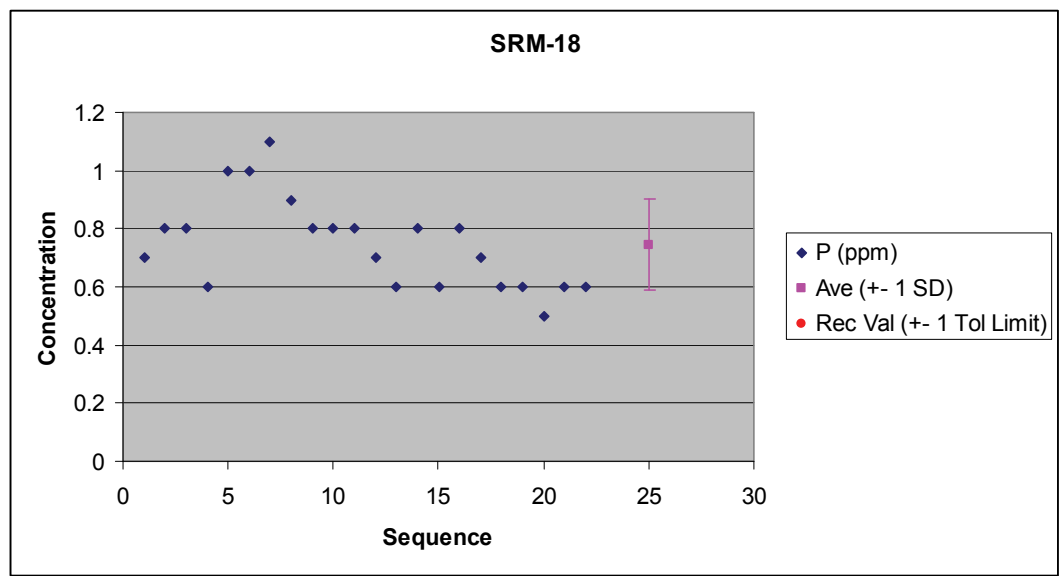
Note: For Li, all values below 0.0125 ppm are deemed acceptable.

Appendix 7. X-plots for MMI™ analysis of SRM-18

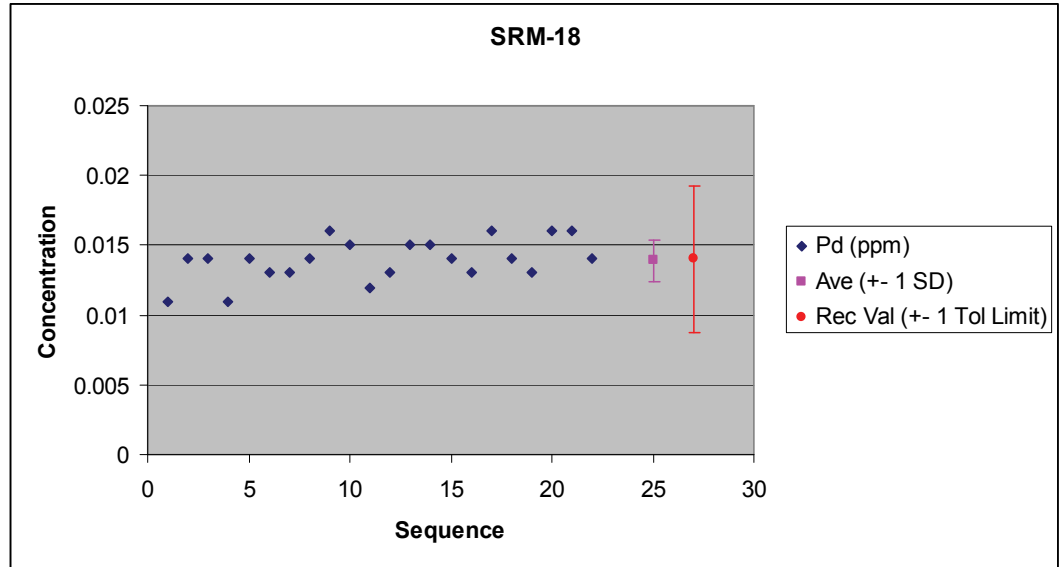
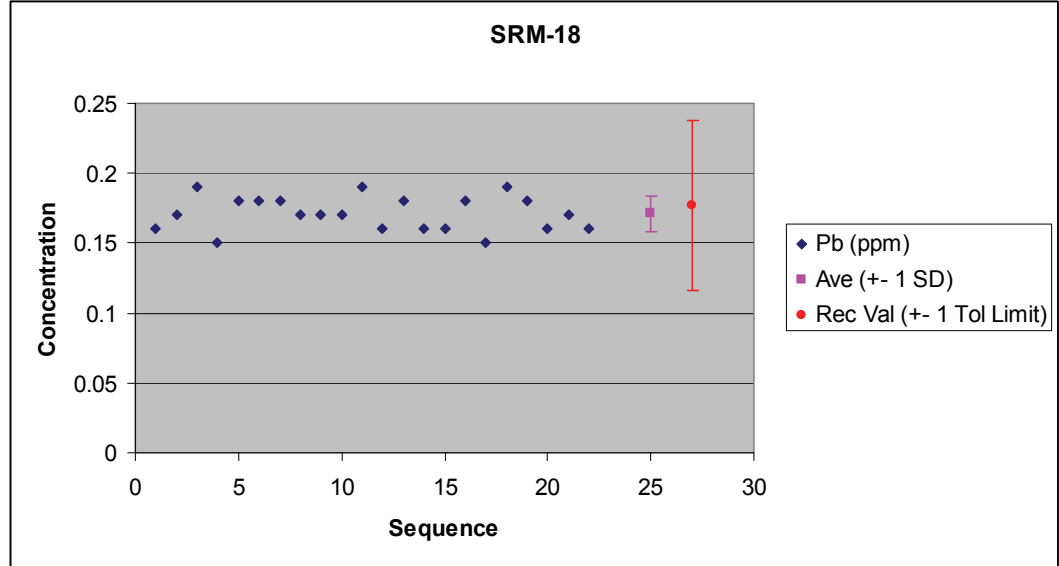


Appendix 7. X-plots for MMI™ analysis of SRM-18

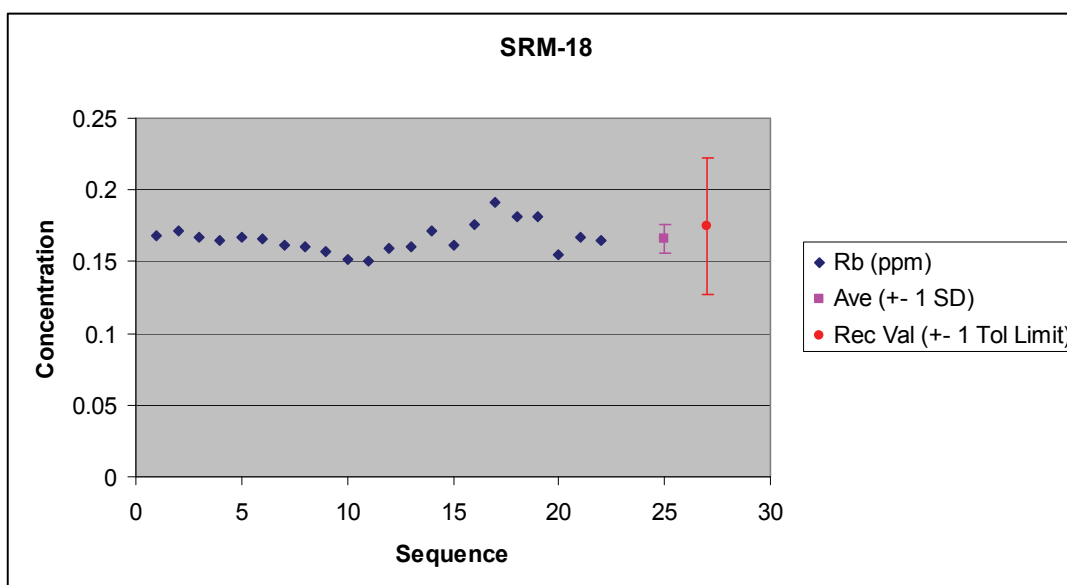
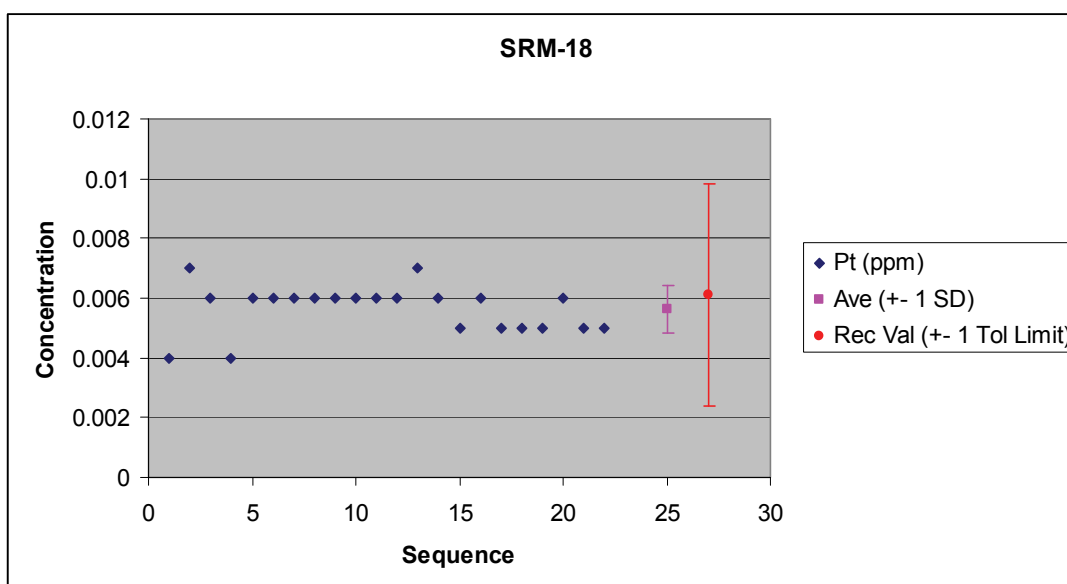
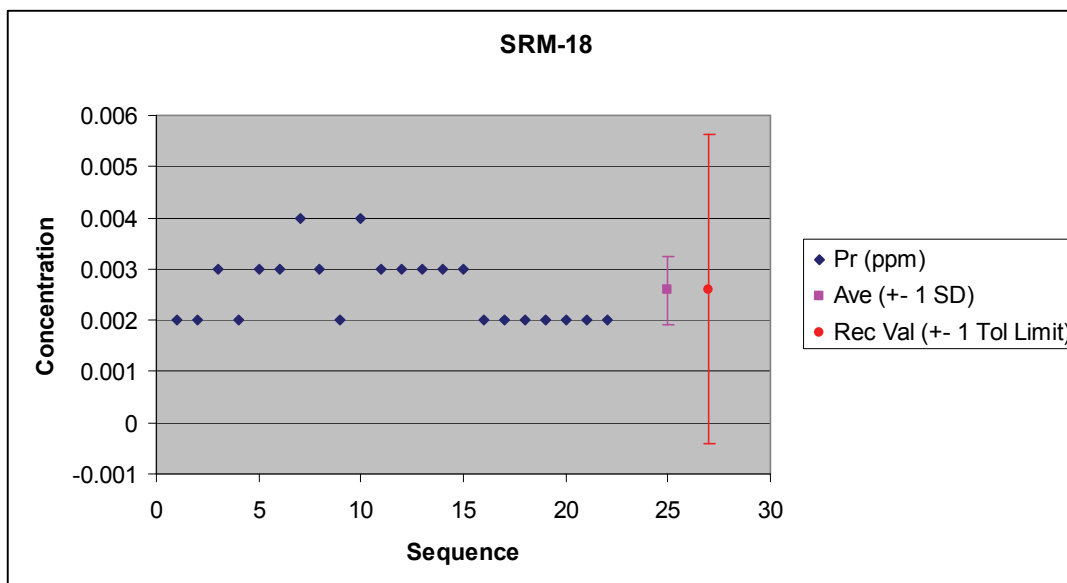




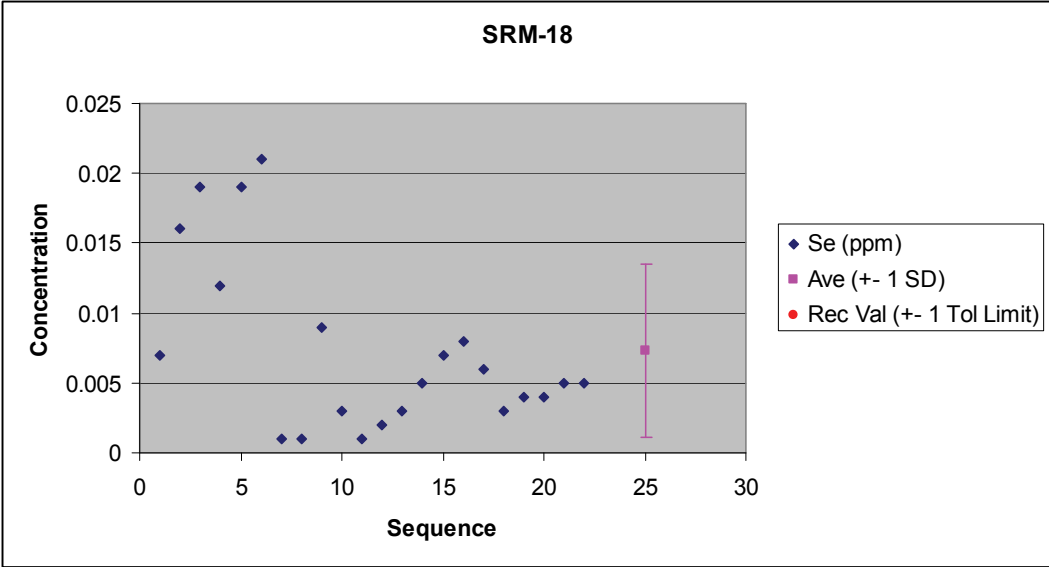
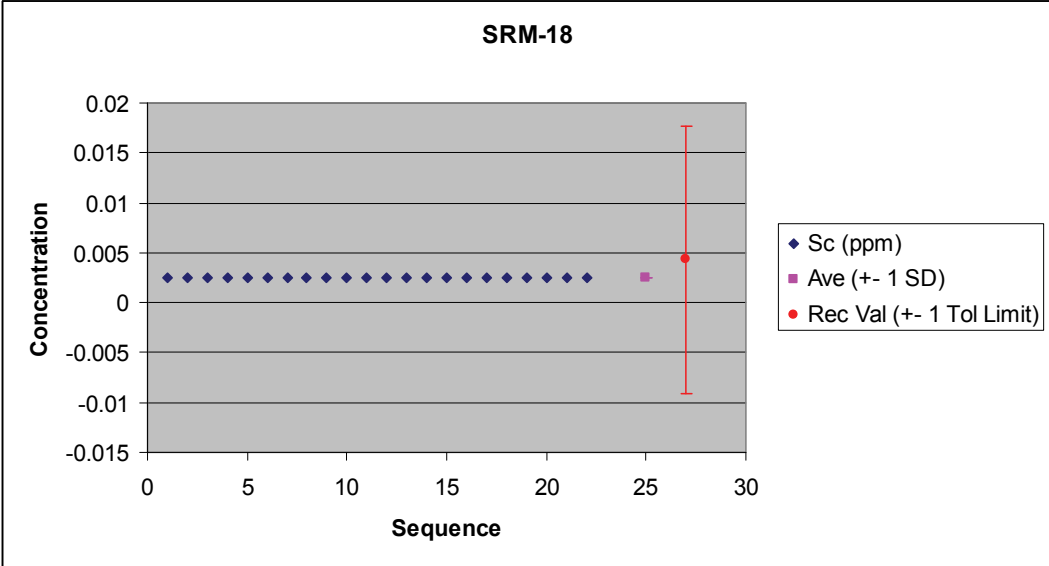
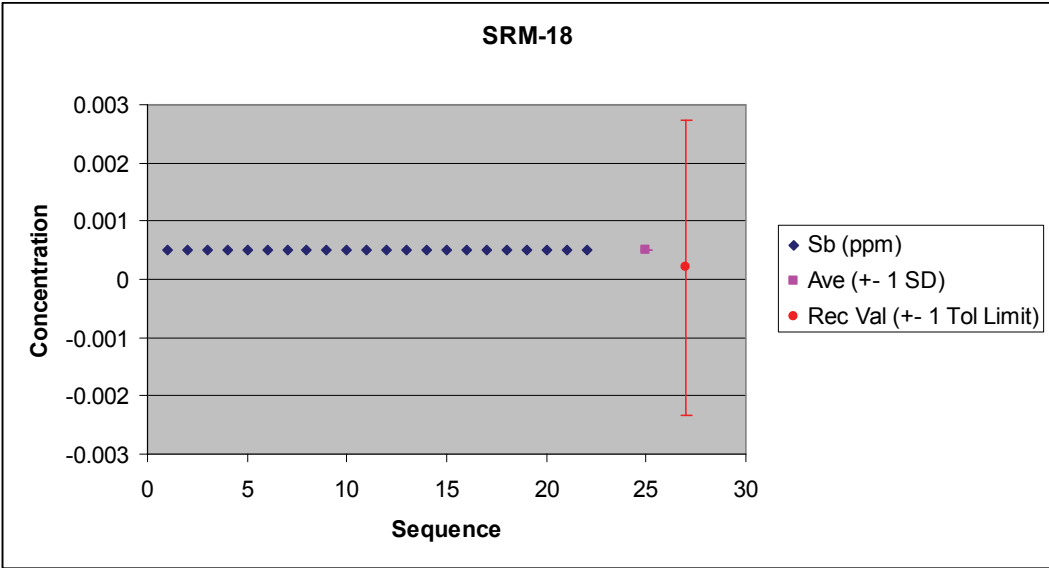
Note: No Recommended Value or Tolerance Limit for P.



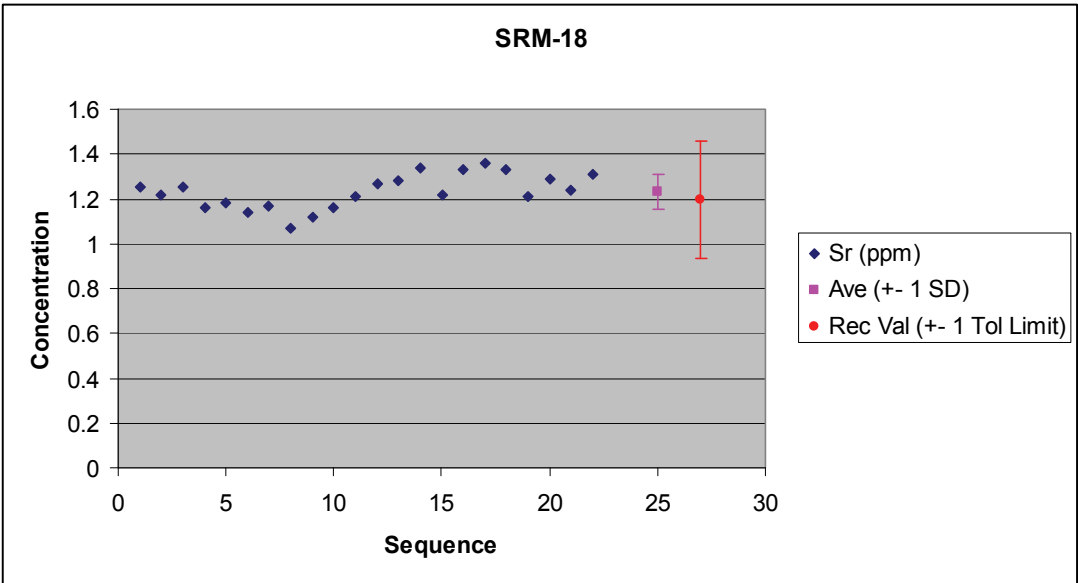
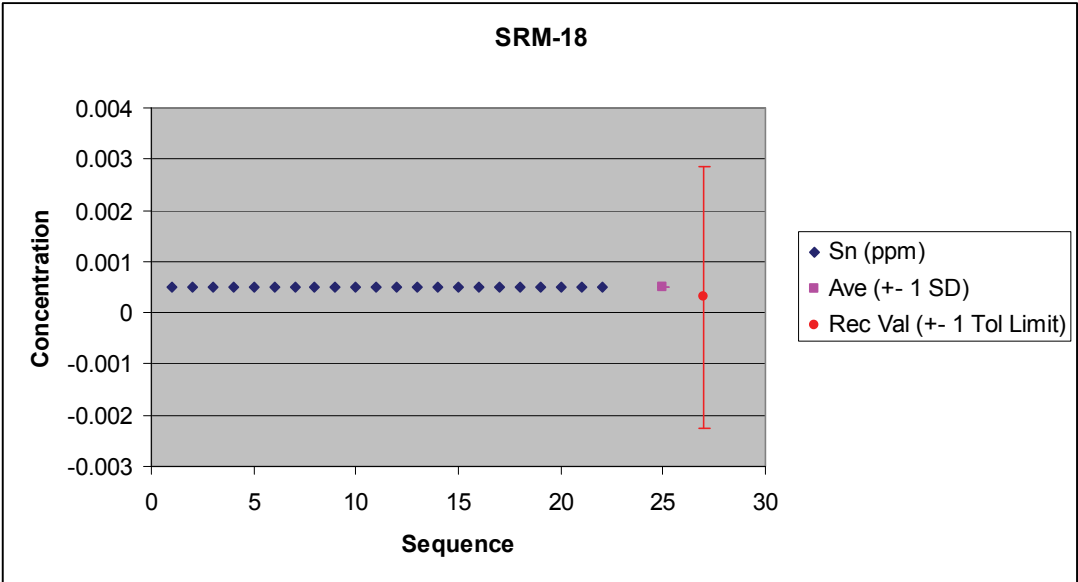
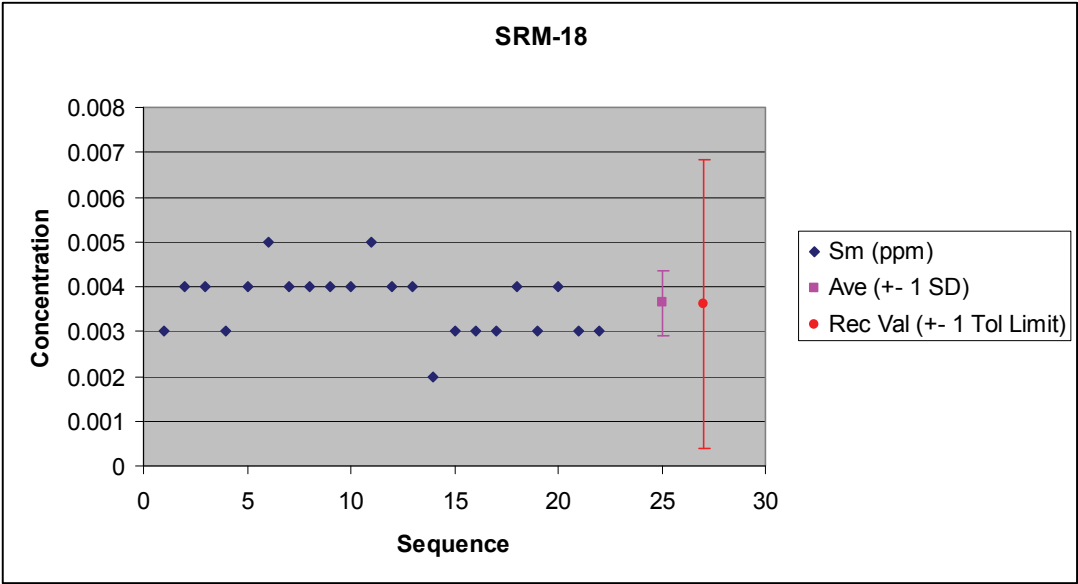
Appendix 7. X-plots for MMI™ analysis of SRM-18

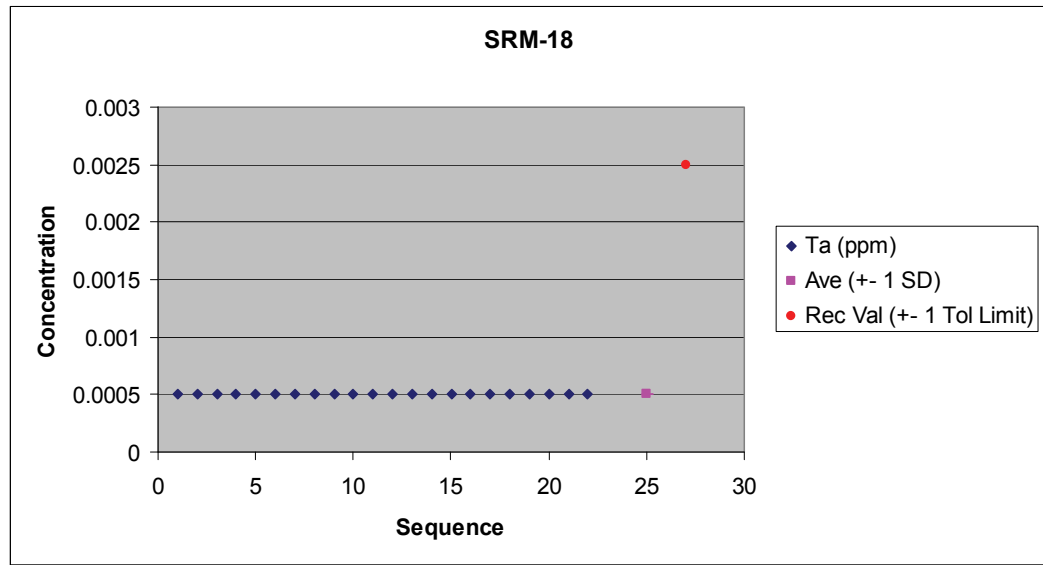


Appendix 7. X-plots for MMI™ analysis of SRM-18

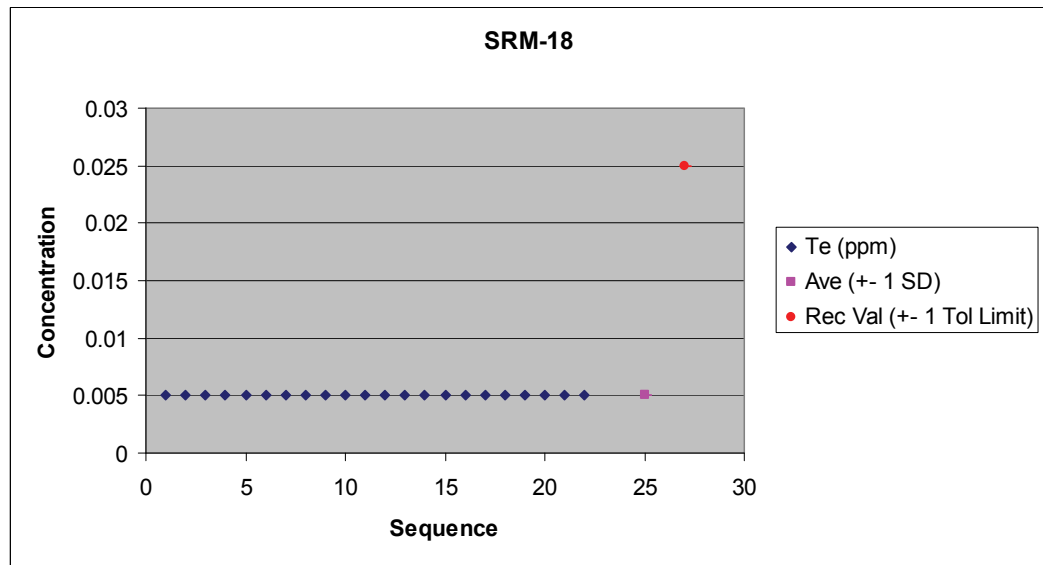
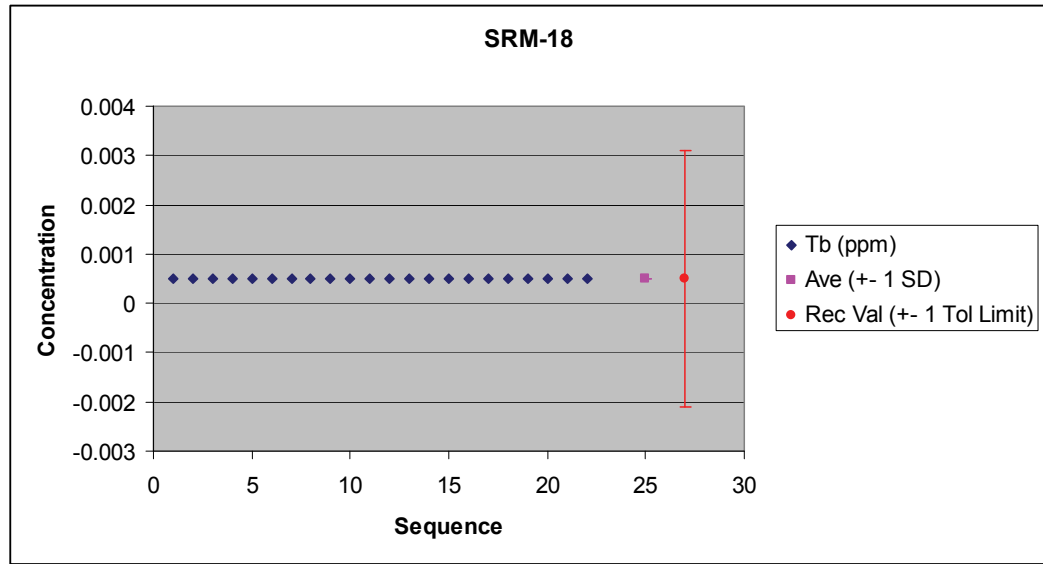


Note: No Recommended Value or Tolerance Limit for Se.



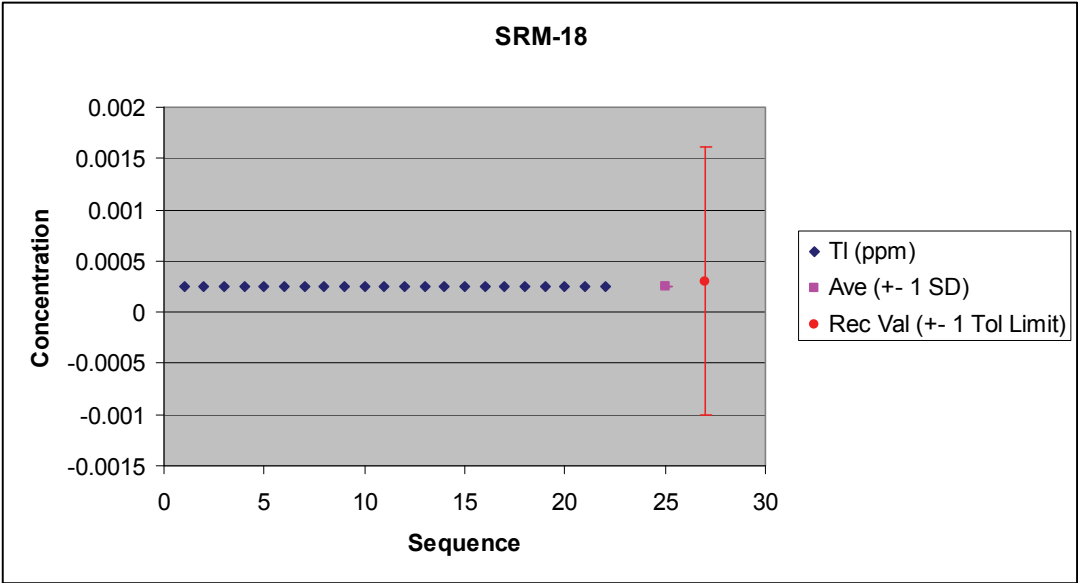
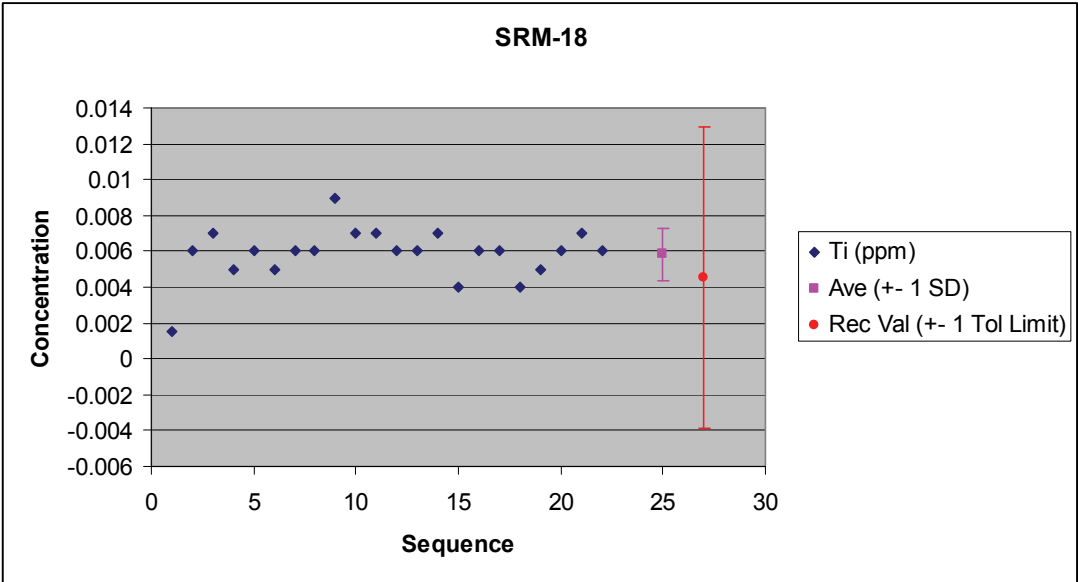
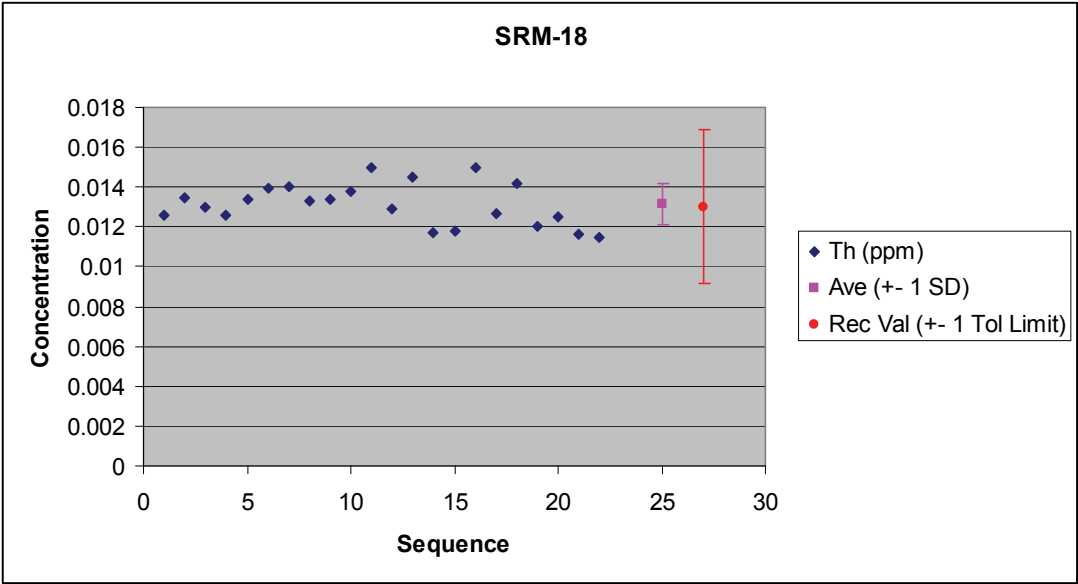


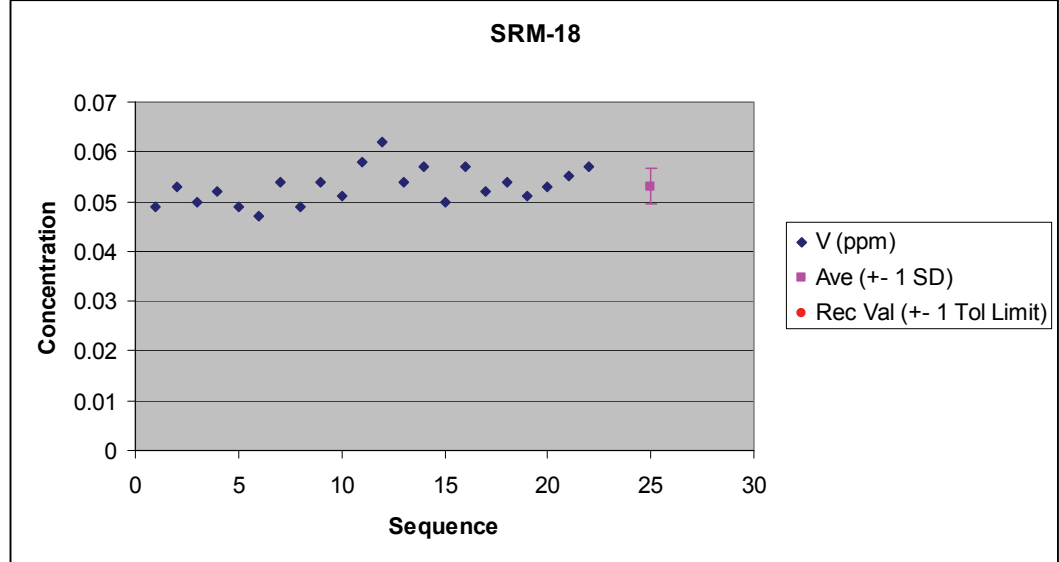
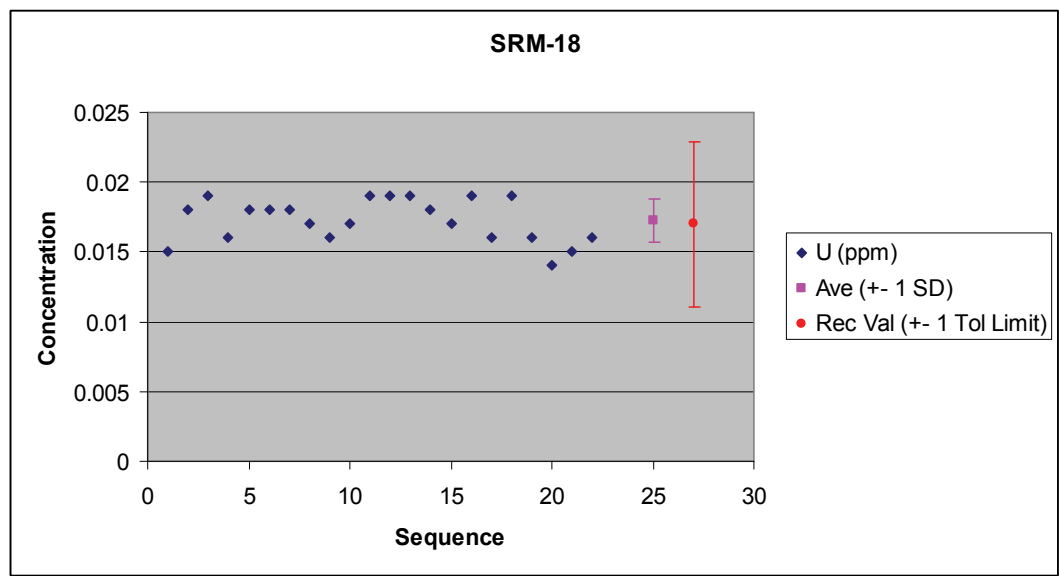
Note: For Ta, all values below 0.0025 ppm are deemed acceptable.



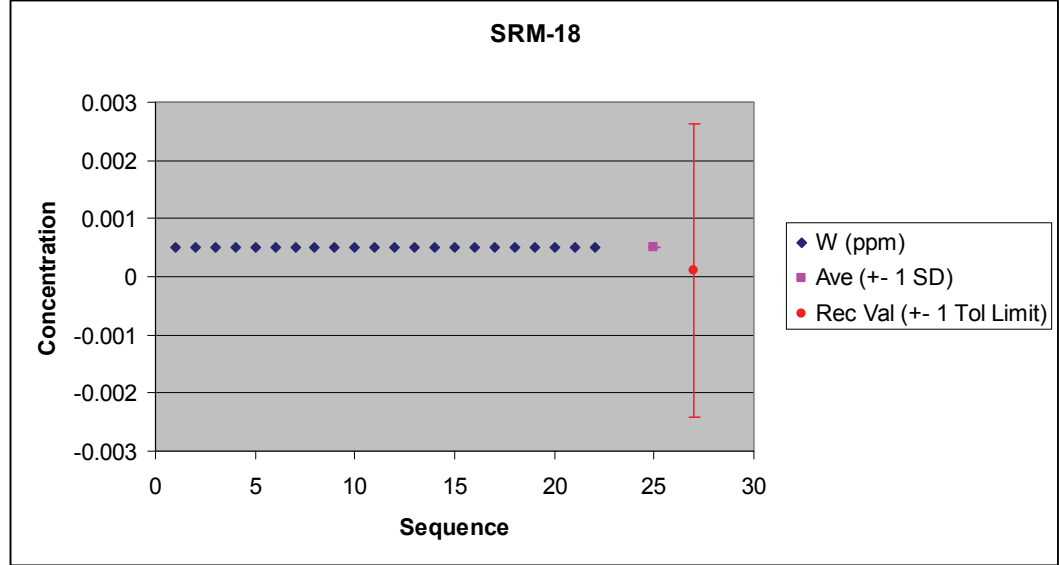
Note: For Te, all values below 0.025 ppm are deemed acceptable.

Appendix 7. X-plots for MMI™ analysis of SRM-18

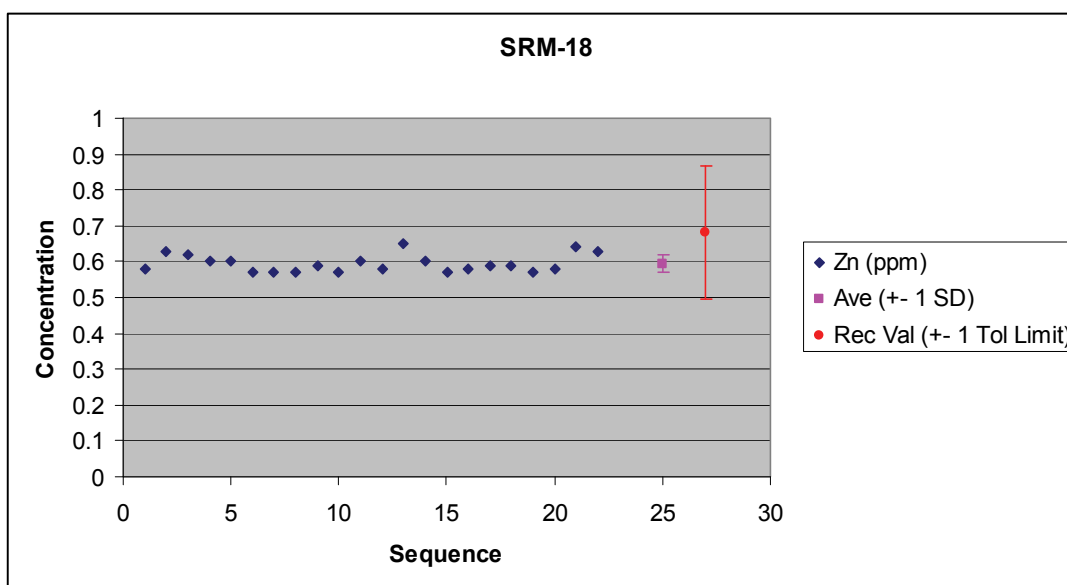
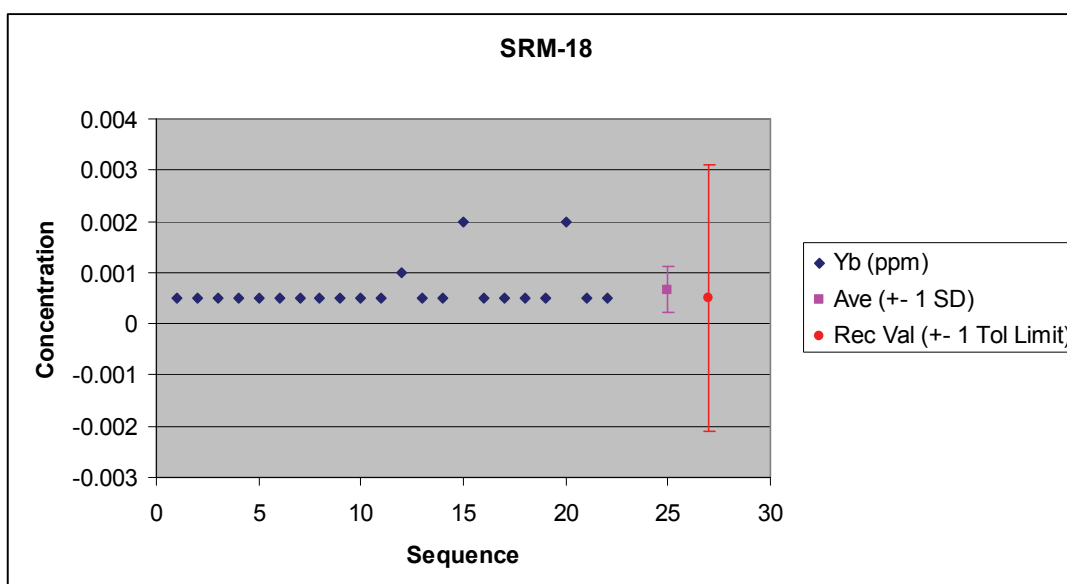
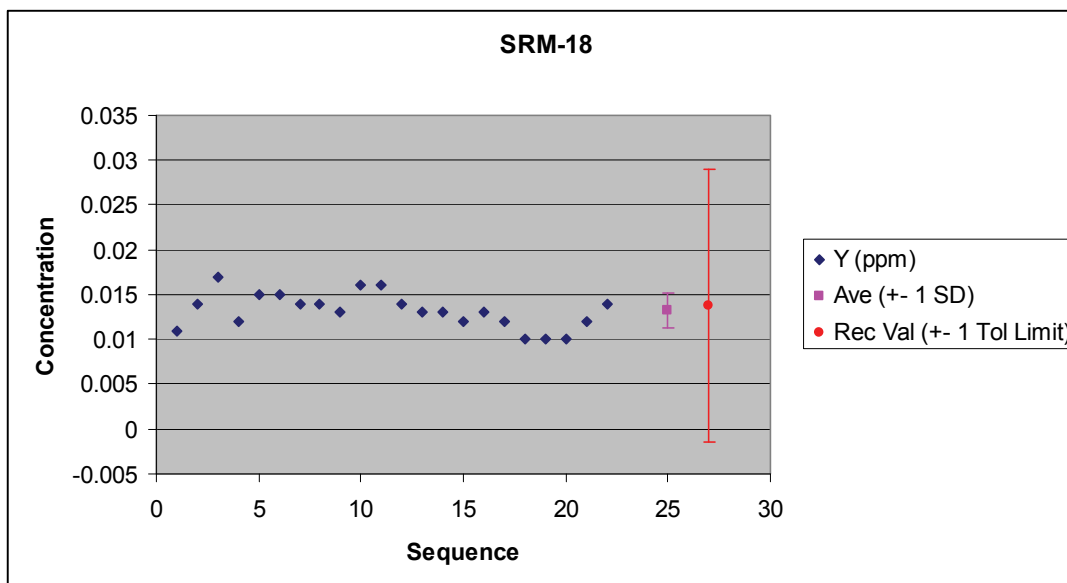


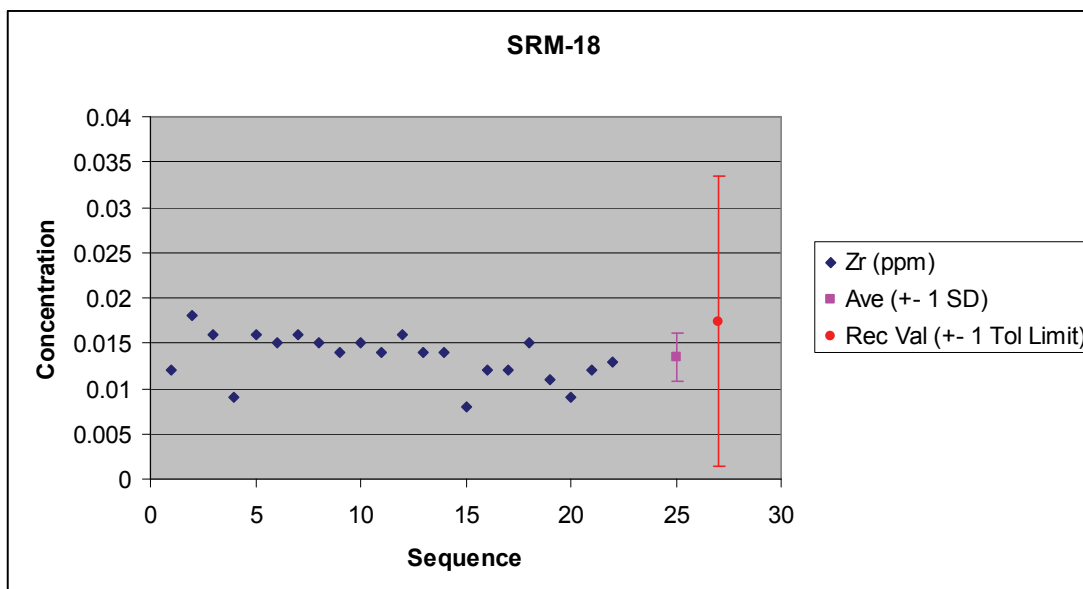


Note: No Recommended Value or Tolerance Limit for V.

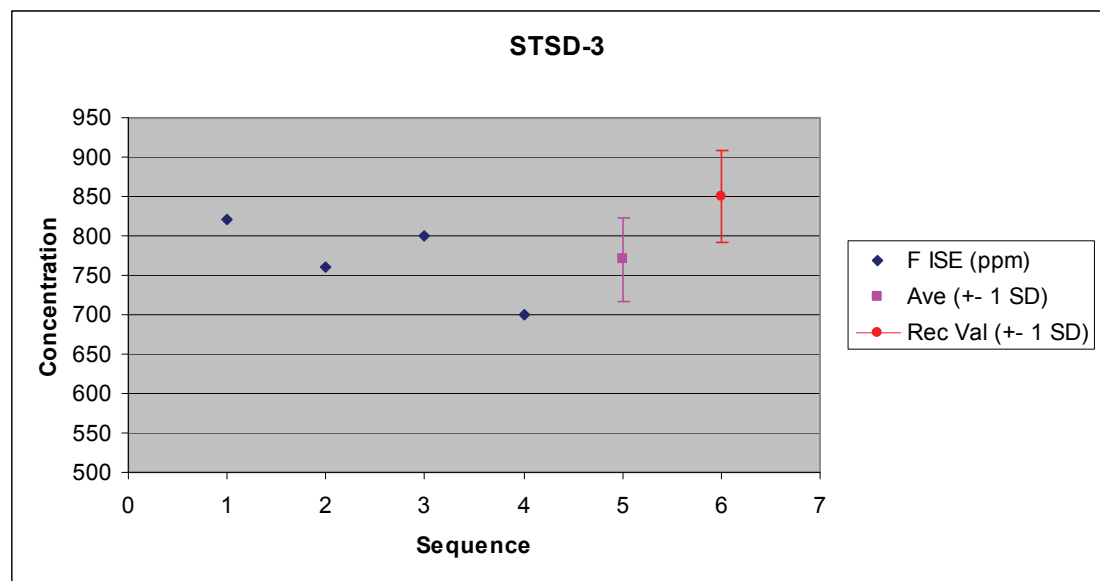


Appendix 7. X-plots for MMI™ analysis of SRM-18



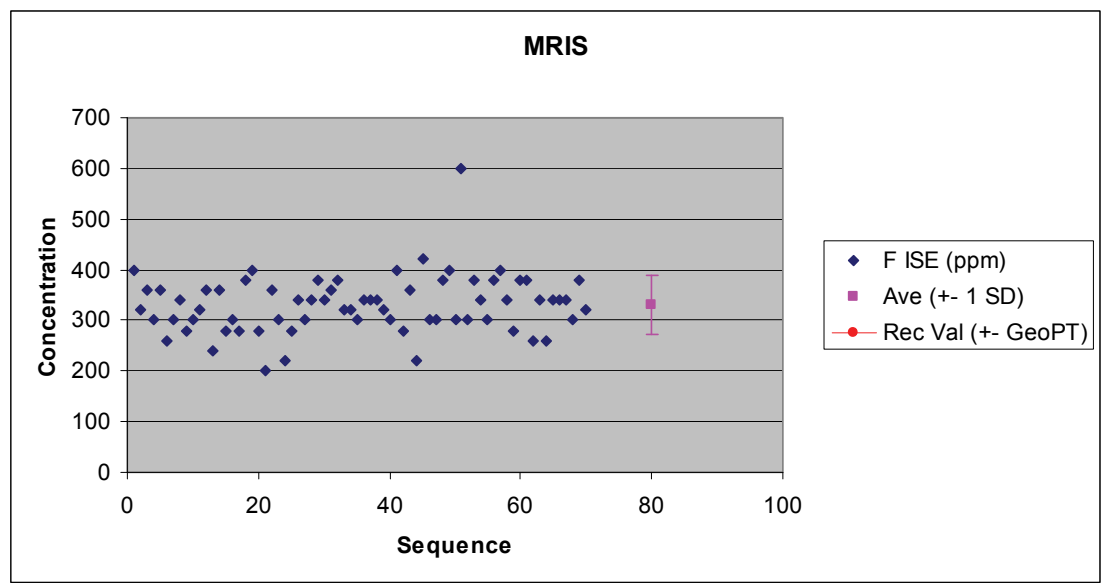


Appendix 8. X-plot for ISE analysis of STSD-3



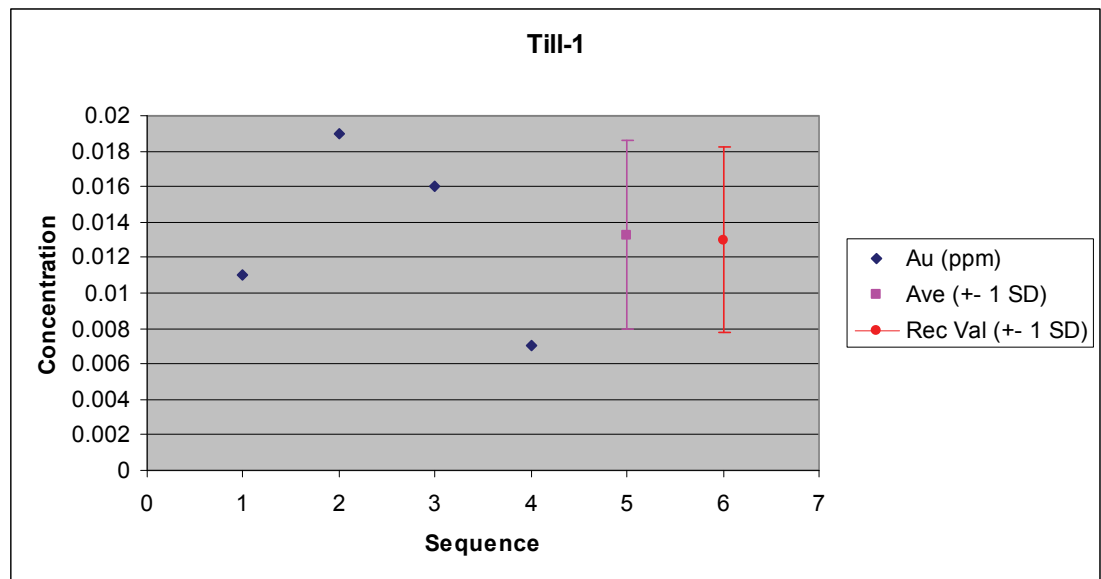
Note: No GeoPT value, so Recommended Value shown with same RSD as data (7%) for error bars

Appendix 9. X-plot for ISE analysis of IPS MRIS

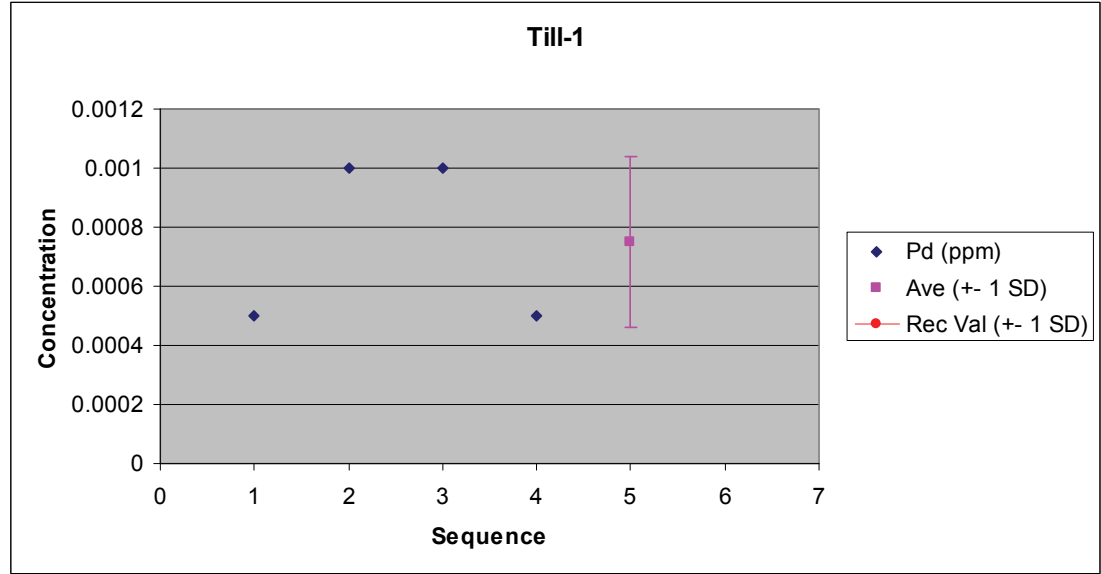


Note: No Recommended Value, no GeoPT values available

Appendix 10. X-plots for FA analysis of Till-1

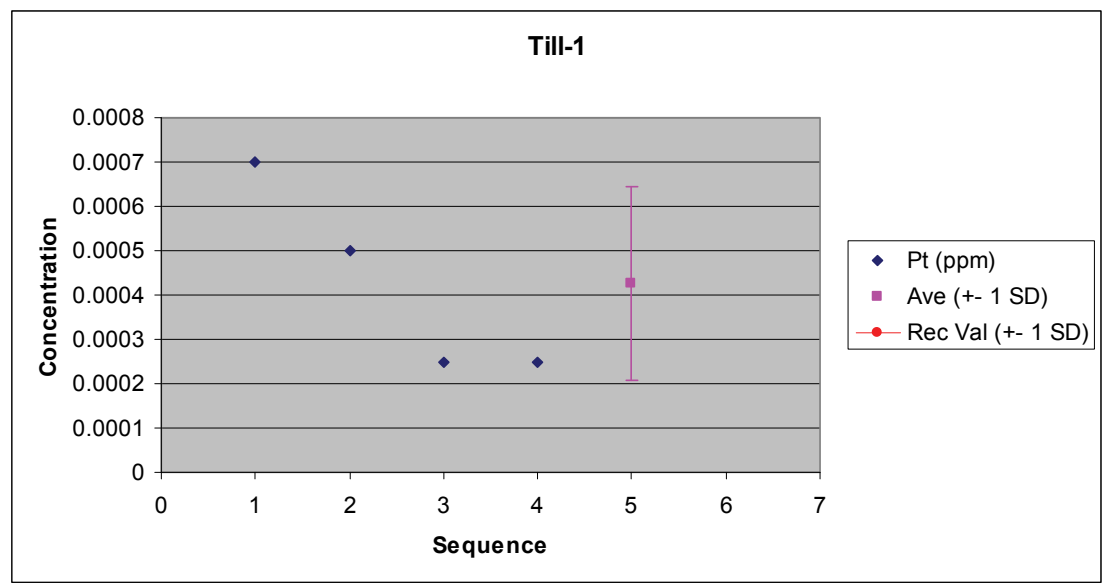


Note: No GeoPT value, so Recommended Value shown with same RSD as data (40%) for error bars



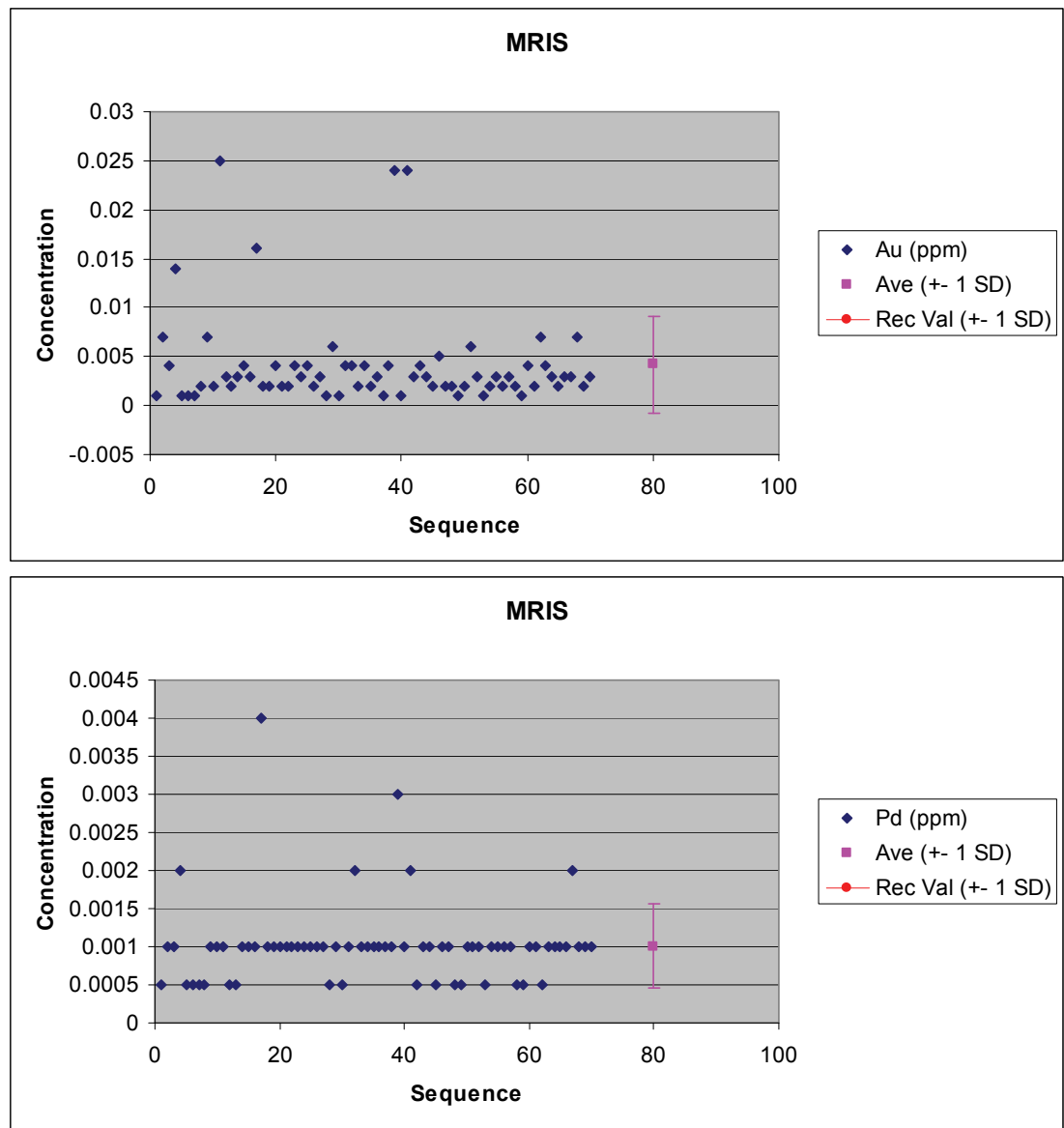
Note: No recommended Value, no GeoPT value. Two of four data points are <LLD

Appendix 10. X-plots for FA analysis of Till-1



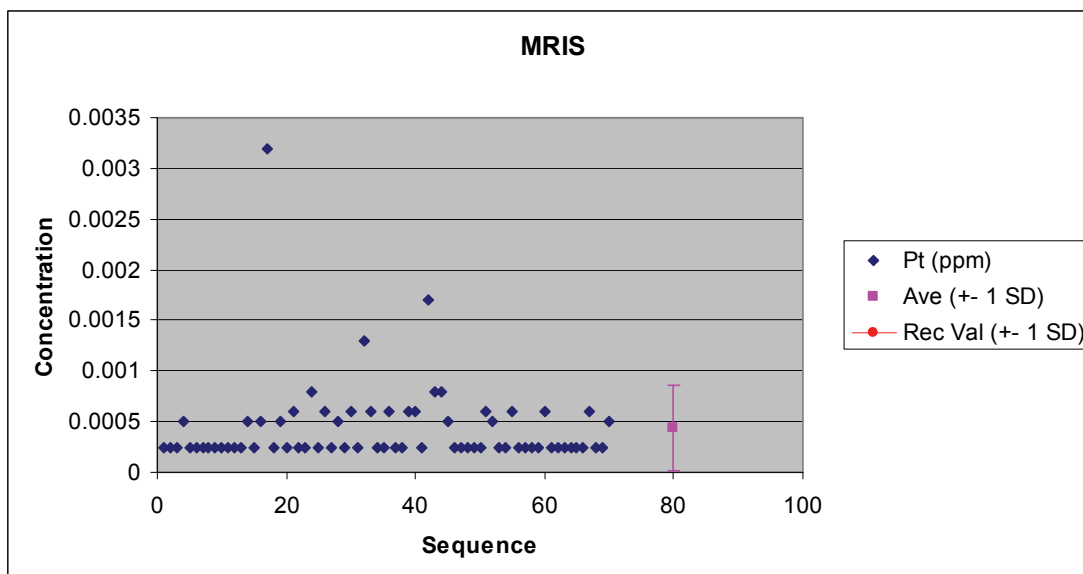
Note: No recommended Value, no GeoPT value. 50% data (2 of 4) are <LLD

Appendix 11. X-plots for FA analysis of IPS MRIS



Note: 24% data (17 of 70) are <LLD

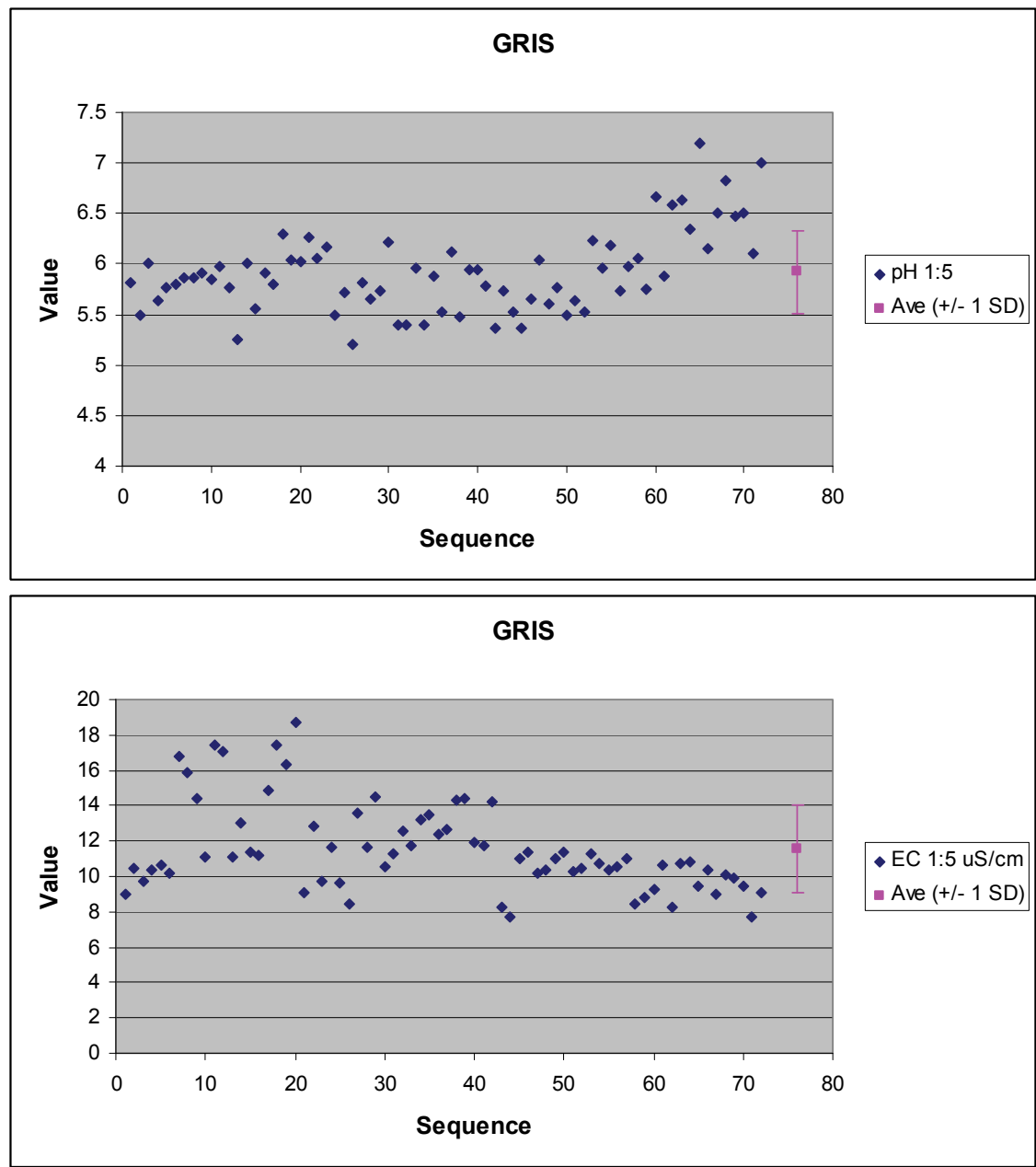
Appendix 11. X-plots for FA analysis of MRIS



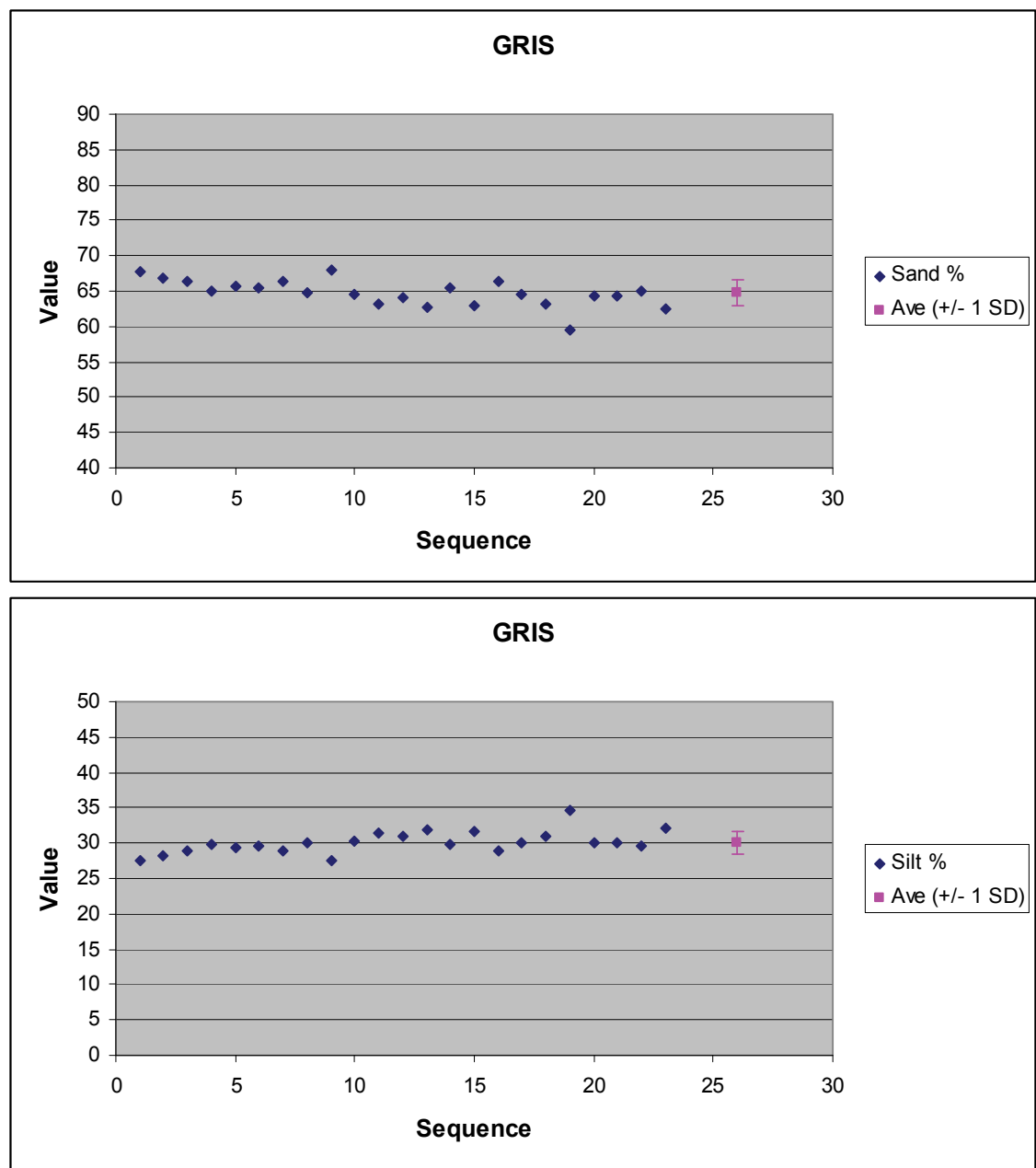
Note: 64% data (45 of 70) are <LLD

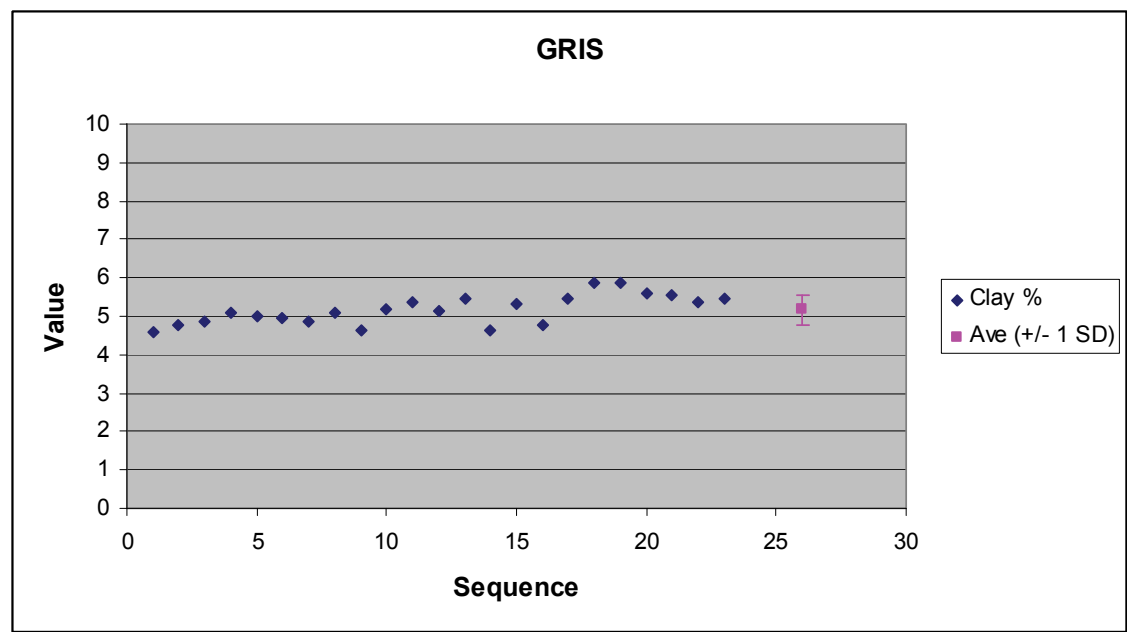
Appendix 12. X-plots for Bulk parameters analysis of GRIS

analysis of IPS GRIS



Appendix 12. X-plots for Bulk parameters analysis of GRIS





Appendix 13. Field duplicates analysis by XRF

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	LOI (%)	LOI (%)	Al2O3 (%)	Al2O3 (%)	CaO (%)	CaO (%)	Cl (ppm)	Cl (ppm)
METHOD:	METHOD:	SIZE	SIZE			Calc	Calc	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0	0	0.005	0.005	0.002	0.002	10	10
2007190003	2007190213	Coarse	Coarse	TOS	TOS	1.8	2.0	7.6890	7.5190	0.4900	0.5050	58.0	67.0
2007190003	2007190213	Fine	Fine	TOS	TOS	3.9	5.1	11.1960	11.0010	0.8930	0.8940	70.0	49.0
2007190003	2007190213	Coarse	Coarse	BOS	BOS	2.6	1.8	8.0880	7.9680	0.4890	0.4740	67.0	72.0
2007190003	2007190213	Fine	Fine	BOS	BOS	5.3	4.4	11.7150	11.5430	0.8780	0.8930	64.0	68.0
2007190005	2007191059	Coarse	Coarse	TOS	TOS	5.0	6.9	10.0350	11.3590	0.9630	1.1730	41.0	24.0
2007190005	2007191059	Fine	Fine	TOS	TOS	10.7	11.3	14.6380	14.2260	1.9980	1.9800	36.0	39.0
2007190005	2007191059	Coarse	Coarse	BOS	BOS	2.6	4.0	8.7990	11.1030	0.5790	1.0540	34.0	31.0
2007190005	2007191059	Fine	Fine	BOS	BOS	9.5	7.0	14.2090	14.6540	1.4710	2.1130	56.0	47.0
2007190032	2007190632	Coarse	Coarse	TOS	TOS	9.3	13.0	9.4230	8.6290	0.5790	0.7410	114.0	64.0
2007190032	2007190632	Fine	Fine	TOS	TOS	11.5	13.6	11.6830	10.5160	0.8060	0.9720	114.0	79.0
2007190032	2007190632	Coarse	Coarse	BOS	BOS	7.3	11.6	10.5410	11.1860	0.5970	0.8100	75.0	58.0
2007190032	2007190632	Fine	Fine	BOS	BOS	9.6	12.5	14.0450	12.9350	0.9090	1.0420	92.0	87.0
2007190035	2007190876	Coarse	Coarse	TOS	TOS	1.5	1.5	7.7030	7.8380	0.6340	0.6700	55.0	55.0
2007190035	2007190876	Fine	Fine	TOS	TOS	1.7	4.6	10.1320	10.1140	1.0930	1.0900	64.0	29.0
2007190035	2007190876	Coarse	Coarse	BOS	BOS	2.6	4.3	12.5870	11.8030	0.5570	0.6100	68.0	30.0
2007190035	2007190876	Fine	Fine	BOS	BOS	7.8	7.8	16.8970	15.7690	0.7750	0.8810	72.0	33.0
2007190039	2007190984	Coarse	Coarse	TOS	TOS	2.0	2.6	8.0070	4.9410	0.2270	0.1690	70.0	25.0
2007190039	2007190984	Fine	Fine	TOS	TOS	4.5	6.4	13.3760	12.2990	0.3370	0.3130	67.0	47.0
2007190039	2007190984	Coarse	Coarse	BOS	BOS	7.8	11.0	15.2940	16.1850	0.3760	0.9450	82.0	2250.0
2007190039	2007190984	Fine	Fine	BOS	BOS	12.7	13.0	20.6610	20.1050	0.5160	0.9610	93.0	3200.0
2007190050	2007191481	Coarse	Coarse	TOS	TOS	0.7	0.3	7.5970	7.7700	0.2010	0.2140	42.0	20.0
2007190050	2007191481	Fine	Fine	TOS	TOS	3.9	5.0	10.3670	10.3750	0.6590	0.6750	53.0	24.0
2007190050	2007191481	Coarse	Coarse	BOS	BOS	0.0	0.3	8.7710	8.5650	0.2200	0.2160	70.0	29.0
2007190050	2007191481	Fine	Fine	BOS	BOS	2.2	4.2	12.1830	11.7960	0.5650	0.5750	53.0	25.0
2007190067	2007191121	Coarse	Coarse	TOS	TOS	0.0	2.0	3.2650	2.6760	0.1770	0.1580	5163.0	1440.0
2007190067	2007191121	Fine	Fine	TOS	TOS	2.9	3.4	9.0420	8.1160	0.7300	0.7210	6452.0	2183.0
2007190067	2007191121	Coarse	Coarse	BOS	BOS	4.9	4.3	5.0200	3.7500	1.5500	1.5540	4660.0	3493.0
2007190067	2007191121	Fine	Fine	BOS	BOS	13.5	11.8	11.3000	9.3840	4.6170	5.5310	10290.0	5107.0
2007190071	2007190289	Coarse	Coarse	TOS	TOS	1.3	0.3	3.3270	3.1550	0.2470	0.2070	1287.0	887.0
2007190071	2007190289	Fine	Fine	TOS	TOS	3.7	2.6	10.4310	9.9580	0.6430	0.5510	4118.0	2281.0
2007190071	2007190289	Coarse	Coarse	BOS	BOS	5.2	3.9	9.0540	8.7940	1.4180	0.7450	2708.0	2186.0
2007190071	2007190289	Fine	Fine	BOS	BOS	15.7	12.0	20.2590	21.4780	1.9120	1.1280	6456.0	5926.0
2007190074	2007190389	Coarse	Coarse	TOS	TOS	3.4	1.5	8.4470	5.8650	0.3510	0.1530	57.0	58.0
2007190074	2007190389	Fine	Fine	TOS	TOS	8.7	7.1	10.3060	10.1310	0.4780	0.3660	67.0	45.0
2007190074	2007190389	Coarse	Coarse	BOS	BOS	1.3	2.5	5.1170	5.9030	0.1270	0.2220	89.0	53.0
2007190074	2007190389	Fine	Fine	BOS	BOS	5.2	9.5	9.1810	10.9460	0.4120	0.6790	94.0	49.0
2007190091	2007191053	Coarse	Coarse	TOS	TOS	2.7	3.3	4.8790	6.7430	0.3440	0.5760	41.0	10.0
2007190091	2007191053	Fine	Fine	TOS	TOS	5.7	6.5	10.1980	10.7640	1.2950	1.3360	24.0	18.0
2007190091	2007191053	Coarse	Coarse	BOS	BOS	3.6	1.5	5.1500	4.7970	0.2860	0.2400	27.0	29.0
2007190091	2007191053	Fine	Fine	BOS	BOS	4.2	7.3	9.1620	6.0780	0.6540	2.9080	28.0	845.0
2007190107	2007190913	Coarse	Coarse	TOS	TOS	0.8	0.6	3.8330	4.3020	0.1170	0.1200	30.0	40.0
2007190107	2007190913	Fine	Fine	TOS	TOS	6.0	7.0	11.1860	12.3200	0.3580	0.3500	38.0	42.0
2007190107	2007190913	Coarse	Coarse	BOS	BOS	1.0	1.4	3.4880	5.5550	0.0840	0.1230	206.0	421.0
2007190107	2007190913	Fine	Fine	BOS	BOS	3.3	10.9	8.8150	17.5700	0.2370	0.3680	600.0	1640.0
2007190110	2007191182	Coarse	Coarse	TOS	TOS	8.3	6.4	9.7560	10.7060	0.7050	0.7380	125.0	108.0
2007190110	2007191182	Fine	Fine	TOS	TOS	10.6	13.3	10.2290	11.2520	0.9280	0.9340	155.0	95.0
2007190110	2007191182	Coarse	Coarse	BOS	BOS	9.4	4.8	14.0680	12.2290	1.1620	0.8860	123.0	115.0
2007190110	2007191182	Fine	Fine	BOS	BOS	8.9	11.7	13.5200	12.7530	1.2470	1.0960	121.0	134.0
2007190114	2007191045	Coarse	Coarse	TOS	TOS	8.7	10.9	12.8860	13.6000	1.0310	1.4450	55.0	52.0
2007190114	2007191045	Fine	Fine	TOS	TOS	9.7	7.3	14.2780	13.2850	1.2920	1.3260	73.0	52.0
2007190114	2007191045	Coarse	Coarse	BOS	BOS	5.9	6.1	11.6650	13.0980	1.0400	1.1660	94.0	52.0
2007190114	2007191045	Fine	Fine	BOS	BOS	7.5	12.0	13.5050	13.5500	1.4580	1.4830	106.0	40.0
2007190118	2007191552	Coarse	Coarse	TOS	TOS	10.8	7.4	13.1190	11.5830	0.1550	0.1140	64.0	38.0
2007190118	2007191552	Fine	Fine	TOS	TOS	8.3	6.9	12.3850	10.0640	0.1510	0.1120	81.0	29.0
2007190118	2007191552	Coarse	Coarse	BOS	BOS	9.4	7.7	16.5280	16.2410	0.1270	0.2900	55.0	36.0
2007190118	2007191552	Fine	Fine	BOS	BOS	8.3	7.8	15.0410	14.2610	0.1240	0.2690	66.0	23.0
2007190121	2007191545	Coarse	Coarse	TOS	TOS	0.8	2.6	3.6730	5.2880	0.1250	0.2250	29.0	60.0
2007190121	2007191545	Fine	Fine	TOS	TOS	6.3	8.2	10.4120	16.7130	0.4080	0.7330	24.0	129.0
2007190121	2007191545	Coarse	Coarse	BOS	BOS	2.7	6.6	3.8160	6.0880	0.7260	4.3690	33.0	97.0
2007190121	2007191545	Fine	Fine	BOS	BOS	8.8	19.4	10.2340	13.9700	4.2500	13.0570	28.0	284.0
2007190125	2007191532	Coarse	Coarse	TOS	TOS	6.3	2.4	11.1580	10.7090	1.5040	1.1870	329.0	241.0
2007190125	2007191532	Fine	Fine	TOS	TOS	6.9	3.9	11.0940	10.6570	1.5250	1.4580	321.0	251.0
2007190125	2007191532	Coarse	Coarse	BOS	BOS	2.9	2.4	11.6160	11.5180	1.5340	1.3340	360.0	284.0
2007190125	2007191532	Fine	Fine	BOS	BOS	4.9	5.6	11.8680	11.7660	1.8150	1.5830	359.0	289.0
2007190145	2007191105	Coarse	Coarse	TOS	TOS	18.8	19.1	11.1990	11.8110	12.3520	11.8640	335.0	202.0
2007190145	2007191105	Fine	Fine	TOS	TOS	17.7	19.8	12.4010	12.5640	10.4090	10.4200	369.0	193.0
2007190145	2007191105	Coarse	Coarse	BOS	BOS	20.2	20.7	11.3540	10.5300	15.3500	16.3580	1568.0	2490.0
2007190145	2007191105	Fine	Fine	BOS	BOS	19.3	22.6	12.5280	11.2540	14.1430	15.2130	1779.0	2676.0
2007190154	2007190568	Coarse	Coarse	TOS	TOS	40.9	41.9	28.0250	24.2100	0.0650	0.0790	97.0	90.0
2007190154	2007190568	Fine	Fine	TOS	TOS	42.5	40.8	25.9930	24.1760	0.0670	0.0790	102.0	139.0
2007190154	2007190568	Coarse	Coarse	BOS	BOS	26.7	20.9	36.7700	33.9260	0.0460	0.0390	65.0	33.0
2007190154	2007190568	Fine	Fine	BOS	BOS	29.4	22.8	35.5590	34.0560	0.0470	0.0400	64.0	33.0
2007190155	2007191031	Coarse	Coarse	TOS	TOS	7.8	8.4	9.8180	10.3200	0.4090	0.4050	30.0	52.0
2007190155	2007191031	Fine	Fine	TOS	TOS	10.1	11.1	14.3080	14.9830	0.6060	0.5970	28.0	51.0
2007190155	2007191031	Coarse	Coarse	BOS	BOS	7.8	5.6	9.9950	7.5380	0.4530	0.3490	36.0	40.0
2007190155	2007191031	Fine	Fine	BOS	BOS	12.7	12.1	15.3250	15.5930	0.6940	0.7170	14.0	44.0
2007190161	2007191413	Coarse	Coarse	TOS	TOS	8.0	24.1	10.2350	9.1570	2.0020	11.4110	100.0	64.0
2007190161	2007191413	Fine	Fine	TOS	TOS	16.6	20.6	16.9240	14.6260	3.7020	6.2060	113.0	103.0
2007190161	2007191413	Coarse	Coarse	BOS	BOS	16.8	20.6	12.5080	11.3370	4.8170	7.9080	4978.0	2997.0
2007190161	2007191413	Fine	Fine	BOS	BOS	17.4	19.6	16.0490	14.7860	2.8020	4.8410	6269.0	3986.0
2007190176	2007191566	Coarse	Coarse	TOS	TOS	2.8	1.4	2.9170	3.4980	0.0430	0.0380	199.0	17.0
2007190176	2007191566	Fine	Fine	TOS	TOS	10.1	8.4	13.4320	15.2030	0.1100	0.0700	249.0	26.0
2007190176	2007191566	Coarse	Coarse	BOS	BOS	2.2	0.2	4.1140	4.3350	0.0350	0.0400	300.0	34.0
2007190176	2007191566	Fine	Fine	BOS	BOS	5.4	6.1	12.5290	14.8410	0.0490	0.0600	273.0	39.0
2007190181	2007191396	Coarse	Coarse	TOS	TOS</								

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	Cu (ppm)	Cu (ppm)	F (ppm)	F (ppm)	Fe2O3 (%)	Fe2O3 (%)	K2O (%)	K2O (%)	MgO (%)	MgO (%)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	50	50	0.005	0.005	0.005	0.005	0.01	0.01
2007190003	2007190213	13.1	13.0	25.0	25.0	3.3950	3.3510	2.1750	2.0950	0.437	0.445
2007190003	2007190213	33.1	22.6	25.0	25.0	6.7520	6.6390	2.2430	2.2070	0.886	0.881
2007190003	2007190213	10.3	12.8	25.0	25.0	3.3040	3.3290	2.1890	2.1780	0.536	0.518
2007190003	2007190213	24.0	27.8	25.0	25.0	6.1650	6.2340	2.2370	2.2260	1.010	0.979
2007190005	2007191059	5.0	5.0	25.0	25.0	3.9600	4.5010	1.4690	1.5820	0.583	0.706
2007190005	2007191059	15.7	5.0	25.0	25.0	6.6130	6.3990	1.7210	1.6820	1.093	1.036
2007190005	2007191059	5.0	5.0	25.0	25.0	2.8070	4.1000	1.4490	1.6510	0.350	0.621
2007190005	2007191059	5.0	14.4	25.0	25.0	6.2870	7.3800	1.7600	1.6980	0.874	1.138
2007190032	2007190632	13.9	5.0	25.0	25.0	3.6700	3.6090	1.4420	1.3030	0.647	0.618
2007190032	2007190632	15.7	10.5	141.0	25.0	4.3210	3.9900	1.7300	1.5520	0.780	0.736
2007190032	2007190632	13.2	5.0	62.0	25.0	4.1420	4.7940	1.3910	1.4210	0.774	0.891
2007190032	2007190632	19.2	15.8	175.0	25.0	5.1750	5.1950	1.7780	1.6480	1.010	1.007
2007190035	2007190876	5.0	5.0	25.0	25.0	1.9180	2.1810	2.3210	2.3350	0.195	0.208
2007190035	2007190876	12.2	5.0	25.0	25.0	2.7930	3.0110	2.1950	2.1860	0.347	0.385
2007190035	2007190876	21.5	14.0	52.0	25.0	3.8700	3.6110	2.3200	2.3100	0.497	0.443
2007190035	2007190876	19.2	15.5	25.0	25.0	5.6230	5.2230	2.2120	2.2240	0.773	0.697
2007190039	2007190984	19.1	5.0	25.0	25.0	3.6690	2.4720	1.6290	1.2050	0.288	0.125
2007190039	2007190984	37.1	20.5	25.0	25.0	6.0620	5.2290	2.3220	2.0290	0.567	0.544
2007190039	2007190984	29.7	22.7	25.0	25.0	6.3170	6.6370	1.7860	1.8350	1.126	1.446
2007190039	2007190984	40.2	32.7	25.0	25.0	8.3080	8.1630	2.0890	2.0560	1.548	1.889
2007190050	2007191481	5.0	5.0	25.0	25.0	1.5680	1.6790	4.0200	4.0320	0.120	0.128
2007190050	2007191481	17.8	14.9	25.0	25.0	3.9690	4.0330	2.4590	2.4090	0.457	0.461
2007190050	2007191481	12.4	5.0	25.0	25.0	2.0410	1.9820	4.0860	4.0560	0.163	0.163
2007190050	2007191481	24.2	12.6	25.0	25.0	4.4870	4.2880	2.6240	2.5690	0.428	0.431
2007190067	2007191121	16.3	5.0	84.0	25.0	4.7970	4.6170	0.5490	0.4790	0.297	0.154
2007190067	2007191121	28.8	17.2	25.0	25.0	7.9800	7.4150	1.3880	1.2960	1.065	0.758
2007190067	2007191121	14.6	5.0	25.0	25.0	5.2920	5.5950	0.6710	0.5310	2.096	1.429
2007190067	2007191121	39.3	24.9	575.0	25.0	6.5440	6.4340	1.3610	1.1670	5.675	4.622
2007190071	2007190289	5.0	5.0	25.0	25.0	0.6920	0.9190	0.8760	0.7820	0.025	0.024
2007190071	2007190289	5.0	5.0	25.0	25.0	1.6560	1.6480	2.6320	2.5570	0.192	0.157
2007190071	2007190289	12.1	11.2	254.0	25.0	2.0950	2.1030	1.0530	0.9430	0.593	0.439
2007190071	2007190289	27.5	31.6	191.0	300.0	4.3050	4.7770	1.8510	1.8490	1.395	1.202
2007190074	2007190389	20.1	5.0	323.0	25.0	3.4800	2.8230	1.9710	2.5550	0.318	0.095
2007190074	2007190389	5.0	5.0	25.0	25.0	4.8490	5.1480	1.7040	1.8320	0.530	0.444
2007190074	2007190389	5.0	5.0	98.0	25.0	2.0110	3.7550	2.4940	2.3190	0.057	0.145
2007190074	2007190389	12.5	5.0	238.0	25.0	4.2650	4.7910	1.7210	1.8880	0.368	0.547
2007190091	2007191053	5.0	5.0	25.0	25.0	1.4140	2.2760	1.3440	1.3830	0.165	0.285
2007190091	2007191053	5.0	5.0	25.0	25.0	4.1630	4.3560	1.5380	1.4770	0.630	0.629
2007190091	2007191053	5.0	5.0	25.0	25.0	1.5620	1.4340	1.2420	1.3150	0.146	0.137
2007190091	2007191053	5.0	5.0	25.0	25.0	3.0400	2.9310	1.6140	1.7100	0.339	0.979
2007190107	2007190913	5.0	5.0	25.0	25.0	2.1130	1.8490	0.9460	1.0690	0.114	0.153
2007190107	2007190913	13.9	18.2	25.0	25.0	4.8560	5.1680	1.7610	1.8840	0.499	0.638
2007190107	2007190913	5.0	5.0	109.0	25.0	1.8090	2.2200	0.9220	1.2350	0.106	0.418
2007190107	2007190913	12.8	17.1	316.0	25.0	3.9800	6.3800	1.6740	2.5020	0.382	1.692
2007190110	2007191182	5.0	5.0	25.0	25.0	2.5120	2.8730	2.9880	3.2100	0.655	0.759
2007190110	2007191182	5.0	10.6	25.0	25.0	3.5090	4.0930	2.2470	2.4080	0.999	1.163
2007190110	2007191182	22.0	12.0	25.0	25.0	5.7920	3.5730	2.4350	3.2170	1.453	1.074
2007190110	2007191182	29.0	12.7	25.0	25.0	5.5500	4.7920	2.2840	2.4310	1.361	1.435
2007190114	2007191045	19.0	18.0	25.0	25.0	5.7170	5.1170	2.0110	1.8480	0.903	0.952
2007190114	2007191045	26.0	19.4	25.0	25.0	5.6040	5.2230	1.8020	1.6910	0.962	0.929
2007190114	2007191045	16.0	19.6	25.0	25.0	5.1800	5.3510	2.0280	1.8780	0.809	0.917
2007190114	2007191045	22.0	16.3	25.0	25.0	5.4370	5.0980	1.7790	1.7570	0.983	0.964
2007190118	2007191552	21.0	24.0	25.0	25.0	5.5480	5.3250	1.5560	1.5010	0.508	0.444
2007190118	2007191552	28.0	18.1	283.0	25.0	5.1000	4.1360	1.5220	1.4120	0.494	0.388
2007190118	2007191552	33.0	41.9	194.0	25.0	6.3870	7.0280	2.0160	2.0730	0.846	1.070
2007190118	2007191552	33.0	29.2	77.0	25.0	5.7630	5.8550	1.8960	1.9270	0.761	0.933
2007190121	2007191545	5.0	5.0	294.0	25.0	2.4440	2.7480	0.2750	0.4780	0.109	0.244
2007190121	2007191545	11.9	28.3	129.0	25.0	5.0380	7.0520	1.6130	1.8580	0.465	0.922
2007190121	2007191545	5.0	5.0	173.0	25.0	2.3660	2.7800	0.3020	0.5740	0.187	0.863
2007190121	2007191545	14.7	20.5	388.0	534.0	4.8040	5.4630	1.5450	1.4790	0.730	2.275
2007190125	2007191532	35.0	31.2	25.0	25.0	5.9870	5.4190	2.6830	2.7120	1.228	0.995
2007190125	2007191532	37.0	45.2	25.0	25.0	7.0140	8.2490	2.4280	2.1830	1.307	1.216
2007190125	2007191532	36.0	37.3	138.0	25.0	6.5440	6.0840	2.8580	2.8210	1.278	1.203
2007190125	2007191532	45.0	48.4	25.0	25.0	8.5430	8.5920	2.5190	2.3740	1.520	1.446
2007190145	2007191105	10.0	10.1	99.0	25.0	4.4760	4.7000	2.1690	2.2750	2.479	2.480
2007190145	2007191105	17.7	5.0	79.0	25.0	4.9760	5.0280	2.4040	2.4370	2.603	2.520
2007190145	2007191105	12.7	15.2	236.0	25.0	4.5150	4.2210	2.1610	1.9990	2.536	2.426
2007190145	2007191105	20.1	10.1	584.0	60.0	5.0050	4.5350	2.3770	2.1380	2.714	2.582
2007190154	2007190568	5.0	5.0	25.0	25.0	1.8790	1.5740	0.0260	0.0270	0.033	0.090
2007190154	2007190568	5.0	5.0	25.0	25.0	1.8960	1.5640	0.0280	0.0300	0.041	0.089
2007190154	2007190568	5.0	5.0	25.0	25.0	1.7020	1.5920	0.0260	0.0440	0.015	0.059
2007190154	2007190568	5.0	5.0	25.0	25.0	1.7460	1.6110	0.0270	0.0450	0.015	0.063
2007190155	2007191031	11.3	12.3	25.0	25.0	4.0440	4.3600	1.3310	1.4020	0.744	0.768
2007190155	2007191031	26.1	26.2	25.0	349.0	5.9300	6.3690	1.7470	1.8170	1.128	1.153
2007190155	2007191031	13.9	5.0	25.0	56.0	4.0930	3.2060	1.2620	1.1470	0.807	0.577
2007190155	2007191031	24.9	29.8	25.0	104.0	6.2700	6.5350	1.6690	1.8390	1.263	1.319
2007190161	2007191413	30.5	20.1	25.0	25.0	7.3650	5.2120	0.9020	0.7280	3.993	5.132
2007190161	2007191413	36.1	34.2	25.0	25.0	8.4430	7.2500	1.3030	1.0840	7.093	8.175
2007190161	2007191413	30.9	26.6	25.0	25.0	6.9210	5.9630	1.0000	0.8920	6.886	6.837
2007190161	2007191413	37.1	33.6	25.0	25.0	7.9820	7.2600	1.2090	1.0970	8.940	9.076
2007190176	2007191566	5.0	5.0	25.0	25.0	1.7510	1.9410	0.0710	0.1170	0.005	0.005
2007190176	2007191566	18.3	19.6	25.0	25.0	6.2700	7.0970	0.7540	0.8880	0.099	0.135
2007190176	2007191566	5.0	5.0	25.0	25.0	2.1920	2.2220	0.1070	0.1390	0.005	0.016
2007190176	2007191566	16.3	19.0	25.0	25.0	5.8000	6.7760	0.7370	0.8900	0.068	0.105
2007190181	2007191396	24.1	13.5	25.0	25.0	6.2520	5.5320	1.4330	1.4460	1.116	1.123

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	MnO (%)	MnO (%)	Na2O (%)	Na2O (%)	Ni (ppm)	Ni (ppm)	P2O5 (%)	P2O5 (%)	Rb (ppm)	Rb (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.005	0.005	0.01	0.01	10	10	0.005	0.005	10	10
2007190003	2007190213	0.0550	0.0550	0.752	0.738	14.9	14.9	0.0670	0.0650	89.0	91.1
2007190003	2007190213	0.1070	0.1060	0.840	0.812	32.7	22.1	0.1140	0.1050	105.9	109.1
2007190003	2007190213	0.0460	0.0490	0.752	0.717	5.0	16.9	0.0530	0.0550	90.2	91.7
2007190003	2007190213	0.0760	0.0790	0.884	0.878	21.4	24.3	0.0780	0.0780	110.8	107.6
2007190005	2007191059	0.0620	0.0720	1.926	2.191	11.6	11.5	0.1440	0.1830	56.9	55.2
2007190005	2007191059	0.1010	0.1020	2.405	2.459	21.0	21.2	0.2660	0.2670	57.0	55.1
2007190005	2007191059	0.0440	0.0590	2.045	2.440	5.0	14.2	0.0870	0.1180	64.1	58.7
2007190005	2007191059	0.1180	0.1160	2.414	2.688	16.5	29.7	0.2250	0.2240	66.3	56.6
2007190032	2007190632	0.0420	0.0410	0.475	0.487	25.1	11.9	0.1030	0.1080	93.2	86.6
2007190032	2007190632	0.0410	0.0420	0.715	0.723	32.7	23.8	0.1170	0.1240	105.2	95.9
2007190032	2007190632	0.0610	0.0520	0.497	0.577	31.9	27.4	0.0760	0.0820	90.8	93.6
2007190032	2007190632	0.0670	0.0500	0.800	0.768	42.7	41.9	0.0950	0.0950	110.8	103.4
2007190035	2007190876	0.0690	0.0740	1.285	1.315	5.0	5.0	0.0510	0.0530	112.3	110.5
2007190035	2007190876	0.1110	0.1260	1.827	1.709	14.7	5.0	0.0780	0.0850	104.0	109.2
2007190035	2007190876	0.0430	0.0380	1.001	1.005	18.4	5.0	0.0650	0.0610	121.8	121.0
2007190035	2007190876	0.0630	0.0560	1.157	1.185	21.0	10.0	0.0930	0.0870	135.1	134.6
2007190039	2007190984	0.0540	0.0270	0.401	0.333	19.5	5.0	0.0770	0.0430	73.3	54.4
2007190039	2007190984	0.1020	0.0930	0.517	0.480	35.9	17.7	0.1250	0.0870	102.2	93.3
2007190039	2007190984	0.0610	0.0660	0.256	0.602	36.3	22.7	0.0670	0.0740	93.7	101.6
2007190039	2007190984	0.0880	0.1120	0.239	0.699	45.0	41.1	0.0850	0.0860	114.5	116.2
2007190050	2007191481	0.0200	0.0240	0.720	0.740	10.8	10.2	0.0290	0.0310	199.6	193.5
2007190050	2007191481	0.0730	0.0750	1.192	1.227	37.2	31.2	0.0530	0.0550	126.9	117.0
2007190050	2007191481	0.0210	0.0200	0.780	0.754	25.4	18.1	0.0270	0.0300	199.0	193.9
2007190050	2007191481	0.0470	0.0450	1.244	1.231	51.6	36.1	0.0430	0.0470	135.2	128.6
2007190067	2007191121	0.0450	0.0300	0.927	0.550	36.7	11.9	0.0260	0.0240	31.3	26.0
2007190067	2007191121	0.1000	0.0860	1.796	1.441	81.7	61.0	0.0530	0.0510	53.3	47.8
2007190067	2007191121	0.0310	0.0270	0.936	0.805	49.4	29.5	0.0290	0.0290	35.9	24.7
2007190067	2007191121	0.0650	0.0610	2.013	1.562	106.0	79.2	0.0610	0.0520	49.8	44.3
2007190071	2007190289	0.0050	0.0060	0.554	0.440	5.0	5.0	0.0160	0.0160	41.1	37.9
2007190071	2007190289	0.0250	0.0260	1.547	1.262	11.3	13.2	0.0370	0.0380	83.4	79.3
2007190071	2007190289	0.0320	0.0180	0.789	0.693	24.9	23.4	0.0160	0.0170	50.8	46.6
2007190071	2007190289	0.0930	0.0510	1.469	1.409	66.2	61.9	0.0240	0.0240	90.4	86.2
2007190074	2007190389	0.0350	0.0370	0.234	0.233	5.0	5.0	0.0630	0.0390	76.5	85.1
2007190074	2007190389	0.0600	0.0580	0.292	0.300	5.0	5.0	0.0810	0.0860	92.5	82.4
2007190074	2007190389	0.0190	0.0630	0.211	0.218	5.0	5.0	0.0320	0.0390	85.3	78.8
2007190074	2007190389	0.0520	0.0520	0.291	0.328	5.0	5.0	0.0770	0.0810	78.9	86.4
2007190091	2007191053	0.0230	0.0380	0.477	0.615	5.0	5.0	0.0480	0.0740	56.5	61.6
2007190091	2007191053	0.0770	0.0650	1.096	1.119	17.9	17.2	0.1450	0.1360	63.1	59.7
2007190091	2007191053	0.0330	0.0210	0.419	0.386	5.0	5.0	0.0480	0.0450	57.8	58.9
2007190091	2007191053	0.0590	0.0430	0.857	0.665	10.0	5.0	0.0980	0.0900	73.7	76.0
2007190107	2007190913	0.0150	0.0150	0.175	0.208	5.0	5.0	0.0330	0.0320	58.8	66.6
2007190107	2007190913	0.0510	0.0500	0.243	0.256	14.1	14.4	0.0810	0.0850	83.8	89.8
2007190107	2007190913	0.0110	0.0130	0.190	0.290	5.0	5.0	0.0260	0.0310	59.1	69.9
2007190107	2007190913	0.0320	0.0390	0.330	0.572	15.6	23.8	0.0520	0.0730	75.9	106.1
2007190110	2007191182	0.0390	0.0460	1.256	1.360	5.0	5.0	0.1520	0.1330	145.9	149.1
2007190110	2007191182	0.0580	0.0680	1.121	1.059	16.0	11.6	0.2360	0.2290	122.3	136.5
2007190110	2007191182	0.1190	0.0620	1.108	1.399	38.0	16.2	0.1580	0.1420	138.6	154.7
2007190110	2007191182	0.1170	0.0940	1.148	1.031	41.0	19.0	0.1640	0.2320	125.8	145.6
2007190114	2007191045	0.1490	0.1190	1.551	1.748	23.0	19.2	0.1210	0.1360	87.0	85.0
2007190114	2007191045	0.1290	0.1120	1.756	1.909	29.0	19.7	0.1240	0.0800	82.3	74.0
2007190114	2007191045	0.1250	0.1130	1.649	1.793	16.0	19.7	0.0730	0.0790	85.8	81.9
2007190114	2007191045	0.1460	0.1170	1.952	1.778	28.0	16.1	0.0810	0.1340	80.6	80.1
2007190118	2007191552	0.0580	0.0880	0.125	0.134	28.0	20.9	0.0880	0.0780	127.0	123.4
2007190118	2007191552	0.0550	0.0710	0.145	0.151	33.0	15.4	0.0870	0.0720	118.7	111.9
2007190118	2007191552	0.0530	0.0560	0.275	0.435	37.0	45.1	0.0660	0.0450	150.8	161.0
2007190118	2007191552	0.0460	0.0340	0.277	0.409	40.0	29.3	0.0590	0.0440	140.8	146.4
2007190121	2007191545	0.0100	0.0250	0.028	0.049	5.0	5.0	0.0320	0.0410	29.3	47.9
2007190121	2007191545	0.0440	0.0820	0.162	0.182	12.9	33.1	0.0680	0.1050	82.7	118.1
2007190121	2007191545	0.0090	0.0150	0.025	0.057	5.0	5.0	0.0290	0.0540	32.1	47.5
2007190121	2007191545	0.0360	0.0360	0.163	0.152	13.2	18.5	0.0670	0.1280	81.3	97.7
2007190125	2007191532	0.0860	0.0680	2.011	2.096	22.0	13.4	0.1430	0.0760	108.1	112.2
2007190125	2007191532	0.0900	0.1040	1.883	1.793	21.0	19.3	0.1500	0.1070	96.8	91.8
2007190125	2007191532	0.0800	0.0730	2.181	2.151	24.0	18.6	0.1120	0.0900	113.4	118.2
2007190125	2007191532	0.0900	0.1030	1.959	1.802	28.0	21.3	0.1450	0.1260	102.9	103.9
2007190145	2007191105	0.0680	0.0680	0.281	0.239	10.1	5.0	0.1150	0.1120	64.5	69.8
2007190145	2007191105	0.0650	0.0640	0.306	0.252	18.1	5.0	0.1190	0.1160	73.9	70.2
2007190145	2007191105	0.0430	0.0450	0.486	0.614	10.6	13.0	0.1130	0.1070	60.6	55.6
2007190145	2007191105	0.0410	0.0400	0.570	0.662	22.8	13.2	0.1140	0.1060	66.8	63.2
2007190154	2007190568	0.0025	0.0060	0.018	0.017	5.0	5.0	0.0960	0.0710	25.7	28.0
2007190154	2007190568	0.0025	0.0080	0.015	0.018	5.0	5.0	0.1210	0.0880	25.6	25.4
2007190154	2007190568	0.0025	0.0025	0.030	0.033	14.4	19.3	0.0510	0.0350	32.7	26.0
2007190154	2007190568	0.0025	0.0025	0.028	0.034	5.0	17.5	0.0610	0.0390	32.0	27.8
2007190155	2007191031	0.0340	0.0370	0.205	0.199	5.0	5.0	0.0800	0.0930	55.8	61.0
2007190155	2007191031	0.0510	0.0540	0.298	0.260	16.2	15.0	0.1190	0.1600	74.5	72.1
2007190155	2007191031	0.0330	0.0300	0.216	0.191	5.0	5.0	0.0680	0.0660	60.6	51.4
2007190155	2007191031	0.0540	0.0750	0.261	0.257	24.1	39.9	0.1000	0.1450	76.7	78.0
2007190161	2007191413	0.0670	0.0940	0.237	0.176	46.7	28.5	0.0700	0.0670	42.5	35.2
2007190161	2007191413	0.1030	0.1560	0.291	0.226	65.8	52.4	0.1130	0.1000	59.3	52.5
2007190161	2007191413	0.1200	0.1190	1.073	0.724	53.8	36.8	0.0930	0.0890	43.4	45.3
2007190161	2007191413	0.1650	0.1680	1.361	0.923	63.6	49.5	0.1170	0.1150	52.9	49.8
2007190176	2007191566	0.0050	0.0050	0.005	0.019	5.0	5.0	0.0250	0.0360	20.8	20.3
2007190176	2007191566	0.0270	0.0280	0.059	0.078	26.2	28.0	0.0980	0.1230	58.9	66.3
2007190176	2007191566	0.0050	0.0230	0.005	0.021	5.0	5.0	0.0260	0.0310	21.9	18.6
2007190176	2007191566	0.0220	0.1020	0.045	0.065	24.6	24.5	0.0620	0.0720	52.6	63.8
2007190181	2007191396	0.0890	0.0870	0.992	1.024	29.5	17.8	0.1920	0.1600	69.6	71.4

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	S (ppm)	S (ppm)	SiO2 (%)	SiO2 (%)	Sr (ppm)	Sr (ppm)	TiO2 (%)	TiO2 (%)	Zn (ppm)	Zn (ppm)	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	0.01	0.01	10	10	0.005	0.005	10	10	10	10
2007190003	2007190213	41.3	40.5	82.633	82.702	64.3	67.9	0.5100	0.5240	28.6	28.7	262.8	298.3
2007190003	2007190213	76.6	70.6	71.733	70.936	81.3	80.2	1.2050	1.1730	62.3	57.2	890.6	865.5
2007190003	2007190213	45.0	47.5	81.491	82.384	64.6	63.7	0.4490	0.4480	24.1	24.9	185.4	201.0
2007190003	2007190213	60.1	67.8	70.584	71.621	85.8	80.1	0.9750	1.0070	49.2	53.5	606.8	667.7
2007190005	2007191059	191.2	230.7	75.040	70.302	179.7	200.5	0.8990	1.0710	51.5	60.6	226.5	234.9
2007190005	2007191059	287.7	291.1	58.667	58.689	260.8	257.0	1.8490	1.8870	93.9	89.1	372.3	383.6
2007190005	2007191059	104.3	100.4	80.673	73.887	160.1	211.0	0.6590	1.0100	30.9	52.7	249.7	261.8
2007190005	2007191059	195.3	115.9	61.280	60.515	235.5	273.5	1.9230	2.4230	81.3	103.6	674.7	648.2
2007190032	2007190632	358.8	342.2	73.204	70.482	86.0	99.8	1.0160	1.0270	46.1	29.1	321.3	334.5
2007190032	2007190632	416.7	389.2	66.800	66.375	116.6	131.2	1.3610	1.3430	54.6	42.4	487.6	491.5
2007190032	2007190632	153.4	158.1	73.590	67.430	91.5	115.4	0.9890	1.1270	49.0	43.9	311.5	325.4
2007190032	2007190632	207.6	200.2	64.978	63.324	135.4	147.9	1.3860	1.3910	62.6	56.5	430.4	419.7
2007190035	2007190876	65.8	51.7	83.732	83.338	95.0	91.4	0.5250	0.5640	17.8	21.9	458.9	523.0
2007190035	2007190876	74.4	80.8	78.569	75.628	137.1	134.0	1.0400	1.1030	39.5	32.0	1126.2	1290.1
2007190035	2007190876	51.8	35.3	75.761	75.314	81.8	82.7	0.6400	0.6280	48.1	35.9	401.8	446.0
2007190035	2007190876	49.1	51.9	63.532	65.201	108.0	108.9	0.9670	0.9820	59.2	51.7	666.9	786.6
2007190039	2007190984	150.9	123.9	82.913	87.909	51.5	41.0	0.6340	0.3140	33.0	5.0	381.5	362.7
2007190039	2007190984	160.0	118.1	70.633	71.552	67.0	64.2	1.3300	1.0300	62.6	41.3	1009.3	1434.2
2007190039	2007190984	120.5	457.7	66.155	60.344	58.8	65.7	0.6410	0.7690	58.7	51.3	195.0	203.7
2007190039	2007190984	90.9	487.4	52.761	51.771	69.3	73.5	0.8880	0.9600	78.5	70.1	293.5	258.1
2007190050	2007191481	21.0	30.3	84.858	84.896	49.3	47.3	0.1600	0.1770	5.0	13.7	106.7	109.7
2007190050	2007191481	54.3	67.5	76.064	74.890	80.7	77.1	0.7590	0.7630	35.0	34.6	683.2	680.3
2007190050	2007191481	31.5	34.7	84.364	83.689	46.9	44.5	0.2220	0.2040	18.5	15.6	132.2	115.8
2007190050	2007191481	51.9	44.1	75.241	73.978	76.9	75.2	0.7970	0.7600	37.4	27.7	718.3	700.6
2007190067	2007191121	344.1	180.5	88.982	88.991	52.7	48.1	0.3620	0.3110	26.9	10.2	65.7	51.2
2007190067	2007191121	834.6	340.2	72.656	75.085	105.1	105.8	1.5320	1.4560	69.5	61.0	426.8	373.6
2007190067	2007191121	445.8	391.1	78.656	81.330	53.8	52.0	0.3330	0.3260	26.4	17.2	57.0	45.3
2007190067	2007191121	1023.4	896.2	52.877	57.854	86.9	92.3	0.7590	0.9060	63.5	55.1	180.1	219.4
2007190071	2007190289	95.6	74.8	92.569	93.807	64.8	51.0	0.2180	0.2320	5.0	5.0	191.0	206.5
2007190071	2007190289	259.9	180.0	77.424	79.540	144.7	135.6	1.0920	1.1800	19.5	23.8	1685.6	1882.2
2007190071	2007190289	231.1	211.1	79.038	81.746	74.6	54.0	0.3170	0.3440	5.0	5.0	149.6	191.3
2007190071	2007190289	505.8	535.6	51.467	54.536	96.3	78.2	0.7220	0.7950	18.2	21.3	449.1	501.4
2007190074	2007190389	230.2	108.7	80.837	85.799	115.3	118.5	0.6780	0.8290	31.3	18.7	598.2	534.6
2007190074	2007190389	296.0	319.0	71.246	72.656	133.2	117.4	1.4540	1.4870	37.2	46.6	2706.5	3053.8
2007190074	2007190389	88.2	124.1	88.173	83.414	103.1	110.6	0.3970	1.3230	11.1	29.4	229.9	719.8
2007190074	2007190389	247.8	319.2	76.786	69.848	106.2	127.8	1.3150	1.1140	45.0	40.3	2408.3	1620.9
2007190091	2007191053	82.0	99.7	88.237	83.994	85.4	105.9	0.4070	0.8190	13.6	26.6	234.2	445.0
2007190091	2007191053	137.8	117.7	72.840	71.475	168.8	175.1	2.1570	2.1220	60.5	53.1	1706.0	1337.9
2007190091	2007191053	61.4	85.8	86.933	89.726	78.1	72.5	0.5810	0.5130	12.5	13.1	419.3	383.0
2007190091	2007191053	96.8	268.6	78.012	76.620	133.3	202.4	1.7910	0.6060	45.8	13.9	1814.9	452.9
2007190107	2007190913	81.4	90.8	91.527	91.300	27.7	29.6	0.2730	0.2820	5.0	15.2	267.4	268.5
2007190107	2007190913	227.0	257.7	73.400	70.829	88.4	90.7	1.2820	1.2020	54.0	55.4	2258.3	1861.0
2007190107	2007190913	81.7	152.7	92.028	88.342	24.1	38.8	0.2570	0.3170	5.0	16.8	264.7	255.8
2007190107	2007190913	184.8	455.3	79.542	58.599	83.9	113.8	1.2670	0.9730	38.2	64.5	2486.5	852.1
2007190110	2007191182	303.0	302.6	73.266	73.316	94.3	94.5	0.3800	0.4180	34.0	47.6	184.0	192.6
2007190110	2007191182	481.0	547.5	69.186	64.531	92.5	95.1	0.7850	0.8300	64.0	72.9	614.0	610.9
2007190110	2007191182	188.0	144.5	63.200	72.079	125.6	102.2	1.0570	0.4910	82.0	65.5	313.0	186.1
2007190110	2007191182	172.0	272.8	64.483	63.573	129.4	111.5	1.1080	0.8000	82.0	88.7	401.0	443.5
2007190114	2007191045	149.0	238.7	65.872	62.998	152.7	181.8	1.0150	1.0690	59.0	59.4	277.0	275.4
2007190114	2007191045	213.0	98.0	62.945	66.667	176.5	184.9	1.2860	1.3880	71.0	53.6	402.0	472.6
2007190114	2007191045	73.0	85.5	70.457	68.329	151.1	169.8	1.0480	1.1030	49.0	52.6	347.0	335.2
2007190114	2007191045	131.0	228.3	65.613	61.936	184.7	187.7	1.3970	1.1370	64.0	57.8	581.0	311.3
2007190118	2007191552	218.0	107.6	66.935	72.453	36.0	36.7	1.0230	1.0000	35.0	41.4	397.0	389.3
2007190118	2007191552	183.0	103.2	70.484	75.764	33.6	33.1	1.1030	1.0550	40.0	31.2	521.0	478.3
2007190118	2007191552	53.0	39.7	63.241	64.196	41.1	52.8	0.9640	0.9760	51.0	58.9	295.0	282.3
2007190118	2007191552	47.0	35.7	66.605	67.609	40.8	47.4	1.0180	0.9950	49.0	48.1	367.0	346.7
2007190121	2007191545	63.5	161.9	92.139	87.899	21.4	46.3	0.3200	0.3700	11.0	19.0	305.1	259.5
2007190121	2007191545	149.6	576.9	73.833	62.823	77.4	129.2	1.3820	1.1440	44.9	87.6	2114.3	953.8
2007190121	2007191545	57.2	1684.6	89.415	78.029	35.0	151.1	0.3280	0.3620	5.0	22.4	351.4	248.7
2007190121	2007191545	173.5	5782.5	67.753	42.478	134.5	415.5	1.3010	0.7730	43.6	62.3	1973.6	528.7
2007190125	2007191532	171.0	59.2	67.829	73.586	70.6	67.0	0.9370	0.8810	38.0	27.7	476.0	436.7
2007190125	2007191532	160.0	72.2	66.271	68.759	68.5	62.3	1.2200	1.5990	40.0	40.2	743.0	1116.0
2007190125	2007191532	65.0	50.7	69.713	71.481	67.9	67.4	1.0020	0.9300	35.0	33.0	556.0	469.3
2007190125	2007191532	75.0	67.4	65.057	65.156	67.0	64.8	1.4360	1.4470	40.0	39.3	991.0	993.7
2007190145	2007191105	480.9	411.1	47.337	46.609	178.1	159.7	0.6060	0.6220	52.8	55.3	239.7	242.4
2007190145	2007191105	473.2	393.7	48.176	45.999	167.0	145.6	0.7140	0.6970	60.8	57.6	379.0	303.6
2007190145	2007191105	545.1	678.0	42.346	42.081	236.1	264.7	0.5870	0.5640	54.2	47.6	193.9	214.4
2007190145	2007191105	584.0	711.1	42.205	39.877	232.3	265.6	0.6680	0.6270	63.3	46.9	265.8	265.7
2007190154	2007190568	460.3	282.7	27.125	30.167	26.0	34.9	1.8640	1.8450	5.0	5.0	635.4	790.6
2007190154	2007190568	510.8	339.4	27.683	31.182	27.7	32.5	1.7260	1.9220	5.0	5.0	765.0	869.3
2007190154	2007190568	462.1	240.4	32.045	40.740	26.1	24.0	2.6230	2.5870	5.0	5.0	822.8	1071.1
2007190154	2007190568	487.6	267.0	30.555	38.583	21.8	23.1	2.6170	2.7200	5.0	5.0	882.0	1209.8
2007190155	2007191031	186.6	191.0	74.939	73.428	109.4	118.3	0.5700	0.5680	40.9	40.3	363.8	323.3
2007190155	2007191031	205.3	202.8	64.618	62.373	162.4	163.7	0.9640	0.9510	70.4	69.1	897.8	831.3
2007190155	2007191031	193.8	147.3	74.719	80.745	120.3	91.3	0.5630	0.4580	38.9	28.8	311.8	314.3
2007190155	2007191031	184.0	180.5	60.725	60.372	179.3	175.7	0.8970	0.9390	67.7	72.1	660.9	809.3
2007190161	2007191413	867.2	54332.5	66.475	38.163	60.9							

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	LOI (%)	LOI (%)	Al2O3 (%)	Al2O3 (%)	CaO (%)	CaO (%)	Cl (ppm)	Cl (ppm)
METHOD:	METHOD:	SIZE	SIZE			Calc	Calc	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0	0	0.005	0.005	0.002	0.002	10	10
2007190181	2007191396	Fine	Fine	TOS	TOS	15.4	11.6	11.1150	12.0970	0.9930	0.9050	106.0	28.0
2007190181	2007191396	Coarse	Coarse	BOS	BOS	7.9	9.2	11.7780	11.5990	0.8900	0.9350	174.0	29.0
2007190181	2007191396	Fine	Fine	BOS	BOS	10.4	10.6	13.4320	13.3910	1.0280	1.0920	71.0	27.0
2007190183	2007190471	Coarse	Coarse	TOS	TOS	2.2	0.4	3.5910	3.5490	1.4040	0.9030	8027.0	1652.0
2007190183	2007190471	Fine	Fine	TOS	TOS	5.9	5.6	7.6150	8.0580	2.7350	2.4840	10353.0	2079.0
2007190183	2007190471	Coarse	Coarse	BOS	BOS	12.9	7.2	10.5570	7.4950	7.3870	4.5990	8743.0	5458.0
2007190183	2007190471	Fine	Fine	BOS	BOS	12.1	12.8	11.9150	11.1320	5.6740	6.5040	3869.0	4191.0
2007190185	2007191253	Coarse	Coarse	TOS	TOS	4.2	5.6	10.7310	9.3730	1.0180	0.8600	64.0	26.0
2007190185	2007191253	Fine	Fine	TOS	TOS	6.8	5.6	11.7180	10.6970	1.1600	0.9920	61.0	29.0
2007190185	2007191253	Coarse	Coarse	BOS	BOS	6.3	6.9	12.8990	11.0420	1.1030	1.1530	58.0	23.0
2007190185	2007191253	Fine	Fine	BOS	BOS	8.4	7.5	13.1490	12.3600	1.2910	1.5220	41.0	13.0
2007190189	2007191542	Coarse	Coarse	TOS	TOS	9.7	11.2	13.4990	12.7180	0.8220	0.9450	288.0	645.0
2007190189	2007191542	Fine	Fine	TOS	TOS	10.6	9.8	12.0380	12.1170	0.7490	0.9610	270.0	609.0
2007190189	2007191542	Coarse	Coarse	BOS	BOS	8.3	10.2	13.3040	12.9510	0.8300	1.1050	1566.0	1977.0
2007190189	2007191542	Fine	Fine	BOS	BOS	10.3	9.2	12.6000	12.4430	0.7710	1.0590	1514.0	2001.0
2007190193	2007190788	Coarse	Coarse	TOS	TOS	13.6	18.8	9.4190	11.9440	0.8590	0.4990	160.0	130.0
2007190193	2007190788	Fine	Fine	TOS	TOS	11.5	16.9	8.8880	10.2460	0.6440	0.4300	98.0	90.0
2007190193	2007190788	Coarse	Coarse	BOS	BOS	8.7	6.9	12.0460	11.6840	0.7710	0.4440	68.0	120.0
2007190193	2007190788	Fine	Fine	BOS	BOS	7.8	8.3	11.6930	11.5020	0.8800	0.4710	68.0	131.0
2007190194	2007190704	Coarse	Coarse	TOS	TOS	10.2	11.9	9.0850	8.3880	0.3230	0.3490	77.0	73.0
2007190194	2007190704	Fine	Fine	TOS	TOS	9.4	9.5	8.8550	7.9130	0.2960	0.2870	69.0	82.0
2007190194	2007190704	Coarse	Coarse	BOS	BOS	7.5	6.7	9.6560	10.4100	0.4950	0.4520	57.0	74.0
2007190194	2007190704	Fine	Fine	BOS	BOS	6.8	7.5	9.6160	9.6290	0.5610	0.4350	80.0	84.0
2007190197	2007190962	Coarse	Coarse	TOS	TOS	0.7	1.1	1.2320	1.5360	0.0480	0.0450	45.0	20.0
2007190197	2007190962	Fine	Fine	TOS	TOS	2.8	4.2	4.9310	6.1050	0.1270	0.1280	96.0	50.0
2007190197	2007190962	Coarse	Coarse	BOS	BOS	4.0	2.8	6.1060	6.0450	0.0500	0.0540	41.0	23.0
2007190197	2007190962	Fine	Fine	BOS	BOS	9.2	8.1	21.0730	14.2600	0.1060	0.1030	75.0	18.0
2007190208	2007191593	Coarse	Coarse	TOS	TOS	3.0	3.8	2.0280	2.0240	0.0700	0.0790	34.0	32.0
2007190208	2007191593	Fine	Fine	TOS	TOS	3.1	3.1	2.9090	2.8360	0.0980	0.1030	40.0	30.0
2007190208	2007191593	Coarse	Coarse	BOS	BOS	6.5	3.9	10.9180	6.7940	0.0520	0.0610	192.0	181.0
2007190208	2007191593	Fine	Fine	BOS	BOS	7.2	3.6	12.4530	6.1730	0.0620	0.0740	219.0	167.0
2007190209	2007191254	Coarse	Coarse	TOS	TOS	7.4	6.3	7.9450	6.4750	0.7360	0.4170	60.0	14.0
2007190209	2007191254	Fine	Fine	TOS	TOS	10.7	8.6	9.3550	8.8100	0.8580	0.5690	49.0	20.0
2007190209	2007191254	Coarse	Coarse	BOS	BOS	5.1	5.2	7.0680	5.4880	0.6590	0.3930	90.0	18.0
2007190209	2007191254	Fine	Fine	BOS	BOS	9.5	9.0	9.8140	9.6290	0.8150	0.6920	115.0	13.0
2007190212	2007190747	Coarse	Coarse	TOS	TOS	2.2	0.1	2.6820	1.6140	0.0750	0.0620	39.0	58.0
2007190212	2007190747	Fine	Fine	TOS	TOS	7.6	13.3	10.1590	10.0780	0.3450	0.5660	35.0	54.0
2007190212	2007190747	Coarse	Coarse	BOS	BOS	6.9	0.0	9.6260	2.2620	0.3250	0.0630	55.0	48.0
2007190212	2007190747	Fine	Fine	BOS	BOS	4.2	4.3	9.5280	7.9600	0.2130	0.2610	36.0	39.0
2007190218	2007191348	Coarse	Coarse	TOS	TOS	2.0	2.7	5.2880	7.3450	0.0430	0.0560	50.0	17.0
2007190218	2007191348	Fine	Fine	TOS	TOS	7.8	9.2	15.0200	19.7750	0.0650	0.0950	34.0	25.0
2007190218	2007191348	Coarse	Coarse	BOS	BOS	1.7	3.2	6.3820	9.9780	0.0540	0.1160	58.0	66.0
2007190218	2007191348	Fine	Fine	BOS	BOS	7.9	10.2	16.3730	21.5120	0.0910	0.2100	56.0	101.0
2007190241	2007190978	Coarse	Coarse	TOS	TOS	8.4	7.3	7.9350	7.1810	1.7840	1.4550	46.0	69.0
2007190241	2007190978	Fine	Fine	TOS	TOS	14.7	14.2	12.1890	12.3580	3.1760	2.8210	30.0	84.0
2007190241	2007190978	Coarse	Coarse	BOS	BOS	8.3	7.2	8.3680	8.1160	1.8460	1.7390	39.0	35.0
2007190241	2007190978	Fine	Fine	BOS	BOS	17.5	15.8	13.7370	13.1310	3.6310	3.4760	35.0	43.0
2007190248	2007191198	Coarse	Coarse	TOS	TOS	2.8	1.4	2.5650	2.9060	0.3650	0.2750	25.0	39.0
2007190248	2007191198	Fine	Fine	TOS	TOS	4.8	2.1	7.1360	4.6640	0.7190	0.4740	61.0	60.0
2007190248	2007191198	Coarse	Coarse	BOS	BOS	1.7	2.1	2.8620	2.9470	0.3200	0.4680	34.0	146.0
2007190248	2007191198	Fine	Fine	BOS	BOS	2.6	5.0	5.7220	7.9300	0.6870	1.3590	59.0	488.0
2007190256	2007190875	Coarse	Coarse	TOS	TOS	0.8	1.6	2.5980	1.6200	0.2210	0.1300	63.0	66.0
2007190256	2007190875	Fine	Fine	TOS	TOS	4.9	4.9	8.2610	9.5270	0.6870	0.8020	38.0	75.0
2007190256	2007190875	Coarse	Coarse	BOS	BOS	4.0	2.3	8.3030	3.6470	0.6670	0.2780	93.0	62.0
2007190256	2007190875	Fine	Fine	BOS	BOS	5.5	4.6	9.1790	8.2440	0.7590	0.7120	103.0	57.0
2007190258	2007191176	Coarse	Coarse	TOS	TOS	6.3	5.3	10.4880	9.7880	0.9410	0.8620	66.0	48.0
2007190258	2007191176	Fine	Fine	TOS	TOS	8.2	6.1	12.9240	12.4090	1.2350	1.1480	77.0	73.0
2007190258	2007191176	Coarse	Coarse	BOS	BOS	2.7	2.6	9.9680	10.1070	0.8240	0.9460	52.0	35.0
2007190258	2007191176	Fine	Fine	BOS	BOS	4.8	4.5	13.8040	13.2280	1.2450	1.3030	83.0	41.0
2007190266	2007191458	Coarse	Coarse	TOS	TOS	5.4	2.8	5.8810	4.2500	1.2970	1.7760	336.0	91.0
2007190266	2007191458	Fine	Fine	TOS	TOS	7.8	9.3	9.8480	10.0100	1.6660	2.6170	599.0	174.0
2007190266	2007191458	Coarse	Coarse	BOS	BOS	3.6	0.0	3.8250	1.8740	1.1540	0.7620	4471.0	83.0
2007190266	2007191458	Fine	Fine	BOS	BOS	9.7	8.6	10.4640	8.5610	2.8230	2.7730	11556.0	324.0
2007190285	2007190406	Coarse	Coarse	TOS	TOS	10.3	7.9	12.1320	11.9380	0.7650	0.3190	21.0	75.0
2007190285	2007190406	Fine	Fine	TOS	TOS	11.5	9.6	13.0420	12.7330	0.7420	0.3420	19.0	88.0
2007190285	2007190406	Coarse	Coarse	BOS	BOS	9.5	7.4	11.6250	12.1940	0.9840	0.4000	474.0	581.0
2007190285	2007190406	Fine	Fine	BOS	BOS	10.7	10.4	12.8720	13.2370	0.6840	0.4310	572.0	663.0
2007190296	2007190758	Coarse	Coarse	TOS	TOS	1.9	0.4	3.8630	3.5060	0.0560	0.0500	23.0	45.0
2007190296	2007190758	Fine	Fine	TOS	TOS	4.3	4.6	9.2750	9.4310	0.1110	0.1030	13.0	35.0
2007190296	2007190758	Coarse	Coarse	BOS	BOS	2.3	0.3	4.7570	4.6390	0.0690	0.0550	34.0	31.0
2007190296	2007190758	Fine	Fine	BOS	BOS	4.9	4.1	10.9500	10.4480	0.1400	0.0990	25.0	47.0
2007190311	2007191259	Coarse	Coarse	TOS	TOS	1.3	2.0	0.5690	0.6610	0.1050	0.0990	3677.0	1180.0
2007190311	2007191259	Fine	Fine	TOS	TOS	12.8	12.4	4.4810	5.4250	0.5040	0.4600	32666.0	5836.0
2007190311	2007191259	Coarse	Coarse	BOS	BOS	2.2	1.6	1.8220	1.2090	0.0950	0.0710	4164.0	1626.0
2007190311	2007191259	Fine	Fine	BOS	BOS	7.1	8.3	7.8390	9.6750	0.2930	0.3640	13909.0	11011.0
2007190328	2007191598	Coarse	Coarse	TOS	TOS	0.0	1.8	2.0130	2.2480	0.0520	0.0490	38.0	32.0
2007190328	2007191598	Fine	Fine	TOS	TOS	3.0	4.6	5.7100	7.4410	0.1180	0.1320	34.0	43.0
2007190328	2007191598	Coarse	Coarse	BOS	BOS	0.2	2.0	4.2000	4.1700	0.0480	0.0420	29.0	24.0
2007190328	2007191598	Fine	Fine	BOS	BOS	4.5	5.8	11.9580	13.3830	0.0830	0.0720	34.0	23.0
2007190335	2007190692	Coarse	Coarse	TOS	TOS	8.1	8.7	12.5830	11.8370	0.4840	0.4680	37.0	33.0
2007190335	2007190692	Fine	Fine	TOS	TOS	11.4	12.3	15.6260	15.8230	0.5590	0.5960	31.0	44.0
2007190335	2007190692	Coarse	Coarse	BOS	BOS	12.1	10.2	13.2020	13.1160	2.4840	2.4950	43.0	25.0
2007190335	2007190692	Fine	Fine	BOS	BOS	16.2	14.5	16.2120	16.6590	2.8040	2.7610	40.0	28.0
2007190342	2007190989	Coarse	Coarse	TOS	TOS	5.6	6.0	10.9000	12.5540	0.2300	0.2110	36.0	29.0
2007190342	2007190989	Fine	Fine	TOS	TOS	6.9	10.5	15.9820	17.4330	0.3600	0.2990	55.0	19

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	Cu (ppm)	Cu (ppm)	F (ppm)	F (ppm)	Fe2O3 (%)	Fe2O3 (%)	K2O (%)	K2O (%)	MgO (%)	MgO (%)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	50	50	0.005	0.005	0.005	0.005	0.01	0.01
2007190181	2007191396	17.5	18.3	25.0	25.0	5.3870	5.1930	1.3030	1.3540	0.997	1.078
2007190181	2007191396	21.1	14.8	25.0	25.0	5.0140	4.9120	1.4200	1.3840	1.027	1.002
2007190181	2007191396	27.3	20.9	25.0	25.0	5.9190	5.8670	1.4100	1.3950	1.233	1.224
2007190183	2007190471	5.0	5.0	25.0	25.0	2.0720	2.7870	1.7590	1.6490	0.307	0.276
2007190183	2007190471	5.0	5.0	25.0	25.0	3.7900	3.7030	2.6700	2.7680	0.983	0.879
2007190183	2007190471	10.7	5.0	602.0	188.0	4.5200	4.8720	4.0850	2.6900	5.082	3.249
2007190183	2007190471	5.0	5.0	683.0	298.0	4.9280	4.5590	4.5560	3.8390	5.953	5.845
2007190185	2007191253	49.8	36.4	172.0	25.0	9.4620	9.4400	1.8890	1.7590	1.479	1.236
2007190185	2007191253	47.5	46.1	25.0	25.0	10.0150	10.7950	1.8820	1.7790	1.546	1.355
2007190185	2007191253	50.0	41.8	114.0	25.0	10.0890	9.5880	2.0490	1.9010	1.864	1.568
2007190185	2007191253	47.3	49.1	25.0	25.0	10.1260	9.9090	1.9960	1.9680	1.898	1.732
2007190189	2007191542	24.6	13.3	25.0	25.0	5.1900	4.9040	1.9370	1.8840	1.296	1.340
2007190189	2007191542	12.8	20.0	25.0	25.0	4.5020	4.5780	1.8050	1.8640	1.145	1.253
2007190189	2007191542	23.4	16.6	25.0	25.0	5.0650	4.9810	1.8530	1.8250	1.305	1.267
2007190189	2007191542	14.4	20.5	25.0	25.0	4.7000	4.6680	1.7840	1.8170	1.214	1.239
2007190193	2007190788	11.3	5.0	25.0	25.0	2.9970	3.6790	1.8000	1.8750	0.568	0.702
2007190193	2007190788	5.0	5.0	25.0	25.0	2.5280	3.0390	1.7290	1.6900	0.500	0.568
2007190193	2007190788	5.0	10.5	25.0	25.0	3.6750	3.4920	2.1200	2.0760	0.798	0.637
2007190193	2007190788	14.9	11.6	125.0	25.0	3.3900	3.3360	2.0380	1.9110	0.767	0.645
2007190194	2007190704	11.9	5.0	25.0	25.0	2.9220	2.7110	1.4900	1.4600	0.402	0.375
2007190194	2007190704	12.5	5.0	25.0	25.0	2.8920	2.4520	1.3170	1.2450	0.397	0.351
2007190194	2007190704	15.0	14.6	25.0	25.0	3.3650	3.6340	1.5940	1.5930	0.429	0.501
2007190194	2007190704	24.9	10.2	25.0	25.0	3.2020	3.1860	1.4810	1.4460	0.438	0.456
2007190197	2007190962	5.0	5.0	25.0	25.0	1.1810	1.3650	0.1870	0.1670	0.005	0.005
2007190197	2007190962	5.0	5.0	25.0	25.0	1.3150	1.4680	1.1240	1.0300	0.087	0.112
2007190197	2007190962	5.0	5.0	25.0	25.0	2.4690	2.5400	0.2550	0.2410	0.069	0.060
2007190197	2007190962	13.5	5.0	25.0	25.0	5.4930	4.3730	1.0110	0.9000	0.303	0.188
2007190208	2007191593	5.0	5.0	25.0	25.0	1.2940	1.3280	0.2930	0.2790	0.010	0.005
2007190208	2007191593	5.0	5.0	25.0	25.0	0.5910	0.5620	0.4360	0.4260	0.027	0.019
2007190208	2007191593	5.0	5.0	25.0	25.0	2.6810	1.8720	0.4390	0.3530	0.211	0.154
2007190208	2007191593	5.0	5.0	25.0	25.0	2.9550	1.3790	0.5330	0.4240	0.252	0.139
2007190209	2007191254	11.1	5.0	25.0	25.0	3.3640	2.8130	0.3340	0.2720	0.648	0.470
2007190209	2007191254	5.0	5.0	25.0	25.0	3.7700	3.6000	0.4200	0.4060	0.769	0.639
2007190209	2007191254	12.8	5.0	25.0	25.0	3.0150	2.4650	0.3010	0.2010	0.573	0.365
2007190209	2007191254	12.4	10.8	25.0	25.0	4.0010	3.9680	0.4510	0.3960	0.806	0.676
2007190212	2007190747	5.0	5.0	25.0	25.0	1.3740	1.2210	0.6080	0.3650	0.073	0.030
2007190212	2007190747	13.4	10.8	25.0	25.0	3.8010	4.1770	2.3620	2.1920	0.415	0.462
2007190212	2007190747	15.8	5.0	25.0	25.0	6.8220	1.3260	1.7210	0.5170	0.691	0.049
2007190212	2007190747	10.2	5.0	25.0	25.0	3.3100	2.9490	2.3760	2.2450	0.321	0.263
2007190218	2007191348	5.0	11.2	25.0	25.0	3.5870	3.8050	0.1680	0.2590	0.023	0.061
2007190218	2007191348	18.8	31.4	25.0	25.0	6.0640	7.5730	0.6820	0.7900	0.126	0.201
2007190218	2007191348	13.4	20.2	25.0	25.0	4.1880	4.7470	0.1990	0.3430	0.039	0.109
2007190218	2007191348	20.7	28.9	25.0	25.0	6.6800	7.9940	0.7270	0.8090	0.145	0.263
2007190241	2007190978	25.3	20.8	25.0	25.0	5.9190	5.4310	0.8300	0.9720	1.496	1.249
2007190241	2007190978	42.9	44.0	25.0	25.0	10.2730	10.3440	1.0960	1.4200	2.531	2.374
2007190241	2007190978	23.8	23.6	25.0	25.0	5.3310	5.2720	0.7550	0.8310	1.436	1.350
2007190241	2007190978	43.2	38.5	25.0	25.0	9.3270	9.0850	1.0120	1.0850	2.614	2.368
2007190248	2007191198	5.0	5.0	25.0	25.0	1.3030	1.2910	0.5390	0.6510	0.115	0.087
2007190248	2007191198	5.0	17.6	25.0	25.0	3.6630	7.5810	1.2080	0.8530	0.540	0.457
2007190248	2007191198	5.0	5.0	25.0	25.0	1.5940	1.5410	0.5920	0.5330	0.120	0.168
2007190248	2007191198	13.5	13.6	25.0	25.0	5.2040	4.8860	1.0050	1.1600	0.455	0.714
2007190256	2007190875	5.0	5.0	25.0	25.0	4.4930	3.3420	0.6440	0.5070	0.154	0.078
2007190256	2007190875	5.0	14.4	25.0	25.0	3.5190	5.0760	1.5970	1.6360	0.565	0.780
2007190256	2007190875	10.7	5.0	25.0	25.0	3.4820	2.7410	1.5630	0.9090	0.648	0.244
2007190256	2007190875	5.0	5.0	25.0	25.0	3.6460	3.6140	1.7440	1.5880	0.635	0.570
2007190258	2007191176	5.0	5.0	25.0	25.0	3.1410	2.8610	1.9610	1.7940	0.573	0.496
2007190258	2007191176	13.0	11.8	25.0	25.0	4.2370	3.9220	2.1640	2.0510	0.821	0.731
2007190258	2007191176	5.0	5.0	25.0	25.0	2.2230	2.6670	2.0780	2.1770	0.368	0.490
2007190258	2007191176	5.0	16.2	25.0	25.0	4.2840	4.4040	2.1360	2.2390	0.768	0.863
2007190266	2007191458	5.0	5.0	25.0	25.0	2.4710	1.8270	1.3500	1.2690	0.681	0.532
2007190266	2007191458	12.5	13.5	25.0	25.0	4.1740	4.3210	1.7210	1.7210	1.083	1.246
2007190266	2007191458	5.0	5.0	25.0	25.0	1.6930	0.9260	1.2280	1.1120	0.522	0.128
2007190266	2007191458	14.5	5.0	25.0	25.0	4.5780	3.8830	1.9020	1.5700	1.826	1.140
2007190285	2007190406	18.8	24.2	25.0	25.0	6.3090	6.2210	0.3710	0.4260	0.723	0.527
2007190285	2007190406	25.7	23.2	25.0	25.0	6.7840	6.6150	0.4030	0.4570	0.779	0.572
2007190285	2007190406	20.9	28.0	25.0	25.0	6.2260	6.4190	0.3620	0.3730	0.762	0.621
2007190285	2007190406	25.5	27.2	25.0	25.0	6.8930	6.9540	0.3940	0.4040	0.840	0.683
2007190296	2007190758	5.0	5.0	25.0	25.0	1.5880	1.7310	0.3570	0.3210	0.035	0.020
2007190296	2007190758	10.1	10.9	25.0	25.0	2.8020	2.7910	1.0200	1.0470	0.134	0.128
2007190296	2007190758	5.0	5.0	25.0	25.0	1.7860	1.8160	0.3580	0.3740	0.049	0.039
2007190296	2007190758	5.0	10.4	25.0	25.0	3.1330	3.0000	1.0440	1.0600	0.158	0.133
2007190311	2007191259	5.0	5.0	25.0	25.0	0.8290	0.9120	0.1730	0.1740	0.083	0.019
2007190311	2007191259	5.0	5.0	25.0	25.0	1.5860	1.3440	2.0880	2.3770	0.549	0.244
2007190311	2007191259	5.0	5.0	25.0	25.0	1.9330	1.3810	0.3480	0.1000	0.343	0.148
2007190311	2007191259	5.0	5.0	136.0	25.0	5.9300	6.2800	1.9560	1.2130	1.467	1.327
2007190328	2007191598	5.0	5.0	25.0	25.0	1.1320	1.3440	0.0860	0.0870	0.005	0.005
2007190328	2007191598	5.0	10.0	25.0	25.0	1.9350	2.7400	0.4340	0.4840	0.046	0.039
2007190328	2007191598	5.0	5.0	25.0	25.0	1.6340	1.7680	0.1230	0.1120	0.010	0.005
2007190328	2007191598	5.0	10.2	25.0	25.0	3.6320	4.4930	0.5040	0.5130	0.071	0.042
2007190335	2007190692	27.6	18.9	25.0	25.0	4.8890	4.6010	1.3840	1.3580	0.660	0.596
2007190335	2007190692	23.7	21.3	25.0	25.0	5.9440	5.9470	1.6810	1.7620	0.839	0.804
2007190335	2007190692	16.1	18.3	25.0	25.0	5.0090	4.8660	1.5600	1.5860	1.784	1.448
2007190335	2007190692	17.9	15.0	25.0	25.0	6.0010	6.0440	1.8150	1.9250	2.073	1.822
2007190342	2007190989	23.6	29.3	25.0	25.0	6.1200	7.0390	1.6940	1.7870	0.436	0.548
2007190342	2007190989	53.4	42.4	25.0	25.0	9.0630	9.3450	1.9270	1.9900	0.718	0.832

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	MnO (%)	MnO (%)	Na2O (%)	Na2O (%)	Ni (ppm)	Ni (ppm)	P2O5 (%)	P2O5 (%)	Rb (ppm)	Rb (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.005	0.005	0.01	0.01	10	10	0.005	0.005	10	10
2007190181	2007191396	0.0890	0.0910	0.991	1.051	24.1	18.9	0.2110	0.1600	62.4	66.8
2007190181	2007191396	0.0890	0.0900	1.040	1.018	23.3	19.2	0.0910	0.0860	73.2	68.2
2007190181	2007191396	0.1230	0.1300	1.126	1.091	71.3	29.3	0.1090	0.1000	73.5	73.3
2007190183	2007190471	0.0190	0.0300	1.020	0.381	5.0	5.0	0.0320	0.0370	65.9	60.2
2007190183	2007190471	0.0430	0.0410	1.439	0.726	5.0	5.0	0.0830	0.0900	95.2	97.5
2007190183	2007190471	0.0800	0.0520	1.728	1.230	19.0	13.1	0.1520	0.1180	115.6	93.8
2007190183	2007190471	0.0810	0.0670	1.357	1.402	17.8	17.6	0.1830	0.1930	135.3	124.6
2007190185	2007191253	0.0910	0.0750	0.440	0.412	57.4	29.7	0.0760	0.0880	89.2	77.7
2007190185	2007191253	0.1030	0.0990	0.429	0.426	42.8	37.2	0.0820	0.1010	89.5	85.6
2007190185	2007191253	0.1190	0.0940	0.334	0.339	49.6	34.7	0.0800	0.0750	104.8	89.8
2007190185	2007191253	0.1270	0.1140	0.372	0.386	43.3	37.1	0.0800	0.0820	103.8	97.3
2007190189	2007191542	0.0800	0.0910	0.718	0.802	25.7	12.1	0.1460	0.1680	86.9	85.9
2007190189	2007191542	0.0660	0.0740	0.729	0.844	16.7	18.6	0.1290	0.1650	86.5	83.1
2007190189	2007191542	0.0760	0.0820	1.194	1.205	27.3	13.8	0.1140	0.1310	84.9	83.5
2007190189	2007191542	0.0670	0.0770	1.178	1.228	19.6	18.0	0.1120	0.1410	84.8	80.4
2007190193	2007190788	0.1240	0.0510	0.575	0.449	14.8	5.0	0.1510	0.1200	102.9	133.9
2007190193	2007190788	0.0970	0.0410	0.555	0.481	5.0	5.0	0.1210	0.1130	107.5	116.1
2007190193	2007190788	0.0830	0.1120	0.584	0.571	5.0	18.1	0.0590	0.0530	142.7	134.1
2007190193	2007190788	0.0570	0.1050	0.592	0.575	16.6	10.9	0.0670	0.0590	129.5	129.3
2007190194	2007190704	0.0240	0.0210	0.293	0.287	12.0	5.0	0.1120	0.1020	84.8	84.5
2007190194	2007190704	0.0250	0.0170	0.292	0.289	10.4	5.0	0.1200	0.1020	81.8	75.4
2007190194	2007190704	0.0860	0.0640	0.385	0.419	13.5	15.5	0.1140	0.0920	92.9	91.4
2007190194	2007190704	0.0800	0.0630	0.400	0.427	20.7	5.0	0.1210	0.0860	83.7	85.7
2007190197	2007190962	0.0100	0.0100	0.019	0.015	5.0	5.0	0.0180	0.0210	29.0	27.6
2007190197	2007190962	0.0360	0.0400	0.132	0.114	5.0	5.0	0.0340	0.0410	72.3	70.9
2007190197	2007190962	0.0510	0.0190	0.048	0.023	5.0	5.0	0.0250	0.0260	49.3	42.2
2007190197	2007190962	0.1980	0.0520	0.168	0.089	33.9	15.2	0.0490	0.0450	124.8	96.7
2007190208	2007191593	0.0140	0.0260	0.206	0.218	5.0	5.0	0.0210	0.0260	28.9	35.6
2007190208	2007191593	0.0160	0.0310	0.331	0.382	5.0	5.0	0.0270	0.0290	39.9	39.5
2007190208	2007191593	0.0050	0.0100	0.329	0.276	5.0	5.0	0.0180	0.0220	52.7	46.1
2007190208	2007191593	0.0070	0.0100	0.411	0.366	5.0	5.0	0.0230	0.0240	59.2	44.7
2007190209	2007191254	0.0780	0.0600	0.073	0.030	11.4	5.0	0.0410	0.0370	45.2	38.8
2007190209	2007191254	0.0810	0.0720	0.083	0.054	5.0	5.0	0.0470	0.0450	58.1	54.7
2007190209	2007191254	0.0710	0.0440	0.112	0.030	13.3	5.0	0.0350	0.0280	46.3	32.1
2007190209	2007191254	0.1140	0.0910	0.159	0.058	13.5	16.2	0.0470	0.0470	54.3	50.1
2007190212	2007190747	0.0070	0.0070	0.025	0.020	5.0	5.0	0.0320	0.0270	39.6	26.8
2007190212	2007190747	0.0470	0.0640	0.164	0.168	5.0	5.0	0.1100	0.1550	111.1	112.8
2007190212	2007190747	0.0400	0.0070	0.172	0.026	12.5	5.0	0.1230	0.0290	69.8	32.3
2007190212	2007190747	0.0270	0.0290	0.159	0.174	5.0	5.0	0.0710	0.0820	105.6	102.4
2007190218	2007191348	0.0070	0.0090	0.014	0.020	10.8	5.0	0.0270	0.0450	28.9	33.3
2007190218	2007191348	0.0230	0.0260	0.047	0.057	23.4	36.4	0.0630	0.0960	61.3	75.5
2007190218	2007191348	0.0190	0.0300	0.024	0.036	14.5	21.7	0.0270	0.0380	30.3	39.6
2007190218	2007191348	0.0510	0.0570	0.052	0.076	31.9	39.8	0.0470	0.0650	63.4	78.3
2007190241	2007190978	0.0910	0.0840	0.385	0.306	59.3	50.0	0.2330	0.2370	32.9	37.8
2007190241	2007190978	0.1620	0.1670	0.747	0.662	93.5	95.4	0.3750	0.4480	35.5	41.1
2007190241	2007190978	0.0850	0.0790	0.364	0.315	55.2	54.1	0.2280	0.2050	33.4	41.7
2007190241	2007190978	0.1570	0.1510	0.721	0.613	93.6	88.1	0.4060	0.3640	36.0	45.3
2007190248	2007191198	0.0130	0.0100	0.297	0.428	5.0	5.0	0.0390	0.0310	30.1	33.7
2007190248	2007191198	0.0530	0.1200	0.641	0.572	5.0	5.0	0.0850	0.0830	55.3	64.9
2007190248	2007191198	0.0190	0.0140	0.370	0.371	5.0	5.0	0.0320	0.0400	29.6	29.6
2007190248	2007191198	0.0850	0.0650	0.717	0.929	10.4	5.0	0.0760	0.0930	57.4	56.6
2007190256	2007190875	0.0210	0.0120	0.263	0.153	5.0	5.0	0.0910	0.0680	25.2	28.3
2007190256	2007190875	0.0430	0.0630	0.944	0.947	5.0	12.9	0.0990	0.1280	67.5	65.4
2007190256	2007190875	0.0330	0.0200	0.830	0.358	5.0	5.0	0.0950	0.0680	57.5	40.3
2007190256	2007190875	0.0410	0.0470	1.053	1.012	5.0	5.0	0.1130	0.1010	64.4	67.5
2007190258	2007191176	0.0570	0.0490	1.773	1.757	12.7	5.0	0.0860	0.0830	87.5	80.7
2007190258	2007191176	0.0840	0.0740	2.010	2.178	22.0	17.8	0.1270	0.1260	99.6	90.2
2007190258	2007191176	0.0350	0.0470	2.134	1.893	5.0	5.0	0.0460	0.0610	89.0	93.4
2007190258	2007191176	0.0780	0.0870	2.639	2.185	21.0	21.5	0.0930	0.1130	96.4	96.4
2007190266	2007191458	0.0250	0.0190	0.313	0.169	5.0	5.0	0.0700	0.0520	59.3	56.7
2007190266	2007191458	0.0460	0.0510	0.712	0.530	5.0	5.0	0.1110	0.1000	71.7	74.2
2007190266	2007191458	0.0150	0.0060	0.760	0.066	5.0	5.0	0.0540	0.0320	51.1	45.2
2007190266	2007191458	0.0560	0.0480	2.109	0.481	5.0	5.0	0.1240	0.0990	83.0	72.2
2007190285	2007190406	0.1410	0.1270	0.225	0.212	45.9	45.1	0.0560	0.0740	49.7	53.8
2007190285	2007190406	0.1340	0.1310	0.253	0.238	48.4	45.2	0.0600	0.0770	53.8	54.1
2007190285	2007190406	0.1430	0.1320	0.351	0.324	49.9	54.4	0.0550	0.0570	46.1	47.5
2007190285	2007190406	0.1550	0.1390	0.401	0.369	55.2	54.2	0.0590	0.0650	51.5	52.2
2007190296	2007190758	0.0140	0.0140	0.034	0.025	5.0	5.0	0.0300	0.0250	33.9	32.2
2007190296	2007190758	0.0440	0.0420	0.073	0.081	5.0	5.0	0.0560	0.0520	65.5	70.9
2007190296	2007190758	0.0080	0.0100	0.030	0.029	5.0	5.0	0.0220	0.0220	34.4	37.7
2007190296	2007190758	0.0250	0.0240	0.066	0.069	17.8	5.0	0.0430	0.0390	74.9	72.6
2007190311	2007191259	0.0060	0.0060	0.350	0.157	5.0	5.0	0.0180	0.0200	22.0	20.5
2007190311	2007191259	0.0170	0.0140	2.894	0.821	5.0	5.0	0.0570	0.0590	79.1	87.0
2007190311	2007191259	0.0050	0.0025	0.482	0.209	5.0	5.0	0.0140	0.0140	42.5	28.5
2007190311	2007191259	0.0190	0.0060	1.492	1.325	14.0	5.0	0.0250	0.0260	137.6	106.3
2007190328	2007191598	0.0100	0.0060	0.005	0.005	5.0	5.0	0.0200	0.0220	20.8	27.6
2007190328	2007191598	0.0260	0.0230	0.023	0.011	5.0	35.4	0.0370	0.0460	51.9	59.2
2007190328	2007191598	0.0060	0.0050	0.005	0.005	5.0	5.0	0.0230	0.0220	28.2	31.1
2007190328	2007191598	0.0150	0.0160	0.029	0.015	11.7	10.1	0.0390	0.0400	66.8	74.3
2007190335	2007190692	0.1060	0.0660	0.162	0.151	24.9	16.5	0.0790	0.0820	74.6	74.9
2007190335	2007190692	0.1200	0.0850	0.232	0.234	26.8	21.0	0.0960	0.1030	87.0	93.2
2007190335	2007190692	0.0420	0.0340	0.179	0.146	20.5	17.4	0.0440	0.0450	78.9	81.2
2007190335	2007190692	0.0490	0.0400	0.219	0.177	23.4	19.2	0.0570	0.0540	92.2	100.2
2007190342	2007190989	0.0980	0.1240	0.294	0.305	19.8	24.8	0.0920	0.0980	81.4	93.8
2007190342	2007190989	0.1730	0.1770	0.369	0.349	42.6	34.6	0.1350	0.1340	105.5	119.7

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	S (ppm)	S (ppm)	SiO2 (%)	SiO2 (%)	Sr (ppm)	Sr (ppm)	TiO2 (%)	TiO2 (%)	Zn (ppm)	Zn (ppm)	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	0.01	0.01	10	10	0.005	0.005	10	10	10	10
2007190181	2007191396	392.3	223.5	62.551	65.418	140.0	137.2	0.9180	1.0080	54.5	57.7	381.9	435.1
2007190181	2007191396	101.7	85.9	69.772	68.901	135.3	133.4	0.8750	0.8590	52.6	49.0	281.4	293.6
2007190181	2007191396	116.0	107.0	64.136	63.987	142.8	150.5	1.0530	1.0480	63.7	61.9	383.8	394.8
2007190183	2007190471	5227.2	2981.6	85.873	89.001	121.4	94.2	0.3580	0.5580	10.2	19.4	402.8	330.2
2007190183	2007190471	6945.5	8724.8	71.536	73.308	183.6	168.4	1.1770	1.0390	37.2	40.4	2780.6	2147.8
2007190183	2007190471	20410.3	12639.3	49.833	65.949	717.2	413.2	0.5660	0.6150	60.2	46.4	179.7	229.4
2007190183	2007190471	5520.0	12514.2	51.542	51.126	484.9	1093.4	0.6500	0.6840	61.7	69.1	226.4	321.0
2007190185	2007191253	164.0	147.3	69.462	70.188	45.6	40.1	1.0320	1.0580	83.2	71.9	231.4	213.2
2007190185	2007191253	187.3	178.0	64.973	66.809	44.9	47.5	1.2160	1.4000	82.8	85.8	394.3	457.5
2007190185	2007191253	173.3	168.7	64.102	66.471	52.9	49.4	0.9510	0.9710	85.1	72.9	177.8	192.7
2007190185	2007191253	180.2	190.9	61.413	63.353	57.3	56.3	1.0780	1.1080	79.7	79.1	288.6	310.0
2007190189	2007191542	215.9	207.8	65.522	65.047	126.8	142.5	1.0090	0.9540	70.9	55.1	314.5	288.8
2007190189	2007191542	194.1	220.6	67.148	67.337	126.4	136.0	0.9850	0.9850	52.2	59.8	453.7	416.4
2007190189	2007191542	524.7	443.9	66.698	65.059	134.4	146.3	1.0270	1.0250	67.6	58.1	315.8	294.9
2007190189	2007191542	503.8	492.6	65.979	66.927	139.0	151.9	1.0210	1.0280	56.4	59.8	384.9	372.5
2007190193	2007190788	418.6	638.7	69.098	60.986	88.4	78.2	0.7280	0.7870	94.7	55.7	413.8	292.5
2007190193	2007190788	371.2	586.9	72.617	65.713	79.2	71.6	0.7400	0.7210	82.1	39.7	577.1	390.1
2007190193	2007190788	100.0	141.3	70.376	73.179	86.9	74.8	0.7820	0.7930	43.9	42.7	364.4	354.0
2007190193	2007190788	127.3	161.1	71.820	72.202	84.6	79.5	0.8280	0.8720	51.9	42.4	470.9	516.5
2007190194	2007190704	286.7	398.1	74.422	73.770	65.3	64.8	0.6790	0.6620	39.4	36.5	444.4	486.1
2007190194	2007190704	268.9	354.5	75.540	77.060	68.7	58.8	0.8030	0.7720	41.8	35.4	752.8	827.1
2007190194	2007190704	116.4	165.3	75.534	75.319	84.7	78.3	0.7900	0.8280	38.4	41.7	410.1	421.9
2007190194	2007190704	138.0	175.6	76.260	75.902	88.9	80.6	0.9160	0.8550	48.7	33.7	552.0	552.6
2007190197	2007190962	35.4	31.3	96.405	95.798	5.0	12.2	0.1780	0.1760	5.0	5.0	236.0	237.7
2007190197	2007190962	61.8	79.0	88.476	85.939	41.3	39.2	0.8550	0.8640	5.0	5.0	1305.2	1330.1
2007190197	2007190962	47.5	34.1	86.624	88.067	23.2	18.7	0.3200	0.2890	5.0	5.0	171.2	220.2
2007190197	2007190962	86.6	79.5	61.170	71.008	60.3	42.1	1.1710	0.9580	19.5	5.0	768.8	1184.5
2007190208	2007191593	92.2	86.0	92.693	91.834	22.9	28.6	0.4770	0.5330	5.0	5.0	704.5	755.8
2007190208	2007191593	104.8	107.5	91.643	91.720	30.4	36.6	0.8070	0.8410	5.0	5.0	1339.1	1271.7
2007190208	2007191593	304.6	160.0	78.357	86.065	22.2	27.8	0.5880	0.6430	17.1	14.7	499.3	634.6
2007190208	2007191593	425.5	209.1	75.339	87.026	29.3	38.2	0.7740	0.8410	24.0	12.8	866.0	1056.2
2007190209	2007191254	96.3	75.6	78.635	82.687	71.0	53.6	0.6670	0.5550	30.9	18.9	497.1	465.7
2007190209	2007191254	106.3	94.8	73.091	76.515	89.4	75.1	0.8130	0.8160	27.8	30.3	794.3	1024.4
2007190209	2007191254	128.3	68.0	82.382	85.466	72.8	48.3	0.5970	0.4660	29.6	14.3	456.6	423.4
2007190209	2007191254	200.3	92.5	73.326	74.699	109.2	79.9	0.8500	0.8580	36.2	35.8	782.3	970.3
2007190212	2007190747	59.8	32.7	92.930	96.630	25.1	21.1	0.1610	0.1120	5.0	5.0	304.7	292.0
2007190212	2007190747	188.2	283.3	73.995	67.524	81.8	93.6	0.8810	1.0800	33.7	45.8	2185.7	4081.5
2007190212	2007190747	364.4	41.5	73.150	96.093	148.7	22.4	0.5090	0.1310	59.4	5.0	411.5	219.3
2007190212	2007190747	103.1	95.0	78.893	80.733	69.8	70.0	0.8210	0.8790	25.7	23.9	1911.8	2815.3
2007190218	2007191348	57.9	61.1	88.527	85.265	12.3	17.5	0.3430	0.4230	12.1	18.9	232.2	247.7
2007190218	2007191348	94.3	107.6	68.970	60.983	27.4	33.4	0.9970	1.0780	30.8	51.6	937.6	620.0
2007190218	2007191348	67.8	65.3	86.927	80.776	10.3	22.2	0.3920	0.5350	15.5	28.1	271.9	271.6
2007190218	2007191348	133.9	101.0	66.782	57.672	32.6	39.0	1.0490	1.0970	33.1	50.6	910.3	559.9
2007190241	2007190978	208.9	220.5	71.487	74.462	430.5	416.8	1.3660	1.1860	54.4	50.0	514.5	370.2
2007190241	2007190978	307.0	376.2	51.964	52.378	377.0	364.5	2.7050	2.6260	96.1	108.0	612.7	580.0
2007190241	2007190978	103.7	111.8	72.190	73.749	334.0	349.5	1.0980	1.0670	47.6	44.6	265.2	302.4
2007190241	2007190978	195.1	223.1	48.687	51.701	396.2	353.4	2.1240	2.1250	82.5	80.1	354.8	483.6
2007190248	2007191198	142.0	100.9	91.723	92.693	69.1	82.0	0.3370	0.4110	5.0	5.0	380.8	452.0
2007190248	2007191198	205.1	110.5	79.309	76.630	135.5	131.5	1.6540	5.3750	39.0	71.4	3262.6	12651.2
2007190248	2007191198	124.8	103.0	91.844	91.510	70.2	70.6	0.5930	0.4830	5.0	5.0	771.8	498.8
2007190248	2007191198	154.1	151.4	79.540	75.179	132.2	170.7	3.2480	2.2900	52.4	53.3	7644.5	4681.7
2007190256	2007190875	615.7	524.4	90.376	92.374	128.1	90.4	0.2890	0.1980	24.7	10.8	225.5	119.5
2007190256	2007190875	556.4	625.3	78.176	74.749	219.2	211.6	1.0340	1.1990	36.0	62.8	1757.2	2249.4
2007190256	2007190875	523.6	483.0	79.695	89.176	177.6	112.9	0.5490	0.2790	41.2	17.2	379.0	184.2
2007190256	2007190875	614.2	525.0	76.176	78.250	205.1	198.7	1.0150	1.1090	40.5	44.8	1267.3	2004.3
2007190258	2007191176	198.7	182.6	73.919	76.112	147.7	139.3	0.6890	0.8350	42.9	35.1	288.8	571.1
2007190258	2007191176	262.8	239.4	67.073	69.792	170.2	168.5	1.0660	1.3500	64.7	59.9	556.8	1112.3
2007190258	2007191176	61.1	74.9	79.091	78.382	145.8	149.2	0.5240	0.6400	20.6	32.4	369.0	392.1
2007190258	2007191176	108.3	120.3	68.642	69.594	183.2	172.4	1.3070	1.3070	51.9	65.7	1390.2	1097.3
2007190266	2007191458	942.3	686.4	82.020	87.030	186.6	196.7	0.3420	0.2540	28.4	19.5	209.2	213.4
2007190266	2007191458	1771.9	1528.9	71.771	69.152	239.7	293.9	0.7440	0.7810	59.0	58.7	614.6	890.3
2007190266	2007191458	744.4	390.1	86.405	95.201	148.1	140.2	0.2290	0.0830	15.2	5.0	216.2	68.5
2007190266	2007191458	1771.9	1367.7	64.160	71.564	243.9	293.0	0.8190	0.9630	70.1	54.6	969.2	2024.6
2007190285	2007190406	108.6	103.6	67.433	70.689	81.3	58.7	1.5280	1.5350	45.9	46.2	299.8	330.3
2007190285	2007190406	117.8	112.9	64.597	67.474	95.3	64.9	1.7250	1.7680	50.0	49.9	415.1	505.1
2007190285	2007190406	413.5	142.9	68.434	70.444	93.1	73.3	1.5470	1.5610	45.4	51.2	297.1	303.3
2007190285	2007190406	318.3	184.0	65.055	65.444	105.1	81.7	1.8080	1.8110	52.4	51.7	422.5	447.4
2007190296	2007190758	30.2	18.3	91.864	93.782	15.7	14.5	0.2640	0.2430	5.0	5.0	253.6	240.5
2007190296	2007190758	53.4	51.0	81.329	81.027	41.1	39.1	0.7610	0.7630	18.3	17.6	1182.3	1138.3
2007190296	2007190758	37.7	31.1	90.346	92.604	13.5	17.0	0.2830	0.2830	5.0	11.1	250.2	266.7
2007190296	2007190758	49.6	51.7	78.683	80.326	42.9	38.8	0.8030	0.7970	14.3	17.2	1178.4	1233.7
2007190311	2007191259	235.6	172.5	95.773	95.456	20.5	13.6	0.4180	0.4510	5.0	5.0	360.4	658.4
2007190311	2007191259	1459.4	742.8	69.363	74.224	86.3	83.1	2.1670	1.8780	5.0	5.0	1547.6	1962.4
2007190311	2007191259	310.4	176.5	91.774	95.055	17.4	12.0	0.5260	0.1920	5.0	5.0	357.3	244.6
2007190311	2007191259	1024.4	989.0	70.323	69.203	48.0	38.8	1.9360	1.0890	14.3	14.8	985.6	772.2
2007190328	2007191598	34.3	23.8	96.603	94.431	12.6	13.9	0.2200	0.2280	5.0	5.0	290.8	306.3
2007190328	2007191598	56.0	80.8	87.718	8								

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	LOI (%)	LOI (%)	Al2O3 (%)	Al2O3 (%)	CaO (%)	CaO (%)	Cl (ppm)	Cl (ppm)
METHOD:	METHOD:	SIZE	SIZE			Calc	Calc	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0	0	0.005	0.005	0.002	0.002	10	10
2007190342	2007190989	Coarse	Coarse	BOS	BOS	6.5	8.3	13.5870	14.8640	0.2360	0.2890	43.0	23.0
2007190342	2007190989	Fine	Fine	BOS	BOS	9.9	13.3	20.7870	20.4060	0.3580	0.3870	42.0	20.0
2007190349	2007191436	Coarse	Coarse	TOS	TOS	4.4	3.7	10.7730	10.3400	0.8440	0.8380	51.0	28.0
2007190349	2007191436	Fine	Fine	TOS	TOS	4.9	4.6	12.4650	11.7560	0.9870	1.0190	44.0	36.0
2007190349	2007191436	Coarse	Coarse	BOS	BOS	4.3	4.6	11.8680	11.3260	0.8650	0.8530	48.0	25.0
2007190349	2007191436	Fine	Fine	BOS	BOS	7.8	6.1	15.6390	14.4000	1.0200	1.0310	40.0	38.0
2007190352	2007190611	Coarse	Coarse	TOS	TOS	33.7	24.1	12.2380	15.3590	0.4050	0.3980	385.0	823.0
2007190352	2007190611	Fine	Fine	TOS	TOS	35.9	29.0	12.3720	15.0120	0.4420	0.4270	483.0	1023.0
2007190352	2007190611	Coarse	Coarse	BOS	BOS	13.8	17.0	16.6940	19.0720	0.2760	0.2330	4126.0	2308.0
2007190352	2007190611	Fine	Fine	BOS	BOS	13.4	19.0	17.2960	17.9620	0.3360	0.2460	4663.0	2356.0
2007190355	2007191257	Coarse	Coarse	TOS	TOS	9.4	11.2	16.2950	17.2420	0.5090	0.2260	1167.0	4795.0
2007190355	2007191257	Fine	Fine	TOS	TOS	11.5	11.7	20.0720	20.0680	0.5060	0.3730	1276.0	4708.0
2007190355	2007191257	Coarse	Coarse	BOS	BOS	15.4	15.3	17.4880	18.9780	2.0990	1.4060	6777.0	7056.0
2007190355	2007191257	Fine	Fine	BOS	BOS	18.0	16.2	18.9860	19.8690	1.9150	1.6130	7140.0	7466.0
2007190357	2007190856	Coarse	Coarse	TOS	TOS	0.2	2.0	1.2050	1.4100	0.0420	0.0450	39.0	27.0
2007190357	2007190856	Fine	Fine	TOS	TOS	3.4	3.6	4.4300	5.0840	0.0720	0.0880	39.0	45.0
2007190357	2007190856	Coarse	Coarse	BOS	BOS	1.7	4.7	3.3210	4.8840	0.0630	0.1680	59.0	20.0
2007190357	2007190856	Fine	Fine	BOS	BOS	6.3	9.6	8.2790	10.6370	0.1060	0.3490	98.0	22.0
2007190361	2007191094	Coarse	Coarse	TOS	TOS	20.6	16.8	12.4830	12.9760	11.3150	9.4390	2861.0	10340.0
2007190361	2007191094	Fine	Fine	TOS	TOS	20.4	17.0	13.0600	13.3890	10.8730	8.6890	3054.0	9170.0
2007190361	2007191094	Coarse	Coarse	BOS	BOS	30.6	29.7	7.3530	7.6530	28.4150	27.3380	3212.0	5364.0
2007190361	2007191094	Fine	Fine	BOS	BOS	27.4	28.1	8.2860	8.5860	26.9900	24.7720	3501.0	5805.0
2007190383	2007191416	Coarse	Coarse	TOS	TOS	6.9	3.6	9.5960	6.0610	0.4170	0.2070	30.0	27.0
2007190383	2007191416	Fine	Fine	TOS	TOS	9.1	11.1	11.2220	14.6660	0.5370	0.4780	14.0	30.0
2007190383	2007191416	Coarse	Coarse	BOS	BOS	6.1	6.9	10.2100	9.7080	0.4510	0.4450	1362.0	1164.0
2007190383	2007191416	Fine	Fine	BOS	BOS	9.4	10.8	13.3770	13.4860	0.5670	0.6030	1745.0	1619.0
2007190393	2007191050	Coarse	Coarse	TOS	TOS	19.6	15.0	12.0680	13.3200	0.7240	0.4330	1951.0	103.0
2007190393	2007191050	Fine	Fine	TOS	TOS	15.6	13.3	11.1710	11.7640	0.5850	0.3820	1581.0	88.0
2007190393	2007191050	Coarse	Coarse	BOS	BOS	6.7	9.7	11.4880	13.6920	0.3420	0.2730	2675.0	494.0
2007190393	2007191050	Fine	Fine	BOS	BOS	6.1	9.4	9.9500	11.8470	0.3070	0.2560	2059.0	466.0
2007190414	2007191386	Coarse	Coarse	TOS	TOS	6.0	7.3	8.3260	8.8930	0.3230	0.3200	759.0	325.0
2007190414	2007191386	Fine	Fine	TOS	TOS	6.0	5.5	7.9190	8.7990	0.2940	0.3010	682.0	304.0
2007190414	2007191386	Coarse	Coarse	BOS	BOS	5.0	5.3	9.1010	9.1480	0.4020	0.3670	2176.0	2060.0
2007190414	2007191386	Fine	Fine	BOS	BOS	5.8	5.9	9.1860	10.6210	0.4060	0.4080	2121.0	2449.0
2007190419	2007190974	Coarse	Coarse	TOS	TOS	9.1	7.7	8.0980	6.7150	0.5110	0.3470	81.0	48.0
2007190419	2007190974	Fine	Fine	TOS	TOS	11.3	12.3	8.9480	9.1800	0.5690	0.4840	86.0	36.0
2007190419	2007190974	Coarse	Coarse	BOS	BOS	4.3	6.1	7.4760	7.5390	0.3850	0.3950	71.0	23.0
2007190419	2007190974	Fine	Fine	BOS	BOS	10.0	11.0	11.7440	11.7780	0.5920	0.6050	71.0	18.0
2007190425	2007190768	Coarse	Coarse	TOS	TOS	12.4	11.5	10.1950	9.5750	0.5510	0.4790	58.0	76.0
2007190425	2007190768	Fine	Fine	TOS	TOS	8.0	7.8	9.2710	8.8070	0.4710	0.4190	67.0	55.0
2007190425	2007190768	Coarse	Coarse	BOS	BOS	4.8	6.2	10.1310	10.2530	0.3780	0.4030	83.0	49.0
2007190425	2007190768	Fine	Fine	BOS	BOS	3.6	5.2	9.6260	9.8770	0.3790	0.4150	89.0	70.0
2007190434	2007191027	Coarse	Coarse	TOS	TOS	7.0	5.5	10.3190	8.3080	0.6830	1.8100	54.0	736.0
2007190434	2007191027	Fine	Fine	TOS	TOS	15.4	17.2	21.3530	19.1170	1.1370	4.3730	80.0	2015.0
2007190434	2007191027	Coarse	Coarse	BOS	BOS	15.6	12.3	9.3180	9.0750	11.6800	10.0120	1936.0	1572.0
2007190434	2007191027	Fine	Fine	BOS	BOS	23.7	22.6	15.3000	15.3930	15.3460	14.1470	3555.0	3109.0
2007190457	2007191004	Coarse	Coarse	TOS	TOS	6.4	5.1	8.8400	6.1780	0.4970	0.3000	118.0	86.0
2007190457	2007191004	Fine	Fine	TOS	TOS	6.0	8.4	10.2910	9.4520	0.6020	0.4990	120.0	107.0
2007190457	2007191004	Coarse	Coarse	BOS	BOS	1.6	1.6	5.3190	5.9220	0.2430	0.2770	173.0	55.0
2007190457	2007191004	Fine	Fine	BOS	BOS	2.1	4.0	9.1520	9.6000	0.4800	0.4850	267.0	98.0
2007190458	2007190774	Coarse	Coarse	TOS	TOS	7.8	8.3	11.2710	10.1460	0.8250	0.7960	72.0	61.0
2007190458	2007190774	Fine	Fine	TOS	TOS	6.6	7.7	10.4290	10.6030	0.8240	0.8570	82.0	58.0
2007190458	2007190774	Coarse	Coarse	BOS	BOS	8.1	7.2	10.5510	9.7180	0.8070	0.7760	48.0	47.0
2007190458	2007190774	Fine	Fine	BOS	BOS	7.3	7.5	11.3360	10.9870	0.8930	0.9070	65.0	58.0
2007190472	2007191312	Coarse	Coarse	TOS	TOS	11.6	11.7	12.4500	12.8010	0.9020	0.7430	28.0	17.0
2007190472	2007191312	Fine	Fine	TOS	TOS	11.8	15.0	13.6960	14.0520	0.9870	0.8160	25.0	10.0
2007190472	2007191312	Coarse	Coarse	BOS	BOS	14.3	12.3	10.8650	12.5580	6.9030	0.7900	23.0	5.0
2007190472	2007191312	Fine	Fine	BOS	BOS	14.5	15.6	13.5590	14.2810	4.9540	0.9190	49.0	15.0
2007190481	2007191594	Coarse	Coarse	TOS	TOS	4.3	4.7	4.8250	5.4250	2.4820	2.3570	573.0	212.0
2007190481	2007191594	Fine	Fine	TOS	TOS	5.3	3.4	6.1400	5.8980	3.6430	2.6210	546.0	201.0
2007190481	2007191594	Coarse	Coarse	BOS	BOS	4.3	5.3	7.0240	6.2400	3.2710	3.1050	2943.0	1938.0
2007190481	2007191594	Fine	Fine	BOS	BOS	5.6	4.2	6.7400	6.2810	3.6190	3.6270	1766.0	1505.0
2007190495	2007191318	Fine	Fine	TOS	TOS	39.2	43.2	3.7840	3.5430	32.7630	30.6380	1370.0	2290.0
2007190495	2007191318	Coarse	Coarse	BOS	BOS	37.9	38.3	1.4650	1.4100	41.4890	43.1270	2033.0	2019.0
2007190495	2007191318	Fine	Fine	BOS	BOS	40.3	38.6	2.2500	3.1660	38.4970	37.3690	3594.0	5239.0
2007190497	2007190586	Coarse	Coarse	TOS	TOS	4.3	4.5	4.8010	4.8500	0.2540	0.2610	36.0	16.0
2007190497	2007190586	Fine	Fine	TOS	TOS	9.6	7.8	9.4750	9.2050	0.4380	0.4910	33.0	55.0
2007190497	2007190586	Coarse	Coarse	BOS	BOS	5.5	6.4	7.4330	7.1670	0.3430	0.4000	37.0	19.0
2007190497	2007190586	Fine	Fine	BOS	BOS	11.6	9.5	13.2240	12.9700	0.5920	0.6730	5.0	32.0
2007190506	2007190631	Coarse	Coarse	TOS	TOS	6.0	8.6	10.0910	10.3380	0.5890	0.5910	107.0	68.0
2007190506	2007190631	Fine	Fine	TOS	TOS	5.3	5.7	8.5820	8.3350	0.5330	0.5190	96.0	84.0
2007190506	2007190631	Coarse	Coarse	BOS	BOS	6.1	8.0	10.3600	10.3120	0.6440	0.5930	1674.0	1580.0
2007190506	2007190631	Fine	Fine	BOS	BOS	8.4	7.3	10.7720	10.1070	0.6670	0.6140	1790.0	1632.0
2007190508	2007191119	Coarse	Coarse	TOS	TOS	17.7	16.6	13.7990	13.5620	1.7280	1.6240	46.0	30.0
2007190508	2007191119	Fine	Fine	TOS	TOS	17.3	15.0	13.0620	13.5470	1.7770	1.6240	63.0	42.0
2007190508	2007191119	Coarse	Coarse	BOS	BOS	8.8	11.7	13.7650	13.7620	1.3110	1.5180	77.0	53.0
2007190508	2007191119	Fine	Fine	BOS	BOS	10.8	11.9	13.7190	13.7900	1.3270	1.6080	70.0	58.0
2007190526	2007191599	Coarse	Coarse	TOS	TOS	10.2	10.1	12.4460	11.7540	0.9170	0.9920	86.0	72.0
2007190526	2007191599	Fine	Fine	TOS	TOS	12.3	11.0	12.7770	12.5190	0.9230	1.0860	64.0	78.0
2007190526	2007191599	Coarse	Coarse	BOS	BOS	6.2	7.0	13.4190	12.5850	0.5760	0.6450	44.0	68.0
2007190526	2007191599	Fine	Fine	BOS	BOS	7.3	6.7	13.7950	13.1060	0.5670	0.6660	46.0	78.0
2007190527	2007190609	Coarse	Coarse	TOS	TOS	9.2	7.0	11.5120	10.7610	0.5650	0.5360	47.0	94.0
2007190527	2007190609	Fine	Fine	TOS	TOS	9.1	6.3	9.8290	9.4320	0.5710	0.4690	40.0	82.0
2007190527	2007190609	Coarse	Coarse	BOS	BOS	2.8	0.6	5.9250	6.0640	0.2220	0.2550	135.0	152.0
2007190													

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	Cu (ppm)	Cu (ppm)	F (ppm)	F (ppm)	Fe2O3 (%)	Fe2O3 (%)	K2O (%)	K2O (%)	MgO (%)	MgO (%)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	50	50	0.005	0.005	0.005	0.005	0.01	0.01
2007190342	2007190989	29.8	30.0	25.0	25.0	6.9310	7.3970	1.6620	1.5800	0.613	0.962
2007190342	2007190989	53.0	37.5	25.0	25.0	10.1330	9.7750	1.8930	1.7950	1.013	1.426
2007190349	2007191436	38.2	35.2	25.0	25.0	5.7710	5.5960	1.8740	1.9040	1.473	1.326
2007190349	2007191436	59.8	53.9	25.0	25.0	7.5490	7.2270	1.6750	1.6520	1.926	1.742
2007190349	2007191436	42.6	39.9	25.0	25.0	6.1500	5.9640	1.8330	1.9000	1.586	1.423
2007190349	2007191436	69.9	70.6	25.0	25.0	9.0010	8.5240	1.7290	1.7390	2.449	2.064
2007190352	2007190611	5.0	14.5	25.0	25.0	6.2730	5.6830	0.9390	1.2600	0.694	0.905
2007190352	2007190611	5.0	5.0	25.0	25.0	8.0350	6.7020	0.9350	1.2310	0.704	0.900
2007190352	2007190611	5.0	17.1	25.0	102.0	7.3550	9.1780	1.3730	1.4320	0.923	1.069
2007190352	2007190611	15.4	13.5	25.0	25.0	8.6440	10.0140	1.4560	1.3800	0.964	1.003
2007190355	2007191257	42.2	44.7	25.0	25.0	7.9950	8.2640	1.5320	1.6230	2.172	2.516
2007190355	2007191257	60.8	62.8	25.0	25.0	10.2190	9.9810	1.6910	1.7940	2.064	2.414
2007190355	2007191257	40.9	46.8	25.0	25.0	8.2030	9.0470	1.3470	1.4050	3.928	3.791
2007190355	2007191257	41.9	52.9	25.0	25.0	8.7680	9.4090	1.3490	1.4120	4.451	4.229
2007190357	2007190856	5.0	5.0	25.0	25.0	1.2450	1.1370	0.1300	0.1430	0.018	0.023
2007190357	2007190856	5.0	5.0	25.0	25.0	1.9960	2.0760	0.7170	0.7500	0.146	0.179
2007190357	2007190856	5.0	5.0	25.0	25.0	1.7680	2.7360	0.3020	0.4370	0.189	0.424
2007190357	2007190856	5.0	5.0	25.0	25.0	3.0800	5.3640	0.8840	1.0760	0.528	0.992
2007190361	2007191094	14.4	19.4	25.0	25.0	5.1150	5.3070	2.2700	2.4560	2.773	3.133
2007190361	2007191094	19.3	24.8	25.0	25.0	5.3550	5.4900	2.3760	2.5460	2.859	3.150
2007190361	2007191094	5.0	5.0	208.0	173.0	3.0160	3.1490	1.3180	1.3940	2.147	2.202
2007190361	2007191094	15.7	5.0	208.0	168.0	3.4040	3.5060	1.4800	1.5610	2.297	2.296
2007190383	2007191416	5.0	5.0	25.0	25.0	3.1950	2.0760	0.6260	0.4300	0.409	0.216
2007190383	2007191416	5.0	5.0	25.0	25.0	3.5370	4.6910	0.7890	0.9180	0.476	0.576
2007190383	2007191416	5.0	5.0	25.0	25.0	3.3480	3.2330	0.6800	0.6460	0.433	0.415
2007190383	2007191416	5.0	5.0	25.0	25.0	4.2500	4.2890	0.9000	0.9060	0.581	0.580
2007190393	2007191050	5.0	5.0	25.0	25.0	3.4160	3.7390	1.9050	2.0740	0.841	0.758
2007190393	2007191050	5.0	5.0	25.0	25.0	3.0750	3.3120	1.8210	1.9160	0.738	0.661
2007190393	2007191050	11.3	10.4	25.0	152.0	4.1110	4.0900	1.9640	2.0520	0.736	0.711
2007190393	2007191050	5.0	5.0	25.0	25.0	3.1550	3.3850	1.7880	1.8820	0.598	0.621
2007190414	2007191386	5.0	5.0	25.0	25.0	2.8610	3.2420	1.4800	1.5480	0.460	0.497
2007190414	2007191386	5.0	12.0	25.0	107.0	2.5510	2.9030	1.4240	1.5510	0.430	0.485
2007190414	2007191386	10.6	10.0	25.0	25.0	3.3650	3.5120	1.5380	1.5580	0.614	0.609
2007190414	2007191386	5.0	16.0	25.0	25.0	3.1150	3.8140	1.5460	1.7440	0.599	0.733
2007190419	2007190974	13.4	5.0	25.0	25.0	3.3200	2.8180	0.4020	0.2520	0.494	0.393
2007190419	2007190974	5.0	5.0	25.0	25.0	3.6530	3.8240	0.4630	0.3560	0.560	0.555
2007190419	2007190974	14.6	10.4	25.0	25.0	3.1130	3.0990	0.1430	0.1460	0.395	0.394
2007190419	2007190974	14.7	5.0	25.0	25.0	4.7330	4.7180	0.2320	0.2310	0.630	0.628
2007190425	2007190768	13.3	5.0	25.0	25.0	3.4680	3.3960	1.6540	1.5820	0.582	0.531
2007190425	2007190768	16.5	12.5	25.0	25.0	3.0220	2.9940	1.5830	1.5120	0.508	0.471
2007190425	2007190768	17.1	5.0	25.0	25.0	3.4170	3.8480	1.6400	1.5770	0.531	0.583
2007190425	2007190768	19.3	17.9	25.0	25.0	3.0880	3.4830	1.5800	1.5530	0.510	0.553
2007190434	2007191027	12.5	11.8	25.0	25.0	3.1940	2.4790	1.5270	1.3780	0.613	0.624
2007190434	2007191027	35.3	30.9	25.0	25.0	6.7110	5.9440	2.4930	2.3720	1.411	1.685
2007190434	2007191027	14.6	19.1	25.0	25.0	2.7760	2.6430	1.4040	1.4180	1.113	1.106
2007190434	2007191027	31.4	29.0	25.0	25.0	4.7740	4.7650	1.9140	1.9530	1.843	1.889
2007190457	2007191004	5.0	5.0	25.0	25.0	2.7660	1.9140	2.1160	1.6200	0.683	0.374
2007190457	2007191004	5.0	5.0	25.0	25.0	2.7880	2.6280	2.4170	2.1870	0.803	0.711
2007190457	2007191004	5.0	5.0	25.0	25.0	1.3610	1.3190	1.4870	1.6670	0.246	0.251
2007190457	2007191004	5.0	5.0	25.0	25.0	1.4970	1.5440	2.3800	2.4780	0.450	0.481
2007190458	2007190774	17.9	10.7	25.0	25.0	4.5540	4.1410	1.4650	1.3660	0.894	0.783
2007190458	2007190774	21.8	15.3	25.0	25.0	4.1300	4.3150	1.4050	1.3630	0.793	0.806
2007190458	2007190774	11.8	5.0	25.0	25.0	4.3060	3.8980	1.3590	1.3210	0.819	0.735
2007190458	2007190774	19.1	17.4	25.0	25.0	4.5220	4.4540	1.4060	1.3820	0.875	0.851
2007190472	2007191312	11.0	17.9	25.0	25.0	4.8400	4.9990	1.7800	1.7720	1.479	1.326
2007190472	2007191312	22.8	16.0	25.0	25.0	5.2580	5.4080	1.9990	1.9950	1.607	1.455
2007190472	2007191312	10.9	17.4	25.0	25.0	4.2440	4.8980	1.5220	1.7170	1.312	1.396
2007190472	2007191312	19.4	20.2	115.0	25.0	5.0980	5.4970	1.9190	1.9850	1.593	1.584
2007190481	2007191594	5.0	5.0	25.0	25.0	2.5130	2.4910	1.2350	1.4780	0.804	0.735
2007190481	2007191594	5.0	5.0	25.0	25.0	2.5400	2.3930	1.7300	1.6710	1.018	0.805
2007190481	2007191594	14.6	5.0	25.0	25.0	3.2150	2.8930	1.8550	1.6280	1.267	1.080
2007190481	2007191594	5.0	11.7	25.0	25.0	2.7800	2.5970	1.9240	1.8000	1.181	1.060
2007190495	2007191318	5.0	5.0	228.0	262.0	1.4490	1.3760	0.6750	0.5500	1.903	1.540
2007190495	2007191318	5.0	5.0	235.0	253.0	0.5690	0.5490	0.3540	0.3270	1.854	1.723
2007190495	2007191318	5.0	5.0	208.0	255.0	0.8680	1.2650	0.5020	0.5660	2.665	2.188
2007190497	2007190586	5.0	5.0	25.0	25.0	2.3400	2.2160	0.5070	0.4910	0.220	0.231
2007190497	2007190586	12.5	19.7	25.0	25.0	3.6740	3.6800	1.1190	1.0370	0.451	0.450
2007190497	2007190586	5.0	5.0	25.0	25.0	3.2510	2.9860	0.5570	0.4970	0.389	0.392
2007190497	2007190586	14.6	20.2	25.0	25.0	5.3290	5.1950	1.0760	0.9860	0.697	0.714
2007190506	2007190631	20.0	5.0	25.0	25.0	4.2430	4.3120	1.3160	1.3270	0.823	0.879
2007190506	2007190631	13.8	5.0	25.0	25.0	3.6530	3.4800	1.1670	1.1510	0.689	0.686
2007190506	2007190631	21.0	10.3	25.0	25.0	4.3730	4.2600	1.3020	1.3180	0.907	0.927
2007190506	2007190631	16.4	13.3	25.0	25.0	4.5160	4.2100	1.2690	1.2500	0.953	0.914
2007190508	2007191119	30.0	24.9	25.0	25.0	7.0940	6.5920	1.7010	1.9360	2.078	1.911
2007190508	2007191119	25.4	29.4	25.0	25.0	6.2080	6.2190	1.8230	2.0780	1.822	1.817
2007190508	2007191119	35.2	23.0	25.0	25.0	5.6840	5.7980	2.3140	2.2980	1.476	1.509
2007190508	2007191119	24.2	28.5	25.0	25.0	5.4690	5.5480	2.3090	2.3260	1.451	1.525
2007190526	2007191599	13.0	11.0	25.0	25.0	4.5350	4.2940	2.5540	2.5880	1.124	1.070
2007190526	2007191599	5.0	18.1	25.0	25.0	4.5490	4.6560	2.4110	2.4440	1.199	1.264
2007190526	2007191599	16.1	18.1	25.0	25.0	4.8870	4.6790	2.6890	2.6640	1.140	1.085
2007190526	2007191599	13.9	20.8	25.0	25.0	4.6770	4.5720	2.6350	2.6450	1.196	1.185
2007190527	2007190609	15.3	22.0	25.0	25.0	4.2770	4.0250	1.0490	1.1670	0.527	0.518
2007190527	2007190609	12.1	12.8	25.0	25.0	3.7010	3.4560	0.9600	1.0480	0.463	0.432
2007190527	2007190609	5.0	10.5	25.0	25.0	2.3280	2.1320	1.4840	1.4290	0.153	0.166
2007190527	2007190609	12.5	15.7	25.0	25.0	4.1680	3.6200	1.0200	0.9620	0.460	0.411

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	MnO (%)	MnO (%)	Na2O (%)	Na2O (%)	Ni (ppm)	Ni (ppm)	P2O5 (%)	P2O5 (%)	Rb (ppm)	Rb (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.005	0.005	0.01	0.01	10	10	0.005	0.005	10	10
2007190342	2007190989	0.0830	0.0850	0.238	0.241	29.4	30.7	0.0670	0.0630	84.3	94.4
2007190342	2007190989	0.1340	0.1230	0.249	0.227	50.4	39.7	0.0960	0.0740	120.3	123.1
2007190349	2007191436	0.0580	0.0580	1.299	1.285	66.2	54.6	0.0420	0.0470	87.5	93.5
2007190349	2007191436	0.0860	0.0870	1.028	0.990	91.4	77.7	0.0560	0.0630	79.7	81.0
2007190349	2007191436	0.0560	0.0530	1.194	1.186	73.1	61.0	0.0410	0.0460	89.0	95.6
2007190349	2007191436	0.0840	0.0800	0.940	0.894	109.8	95.4	0.0540	0.0630	84.3	84.5
2007190352	2007190611	0.0120	0.0150	0.540	0.649	5.0	15.6	0.3290	0.2760	80.4	97.2
2007190352	2007190611	0.0160	0.0150	0.591	0.675	12.0	12.4	0.3920	0.3270	79.8	95.9
2007190352	2007190611	0.0100	0.0130	1.195	0.918	18.1	25.0	0.1430	0.2480	92.4	101.2
2007190352	2007190611	0.0120	0.0120	1.426	0.974	23.8	18.1	0.1680	0.2800	90.8	94.8
2007190355	2007191257	0.1050	0.0870	0.523	1.153	88.8	83.6	0.0890	0.0920	63.0	68.3
2007190355	2007191257	0.1340	0.1230	0.583	1.172	117.0	109.4	0.1080	0.1080	66.2	73.9
2007190355	2007191257	0.0760	0.0900	1.376	1.521	90.2	108.6	0.0710	0.0760	60.5	67.2
2007190355	2007191257	0.1220	0.1340	1.502	1.590	102.1	119.0	0.0750	0.0890	65.5	67.8
2007190357	2007190856	0.0025	0.0025	0.005	0.005	5.0	5.0	0.0210	0.0210	18.3	26.3
2007190357	2007190856	0.0050	0.0060	0.028	0.038	5.0	5.0	0.0310	0.0330	51.7	59.8
2007190357	2007190856	0.0130	0.0100	0.031	0.024	5.0	5.0	0.0220	0.0220	39.8	47.0
2007190357	2007190856	0.0370	0.0200	0.101	0.052	5.0	5.0	0.0310	0.0310	87.0	90.7
2007190361	2007191094	0.0750	0.0770	0.531	1.070	32.9	42.8	0.0680	0.0670	61.8	69.5
2007190361	2007191094	0.0570	0.0640	0.573	0.985	38.1	44.4	0.0740	0.0700	67.7	72.8
2007190361	2007191094	0.0320	0.0320	0.626	0.805	5.0	14.1	0.0370	0.0360	38.4	39.5
2007190361	2007191094	0.0310	0.0310	0.703	0.842	23.0	13.5	0.0420	0.0440	38.4	44.6
2007190383	2007191416	0.0960	0.0450	0.356	0.161	5.0	5.0	0.0650	0.0520	62.5	41.2
2007190383	2007191416	0.1080	0.1040	0.572	0.419	5.0	11.9	0.0730	0.1030	65.1	83.9
2007190383	2007191416	0.1150	0.1060	0.616	0.532	5.0	5.0	0.0660	0.0680	59.7	59.1
2007190383	2007191416	0.1820	0.1760	0.872	0.819	5.0	12.6	0.0830	0.0910	72.1	77.7
2007190393	2007191050	0.0710	0.0670	0.338	0.344	5.0	12.7	0.1160	0.0980	147.3	148.7
2007190393	2007191050	0.0550	0.0700	0.366	0.391	5.0	5.0	0.1100	0.0970	136.3	133.5
2007190393	2007191050	0.0400	0.0220	0.554	0.387	14.7	26.0	0.0780	0.0660	126.2	155.2
2007190393	2007191050	0.0300	0.0220	0.560	0.425	5.0	5.0	0.0670	0.0630	112.3	130.2
2007190414	2007191386	0.0620	0.0660	0.490	0.458	11.5	5.0	0.0760	0.0840	88.5	92.9
2007190414	2007191386	0.0420	0.0580	0.530	0.507	5.0	5.0	0.0680	0.0810	80.0	91.6
2007190414	2007191386	0.0750	0.0450	0.606	0.635	12.9	5.0	0.0530	0.0570	90.6	94.0
2007190414	2007191386	0.0690	0.0470	0.645	0.713	5.0	10.0	0.0540	0.0600	91.3	109.3
2007190419	2007190974	0.0840	0.0560	0.044	0.031	5.0	5.0	0.1050	0.0610	46.8	41.3
2007190419	2007190974	0.0880	0.0940	0.043	0.036	5.0	5.0	0.1310	0.0950	54.1	50.9
2007190419	2007190974	0.0610	0.0550	0.037	0.029	10.6	5.0	0.0490	0.0430	30.1	36.4
2007190419	2007190974	0.1310	0.1140	0.069	0.048	12.3	5.0	0.0650	0.0590	44.1	51.3
2007190425	2007190768	0.0410	0.0560	0.507	0.496	5.0	5.0	0.1280	0.1270	98.1	88.8
2007190425	2007190768	0.0370	0.0500	0.534	0.534	5.0	10.1	0.1230	0.1130	88.6	86.7
2007190425	2007190768	0.0170	0.0510	0.647	0.544	5.0	582.0	0.0480	0.0800	97.7	93.1
2007190425	2007190768	0.0170	0.0480	0.648	0.555	11.6	14.5	0.0480	0.0790	90.6	91.4
2007190434	2007191027	0.0330	0.0270	0.397	0.532	45.1	38.7	0.0330	0.0280	74.0	60.9
2007190434	2007191027	0.0730	0.0630	0.309	0.583	116.9	104.5	0.0640	0.0650	120.2	102.0
2007190434	2007191027	0.0280	0.0290	0.627	0.669	42.0	45.5	0.0230	0.0230	60.5	59.5
2007190434	2007191027	0.0490	0.0490	0.798	0.793	80.7	81.7	0.0380	0.0400	85.7	83.5
2007190457	2007191004	0.0440	0.0230	0.860	0.756	5.0	5.0	0.0810	0.0580	93.6	75.7
2007190457	2007191004	0.0390	0.0330	1.065	1.071	5.0	5.0	0.0880	0.0840	104.2	97.6
2007190457	2007191004	0.0150	0.0150	0.728	0.854	5.0	5.0	0.0270	0.0300	65.2	68.2
2007190457	2007191004	0.0200	0.0190	1.293	1.310	5.0	5.0	0.0380	0.0380	96.2	97.3
2007190458	2007190774	0.0790	0.0780	0.887	0.827	15.1	5.0	0.1260	0.1030	68.4	70.1
2007190458	2007190774	0.0800	0.0840	0.986	0.951	18.5	13.2	0.1250	0.1090	63.1	67.7
2007190458	2007190774	0.0790	0.0710	0.825	0.809	11.6	10.2	0.1040	0.0920	69.1	68.4
2007190458	2007190774	0.1010	0.0980	0.989	0.940	18.8	20.7	0.1120	0.1070	64.6	66.7
2007190472	2007191312	0.0320	0.0280	0.036	0.019	5.0	5.0	0.0330	0.0340	66.2	68.3
2007190472	2007191312	0.0320	0.0270	0.054	0.027	15.2	5.0	0.0390	0.0360	70.0	72.8
2007190472	2007191312	0.0320	0.0310	0.036	0.021	11.0	5.0	0.0300	0.0320	57.0	70.7
2007190472	2007191312	0.0310	0.0330	0.052	0.025	13.1	5.0	0.0400	0.0380	70.1	75.4
2007190481	2007191594	0.0320	0.0340	0.512	0.525	5.0	5.0	0.0460	0.0490	58.4	66.8
2007190481	2007191594	0.0370	0.0350	0.733	0.633	5.0	5.0	0.0520	0.0520	69.9	71.8
2007190481	2007191594	0.0430	0.0390	1.108	0.811	5.0	5.0	0.0510	0.0500	77.7	72.6
2007190481	2007191594	0.0400	0.0390	1.039	0.851	5.0	5.0	0.0490	0.0490	78.1	75.7
2007190495	2007191318	0.0160	0.0250	0.318	0.261	5.0	5.0	0.1150	0.1790	26.6	22.8
2007190495	2007191318	0.0080	0.0110	0.372	0.343	5.0	5.0	0.0480	0.0770	5.0	5.0
2007190495	2007191318	0.0090	0.0180	0.598	0.677	5.0	5.0	0.0530	0.0980	5.0	19.1
2007190497	2007190586	0.0680	0.0590	0.031	0.019	5.0	5.0	0.0290	0.0300	50.0	50.9
2007190497	2007190586	0.1110	0.1070	0.058	0.043	5.0	5.0	0.0440	0.0430	86.0	87.1
2007190497	2007190586	0.0710	0.0510	0.026	0.010	5.0	5.0	0.0250	0.0260	60.6	57.6
2007190497	2007190586	0.1730	0.1420	0.047	0.041	10.2	23.7	0.0370	0.0350	94.4	88.7
2007190506	2007190631	0.0630	0.0640	0.382	0.362	11.5	5.0	0.0600	0.0640	75.5	74.3
2007190506	2007190631	0.0490	0.0460	0.372	0.361	5.0	5.0	0.0520	0.0530	64.9	68.0
2007190506	2007190631	0.0650	0.0610	0.612	0.647	12.3	5.0	0.0560	0.0660	74.2	74.9
2007190506	2007190631	0.0740	0.0750	0.621	0.634	13.7	13.7	0.0610	0.0680	73.7	72.0
2007190508	2007191119	0.1090	0.1050	0.717	0.783	58.4	44.7	0.1590	0.1740	85.5	90.3
2007190508	2007191119	0.0940	0.0960	0.861	0.930	46.8	40.6	0.1540	0.1770	87.8	99.9
2007190508	2007191119	0.1060	0.1040	1.044	1.011	40.0	26.7	0.1300	0.1400	116.5	116.4
2007190508	2007191119	0.0950	0.0870	1.134	1.074	29.1	25.5	0.1290	0.1460	120.9	123.2
2007190526	2007191599	0.0820	0.0730	0.847	0.882	15.4	5.0	0.2540	0.1700	146.5	142.0
2007190526	2007191599	0.0830	0.0800	0.791	0.880	5.0	10.0	0.2740	0.1990	151.8	141.9
2007190526	2007191599	0.0500	0.0620	0.723	0.710	18.2	13.0	0.1350	0.1210	156.3	152.7
2007190526	2007191599	0.0430	0.0520	0.698	0.713	14.0	16.1	0.1240	0.1240	155.5	154.0
2007190527	2007190609	0.0750	0.0780	0.503	0.569	5.0	14.5	0.1160	0.1170	62.7	64.4
2007190527	2007190609	0.0760	0.0630	0.529	0.607	5.0	5.0	0.1030	0.0980	58.7	59.4
2007190527	2007190609	0.0250	0.0270	0.620	0.676	5.0	5.0	0.0500	0.0450	64.7	62.9
2007190527	2007190609	0.0700	0.0620	0.560	0.618	16.6	14.4	0.0860	0.0730	60.2	57.8

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	S (ppm)	S (ppm)	SiO2 (%)	SiO2 (%)	Sr (ppm)	Sr (ppm)	TiO2 (%)	TiO2 (%)	Zn (ppm)	Zn (ppm)	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	0.01	0.01	10	10	0.005	0.005	10	10	10	10
2007190342	2007190989	71.6	90.2	69.376	65.635	38.3	43.2	0.6700	0.6780	55.6	61.0	193.4	178.0
2007190342	2007190989	107.0	90.5	54.285	51.618	49.5	45.4	1.0490	0.9100	94.2	83.2	324.6	239.3
2007190349	2007191436	45.0	38.1	72.656	74.247	82.8	90.3	0.8150	0.7880	53.8	50.3	331.2	318.1
2007190349	2007191436	59.2	58.1	67.988	69.643	84.9	88.2	1.1950	1.2300	74.8	72.6	920.4	991.9
2007190349	2007191436	41.5	40.4	71.240	71.991	82.2	85.2	0.7740	0.7740	56.7	51.8	289.2	301.0
2007190349	2007191436	57.2	70.8	60.121	64.027	88.1	84.8	1.0940	1.1650	83.7	83.3	514.0	788.5
2007190352	2007190611	1529.2	1294.9	44.017	50.244	70.4	78.9	0.6700	0.8220	37.3	60.1	132.9	167.8
2007190352	2007190611	1770.5	1654.9	39.716	44.599	75.7	79.2	0.6710	0.8050	45.3	56.8	159.7	163.8
2007190352	2007190611	1765.2	1712.4	56.766	49.455	79.2	65.2	0.8850	0.9460	48.1	70.3	240.5	166.7
2007190352	2007190611	2272.8	2129.8	54.568	47.736	93.3	67.6	0.9550	0.9000	57.3	63.9	286.9	170.4
2007190355	2007191257	352.8	810.3	60.455	56.345	51.8	47.3	0.8080	0.7660	73.6	80.3	158.8	151.6
2007190355	2007191257	532.7	1194.3	51.754	50.690	56.0	48.1	1.1500	1.0720	94.8	100.6	297.3	314.4
2007190355	2007191257	1020.5	1045.5	48.458	46.804	68.9	64.4	0.7890	0.8540	72.7	77.9	137.2	133.8
2007190355	2007191257	1114.8	1128.8	43.161	43.815	79.1	73.5	0.8400	0.8890	74.2	86.1	153.5	145.4
2007190357	2007190856	32.3	49.7	97.128	95.255	17.5	20.1	0.0980	0.1000	5.0	5.0	72.5	99.5
2007190357	2007190856	55.8	107.8	88.709	87.669	29.3	36.2	0.4830	0.4940	5.0	5.0	680.3	938.4
2007190357	2007190856	65.0	118.0	92.406	86.360	23.2	28.8	0.2490	0.2840	5.0	5.0	266.9	199.3
2007190357	2007190856	177.4	430.7	79.911	71.109	49.1	66.2	0.7350	0.6810	5.0	13.7	1065.9	677.5
2007190361	2007191094	391.8	575.1	43.865	46.913	130.8	140.6	0.6180	0.6500	51.7	64.5	158.7	178.2
2007190361	2007191094	413.0	745.9	43.390	46.885	134.6	147.2	0.6800	0.7160	55.8	67.1	203.2	224.6
2007190361	2007191094	773.6	812.4	25.579	26.574	362.0	345.7	0.3740	0.3820	5.0	5.0	108.6	112.3
2007190361	2007191094	883.8	848.2	28.427	29.113	334.1	336.9	0.4420	0.4520	20.8	5.0	143.1	159.7
2007190383	2007191416	114.0	75.6	77.701	86.763	95.5	50.8	0.6590	0.4070	36.1	19.4	294.1	223.8
2007190383	2007191416	120.9	109.5	72.751	65.965	123.6	116.0	0.8450	0.9740	38.2	43.1	612.0	507.8
2007190383	2007191416	580.3	500.6	77.141	77.103	97.1	88.7	0.6750	0.6460	38.4	36.7	259.8	240.5
2007190383	2007191416	471.6	423.1	68.720	67.204	132.3	132.7	0.8920	0.9020	47.8	45.9	366.0	375.3
2007190393	2007191050	565.4	484.1	60.018	63.279	76.6	59.5	0.7050	0.7740	58.8	61.4	254.8	310.7
2007190393	2007191050	445.2	397.8	65.551	67.245	73.9	59.0	0.7010	0.7470	48.1	47.5	351.5	414.5
2007190393	2007191050	224.8	172.6	72.796	68.050	55.9	52.0	0.8480	0.8310	51.8	51.8	409.7	282.0
2007190393	2007191050	195.5	223.3	76.413	71.172	54.2	51.9	0.7920	0.7960	41.3	43.5	480.9	349.4
2007190414	2007191386	188.5	196.0	78.940	76.650	61.8	60.7	0.8510	0.8230	29.5	29.0	512.5	432.0
2007190414	2007191386	167.6	178.0	79.713	78.704	59.2	62.0	0.9440	0.9280	26.5	35.0	752.5	597.0
2007190414	2007191386	163.5	194.0	78.176	77.730	63.8	61.6	0.7850	0.7680	34.2	27.0	452.8	428.0
2007190414	2007191386	174.4	224.0	77.416	74.599	71.2	74.7	0.9070	0.9750	31.3	38.0	676.7	618.0
2007190419	2007190974	285.6	175.0	77.162	81.215	54.6	44.0	0.6520	0.5420	35.4	17.5	440.7	405.6
2007190419	2007190974	312.7	260.1	73.424	72.413	60.2	52.9	0.7410	0.7590	33.5	24.9	695.3	804.0
2007190419	2007190974	91.3	68.0	83.395	81.754	46.0	45.8	0.5820	0.5820	25.7	18.2	382.8	393.1
2007190419	2007190974	127.6	100.7	70.842	69.960	65.6	66.8	0.9160	0.9140	33.9	25.4	721.3	746.5
2007190425	2007190768	477.2	326.3	69.727	71.423	84.1	74.0	0.7600	0.7520	47.8	41.0	434.1	468.6
2007190425	2007190768	351.6	267.4	75.734	76.427	76.9	71.2	0.7750	0.8020	47.5	41.2	547.9	668.3
2007190425	2007190768	107.8	88.1	77.668	75.586	70.8	72.0	0.7630	0.7500	50.7	36.9	478.4	506.8
2007190425	2007190768	99.7	113.3	79.685	77.307	73.3	75.4	0.8220	0.8320	51.6	43.7	603.0	701.9
2007190434	2007191027	299.6	319.3	75.978	78.932	66.2	76.3	0.3580	0.2850	27.5	25.9	91.2	72.9
2007190434	2007191027	618.4	895.0	50.307	47.590	77.3	109.5	0.7940	0.7040	62.5	61.3	209.7	187.8
2007190434	2007191027	397.6	409.2	57.049	62.256	116.6	124.3	0.3060	0.3030	20.2	24.5	73.2	71.4
2007190434	2007191027	667.2	752.3	35.386	37.447	138.5	153.8	0.5390	0.5570	41.1	38.3	132.2	142.0
2007190457	2007191004	260.7	203.8	77.152	83.404	73.4	61.8	0.5030	0.3710	22.1	5.0	350.4	428.9
2007190457	2007191004	264.4	325.9	75.163	74.281	85.7	77.2	0.6450	0.6420	29.2	19.7	542.7	721.8
2007190457	2007191004	85.9	72.1	88.697	87.687	55.1	56.0	0.3420	0.3960	5.0	5.0	289.6	351.5
2007190457	2007191004	123.5	91.1	81.783	79.321	90.8	87.3	0.7810	0.7620	13.6	5.0	747.0	602.3
2007190458	2007190774	145.4	134.9	71.179	72.655	122.9	120.3	0.8900	0.8220	62.0	43.6	362.0	387.5
2007190458	2007190774	151.1	136.4	73.579	72.098	123.8	130.0	0.9860	1.0140	59.0	48.9	596.1	635.0
2007190458	2007190774	104.1	105.5	72.173	74.594	119.9	115.0	0.8520	0.7730	49.2	40.7	391.8	348.8
2007190458	2007190774	117.6	113.4	71.426	71.768	132.6	134.0	1.0010	0.9920	62.2	52.2	538.3	576.4
2007190472	2007191312	124.3	93.7	66.139	66.014	72.3	81.8	0.6680	0.6760	32.4	35.9	305.5	331.1
2007190472	2007191312	147.3	100.9	63.739	60.513	78.8	86.7	0.7580	0.7630	41.8	36.6	478.8	474.2
2007190472	2007191312	91.8	87.8	60.116	65.720	90.5	74.1	0.5910	0.6620	27.9	34.8	289.1	294.4
2007190472	2007191312	111.4	104.4	57.393	59.384	90.5	82.4	0.7410	0.7750	38.4	36.3	418.1	444.5
2007190481	2007191594	346.1	156.2	82.624	81.542	150.2	140.9	0.6390	0.7860	14.3	14.6	386.4	495.0
2007190481	2007191594	355.6	167.0	77.905	81.647	209.5	158.5	0.8970	0.8900	14.4	20.6	564.3	570.1
2007190481	2007191594	332.5	289.2	76.702	78.027	190.9	175.3	0.9050	0.7910	22.5	18.9	432.7	417.8
2007190481	2007191594	275.3	248.2	76.044	78.592	217.9	201.4	0.9310	0.8600	13.6	21.2	469.7	470.7
2007190495	2007191318	1403.0	1162.4	19.043	17.928	1106.5	1045.1	0.2970	0.2590	5.0	5.0	312.4	300.8
2007190495	2007191318	926.0	878.3	15.397	13.646	1445.6	1378.0	0.0890	0.0730	5.0	5.0	98.6	64.3
2007190495	2007191318	1419.1	1514.1	13.309	14.981	1614.2	1346.9	0.2020	0.2280	5.0	5.0	327.2	231.2
2007190497	2007190586	52.6	60.9	86.997	87.011	25.7	26.9	0.4440	0.4340	5.0	5.0	384.8	377.5
2007190497	2007190586	97.8	95.3	74.085	76.249	53.9	52.4	0.8590	0.8180	17.6	23.2	715.4	805.9
2007190497	2007190586	56.3	63.4	81.877	81.676	27.1	33.6	0.4980	0.4880	13.5	10.1	349.2	368.4
2007190497	2007190586	71.4	85.5	66.249	68.842	52.1	47.5	0.8840	0.8670	22.4	31.7	706.3	702.4
2007190506	2007190631	135.2	146.1	75.731	72.789	95.3	97.4	0.7780	0.7500	42.3	37.0	456.2	417.6
2007190506	2007190631	123.4	130.0	78.754	78.900	88.9	90.4	0.8710	0.8000	36.5	31.5	884.0	770.5
2007190506	2007190631	194.6	336.9	74.702	72.993	105.3	101.2	0.7550	0.7150	43.9	36.7	418.9	368.6
2007190506	2007190631	237.1	334.7	71.739	73.794	119.9	111.1	0.8580	0.8060	42.1	41.2	583.7	543.1
2007190508	2007191119	274.5	254.9	53.805	55.664	134.7	127.5	1.0660	1.0220	68.8	61.7	214.0	224.6
2007190508	2007191119	311.3	250.2	55.830	57.367	141.8	132.8	1.0410	1.0580	64.1	64.0	295.4	308.8
2007190508	2007191119	130.3	114.0	64.364	61.101	128.2	134.6	0.9350	0.9360	71.9	60.4	256.6	245.9
2007190508	2007191119	114.8	110.2	62.547	60.988	132.5	143.6						

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	LOI (%)	LOI (%)	Al2O3 (%)	Al2O3 (%)	CaO (%)	CaO (%)	Cl (ppm)	Cl (ppm)
METHOD:	METHOD:	SIZE	SIZE			Calc	Calc	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0	0	0.005	0.005	0.002	0.002	10	10
2007190531	2007190703	Coarse	Coarse	TOS	TOS	12.6	13.0	15.1260	14.8040	2.4740	2.6480	25.0	27.0
2007190531	2007190703	Fine	Fine	TOS	TOS	13.0	12.3	13.9890	13.7820	1.9800	2.2850	10.0	18.0
2007190531	2007190703	Coarse	Coarse	BOS	BOS	13.5	12.6	14.9590	15.0970	2.3390	2.5520	44.0	66.0
2007190531	2007190703	Fine	Fine	BOS	BOS	13.4	12.4	14.3710	14.5380	2.0000	2.2140	41.0	56.0
2007190534	2007191522	Coarse	Coarse	TOS	TOS	5.6	6.1	9.0830	9.2410	0.4440	0.4930	36.0	38.0
2007190534	2007191522	Fine	Fine	TOS	TOS	9.7	10.0	11.0350	11.4110	0.5760	0.6520	27.0	33.0
2007190534	2007191522	Coarse	Coarse	BOS	BOS	3.2	1.1	6.5300	5.4960	0.2870	0.2200	30.0	29.0
2007190534	2007191522	Fine	Fine	BOS	BOS	9.9	6.1	11.6400	9.6270	0.6980	0.4900	43.0	30.0
2007190536	2007190909	Coarse	Coarse	TOS	TOS	0.5	1.8	3.8510	3.4020	0.2360	0.2100	44.0	38.0
2007190536	2007190909	Fine	Fine	TOS	TOS	3.2	4.1	6.8460	6.9460	0.5250	0.5160	58.0	44.0
2007190536	2007190909	Coarse	Coarse	BOS	BOS	2.2	4.3	4.8890	4.7410	0.6720	0.7420	48.0	30.0
2007190536	2007190909	Fine	Fine	BOS	BOS	9.0	8.8	9.6970	9.6240	2.4040	2.7680	57.0	39.0
2007190548	2007191236	Coarse	Coarse	TOS	TOS	7.2	5.9	14.2880	13.7400	1.9250	1.9000	59.0	45.0
2007190548	2007191236	Fine	Fine	TOS	TOS	7.7	6.2	15.6960	15.2430	2.3810	2.5090	66.0	56.0
2007190548	2007191236	Coarse	Coarse	BOS	BOS	5.2	5.6	13.9510	13.2490	1.9240	1.9080	52.0	29.0
2007190548	2007191236	Fine	Fine	BOS	BOS	7.4	6.7	16.3660	16.2740	2.3310	2.5200	61.0	54.0
2007190549	2007191507	Coarse	Coarse	TOS	TOS	0.1	1.6	2.7610	3.2620	0.0410	0.0420	50.0	30.0
2007190549	2007191507	Fine	Fine	TOS	TOS	3.6	3.5	7.7340	7.7700	0.0720	0.0680	45.0	40.0
2007190549	2007191507	Coarse	Coarse	BOS	BOS	0.7	2.2	3.6760	4.1620	0.0640	0.0440	78.0	269.0
2007190549	2007191507	Fine	Fine	BOS	BOS	4.6	4.2	9.3650	10.3530	0.1170	0.0750	124.0	806.0
2007190552	2007190675	Coarse	Coarse	TOS	TOS	1.4	2.2	2.6170	2.6470	0.1180	0.1380	512.0	935.0
2007190552	2007190675	Fine	Fine	TOS	TOS	10.3	11.2	10.4040	10.1540	0.5650	0.6830	2840.0	4824.0
2007190552	2007190675	Coarse	Coarse	BOS	BOS	4.6	4.2	7.1580	6.5910	0.2920	0.1430	1765.0	2622.0
2007190552	2007190675	Fine	Fine	BOS	BOS	12.9	12.3	20.4180	19.4430	0.6260	0.3250	5671.0	7573.0
2007190554	2007190752	Coarse	Coarse	TOS	TOS	1.5	2.9	2.6270	5.0180	0.0340	0.0390	32.0	42.0
2007190554	2007190752	Fine	Fine	TOS	TOS	5.2	7.4	7.5630	8.9800	0.0430	0.0460	41.0	46.0
2007190554	2007190752	Coarse	Coarse	BOS	BOS	0.6	2.9	1.4960	8.5230	0.0320	0.0340	39.0	34.0
2007190554	2007190752	Fine	Fine	BOS	BOS	3.9	7.3	8.1540	14.9810	0.0400	0.0370	48.0	37.0
2007190583	2007191063	Coarse	Coarse	TOS	TOS	2.0	4.0	4.0700	4.4700	0.0810	0.0790	38.0	46.0
2007190583	2007191063	Fine	Fine	TOS	TOS	2.1	3.3	5.4350	5.7440	0.1040	0.0860	40.0	43.0
2007190583	2007191063	Coarse	Coarse	BOS	BOS	5.4	5.4	11.0290	10.9280	0.1050	0.1180	23.0	28.0
2007190583	2007191063	Fine	Fine	BOS	BOS	5.7	5.3	13.1810	12.1510	0.1220	0.1250	23.0	53.0
2007190618	2007191166	Coarse	Coarse	TOS	TOS	16.6	18.0	10.7210	10.9880	2.8390	2.9140	108.0	115.0
2007190618	2007191166	Fine	Fine	TOS	TOS	18.6	18.1	12.0990	12.4720	3.6370	3.7010	147.0	102.0
2007190618	2007191166	Coarse	Coarse	BOS	BOS	8.0	7.8	12.6100	12.1740	2.7520	2.6290	69.0	73.0
2007190618	2007191166	Fine	Fine	BOS	BOS	11.6	10.4	14.4030	14.5000	3.3090	3.3990	104.0	84.0
2007190647	2007191525	Coarse	Coarse	TOS	TOS	4.3	2.2	5.0540	2.9820	0.1740	0.0940	54.0	36.0
2007190647	2007191525	Fine	Fine	TOS	TOS	4.7	3.4	9.0120	7.0450	0.2590	0.1280	65.0	45.0
2007190647	2007191525	Coarse	Coarse	BOS	BOS	4.0	1.4	6.6620	3.1910	0.1110	0.0550	44.0	34.0
2007190647	2007191525	Fine	Fine	BOS	BOS	3.8	2.2	10.7930	7.4050	0.1820	0.0970	66.0	33.0
2007190659	2007190739	Coarse	Coarse	TOS	TOS	2.5	4.2	4.2900	3.9780	0.1260	0.2120	891.0	970.0
2007190659	2007190739	Fine	Fine	TOS	TOS	9.5	13.3	15.6860	13.9860	0.3850	0.6600	3322.0	3138.0
2007190659	2007190739	Coarse	Coarse	BOS	BOS	5.4	3.4	8.7360	5.4460	0.9760	0.3180	2640.0	2532.0
2007190659	2007190739	Fine	Fine	BOS	BOS	13.5	12.3	19.5820	17.0940	2.0880	0.7410	5563.0	8293.0
2007190661	2007191334	Coarse	Coarse	TOS	TOS	1.1	2.0	4.4320	4.6690	0.3530	0.4030	53.0	29.0
2007190661	2007191334	Fine	Fine	TOS	TOS	5.0	6.2	7.4560	8.2130	0.6190	0.7360	70.0	34.0
2007190661	2007191334	Coarse	Coarse	BOS	BOS	2.8	2.7	6.9690	6.4000	0.5020	0.4130	103.0	32.0
2007190661	2007191334	Fine	Fine	BOS	BOS	7.4	8.8	11.1070	12.3920	0.8300	0.7410	62.0	25.0
2007190686	2007191430	Coarse	Coarse	TOS	TOS	3.4	2.8	4.7320	5.0710	0.0370	0.0400	46.0	31.0
2007190686	2007191430	Fine	Fine	TOS	TOS	11.9	8.4	14.7830	13.0010	0.0560	0.0590	70.0	56.0
2007190686	2007191430	Coarse	Coarse	BOS	BOS	2.9	4.7	10.6360	12.4240	0.0330	0.0360	38.0	37.0
2007190686	2007191430	Fine	Fine	BOS	BOS	11.8	12.4	27.2400	26.6700	0.0350	0.0400	20.0	17.0
2007190695	2007190924	Coarse	Coarse	TOS	TOS	1.5	1.2	2.7460	3.0270	0.0840	0.1050	30.0	25.0
2007190695	2007190924	Fine	Fine	TOS	TOS	5.2	4.9	6.9910	7.2630	0.1970	0.2120	43.0	18.0
2007190695	2007190924	Coarse	Coarse	BOS	BOS	5.4	5.6	11.7350	11.7360	0.2320	0.2760	21.0	23.0
2007190695	2007190924	Fine	Fine	BOS	BOS	12.1	12.7	21.2800	19.2130	0.4020	0.4450	17.0	5.0
2007190698	2007190813	Coarse	Coarse	TOS	TOS	11.0	8.7	13.3760	11.4450	0.5720	0.5470	408.0	84.0
2007190698	2007190813	Fine	Fine	TOS	TOS	9.6	7.9	12.2600	10.3840	0.5690	0.5560	362.0	80.0
2007190698	2007190813	Coarse	Coarse	BOS	BOS	10.0	9.9	13.6310	12.8680	0.6490	0.7060	2060.0	1450.0
2007190698	2007190813	Fine	Fine	BOS	BOS	9.6	9.4	12.9940	13.2500	0.6590	0.7550	1917.0	1571.0
2007190732	2007191450	Coarse	Coarse	TOS	TOS	3.5	4.1	7.0920	9.0960	0.3630	0.4020	46.0	28.0
2007190732	2007191450	Fine	Fine	TOS	TOS	3.1	6.1	7.5370	9.8300	0.4620	0.4820	43.0	29.0
2007190732	2007191450	Coarse	Coarse	BOS	BOS	4.7	4.0	8.3790	7.7940	0.4730	0.4440	676.0	26.0
2007190732	2007191450	Fine	Fine	BOS	BOS	5.7	7.8	11.3320	11.2770	0.6520	0.6470	934.0	16.0
2007190735	2007191549	Coarse	Coarse	TOS	TOS	9.7	9.8	11.7760	12.7380	0.6930	0.7570	156.0	72.0
2007190735	2007191549	Fine	Fine	TOS	TOS	7.2	8.5	9.8540	10.4870	0.5960	0.6440	146.0	48.0
2007190735	2007191549	Coarse	Coarse	BOS	BOS	10.7	8.8	12.6890	12.9380	0.7580	0.7340	3824.0	1870.0
2007190735	2007191549	Fine	Fine	BOS	BOS	9.4	9.1	12.3010	11.7970	0.8100	0.6870	3595.0	1754.0
2007190743	2007190906	Coarse	Coarse	TOS	TOS	6.5	8.3	9.9770	11.0150	0.6040	1.0190	85.0	93.0
2007190743	2007190906	Fine	Fine	TOS	TOS	8.6	11.0	15.4210	15.1320	0.9080	1.2620	79.0	108.0
2007190743	2007190906	Coarse	Coarse	BOS	BOS	7.2	8.1	10.3960	10.0160	1.8660	1.6970	900.0	895.0
2007190743	2007190906	Fine	Fine	BOS	BOS	12.1	11.4	15.4830	15.7700	2.5150	2.2070	1370.0	1444.0
2007190746	2007191241	Coarse	Coarse	TOS	TOS	0.0	2.3	1.3620	1.9590	0.0990	0.1280	43.0	31.0
2007190746	2007191241	Fine	Fine	TOS	TOS	1.1	2.3	4.6710	5.4490	0.3340	0.3640	57.0	44.0
2007190746	2007191241	Coarse	Coarse	BOS	BOS	0.2	2.4	2.4060	2.6210	0.1300	0.1630	214.0	52.0
2007190746	2007191241	Fine	Fine	BOS	BOS	2.3	3.3	6.3430	6.0970	0.3700	0.4020	490.0	86.0
2007190753	2007191299	Coarse	Coarse	TOS	TOS	12.6	13.7	16.2190	14.7090	0.6310	0.6300	35.0	5.0
2007190753	2007191299	Fine	Fine	TOS	TOS	14.2	12.2	15.7290	15.1380	0.6180	0.6640	23.0	5.0
2007190753	2007191299	Coarse	Coarse	BOS	BOS	12.3	10.4	16.3230	14.2790	0.6160	0.7610	911.0	477.0
2007190753	2007191299	Fine	Fine	BOS	BOS	14.2	11.7	16.5620	15.4810	0.6050	0.6990	933.0	545.0
2007190798	2007191229	Coarse	Coarse	TOS	TOS	1.0	0.0	0.8500	1.0500	0.0480	0.0480	44.0	50.0
2007190798	2007191229	Fine	Fine	TOS	TOS	1.9	2.2	3.0740	3.1150	0.0840	0.0720	75.0	62.0
2007190798	2007191229	Coarse	Coarse	BOS	BOS	0.1	0.0	0.7180	0.7160	0.0420	0.0440	64.0	51.0
2007190798	2007191229	Fine	Fine	BOS	BOS	1.2	1.8	3.1420	2.7780	0.0840	0.0790	72.0	69.0
2007190818	2007191157	Coarse	Coarse	TOS	TOS	5.4	0.6	6.8220	5.3560	0.5770	0.4690	74.	

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	Cu (ppm)	Cu (ppm)	F (ppm)	F (ppm)	Fe2O3 (%)	Fe2O3 (%)	K2O (%)	K2O (%)	MgO (%)	MgO (%)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	50	50	0.005	0.005	0.005	0.005	0.01	0.01
2007190531	2007190703	15.4	14.2	25.0	25.0	5.9550	5.7530	1.4530	1.4190	1.477	1.437
2007190531	2007190703	5.0	5.0	25.0	25.0	5.1650	4.9170	1.4180	1.4130	1.295	1.254
2007190531	2007190703	12.6	15.7	25.0	25.0	5.9170	5.8300	1.4340	1.4360	1.453	1.461
2007190531	2007190703	5.0	10.7	25.0	25.0	5.4120	5.3340	1.4320	1.4590	1.351	1.335
2007190534	2007191522	5.0	5.0	25.0	25.0	2.2510	2.4670	1.9230	1.8840	0.326	0.331
2007190534	2007191522	5.0	5.0	25.0	25.0	2.7150	2.9310	2.0700	2.0480	0.445	0.453
2007190534	2007191522	5.0	5.0	25.0	25.0	1.6590	1.4950	1.4700	1.3150	0.208	0.145
2007190534	2007191522	5.0	5.0	25.0	25.0	3.0300	2.5160	1.9840	1.8660	0.479	0.360
2007190536	2007190909	5.0	5.0	25.0	25.0	1.7300	1.6130	0.9870	0.9560	0.191	0.141
2007190536	2007190909	10.0	5.0	25.0	25.0	3.5170	3.6030	1.2600	1.3050	0.479	0.495
2007190536	2007190909	5.0	5.0	25.0	25.0	2.0320	1.9190	1.0160	1.0040	0.425	0.452
2007190536	2007190909	10.5	13.0	25.0	25.0	4.6640	4.5480	1.2460	1.2560	1.220	1.322
2007190548	2007191236	16.4	13.0	25.0	25.0	4.9250	4.5790	2.9960	2.9340	1.047	0.940
2007190548	2007191236	27.6	24.2	25.0	25.0	5.7770	5.5100	2.9220	2.8620	1.164	1.062
2007190548	2007191236	18.0	5.0	25.0	25.0	5.1770	4.4610	2.8070	2.8160	1.067	0.864
2007190548	2007191236	32.9	34.5	25.0	25.0	6.2650	6.2160	2.8420	2.8590	1.250	1.203
2007190549	2007191507	5.0	5.0	25.0	25.0	1.7260	1.9970	0.2010	0.2400	0.011	0.034
2007190549	2007191507	10.2	14.4	25.0	25.0	4.0820	4.0650	0.5870	0.6300	0.117	0.145
2007190549	2007191507	5.0	5.0	25.0	25.0	2.0170	2.2400	0.2390	0.3210	0.058	0.103
2007190549	2007191507	13.8	15.9	25.0	25.0	4.5320	4.7640	0.6740	0.8550	0.235	0.373
2007190552	2007190675	5.0	5.0	25.0	25.0	1.1580	1.2840	0.8670	0.8520	0.084	0.104
2007190552	2007190675	12.6	12.2	25.0	25.0	3.2680	3.1840	2.2740	2.2470	0.600	0.663
2007190552	2007190675	5.0	5.0	25.0	25.0	2.5150	2.3580	1.2880	1.2600	0.601	0.595
2007190552	2007190675	21.6	26.1	25.0	25.0	7.1950	6.7830	2.8250	2.8660	1.968	2.017
2007190554	2007190752	5.0	5.0	25.0	25.0	1.5350	2.0420	0.0640	0.1350	0.012	0.039
2007190554	2007190752	5.0	5.0	25.0	25.0	2.4690	3.0810	0.2170	0.2610	0.074	0.089
2007190554	2007190752	5.0	11.9	25.0	25.0	1.1370	3.2650	0.0290	0.1760	0.005	0.059
2007190554	2007190752	13.4	13.2	25.0	25.0	3.3770	5.0310	0.2120	0.3170	0.069	0.118
2007190583	2007191063	5.0	5.0	25.0	25.0	1.9770	1.8990	0.9740	0.9920	0.098	0.097
2007190583	2007191063	5.0	5.0	25.0	25.0	2.0940	1.9610	1.3040	1.3030	0.152	0.147
2007190583	2007191063	15.4	12.4	25.0	25.0	4.4250	4.0700	1.5050	1.5300	0.325	0.352
2007190583	2007191063	24.3	20.5	25.0	25.0	5.2580	4.6680	1.7560	1.7220	0.400	0.385
2007190618	2007191166	28.9	23.6	25.0	25.0	6.3150	6.2090	1.2720	1.2010	1.717	1.710
2007190618	2007191166	26.3	29.3	25.0	25.0	7.0160	6.9470	1.1450	1.0890	2.045	2.002
2007190618	2007191166	38.8	32.3	25.0	25.0	7.1820	6.7740	1.2520	1.2950	1.721	1.712
2007190618	2007191166	45.8	45.5	25.0	25.0	8.5960	8.4140	1.0310	1.0790	1.997	2.054
2007190647	2007191525	5.0	5.0	25.0	25.0	2.0710	1.3220	1.4860	1.1810	0.157	0.047
2007190647	2007191525	11.9	5.0	25.0	25.0	2.3740	2.1360	2.1760	1.9700	0.331	0.202
2007190647	2007191525	5.0	5.0	25.0	25.0	2.2690	1.2320	1.4730	1.2560	0.237	0.056
2007190647	2007191525	13.6	5.0	25.0	25.0	2.9790	1.7930	2.0560	2.1710	0.435	0.214
2007190659	2007190739	5.0	5.0	25.0	25.0	1.8480	1.6650	0.8400	0.8150	0.367	0.348
2007190659	2007190739	5.0	5.0	25.0	25.0	5.9310	5.0070	3.1920	3.0150	1.463	1.264
2007190659	2007190739	5.0	5.0	25.0	25.0	3.5820	2.1780	1.6220	1.0960	0.849	0.545
2007190659	2007190739	5.0	5.0	25.0	25.0	7.7980	6.3460	3.6610	3.5500	1.916	1.779
2007190661	2007191334	5.0	5.0	25.0	25.0	2.2380	2.2230	0.9750	0.9000	0.153	0.184
2007190661	2007191334	15.2	19.4	25.0	25.0	5.4450	5.3490	1.2750	1.1580	0.419	0.494
2007190661	2007191334	11.2	5.0	25.0	25.0	3.3590	2.9600	0.9490	0.8690	0.365	0.299
2007190661	2007191334	18.9	14.6	25.0	25.0	6.4260	6.9630	1.1770	1.1380	0.706	0.745
2007190686	2007191430	5.0	5.0	25.0	25.0	0.9260	0.9120	0.3440	0.4380	0.034	0.045
2007190686	2007191430	5.0	5.0	25.0	25.0	1.4410	1.3870	1.2290	1.3210	0.164	0.156
2007190686	2007191430	5.0	5.0	25.0	25.0	1.4570	1.8880	0.2930	0.3950	0.049	0.061
2007190686	2007191430	5.0	5.0	25.0	25.0	3.0580	3.7670	0.7420	0.8510	0.170	0.161
2007190695	2007190924	5.0	5.0	25.0	25.0	1.7840	1.6990	0.2530	0.2730	0.058	0.075
2007190695	2007190924	5.0	5.0	25.0	25.0	2.9670	2.9200	0.8460	0.8530	0.213	0.233
2007190695	2007190924	14.9	16.4	25.0	25.0	4.2980	4.3610	0.6960	0.7140	0.328	0.340
2007190695	2007190924	23.5	14.6	25.0	25.0	7.5050	6.7810	1.3210	1.2630	0.600	0.588
2007190698	2007190813	12.2	5.0	25.0	25.0	4.7430	3.9410	1.9840	1.8180	1.102	0.883
2007190698	2007190813	17.3	5.0	25.0	25.0	4.2640	3.4080	1.8810	1.7090	1.002	0.757
2007190698	2007190813	16.2	5.0	25.0	25.0	4.8390	4.5290	1.8370	1.7730	1.361	1.225
2007190698	2007190813	19.4	16.2	25.0	25.0	4.5170	4.6160	1.7730	1.7620	1.277	1.288
2007190732	2007191450	5.0	10.4	25.0	25.0	2.4890	3.0440	0.6430	0.6710	0.269	0.314
2007190732	2007191450	5.0	5.0	25.0	25.0	2.3790	3.2440	0.7240	0.7510	0.289	0.341
2007190732	2007191450	5.0	5.0	25.0	25.0	2.9310	2.6550	0.6440	0.6080	0.443	0.313
2007190732	2007191450	13.9	5.0	25.0	25.0	3.7090	3.7280	0.8020	0.7730	0.629	0.506
2007190735	2007191549	15.4	14.1	25.0	25.0	4.8260	5.0870	1.3340	1.5510	1.148	1.255
2007190735	2007191549	14.2	5.0	25.0	25.0	3.9310	4.1350	1.2420	1.3870	0.922	0.995
2007190735	2007191549	15.0	16.9	25.0	25.0	5.2390	5.1750	1.3730	1.5110	1.278	1.354
2007190735	2007191549	18.0	13.5	25.0	25.0	4.9390	4.6750	1.3670	1.4320	1.241	1.229
2007190743	2007190906	13.4	16.5	25.0	25.0	4.4140	4.7500	1.5190	1.6320	1.458	1.643
2007190743	2007190906	29.1	22.3	25.0	25.0	6.1310	5.9600	2.2990	2.2000	2.343	2.290
2007190743	2007190906	18.4	15.2	25.0	25.0	4.6060	4.4530	1.5000	1.4350	1.728	1.631
2007190743	2007190906	24.9	29.2	25.0	25.0	6.1930	6.3370	2.1350	2.1410	2.554	2.606
2007190746	2007191241	5.0	5.0	25.0	25.0	1.1840	1.6210	0.2770	0.3700	0.042	0.072
2007190746	2007191241	5.0	5.0	25.0	25.0	1.9340	2.3020	0.9910	1.0130	0.235	0.289
2007190746	2007191241	5.0	5.0	25.0	25.0	1.6780	1.5930	0.3740	0.4550	0.127	0.106
2007190746	2007191241	5.0	5.0	25.0	25.0	2.3680	2.4030	1.0720	1.0530	0.374	0.315
2007190753	2007191299	16.1	5.0	25.0	25.0	6.0530	5.5140	1.5000	1.3500	1.071	0.913
2007190753	2007191299	5.0	16.3	25.0	25.0	5.8200	5.6710	1.4750	1.4170	1.030	0.966
2007190753	2007191299	15.1	19.2	25.0	25.0	5.9960	5.3420	1.6420	1.4420	1.201	0.998
2007190753	2007191299	11.2	16.9	25.0	25.0	6.0590	5.7220	1.6870	1.5790	1.225	1.081
2007190798	2007191229	5.0	5.0	25.0	25.0	1.1390	1.2640	0.0660	0.1000	0.013	0.026
2007190798	2007191229	5.0	5.0	25.0	25.0	1.0750	1.2010	0.7740	0.6210	0.107	0.111
2007190798	2007191229	5.0	5.0	25.0	25.0	1.0700	1.0880	0.0730	0.0710	0.005	0.013
2007190798	2007191229	5.0	5.0	25.0	25.0	0.8970	0.8430	1.0450	0.9250	0.107	0.100
2007190818	2007191157	5.0	5.0	25.0	25.0	1.7400	1.1150	1.5600	1.4550	0.318	0.147

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	MnO (%)	MnO (%)	Na2O (%)	Na2O (%)	Ni (ppm)	Ni (ppm)	P2O5 (%)	P2O5 (%)	Rb (ppm)	Rb (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.005	0.005	0.01	0.01	10	10	0.005	0.005	10	10
2007190531	2007190703	0.0660	0.0770	1.061	1.086	17.4	14.3	0.1050	0.1110	60.8	59.9
2007190531	2007190703	0.0520	0.0610	1.210	1.274	5.0	5.0	0.0980	0.1080	60.4	57.7
2007190531	2007190703	0.0650	0.0710	1.158	1.255	16.9	16.2	0.1010	0.1120	61.3	61.9
2007190531	2007190703	0.0590	0.0630	1.290	1.396	5.0	12.1	0.1030	0.1140	63.5	59.7
2007190534	2007191522	0.0460	0.0490	0.645	0.608	5.0	5.0	0.0990	0.1060	79.7	86.3
2007190534	2007191522	0.0570	0.0620	0.718	0.673	5.0	5.0	0.1390	0.1440	89.6	97.7
2007190534	2007191522	0.0300	0.0220	0.431	0.384	5.0	5.0	0.0610	0.0520	70.0	62.8
2007190534	2007191522	0.0670	0.0500	0.656	0.603	5.0	5.0	0.1270	0.1190	98.9	95.8
2007190536	2007190909	0.0120	0.0110	0.243	0.227	5.0	5.0	0.0290	0.0270	46.2	41.4
2007190536	2007190909	0.0450	0.0460	0.511	0.491	5.0	5.0	0.0540	0.0520	59.5	67.3
2007190536	2007190909	0.0120	0.0090	0.216	0.193	5.0	5.0	0.0300	0.0300	49.5	50.6
2007190536	2007190909	0.0430	0.0380	0.381	0.381	5.0	5.0	0.0550	0.0560	63.1	67.1
2007190548	2007191236	0.0840	0.0740	1.772	1.837	15.8	5.0	0.1010	0.0850	128.9	125.5
2007190548	2007191236	0.1040	0.0980	1.809	1.828	25.0	13.7	0.1330	0.1190	128.2	124.1
2007190548	2007191236	0.0910	0.0750	1.763	1.804	17.2	5.0	0.0810	0.0750	121.0	124.0
2007190548	2007191236	0.1120	0.1110	1.764	1.786	28.4	23.8	0.1150	0.1150	134.6	129.3
2007190549	2007191507	0.0050	0.0050	0.005	0.018	5.0	5.0	0.0220	0.0230	24.5	23.0
2007190549	2007191507	0.0200	0.0190	0.065	0.073	5.0	5.0	0.0410	0.0460	51.9	52.2
2007190549	2007191507	0.0070	0.0090	0.021	0.076	5.0	5.0	0.0200	0.0240	28.2	28.2
2007190549	2007191507	0.0290	0.0350	0.079	0.216	13.5	13.4	0.0390	0.0460	58.7	63.2
2007190552	2007190675	0.0250	0.0320	0.214	0.250	5.0	5.0	0.0330	0.0370	42.3	46.7
2007190552	2007190675	0.1330	0.1620	0.888	1.059	16.0	10.3	0.1150	0.1310	108.6	112.6
2007190552	2007190675	0.0390	0.0540	0.464	0.541	5.0	5.0	0.0270	0.0320	79.8	80.2
2007190552	2007190675	0.1260	0.1940	1.221	1.409	52.1	44.5	0.0570	0.0720	177.7	192.0
2007190554	2007190752	0.0130	0.0200	0.005	0.017	5.0	5.0	0.0260	0.0340	27.0	37.8
2007190554	2007190752	0.0370	0.0370	0.026	0.032	5.0	5.0	0.0520	0.0550	48.1	48.2
2007190554	2007190752	0.0025	0.0090	0.014	0.026	5.0	5.0	0.0220	0.0370	20.9	40.7
2007190554	2007190752	0.0190	0.0170	0.035	0.042	13.3	19.7	0.0590	0.0530	43.1	50.3
2007190583	2007191063	0.0340	0.0110	0.040	0.070	5.0	5.0	0.0370	0.0430	60.7	58.4
2007190583	2007191063	0.0480	0.0120	0.076	0.092	5.0	5.0	0.0510	0.0520	76.1	73.0
2007190583	2007191063	0.0390	0.0350	0.049	0.083	12.6	5.0	0.0420	0.0420	102.5	102.7
2007190583	2007191063	0.0490	0.0440	0.066	0.092	19.5	12.5	0.0500	0.0470	119.2	110.2
2007190618	2007191166	0.1100	0.1110	1.199	1.204	29.7	26.4	0.2360	0.2320	60.8	56.8
2007190618	2007191166	0.1170	0.1280	1.368	1.381	33.5	35.4	0.2560	0.2460	58.5	54.5
2007190618	2007191166	0.1270	0.1100	1.296	1.345	47.1	35.4	0.1210	0.0910	60.0	58.5
2007190618	2007191166	0.1480	0.1370	1.341	1.419	48.9	52.3	0.1490	0.1130	55.0	51.9
2007190647	2007191525	0.0240	0.0120	0.297	0.114	5.0	5.0	0.0510	0.0290	94.7	71.7
2007190647	2007191525	0.0310	0.0350	0.640	0.293	5.0	5.0	0.0710	0.0550	138.9	117.4
2007190647	2007191525	0.0130	0.0060	0.339	0.106	5.0	5.0	0.0250	0.0240	105.5	72.1
2007190647	2007191525	0.0210	0.0130	0.628	0.273	5.0	5.0	0.0330	0.0430	151.4	130.0
2007190659	2007190739	0.0025	0.0025	0.207	0.159	5.0	5.0	0.0120	0.0140	46.8	43.7
2007190659	2007190739	0.0110	0.0090	0.769	0.648	41.0	31.3	0.0220	0.0270	125.7	120.1
2007190659	2007190739	0.0050	0.0025	0.539	0.416	22.1	10.7	0.0150	0.0150	68.9	50.0
2007190659	2007190739	0.0110	0.0130	1.155	1.346	55.7	45.9	0.0200	0.0240	141.6	126.3
2007190661	2007191334	0.0520	0.0390	0.637	0.623	5.0	5.0	0.0710	0.0660	47.7	46.1
2007190661	2007191334	0.1230	0.1070	1.050	1.059	20.1	20.2	0.1340	0.1320	58.0	50.4
2007190661	2007191334	0.0500	0.0210	0.650	0.541	22.8	10.5	0.0840	0.0670	53.8	48.7
2007190661	2007191334	0.1090	0.0640	0.974	0.818	43.3	32.2	0.1490	0.1350	59.5	63.0
2007190686	2007191430	0.0050	0.0050	0.039	0.048	5.0	5.0	0.0260	0.0250	53.8	59.7
2007190686	2007191430	0.0080	0.0110	0.125	0.132	5.0	5.0	0.0550	0.0560	131.4	128.0
2007190686	2007191430	0.0025	0.0025	0.033	0.032	5.0	5.0	0.0230	0.0260	59.6	70.9
2007190686	2007191430	0.0025	0.0060	0.057	0.070	5.0	5.0	0.0350	0.0370	131.5	134.9
2007190695	2007190924	0.0090	0.0080	0.016	0.022	5.0	5.0	0.0240	0.0270	33.5	35.7
2007190695	2007190924	0.0240	0.0200	0.053	0.068	5.0	5.0	0.0460	0.0430	68.2	66.3
2007190695	2007190924	0.0170	0.0160	0.024	0.034	10.0	11.8	0.0260	0.0310	73.8	71.5
2007190695	2007190924	0.0350	0.0300	0.047	0.059	18.6	14.6	0.0380	0.0390	125.6	117.2
2007190698	2007190813	0.0860	0.0710	0.585	0.547	21.5	15.2	0.0680	0.0560	117.9	109.1
2007190698	2007190813	0.0840	0.0710	0.624	0.626	21.0	14.0	0.0730	0.0590	110.7	106.3
2007190698	2007190813	0.0840	0.0650	0.897	0.787	24.8	16.4	0.0480	0.0480	118.3	114.1
2007190698	2007190813	0.0850	0.0790	0.908	0.860	26.1	25.8	0.0500	0.0540	113.5	114.3
2007190732	2007191450	0.0630	0.0710	0.476	0.371	5.0	14.8	0.0530	0.0610	54.4	58.4
2007190732	2007191450	0.0560	0.0660	0.669	0.475	5.0	5.0	0.0570	0.0690	54.7	63.6
2007190732	2007191450	0.0670	0.0580	0.573	0.392	5.0	5.0	0.0400	0.0420	50.8	52.6
2007190732	2007191450	0.1040	0.0890	0.776	0.533	20.8	5.0	0.0500	0.0530	58.1	61.9
2007190735	2007191549	0.0940	0.0820	0.599	0.650	19.2	16.8	0.0920	0.1070	69.9	78.8
2007190735	2007191549	0.0750	0.0610	0.606	0.631	15.6	12.4	0.0810	0.0890	69.4	67.2
2007190735	2007191549	0.1020	0.0830	1.123	1.066	20.2	24.6	0.0980	0.0980	70.3	76.1
2007190735	2007191549	0.1330	0.0840	1.142	1.003	27.7	25.7	0.0900	0.0900	74.0	69.0
2007190743	2007190906	0.0430	0.0470	0.351	0.341	5.0	5.0	0.0870	0.1090	73.5	72.4
2007190743	2007190906	0.0550	0.0530	0.601	0.541	20.3	12.4	0.1300	0.1410	99.3	96.9
2007190743	2007190906	0.0410	0.0400	0.707	0.645	5.0	5.0	0.0850	0.0860	69.3	69.1
2007190743	2007190906	0.0620	0.0620	1.005	1.007	16.3	18.1	0.1220	0.1210	93.3	97.2
2007190746	2007191241	0.0080	0.0080	0.129	0.135	5.0	5.0	0.0220	0.0300	21.9	23.6
2007190746	2007191241	0.0220	0.0240	0.624	0.556	5.0	5.0	0.0410	0.0520	46.4	48.4
2007190746	2007191241	0.0120	0.0090	0.225	0.162	5.0	5.0	0.0260	0.0310	24.8	29.5
2007190746	2007191241	0.0250	0.0220	0.793	0.581	5.0	5.0	0.0420	0.0480	55.4	57.9
2007190753	2007191299	0.0680	0.0610	0.296	0.199	16.9	5.0	0.0930	0.0910	70.3	65.2
2007190753	2007191299	0.0740	0.0770	0.301	0.270	11.1	12.1	0.0930	0.0940	72.2	71.3
2007190753	2007191299	0.0650	0.0660	0.765	0.494	19.3	19.1	0.0980	0.0850	71.5	61.4
2007190753	2007191299	0.0710	0.0750	0.771	0.549	15.9	35.7	0.0940	0.0910	73.0	71.2
2007190798	2007191229	0.0060	0.0070	0.005	0.022	5.0	5.0	0.0200	0.0210	21.7	26.0
2007190798	2007191229	0.0140	0.0140	0.049	0.056	5.0	5.0	0.0470	0.0420	76.1	62.4
2007190798	2007191229	0.0060	0.0070	0.010	0.023	12.8	5.0	0.0200	0.0200	23.0	18.0
2007190798	2007191229	0.0080	0.0090	0.053	0.066	12.9	5.0	0.0310	0.0330	63.2	66.1
2007190818	2007191157	0.0220	0.0140	0.949	0.926	5.0	5.0	0.0300	0.0260	57.8	46.8

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	S (ppm)	S (ppm)	SiO2 (%)	SiO2 (%)	Sr (ppm)	Sr (ppm)	TiO2 (%)	TiO2 (%)	Zn (ppm)	Zn (ppm)	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	0.01	0.01	10	10	0.005	0.005	10	10	10	10
2007190531	2007190703	140.5	187.4	58.784	58.780	222.7	185.6	0.8770	0.8880	72.3	68.0	217.5	219.6
2007190531	2007190703	143.1	152.9	60.943	61.752	222.2	192.1	0.8440	0.8640	58.5	56.3	246.8	270.0
2007190531	2007190703	141.2	153.2	58.166	58.742	216.8	188.6	0.8730	0.8960	68.2	71.0	207.7	220.9
2007190531	2007190703	144.3	161.0	59.718	60.247	222.6	192.4	0.8640	0.8940	58.7	63.5	234.2	238.3
2007190534	2007191522	137.8	134.6	78.937	78.248	100.0	109.0	0.6450	0.6130	51.3	43.5	455.7	386.1
2007190534	2007191522	167.1	182.3	71.561	70.764	116.7	130.5	0.9720	0.9300	58.0	55.0	1085.6	908.5
2007190534	2007191522	91.6	71.6	85.680	89.382	75.4	66.5	0.4720	0.4690	25.6	24.4	352.8	468.9
2007190534	2007191522	160.3	113.6	70.086	76.639	137.4	116.6	1.1400	1.3790	52.0	46.1	2183.2	3730.7
2007190536	2007190909	79.9	68.2	92.017	91.487	56.7	46.1	0.3100	0.2820	11.8	5.0	340.6	338.4
2007190536	2007190909	110.7	119.7	81.719	80.578	102.3	109.5	1.6230	1.6520	39.9	37.8	3621.7	3718.6
2007190536	2007190909	77.2	85.5	88.337	86.424	62.3	61.6	0.3270	0.3220	14.9	5.0	353.4	330.5
2007190536	2007190909	145.3	163.2	69.620	69.617	120.0	128.9	1.4760	1.4140	43.3	44.6	3206.3	3029.5
2007190548	2007191236	150.4	65.2	64.917	67.411	272.6	277.2	0.7430	0.7130	70.0	60.2	402.9	375.3
2007190548	2007191236	175.2	88.2	61.171	63.534	286.1	298.1	1.0080	1.0590	88.4	75.9	861.1	941.7
2007190548	2007191236	74.9	48.8	67.042	68.537	247.9	279.8	0.8620	0.7470	67.3	50.6	378.4	363.5
2007190548	2007191236	104.8	83.9	60.354	61.103	260.9	278.2	1.0450	1.1010	91.8	92.5	872.8	973.0
2007190549	2007191507	61.6	84.7	94.938	92.617	14.9	11.5	0.2330	0.2680	10.4	5.0	191.8	238.1
2007190549	2007191507	73.6	93.1	82.209	82.536	28.6	25.3	1.2180	1.1000	23.9	25.0	2128.6	1705.9
2007190549	2007191507	204.2	145.8	92.921	90.587	17.6	13.7	0.2840	0.3010	5.0	5.0	280.3	236.0
2007190549	2007191507	116.2	170.0	78.764	77.819	35.2	27.5	1.2600	1.0950	26.8	30.5	2411.9	1523.5
2007190552	2007190675	173.3	212.9	93.452	92.345	32.4	32.3	0.1460	0.1480	5.0	5.0	138.7	116.9
2007190552	2007190675	749.6	993.3	70.293	69.195	102.6	111.7	0.8110	0.7890	37.7	37.5	1093.1	878.1
2007190552	2007190675	273.0	718.4	82.755	83.762	51.3	47.2	0.2550	0.2620	16.8	16.1	157.2	139.2
2007190552	2007190675	717.6	923.3	51.382	53.073	104.7	105.7	0.7090	0.7850	69.3	69.0	339.3	285.7
2007190554	2007190752	49.1	74.7	93.910	89.141	10.9	15.2	0.2780	0.5780	5.0	5.0	277.3	545.3
2007190554	2007190752	109.2	120.7	83.126	78.785	22.9	21.2	1.0310	1.1460	5.0	5.0	1512.7	1123.6
2007190554	2007190752	35.0	62.2	96.574	84.233	5.0	13.9	0.1210	0.7050	5.0	5.0	91.7	435.4
2007190554	2007190752	75.8	85.4	83.053	70.727	17.0	17.7	0.9500	1.3070	10.6	5.0	1171.9	795.1
2007190583	2007191063	76.5	121.2	90.199	87.928	31.0	29.7	0.4990	0.4890	5.0	5.0	555.0	468.3
2007190583	2007191063	76.0	119.1	87.683	86.566	37.6	37.8	0.9300	0.7760	10.8	10.7	1292.6	907.8
2007190583	2007191063	74.3	98.1	76.404	76.829	44.9	46.6	0.6650	0.6850	16.6	13.3	389.0	387.2
2007190583	2007191063	81.5	81.7	72.575	74.629	49.9	50.4	0.8630	0.8370	24.1	23.1	573.2	558.2
2007190618	2007191166	659.3	650.3	58.119	56.556	108.6	108.8	0.8140	0.8120	77.3	74.4	187.8	203.1
2007190618	2007191166	706.3	689.1	52.576	52.776	119.7	124.3	1.0420	1.0180	84.3	89.2	281.6	232.2
2007190618	2007191166	157.7	133.1	63.965	65.140	113.2	114.5	0.9390	0.9120	93.2	82.7	200.7	209.8
2007190618	2007191166	206.2	186.3	56.175	57.256	119.5	123.2	1.1790	1.1890	108.2	105.9	232.5	264.2
2007190647	2007191525	117.8	459.6	86.114	91.862	39.0	22.8	0.4110	0.2480	16.7	5.0	301.6	190.6
2007190647	2007191525	139.7	80.8	79.745	84.023	52.4	37.5	0.7130	0.7150	42.5	25.2	715.9	696.0
2007190647	2007191525	24.7	44.9	84.585	92.460	33.7	21.0	0.4410	0.2860	10.6	5.0	342.5	208.0
2007190647	2007191525	36.3	70.4	78.397	84.988	49.9	35.4	0.7270	0.7880	36.2	21.9	720.0	715.5
2007190659	2007190739	132.8	240.0	89.403	88.312	19.1	22.8	0.2910	0.2570	5.0	5.0	326.4	238.1
2007190659	2007190739	386.3	845.3	61.818	60.770	50.6	64.1	0.8220	0.8230	24.7	18.2	522.7	494.6
2007190659	2007190739	450.5	433.3	77.581	85.983	29.3	22.6	0.3910	0.3310	12.4	5.0	184.7	240.5
2007190659	2007190739	1001.0	1055.6	48.862	55.003	61.1	52.2	0.7760	0.8670	27.1	23.5	207.1	321.5
2007190661	2007191334	110.4	139.3	88.916	87.988	76.4	86.0	1.0210	0.9420	21.6	19.6	492.1	473.7
2007190661	2007191334	145.9	203.2	74.300	73.152	121.2	128.3	3.9670	3.3870	56.8	58.7	1842.9	1521.7
2007190661	2007191334	91.3	92.5	83.036	84.871	93.4	77.4	1.2170	0.8910	33.9	28.7	440.2	448.4
2007190661	2007191334	107.9	113.8	68.004	65.375	139.9	121.4	3.0150	2.7860	61.3	67.6	1016.0	1153.9
2007190686	2007191430	74.6	81.7	90.225	90.228	21.6	19.7	0.3580	0.4410	5.0	5.0	529.8	627.3
2007190686	2007191430	199.2	152.7	69.336	74.279	37.0	39.6	0.9340	1.0500	5.0	16.4	1671.2	2260.6
2007190686	2007191430	47.7	74.0	84.232	79.982	15.6	17.8	0.4340	0.5450	5.0	11.0	403.6	457.4
2007190686	2007191430	73.0	86.6	55.875	54.910	29.9	31.0	0.9920	1.0700	12.0	17.5	857.1	1026.4
2007190695	2007190924	53.6	59.3	93.381	93.349	25.6	18.6	0.2660	0.2710	5.0	5.0	288.5	250.8
2007190695	2007190924	78.0	85.0	82.734	82.740	39.1	34.5	0.7400	0.7450	13.2	16.7	1160.2	1211.8
2007190695	2007190924	51.4	66.7	76.838	76.458	28.1	24.3	0.4800	0.4750	21.7	25.2	234.1	214.8
2007190695	2007190924	58.4	70.1	55.892	58.029	42.3	39.5	0.8790	0.8350	35.7	30.0	457.6	557.2
2007190698	2007190813	263.4	166.8	65.602	71.262	85.4	77.4	0.7670	0.6740	53.6	41.5	275.3	317.9
2007190698	2007190813	293.9	190.0	68.803	73.684	87.4	84.3	0.7840	0.7610	51.3	38.3	419.6	543.2
2007190698	2007190813	258.6	234.0	65.651	67.205	107.6	104.7	0.7960	0.7160	54.1	45.0	264.3	261.7
2007190698	2007190813	292.4	270.1	67.077	66.918	111.1	109.2	0.8120	0.8050	55.1	49.7	362.5	370.6
2007190732	2007191450	114.5	142.8	84.297	81.165	79.8	90.9	0.7020	0.7750	21.4	31.4	509.7	528.4
2007190732	2007191450	119.3	145.7	83.715	77.626	94.3	106.4	0.9350	1.0370	24.3	30.2	855.6	923.4
2007190732	2007191450	207.7	132.2	80.975	83.212	100.1	97.1	0.6700	0.6210	24.8	22.9	388.1	383.4
2007190732	2007191450	293.3	193.4	75.028	73.771	136.5	131.4	0.9820	0.9650	41.7	32.5	649.7	674.6
2007190735	2007191549	133.3	135.8	68.854	66.980	125.1	125.2	0.8720	0.9320	53.5	57.8	382.4	350.2
2007190735	2007191549	116.1	118.0	74.501	72.069	115.5	110.5	0.9160	0.9200	46.3	45.5	711.5	600.3
2007190735	2007191549	1104.4	258.0	65.206	67.108	134.7	129.4	0.8990	0.9370	58.4	60.0	299.8	334.5
2007190735	2007191549	1507.2	263.7	67.082	68.724	141.6	125.3	0.9330	0.9310	57.2	52.9	425.4	426.7
2007190743	2007190906	424.5	466.2	74.550	70.569	101.1	108.3	0.5790	0.6150	44.4	52.0	239.9	207.9
2007190743	2007190906	537.1	578.7	62.665	60.574	147.6	153.5	0.8850	0.8500	76.2	67.1	384.6	365.0
2007190743	2007190906	916.4	613.7	71.270	71.348	128.1	121.8	0.5780	0.5640	46.9	42.0	184.7	196.0
2007190743	2007190906	1378.7	941.2	56.779	57.321	188.2	187.5	0.8390	0.8560	67.4	71.0	298.1	304.5
2007190746	2007191241	122.0	174.4	97.611	93.337	34.2	38.8	0.1690	0.2280	5.0	5.0	217.5	279.3
2007190746	2007191241	173.4	242.9	89.037	86.585	93.8	97.8	0.9600	1.0060	18.8	24.1	1772.8	1804.4
2007190746	2007191241	128.5	154.8	94.707	92.383	42.0	44.3	0.2090	0.2520	11.5	5.0	196.2	278.0
2007190746	2007191241	188.1	243.0	85.410	84.896	104.9	111.8	0.8910	0.9270	26.1	20.9	1451.0	1556.0
2007190753	2007191299	166.5	167.7	60.474	62.127	128.0							

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	LOI (%)	LOI (%)	Al2O3 (%)	Al2O3 (%)	CaO (%)	CaO (%)	Cl (ppm)	Cl (ppm)
METHOD:	METHOD:	SIZE	SIZE			Calc	Calc	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0	0	0.005	0.005	0.002	0.002	10	10
2007190818	2007191157	Fine	Fine	TOS	TOS	10.1	9.3	12.0460	10.9840	0.9800	0.9750	136.0	87.0
2007190818	2007191157	Coarse	Coarse	BOS	BOS	0.8	1.1	4.3250	6.4660	0.3180	0.5720	45.0	86.0
2007190818	2007191157	Fine	Fine	BOS	BOS	5.6	8.1	10.3080	11.8480	0.8710	1.1010	108.0	157.0
2007190825	2007191214	Coarse	Coarse	TOS	TOS	5.3	6.5	8.6820	10.0500	0.6840	0.7270	68.0	64.0
2007190825	2007191214	Fine	Fine	TOS	TOS	5.8	7.9	8.0400	10.0520	0.7160	0.7890	50.0	51.0
2007190825	2007191214	Coarse	Coarse	BOS	BOS	7.0	7.1	10.6710	10.7810	0.9310	0.8490	100.0	167.0
2007190825	2007191052	Fine	Fine	BOS	BOS	8.0	8.1	10.7440	11.3840	0.8800	0.8880	97.0	157.0
2007190826	2007191052	Coarse	Coarse	TOS	TOS	3.3	5.8	3.1880	4.1660	0.1170	0.2410	22.0	26.0
2007190826	2007191052	Fine	Fine	TOS	TOS	5.4	7.5	7.8350	9.0770	0.2950	0.4110	38.0	17.0
2007190826	2007191052	Coarse	Coarse	BOS	BOS	3.3	3.9	4.1480	3.9300	0.3420	0.2270	24.0	31.0
2007190826	2007191052	Fine	Fine	BOS	BOS	8.2	7.2	10.8600	9.3520	0.8890	0.5240	33.0	23.0
2007190827	2007191440	Coarse	Coarse	TOS	TOS	2.8	3.3	6.1400	7.9220	0.9100	0.1670	50.0	45.0
2007190827	2007191440	Fine	Fine	TOS	TOS	10.1	10.1	14.6830	17.1420	1.9840	0.3630	30.0	64.0
2007190827	2007191440	Coarse	Coarse	BOS	BOS	4.3	14.1	7.0530	9.7890	2.0640	9.5560	46.0	1020.0
2007190827	2007191440	Fine	Fine	BOS	BOS	14.3	21.9	15.4080	14.0150	5.8350	12.9340	55.0	1496.0
2007190834	2007190889	Coarse	Coarse	TOS	TOS	2.9	0.3	4.1910	4.5950	0.2600	0.3330	64.0	65.0
2007190834	2007190889	Fine	Fine	TOS	TOS	10.8	7.6	12.9310	12.4270	0.5440	0.6710	242.0	157.0
2007190834	2007190889	Coarse	Coarse	BOS	BOS	1.2	0.0	3.2780	3.1980	0.2280	0.2410	56.0	99.0
2007190834	2007190889	Fine	Fine	BOS	BOS	6.5	6.8	10.7040	11.3160	0.7240	0.7580	211.0	374.0
2007190849	2007191277	Coarse	Coarse	TOS	TOS	8.3	5.6	11.0160	8.8900	0.4340	0.3470	2330.0	80.0
2007190849	2007191277	Fine	Fine	TOS	TOS	8.8	8.9	12.7880	11.0670	0.5000	0.4170	2528.0	77.0
2007190849	2007191277	Coarse	Coarse	BOS	BOS	10.1	7.7	9.8780	9.9710	1.9020	1.8110	2538.0	1085.0
2007190853	2007190939	Coarse	Coarse	TOS	TOS	8.8	1.9	8.4680	4.2670	1.2860	0.4330	31336.0	14223.0
2007190853	2007190939	Fine	Fine	TOS	TOS	9.4	5.6	11.0520	9.1760	1.5670	0.9920	33125.0	19473.0
2007190853	2007190939	Coarse	Coarse	BOS	BOS	1.9	2.3	2.1770	3.4390	0.1540	0.1320	8142.0	16980.0
2007190853	2007190939	Fine	Fine	BOS	BOS	10.2	8.0	11.9210	11.9580	0.6250	0.4480	46628.0	61435.0
2007190865	2007191183	Coarse	Coarse	TOS	TOS	1.8	0.2	0.6130	0.7310	0.2240	0.1390	5.0	30.0
2007190865	2007191183	Fine	Fine	TOS	TOS	9.0	6.3	9.5890	7.1290	1.6440	0.8920	55.0	60.0
2007190865	2007191183	Coarse	Coarse	BOS	BOS	1.8	0.0	0.9110	0.8150	0.2400	0.1350	22.0	31.0
2007190865	2007191183	Fine	Fine	BOS	BOS	4.2	5.6	6.5070	6.7550	1.0880	0.8330	65.0	72.0
2007190874	2007191297	Coarse	Coarse	TOS	TOS	4.8	8.0	5.4830	6.5320	0.2810	0.7590	36.0	36.0
2007190874	2007191297	Fine	Fine	TOS	TOS	8.3	10.7	9.2160	9.0190	0.6520	1.4010	37.0	47.0
2007190874	2007191297	Coarse	Coarse	BOS	BOS	4.2	8.3	5.6530	7.3120	0.2100	0.7170	33.0	28.0
2007190874	2007191297	Fine	Fine	BOS	BOS	7.1	11.1	9.3470	9.5750	0.6360	1.2200	55.0	38.0
2007190887	2007191058	Coarse	Coarse	TOS	TOS	8.8	10.4	17.6370	17.3700	0.2020	0.1730	41.0	31.0
2007190887	2007191058	Fine	Fine	TOS	TOS	8.6	8.6	15.3490	15.5590	0.1850	0.1640	31.0	44.0
2007190887	2007191058	Coarse	Coarse	BOS	BOS	8.6	12.4	18.1810	21.3540	0.2280	0.2000	28.0	30.0
2007190887	2007191058	Fine	Fine	BOS	BOS	8.3	10.2	15.9690	18.3680	0.2000	0.1800	33.0	47.0
2007190895	2007190947	Coarse	Coarse	TOS	TOS	12.5	12.3	12.0460	12.8590	0.7960	1.2050	33.0	96.0
2007190895	2007190947	Fine	Fine	TOS	TOS	10.7	10.9	11.1330	11.0730	0.7420	1.0470	51.0	87.0
2007190895	2007190947	Coarse	Coarse	BOS	BOS	10.3	9.9	11.3890	13.1200	0.8840	1.5060	399.0	360.0
2007190895	2007190947	Fine	Fine	BOS	BOS	9.7	10.5	11.3680	12.2770	0.8240	1.3370	418.0	365.0
2007190896	2007191441	Coarse	Coarse	TOS	TOS	4.2	5.1	8.5080	13.5250	0.0960	0.1350	41.0	44.0
2007190896	2007191441	Fine	Fine	TOS	TOS	7.9	11.5	18.4910	22.7040	0.1740	0.1710	47.0	58.0
2007190896	2007191441	Coarse	Coarse	BOS	BOS	3.4	5.6	8.9600	13.6740	0.1140	0.1430	39.0	61.0
2007190896	2007191441	Fine	Fine	BOS	BOS	8.5	11.3	19.5780	23.1320	0.2300	0.1830	48.0	108.0
2007190922	2007191082	Coarse	Coarse	TOS	TOS	1.1	0.0	2.6280	2.7290	0.1300	0.1250	37.0	52.0
2007190922	2007191082	Fine	Fine	TOS	TOS	12.4	7.8	9.4900	8.6840	0.7310	0.6710	90.0	115.0
2007190922	2007191082	Coarse	Coarse	BOS	BOS	9.4	7.4	5.5820	5.8960	7.1680	6.7020	139.0	122.0
2007190922	2007191082	Fine	Fine	BOS	BOS	28.4	28.4	10.3120	11.2500	23.0600	22.5100	301.0	243.0
2007190927	2007191444	Coarse	Coarse	TOS	TOS	4.2	5.4	12.7240	12.8780	1.1670	1.1200	50.0	54.0
2007190927	2007191444	Fine	Fine	TOS	TOS	9.1	11.2	13.1010	13.0130	1.1190	1.1080	48.0	59.0
2007190927	2007191444	Coarse	Coarse	BOS	BOS	2.3	3.6	13.1830	13.4610	1.1510	1.1950	48.0	39.0
2007190927	2007191444	Fine	Fine	BOS	BOS	5.4	6.7	13.5730	13.7590	0.9520	1.0390	41.0	39.0
2007190949	2007191504	Coarse	Coarse	TOS	TOS	11.1	8.6	15.4940	14.0590	1.1730	0.7180	4757.0	118.0
2007190949	2007191504	Fine	Fine	TOS	TOS	12.0	11.2	17.2160	16.5850	1.3610	0.8540	5663.0	140.0
2007190949	2007191504	Coarse	Coarse	BOS	BOS	12.2	13.0	14.3450	13.5370	2.9500	3.6420	1560.0	1350.0
2007190949	2007191504	Fine	Fine	BOS	BOS	15.0	17.0	16.8160	15.7300	3.5100	4.9910	2003.0	1780.0
2007190968	2007191437	Coarse	Coarse	TOS	TOS	2.0	2.0	3.0170	2.5370	0.1330	0.1270	36.0	39.0
2007190968	2007191437	Fine	Fine	TOS	TOS	4.9	2.7	7.1600	6.4980	0.2970	0.3050	37.0	92.0
2007190968	2007191437	Coarse	Coarse	BOS	BOS	7.2	6.5	7.2720	8.4030	1.1680	0.5350	81.0	3466.0
2007190968	2007191437	Fine	Fine	BOS	BOS	12.2	11.4	12.2980	14.4700	1.9160	0.6710	95.0	6069.0
2007190970	2007191245	Coarse	Coarse	TOS	TOS	22.0	26.3	7.0850	7.4180	0.3740	0.3190	7496.0	7269.0
2007190970	2007191245	Fine	Fine	TOS	TOS	13.0	15.2	7.1220	7.6450	0.3430	0.3050	4049.0	3923.0
2007190970	2007191245	Coarse	Coarse	BOS	BOS	13.6	4.8	6.6960	3.3270	0.3180	0.1710	1896.0	464.0
2007190970	2007191245	Fine	Fine	BOS	BOS	11.0	8.1	7.3160	7.4210	0.3460	0.3340	1189.0	825.0
2007190986	2007191592	Coarse	Coarse	TOS	TOS	2.0	2.6	10.5820	10.2910	1.7980	1.6600	195.0	163.0
2007190986	2007191592	Fine	Fine	TOS	TOS	4.0	1.9	10.5250	9.4930	1.6230	1.4740	173.0	147.0
2007190986	2007191592	Coarse	Coarse	BOS	BOS	1.7	2.9	11.2030	11.3000	2.1320	1.8740	230.0	208.0
2007190986	2007191592	Fine	Fine	BOS	BOS	4.8	4.2	12.4360	12.5890	1.9310	1.7320	257.0	239.0
2007190990	2007191537	Coarse	Coarse	TOS	TOS	9.0	10.7	12.3300	11.6160	0.0600	0.0790	39.0	33.0
2007190990	2007191537	Fine	Fine	TOS	TOS	9.6	7.2	10.8100	10.9330	0.0590	0.0720	38.0	48.0
2007190990	2007191537	Coarse	Coarse	BOS	BOS	4.0	2.9	7.4280	8.8250	0.0510	0.0450	30.0	35.0
2007190990	2007191537	Fine	Fine	BOS	BOS	6.2	3.4	10.5430	8.2420	0.0570	0.0540	18.0	33.0
2007191007	2007191551	Coarse	Coarse	TOS	TOS	1.7	1.3	4.7770	4.9510	0.5360	0.5170	33.0	27.0
2007191007	2007191551	Fine	Fine	TOS	TOS	5.1	5.1	8.8330	8.3860	1.1610	1.0080	41.0	30.0
2007191007	2007191551	Coarse	Coarse	BOS	BOS	2.2	2.6	5.2000	6.3960	0.4780	0.4880	28.0	33.0
2007191007	2007191551	Fine	Fine	BOS	BOS	4.8	6.0	9.3120	9.5680	1.0700	0.8900	18.0	45.0
2007191028	2007191531	Coarse	Coarse	TOS	TOS	4.6	2.9	5.4720	3.7890	0.3240	0.1790	35.0	28.0
2007191028	2007191531	Fine	Fine	TOS	TOS	8.6	6.8	10.4110	8.4110	0.5780	0.3690	39.0	28.0
2007191028	2007191531	Coarse	Coarse	BOS	BOS	8.5	1.8	7.0930	4.4070	3.0310	0.3430	71.0	36.0
2007191028	2007191531	Fine	Fine	BOS	BOS	11.0	7.9	10.4020	9.7300	2.5710	0.5840	87.0	32.0
2007191051	2007191331	Coarse	Coarse	TOS	TOS	8.0	6.2	10.1760	9.6870	0.3780	0.3680	48.0	16.0
2007191051	2007191331	Fine	Fine	TOS	TOS	7.9	5.9	9.1590	8.6780	0.3340	0.3260	36.0	31.0
2007191051	2007191331	Coarse	Coarse	BOS	BOS	6.9	6.4	10.0160	10.8270				

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	Cu (ppm)	Cu (ppm)	F (ppm)	F (ppm)	Fe2O3 (%)	Fe2O3 (%)	K2O (%)	K2O (%)	MgO (%)	MgO (%)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	50	50	0.005	0.005	0.005	0.005	0.01	0.01
2007190818	2007191157	15.2	10.7	25.0	25.0	3.8680	3.2940	2.1380	2.0920	0.775	0.638
2007190818	2007191157	5.0	5.0	25.0	25.0	0.8440	1.5670	1.4920	1.6090	0.077	0.229
2007190818	2007191157	12.1	17.0	25.0	25.0	2.9170	3.7140	2.1840	2.1860	0.587	0.729
2007190825	2007191214	13.7	18.6	25.0	25.0	3.4760	4.1020	1.0310	1.1250	0.574	0.695
2007190825	2007191214	5.0	5.0	25.0	25.0	3.1850	4.0930	1.0060	1.1240	0.495	0.688
2007190825	2007191214	17.5	16.3	25.0	25.0	4.3810	4.4020	1.1190	1.1550	0.798	0.794
2007190825	2007191214	15.6	15.2	25.0	25.0	4.3520	4.6400	1.1280	1.1890	0.790	0.839
2007190826	2007191052	5.0	5.0	25.0	25.0	1.5740	1.8010	0.4750	0.5740	0.297	0.689
2007190826	2007191052	5.0	5.0	25.0	25.0	2.7050	3.2020	1.2690	1.2550	0.772	1.454
2007190826	2007191052	5.0	5.0	25.0	25.0	1.7030	1.7330	0.4900	0.5090	0.502	0.442
2007190826	2007191052	5.0	5.0	25.0	25.0	3.5320	3.1950	1.3230	1.3100	1.459	1.127
2007190827	2007191440	5.0	5.0	25.0	25.0	2.1750	3.0430	1.2320	1.3090	0.502	0.342
2007190827	2007191440	15.7	20.4	25.0	25.0	5.8550	6.8150	1.6290	1.8890	1.528	0.929
2007190827	2007191440	5.0	5.0	25.0	25.0	2.3850	3.3190	1.2250	1.2690	0.770	3.086
2007190827	2007191440	11.3	5.0	25.0	25.0	5.5940	4.8080	1.5830	1.4380	1.993	3.556
2007190834	2007190889	5.0	5.0	25.0	25.0	1.5470	1.4860	1.1090	1.2410	0.080	0.100
2007190834	2007190889	14.3	16.4	25.0	25.0	5.1030	4.9060	1.6360	1.8040	0.448	0.480
2007190834	2007190889	5.0	5.0	25.0	25.0	1.0680	1.0410	1.1100	1.1090	0.036	0.036
2007190834	2007190889	5.0	10.7	25.0	25.0	3.4710	3.7710	1.9520	2.0120	0.329	0.393
2007190849	2007191277	5.0	14.6	25.0	25.0	4.0960	3.3760	0.9570	0.6990	0.726	0.474
2007190849	2007191277	19.2	12.3	25.0	25.0	4.6880	4.1660	1.1270	0.8780	0.797	0.599
2007190849	2007191277	5.0	16.2	25.0	25.0	3.6770	3.7210	0.8240	0.8160	0.804	0.715
2007190853	2007190939	5.0	5.0	25.0	25.0	3.5670	2.0850	1.4890	1.0550	2.498	1.221
2007190853	2007190939	17.2	16.2	25.0	25.0	4.7010	4.5650	2.0330	1.9210	3.311	2.730
2007190853	2007190939	5.0	5.0	25.0	25.0	1.2240	1.7500	0.4960	0.6710	0.880	1.364
2007190853	2007190939	20.3	22.1	25.0	25.0	5.1760	5.0430	2.0520	2.0190	5.844	5.221
2007190865	2007191183	5.0	5.0	25.0	25.0	0.7740	1.0080	0.1290	0.1420	0.053	0.048
2007190865	2007191183	16.4	5.0	25.0	25.0	4.0820	3.2380	1.8030	1.5780	1.436	0.850
2007190865	2007191183	5.0	5.0	25.0	25.0	1.1270	1.0070	0.1830	0.1550	0.095	0.052
2007190865	2007191183	5.0	5.0	25.0	25.0	3.0360	3.1600	1.6160	1.5830	0.850	0.763
2007190874	2007191297	5.0	5.0	25.0	25.0	5.5350	5.2980	0.6110	0.8060	0.270	0.441
2007190874	2007191297	17.1	16.6	25.0	25.0	6.1380	6.0760	1.4020	1.4630	0.618	0.770
2007190874	2007191297	5.0	5.0	25.0	25.0	8.6960	6.0460	0.4230	0.9500	0.206	0.472
2007190874	2007191297	19.6	17.5	25.0	25.0	5.9500	5.9580	1.3250	1.6320	0.654	0.799
2007190887	2007191058	16.3	17.4	25.0	25.0	5.5580	5.3760	2.1180	2.2310	0.613	0.565
2007190887	2007191058	10.8	16.5	25.0	25.0	4.5430	4.6440	1.9300	2.1320	0.528	0.496
2007190887	2007191058	15.7	17.7	25.0	25.0	4.9160	5.8990	2.1270	2.2300	0.657	0.697
2007190887	2007191058	10.1	17.8	25.0	25.0	4.4060	5.1390	1.9610	2.1160	0.566	0.583
2007190895	2007190947	5.0	18.1	25.0	25.0	4.7480	4.9890	1.3240	1.6250	0.873	1.049
2007190895	2007190947	13.0	12.7	25.0	25.0	4.3190	4.2000	1.2860	1.5040	0.783	0.873
2007190895	2007190947	10.7	15.0	25.0	25.0	4.3970	4.9840	1.2330	1.4210	0.841	1.014
2007190895	2007190947	14.0	14.2	25.0	25.0	4.3350	4.6160	1.2360	1.3680	0.827	0.948
2007190896	2007191441	5.0	24.4	25.0	25.0	3.1100	4.9000	1.7140	1.7180	0.062	0.188
2007190896	2007191441	29.4	37.8	25.0	25.0	6.6790	8.4100	1.7580	1.5180	0.227	0.403
2007190896	2007191441	5.0	19.7	25.0	25.0	3.2270	4.9400	1.6710	1.6790	0.084	0.241
2007190896	2007191441	30.2	38.6	25.0	25.0	6.7810	8.4630	1.6380	1.4820	0.308	0.493
2007190922	2007191082	5.0	5.0	25.0	25.0	1.3990	1.3550	0.8260	0.9590	0.055	0.055
2007190922	2007191082	5.0	5.0	25.0	25.0	4.6450	4.4800	1.6640	1.7350	0.432	0.398
2007190922	2007191082	5.0	5.0	25.0	25.0	3.0520	3.0300	0.9190	1.0230	0.744	0.863
2007190922	2007191082	5.0	5.0	25.0	25.0	5.9680	6.2730	0.9430	1.0880	2.011	2.472
2007190927	2007191444	12.9	21.1	25.0	25.0	3.9590	4.2200	2.7860	2.7120	1.067	1.073
2007190927	2007191444	15.3	16.5	25.0	25.0	4.3660	4.4710	2.3890	2.4270	1.212	1.171
2007190927	2007191444	15.7	17.1	156.0	25.0	4.2240	4.3720	2.8640	2.7900	1.146	1.134
2007190927	2007191444	14.8	15.1	25.0	25.0	4.5990	4.7900	2.4800	2.4860	1.247	1.256
2007190949	2007191504	12.3	10.5	25.0	25.0	6.1190	5.5050	3.1890	3.3070	1.453	1.246
2007190949	2007191504	21.3	19.3	106.0	156.0	6.9160	6.6820	2.7990	2.8890	1.807	1.671
2007190949	2007191504	13.3	5.0	134.0	339.0	5.5180	5.2250	3.0410	2.9370	2.264	2.199
2007190949	2007191504	21.5	15.1	488.0	389.0	6.5820	6.0510	2.6110	2.4680	2.893	2.740
2007190968	2007191437	5.0	5.0	25.0	25.0	1.6310	1.4030	0.3990	0.3320	0.172	0.121
2007190968	2007191437	5.0	5.0	25.0	25.0	2.6900	2.4450	1.0790	0.9910	0.428	0.363
2007190968	2007191437	5.0	13.2	25.0	25.0	2.9360	3.4470	0.6970	0.9270	0.965	0.887
2007190968	2007191437	13.1	23.2	25.0	25.0	4.6370	5.4940	1.2280	1.6330	1.621	1.475
2007190970	2007191245	36.5	80.3	1891.0	2440.0	4.7330	5.4230	1.0780	1.1390	0.928	1.038
2007190970	2007191245	26.4	73.8	2369.0	3644.0	3.7460	4.0890	1.0490	1.1270	0.887	1.021
2007190970	2007191245	10.5	5.0	25.0	25.0	4.3100	1.9200	1.0490	0.5510	0.728	0.356
2007190970	2007191245	10.8	15.8	222.0	25.0	4.2120	4.2150	1.1240	1.1140	0.797	0.879
2007190986	2007191592	11.6	5.0	25.0	25.0	5.5000	4.4550	2.3710	2.3890	1.295	1.070
2007190986	2007191592	17.5	24.7	25.0	25.0	8.4440	7.3530	1.8930	1.7380	1.255	1.046
2007190986	2007191592	12.9	16.4	25.0	25.0	6.0700	5.8750	2.4860	2.5270	1.579	1.479
2007190986	2007191592	21.7	32.7	25.0	25.0	8.1610	7.0460	2.2520	2.3180	1.772	1.605
2007190990	2007191537	5.0	5.0	25.0	25.0	3.1570	2.9390	1.3840	1.3710	0.203	0.178
2007190990	2007191537	5.0	5.0	25.0	25.0	3.0300	2.7490	1.3810	1.4210	0.166	0.161
2007190990	2007191537	5.0	5.0	25.0	25.0	1.7570	1.4680	1.0740	0.9240	0.097	0.041
2007190990	2007191537	5.0	5.0	25.0	25.0	2.2600	2.0190	1.3390	1.2440	0.149	0.105
2007191007	2007191551	5.0	5.0	25.0	25.0	1.9670	1.9360	1.1020	1.1790	0.160	0.141
2007191007	2007191551	5.0	5.0	25.0	25.0	3.1480	2.8800	1.5000	1.5410	0.390	0.336
2007191007	2007191551	5.0	5.0	25.0	25.0	1.9830	2.3390	1.1390	1.2740	0.178	0.230
2007191007	2007191551	5.0	10.3	25.0	25.0	3.3910	3.3470	1.5400	1.6110	0.391	0.405
2007191028	2007191531	5.0	5.0	25.0	25.0	2.3870	1.8410	0.5490	0.2830	0.491	0.219
2007191028	2007191531	18.2	11.8	25.0	25.0	4.0110	3.4330	1.1170	0.7670	0.952	0.535
2007191028	2007191531	10.5	5.0	25.0	25.0	2.8270	2.0170	0.4940	0.2230	1.199	0.359
2007191028	2007191531	16.1	12.4	25.0	25.0	3.9270	3.9050	0.8100	0.6140	1.558	0.827
2007191051	2007191331	10.9	15.0	25.0	25.0	3.7810	3.7270	0.4820	0.5220	0.352	0.338
2007191051	2007191331	5.0	11.4	25.0	25.0	3.3320	3.4580	0.4800	0.5160	0.308	0.307
2007191051	2007191331	12.8	15.6	25.0	25.0	3.7930	3.9680	0.4440	0.4610	0.333	0.378

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	MnO (%)	MnO (%)	Na2O (%)	Na2O (%)	Ni (ppm)	Ni (ppm)	P2O5 (%)	P2O5 (%)	Rb (ppm)	Rb (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.005	0.005	0.01	0.01	10	10	0.005	0.005	10	10
2007190818	2007191157	0.0560	0.0510	1.387	1.430	16.8	5.0	0.0640	0.0650	80.9	78.6
2007190818	2007191157	0.0080	0.0190	0.735	1.000	5.0	5.0	0.0170	0.0250	49.8	55.1
2007190818	2007191157	0.0460	0.0510	1.379	1.382	14.0	19.6	0.0420	0.0540	77.8	81.7
2007190825	2007191214	0.0870	0.0910	0.957	0.903	5.0	5.0	0.0550	0.0810	61.5	65.7
2007190825	2007191214	0.0680	0.0900	1.121	1.054	5.0	5.0	0.0550	0.0780	56.8	60.9
2007190825	2007191214	0.0970	0.1010	0.991	0.959	5.0	5.0	0.0720	0.0820	62.7	65.6
2007190825	2007191214	0.1020	0.1110	1.096	1.062	5.0	5.0	0.0730	0.0860	63.2	66.0
2007190826	2007191052	0.0090	0.0130	0.022	0.019	5.0	5.0	0.0250	0.0260	42.0	48.0
2007190826	2007191052	0.0250	0.0330	0.079	0.070	5.0	5.0	0.0490	0.0490	78.2	82.3
2007190826	2007191052	0.0080	0.0090	0.017	0.015	5.0	5.0	0.0220	0.0230	46.4	46.7
2007190826	2007191052	0.0270	0.0240	0.069	0.066	5.0	5.0	0.0460	0.0470	89.5	88.6
2007190827	2007191440	0.0160	0.0320	0.099	0.098	5.0	5.0	0.0320	0.0440	66.2	85.0
2007190827	2007191440	0.0520	0.0770	0.169	0.186	21.3	20.5	0.0750	0.0860	101.8	134.0
2007190827	2007191440	0.0160	0.0200	0.099	0.246	5.0	5.0	0.0340	0.0480	70.7	84.8
2007190827	2007191440	0.0410	0.0330	0.161	0.315	21.5	5.0	0.0720	0.0700	106.3	109.5
2007190834	2007190889	0.0110	0.0170	0.586	0.713	5.0	5.0	0.0190	0.0180	49.4	47.9
2007190834	2007190889	0.0510	0.0650	1.095	1.264	13.5	20.4	0.0650	0.0530	70.5	72.9
2007190834	2007190889	0.0070	0.0080	0.563	0.591	5.0	5.0	0.0130	0.0160	43.0	43.9
2007190834	2007190889	0.0340	0.0380	1.484	1.557	5.0	14.6	0.0390	0.1090	71.0	74.5
2007190849	2007191277	0.1350	0.1140	0.414	0.188	10.8	12.0	0.0660	0.0500	67.1	57.0
2007190849	2007191277	0.1490	0.1340	0.485	0.246	18.2	5.0	0.0800	0.0660	76.6	67.3
2007190849	2007191277	0.1240	0.0600	0.594	0.487	13.4	12.7	0.0430	0.0460	56.9	51.6
2007190853	2007190939	0.0420	0.0210	3.255	1.703	5.0	5.0	0.0820	0.0440	67.6	47.8
2007190853	2007190939	0.0650	0.0490	3.619	2.446	16.5	16.7	0.1000	0.0910	82.7	80.9
2007190853	2007190939	0.0100	0.0160	0.955	1.946	5.0	5.0	0.0350	0.0420	32.5	43.1
2007190853	2007190939	0.0640	0.0620	4.796	6.239	19.2	25.2	0.1220	0.1210	90.4	85.3
2007190865	2007191183	0.0025	0.0060	0.015	0.005	5.0	5.0	0.0220	0.0170	22.1	20.0
2007190865	2007191183	0.0540	0.0370	0.312	0.299	5.0	5.0	0.0870	0.0730	79.0	77.8
2007190865	2007191183	0.0090	0.0070	0.025	0.005	5.0	5.0	0.0220	0.0200	26.5	17.6
2007190865	2007191183	0.0460	0.0370	0.344	0.335	5.0	5.0	0.0700	0.0680	75.4	78.5
2007190874	2007191297	0.0300	0.0520	0.054	0.020	5.0	5.0	0.0490	0.0570	44.7	50.4
2007190874	2007191297	0.0630	0.0900	0.095	0.065	11.1	5.0	0.0800	0.0770	76.8	74.1
2007190874	2007191297	0.0280	0.0590	0.046	0.044	5.0	5.0	0.0400	0.0570	32.8	49.6
2007190874	2007191297	0.0630	0.0990	0.126	0.059	12.6	5.0	0.0640	0.0780	74.9	80.7
2007190887	2007191058	0.0550	0.0420	0.232	0.216	11.7	10.7	0.0530	0.0680	156.6	157.7
2007190887	2007191058	0.0470	0.0370	0.226	0.229	5.0	29.2	0.0530	0.0610	134.3	143.5
2007190887	2007191058	0.0220	0.0350	0.258	0.179	14.3	15.4	0.0580	0.0630	157.4	175.4
2007190887	2007191058	0.0200	0.0320	0.234	0.205	5.0	14.2	0.0570	0.0620	137.3	157.6
2007190895	2007190947	0.0490	0.0690	0.353	0.355	10.7	26.7	0.1240	0.2260	64.7	66.5
2007190895	2007190947	0.0480	0.0520	0.386	0.381	14.2	18.4	0.1220	0.1920	62.6	60.0
2007190895	2007190947	0.0440	0.0610	0.464	0.517	12.0	23.9	0.1000	0.1430	62.9	69.7
2007190895	2007190947	0.0450	0.0490	0.499	0.522	13.8	16.4	0.0970	0.1360	66.6	64.1
2007190896	2007191441	0.0190	0.0480	0.184	0.249	5.0	23.0	0.0550	0.0950	77.4	87.2
2007190896	2007191441	0.0560	0.0920	0.327	0.234	31.1	45.0	0.1310	0.1630	98.9	106.8
2007190896	2007191441	0.0470	0.0560	0.192	0.278	5.0	71.1	0.0470	0.0690	74.8	89.5
2007190896	2007191441	0.1090	0.0790	0.302	0.276	34.9	98.9	0.0950	0.1180	100.2	107.0
2007190922	2007191082	0.0070	0.0070	0.176	0.182	5.0	5.0	0.0470	0.0400	48.9	47.2
2007190922	2007191082	0.0330	0.0330	0.859	0.904	5.0	12.5	0.2160	0.1770	80.4	81.3
2007190922	2007191082	0.0060	0.0080	0.237	0.227	5.0	10.0	0.0320	0.0280	54.4	51.6
2007190922	2007191082	0.0140	0.0150	0.462	0.360	12.6	23.2	0.0550	0.0450	55.6	60.2
2007190927	2007191444	0.0620	0.0740	2.210	2.086	5.0	14.0	0.0950	0.1210	101.7	100.5
2007190927	2007191444	0.0840	0.0880	1.819	1.744	5.0	5.0	0.1450	0.1670	97.6	106.8
2007190927	2007191444	0.0690	0.0730	2.260	2.172	13.0	11.9	0.0870	0.0980	105.3	104.5
2007190927	2007191444	0.0810	0.0850	1.929	1.796	10.2	11.7	0.1230	0.1310	104.0	106.8
2007190949	2007191504	0.0730	0.0840	0.771	0.746	12.1	5.0	0.1070	0.0890	123.6	131.9
2007190949	2007191504	0.0870	0.0870	0.595	0.480	24.1	17.6	0.1150	0.1070	106.9	112.2
2007190949	2007191504	0.0540	0.0580	1.016	0.899	5.0	5.0	0.0940	0.0820	114.9	116.0
2007190949	2007191504	0.0590	0.0550	0.905	0.668	18.9	12.7	0.1130	0.1010	94.2	98.4
2007190968	2007191437	0.0180	0.0100	0.114	0.075	5.0	5.0	0.0320	0.0330	27.6	27.4
2007190968	2007191437	0.0370	0.0240	0.391	0.351	5.0	5.0	0.0560	0.0540	49.8	49.6
2007190968	2007191437	0.0440	0.0390	0.221	0.833	5.0	5.0	0.0420	0.0620	43.1	47.6
2007190968	2007191437	0.0860	0.0750	0.408	1.439	5.0	14.2	0.0740	0.0920	60.3	70.5
2007190970	2007191245	0.0550	0.0860	1.148	1.114	11.4	5.0	0.1050	0.1000	72.6	87.4
2007190970	2007191245	0.0360	0.0430	0.887	0.862	10.2	5.0	0.0820	0.0920	66.9	85.1
2007190970	2007191245	0.0180	0.0150	0.607	0.294	25.9	5.0	0.0590	0.0320	62.2	39.4
2007190970	2007191245	0.0180	0.0360	0.683	0.692	23.1	33.3	0.0610	0.0580	62.7	62.0
2007190986	2007191592	0.0760	0.0570	1.105	1.107	17.1	5.0	0.0910	0.0710	88.7	93.4
2007190986	2007191592	0.0990	0.0870	0.695	0.558	21.0	20.2	0.1460	0.1240	83.8	74.2
2007190986	2007191592	0.0890	0.0780	1.257	1.092	20.8	12.5	0.0770	0.0860	91.4	100.7
2007190986	2007191592	0.0860	0.0760	0.893	0.837	23.3	24.5	0.1240	0.1190	100.6	102.9
2007190990	2007191537	0.0170	0.0210	0.193	0.166	5.0	5.0	0.0650	0.0540	116.8	117.8
2007190990	2007191537	0.0140	0.0190	0.203	0.191	5.0	5.0	0.0660	0.0560	113.4	109.8
2007190990	2007191537	0.0070	0.0070	0.166	0.116	5.0	5.0	0.0310	0.0260	90.9	67.4
2007190990	2007191537	0.0100	0.0110	0.211	0.182	5.0	5.0	0.0430	0.0460	109.6	97.3
2007191007	2007191551	0.0480	0.0430	0.786	0.812	5.0	5.0	0.0580	0.0750	51.2	59.0
2007191007	2007191551	0.0990	0.0890	1.551	1.456	39.4	5.0	0.1110	0.1450	66.1	70.4
2007191007	2007191551	0.0350	0.0280	0.745	0.770	5.0	5.0	0.0500	0.0820	58.2	61.6
2007191007	2007191551	0.0810	0.0580	1.473	1.359	5.0	5.0	0.0950	0.1240	70.6	74.8
2007191028	2007191531	0.0330	0.0200	0.034	0.005	5.0	5.0	0.0530	0.0400	52.2	47.0
2007191028	2007191531	0.0600	0.0440	0.084	0.053	13.7	5.0	0.0820	0.0710	83.1	72.8
2007191028	2007191531	0.0380	0.0210	0.051	0.011	5.0	5.0	0.0620	0.0310	51.4	34.8
2007191028	2007191531	0.0510	0.0530	0.094	0.036	12.4	5.0	0.0830	0.0500	69.6	56.2
2007191051	2007191331	0.0770	0.0790	0.285	0.287	5.0	5.0	0.0790	0.0810	39.2	40.7
2007191051	2007191331	0.0650	0.0630	0.306	0.331	5.0	5.0	0.0700	0.0720	42.0	37.1
2007191051	2007191331	0.0780	0.0890	0.263	0.314	5.0	5.0	0.0710	0.0670	40.7	39.5

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	S (ppm)	S (ppm)	SiO2 (%)	SiO2 (%)	Sr (ppm)	Sr (ppm)	TiO2 (%)	TiO2 (%)	Zn (ppm)	Zn (ppm)	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	0.01	0.01	10	10	0.005	0.005	10	10	10	10
2007190818	2007191157	356.6	321.7	67.045	69.701	170.2	174.1	1.3990	1.3340	33.7	26.9	1427.4	1426.3
2007190818	2007191157	70.8	141.1	91.241	86.938	111.0	132.1	0.2050	0.3960	5.0	11.8	115.5	223.3
2007190818	2007191157	216.5	215.4	74.710	69.492	157.3	162.0	1.2220	1.1750	26.5	30.0	1182.8	1011.8
2007190825	2007191214	102.9	131.3	78.482	74.933	107.3	119.0	0.7860	0.8640	32.2	40.4	530.9	518.5
2007190825	2007191214	90.5	133.4	78.572	73.198	110.1	124.7	1.0340	1.0690	24.8	36.6	999.8	855.2
2007190825	2007191214	125.5	137.0	73.158	73.032	133.3	133.8	0.8680	0.8610	47.1	42.3	462.9	430.9
2007190825	2007191214	139.7	136.8	71.935	70.734	137.9	139.5	1.0170	1.0210	44.4	43.7	698.1	632.3
2007190826	2007191052	54.1	53.8	90.902	86.627	28.4	29.7	0.2080	0.2680	5.0	5.0	269.6	331.8
2007190826	2007191052	94.5	78.5	80.900	76.315	67.3	56.6	0.6810	0.6910	21.4	20.5	1309.8	1085.1
2007190826	2007191052	40.0	34.1	89.426	89.180	25.6	27.7	0.2270	0.2290	5.0	5.0	237.3	242.5
2007190826	2007191052	89.3	71.5	72.896	76.510	61.6	64.6	0.7370	0.7050	22.7	17.2	1172.7	1240.4
2007190827	2007191440	89.3	71.7	85.880	83.472	37.5	41.0	0.2850	0.4000	20.3	27.2	117.6	166.8
2007190827	2007191440	119.5	126.3	62.767	61.513	58.5	61.2	1.0890	1.0560	57.8	65.8	792.4	528.3
2007190827	2007191440	96.7	798.1	81.750	58.068	55.9	198.8	0.3010	0.3610	20.7	28.8	115.3	110.5
2007190827	2007191440	183.5	1537.4	54.099	40.059	112.5	307.8	0.8520	0.5900	53.5	43.9	495.4	230.9
2007190834	2007190889	71.1	72.2	89.222	90.908	58.7	64.2	0.2200	0.3220	5.0	5.0	148.0	235.8
2007190834	2007190889	330.1	243.8	66.273	69.337	88.2	110.8	0.9780	1.1680	23.7	27.0	1267.4	1935.3
2007190834	2007190889	56.1	60.6	92.555	94.261	52.4	55.7	0.1410	0.1540	5.0	5.0	75.3	77.9
2007190834	2007190889	209.5	358.2	73.786	71.866	119.6	123.8	0.9980	1.1130	20.0	24.3	1606.4	1983.8
2007190849	2007191277	147.4	157.1	72.937	79.629	89.3	72.3	0.7320	0.6780	50.7	40.7	330.9	452.8
2007190849	2007191277	163.0	161.9	69.396	72.540	106.4	92.8	0.9360	0.9780	64.7	48.9	565.2	894.3
2007190849	2007191277	9255.6	8573.8	70.115	72.926	133.0	131.0	0.7600	0.7730	38.1	50.3	311.6	348.8
2007190853	2007190939	3036.4	702.2	66.636	85.492	295.9	108.9	0.4770	0.3520	39.7	19.7	180.2	245.4
2007190853	2007190939	3850.0	1361.1	59.604	69.138	545.3	246.6	0.7740	1.0420	55.5	47.6	483.8	1262.4
2007190853	2007190939	547.0	705.0	91.245	86.457	56.4	71.7	0.1440	0.2090	5.0	12.1	85.7	85.3
2007190853	2007190939	2257.4	2291.9	53.547	53.716	117.3	206.7	0.7470	0.7510	63.9	66.4	408.8	381.6
2007190865	2007191183	110.9	92.0	96.427	97.863	21.3	23.3	0.0580	0.0650	5.0	5.0	57.6	66.2
2007190865	2007191183	325.6	228.1	70.837	78.231	127.3	104.8	0.9580	1.1200	50.8	34.2	2435.4	4227.0
2007190865	2007191183	111.8	102.7	95.681	98.161	22.8	20.3	0.0710	0.0730	5.0	5.0	70.4	98.2
2007190865	2007191183	214.2	220.7	80.670	79.402	99.1	102.0	1.1920	1.1890	37.1	36.4	4527.5	4579.8
2007190874	2007191297	85.0	172.7	82.526	77.698	11.1	18.2	0.4610	0.4620	12.0	14.2	302.2	215.5
2007190874	2007191297	145.8	240.0	72.526	69.578	27.7	25.6	0.8980	0.7990	31.0	27.0	886.4	740.0
2007190874	2007191297	72.0	153.2	80.096	75.646	5.0	13.6	0.4530	0.5190	14.0	17.2	199.0	254.9
2007190874	2007191297	128.3	234.1	73.858	68.732	23.0	26.7	0.8770	0.7980	30.3	27.3	993.1	755.8
2007190887	2007191058	102.1	106.1	63.703	62.614	42.6	37.6	1.0270	1.0410	28.1	29.2	411.3	394.0
2007190887	2007191058	104.5	80.6	67.564	67.117	39.4	40.1	0.9900	1.0190	23.8	27.9	487.9	441.4
2007190887	2007191058	64.2	50.5	64.042	56.065	46.9	43.4	0.9690	1.0210	30.2	30.2	357.7	278.1
2007190887	2007191058	54.3	56.9	67.383	62.191	39.6	38.3	0.9490	1.0040	26.2	29.3	425.8	358.7
2007190895	2007190947	226.6	303.5	66.093	64.220	111.1	140.3	0.9580	1.0150	51.4	68.0	432.3	356.4
2007190895	2007190947	233.8	275.9	69.353	68.775	112.6	127.5	1.0050	0.9710	52.2	55.3	607.6	477.8
2007190895	2007190947	203.3	229.0	69.287	66.203	115.7	162.5	0.9580	1.0700	48.8	61.9	459.9	372.7
2007190895	2007190947	209.0	264.3	69.820	67.071	120.0	158.7	1.0520	1.0630	53.3	56.9	619.5	451.7
2007190896	2007191441	45.2	99.2	81.641	73.533	51.2	61.7	0.4210	0.6510	12.5	44.9	187.9	207.4
2007190896	2007191441	137.5	164.4	62.838	53.646	55.6	63.3	1.2880	1.2370	62.2	77.9	842.1	406.1
2007190896	2007191441	64.4	112.4	81.827	72.820	49.7	65.1	0.4280	0.6410	19.0	38.1	187.9	201.7
2007190896	2007191441	113.9	183.1	61.072	53.341	60.0	62.7	1.2340	1.1990	61.7	75.6	784.8	377.1
2007190922	2007191082	92.5	55.4	93.520	94.400	31.8	30.9	0.1760	0.1690	5.0	5.0	158.6	128.0
2007190922	2007191082	423.3	256.6	68.420	73.819	108.1	102.5	0.9990	1.1070	36.4	29.4	1635.5	2346.0
2007190922	2007191082	181.0	182.1	72.685	74.557	188.3	201.8	0.1980	0.2300	5.0	14.1	122.0	110.0
2007190922	2007191082	474.4	434.6	28.188	27.026	512.5	604.7	0.4210	0.4260	22.0	16.7	316.1	242.4
2007190927	2007191444	120.1	195.5	71.141	69.792	158.0	150.8	0.5580	0.5980	64.8	78.0	188.2	204.2
2007190927	2007191444	261.4	337.9	65.790	63.895	146.3	152.5	0.7850	0.7670	83.0	83.4	466.3	352.1
2007190927	2007191444	63.4	80.0	71.929	70.527	157.6	162.2	0.6930	0.6950	66.5	69.7	295.2	278.3
2007190927	2007191444	119.1	118.8	68.607	67.190	133.7	142.2	0.8740	0.8920	77.2	81.7	691.6	623.3
2007190949	2007191504	380.9	485.6	59.172	64.746	118.8	100.3	0.7720	0.7690	64.0	56.6	278.3	393.7
2007190949	2007191504	417.7	550.2	55.504	58.253	120.5	106.4	0.9170	0.9850	81.4	75.1	420.4	533.9
2007190949	2007191504	707.6	1303.4	57.583	57.437	135.4	128.3	0.6350	0.6290	52.7	49.6	248.4	273.1
2007190949	2007191504	846.2	1349.0	50.338	49.077	145.8	138.9	0.7980	0.7480	73.9	63.4	267.2	294.1
2007190968	2007191437	205.7	227.1	92.393	93.321	55.3	51.9	0.3070	0.2400	10.0	5.0	300.9	228.3
2007190968	2007191437	175.8	144.5	82.188	85.583	97.0	88.3	0.8410	0.7120	29.2	31.8	1117.9	971.5
2007190968	2007191437	540.5	2668.5	79.154	77.439	118.9	112.1	0.4430	0.4770	29.2	41.5	228.2	194.8
2007190968	2007191437	875.8	3022.8	64.723	61.636	192.1	182.1	0.7900	0.8460	52.6	71.5	598.9	495.5
2007190970	2007191245	1933.3	1675.1	60.467	55.104	52.6	48.7	0.8010	0.7250	156.1	86.6	237.6	222.8
2007190970	2007191245	1251.8	1179.6	71.022	67.797	48.3	51.1	0.9510	0.8510	121.1	85.6	324.9	289.4
2007190970	2007191245	19306.5	8597.8	69.506	87.031	45.0	28.3	0.9150	0.5970	195.9	26.3	280.4	164.8
2007190970	2007191245	18847.5	18847.3	71.078	73.533	48.9	49.8	1.2240	1.6000	180.0	65.6	479.5	712.1
2007190986	2007191592	74.7	45.7	74.340	75.843	75.6	81.6	0.8480	0.6170	51.1	35.5	589.8	355.8
2007190986	2007191592	99.4	69.1	69.222	74.488	74.5	68.7	1.8310	1.6010	77.9	70.4	2935.6	2171.7
2007190986	2007191592	70.5	67.5	72.551	72.005	78.2	78.7	0.8570	0.8210	53.1	51.6	416.4	424.3
2007190986	2007191592	100.5	94.8	65.964	68.335	79.6	80.9	1.3850	1.1120	74.2	75.3	1684.1	1080.9
2007190990	2007191537	138.3	156.7	72.672	72.054	31.8	34.6	0.9430	0.9150	24.0	5.0	504.0	592.7
2007190990	2007191537	141.5	137.2	73.799	76.307	33.5	30.9	0.8970	0.9060	14.6	20.7	663.7	712.6
2007190990	2007191537	69.0	57.9	84.899	89.350	23.6	20.2	0.6030	0.4530	5.0	5.0	490.0	438.3
2007190990	2007191537	59.1	85.4	78.278	83.835	29.3	28.6	0.9150	0.8600	14.6	16.8	947.5	1438.7
2007191007	2007191551	101.7	90.2	88.238	88.422	91.5	94.5	0.6700	0.7370	13.9	17.4	561.9	610.8
2007191007	2007191551	151.9	158.8	76.457	77.588	165.0	159.6	1.5540	1.5520	34.4	33.7	1419.5	1323.6
2007191007	2007191551	90.7	85.3	87.47									

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	LOI (%)	LOI (%)	Al2O3 (%)	Al2O3 (%)	CaO (%)	CaO (%)	Cl (ppm)	Cl (ppm)
METHOD:	METHOD:	SIZE	SIZE			Calc	Calc	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0	0	0.005	0.005	0.002	0.002	10	10
2007191051	2007191331	Fine	Fine	BOS	BOS	8.3	7.8	10.2540	10.3980	0.3340	0.4160	35.0	107.0
2007191066	2007191379	Coarse	Coarse	TOS	TOS	7.2	12.4	8.4300	5.5100	4.2030	10.2620	63.0	2673.0
2007191066	2007191379	Fine	Fine	TOS	TOS	11.3	19.9	11.4860	9.9970	6.1260	14.4900	70.0	4689.0
2007191066	2007191379	Coarse	Coarse	BOS	BOS	6.1	11.3	7.2970	3.0060	3.5830	11.9960	609.0	1881.0
2007191066	2007191379	Fine	Fine	BOS	BOS	13.2	30.5	11.7050	5.8430	7.5420	29.9190	1050.0	3970.0
2007191092	2007191211	Coarse	Coarse	TOS	TOS	16.2	13.8	7.2960	9.5640	1.0380	2.0860	133.0	70.0
2007191092	2007191211	Fine	Fine	TOS	TOS	21.9	14.6	9.4980	11.9400	1.3960	2.4300	173.0	85.0
2007191092	2007191211	Coarse	Coarse	BOS	BOS	11.1	8.9	10.6620	11.4070	0.6610	3.0510	70.0	42.0
2007191092	2007191211	Fine	Fine	BOS	BOS	17.3	11.4	13.1720	15.0870	0.9880	3.5520	67.0	45.0
2007191134	2007191282	Coarse	Coarse	TOS	TOS	2.4	0.3	4.3970	3.9010	0.1100	0.0760	2143.0	604.0
2007191134	2007191282	Fine	Fine	TOS	TOS	5.8	4.4	9.4360	9.9080	0.3810	0.3000	4400.0	2177.0
2007191134	2007191282	Coarse	Coarse	BOS	BOS	18.8	5.1	7.1340	8.8610	9.3000	2.1110	4927.0	1889.0
2007191134	2007191282	Fine	Fine	BOS	BOS	28.3	11.2	8.9240	15.8870	14.2740	3.5680	6472.0	4392.0
2007191152	2007191578	Coarse	Coarse	TOS	TOS	2.6	1.7	3.1520	2.9300	0.0720	0.0720	36.0	34.0
2007191152	2007191578	Fine	Fine	TOS	TOS	3.8	4.7	7.4610	6.7350	0.1500	0.1500	50.0	36.0
2007191152	2007191578	Coarse	Coarse	BOS	BOS	10.0	6.2	10.1630	8.8050	1.3320	0.8570	1124.0	1741.0
2007191152	2007191578	Fine	Fine	BOS	BOS	12.6	11.9	16.2150	15.7370	1.1760	1.3730	1817.0	2758.0
2007191168	2007191195	Coarse	Coarse	TOS	TOS	3.6	5.7	9.5320	9.0110	0.4300	0.5240	58.0	39.0
2007191168	2007191195	Fine	Fine	TOS	TOS	8.7	10.2	14.2370	12.9390	0.5110	0.6520	57.0	42.0
2007191168	2007191195	Coarse	Coarse	BOS	BOS	5.0	6.1	10.5630	10.3620	0.7810	0.7640	55.0	85.0
2007191168	2007191195	Fine	Fine	BOS	BOS	12.1	15.4	15.6880	16.5350	1.2860	1.3550	73.0	102.0
2007191192	2007191339	Coarse	Coarse	TOS	TOS	4.8	4.0	11.4920	12.3940	0.9030	0.9320	56.0	54.0
2007191192	2007191339	Fine	Fine	TOS	TOS	7.5	5.4	13.2890	13.4560	1.0590	1.0710	38.0	55.0
2007191192	2007191339	Coarse	Coarse	BOS	BOS	6.9	5.6	13.7920	13.8260	1.6650	1.3480	62.0	49.0
2007191192	2007191339	Fine	Fine	BOS	BOS	9.8	8.4	15.0270	15.1310	2.1020	1.7320	37.0	50.0
2007191215	2007191281	Coarse	Coarse	TOS	TOS	3.1	3.3	4.7850	4.7570	0.4570	0.1890	31.0	5.0
2007191215	2007191281	Fine	Fine	TOS	TOS	10.8	4.9	8.3510	8.3590	1.0290	0.4130	20.0	31.0
2007191215	2007191281	Coarse	Coarse	BOS	BOS	1.8	2.8	5.3640	4.4840	0.6530	0.1680	32.0	5.0
2007191215	2007191281	Fine	Fine	BOS	BOS	6.7	2.4	8.8690	7.4140	2.0900	0.3500	27.0	19.0
2007191216	2007191385	Coarse	Coarse	TOS	TOS	2.8	5.2	3.9490	6.5210	0.3500	0.3050	21.0	17.0
2007191216	2007191385	Fine	Fine	TOS	TOS	8.0	9.8	8.2950	13.3360	0.6460	0.6380	5.0	32.0
2007191216	2007191385	Coarse	Coarse	BOS	BOS	5.6	3.8	4.3930	6.8680	2.6810	0.2800	13.0	28.0
2007191216	2007191385	Fine	Fine	BOS	BOS	14.3	9.3	9.4630	16.0080	7.3180	0.6410	5.0	30.0
2007191264	2007191486	Coarse	Coarse	TOS	TOS	1.6	1.9	6.4910	6.3260	0.6720	0.5860	78.0	55.0
2007191264	2007191486	Fine	Fine	TOS	TOS	3.3	4.4	8.0840	8.6470	0.9630	1.0190	83.0	80.0
2007191264	2007191486	Coarse	Coarse	BOS	BOS	0.7	2.8	6.0860	8.3670	0.5900	0.9190	69.0	77.0
2007191264	2007191486	Fine	Fine	BOS	BOS	4.7	4.0	9.1510	5.5930	1.0800	0.5410	96.0	44.0
2007191275	2007191590	Coarse	Coarse	TOS	TOS	4.1	7.5	5.1620	11.7630	2.5030	0.4460	36.0	45.0
2007191275	2007191590	Fine	Fine	TOS	TOS	14.5	12.6	11.1780	19.2940	8.2700	0.7800	29.0	34.0
2007191275	2007191590	Coarse	Coarse	BOS	BOS	9.2	6.8	4.8890	11.6540	10.2240	0.4530	40.0	18.0
2007191275	2007191590	Fine	Fine	BOS	BOS	24.4	12.9	8.3420	20.5010	22.8310	0.8480	36.0	31.0
2007191293	2007191518	Coarse	Coarse	TOS	TOS	5.5	4.6	9.8280	7.3310	0.5050	0.2650	910.0	38.0
2007191293	2007191518	Fine	Fine	TOS	TOS	7.0	4.3	9.6230	8.1800	0.4920	0.2750	895.0	35.0
2007191293	2007191518	Coarse	Coarse	BOS	BOS	7.1	6.6	10.6910	10.1930	0.7710	0.4680	3660.0	1678.0
2007191293	2007191518	Fine	Fine	BOS	BOS	9.1	7.3	11.4610	11.0990	1.1320	0.5500	4324.0	1843.0
2007191295	2007191498	Coarse	Coarse	TOS	TOS	0.8	1.2	3.4560	3.3100	0.3230	0.3120	58.0	46.0
2007191295	2007191498	Fine	Fine	TOS	TOS	1.7	1.2	5.7040	5.1860	0.5700	0.5750	74.0	75.0
2007191295	2007191498	Coarse	Coarse	BOS	BOS	0.8	0.8	3.4540	3.3420	0.3390	0.3410	56.0	40.0
2007191295	2007191498	Fine	Fine	BOS	BOS	1.7	1.9	5.5650	5.5940	0.6220	0.6700	79.0	69.0
2007191346	2007191429	Coarse	Coarse	TOS	TOS	7.5	8.9	10.8280	13.5090	1.9240	2.6020	64.0	73.0
2007191346	2007191429	Fine	Fine	TOS	TOS	5.0	6.8	10.9590	11.8300	2.2880	2.5240	74.0	55.0
2007191346	2007191429	Coarse	Coarse	BOS	BOS	2.9	4.7	7.0220	8.6800	0.9490	1.4480	52.0	55.0
2007191346	2007191429	Fine	Fine	BOS	BOS	5.1	5.0	10.3850	10.8650	2.0050	2.2340	69.0	68.0
2007191372	2007191445	Coarse	Coarse	TOS	TOS	11.4	4.2	11.6150	5.0570	0.3320	0.3210	76.0	84.0
2007191372	2007191445	Fine	Fine	TOS	TOS	18.2	15.2	17.2280	11.0240	0.4610	0.7100	120.0	153.0
2007191372	2007191445	Coarse	Coarse	BOS	BOS	5.6	2.8	10.7670	5.3290	0.1150	0.2900	48.0	38.0
2007191372	2007191445	Fine	Fine	BOS	BOS	12.3	9.8	19.3250	11.4280	0.1970	0.6640	38.0	70.0
2007191382	2007191509	Coarse	Coarse	TOS	TOS	8.6	2.1	16.1860	10.3030	0.2930	0.1950	51.0	63.0
2007191382	2007191509	Fine	Fine	TOS	TOS	12.4	6.8	21.1340	14.4880	0.3920	0.3020	42.0	47.0
2007191382	2007191509	Coarse	Coarse	BOS	BOS	12.4	12.8	17.2740	18.4480	3.4450	0.7490	37.0	60.0
2007191382	2007191509	Fine	Fine	BOS	BOS	15.2	8.2	21.6700	24.8270	3.5670	0.8660	41.0	78.0
2007191473	2007191510	Coarse	Coarse	TOS	TOS	16.1	16.0	11.0400	10.6510	8.7500	9.3040	60.0	61.0
2007191473	2007191510	Fine	Fine	TOS	TOS	15.5	16.4	11.7320	11.9790	8.2020	8.8020	69.0	68.0
2007191473	2007191510	Coarse	Coarse	BOS	BOS	25.5	22.4	7.6540	8.6810	22.4860	18.5040	3283.0	3628.0
2007191473	2007191510	Fine	Fine	BOS	BOS	27.0	23.6	8.2410	9.3350	24.4250	19.9510	3150.0	3860.0

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	Cu (ppm)	Cu (ppm)	F (ppm)	F (ppm)	Fe2O3 (%)	Fe2O3 (%)	K2O (%)	K2O (%)	MgO (%)	MgO (%)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	50	50	0.005	0.005	0.005	0.005	0.01	0.01
2007191051	2007191331	5.0	12.0	25.0	25.0	3.9110	3.8210	0.4800	0.4740	0.341	0.358
2007191066	2007191379	15.0	5.0	25.0	25.0	3.8400	2.7960	2.1070	1.1000	1.472	1.549
2007191066	2007191379	17.6	17.1	25.0	25.0	4.8250	4.3430	2.6460	1.6030	2.124	3.008
2007191066	2007191379	14.6	5.0	25.0	25.0	3.4340	2.2160	1.7870	0.6780	1.227	0.638
2007191066	2007191379	22.6	5.0	25.0	393.0	5.0100	2.5450	2.5090	0.8720	2.230	1.418
2007191092	2007191211	20.1	5.0	25.0	25.0	5.5810	5.4430	0.5290	0.8780	0.475	1.181
2007191092	2007191211	17.6	17.7	25.0	25.0	6.0890	6.0090	0.5890	0.9700	0.610	1.144
2007191092	2007191211	22.1	21.4	25.0	25.0	9.8330	8.0430	0.5720	0.8650	0.744	1.676
2007191092	2007191211	23.8	26.2	25.0	25.0	12.1560	8.0970	0.6280	0.9160	0.875	1.629
2007191134	2007191282	5.0	5.0	25.0	25.0	1.1040	0.8400	1.9670	1.9140	0.140	0.061
2007191134	2007191282	5.0	5.0	25.0	25.0	1.9150	1.8810	2.9210	3.0760	0.468	0.340
2007191134	2007191282	5.0	5.0	25.0	25.0	2.0750	2.2190	1.4230	2.4210	6.073	0.992
2007191134	2007191282	5.0	19.8	25.0	25.0	2.6920	4.7280	1.2020	2.5440	9.077	2.169
2007191152	2007191578	5.0	5.0	25.0	25.0	1.9000	1.6790	0.5060	0.4950	0.087	0.063
2007191152	2007191578	5.0	5.0	25.0	25.0	2.8840	2.5530	1.3690	1.3000	0.240	0.203
2007191152	2007191578	5.0	5.0	25.0	25.0	3.8660	3.3920	1.1230	0.9760	1.424	0.966
2007191152	2007191578	12.8	10.0	25.0	25.0	5.7990	5.5720	1.8350	1.7940	2.234	1.745
2007191168	2007191195	16.7	13.8	25.0	25.0	3.5790	3.3860	1.5600	1.4240	0.626	0.656
2007191168	2007191195	21.9	21.2	25.0	25.0	5.7800	5.1850	2.4510	2.1200	1.155	1.147
2007191168	2007191195	15.0	15.8	25.0	25.0	3.9680	4.0690	1.4740	1.3800	0.862	0.921
2007191168	2007191195	21.6	27.0	25.0	25.0	6.4590	6.7960	2.1870	2.1390	1.559	1.835
2007191192	2007191339	23.4	22.9	25.0	25.0	4.8110	5.3870	2.3250	2.4140	0.874	0.983
2007191192	2007191339	21.7	28.5	25.0	25.0	6.0780	6.2060	2.3420	2.3240	1.084	1.069
2007191192	2007191339	31.5	28.9	25.0	25.0	5.9660	5.9350	2.4070	2.3940	1.344	1.325
2007191192	2007191339	29.8	30.6	25.0	25.0	6.7270	6.7330	2.3740	2.3610	1.536	1.504
2007191215	2007191281	5.0	5.0	25.0	25.0	2.2030	2.0070	1.2360	1.2270	0.202	0.159
2007191215	2007191281	19.0	18.9	25.0	25.0	4.0500	4.2050	1.7620	1.8090	0.493	0.398
2007191215	2007191281	5.0	5.0	25.0	25.0	2.2420	1.8590	1.2670	1.1970	0.241	0.152
2007191215	2007191281	15.9	15.3	25.0	25.0	4.4360	3.9150	1.7890	1.7560	0.524	0.352
2007191216	2007191385	5.0	5.0	25.0	25.0	2.0020	2.8480	0.3550	0.4560	0.300	0.289
2007191216	2007191385	5.0	20.9	25.0	25.0	3.0960	4.9190	1.0060	1.0400	0.685	0.647
2007191216	2007191385	5.0	5.0	25.0	25.0	2.0400	2.9040	0.3250	0.4280	0.366	0.241
2007191216	2007191385	5.0	23.6	25.0	25.0	3.4760	5.8440	0.8530	1.0580	0.908	0.617
2007191264	2007191486	10.2	5.0	25.0	25.0	2.8410	2.6260	1.4530	1.4280	0.556	0.523
2007191264	2007191486	15.9	11.9	25.0	25.0	4.3800	4.5350	1.5620	1.6540	0.760	0.855
2007191264	2007191486	11.0	15.6	25.0	25.0	2.6480	4.2120	1.3500	1.6670	0.447	0.761
2007191264	2007191486	17.7	5.0	25.0	25.0	5.0170	1.9210	1.6760	1.3280	0.882	0.211
2007191275	2007191590	5.0	5.0	25.0	25.0	2.2910	4.9300	1.4880	2.0800	0.350	0.734
2007191275	2007191590	14.3	27.6	25.0	25.0	4.7190	7.9500	1.5450	2.6070	0.996	1.291
2007191275	2007191590	10.6	14.1	25.0	25.0	2.1450	4.7660	1.2470	1.9630	0.488	0.753
2007191275	2007191590	13.2	33.0	25.0	25.0	3.5090	8.2370	1.0550	2.4760	1.071	1.481
2007191293	2007191518	16.8	10.6	25.0	25.0	3.3540	2.6020	0.8200	0.6930	0.457	0.271
2007191293	2007191518	5.0	15.8	25.0	25.0	3.2330	2.7530	0.8870	0.8140	0.452	0.304
2007191293	2007191518	15.3	11.9	25.0	25.0	3.5940	3.4020	0.7520	0.7080	0.481	0.400
2007191293	2007191518	16.8	17.8	25.0	25.0	3.7550	3.6360	0.8460	0.7890	0.540	0.450
2007191295	2007191498	5.0	5.0	25.0	25.0	1.4920	1.6190	0.8700	0.8320	0.181	0.159
2007191295	2007191498	12.3	13.0	147.0	25.0	4.6900	4.1700	1.0490	0.9540	0.464	0.419
2007191295	2007191498	5.0	5.0	25.0	25.0	1.6600	1.5310	0.8360	0.8420	0.175	0.174
2007191295	2007191498	11.9	13.5	25.0	25.0	4.5270	5.5970	0.9630	0.9180	0.468	0.527
2007191346	2007191429	5.0	20.1	25.0	25.0	3.6840	4.7880	3.0190	3.3050	1.336	1.830
2007191346	2007191429	12.7	17.4	25.0	25.0	3.6440	3.9640	3.1800	3.2950	1.398	1.568
2007191346	2007191429	5.0	5.0	25.0	25.0	2.2430	2.8730	2.4590	2.7690	0.640	0.931
2007191346	2007191429	15.6	16.2	25.0	25.0	3.6280	3.6800	3.0170	3.1660	1.259	1.357
2007191372	2007191445	14.9	5.0	25.0	25.0	8.1020	2.0430	0.4960	0.7050	0.065	0.071
2007191372	2007191445	20.7	5.0	25.0	25.0	10.5360	3.3500	0.8470	1.2190	0.112	0.237
2007191372	2007191445	11.8	5.0	25.0	25.0	5.9500	2.1460	0.4610	0.7140	0.021	0.083
2007191372	2007191445	19.5	5.0	25.0	25.0	9.3460	3.7110	0.9270	1.3380	0.068	0.258
2007191382	2007191509	22.3	13.9	25.0	25.0	5.9160	3.8130	3.0220	3.3710	1.056	0.294
2007191382	2007191509	36.9	23.6	25.0	25.0	8.3840	5.8120	2.4010	2.6000	1.441	0.576
2007191382	2007191509	28.2	30.9	25.0	25.0	6.6930	6.8450	2.6600	2.6180	1.440	1.259
2007191382	2007191509	37.4	46.1	25.0	25.0	8.5870	9.2510	2.2810	2.4270	1.981	1.802
2007191473	2007191510	14.1	14.6	25.0	25.0	4.4870	4.3900	1.6010	1.5300	1.756	1.735
2007191473	2007191510	14.8	19.7	25.0	25.0	4.7780	4.8940	1.7260	1.7200	1.804	1.892
2007191473	2007191510	15.1	17.6	25.0	25.0	3.1510	3.5670	0.9490	1.0530	1.375	1.525
2007191473	2007191510	13.3	24.6	173.0	25.0	3.3800	3.8230	1.0050	1.1270	1.240	1.635

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	MnO (%)	MnO (%)	Na2O (%)	Na2O (%)	Ni (ppm)	Ni (ppm)	P2O5 (%)	P2O5 (%)	Rb (ppm)	Rb (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.005	0.005	0.01	0.01	10	10	0.005	0.005	10	10
2007191051	2007191331	0.0920	0.0900	0.316	0.328	5.0	5.0	0.0730	0.0670	41.5	39.3
2007191066	2007191379	0.0650	0.0230	0.632	0.645	11.4	5.0	0.1160	0.0630	90.2	50.2
2007191066	2007191379	0.0870	0.0390	0.860	1.037	11.9	30.4	0.1660	0.1010	107.6	72.8
2007191066	2007191379	0.0480	0.0300	0.555	0.439	5.0	24.7	0.0760	0.0580	76.6	34.1
2007191066	2007191379	0.0810	0.0580	0.919	0.740	14.6	5.0	0.1290	0.0950	104.6	39.6
2007191092	2007191211	0.0800	0.0580	0.521	1.114	37.7	38.1	0.2700	0.1450	42.1	49.8
2007191092	2007191211	0.0860	0.0650	0.755	1.532	39.7	44.7	0.3280	0.1740	47.8	49.6
2007191092	2007191211	0.1030	0.0540	0.432	1.585	70.6	73.3	0.2210	0.1670	42.4	34.2
2007191092	2007191211	0.1460	0.0610	0.632	2.267	85.3	80.9	0.3050	0.2030	48.4	37.8
2007191134	2007191282	0.0140	0.0025	0.713	0.462	5.0	5.0	0.0230	0.0210	80.5	76.9
2007191134	2007191282	0.0340	0.0190	1.653	1.542	5.0	13.0	0.0490	0.0560	123.6	125.8
2007191134	2007191282	0.0400	0.0170	0.943	1.006	5.0	5.0	0.0170	0.0170	71.9	100.8
2007191134	2007191282	0.0650	0.0480	1.118	1.659	5.0	22.7	0.0160	0.0250	72.5	126.0
2007191152	2007191578	0.0070	0.0100	0.030	0.005	5.0	5.0	0.0340	0.0330	38.0	37.4
2007191152	2007191578	0.0170	0.0220	0.106	0.068	5.0	5.0	0.0600	0.0570	72.4	67.6
2007191152	2007191578	0.0250	0.0160	0.341	0.276	5.0	5.0	0.0330	0.0340	69.2	65.0
2007191152	2007191578	0.0580	0.0350	0.547	0.487	18.2	5.0	0.0470	0.0500	98.3	99.5
2007191168	2007191195	0.0500	0.0430	0.822	0.807	5.0	5.0	0.0840	0.0850	74.0	62.8
2007191168	2007191195	0.0750	0.0590	0.607	0.642	17.2	14.8	0.1380	0.1310	108.5	89.7
2007191168	2007191195	0.0470	0.0540	0.869	0.782	11.3	10.9	0.0720	0.0640	73.5	67.1
2007191168	2007191195	0.0710	0.0670	0.583	0.423	15.9	18.4	0.1030	0.0940	108.4	103.1
2007191192	2007191339	0.0640	0.0650	1.051	1.125	12.1	19.2	0.1190	0.0980	95.5	107.4
2007191192	2007191339	0.0840	0.0740	1.075	1.167	13.8	22.0	0.1450	0.1110	102.2	102.5
2007191192	2007191339	0.0680	0.0690	0.956	0.967	24.0	26.1	0.1120	0.0980	104.0	109.3
2007191192	2007191339	0.0720	0.0730	0.930	0.967	19.9	23.7	0.1270	0.1110	107.6	109.3
2007191215	2007191281	0.0760	0.0580	0.491	0.489	5.0	5.0	0.1590	0.0740	61.5	65.0
2007191215	2007191281	0.1680	0.1250	0.811	0.927	12.1	18.0	0.3210	0.1410	85.7	84.9
2007191215	2007191281	0.0430	0.0310	0.497	0.519	5.0	5.0	0.0950	0.0370	64.5	61.4
2007191215	2007191281	0.0870	0.0570	0.903	1.059	13.7	5.0	0.2020	0.0630	81.1	77.6
2007191216	2007191385	0.0140	0.0280	0.020	0.015	5.0	5.0	0.0290	0.0390	35.2	48.0
2007191216	2007191385	0.0290	0.0550	0.080	0.080	5.0	10.0	0.0470	0.0710	60.9	75.2
2007191216	2007191385	0.0090	0.0150	0.005	0.015	5.0	5.0	0.0280	0.0330	35.9	44.7
2007191216	2007191385	0.0220	0.0420	0.046	0.061	5.0	23.6	0.0450	0.0510	60.3	80.2
2007191264	2007191486	0.0260	0.0230	0.469	0.423	5.0	5.0	0.0560	0.0570	65.9	59.8
2007191264	2007191486	0.0580	0.0580	0.484	0.567	5.0	5.0	0.0960	0.0990	75.3	76.9
2007191264	2007191486	0.0230	0.0540	0.430	0.555	5.0	13.6	0.0510	0.0910	59.8	76.4
2007191264	2007191486	0.0700	0.0210	0.529	1.012	16.3	5.0	0.1070	0.0520	80.0	53.1
2007191275	2007191590	0.0190	0.0560	0.101	0.078	5.0	15.0	0.0420	0.1170	66.2	87.7
2007191275	2007191590	0.0450	0.0840	0.112	0.092	15.8	33.5	0.0830	0.1920	73.0	111.3
2007191275	2007191590	0.0150	0.0490	0.104	0.079	5.0	21.9	0.0380	0.0650	51.3	88.3
2007191275	2007191590	0.0230	0.0750	0.101	0.077	11.4	38.9	0.0710	0.1100	49.3	117.1
2007191293	2007191518	0.0590	0.0490	0.362	0.202	5.0	5.0	0.1060	0.0740	51.2	50.6
2007191293	2007191518	0.0410	0.0470	0.393	0.256	5.0	5.0	0.1020	0.0790	54.5	54.2
2007191293	2007191518	0.0610	0.0600	0.800	0.511	5.0	5.0	0.0770	0.0680	50.0	51.9
2007191293	2007191518	0.0650	0.0650	0.859	0.565	5.0	5.0	0.0900	0.0720	54.1	57.5
2007191295	2007191498	0.0130	0.0130	0.418	0.419	5.0	35.6	0.0300	0.0260	40.4	41.5
2007191295	2007191498	0.0700	0.0640	0.600	0.560	5.0	5.0	0.0710	0.0600	60.1	56.5
2007191295	2007191498	0.0140	0.0130	0.423	0.408	5.0	5.0	0.0290	0.0270	42.1	40.2
2007191295	2007191498	0.0680	0.0870	0.577	0.573	5.0	11.3	0.0570	0.0650	57.3	63.2
2007191346	2007191429	0.0510	0.0730	0.472	0.440	5.0	12.1	0.0960	0.1250	129.7	141.2
2007191346	2007191429	0.0520	0.0590	0.565	0.532	5.0	11.5	0.0980	0.1130	127.4	134.3
2007191346	2007191429	0.0270	0.0360	0.404	0.444	5.0	5.0	0.0570	0.0750	97.0	109.5
2007191346	2007191429	0.0520	0.0500	0.500	0.533	11.6	10.4	0.1000	0.1060	118.0	121.5
2007191372	2007191445	0.0430	0.0270	0.097	0.347	19.1	5.0	0.0450	0.0410	28.3	32.1
2007191372	2007191445	0.0500	0.0500	0.153	0.667	26.9	5.0	0.0690	0.0900	37.1	53.1
2007191372	2007191445	0.0280	0.0270	0.101	0.356	25.1	5.0	0.0400	0.0450	27.0	36.1
2007191372	2007191445	0.0380	0.0530	0.190	0.767	28.2	5.0	0.0610	0.0940	42.3	57.2
2007191382	2007191509	0.0790	0.0420	0.266	0.365	25.8	13.0	0.0860	0.0940	132.5	131.8
2007191382	2007191509	0.0970	0.0740	0.237	0.440	42.6	24.4	0.1280	0.1260	125.7	119.3
2007191382	2007191509	0.0570	0.0560	0.201	0.184	30.3	37.3	0.0790	0.0730	117.2	122.8
2007191382	2007191509	0.0590	0.0850	0.173	0.186	50.0	65.3	0.0950	0.0910	111.3	128.9
2007191473	2007191510	0.1280	0.1230	0.171	0.195	16.5	16.3	0.0690	0.0560	64.0	58.6
2007191473	2007191510	0.0460	0.0420	0.198	0.227	16.8	18.8	0.0690	0.0600	71.7	66.4
2007191473	2007191510	0.0720	0.0920	0.447	0.552	5.0	10.5	0.0450	0.0510	43.9	44.3
2007191473	2007191510	0.0300	0.0290	0.483	0.573	5.0	10.2	0.0510	0.0510	44.2	47.5

Appendix 13. Field duplicates analysis by XRF

SITEID	SITEID	S (ppm)	S (ppm)	SiO2 (%)	SiO2 (%)	Sr (ppm)	Sr (ppm)	TiO2 (%)	TiO2 (%)	Zn (ppm)	Zn (ppm)	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	10	10	0.01	0.01	10	10	0.005	0.005	10	10	10	10
2007191051	2007191331	164.2	243.1	74.658	75.242	129.7	143.7	1.1000	1.0560	33.5	38.6	810.4	726.6
2007191066	2007191379	141.8	435.1	71.475	65.146	97.3	134.8	0.5390	0.3310	49.4	25.7	192.9	146.2
2007191066	2007191379	167.9	794.8	59.713	44.448	126.5	199.0	0.7540	0.6110	68.0	49.9	268.8	349.7
2007191066	2007191379	149.1	419.4	75.484	69.368	93.5	112.0	0.4550	0.1950	40.6	14.8	200.3	77.8
2007191066	2007191379	230.8	1143.8	55.890	26.999	161.4	272.6	0.7440	0.3570	66.4	5.0	279.7	246.9
2007191092	2007191211	466.3	407.3	66.508	64.541	107.0	162.0	1.4260	1.1520	30.2	38.6	389.6	262.1
2007191092	2007191211	600.9	484.9	56.664	59.495	145.1	218.1	2.0120	1.5560	33.0	53.6	749.6	428.0
2007191092	2007191211	186.3	196.9	63.902	62.768	71.1	190.6	1.7460	1.4990	57.6	51.6	412.2	234.7
2007191092	2007191211	276.2	247.4	51.287	54.689	98.7	283.2	2.3890	2.0320	64.9	64.6	601.3	324.3
2007191134	2007191282	262.0	71.2	88.696	92.127	26.8	26.2	0.3130	0.2510	5.0	5.0	377.8	256.6
2007191134	2007191282	1076.4	348.6	75.702	77.094	62.7	63.6	0.9700	0.9820	5.0	14.2	2105.6	1886.9
2007191134	2007191282	422.6	223.2	53.326	76.688	201.7	59.5	0.3500	0.4060	5.0	5.0	196.4	273.3
2007191134	2007191282	600.4	428.9	33.134	56.800	290.6	88.2	0.4450	0.8310	5.0	18.1	307.3	640.5
2007191152	2007191578	71.1	83.3	91.291	92.940	19.9	24.0	0.2700	0.2560	5.0	5.0	318.3	308.2
2007191152	2007191578	83.1	92.4	82.924	83.534	43.1	42.9	0.8120	0.7180	16.1	13.3	1412.0	1301.5
2007191152	2007191578	6359.1	1096.4	70.527	77.953	39.9	34.7	0.4080	0.3640	15.3	16.8	203.4	221.0
2007191152	2007191578	3893.7	2087.9	58.212	60.251	57.8	55.7	0.6990	0.7070	31.2	28.3	535.6	621.3
2007191168	2007191195	115.7	187.3	79.187	77.875	68.9	68.9	0.6400	0.5750	57.9	58.1	243.1	235.1
2007191168	2007191195	197.5	265.8	65.318	66.067	93.8	90.7	1.0690	0.9000	79.4	79.8	581.3	522.0
2007191168	2007191195	89.6	140.0	75.922	74.857	89.2	91.0	0.6200	0.6570	57.5	63.0	240.6	216.7
2007191168	2007191195	159.3	225.6	59.144	54.461	126.0	147.0	0.9580	0.8810	79.1	81.0	451.1	358.3
2007191192	2007191339	137.3	134.4	72.900	71.739	91.6	93.7	0.7260	0.8190	47.0	53.4	411.0	438.6
2007191192	2007191339	139.2	121.5	66.323	67.985	99.1	98.8	1.0220	1.0800	54.0	59.9	660.4	672.4
2007191192	2007191339	168.8	152.6	66.072	67.666	107.4	101.0	0.7750	0.7690	58.8	57.2	320.6	319.5
2007191192	2007191339	183.7	174.7	60.353	62.106	119.0	112.7	0.9150	0.9250	60.5	59.7	423.7	439.5
2007191215	2007191281	170.7	76.7	86.783	87.237	75.0	53.6	0.6320	0.6380	42.4	18.1	312.2	338.6
2007191215	2007191281	382.6	140.0	70.561	76.781	156.2	99.6	1.6900	1.9800	93.5	66.3	1022.5	1283.1
2007191215	2007191281	75.3	52.4	87.292	88.325	86.0	54.4	0.6340	0.6340	27.0	11.1	315.7	331.8
2007191215	2007191281	154.9	54.7	72.511	80.495	185.2	100.0	1.8990	2.1650	60.7	51.2	1301.5	1616.8
2007191216	2007191385	62.6	75.4	90.007	83.977	24.3	36.4	0.3460	0.4380	5.0	13.6	348.4	333.9
2007191216	2007191385	107.2	115.3	77.416	68.570	52.5	64.6	0.7620	0.8760	18.8	37.5	1076.0	747.6
2007191216	2007191385	59.0	63.4	84.395	85.092	30.5	28.8	0.3380	0.4340	5.0	15.2	336.8	343.9
2007191216	2007191385	85.1	93.8	62.973	65.448	66.6	61.1	0.7210	0.9470	11.4	38.7	874.2	725.6
2007191264	2007191486	115.8	80.4	85.415	85.676	70.3	63.6	0.4990	0.4600	28.0	25.2	475.2	421.5
2007191264	2007191486	153.7	116.1	78.510	76.428	89.0	93.9	1.5270	1.4910	46.5	47.4	2916.9	2828.6
2007191264	2007191486	99.1	104.6	87.214	78.915	62.0	90.3	0.4580	1.3860	24.9	45.6	412.8	2773.6
2007191264	2007191486	160.6	161.1	74.819	84.993	98.0	135.3	1.6920	0.3580	55.1	11.1	3313.9	348.2
2007191275	2007191590	113.1	146.9	83.763	71.887	55.9	64.7	0.2880	0.5760	18.4	53.5	209.0	197.5
2007191275	2007191590	239.2	250.1	57.638	54.241	89.9	84.6	0.8410	0.9890	47.1	94.7	906.3	394.4
2007191275	2007191590	168.3	113.8	71.344	73.033	101.6	62.3	0.2930	0.5550	22.2	45.7	187.3	192.3
2007191275	2007191590	281.2	191.4	37.956	52.378	185.6	79.1	0.5570	0.9870	31.8	85.4	478.3	356.7
2007191293	2007191518	189.8	157.0	78.145	83.216	109.6	83.7	0.8430	0.7640	46.4	31.1	463.1	648.3
2007191293	2007191518	166.2	154.3	76.762	82.176	114.1	90.4	0.9390	0.9210	39.5	39.7	892.6	911.5
2007191293	2007191518	1227.9	308.3	74.393	76.625	137.1	122.4	0.9000	0.8750	44.9	38.5	384.2	423.8
2007191293	2007191518	2415.7	427.7	70.447	74.407	153.7	135.0	1.0220	0.9960	46.7	44.6	625.4	606.8
2007191295	2007191498	104.8	101.3	92.014	91.797	63.8	66.6	0.3310	0.3030	5.0	12.5	363.7	308.3
2007191295	2007191498	149.5	132.2	81.428	83.557	125.4	117.2	2.8940	2.6530	49.4	43.9	6796.5	5750.9
2007191295	2007191498	96.7	87.1	91.904	92.202	64.7	64.7	0.3080	0.3030	5.0	5.0	318.7	309.5
2007191295	2007191498	126.1	137.0	81.965	79.494	121.8	130.4	2.8540	3.6490	47.7	57.2	6341.1	8567.7
2007191346	2007191429	221.2	284.4	70.617	63.851	98.8	104.2	0.5370	0.6680	35.3	61.4	284.1	250.2
2007191346	2007191429	212.2	221.9	72.143	68.720	98.6	101.6	0.6580	0.6330	44.5	53.4	453.8	310.3
2007191346	2007191429	118.2	119.0	82.973	77.652	72.6	85.1	0.3600	0.4780	21.0	29.8	352.3	372.0
2007191346	2007191429	157.8	135.7	73.143	72.318	96.3	99.7	0.7980	0.7460	45.2	50.1	981.9	597.7
2007191372	2007191445	244.7	135.2	65.690	86.389	51.5	54.8	2.1490	0.9450	24.5	15.1	742.0	676.6
2007191372	2007191445	400.8	326.1	49.866	65.497	72.1	108.9	2.4830	1.8680	26.7	20.5	1418.4	2293.3
2007191372	2007191445	134.4	85.4	75.194	87.350	30.7	54.0	1.8050	1.0110	20.5	13.2	871.6	782.5
2007191372	2007191445	241.9	202.0	55.000	69.647	51.0	105.8	2.5470	2.1700	29.7	27.0	1877.0	2770.2
2007191382	2007191509	95.2	117.3	63.837	78.639	44.9	45.1	0.6040	0.7440	55.4	32.1	198.6	306.2
2007191382	2007191509	128.7	167.9	52.283	67.059	62.3	67.0	1.0480	1.6180	83.3	54.7	507.3	1148.2
2007191382	2007191509	146.5	89.5	55.048	56.287	63.2	45.8	0.6570	0.6960	58.0	67.6	147.2	157.0
2007191382	2007191509	159.4	102.9	45.534	51.257	70.2	55.4	0.8500	0.9860	85.9	101.4	189.8	199.7
2007191473	2007191510	208.7	231.0	55.355	55.410	60.8	70.2	0.6210	0.6270	48.1	44.2	301.1	326.2
2007191473	2007191510	193.1	230.7	55.214	53.302	62.1	71.6	0.7380	0.7380	47.4	54.2	481.5	426.7
2007191473	2007191510	784.3	544.3	37.530	42.743	125.7	109.6	0.4540	0.5060	20.9	30.7	222.6	237.6
2007191473	2007191510	857.7	609.4	33.176	38.859	162.2	117.9	0.5200	0.5670	15.6	38.7	335.5	307.3

Appendix 14. QC samples analysis by XRF

Appendix 14. QC samples analysis by XRF

SITEID	DATE TIME	Initial_Wt_g	Final_Wt_g	LOI (%)	Al2O3 (%)	CaO (%)	Cl (ppm)	Cu (ppm)	F (ppm)
METHOD:				Calc	XRF	XRF	XRF	XRF	XRF
LLD:				0	0.005	0.002	10	10	50
1956879	1/11/2008	0.8001	5.6011	13.1962	16.248	1.252	2315	27.2	25
AGV-2	28/01/2010	0.6004	5.4003	1.3735	16.933	5.137	92	52.6	470
AGV-2	28/01/2010	0.6003	5.401	3.0151	16.673	5.057	84	47.7	25
AN-G	18/05/2010	0.6001	5.4002	2.7789	29.263	15.462	117	14	25
BCR-2	18/05/2010	0.5998	5.3995	3.7788	12.988	6.757	55	25.3	25
BCR-2	18/05/2010	0.8001	5.6006	2.8362	13.071	6.807	69	74.7	185
BIR-1	18/05/2010	0.6003	5.4007	0.7896	15.368	12.943	23	130.5	25
CAL-S	18/05/2010	0.6003	5.4011	45.6939	0.023	53.847	5	5	25
CAL-S	19/05/2010	0.5996	5.3989	45.6224	0.023	53.908	5	5	25
CCH-1	18/05/2010	0.5996	5.3989	46.302	0.259	49.308	146	5	25
CH-1	18/05/2010	0.7992	5.5997	19.51	11.853	12.475	7986	17.5	25
DVG A	27/01/2010	0.6002	5.401	0.0078	15.244	0.733	68	20.2	23094
DVG B	27/01/2010	0.6001	5.3997	0.6319	15.132	0.728	64	14.4	22727
DWA-1	18/05/2010	0.6012	5.4013	50.8229	0.023	29.005	373	5	25
GA009A	4/09/2008	0.5994	5.3989	0.5445	11.749	0.706	87	5	707
GA009A	8/09/2008	0.6006	5.4	-0.5319	11.882	0.718	96	5	723
GA009A	10/09/2008	0.5987	5.3971	0.4445	11.772	0.705	87	5	729
GA009A	15/09/2008	0.5993	5.3985	0.1821	11.82	0.71	81	5	587
GSD-4	18/05/2010	0.7999	5.6012	15.7234	15.288	7.313	49	39.8	25
GSP-2	29/01/2010	0.6006	5.4007	2.4296	14.699	2.057	274	36.1	2980
GSP-2	29/01/2010	0.6009	5.4011	1.1135	14.888	2.083	298	41.1	3214
JH--1	18/05/2010	0.5996	5.4001	4.2303	5.551	14.383	85	15.2	25
JLK-1	18/05/2010	0.8011	5.6026	11.5478	16.714	0.691	59	63.5	25
JLS-1	18/05/2010	0.6003	5.4007	46.3764	0.025	52.826	5	5	25
JLS-1	19/05/2010	0.6003	5.4007	46.2221	0.026	52.952	5	5	25
JLS-1 repeat	18/05/2010	0.6002	5.4001	45.3819	0.025	53.774	5	5	25
LOESS-001	14/04/2009	0.6006	5.4007	16.8239	6.122	16.033	59	5	25
LOESS-1	15/10/2009	0.5999	5.4008	17.8651	6.048	15.897	36	5	25
LOESS-1	18/05/2010	0.5994	5.3994	20.1504	5.891	15.372	24	5	25
Loess-1	19/05/2010	0.5994	5.3994	19.2145	5.909	15.525	25	5	25
Average				18.513475	5.9925	15.70675	36	5	25
SD				1.465834612	0.111242977	0.309690571	16.26857912	0	0
RSD				8%	2%	2%	45%	0%	0%
MRIS001	12/11/2008	0.5991	5.3984	7.7728	10.902	0.985	97	5	25
MRIS001	17/12/2008	0.6012	5.4015	7.5869	10.849	0.988	85	10.7	25
MRIS001	26/03/2009	0.6003	5.4013	9.0013	10.78	0.974	74	5	25
MRIS001	4/06/2009	0.6	5.4004	8.4361	10.845	0.984	74	5	25
MRIS	14/10/2009	0.6005	5.4004	8.4107	10.827	0.985	90	5	25
MRIS	27/01/2010	0.6004	5.3995	8.5294	10.767	0.975	99	5	25
MRIS2-A	3/02/2010	0.5997	5.4002	8.0939	10.82	0.981	88	5	25
MRIS2-B	3/02/2010	0.6003	5.4011	7.8018	10.902	0.985	96	5	25
MRIS2-C	3/02/2010	0.6008	5.401	7.9453	10.867	0.984	95	5	25
Average				8.175355556	10.83988889	0.982333333	88.66666667	5.633333333	25
SD				0.452540275	0.04746168	0.004795832	9.460443964	1.9	0
RSD				6%	0%	0%	11%	34%	0%
NBS-1b	18/05/2010	0.6002	5.4003	43.3047	1.105	49.104	5	5	25
NBS-88a	18/05/2010	0.5993	5.3998	49.0556	0.205	28.841	35	5	25
NIM-G	4/09/2008	0.6001	5.4009	-0.3691	12.297	0.8	237	10.3	3843
NIM-G	8/09/2008	0.6004	5.4001	-0.5555	12.284	0.794	253	10.2	3855
NIM-G	10/09/2008	0.6007	5.4006	-1.5466	12.37	0.804	275	14.7	4358
NIM-G	15/09/2008	0.6	5.3985	-0.3055	12.243	0.797	233	5	3714
NIM-G	17/09/2008	0.6005	5.4007	-0.1044	12.259	0.796	246	5	3704
NIMG001	19/09/2008	0.5996	5.399	0.1916	12.185	0.792	246	5	3541
NIMG001	26/09/2008	0.6003	5.4005	0.5178	12.174	0.789	249	5	3467
NIMG001	29/09/2008	0.5999	5.3995	-0.2542	12.237	0.796	272	11.6	3815
NIMG001	9/10/2008	0.6002	5.4008	-1.6515	12.396	0.804	288	14	3936
NIMG001	13/10/2008	0.5999	5.3999	0.4912	12.136	0.795	283	5	3625
NIMG001	21/10/2008	0.5998	5.4007	-0.4515	12.24	0.797	243	5	3605
NIM-G	25/10/2008	0.6004	5.4002	0.5611	12.152	0.784	246	5	3425
NIM-G	31/10/2008	0.6002	5.3997	-1.0329	12.365	0.801	244	11.8	3543
NIM-G	11/11/2008	0.6012	5.4015	-0.3523	12.192	0.795	235	12.6	3533
NIMG001	12/11/2008	0.6006	5.4006	-1.65	12.425	0.806	244	11	3644
NIMG001	17/11/2008	0.5999	5.3995	-1.296	12.376	0.804	245	11.7	3776
NIMG001	19/11/2008	0.6006	5.4014	-0.4175	12.256	0.795	263	5	3170
NIM-G	26/11/2008	0.5996	5.3995	-1.0598	12.269	0.797	239	5	3594
NIM-G	2/12/2008	0.6006	5.4012	1.7697	11.975	0.782	240	5	3241
NIMG001	5/12/2008	0.601	5.4006	-1.5255	12.346	0.8	255	12.1	3302
NIMG001	10/12/2008	0.6003	5.401	-0.6016	12.237	0.795	221	5	3273
NIMG001	11/12/2008	0.6004	5.4009	-1.1591	12.382	0.801	228	10.7	3617
NIMG001	17/12/2008	0.5999	5.3997	0.0508	12.191	0.793	218	5	3622
NIM-G001	13/01/2009	0.6006	5.4015	-0.8	12.278	0.8	219	10.7	3375
NIMG001	21/01/2009	0.5991	5.3997	-1.701	12.429	0.813	205	14.9	3642
NIM-G001	29/01/2009	0.5999	5.3991	1.1988	12.133	0.785	189	5	3069
NIM-G001	2/02/2009	0.5995	5.4004	0.1906	12.242	0.793	200	5	3097
NIM-G001	3/02/2009	0.6	5.3991	0.2874	12.179	0.789	227	5	3120
NIMG-001	25/02/2009	0.6002	5.4002	0.2371	12.196	0.797	213	5	3065
NIM-G001	26/02/2009	0.6001	5.4003	0.3333	12.182	0.79	221	5	3281
NIM-G	2/03/2009	0.5993	5.4003	0.2184	12.195	0.794	207	5	3007
NIM-G	4/03/2009	0.6004	5.3999	-0.7824	12.311	0.796	211	5	3685
NIMG-001	17/03/2009	0.5997	5.3992	-1.7372	12.421	0.803	254	12.2	3560
NIM-G001	25/03/2009	0.5991	5.3983	0.8653	12.093	0.784	206	5	2998
NIM-G001	3/04/2009	0.6	5.4001	-1.84	12.401	0.808	293	11.4	3373

Appendix 14. QC samples analysis by XRF

SITEID	Fe2O3 (%)	K2O (%)	MgO (%)	MnO (%)	Na2O (%)	Ni (ppm)	P2O5 (%)	Rb (ppm)	S (ppm)
METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
LLD:	0.005	0.005	0.01	0.005	0.01	10	0.005	10	10
1956879	6.234	1.541	1.028	0.053	1.543	34.5	0.048	67.4	19853.8
AGV-2	6.675	2.905	1.802	0.1	4.131	15	0.461	62	10.2
AGV-2	6.587	2.861	1.762	0.097	4.06	11.1	0.457	61.2	13.6
AN-G	3.24	0.133	1.725	0.043	1.582	27.8	0.02	10.2	129
BCR-2	13.386	1.718	3.453	0.193	3.003	16.4	0.329	45.8	319.2
BCR-2	13.54	1.74	3.536	0.198	3.02	27.2	0.342	41.7	325.9
BIR-1	11.36	0.019	9.571	0.176	1.762	169.7	0.029	5	11.8
CAL-S	0.034	0.002	0.303	0.0025	0.005	5	0.005	5	319.6
CAL-S	0.035	0.001	0.3	0.0025	0.005	5	0.007	5	295.7
CCH-1	0.205	0.082	2.684	0.0025	0.026	5	0.044	5	1252.8
CH-1	4.268	2.186	2.129	0.296	2.275	33.3	0.122	98.9	1250
DVG A	1.931	3.344	0.195	0.084	3.572	5	0.02	1656.4	1632.1
DVG B	1.917	3.323	0.204	0.083	3.568	5	0.02	1663.5	1635.5
DWA-1	0.238	0.005	19.85	0.052	0.011	5	0.014	10.1	79.3
GA009A	2.024	4.369	0.092	0.028	3.288	90.9	0.029	195.5	31.1
GA009A	2.033	4.422	0.101	0.028	3.361	93.9	0.027	207	27.7
GA009A	2.012	4.362	0.095	0.028	3.329	93.4	0.026	199.1	25.5
GA009A	2.033	4.367	0.094	0.028	3.308	90.5	0.024	196.3	22.6
GSD-4	5.801	2.209	0.967	0.104	0.257	39.9	0.101	117.3	379.1
GSP-2	4.798	5.36	0.966	0.039	2.699	5	0.279	235.3	475.1
GSP-2	4.862	5.43	0.987	0.04	2.715	12.3	0.283	233.6	469.9
JH-1	10.034	0.515	16.485	0.181	0.686	50.7	0.099	5	583.5
JLK-1	6.707	2.769	1.733	0.255	1.008	40.2	0.213	131.3	901.2
JLS-1	0.009	0.002	0.652	0.0025	0.005	5	0.031	5	141.1
JLS-1	0.01	0.002	0.665	0.0025	0.005	5	0.029	5	145.8
JLS-1 repeat	0.01	0.002	0.676	0.0025	0.005	5	0.032	5	149.5
LOESS-001	2.081	1.347	2.952	0.062	1.041	29.5	0.124	55.7	109.2
LOESS-1	2.05	1.339	2.909	0.06	1.029	20.8	0.124	56.7	120.2
LOESS-1	1.978	1.295	2.78	0.059	0.991	15.2	0.12	59.5	103.4
Loess-1	2.008	1.31	2.841	0.06	0.987	22.8	0.126	61	116
Average	2.02925	1.32275	2.8705	0.06025	1.012	22.075	0.1235	58.225	112.2
SD	0.045412003	0.024390914	0.075685754	0.001258306	0.027055499	5.903318276	0.002516611	2.451360167	7.413501197
RSD	2%	2%	3%	2%	3%	27%	2%	4%	7%
MRIS001	3.681	2.44	0.915	0.094	1.172	29.5	0.105	120.3	246.6
MRIS001	3.667	2.445	0.904	0.094	1.168	30.5	0.111	122.5	250.8
MRIS001	3.645	2.404	0.914	0.092	1.148	20.4	0.105	118.5	238.1
MRIS001	3.641	2.412	0.895	0.094	1.168	22.2	0.108	125.5	269.3
MRIS	3.654	2.428	0.907	0.093	1.149	23.9	0.106	123.2	248.9
MRIS	3.627	2.425	0.911	0.093	1.149	22.3	0.107	124	257.7
MRIS2-A	3.659	2.435	0.905	0.093	1.16	22.9	0.11	120.6	250
MRIS2-B	3.672	2.45	0.916	0.093	1.157	27.2	0.103	122.1	253.1
MRIS2-C	3.664	2.442	0.922	0.094	1.151	31.2	0.105	122.9	254.2
Average	3.656666667	2.431222222	0.909888889	0.093333333	1.158	25.56666667	0.106666667	122.1777778	252.0777778
SD	0.016815172	0.015449739	0.008038104	0.000707107	0.009433981	4.074309757	0.002598076	2.10877795	8.479354011
RSD	0%	1%	1%	1%	1%	16%	2%	2%	3%
NBS-1b	0.735	0.248	0.275	0.188	0.035	5	0.079	5	136.8
NBS-88a	0.265	0.117	20.334	0.021	0.005	5	0.01	5	23.2
NIM-G	1.996	5.061	0.05	0.016	3.31	7.4	0.012	321.9	99.1
NIM-G	1.973	5.044	0.045	0.016	3.294	5	0.011	324.1	104.9
NIM-G	2.003	5.093	0.046	0.016	3.368	9.4	0.013	323.2	98.2
NIM-G	1.995	5.045	0.049	0.016	3.287	5	0.011	321.6	89.6
NIM-G	1.975	5.037	0.048	0.016	3.268	5	0.013	325.4	98.2
NIMG001	1.962	5.016	0.048	0.015	3.263	5	0.012	322.2	106.3
NIMG001	1.977	5.007	0.05	0.015	3.262	5	0.012	321.9	115.6
NIMG001	2.014	5.033	0.047	0.015	3.282	5	0.011	325.7	100
NIMG001	2.025	5.117	0.055	0.017	3.338	7.3	0.011	317.8	107.8
NIMG001	1.984	5.008	0.05	0.015	3.264	5	0.011	316	103.1
NIMG001	2.012	5.048	0.047	0.015	3.267	5	0.012	319.5	101.5
NIM-G	1.963	4.977	0.045	0.015	3.223	5	0.011	322.5	96.9
NIM-G	2.017	5.112	0.052	0.016	3.281	6.4	0.012	321.1	111.5
NIM-G	1.994	5.064	0.046	0.016	3.28	5	0.012	321.9	99.4
NIMG001	2.022	5.112	0.053	0.016	3.326	6.2	0.013	322.8	107
NIMG001	2.027	5.095	0.054	0.018	3.327	5	0.012	321.5	96.3
NIMG001	2.001	5.04	0.043	0.016	3.288	5	0.013	322.4	116
NIM-G	2.002	5.072	0.052	0.016	3.3	5	0.011	322.8	90.9
NIM-G	1.966	4.964	0.05	0.015	3.247	5	0.012	317.3	95.6
NIMG001	2.045	5.088	0.053	0.016	3.318	6.8	0.013	321.4	108.3
NIMG001	1.996	5.05	0.049	0.016	3.282	5	0.011	320.2	94.7
NIMG001	2.007	5.094	0.055	0.016	3.322	5	0.012	323.4	107.6
NIMG001	1.993	5.015	0.052	0.016	3.259	5	0.014	322.7	98.3
NIM-G001	2.012	5.056	0.051	0.016	3.265	5	0.016	328.9	111
NIMG001	2.013	5.095	0.055	0.016	3.324	5.7	0.016	325.3	102.5
NIM-G001	1.953	4.961	0.048	0.014	3.201	5	0.013	330.4	100.8
NIM-G001	1.982	5.015	0.052	0.015	3.261	5	0.015	318.8	104.2
NIM-G001	1.982	4.999	0.055	0.014	3.237	5	0.013	317.9	105.6
NIMG-001	1.981	5.019	0.054	0.015	3.263	5	0.016	320.3	97.6
NIM-G001	1.991	5.02	0.053	0.014	3.269	5	0.014	323.5	109.2
NIM-G	1.972	5.005	0.058	0.015	3.28	5	0.015	319.6	98.6
NIM-G	1.991	5.077	0.056	0.015	3.329	5	0.016	322.9	91.4
NIMG-001	2.031	5.105	0.056	0.016	3.314	5	0.014	324.7	108.9
NIM-G001	1.971	4.972	0.05	0.015	3.239	5	0.012	316.7	95.2
NIM-G001	2.004	5.114	0.063	0.016	3.344	5	0.015	325.2	129.6

Appendix 14. QC samples analysis by XRF

SITEID	SiO2 (%)	Sr (ppm)	TiO2 (%)	Zn (ppm)	Zr (ppm)	Batch
METHOD:	XRF	XRF	XRF	XRF	XRF	
LLO:	0.01	10	0.005	10	10	
1956879	55.684	87.8	0.956	34.6	354	0-25
AGV-2	59.275	637.1	1.043	89.3	218.1	76-86
AGV-2	58.289	630.2	1.028	82.1	213.9	76-86
AN-G	45.587	77	0.223	18.7	10.5	High Ca 1 - 57-43 Flux
BCR-2	52.057	298.2	2.228	136.3	159.1	High Ca 1 - 57-43 Flux
BCR-2	52.523	291.4	2.252	183	154.6	High Ca 1 - 57-43 Flux
BIR-1	46.981	95.5	0.977	83.3	4.4	High Ca 1 - 57-43 Flux
CAL-S	0.06	222.7	0.005	5	-6.3	High Ca 1 - 57-43 Flux
CAL-S	0.059	219.3	0.005	5	-5.1	High Ca 1 - 57-43 Flux
CCH-1	0.912	268.5	0.017	15	-1.6	High Ca 1 - 57-43 Flux
CH-1	43.369	474.5	0.597	89.4	131	High Ca 1 - 57-43 Flux
DVG A	71.981	122	0.022	1994.4	72.8	76-86
DVG B	71.547	120.9	0.02	1978.5	70.5	76-86
DWA-1	0.06	51.8	0	44.8	2.5	High Ca 1 - 57-43 Flux
GA009A	76.863	33.2	0.17	41	197.9	0-25
GA009A	77.64	37.2	0.176	41.7	206.7	0-25
GA009A	76.911	32.9	0.172	41	205.3	0-25
GA009A	77.137	32	0.172	38.8	203.4	0-25
GSD-4	51.324	128.7	0.885	104.9	167.5	High Ca 1 - 57-43 Flux
GSP-2	65.522	227.1	0.661	103.9	581	76-86
GSP-2	66.409	225.9	0.67	112.1	580.3	76-86
JH-1	47.114	136.3	0.663	66.6	32.1	High Ca 1 - 57-43 Flux
JLK-1	57.598	60.8	0.692	151.5	120.5	High Ca 1 - 57-43 Flux
JLS-1	0.086	272.5	0.003	5	-5.1	High Ca 1 - 57-43 Flux
JLS-1	0.093	276.5	0.004	5	-6	High Ca 1 - 57-43 Flux
JLS-1 repeat	0.092	273.4	0.005	5	-3.1	High Ca 1 - 57-43 Flux
LOESS-001	52.948	281.8	0.42	26.8	340.4	26-50
LOESS-1	52.348	278.4	0.416	21.6	342.2	51-75
LOESS-1	50.992	287.3	0.407	10.4	358.1	High Ca 1 - 57-43 Flux
Loess-1	51.638	290.8	0.414	18.2	356.9	High Ca 1 - 57-43 Flux
Average	51.9815	284.575	0.41425	19.25	349.4	
SD	0.849616973	5.537974961	0.005439056	6.87871112	9.394679345	
RSD	2%	2%	1%	36%	3%	
MRIS001	71.224	88.9	0.643	58.7	338.9	0-25
MRIS001	71.455	86.5	0.643	58.6	361.8	0-25
MRIS001	70.274	87.4	0.637	54.4	346.7	26-50
MRIS001	70.787	90.1	0.639	55.7	365.4	26-50
MRIS	70.868	89.3	0.642	58.3	350	51-75
MRIS	70.684	89.8	0.641	54.3	368.8	76-86
MRIS2-A	71.008	87	0.641	55.9	349.3	76-86
MRIS2-B	71.182	87.3	0.641	54.6	348.5	76-86
MRIS2-C	71.093	88.8	0.638	57.2	357.1	76-86
Average	70.95277778	88.34444444	0.640555556	56.41111111	354.0555556	
SD	0.347975135	1.31444961	0.002127858	1.82923785	9.804732417	
RSD	0%	1%	0%	3%	3%	
NBS-1b	4.798	1198.5	0.048	5	21.7	High Ca 1 - 57-43 Flux
NBS-88a	1.256	45.5	0.01	5	8.9	High Ca 1 - 57-43 Flux
NIM-G	76.241	13.9	0.099	56.2	278.8	0-25
NIM-G	76.506	14.2	0.098	52.3	285.4	0-25
NIM-G	77.188	14.6	0.1	59.8	286.1	0-25
NIM-G	76.292	15	0.098	55.8	287	0-25
NIM-G	76.122	12.8	0.098	52.3	282.5	0-25
NIMG001	75.962	15.8	0.097	50.9	281.8	0-25
NIMG001	75.647	12.6	0.097	51.7	285.8	0-25
NIMG001	76.232	18.4	0.098	55.8	288.6	0-25
NIMG001	77.286	15	0.101	59.8	278.6	0-25
NIMG001	75.68	12.3	0.098	53.7	280.5	0-25
NIMG001	76.453	8.8	0.098	56.4	278	0-25
NIM-G	75.729	12.6	0.096	48.7	280.4	0-25
NIM-G	76.819	13.3	0.1	58.1	283.4	0-25
NIM-G	76.399	15.4	0.099	52.3	281	0-25
NIMG001	77.309	16	0.1	58.2	279.8	0-25
NIMG001	77.005	14.9	0.099	58.4	282.1	0-25
NIMG001	76.445	11.7	0.098	54.8	285.7	0-25
NIM-G	76.982	11.9	0.099	54.7	274.7	0-25
NIM-G	74.702	14.2	0.094	49.2	274.8	0-25
NIMG001	77.309	14.9	0.1	58.4	284.6	0-25
NIMG001	76.641	14.5	0.099	53.6	282.9	0-25
NIMG001	76.906	13.1	0.1	57	280.7	0-25
NIMG001	76.058	14.9	0.097	51.6	279.3	0-25
NIM-G001	76.766	18.1	0.099	54.8	290.5	0-25
NIMG001	77.375	13.7	0.1	59	285.3	0-25
NIM-G001	75.195	20	0.095	46.3	288.4	0-25
NIM -G001	75.931	16.6	0.096	51	284.2	0-25
NIM-G001	75.937	14.1	0.096	52	276.1	0-25
NIMG-001	75.922	13.4	0.097	52	278.7	26-50
NIM -G001	75.808	13.8	0.097	50.1	279.7	26-50
NIM-G	75.955	15.4	0.097	49.8	282.5	26-50
NIM-G	76.629	10.7	0.096	53.7	280.3	26-50
NIMG-001	77.415	18.2	0.098	59.9	287.1	26-50
NIM-G001	75.508	14.4	0.095	49.4	280.8	26-50
NIM-G001	77.528	13.3	0.1	57.6	278.3	26-50

Appendix 14. QC samples analysis by XRF

SITEID	Notes
METHOD:	
LLD:	
1956879	010-ngsa09 and 010
AGV-2	ngsa082
AGV-2	ngsa082
AN-G	57-43 Flux; ngsa high ca 3 samples plus stds
BCR-2	57-43 Flux; ngsa high ca 3 samples plus stds
BCR-2	57-43 Flux; ngsa high ca 3 samples plus stds
BIR-1	57-43 Flux; ngsa high ca 3 samples plus stds
CAL-S	57-43 Flux; ngsa high ca 3 samples plus stds
CAL-S	57-43 Flux; ngsa high ca 3 samples plus stds
CCH-1	57-43 Flux; ngsa high ca 3 samples plus stds
CH--1	57-43 Flux; ngsa high ca 3 samples plus stds
DVG A	ngsa082
DVG B	ngsa082
DWA-1	57-43 Flux; ngsa high ca 3 samples plus stds
GA009A	first3ngsabatches_
GA009A	first3ngsabatches_
GA009A	first3ngsabatches_
GA009A	first3ngsabatches_
GSD-4	57-43 Flux; ngsa high ca 3 samples plus stds
GSP-2	ngsa083
GSP-2	ngsa083
JH--1	57-43 Flux; ngsa high ca 3 samples plus stds
JLK-1	57-43 Flux; ngsa high ca 3 samples plus stds
JLS-1	57-43 Flux; ngsa high ca 3 samples plus stds
JLs-1	57-43 Flux; ngsa high ca 3 samples plus stds
JLs-1 repeat	57-43 Flux; ngsa high ca 3 samples plus stds
LOESS-001	ngsa032
LOESS-1	ngsa065
LOESS-1	57-43 Flux; ngsa high ca 3 samples plus stds
Loess-1	57-43 Flux; ngsa high ca 3 samples plus stds
Average	
SD	
RSD	
MRIS001	011-ngsa010repeat
MRIS001	020-ngsa019
MRIS001	ngsa 29 30
MRIS001	ngsa041
MRIS	ngsa064
MRIS	ngsa082
MRIS2-A	ngsa084
MRIS2-B	ngsa084
MRIS2-C	ngsa084
Average	
SD	
RSD	
NBS-1b	57-43 Flux; ngsa high ca 3 samples plus stds
NBS-88a	57-43 Flux; ngsa high ca 3 samples plus stds
NIM-G	first3ngsabatches_
NIM-G	first3ngsabatches_
NIM-G	first3ngsabatches_
NIM-G	first3ngsabatches_
NIM-G	004-ngsa 18 sept
NIMG001	005-ngsa02
NIMG001	006-ngsa 3 4 5
NIMG001	006-ngsa 3 4 5
NIMG001	006-ngsa 3 4 5
NIMG001	007-ngsa06
NIMG001	008-ngsa07
NIM-G	009-ngsa08
NIM-G	010-ngsa09 and 010
NIM-G	012-ngsa11
NIMG001	011-ngsa010repeat
NIMG001	013-ngsa12
NIMG001	015-ngsa013
NIM-G	016-ngsa014plus57
NIM-G	017-ngsa015
NIMG001	018-ngsa016
NIMG001	019-ngsa 017 018
NIMG001	019-ngsa 017 018
NIMG001	020-ngsa019
NIM-G001	021-ngsa 20 21 22
NIMG001	021-ngsa 20 21 22
NIM-G001	021-ngsa 20 21 22
NIM -G001	022-ngsa023 024
NIM-G001	022-ngsa023 024
NIMG-001	ngsa025
NIM -G001	ngsa026
NIM-G	ngsa 27 28
NIM-G	ngsa 27 28
NIMG-001	ngsa 29 30
NIM-G001	ngsa 29 30
NIM-G001	ngsa031

Appendix 14. QC samples analysis by XRF

SITEID	DATE TIME	Initial_Wt_g	Final_Wt_g	LOI (%)	Al2O3 (%)	CaO (%)	Cl (ppm)	Cu (ppm)	F (ppm)
METHOD:				Calc	XRF	XRF	XRF	XRF	XRF
LLD:				0	0.005	0.002	10	10	50
NIM-G001	14/04/2009	0.6002	5.4009	-1.3638	12.351	0.801	239	11.1	3215
NIM-G001	16/04/2009	0.6008	5.4015	-0.1302	12.195	0.794	234	5	3371
NIM-G001	1/05/2009	0.5992	5.3994	1.0598	12.117	0.786	216	5	2899
NIM-G001	5/05/2009	0.6002	5.4004	0.329	12.156	0.786	219	5	3181
NIM-G001	6/05/2009	0.6002	5.4002	0.8566	12.078	0.781	215	5	2746
NIM-G001	7/05/2009	0.5992	5.3985	0.608	12.157	0.787	212	5	2852
NIM-G001	9/05/2009	0.6006	5.3997	1.357	12.046	0.781	204	5	2594
NIM-G	14/05/2009	0.6002	5.4008	-0.3191	12.252	0.796	224	5	3165
NIM-G	2/06/2009	0.5993	5.3998	0.4923	12.15	0.799	1612	5	2735
NIM-G	3/06/2009	0.5997	5.4004	0.2471	12.217	0.798	217	5	2810
NIM-G	4/06/2009	0.6004	5.4006	0.6832	12.145	0.791	199	5	2499
NIM-G	12/06/2009	0.6005	5.4006	-0.2562	12.206	0.795	215	5	3024
NIM-G	15/06/2009	0.6001	5.4001	0.6037	12.135	0.782	208	5	2796
NIM-G	18/06/2009	0.5991	5.3983	0.7583	12.128	0.797	230	5	2456
NIM-G	22/06/2009	0.6011	5.4017	-0.8271	12.338	0.803	234	10.6	2483
NIM-G	25/06/2009	0.5999	5.4007	-0.6768	12.247	0.8	240	10.8	2720
NIM-G	29/06/2009	0.6002	5.4004	-0.6831	12.267	0.801	227	5	2625
NIM-G	30/06/2009	0.6002	5.4008	-0.7376	12.26	0.8	222	11	2877
NIM-G	2/07/2009	0.6004	5.4003	0.6513	12.135	0.785	221	5	2544
NIM-G	3/07/2009	0.6001	5.4007	-0.6195	12.262	0.784	234	5	2813
NIM-G	6/07/2009	0.6004	5.4013	0.8834	12.074	0.775	227	5	2513
NIMG-001	20/08/2009	0.5995	5.3995	1.7085	12.039	0.781	209	5	2344
NIM-G001	25/08/2009	0.6004	5.4003	0.4263	12.137	0.792	218	5	2250
NIM-G001	27/08/2009	0.5996	5.4002	0.3776	12.201	0.794	226	5	2237
NIM-G-001	31/08/2009	0.6005	5.4001	1.7209	11.986	0.772	214	5	2222
NIM-G-001	16/09/2009	0.6006	5.4008	0.2901	12.137	0.788	254	5	2321
NIM-G-001	29/09/2009	0.5997	5.4002	0.4221	12.149	0.782	224	5	2031
NIM-G	1/10/2009	0.6008	5.4009	-0.8888	12.32	0.798	232	10.3	2441
NIM-G	6/10/2009	0.6008	5.4012	-0.4414	12.289	0.791	227	5	1940
NIM-G	7/10/2009	0.5995	5.3993	0.2189	12.192	0.786	222	5	1851
NIM-G	8/10/2009	0.6002	5.4002	0.4591	12.166	0.785	245	5	2020
NIM-G	9/10/2009	0.8001	5.5998	-1.41	12.389	0.795	228	22.3	2494
NIM-G	14/10/2009	0.6004	5.3996	0.7481	12.161	0.786	222	5	2092
NIM-G	15/10/2009	0.6004	5.4005	0.207	12.2	0.79	230	5	2118
NIM-G	16/10/2009	0.5996	5.3996	0.2694	12.179	0.787	245	5	1854
NIM-G	20/10/2009	0.6009	5.4009	1.2168	12.046	0.781	222	5	1825
NIM-G	21/10/2009	0.6003	5.3996	1.6103	12.021	0.783	227	5	1777
NIM-G	23/10/2009	0.6005	5.4008	1.4806	12.011	0.78	206	5	1483
NIM-G	26/10/2009	0.6009	5.4015	1.1398	12.077	0.812	198	5	1872
NIM-G	27/10/2009	0.6009	5.4007	0.2419	12.184	0.789	219	5	2060
NIM-G	28/10/2009	0.5994	5.4001	0.5184	12.19	0.785	212	5	1736
NIM-G	29/10/2009	0.5997	5.4001	0.8682	12.111	0.79	200	5	1619
NIM-G	5/11/2009	0.5994	5.3995	-0.2422	12.242	0.796	225	5	1972
NIM-G	6/11/2009	0.5993	5.3996	-0.4685	12.26	0.792	225	5	2017
NIM-G	9/11/2009	0.6004	5.4009	0.7427	12.147	0.784	200	5	1704
NIM-G	16/11/2009	0.5994	5.3984	-0.6869	12.264	0.798	223	11	1877
NIM-G	18/11/2009	0.5999	5.3997	0.4735	12.147	0.785	215	5	1630
NIM-G	21/11/2009	0.5996	5.3997	0.1022	12.17	0.79	212	5	1809
NIM-G	23/11/2009	0.5996	5.4003	1.448	12.049	0.782	206	5	1549
NIM-G	18/12/2009	0.6007	5.4015	-0.0866	12.192	0.79	228	5	3906
NIM-G	27/01/2010	0.6005	5.4006	1.3843	12.016	0.778	215	5	3407
NIM-G	29/01/2010	0.5999	5.4003	-0.0989	12.213	0.788	217	5	3789
NIM-G	3/02/2010	0.5996	5.3997	-0.6798	12.258	0.796	228	11.2	3884
NIM-G	4/02/2010	0.5996	5.3999	-0.2027	12.235	0.789	217	5	3786
NIM-G	5/02/2010	0.5996	5.3996	-1.2031	12.342	0.805	222	5	3761
NIM-G	9/02/2010	0.6004	5.401	-0.0863	12.218	0.791	221	5	3903
NIM-G	10/02/2010	0.5994	5.3998	-0.6223	12.335	0.795	224	5	3728
NIM-G	17/02/2010	0.6008	5.4002	0.1939	12.192	0.788	214	5	3557
NIM-G	18/02/2010	0.6003	5.3995	-0.0674	12.242	0.792	209	5	3820
NIM-G	22/02/2010	0.5996	5.4	0.0305	12.189	0.803	204	5	3821
NIM-G	23/02/2010	0.6001	5.4005	-0.1426	12.206	0.795	220	5	3686
NIM-G	24/02/2010	0.6005	5.4	0.1247	12.188	0.792	209	5	3749
NIM-G001	24/02/2010	0.6005	5.4012	0.0704	12.154	0.79	241	5	3612
Average					12.21	0.79	241.35	6.67	2948.44
SD					0.10	0.01	141.25	3.26	742.14
RSD					1%	1%	59%	49%	25%
RV					12.08	0.78	170	12	4200
ORIS001	12/11/2008	0.6002	5.4014	5.9704	9.003	0.277	120	10.2	25
ORIS001	17/12/2008	0.5998	5.3997	7.183	8.874	0.273	81	5	25
ORIS001	26/03/2009	0.601	5.4005	7.4537	8.885	0.273	87	5	25
ORIS001	4/06/2009	0.6	5.4003	8.1019	8.799	0.27	56	5	25
ORIS	14/10/2009	0.5997	5.3988	8.3646	8.815	0.27	95	5	25
ORIS	27/01/2010	0.5996	5.3994	8.4497	8.774	0.269	98	5	25
ORIS	3/02/2010	0.6003	5.4007	7.263	8.867	0.272	97	5	250
Average				7.54	8.86	0.27	90.57	5.74	57.14
SD				0.87	0.08	0.00	19.50	1.97	85.04
RSD				11%	1%	1%	22%	34%	149%
OU-8	25/02/2010	0.6008	5.4012	17.0504	6.419	16.465	54	5	863
OU-8	31/03/2010	0.6008	5.4012	17.4571	6.384	16.21	51	5	826
OU--8	18/05/2010	0.6005	5.4009	18.5083	6.348	15.792	57	5	25
SARM-39a	18/05/2010	0.7997	5.5991	13.3952	4.143	9.285	155	59.2	25
SARM042	25/10/2008	0.6007	5.4012	8.8653	10.005	0.877	95	5	25
SARM042	17/12/2008	0.6008	5.4014	8.6981	10.04	0.876	90	5	25

Appendix 14. QC samples analysis by XRF

SITEID	Fe2O3 (%)	K2O (%)	MgO (%)	MnO (%)	Na2O (%)	Ni (ppm)	P2O5 (%)	Rb (ppm)	S (ppm)
METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
LLD:	0.005	0.005	0.01	0.005	0.01	10	0.005	10	10
NIM-G001	1.999	5.08	0.057	0.016	3.304	5	0.016	324.7	97.6
NIM-G001	1.978	5.035	0.051	0.015	3.314	5	0.014	326.9	92.1
NIM-G001	1.962	4.965	0.049	0.014	3.258	5	0.014	324.9	110.1
NIM-G001	1.97	4.998	0.049	0.016	3.29	5	0.015	321.2	113.1
NIM-G001	1.952	4.961	0.051	0.014	3.227	5	0.014	324.6	121.7
NIM-G001	1.96	4.985	0.051	0.015	3.231	5	0.014	331.5	106.5
NIM-G001	1.934	4.945	0.046	0.014	3.208	5	0.013	331.3	113.1
NIM-G	1.978	5.045	0.049	0.015	3.278	5	0.016	323.8	110.7
NIM-G	1.969	4.994	0.053	0.015	3.312	5	0.014	323.7	132.8
NIM-G	1.98	5	0.053	0.015	3.272	5	0.015	327.9	118.2
NIM-G	1.953	4.978	0.056	0.014	3.292	5	0.015	331.4	122
NIM-G	1.981	5.024	0.054	0.015	3.286	5	0.015	328.2	120.9
NIM-G	1.953	4.985	0.045	0.014	3.282	5	0.015	319.1	133.2
NIM-G	1.978	4.996	0.054	0.015	3.269	5	0.013	318	122
NIM-G	2.007	5.074	0.05	0.016	3.325	5	0.014	322.9	122.4
NIM-G	1.995	5.06	0.051	0.016	3.304	5	0.014	326.9	134.8
NIM-G	1.991	5.049	0.058	0.016	3.311	5	0.013	329.9	121.6
NIM-G	2.007	5.051	0.049	0.016	3.295	5	0.013	325.7	128.1
NIM-G	1.985	5	0.051	0.014	3.264	5	0.014	316	127.9
NIM-G	1.972	5.004	0.046	0.015	3.297	5	0.012	318.6	120.8
NIM-G	1.944	4.938	0.05	0.014	3.214	5	0.013	323.3	117
NIMG-001	1.935	4.947	0.049	0.014	3.184	5	0.012	328.9	112
NIM-G001	1.973	5.019	0.048	0.015	3.248	5	0.012	328.3	121
NIM-G001	1.983	5.026	0.051	0.015	3.273	5	0.013	323.1	122.5
NIM-G-001	1.94	4.95	0.047	0.014	3.214	5	0.013	326.4	119.6
NIM-G-001	1.971	5.009	0.047	0.015	3.277	5	0.013	324.2	136.7
NIM-G-001	1.954	4.995	0.053	0.014	3.224	5	0.011	329.1	98.5
NIM-G	1.995	5.069	0.052	0.016	3.312	5	0.014	322.7	96.6
NIM-G	1.991	5.038	0.05	0.015	3.28	5	0.014	333.8	100.3
NIM-G	1.964	5.001	0.041	0.015	3.245	5	0.013	320.9	93.4
NIM-G	2.03	4.995	0.047	0.015	3.254	5	0.013	327.9	93.2
NIM-G	1.993	5.088	0.042	0.017	3.34	8.2	0.012	311.1	96.4
NIM-G	1.966	5.002	0.051	0.014	3.235	5	0.014	325.6	106.8
NIM-G	1.971	5.027	0.048	0.015	3.27	5	0.013	328.4	109.9
NIM-G	1.967	5.018	0.05	0.014	3.266	5	0.014	329.6	96.3
NIM-G	1.963	4.965	0.047	0.014	3.222	5	0.012	328.8	106.8
NIM-G	1.951	4.969	0.051	0.016	3.179	5	0.013	324.7	95.7
NIM-G	1.951	4.948	0.05	0.014	3.192	5	0.013	326.8	97.3
NIM-G	1.958	4.976	0.038	0.014	3.214	5	0.014	320.9	100.2
NIM-G	1.98	5.024	0.046	0.015	3.2	5	0.016	327.8	107.2
NIM-G	1.959	5	0.035	0.014	3.224	5	0.014	328.1	109.6
NIM-G	1.96	5.006	0.04	0.015	3.2	5	0.016	326	112.7
NIM-G	1.99	5.059	0.038	0.015	3.227	5	0.015	331.9	109.2
NIM-G	1.983	5.061	0.034	0.015	3.232	5	0.016	329.5	103.6
NIM-G	1.974	5.004	0.034	0.015	3.212	5	0.013	331.8	101.7
NIM-G	2.006	5.071	0.04	0.015	3.245	5	0.017	330.8	111.3
NIM-G	1.966	5.012	0.034	0.014	3.194	5	0.013	334.2	102.6
NIM-G	1.98	5.029	0.035	0.014	3.223	5	0.015	334.1	96.8
NIM-G	1.948	4.979	0.03	0.014	3.183	5	0.015	325.8	95.4
NIM-G	2.004	5.013	0.057	0.016	3.249	5	0.015	326.3	90.9
NIM-G	1.949	4.967	0.052	0.014	3.223	5	0.014	323.7	96.9
NIM-G	1.981	5.035	0.05	0.015	3.225	5	0.016	320.3	97.8
NIM-G	1.989	5.067	0.056	0.015	3.274	5	0.014	331.3	100.5
NIM-G	1.978	5.045	0.054	0.015	3.259	5	0.015	324.5	99.6
NIM-G	2.025	5.093	0.061	0.016	3.299	5	0.015	325.1	103.8
NIM-G	1.977	5.041	0.056	0.016	3.285	5	0.015	325.5	101.6
NIM-G	2.001	5.083	0.056	0.015	3.287	5	0.014	326.5	93.8
NIM-G	1.969	5.031	0.054	0.015	3.258	5	0.015	320.2	90.8
NIM-G	1.982	5.043	0.06	0.015	3.276	5	0.016	318.9	95
NIM-G	1.974	5.033	0.054	0.015	3.237	5.5	0.015	324.2	105.9
NIM-G	1.995	5.037	0.058	0.015	3.262	5	0.014	325.5	102.7
NIM-G	1.978	5.038	0.064	0.015	3.257	5	0.015	326.3	89.4
NIM-G001	1.972	5.017	0.054	0.015	3.273	5	0.015	326.6	102.3
Average	1.98	5.03	0.05	0.02	3.27	5.18	0.01	324.49	106.25
SD	0.02	0.04	0.01	0.00	0.04	0.68	0.00	4.42	11.31
RSD	1%	1%	13%	6%	1%	13%	11%	1%	11%
RV	2.02	4.99	0.06	0.021	3.36	8		325	
ORIS001	2.945	2.127	0.559	0.067	0.536	18.3	0.104	117.8	217
ORIS001	2.907	2.097	0.553	0.065	0.529	44.2	0.104	117.5	197.2
ORIS001	2.924	2.095	0.55	0.065	0.524	5	0.103	116.4	199.7
ORIS001	2.874	2.075	0.53	0.064	0.521	5	0.099	120.9	216.5
ORIS	2.873	2.075	0.537	0.064	0.517	5	0.097	121.2	191.9
ORIS	2.863	2.073	0.542	0.064	0.516	5	0.105	117.3	196
ORIS	2.902	2.098	0.549	0.065	0.519	21.2	0.104	119	207.7
Average	2.90	2.09	0.55	0.06	0.52	14.81	0.10	118.59	203.71
SD	0.03	0.02	0.01	0.00	0.01	14.73	0.00	1.85	10.11
RSD	1%	1%	2%	2%	1%	99%	3%	2%	5%
OU-8	1.3	2.926	1.74	0.132	0.65	5	0.027	65.2	1400.7
OU-8	1.281	2.912	1.705	0.13	0.634	5	0.028	64.8	1436.8
OU-8	1.235	2.877	1.788	0.13	0.64	5	0.028	71.5	1533.6
SARM-39a	9.143	1.039	25.836	0.167	0.597	851	1.349	39.6	2901
SARM042	4.601	0.444	1.898	0.094	0.147	119.7	0.043	31.5	170.3
SARM042	4.595	0.44	1.896	0.092	0.14	118.7	0.045	29.9	156.8

Appendix 14. QC samples analysis by XRF

SITEID	SiO2 (%)	Sr (ppm)	TiO2 (%)	Zn (ppm)	Zr (ppm)	Batch
METHOD:	XRF	XRF	XRF	XRF	XRF	
LLO:	0.01	10	0.005	10	10	
NIM-G001	77.216	16.3	0.099	58	282.4	26-50
NIM-G001	76.199	13	0.096	55.7	279.6	26-50
NIM-G001	75.29	16.7	0.095	46.2	284.4	26-50
NIM-G001	75.878	12.2	0.096	50.3	279.1	26-50
NIM-G001	75.594	16.9	0.096	46.3	275.9	26-50
NIM-G001	75.711	16.2	0.096	46.3	282.7	26-50
NIM-G001	75.204	14.9	0.094	43.8	287.5	26-50
NIM-G	76.374	15.3	0.097	53.4	280.9	26-50
NIM-G	75.593	14.4	0.095	49.1	276.9	26-50
NIM-G	75.922	16.3	0.097	52.6	282.4	26-50
NIM-G	75.629	13.7	0.095	49.3	278.5	26-50
NIM-G	76.38	13.7	0.097	51.2	284	26-50
NIM-G	75.71	12.9	0.094	50	280.9	26-50
NIM-G	75.551	14.3	0.094	48.6	275	26-50
NIM-G	76.751	10.8	0.098	55.9	282.4	26-50
NIM-G	76.714	17.3	0.096	54.6	285	26-50
NIM-G	76.716	18	0.096	53.5	280.5	26-50
NIM-G	76.756	16.2	0.098	55.6	284.9	26-50
NIM-G	75.65	11.5	0.094	50	278.9	26-50
NIM-G	76.748	12.7	0.095	53.1	284.8	26-50
NIM-G	75.648	11.9	0.094	47.9	278.9	26-50
NIM-G-001	74.904	15.4	0.093	44.1	284	51-75
NIM-G001	75.906	12.6	0.098	50.8	279.6	51-75
NIM-G001	75.843	14.9	0.096	51.7	281.4	51-75
NIM-G-001	74.926	15.9	0.094	44.6	275.8	51-75
NIM-G-001	76.017	17	0.097	53.4	282.8	51-75
NIM-G-001	75.997	16.2	0.095	48.6	280.9	51-75
NIM-G	76.87	15.6	0.097	56.4	285	51-75
NIM-G	76.58	18.9	0.098	51.6	285.8	51-75
NIM-G	76.147	15.3	0.095	54.8	278.8	51-75
NIM-G	75.837	16.3	0.095	49.5	286	51-75
NIM-G	77.287	8	0.097	63.9	269.3	51-75
NIM-G	75.618	13.7	0.096	50	276.9	51-75
NIM-G	76.049	15.6	0.095	51.6	282.5	51-75
NIM-G	76.052	17.8	0.097	51.1	282.5	51-75
NIM-G	75.357	15.7	0.094	45.9	279.7	51-75
NIM-G	75.037	10.8	0.094	45	276.8	51-75
NIM-G	75.222	11.9	0.094	45.6	284.4	51-75
NIM-G	75.381	10.7	0.095	48.1	276.3	51-75
NIM-G	76.103	17.5	0.095	50.7	282.2	51-75
NIM-G	75.892	12.1	0.095	48	280.2	51-75
NIM-G	75.64	16.5	0.094	49.8	279.9	51-75
NIM-G	76.465	17.3	0.095	53.7	285.3	51-75
NIM-G	76.676	15.1	0.096	54.6	285.3	51-75
NIM-G	75.711	14.2	0.094	48.6	286.5	51-75
NIM-G	76.842	18.1	0.097	54.1	283.6	51-75
NIM-G	76.002	17.9	0.095	50.8	284.8	51-75
NIM-G	76.263	16.8	0.096	54.6	284.9	51-75
NIM-G	75.209	16.7	0.094	43.9	274.6	51-75
NIM-G	76.162	13.2	0.098	50.1	283.7	76-86
NIM-G	75.069	12.5	0.095	45.5	275.6	76-86
NIM-G	76.201	11.7	0.097	51.2	280.9	76-86
NIM-G	76.623	12.9	0.097	52	287.2	76-86
NIM-G	76.239	12.3	0.096	51	284.2	76-86
NIM-G	76.972	11.6	0.098	56.8	279.1	76-86
NIM-G	76.099	15.4	0.098	53.5	280.9	76-86
NIM-G	76.464	14.4	0.099	54.2	288	76-86
NIM-G	75.936	11.4	0.096	57.2	280.4	76-86
NIM-G	76.067	10.2	0.096	52.2	284.1	76-86
NIM-G	76.071	12.8	0.096	50.3	286.5	76-86
NIM-G	76.194	13.7	0.097	48.9	284.1	76-86
NIM-G	75.96	13.4	0.096	50.1	285.9	76-86
NIM-G001	76.08	9.8	0.097	49	280.8	76-86
Average	76.15	14.36	0.10	52.08	281.81	
SD	0.63	2.34	0.00	4.10	3.80	
RSD	1%	16%	2%	8%	1%	
RV	75.7	10		50	300	
ORIS001	77.83	41.5	0.519	54.7	316.9	0-25
ORIS001	76.847	37.6	0.506	47.6	323	0-25
ORIS001	76.592	39.7	0.506	49.1	327.8	26-50
ORIS001	76.194	41.6	0.506	44.7	330.9	26-50
ORIS	75.985	40.7	0.504	46.4	331	51-75
ORIS	75.789	37.9	0.5	41.8	327	76-86
ORIS	76.745	38.2	0.506	46.9	322.8	76-86
Average	76.57	39.60	0.51	47.31	325.63	
SD	0.68	1.72	0.01	4.00	5.07	
RSD	1%	4%	1%	8%	2%	
OU-8	52.769	294.7	0.239	5	201.8	High Ca 1 - 12-22 Flux
OU-8	52.744	285.5	0.235	5	194.8	High Ca 1 - 12-22 Flux
OU-8	52.348	276.1	0.238	5	196.3	High Ca 1 - 57-43 Flux
SARM-39a	32.854	1413.3	1.619	63.8	255.5	High Ca 1 - 57-43 Flux
SARM042	72.663	35.3	0.374	36.9	209	0-25
SARM042	72.806	40.4	0.368	34.7	192	0-25

Appendix 14. QC samples analysis by XRF

SITEID	Notes
METHOD:	
LLO:	
NIM-G001	ngsa032
NIM-G001	ngsa033
NIM-G001	ngsa034
NIM-G001	ngsa035
NIM-G001	ngsa036
NIM-G001	ngsa037 038
NIM-G001	ngsa037 038
NIM-G	ngsa039
NIM-G	ngsa040
NIM-G	ngsa041
NIM-G	ngsa042
NIM-G	ngsa043
NIM-G	ngsa044
NIM-G	ngsa045
NIM-G	ngsa046
NIM-G	ngsa047
NIM-G	ngsa048
NIM-G	ngsa049
NIM-G	ngsa 50 ok
NIM-G	51 and 52_edt
NIM-G	51 and 52_edt
NIMG-001	ngsa053
NIM-G001	ngsa054
NIM-G001	ngsa055
NIM-G-001	ngsa056
NIM-G-001	ngsa057
NIM-G-001	ngsa058
NIM-G	ngsa059
NIM-G	ngsa060
NIM-G	ngsa061
NIM-G	ngsa062
NIM-G	ngsa063
NIM-G	ngsa064
NIM-G	ngsa065
NIM-G	ngsa066
NIM-G	ngsa067
NIM-G	ngsa068
NIM-G	ngsa069
NIM-G	ngsa070
NIM-G	ngsa071
NIM-G	ngsa072
NIM-G	ngsa073
NIM-G	ngsa074
NIM-G	ngsa075
NIM-G	ngsa076
NIM-G	ngsa077
NIM-G	ngsa078
NIM-G	ngsa080
NIM-G	ngsa079
NIM-G	ngsa081
NIM-G	ngsa082
NIM-G	ngsa083
NIM-G	ngsa084
NIM-G	ngsa085
NIM-G	ngsa086
NIM-G	ngsa087
NIM-G	ngsa088
NIM-G	ngsa089
NIM-G	ngsa090
NIM-G	ngsa091 and ngsa092
NIM-G	ngsa092
NIM-G	ngsa093 094
NIM-G001	ngsa093 094
Average	
SD	
RSD	
RV	
ORIS001	011-ngsa010repeat
ORIS001	020-ngsa019
ORIS001	ngsa 29 30
ORIS001	ngsa041
ORIS	ngsa064
ORIS	ngsa082
ORIS	ngsa084
Average	
SD	
RSD	
OU-8	12-22 Flux; High Ca 2
OU-8	12-22 Flux; High Ca Part 40
OU--8	57-43 Flux; ngsa high ca 3 samples plus stds
SARM-39a	57-43 Flux; ngsa high ca 3 samples plus stds
SARM042	009-ngsa08
SARM042	020-ngsa019

Appendix 14. QC samples analysis by XRF

SITEID	DATE_TIME	Initial_Wt_g	Final_Wt_g	LOI (%)	Al2O3 (%)	CaO (%)	Cl (ppm)	Cu (ppm)	F (ppm)
METHOD:				Calc	XRF	XRF	XRF	XRF	XRF
LLD:				0	0.005	0.002	10	10	50
SARM042	26/03/2009	0.6009	5.4012	9.1715	9.946	0.877	88	5	25
SARM-42	20/10/2009	0.6003	5.3999	9.1053	10.011	0.883	103	5	25
SARM-42	27/01/2010	0.6001	5.4008	10.4443	9.835	0.863	91	5	25
SARM-42	18/05/2010	0.601	5.4012	10.8002	9.81	0.873	56	5	25
SARM-42	19/05/2010	0.6003	5.4011	11.9375	9.737	0.866	52	5	25
SARM-42	20/05/2010	0.601	5.4012	11.0165	9.813	0.869	66	5	25
Average				10.00	9.90	0.87	80.13	5.00	25.00
SD				1.20	0.11	0.01	19.25	0.00	0.00
RSD				12%	1%	1%	24%	0%	0%
STM-1	18/05/2010	0.8011	5.602	3.957	17.963	1.119	194	5	25
STSD-1	20/10/2009	0.6002	5.3995	31.117	8.84	3.648	220	15.9	25
STSD-2	20/10/2009	0.6002	5.4005	10.1266	15.855	4.199	150	46.5	25
STSD-3	20/10/2009	0.6004	5.4003	23.5313	10.84	3.308	278	25.8	25
STSD-4	20/10/2009	0.6004	5.3995	12.0914	12.042	4	134	60.1	25
TILL-1	17/09/2008	0.5999	5.4009	8.0846	13.506	2.641	212	40.7	25
TILL001	19/09/2008	0.5998	5.4004	6.4061	13.765	2.689	226	49.8	98
TILL001	26/09/2008	0.5999	5.4	6.7063	13.745	2.677	307	47.3	133
TILL001	29/09/2008	0.6009	5.4011	7.7245	13.596	2.645	228	43.7	25
TILL001	9/10/2008	0.5992	5.3998	6.7457	13.728	2.684	240	49.4	25
TILL001	13/10/2008	0.6	5.4003	7.3958	13.632	2.668	259	50.1	132
TILL001	21/10/2008	0.5993	5.4	7.0208	13.648	2.675	209	44.9	25
TILL-1	25/10/2008	0.6008	5.4009	6.9537	13.645	2.683	225	46.3	25
TILL-1	31/10/2008	0.6004	5.3996	7.1656	13.709	2.673	206	45	25
TILL-1	11/11/2008	0.5997	5.3996	6.0135	13.793	2.7	202	51.5	25
TILL001	12/11/2008	0.601	5.4005	6.9882	13.694	2.679	220	45.5	25
TILL001	17/11/2008	0.5993	5.3994	7.0304	13.665	2.67	223	45.6	25
TILL001	19/11/2008	0.6003	5.4009	7.7041	13.616	2.648	183	41.4	25
TILL-1	26/11/2008	0.5998	5.4001	7.1834	13.643	2.658	223	42.6	25
TILL-1	2/12/2008	0.5996	5.3999	6.777	13.681	2.683	217	44.5	25
TILL001	5/12/2008	0.6009	5.4011	6.3255	13.707	2.685	221	46.7	25
TILL001	10/12/2008	0.6001	5.4001	5.7331	13.784	2.701	226	50.7	203
TILL001	11/12/2008	0.6004	5.4011	6.7488	13.681	2.674	202	45.5	25
TILL001	17/12/2008	0.6	5.3999	5.9952	13.803	2.695	208	52.3	236
TILL-001	13/01/2009	0.6009	5.4016	6.8551	13.647	2.674	207	49.1	25
TILL001	21/01/2009	0.6	5.4005	6.85	13.716	2.662	200	48.5	25
TILL-001	29/01/2009	0.5994	5.3998	7.5269	13.669	2.655	188	42.9	25
TILL-001	2/02/2009	0.6007	5.4007	6.3754	13.905	2.699	194	48.1	25
TILL-001	3/02/2009	0.5997	5.3999	7.8631	13.504	2.653	543	42.5	25
TILL-001	25/02/2009	0.6008	5.4007	6.9132	13.699	2.677	196	47.5	25
TILL-001	26/02/2009	0.6009	5.4014	6.4462	13.731	2.685	200	47.7	25
TILL-1	2/03/2009	0.5993	5.3993	6.6316	13.741	2.681	184	47.6	25
TILL-1	4/03/2009	0.5995	5.3985	7.3886	13.631	2.659	192	42.8	25
TILL-001	17/03/2009	0.5994	5.4004	6.8425	13.747	2.672	188	43.8	25
TILL-001	25/03/2009	0.6005	5.4008	7.2328	13.662	2.668	208	44.5	25
TILL001	3/04/2009	0.6002	5.4002	6.8051	13.723	2.673	290	48.6	25
TILL001	14/04/2009	0.5997	5.3987	6.8813	13.684	2.668	210	47	25
TILL-001	16/04/2009	0.6008	5.4004	8.0365	13.54	2.654	219	44.8	25
TILL-001	1/05/2009	0.5996	5.3993	7.0485	13.705	2.668	204	46.8	25
TILL-001	5/05/2009	0.6	5.4003	7.0404	13.659	2.672	209	45	25
TILL-001	6/05/2009	0.6001	5.4001	7.3025	13.647	2.66	230	45.1	25
TILL-001	7/05/2009	0.5992	5.3986	8.156	13.495	2.629	175	40.5	25
TILL-001	9/05/2009	0.6006	5.4007	6.9556	13.666	2.661	194	44.8	25
TILL-1	14/05/2009	0.6008	5.4011	7.3635	13.608	2.656	200	43.6	25
TILL-1	2/06/2009	0.6	5.3993	8.0202	13.524	2.639	496	42.1	25
TILL-1	3/06/2009	0.5999	5.3999	8.662	13.469	2.636	192	36.6	25
TILL-1	4/06/2009	0.6002	5.4002	7.8197	13.624	2.649	199	40.5	25
TILL-1	12/06/2009	0.5993	5.3987	7.4006	13.567	2.656	199	43	25
TILL-1	15/06/2009	0.6	5.4003	6.9307	13.665	2.663	195	43.5	25
TILL-1	18/06/2009	0.5999	5.4009	6.5506	13.735	2.688	218	51.7	25
TILL-1	22/06/2009	0.6006	5.4006	6.6814	13.715	2.685	228	52.7	25
TILL-1	25/06/2009	0.6004	5.3995	7.4301	13.624	2.672	212	46	25
TILL-1	29/06/2009	0.5997	5.3998	6.8048	13.69	2.675	225	50.2	25
TILL-1	30/06/2009	0.6006	5.4006	7.1588	13.646	2.667	186	46.3	25
TILL-1	2/07/2009	0.6006	5.4012	7.3633	13.626	2.669	193	45.5	25
TILL-1	3/07/2009	0.5999	5.399	7.6021	13.542	2.644	215	43.6	25
TILL-1	6/07/2009	0.6007	5.4012	6.9424	13.63	2.663	205	48.4	25
TILL-001	20/08/2009	0.6002	5.4003	7.1623	13.671	2.68	212	47.7	25
TILL001	25/08/2009	0.6001	5.4002	8.0087	13.552	2.656	188	41.1	25
TILL-001	27/08/2009	0.6004	5.4	7.8566	13.594	2.649	208	44.2	25
TILL-001	31/08/2009	0.6002	5.3995	7.3499	13.592	2.671	191	45	25
TILL-001	16/09/2009	0.6003	5.401	6.4201	13.764	2.691	252	51.8	25
TILL-001	29/09/2009	0.5998	5.3999	7.8594	13.554	2.646	218	42.3	25
TILL-1	1/10/2009	0.5994	5.3993	7.4373	13.581	2.656	222	46.3	25
TILL-1	6/10/2009	0.5995	5.4001	7.7536	13.571	2.656	212	42.4	25
TILL-1	7/10/2009	0.6003	5.4004	6.5094	13.781	2.687	221	52.6	25
TILL-1	8/10/2009	0.6007	5.401	6.5717	13.742	2.705	229	52.9	25
TILL-1	9/10/2009	0.8001	5.6001	7.5331	13.609	2.644	191	53.1	25
TILL-1	14/10/2009	0.6007	5.4014	6.1594	13.773	2.688	227	52.6	25
TILL-1	15/10/2009	0.6	5.3992	7.6853	13.566	2.656	194	49.4	25
TILL-1	16/10/2009	0.6007	5.4004	8.4235	13.454	2.633	211	42.5	25
TILL-1	20/10/2009	0.6006	5.4007	7.1594	13.644	2.67	201	49.6	25
TILL-1	21/10/2009	0.6002	5.4011	7.6426	13.575	2.666	215	48.8	25
TILL-1	23/10/2009	0.5994	5.3999	7.6218	13.541	2.652	191	45.5	25
TILL-1	26/10/2009	0.5997	5.3996	6.3757	13.795	2.686	211	50.1	25

Appendix 14. QC samples analysis by XRF

SITEID	Fe2O3 (%)	K2O (%)	MgO (%)	MnO (%)	Na2O (%)	Ni (ppm)	P2O5 (%)	Rb (ppm)	S (ppm)
METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
LLD:	0.005	0.005	0.01	0.005	0.01	10	0.005	10	10
SARM042	4.602	0.445	1.919	0.093	0.14	111.8	0.049	31.1	158.1
SARM-42	4.606	0.447	1.875	0.093	0.144	112.3	0.044	31	174
SARM-42	4.506	0.436	1.869	0.09	0.143	102.7	0.046	35.9	157.7
SARM-42	4.496	0.436	1.863	0.09	0.12	106	0.046	37.7	139.5
SARM-42	4.453	0.426	1.851	0.09	0.118	100.8	0.047	36.4	146.5
SARM-42	4.486	0.433	1.859	0.091	0.127	107.4	0.047	39.6	156.8
Average	4.54	0.44	1.88	0.09	0.13	109.93	0.05	34.14	157.46
SD	0.06	0.01	0.02	0.00	0.01	6.96	0.00	3.68	11.23
RSD	1%	2%	1%	2%	8%	6%	4%	11%	7%
STM-1	5.087	4.164	0.134	0.215	8.527	5	0.155	104.8	30.6
STSD-1	6.378	1.255	2.232	0.496	1.771	5	0.369	35.5	1838.7
STSD-2	7.442	2.147	3.178	0.135	1.693	51	0.321	95.8	520
STSD-3	6.046	1.811	2.215	0.344	1.517	13.9	0.361	68.5	1597.1
STSD-4	5.547	1.592	2.122	0.191	2.685	20.5	0.217	42.3	938.7
TILL-1	6.863	2.12	2.108	0.188	2.746	21	0.219	49.3	241.6
TILL001	6.965	2.152	2.144	0.192	2.793	29.6	0.218	48.7	240
TILL001	6.957	2.141	2.161	0.19	2.801	25.3	0.216	49.6	238.8
TILL001	6.885	2.122	2.124	0.187	2.741	22.2	0.213	49	235
TILL001	6.946	2.145	2.146	0.191	2.802	25.7	0.218	47.2	226.5
TILL001	6.915	2.14	2.153	0.19	2.765	27.3	0.221	50.3	245.7
TILL001	6.918	2.137	2.141	0.188	2.775	25.6	0.218	46.7	226.2
TILL-1	6.945	2.135	2.129	0.188	2.791	28	0.218	46.9	230.2
TILL-1	6.946	2.152	2.137	0.189	2.788	24.1	0.216	48.2	249.9
TILL-1	7.005	2.159	2.168	0.192	2.791	28.7	0.214	53.5	237.8
TILL001	6.975	2.144	2.149	0.191	2.751	26.6	0.217	48.6	226.4
TILL001	6.968	2.138	2.147	0.189	2.798	22.7	0.217	49.5	241.1
TILL001	6.876	2.122	2.144	0.186	2.749	21.9	0.215	46.8	229.4
TILL-1	6.944	2.136	2.145	0.188	2.757	24.3	0.211	48.7	231.3
TILL-1	6.948	2.153	2.155	0.189	2.794	27.8	0.216	47.9	226.3
TILL001	6.986	2.152	2.175	0.19	2.811	24.8	0.217	47.9	239
TILL001	7.058	2.166	2.179	0.191	2.81	27	0.221	48.9	230.5
TILL001	6.994	2.15	2.165	0.189	2.791	24.5	0.217	47.4	227.3
TILL001	7.003	2.157	2.153	0.191	2.818	28.5	0.218	45.7	232.5
TILL-001	6.948	2.144	2.149	0.189	2.792	22.7	0.214	48.8	235.5
TILL001	6.946	2.139	2.174	0.189	2.76	23.7	0.22	46.7	226.4
TILL-001	6.941	2.126	2.141	0.189	2.754	19	0.219	45.9	227.5
TILL-001	6.985	2.144	2.156	0.19	2.788	39.4	0.221	46.1	231.9
TILL-001	6.907	2.128	2.119	0.187	2.746	16.6	0.217	50.5	329.1
TILL-001	6.952	2.148	2.152	0.189	2.803	24.3	0.216	46.7	227.3
TILL-001	6.973	2.152	2.152	0.19	2.803	24.6	0.22	46.8	233.7
TILL-1	6.957	2.144	2.149	0.188	2.81	22.6	0.218	47.2	228
TILL-1	6.915	2.132	2.13	0.188	2.788	18.4	0.214	49	234.2
TILL-001	6.968	2.14	2.146	0.191	2.789	22.4	0.218	48	222.1
TILL-001	6.97	2.124	2.144	0.189	2.78	22.6	0.217	46.6	236.2
TILL001	6.973	2.143	2.161	0.19	2.759	24	0.22	47.5	237.9
TILL001	6.953	2.133	2.166	0.191	2.779	21	0.218	49	240.3
TILL-001	6.895	2.13	2.138	0.189	2.779	21.1	0.215	48.2	227.4
TILL-001	6.944	2.129	2.154	0.191	2.819	24.4	0.219	46.8	249.5
TILL-001	6.934	2.133	2.146	0.191	2.773	24.9	0.213	49.8	250.4
TILL-001	6.911	2.123	2.156	0.189	2.794	22.4	0.221	48.1	260.5
TILL-001	6.836	2.108	2.122	0.187	2.733	19.9	0.213	46.7	236.5
TILL-001	6.935	2.127	2.147	0.19	2.758	22.8	0.217	48.9	241.5
TILL-1	6.922	2.125	2.135	0.188	2.753	20.4	0.216	44.8	231.7
TILL-1	6.87	2.114	2.106	0.187	2.737	17.4	0.215	50.2	237.6
TILL-1	6.797	2.095	2.112	0.187	2.708	13	0.213	51.3	249.9
TILL-1	6.868	2.114	2.113	0.186	2.76	15.9	0.215	49.6	247.5
TILL-1	6.905	2.119	2.137	0.19	2.795	19.1	0.218	47	253.4
TILL-1	6.924	2.132	2.153	0.189	2.819	21	0.217	46.2	252.9
TILL-1	6.984	2.156	2.167	0.19	2.797	25.3	0.221	47.4	253.1
TILL-1	6.948	2.14	2.15	0.192	2.841	24.2	0.219	50.2	256.6
TILL-1	6.938	2.129	2.145	0.189	2.776	19.5	0.215	46.3	250.2
TILL-1	6.956	2.139	2.146	0.189	2.797	22.8	0.217	48.6	268.7
TILL-1	6.93	2.127	2.165	0.189	2.779	20.2	0.216	48.8	243.8
TILL-1	6.911	2.135	2.13	0.188	2.789	19.2	0.219	47.7	242.2
TILL-1	6.868	2.119	2.138	0.186	2.75	15.9	0.209	49.5	251.3
TILL-1	6.919	2.132	2.122	0.187	2.768	22.5	0.217	48.4	262
TILL-001	6.934	2.131	2.137	0.189	2.757	20.4	0.215	51.1	260.7
TILL001	6.869	2.119	2.123	0.187	2.731	19.8	0.218	47.7	247.2
TILL-001	6.9	2.121	2.141	0.187	2.769	19.1	0.219	48.8	265.9
TILL-001	6.905	2.132	2.141	0.188	2.753	19.4	0.218	49.4	242
TILL-001	6.971	2.147	2.159	0.191	2.773	27.5	0.219	50.4	265.9
TILL-001	6.863	2.119	2.112	0.189	2.716	19.5	0.216	51.5	223.5
TILL-1	6.873	2.132	2.127	0.189	2.771	22.4	0.217	49.5	234.4
TILL-1	6.877	2.124	2.113	0.188	2.74	18.1	0.214	52	221.6
TILL-1	6.964	2.142	2.157	0.191	2.804	24.6	0.217	49.8	236.7
TILL-1	6.98	2.147	2.156	0.19	2.823	25.3	0.219	49.4	455.2
TILL-1	6.868	2.123	2.126	0.191	2.761	27.5	0.215	42.8	229.9
TILL-1	7.019	2.159	2.173	0.191	2.794	25	0.221	49.6	231.6
TILL-1	6.896	2.12	2.142	0.187	2.755	17	0.218	47.6	233.1
TILL-1	6.859	2.114	2.117	0.188	2.744	14.9	0.212	49.6	230.7
TILL-1	6.937	2.138	2.153	0.19	2.757	21	0.223	49.2	237.6
TILL-1	6.906	2.131	2.122	0.189	2.746	21.9	0.215	50	231.1
TILL-1	6.895	2.119	2.131	0.189	2.734	19.6	0.214	50.2	230.4
TILL-1	6.971	2.144	2.159	0.19	2.759	17.5	0.224	47.7	236.8

Appendix 14. QC samples analysis by XRF

SITEID	SiO2 (%)	Sr (ppm)	TiO2 (%)	Zn (ppm)	Zr (ppm)	Batch
METHOD:	XRF	XRF	XRF	XRF	XRF	
LLD:	0.01	10	0.005	10	10	
SARM042	72.422	37.7	0.371	35.6	200.3	26-50
SARM-42	72.582	39.7	0.368	34.6	194.2	51-75
SARM-42	71.396	34.5	0.361	25.5	194.7	76-86
SARM-42	71.167	45.1	0.365	29.2	205	High Ca 1 - 57-43 Flux
SARM-42	70.189	46.1	0.361	24.2	203.9	High Ca 1 - 57-43 Flux
SARM-42	70.96	45	0.364	29.4	206.7	High Ca 1 - 57-43 Flux
Average	71.77	40.48	0.37	31.26	200.73	
SD	0.97	4.54	0.00	4.85	6.41	
RSD	1%	11%	1%	15%	3%	
STM-1	58.368	672.5	0.143	230.6	1217.5	High Ca 1 - 57-43 Flux
STSD-1	43.099	179.2	0.674	162.6	225.3	51-75
STSD-2	54.071	419.2	0.758	243.7	187.8	51-75
STSD-3	49.254	244.5	0.652	191.6	205.7	51-75
STSD-4	58.809	366.6	0.704	90.1	198.1	51-75
TILL-1	60.426	288.4	0.966	89.3	495	0-25
TILL001	61.538	293.5	0.979	98.5	505.5	0-25
TILL001	61.253	292.3	0.984	96.1	493.5	0-25
TILL001	60.666	288.5	0.966	89.7	493	0-25
TILL001	61.285	281.7	0.983	94.7	475.3	0-25
TILL001	60.783	288.9	0.974	94.7	493	0-25
TILL001	61.164	285.5	0.977	93.8	493.1	0-25
TILL-1	61.193	282.2	0.978	94.6	483.6	0-25
TILL-1	60.913	290.5	0.979	94	487.5	0-25
TILL-1	61.837	297.2	0.988	96.8	500.3	0-25
TILL001	61.106	287.7	0.98	95.1	484.3	0-25
TILL001	61.054	288.4	0.977	95.1	495.2	0-25
TILL001	60.65	288.4	0.966	91.5	493.2	0-25
TILL-1	61.044	284.1	0.974	92.7	489.7	0-25
TILL-1	61.307	289.2	0.981	99.3	503.3	0-25
TILL001	61.657	288.3	0.986	95.7	493.5	0-25
TILL001	61.999	290.7	0.991	99.5	508	0-25
TILL001	61.274	288.1	0.981	96	496.1	0-25
TILL001	61.81	287.8	0.988	101.4	501.2	0-25
TILL-001	61.279	293.2	0.983	95.3	491.3	0-25
TILL001	61.227	288.5	0.975	95.5	501.3	0-25
TILL-001	60.689	288.8	0.975	92.4	497.9	0-25
TILL-001	61.432	289.1	0.983	97	489.9	0-25
TILL-001	60.574	303.8	0.972	87.4	505.7	0-25
TILL-001	61.131	286.3	0.977	97.1	485	26-50
TILL-001	61.521	289.2	0.983	96.5	497.4	26-50
TILL-1	61.379	289.1	0.979	94.5	491.3	26-50
TILL-1	60.878	289	0.976	88.3	490.3	26-50
TILL-001	61.196	294.5	0.979	95.5	498.4	26-50
TILL-001	60.938	288.3	0.98	95.8	500.3	26-50
TILL001	61.244	290.3	0.983	95.2	489.5	26-50
TILL001	61.244	289	0.979	100.1	497.3	26-50
TILL-001	60.357	285.2	0.969	91.7	492.9	26-50
TILL-001	61.044	283.8	0.981	95.8	489.7	26-50
TILL-001	61.175	286.3	0.98	94.5	486	26-50
TILL-001	60.941	287.5	0.976	94.7	492.2	26-50
TILL-001	60.496	285.8	0.963	88.9	492.9	26-50
TILL-001	61.292	288.4	0.977	92.6	493.2	26-50
TILL-1	60.979	285.5	0.973	94	489.4	26-50
TILL-1	60.545	286.9	0.968	92	486.1	26-50
TILL-1	60.118	292.9	0.96	87.3	488.8	26-50
TILL-1	60.641	282	0.969	92	494.2	26-50
TILL-1	60.978	285	0.968	93	480.9	26-50
TILL-1	61.267	286.8	0.974	94.4	490.5	26-50
TILL-1	61.495	289.2	0.977	96.8	499.7	26-50
TILL-1	61.388	287.1	0.983	99.2	494.8	26-50
TILL-1	60.878	288.3	0.971	93.2	484.5	26-50
TILL-1	61.355	284.7	0.978	99.2	499.8	26-50
TILL-1	61.099	288	0.973	93.7	493.7	26-50
TILL-1	60.949	281.8	0.971	93.4	492.8	26-50
TILL-1	60.942	283.7	0.968	91.6	495.1	26-50
TILL-1	61.398	284.8	0.978	95.5	496.5	26-50
TILL-001	61.14	295.4	0.979	91.8	492.4	51-75
TILL001	60.549	287.8	0.97	91.3	484.9	51-75
TILL-001	60.574	289.5	0.971	90.5	493.2	51-75
TILL-001	61.063	292.3	0.974	90.8	493.3	51-75
TILL-001	61.644	289.8	0.987	98.6	511.7	51-75
TILL-001	60.77	292.2	0.971	89.9	496.9	51-75
TILL-1	61.038	291.9	0.977	92.8	504.9	51-75
TILL-1	60.793	294.2	0.97	92.9	493.6	51-75
TILL-1	61.557	287.8	0.984	98.2	495.7	51-75
TILL-1	61.452	291.4	0.988	97.3	497.2	51-75
TILL-1	60.948	280.4	0.977	97.9	482.4	51-75
TILL-1	61.821	288.2	0.991	102.3	503.4	51-75
TILL-1	60.809	286	0.976	94.7	488.2	51-75
TILL-1	60.304	289	0.971	88.2	507.6	51-75
TILL-1	61.163	288.4	0.983	94.4	503.3	51-75
TILL-1	60.866	291.3	0.978	93.1	479.5	51-75
TILL-1	60.993	287.8	0.968	90.5	498.1	51-75
TILL-1	61.723	288	0.983	98.9	497.5	51-75

Appendix 14. QC samples analysis by XRF

SITEID	Notes
METHOD:	
LLO:	
SARM042	ngsa 29 30
SARM-42	ngsa067
SARM-42	ngsa082
SARM-42	57-43 Flux; ngsa high ca 3 samples plus stds
SARM-42	57-43 Flux; ngsa high ca 3 samples plus stds
SARM-42	57-43 Flux; ngsa high ca 3 samples plus stds
Average	
SD	
RSD	
STM-1	57-43 Flux; ngsa high ca 3 samples plus stds
STSD-1	ngsa067
STSD-2	ngsa067
STSD-3	ngsa067
STSD-4	ngsa067
TILL-1	004-ngsa 18 sept
TILL001	005-ngsa02
TILL001	006-ngsa 3 4 5
TILL001	006-ngsa 3 4 5
TILL001	006-ngsa 3 4 5
TILL001	007-ngsa06
TILL001	008-ngsa07
TILL-1	009-ngsa08
TILL-1	010-ngsa09 and 010
TILL-1	012-ngsa11
TILL001	011-ngsa010repeat
TILL001	013-ngsa12
TILL001	015-ngsa013
TILL-1	016-ngsa014plus58
TILL-1	017-ngsa015
TILL001	018-ngsa016
TILL001	019-ngsa 017 018
TILL001	019-ngsa 017 018
TILL001	020-ngsa019
TILL-001	021-ngsa 20 21 22
TILL001	021-ngsa 20 21 22
TILL-001	021-ngsa 20 21 22
TILL-001	022-ngsa023 024
TILL-001	022-ngsa023 024
TILL-001	ngsa025
TILL-001	ngsa026
TILL-1	ngsa 27 28
TILL-1	ngsa 27 28
TILL-001	ngsa 29 30
TILL-001	ngsa 29 30
TILL001	ngsa031
TILL001	ngsa032
TILL-001	ngsa033
TILL-001	ngsa034
TILL-001	ngsa035
TILL-001	ngsa036
TILL-001	ngsa037 038
TILL-001	ngsa037 038
TILL-1	ngsa039
TILL-1	ngsa040
TILL-1	ngsa041
TILL-1	ngsa042
TILL-1	ngsa043
TILL-1	ngsa044
TILL-1	ngsa045
TILL-1	ngsa046
TILL-1	ngsa047
TILL-1	ngsa048
TILL-1	ngsa049
TILL-1	ngsa 50 ok
TILL-1	51 and 52_edt
TILL-1	51 and 52_edt
TILL-001	ngsa053
TILL001	ngsa054
TILL-001	ngsa055
TILL-001	ngsa056
TILL-001	ngsa057
TILL-001	ngsa058
TILL-1	ngsa059
TILL-1	ngsa060
TILL-1	ngsa061
TILL-1	ngsa062
TILL-1	ngsa063
TILL-1	ngsa064
TILL-1	ngsa065
TILL-1	ngsa066
TILL-1	ngsa067
TILL-1	ngsa068
TILL-1	ngsa069
TILL-1	ngsa070

Appendix 14. QC samples analysis by XRF

SITEID	DATE_TIME	Initial_Wt_g	Final_Wt_g	LOI (%)	Al2O3 (%)	CaO (%)	Cl (ppm)	Cu (ppm)	F (ppm)
METHOD:				Calc	XRF	XRF	XRF	XRF	XRF
LLD:				0	0.005	0.002	10	10	50
TILL-1	27/10/2009	0.6007	5.4014	8.0157	13.557	2.645	201	41.7	25
TILL-1	28/10/2009	0.6002	5.4004	8.6606	13.429	2.629	190	37.7	25
TILL-1	29/10/2009	0.6001	5.4	9.0021	13.415	2.625	180	38.7	25
TILL-1	5/11/2009	0.6002	5.3996	8.0006	13.54	2.646	193	42.2	25
TILL-1	6/11/2009	0.5995	5.3995	7.4114	13.627	2.667	199	45.4	25
TILL-1	9/11/2009	0.6005	5.4002	6.8709	13.669	2.674	203	46.6	25
TILL-1	16/11/2009	0.6008	5.4015	7.0528	13.672	2.68	204	50.4	25
TILL-1	18/11/2009	0.6001	5.3997	6.904	13.655	2.678	194	46.3	25
TILL-1	21/11/2009	0.6007	5.4011	7.31	13.622	2.666	206	46.6	25
TILL-1	23/11/2009	0.6001	5.4002	6.9603	13.648	2.679	197	49.3	25
TILL-1	18/12/2009	0.6001	5.4011	6.5156	13.701	2.676	215	52.5	579
TILL-1	27/01/2010	0.6005	5.4013	7.0801	13.638	2.662	216	48.1	347
TILL-1	29/01/2010	0.6004	5.4012	8.6226	13.41	2.629	194	38.8	73
TILL-1	3/02/2010	0.5996	5.4001	6.4349	13.686	2.679	207	50.3	231
TILL-1	4/02/2010	0.6	5.4005	6.2669	13.736	2.689	204	52.1	339
TILL-1	5/02/2010	0.6008	5.4016	5.9081	13.837	2.711	204	49.4	327
TILL-1	9/02/2010	0.6003	5.4009	7.1974	13.671	2.655	192	45.3	369
TILL-1	10/02/2010	0.6007	5.4013	7.7642	13.571	2.643	200	44.3	88
TILL-1	17/02/2010	0.6004	5.401	8.1358	13.477	2.641	200	39.8	25
TILL-1	18/02/2010	0.5991	5.4	7.8722	13.537	2.649	192	43.1	57
TILL-1	22/02/2010	0.6004	5.4012	6.327	13.706	2.693	224	48.8	376
TILL-1	23/02/2010	0.599	5.3989	6.2894	13.704	2.704	195	48.6	203
TILL-1	24/02/2010	0.6003	5.4	6.2979	13.712	2.697	211	48.8	239
TILL-001	24/02/2010	0.6004	5.4006	6.3415	13.688	2.689	229	49.4	126
TILL-1	25/02/2010	0.5993	5.3995	5.9062	13.822	2.725	159	37.9	899
TILL-1	31/03/2010	0.6006	5.4001	7.9258	13.582	2.669	136	31.4	847
TILL-1	18/05/2010	0.6009	5.401	9.5102	13.3	2.588	113	39.6	25
TILL-1	19/05/2010	0.6009	5.401	8.6774	13.393	2.618	128	45.4	25
Average				7.20	13.64	2.67	212.36	45.93	80.12
SD				0.73	0.10	0.02	51.18	4.16	151.48
RSD				10%	1%	1%	24%	9%	189%
RV				7.3	13.7	2.72		47	
GeoPT				3%	3%	3%	10%	11%	10%
Abs GeoPT				0.19	0.42	0.07	0.00	5.24	
Bias				99%	100%	98%		98%	
Min				5.73	13.30	2.59	113.00	31.40	25.00
% <DL				0%	0%	0%	0%	0%	80%
TILL-002	11/11/2008	0.6006	5.3993	6.55	16.097	1.297	82	156.9	303
TILL-2	2/06/2009	0.5986	5.3981	8.5213	15.821	1.276	134	146.4	25
TILL-2	3/07/2009	0.6004	5.4007	7.7311	15.926	1.275	71	150.2	25
TILL-2	14/10/2009	0.6005	5.4004	7.9134	15.927	1.286	65	153.7	25
TILL-2	18/05/2010	0.6002	5.4004	9.5574	15.61	1.256	37	142.2	25
TILL-2	19/05/2010	0.6002	5.4004	10.8778	15.395	1.242	40	132.7	25
Average				8.53	15.80	1.27	71.50	147.02	71.33
SD				1.52	0.25	0.02	35.33	8.73	113.49
RSD				18%	2%	2%	49%	6%	159%
TILL-3	3/06/2009	0.6	5.4006	6.2189	11.941	2.54	62	5	25
TILL-3	3/07/2009	0.5993	5.3989	5.7308	11.982	2.522	67	13.2	25
TILL-3	14/10/2009	0.5999	5.3999	4.8983	12.095	2.568	73	20.9	25
Average				5.62	12.01	2.54	67.33	13.03	25.00
SD				0.67	0.08	0.02	5.51	7.95	0.00
RSD				12%	1%	1%	8%	61%	0%
TILL-4	14/10/2009	0.6002	5.4008	6.9576	14.167	1.234	55	236	25
WRIS001	12/11/2008	0.6006	5.4016	13.8605	10.8	1.536	891	20.7	25
WRIS001	17/12/2008	0.6004	5.4001	13.6034	10.793	1.538	886	22.6	25
WRIS001	26/03/2009	0.6007	5.4014	15.0248	10.692	1.517	820	17	25
WRIS001	4/06/2009	0.5995	5.3997	14.2155	10.756	1.526	841	19.8	25
WRIS	14/10/2009	0.6004	5.4003	14.3154	10.74	1.531	894	25	25
WRIS	27/01/2010	0.5991	5.4	14.2488	10.749	1.519	890	22.2	25
WRIS2-A	3/02/2010	0.5999	5.4002	16.624	10.413	1.481	831	22.7	379
WRIS2-B	3/02/2010	0.6002	5.4003	13.1398	10.857	1.54	847	22.6	517
WRIS2-C	3/02/2010	0.6002	5.3998	13.3891	10.85	1.538	862	23.1	252
Average				14.27	10.74	1.53	862.44	21.74	144.22
SD				1.05	0.13	0.02	28.75	2.30	190.72
RSD				7%	1%	1%	3%	11%	132%

Appendix 14. QC samples analysis by XRF

SITEID	Fe2O3 (%)	K2O (%)	MgO (%)	MnO (%)	Na2O (%)	Ni (ppm)	P2O5 (%)	Rb (ppm)	S (ppm)
METHOD:	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
LLD:	0.005	0.005	0.01	0.005	0.01	10	0.005	10	10
TILL-1	6.871	2.119	2.118	0.187	2.693	11.6	0.213	47.1	222.1
TILL-1	6.819	2.104	2.107	0.185	2.68	11.2	0.217	47.7	223.7
TILL-1	6.813	2.103	2.109	0.187	2.683	5	0.219	49.2	222.6
TILL-1	6.875	2.118	2.125	0.189	2.683	35.2	0.223	54.2	233.7
TILL-1	6.938	2.129	2.137	0.189	2.734	18.7	0.225	49.5	240
TILL-1	6.982	2.149	2.149	0.191	2.735	17.8	0.219	54.3	246.2
TILL-1	6.959	2.138	2.147	0.189	2.72	16.1	0.217	52.2	248.5
TILL-1	6.955	2.15	2.145	0.191	2.747	19.7	0.224	52.3	243.7
TILL-1	6.933	2.135	2.138	0.189	2.716	24	0.22	49.4	233.1
TILL-1	6.967	2.144	2.157	0.19	2.736	18.4	0.221	50	234.6
TILL-1	6.964	2.135	2.149	0.191	2.791	25.4	0.223	52	237.3
TILL-1	6.916	2.131	2.151	0.19	2.778	23.3	0.219	48.4	234.5
TILL-1	6.818	2.108	2.11	0.186	2.707	16	0.214	50.8	233.7
TILL-1	6.973	2.151	2.17	0.191	2.772	24.9	0.218	47.6	237
TILL-1	6.998	2.155	2.17	0.192	2.779	23.7	0.223	49.8	225.2
TILL-1	7.02	2.171	2.186	0.192	2.792	23.5	0.221	48.9	230.3
TILL-1	6.937	2.136	2.164	0.189	2.759	22	0.218	48.3	231.9
TILL-1	6.906	2.133	2.127	0.189	2.773	19.9	0.214	48.1	229.3
TILL-1	6.856	2.115	2.119	0.186	2.719	16.8	0.214	47.6	222.2
TILL-1	6.894	2.126	2.124	0.187	2.758	19.3	0.216	47.7	223
TILL-1	7	2.164	2.183	0.192	2.773	27.5	0.22	50	224.6
TILL-1	6.993	2.158	2.185	0.193	2.8	24.1	0.225	50.9	235.6
TILL-1	7.007	2.156	2.176	0.19	2.774	25.7	0.22	49.2	239.1
TILL-001	6.984	2.157	2.168	0.192	2.768	24.3	0.219	48.4	235.3
TILL-1	6.985	2.153	2.192	0.186	2.847	34.3	0.225	44.6	219.4
TILL-1	6.845	2.114	2.118	0.181	2.796	14.9	0.225	45.8	249
TILL-1	6.754	2.075	2.095	0.183	2.699	15.1	0.219	50.5	210.4
TILL-1	6.82	2.096	2.106	0.186	2.703	23.6	0.218	51.5	228.2
Average	6.93	2.13	2.14	0.19	2.77	22.05	0.22	48.74	240.21
SD	0.06	0.02	0.02	0.00	0.03	4.96	0.00	1.97	26.35
RSD	1%	1%	1%	1%	1%	22%	1%	4%	11%
RV	6.82	2.22	2.15	0.18	2.71	24	0.22	44	230
GeoPT	4%	4%	3%	6%	4%	9%	6%	9%	10%
Abs GeoPT	0.25	0.09	0.07	0.01	0.11	2.18	0.01	3.95	25.00
Bias	102%	96%	100%	105%	102%	92%	99%	111%	96%
Min	6.75	2.08	2.10	0.18	2.68	5.00	0.21	42.80	210.40
% <DL	0%	0%	0%	0%	0%	1%	0%	0%	0%
TILL-002	5.606	3.06	1.862	0.103	2.297	35.1	0.172	146.2	355.4
TILL-2	5.483	2.987	1.812	0.099	2.238	28	0.174	144.8	422
TILL-2	5.495	2.998	1.83	0.1	2.274	26.1	0.169	146.6	381.5
TILL-2	5.54	3.019	1.844	0.1	2.253	27.3	0.169	146.8	353.8
TILL-2	5.423	2.948	1.793	0.098	2.186	24.4	0.171	149.7	325.6
TILL-2	5.342	2.905	1.775	0.097	2.167	16.9	0.168	147	319.6
Average	5.48	2.99	1.82	0.10	2.24	26.30	0.17	146.85	359.65
SD	0.09	0.05	0.03	0.00	0.05	5.89	0.00	1.60	37.90
RSD	2%	2%	2%	2%	2%	22%	1%	1%	11%
TILL-3	3.912	2.306	1.668	0.063	2.637	27.7	0.116	62.9	163.2
TILL-3	3.926	2.312	1.668	0.062	2.641	35.2	0.11	63	189.6
TILL-3	3.988	2.345	1.682	0.065	2.678	31.9	0.115	62	163
Average	3.94	2.32	1.67	0.06	2.65	31.60	0.11	62.63	171.93
SD	0.04	0.02	0.01	0.00	0.02	3.76	0.00	0.55	15.30
RSD	1%	1%	0%	2%	1%	12%	3%	1%	9%
TILL-4	5.613	3.148	1.23	0.061	2.425	5	0.207	164.4	679
WRIS001	5.981	1.828	1.43	0.087	0.851	45.7	0.245	97.3	608.7
WRIS001	5.956	1.821	1.437	0.088	0.845	48.3	0.248	96.1	612.2
WRIS001	5.904	1.801	1.42	0.086	0.809	41.8	0.24	95	594.3
WRIS001	5.927	1.805	1.423	0.088	0.856	42.5	0.241	101.3	625.1
WRIS	5.95	1.811	1.423	0.088	0.814	39.7	0.244	98.1	605.7
WRIS	5.918	1.818	1.429	0.087	0.84	43.8	0.247	95.6	614.3
WRIS2-A	5.756	1.761	1.399	0.085	0.811	42.4	0.238	91.8	592.5
WRIS2-B	5.998	1.838	1.449	0.089	0.849	44.2	0.247	99.5	616.9
WRIS2-C	5.996	1.832	1.45	0.088	0.843	46.5	0.247	96.7	614
Average	5.93	1.81	1.43	0.09	0.84	43.88	0.24	96.82	609.30
SD	0.07	0.02	0.02	0.00	0.02	2.64	0.00	2.73	10.51
RSD	1%	1%	1%	1%	2%	6%	1%	3%	2%

Appendix 14. QC samples analysis by XRF

SITEID	SiO2 (%)	Sr (ppm)	TiO2 (%)	Zn (ppm)	Zr (ppm)	Batch
METHOD:	XRF	XRF	XRF	XRF	XRF	
LLD:	0.01	10	0.005	10	10	
TILL-1	60.646	286.3	0.968	88.9	494.7	51-75
TILL-1	60.248	286.3	0.967	86.6	501.3	51-75
TILL-1	59.956	291.6	0.957	84	496.8	51-75
TILL-1	60.675	293.6	0.972	91.7	494.7	51-75
TILL-1	60.989	289.9	0.976	94.3	491.9	51-75
TILL-1	61.401	293.7	0.985	98.1	490.6	51-75
TILL-1	61.262	289.1	0.984	97.1	495	51-75
TILL-1	61.397	296.2	0.982	97.1	511.1	51-75
TILL-1	61.118	291.3	0.977	95.9	482	51-75
TILL-1	61.335	290	0.982	94	506.9	51-75
TILL-1	61.469	292.6	0.982	94.6	497.2	76-86
TILL-1	61.078	286.3	0.978	92	501.6	76-86
TILL-1	60.088	286.7	0.962	85	486.3	76-86
TILL-1	61.573	287.7	0.983	96.4	508.6	76-86
TILL-1	61.63	289.6	0.984	95.9	498.5	76-86
TILL-1	61.791	287.6	0.994	97.9	506.2	76-86
TILL-1	60.916	286	0.978	93.3	507.2	76-86
TILL-1	60.554	284.9	0.976	92.9	505.9	76-86
TILL-1	60.435	287.1	0.967	87.8	483.7	76-86
TILL-1	60.52	283.8	0.972	88.8	493.5	76-86
TILL-1	61.569	291.1	0.99	96.5	502.9	76-86
TILL-1	61.599	293.7	0.987	95.8	495.8	76-86
TILL-1	61.611	293.7	0.988	99	491.1	76-86
TILL-001	61.645	292.1	0.987	97.8	502.7	76-86
TILL-1	61.751	319.5	0.977	86	496.5	High Ca 1 - 12-22 Flux
TILL-1	60.371	316.9	0.952	77	495	High Ca 1 - 12-22 Flux
TILL-1	59.585	289.6	0.962	83.5	489.5	High Ca 1 - 57-43 Flux
TILL-1	60.14	290.5	0.974	91.7	491.7	High Ca 1 - 57-43 Flux
Average	61.06	289.42	0.98	93.74	494.86	
SD	0.47	5.53	0.01	4.18	7.29	
RSD	1%	2%	1%	4%	1%	
RV	60.9	291	0.98	98	502	
GeoPT	2%	7%	5%	9%	7%	
Abs GeoPT	1.35	19.85	0.05	9.12	36.71	
Bias	100%	99%	100%	96%	99%	
Min	59.59	280.40	0.95	77.00	475.30	
% <DL	0%	0%	0%	0%	0%	
TILL-002	61.892	144.1	0.892	131.6	379.9	0-25
TILL-2	60.629	146.6	0.869	121.1	373.5	26-50
TILL-2	61.269	143	0.878	122.6	370.4	26-50
TILL-2	61.051	144.3	0.883	125.6	375.1	51-75
TILL-2	60.04	148.7	0.876	115	368.5	High Ca 1 - 57-43 Flux
TILL-2	59.126	146.9	0.865	108.2	362.2	High Ca 1 - 57-43 Flux
Average	60.67	145.60	0.88	120.68	371.60	
SD	0.98	2.14	0.01	8.19	6.07	
RSD	2%	1%	1%	7%	2%	
TILL-3	68.146	305.6	0.477	44.9	217.3	26-50
TILL-3	68.63	301.5	0.476	46.7	216.4	26-50
TILL-3	69.157	308.5	0.484	54.8	222.2	51-75
Average	68.64	305.20	0.48	48.80	218.63	
SD	0.51	3.52	0.00	5.27	3.12	
RSD	1%	1%	1%	11%	1%	
TILL-4	64.164	112.6	0.786	63.1	392.2	51-75
WRIS001	61.941	175	1.237	81.1	306.4	0-25
WRIS001	62.214	178.5	1.236	81.2	306.3	0-25
WRIS001	61.115	176.4	1.217	74.3	310.8	26-50
WRIS001	61.803	178.3	1.228	78.3	305.2	26-50
WRIS	61.784	177.1	1.227	79.7	319.4	51-75
WRIS	61.695	174	1.231	76	302.9	76-86
WRIS2-A	59.995	167.6	1.188	76.7	287.9	76-86
WRIS2-B	62.485	179.3	1.237	79.5	309.4	76-86
WRIS2-C	62.281	174.7	1.239	81.7	314.8	76-86
Average	61.70	175.66	1.23	78.72	307.01	
SD	0.75	3.54	0.02	2.58	8.81	
RSD	1%	2%	1%	3%	3%	

Appendix 14. QC samples analysis by XRF

SITEID	Notes
METHOD:	
LLD:	
TILL-1	ngsa071
TILL-1	ngsa072
TILL-1	ngsa073
TILL-1	ngsa074
TILL-1	ngsa075
TILL-1	ngsa076
TILL-1	ngsa077
TILL-1	ngsa078
TILL-1	ngsa080
TILL-1	ngsa079
TILL-1	ngsa081
TILL-1	ngsa082
TILL-1	ngsa083
TILL-1	ngsa084
TILL-1	ngsa085
TILL-1	ngsa086
TILL-1	ngsa087
TILL-1	ngsa088
TILL-1	ngsa089
TILL-1	ngsa090
TILL-1	ngsa091 and ngsa092
TILL-1	ngsa092
TILL-1	ngsa093 094
TILL-001	ngsa093 094
TILL-1	12-22 Flux; High Ca 1
TILL-1	12-22 Flux; High Ca Part 39
TILL-1	57-43 Flux; ngsa high ca 3 samples plus stds
TILL-1	57-43 Flux; ngsa high ca 3 samples plus stds
Average	
SD	
RSD	
RV	
GeoPT	
Abs GeoPT	
Bias	
Min	
% <DL	
TILL-002	012-ngsa11
TILL-2	ngsa040
TILL-2	51 and 52_edt
TILL-2	ngsa064
TILL-2	57-43 Flux; ngsa high ca 3 samples plus stds
TILL-2	57-43 Flux; ngsa high ca 3 samples plus stds
Average	
SD	
RSD	
TILL-3	ngsa041
TILL-3	51 and 52_edt
TILL-3	ngsa064
Average	
SD	
RSD	
TILL-4	ngsa064
WRIS001	011-ngsa010repeat
WRIS001	020-ngsa019
WRIS001	ngsa 29 30
WRIS001	ngsa041
WRIS	ngsa064
WRIS	ngsa082
WRIS2-A	ngsa084
WRIS2-B	ngsa084
WRIS2-C	ngsa084
Average	
SD	
RSD	

Appendix 15. Field duplicates analysis by Total digestion ICP-MS

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	Ag (ppm)	Ag (ppm)	As (ppm)	As (ppm)	Ba (ppm)	Ba (ppm)	Be (ppm)	Be (ppm)	Bi (ppm)	Bi (ppm)
METHOD:	METHOD:	SIZE	SIZE			ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0.030	0.030	0.40	0.40	0.50	0.50	1.10	1.10	0.020	0.020
2007190003	2007190213	Coarse	Coarse	TOS	TOS	0.074	0.015	3.69	2.34	400.10	399.67	0.55	1.83	0.246	0.264
2007190003	2007190213	Fine	Fine	TOS	TOS	0.175	0.083	6.25	4.84	479.18	468.00	2.25	1.85	0.508	0.459
2007190003	2007190213	Coarse	Coarse	BOS	BOS	0.015	0.015	3.84	3.14	378.19	396.42	1.83	2.10	0.265	0.227
2007190003	2007190213	Fine	Fine	BOS	BOS	0.143	0.073	5.76	5.44	440.76	457.17	3.42	3.35	0.508	0.483
2007190005	2007191059	Coarse	Coarse	TOS	TOS	0.015	0.085	5.02	3.38	419.70	462.30	1.37	1.55	0.081	0.075
2007190005	2007191059	Fine	Fine	TOS	TOS	0.015	0.125	5.08	3.77	508.90	499.60	1.76	1.87	0.112	0.094
2007190005	2007191059	Coarse	Coarse	BOS	BOS	0.015	0.058	4.40	3.38	437.10	484.40	0.55	1.16	0.068	0.058
2007190005	2007191059	Fine	Fine	BOS	BOS	0.036	0.143	6.05	4.12	554.40	503.30	2.11	1.92	0.115	0.098
2007190032	2007190632	Coarse	Coarse	TOS	TOS	0.080	0.110	13.40	13.38	379.95	389.80	2.00	1.82	0.242	0.186
2007190032	2007190632	Fine	Fine	TOS	TOS	0.097	0.140	16.27	14.99	485.34	461.90	3.24	2.22	0.312	0.274
2007190032	2007190632	Coarse	Coarse	BOS	BOS	0.093	0.092	5.62	8.08	387.23	437.00	1.68	1.68	0.465	0.211
2007190032	2007190632	Fine	Fine	BOS	BOS	0.097	0.132	7.06	8.05	496.01	505.00	2.02	2.20	0.323	0.271
2007190035	2007190876	Coarse	Coarse	TOS	TOS	0.149	0.138	5.45	1.21	372.67	380.70	1.42	0.55	0.201	0.218
2007190035	2007190876	Fine	Fine	TOS	TOS	0.088	0.229	4.58	0.97	411.90	430.20	2.20	1.37	0.326	0.371
2007190035	2007190876	Coarse	Coarse	BOS	BOS	0.052	0.071	7.53	3.21	362.85	370.10	2.28	2.16	0.340	0.397
2007190035	2007190876	Fine	Fine	BOS	BOS	0.085	0.168	10.02	5.93	404.92	414.20	3.28	2.22	0.513	0.572
2007190039	2007190984	Coarse	Coarse	TOS	TOS	0.039	0.084	6.84	2.11	631.73	679.80	0.55	0.55	0.191	0.133
2007190039	2007190984	Fine	Fine	TOS	TOS	0.180	0.203	6.34	3.43	544.50	499.40	0.55	0.55	0.411	0.366
2007190039	2007190984	Coarse	Coarse	BOS	BOS	0.036	0.071	7.51	6.10	495.06	434.70	2.16	2.28	0.285	0.344
2007190039	2007190984	Fine	Fine	BOS	BOS	0.015	0.067	9.85	6.52	329.38	333.20	2.71	2.23	0.378	0.425
2007190050	2007191481	Coarse	Coarse	TOS	TOS	0.063	0.015	1.42	1.40	550.88	538.90	1.79	1.60	0.124	0.120
2007190050	2007191481	Fine	Fine	TOS	TOS	0.147	0.015	4.14	3.70	537.07	519.30	2.02	2.60	0.290	0.300
2007190050	2007191481	Coarse	Coarse	BOS	BOS	0.085	0.015	2.22	2.00	573.04	568.10	0.55	1.60	0.166	0.110
2007190050	2007191481	Fine	Fine	BOS	BOS	0.141	0.015	5.82	3.90	539.91	540.30	2.30	2.20	0.402	0.340
2007190067	2007191121	Coarse	Coarse	TOS	TOS	0.080	0.015	3.88	4.46	390.39	396.50	2.09	1.25	0.141	0.167
2007190067	2007191121	Fine	Fine	TOS	TOS	0.092	0.095	5.81	6.69	415.34	445.40	1.61	1.11	0.375	0.321
2007190067	2007191121	Coarse	Coarse	BOS	BOS	0.045	0.036	6.41	8.31	363.77	420.70	1.31	1.27	0.199	0.183
2007190067	2007191121	Fine	Fine	BOS	BOS	0.052	0.040	9.34	11.78	253.89	264.90	1.64	1.18	0.291	0.276
2007190071	2007190289	Coarse	Coarse	TOS	TOS	0.045	0.015	0.20	0.20	316.55	285.54	0.55	0.55	0.032	0.059
2007190071	2007190289	Fine	Fine	TOS	TOS	0.141	0.110	0.20	0.20	756.45	734.71	1.29	0.55	0.167	0.156
2007190071	2007190289	Coarse	Coarse	BOS	BOS	0.050	0.015	0.20	0.20	361.12	291.75	1.29	2.01	0.119	0.089
2007190071	2007190289	Fine	Fine	BOS	BOS	0.092	0.046	0.97	0.20	447.11	391.32	4.07	5.80	0.235	0.212
2007190074	2007190389	Coarse	Coarse	TOS	TOS	0.146	0.056	3.08	1.34	687.77	919.41	0.55	0.55	0.194	0.104
2007190074	2007190389	Fine	Fine	TOS	TOS	0.358	0.290	3.39	3.69	509.44	525.99	1.32	1.85	0.310	0.272
2007190074	2007190389	Coarse	Coarse	BOS	BOS	0.049	0.080	1.42	1.33	844.97	839.62	0.55	0.55	0.083	0.094
2007190074	2007190389	Fine	Fine	BOS	BOS	0.331	0.192	2.54	3.57	476.55	507.83	0.55	1.74	0.261	0.267
2007190091	2007191053	Coarse	Coarse	TOS	TOS	0.015	0.099	0.65	1.88	243.40	413.20	0.55	1.44	0.047	0.078
2007190091	2007191053	Fine	Fine	TOS	TOS	0.071	0.172	2.25	2.03	448.50	442.00	1.79	2.09	0.192	0.133
2007190091	2007191053	Coarse	Coarse	BOS	BOS	0.015	0.055	1.36	1.70	352.60	388.20	0.55	1.26	0.090	0.049
2007190091	2007191053	Fine	Fine	BOS	BOS	0.079	0.069	1.58	4.16	450.20	225.20	1.36	1.68	0.172	0.138
2007190107	2007190913	Coarse	Coarse	TOS	TOS	0.062	0.015	1.67	0.97	141.54	153.43	0.55	1.42	0.120	0.091
2007190107	2007190913	Fine	Fine	TOS	TOS	0.305	0.190	4.77	4.19	352.79	367.66	1.75	2.87	0.326	0.339
2007190107	2007190913	Coarse	Coarse	BOS	BOS	0.085	0.035	1.23	1.20	156.53	163.33	1.11	1.38	0.116	0.135
2007190107	2007190913	Fine	Fine	BOS	BOS	0.322	0.111	3.15	5.14	371.59	289.07	1.55	3.65	0.296	0.328
2007190110	2007191182	Coarse	Coarse	TOS	TOS	0.040	0.015	3.45	2.60	484.09	484.20	1.68	1.80	0.302	0.290
2007190110	2007191182	Fine	Fine	TOS	TOS	0.082	0.015	4.66	4.10	422.12	441.50	1.78	2.30	0.601	0.470
2007190110	2007191182	Coarse	Coarse	BOS	BOS	0.067	0.015	5.27	3.00	537.12	550.00	3.32	3.00	0.657	0.470
2007190110	2007191182	Fine	Fine	BOS	BOS	0.089	0.015	4.74	4.50	534.71	537.00	2.76	4.20	0.638	0.740
2007190114	2007191045	Coarse	Coarse	TOS	TOS	0.121	0.090	8.46	7.24	460.64	448.15	2.30	0.55	0.326	0.348
2007190114	2007191045	Fine	Fine	TOS	TOS	0.129	0.119	7.79	7.40	432.82	431.17	2.48	0.55	0.314	0.341
2007190114	2007191045	Coarse	Coarse	BOS	BOS	0.137	0.066	8.78	8.02	468.39	444.52	1.87	0.55	0.275	0.304
2007190114	2007191045	Fine	Fine	BOS	BOS	0.167	0.113	8.14	6.83	454.67	429.89	2.11	1.16	0.348	0.366
2007190118	2007191552	Coarse	Coarse	TOS	TOS	0.121	0.329	5.44	5.69	347.89	346.10	2.70	1.93	0.391	0.542
2007190118	2007191552	Fine	Fine	TOS	TOS	0.138	0.318	4.94	4.88	336.01	309.10	2.72	1.83	0.367	0.537
2007190118	2007191552	Coarse	Coarse	BOS	BOS	0.107	0.340	5.67	6.32	466.40	507.20	3.27	2.58	0.413	0.619
2007190118	2007191552	Fine	Fine	BOS	BOS	0.095	0.298	5.13	5.77	442.68	454.90	3.58	2.30	0.383	0.581
2007190121	2007191545	Coarse	Coarse	TOS	TOS	0.107	0.015	2.03	1.90	92.38	143.00	0.55	0.55	0.155	0.140
2007190121	2007191545	Fine	Fine	TOS	TOS	0.277	0.015	4.61	4.90	367.51	309.30	0.55	2.70	0.317	0.420
2007190121	2007191545	Coarse	Coarse	BOS	BOS	0.106	0.015	2.21	3.30	95.17	138.60	0.55	0.55	0.132	0.200
2007190121	2007191545	Fine	Fine	BOS	BOS	0.277	0.015	5.42	7.40	360.49	200.00	1.25	1.50	0.294	0.310
2007190125	2007191532	Coarse	Coarse	TOS	TOS	0.113	0.285	2.48	1.01	585.92	555.10	2.11	1.50	0.182	0.104
2007190125	2007191532	Fine	Fine	TOS	TOS	0.151	0.358	3.02	1.52	570.82	498.40	2.20	1.58	0.241	0.169
2007190125	2007191532	Coarse	Coarse	BOS	BOS	0.125	0.305	2.96	0.42	590.27	581.30	2.34	1.95	0.178	0.088
2007190125	2007191532	Fine	Fine	BOS	BOS	0.189	0.391	3.87	1.77	546.14	539.40	2.44	2.28	0.249	0.153
2007190145	2007191105	Coarse	Coarse	TOS	TOS	0.085	0.015	3.05	1.90	205.22	196.50	1.46	1.50	0.265	0.280
2007190145	2007191105	Fine	Fine	TOS	TOS	0.204	0.015	2.48	2.30	223.89	211.20	1.64	1.70	0.794	0.280
2007190145	2007191105	Coarse	Coarse	BOS	BOS	0.073	0.015	3.63	3.20	188.50	187.90	1.58	1.50	0.260	0.220
2007190145	2007191105	Fine	Fine	BOS	BOS	0.099	0.015	3.63	3.50	201.42	199.50	1.76	1.20	0.312	0.260
2007190154	2007190568	Coarse	Coarse	TOS	TOS	0.047	0.207	1.98	1.82	70.13	74.09	2.36	1.23	0.010	0.276
2007190154	2007190568	Fine	Fine	TOS	TOS	0.073	0.186	1.71	1.84	63.02	72.31	2.24	1.24	0.010	0.212
2007190154	2007190568	Coarse	Coarse	BOS	BOS	0.135	0.192	2.87	2.75	64.98	61.76	1.50	1.44	0.010	0.412
2007190154	2007190568	Fine	Fine	BOS	BOS	0.152	0.190	2.86	2.30	64.53	55.77	1.63	1.60	0.010	0.408
2007190155	2007191031	Coarse	Coarse	TOS	TOS	0.015	0.015	2.54	4.40	447.00	455.39	1.30	1.33	0.212	0.184
2007190155	2007191031	Fine	Fine	TOS	TOS	0.015	0.075	2.78	5.23	346.20	359.60	1.80	1.99	0.268	0.313
2007190155	2007191031	Coarse	Coarse	BOS	BOS	0.015	0.069	3.01	4.03	451.30	445.19				

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	Ag (ppm)	Ag (ppm)	As (ppm)	As (ppm)	Ba (ppm)	Ba (ppm)	Be (ppm)	Be (ppm)	Bi (ppm)	Bi (ppm)
METHOD:	METHOD:	SIZE	SIZE			ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0.030	0.030	0.40	0.40	0.50	0.50	1.10	1.10	0.020	0.020
2007190181	2007191396	Coarse	Coarse	BOS	BOS	0.034	0.015	3.92	3.60	300.98	304.80	0.55	1.40	0.191	0.180
2007190181	2007191396	Fine	Fine	BOS	BOS	0.033	0.015	4.61	4.40	326.35	324.70	0.55	2.00	0.233	0.270
2007190183	2007190471	Coarse	Coarse	TOS	TOS	0.040	0.055	1.10	1.48	688.99	752.40	0.55	0.55	0.087	0.079
2007190183	2007190471	Fine	Fine	TOS	TOS	0.288	0.260	2.68	1.93	577.34	611.20	0.55	0.55	0.221	0.196
2007190183	2007190471	Coarse	Coarse	BOS	BOS	0.015	0.035	5.77	4.28	499.92	760.90	1.38	1.44	0.280	0.209
2007190183	2007190471	Fine	Fine	BOS	BOS	0.050	0.055	5.68	5.63	485.43	501.30	2.02	1.77	0.367	0.225
2007190185	2007191253	Coarse	Coarse	TOS	TOS	0.015	0.015	8.37	8.13	349.41	317.90	0.55	1.84	0.330	0.601
2007190185	2007191253	Fine	Fine	TOS	TOS	0.039	0.015	8.72	7.78	359.85	318.80	0.55	1.75	0.395	0.677
2007190185	2007191253	Coarse	Coarse	BOS	BOS	0.015	0.015	9.71	7.94	403.43	352.50	1.39	2.58	0.388	0.696
2007190185	2007191253	Fine	Fine	BOS	BOS	0.015	0.015	9.93	7.88	405.66	358.00	1.11	2.14	0.405	0.675
2007190189	2007191542	Coarse	Coarse	TOS	TOS	0.064	0.139	3.23	3.77	380.13	377.00	0.55	1.65	0.270	0.298
2007190189	2007191542	Fine	Fine	TOS	TOS	0.072	0.123	3.29	3.10	379.97	353.20	0.55	1.76	0.249	0.275
2007190189	2007191542	Coarse	Coarse	BOS	BOS	0.038	0.196	3.99	4.37	403.44	406.90	0.55	1.59	0.280	0.294
2007190189	2007191542	Fine	Fine	BOS	BOS	0.077	0.152	3.79	3.39	400.56	375.50	0.55	1.26	0.259	0.290
2007190193	2007190788	Coarse	Coarse	TOS	TOS	0.057	0.015	3.14	3.40	386.64	409.30	1.34	2.50	0.368	0.590
2007190193	2007190788	Fine	Fine	TOS	TOS	0.117	0.015	4.33	3.40	366.65	407.60	1.66	2.20	0.376	0.540
2007190193	2007190788	Coarse	Coarse	BOS	BOS	0.122	0.015	5.68	3.90	446.16	421.50	2.52	2.20	0.738	0.590
2007190193	2007190788	Fine	Fine	BOS	BOS	0.133	0.015	4.57	4.50	462.74	471.80	2.11	2.30	0.456	0.620
2007190194	2007190704	Coarse	Coarse	TOS	TOS	0.110	0.141	3.94	1.82	278.96	282.50	1.25	0.55	0.237	0.195
2007190194	2007190704	Fine	Fine	TOS	TOS	0.129	0.153	4.26	1.54	286.07	277.60	1.24	1.17	0.244	0.216
2007190194	2007190704	Coarse	Coarse	BOS	BOS	0.154	0.147	4.32	3.42	339.75	342.50	1.37	2.02	0.285	0.245
2007190194	2007190704	Fine	Fine	BOS	BOS	0.148	0.123	4.14	2.89	359.33	388.70	1.88	1.82	0.283	0.253
2007190197	2007190962	Coarse	Coarse	TOS	TOS	0.050	0.077	3.31	1.69	58.19	47.18	0.55	0.55	0.098	0.086
2007190197	2007190962	Fine	Fine	TOS	TOS	0.162	0.251	3.44	1.32	270.64	244.60	0.55	0.55	0.195	0.228
2007190197	2007190962	Coarse	Coarse	BOS	BOS	0.069	0.071	6.07	4.57	123.89	76.23	0.55	0.55	0.147	0.166
2007190197	2007190962	Fine	Fine	BOS	BOS	0.104	0.203	9.75	6.24	480.02	245.30	2.77	2.01	0.430	0.345
2007190208	2007191593	Coarse	Coarse	TOS	TOS	0.060	0.464	3.58	1.01	109.20	98.81	0.55	0.55	0.010	0.115
2007190208	2007191593	Fine	Fine	TOS	TOS	0.106	0.517	3.46	0.79	146.50	136.10	0.55	0.55	0.010	0.155
2007190208	2007191593	Coarse	Coarse	BOS	BOS	0.110	0.464	3.97	1.03	759.50	369.70	0.55	0.55	0.010	0.203
2007190208	2007191593	Fine	Fine	BOS	BOS	0.098	0.528	4.59	0.98	1192.00	588.80	0.55	0.55	0.010	0.196
2007190209	2007191254	Coarse	Coarse	TOS	TOS	0.015	0.015	2.81	1.48	268.77	200.40	0.55	0.55	0.205	0.425
2007190209	2007191254	Fine	Fine	TOS	TOS	0.093	0.059	2.85	2.18	286.69	229.20	1.34	2.07	0.228	0.509
2007190209	2007191254	Coarse	Coarse	BOS	BOS	0.040	0.015	2.09	1.48	292.47	174.30	1.22	0.55	0.147	0.425
2007190209	2007191254	Fine	Fine	BOS	BOS	0.080	0.063	3.07	1.91	502.91	224.30	1.65	1.51	0.267	0.488
2007190212	2007190747	Coarse	Coarse	TOS	TOS	0.015	0.126	3.30	0.46	142.70	97.14	0.55	0.55	0.830	0.067
2007190212	2007190747	Fine	Fine	TOS	TOS	0.215	0.544	5.27	2.95	473.40	440.40	1.44	1.35	0.328	0.362
2007190212	2007190747	Coarse	Coarse	BOS	BOS	0.015	0.059	9.89	1.32	993.40	120.50	1.71	0.55	0.337	0.085
2007190212	2007190747	Fine	Fine	BOS	BOS	0.185	0.380	4.89	1.96	465.80	464.30	0.55	1.60	0.270	0.267
2007190218	2007191348	Coarse	Coarse	TOS	TOS	0.015	0.015	3.27	3.00	49.98	53.40	0.55	0.55	0.413	0.230
2007190218	2007191348	Fine	Fine	TOS	TOS	0.097	0.015	5.99	6.50	156.03	152.30	0.55	1.30	0.373	0.500
2007190218	2007191348	Coarse	Coarse	BOS	BOS	0.015	0.015	4.09	4.10	55.59	79.00	0.55	0.55	0.216	0.300
2007190218	2007191348	Fine	Fine	BOS	BOS	0.099	0.015	6.88	7.20	170.60	161.60	1.92	2.20	0.356	0.530
2007190241	2007190978	Coarse	Coarse	TOS	TOS	0.015	0.097	2.08	1.86	388.30	401.04	1.77	0.55	0.030	0.087
2007190241	2007190978	Fine	Fine	TOS	TOS	0.015	0.079	2.06	2.72	414.20	424.36	2.24	1.68	0.050	0.137
2007190241	2007190978	Coarse	Coarse	BOS	BOS	0.015	0.040	1.63	2.96	331.60	368.61	1.89	0.55	0.047	0.110
2007190241	2007190978	Fine	Fine	BOS	BOS	0.015	0.077	2.31	3.29	409.10	408.92	2.73	1.84	0.069	0.139
2007190248	2007191198	Coarse	Coarse	TOS	TOS	0.015	0.091	3.04	1.19	289.10	298.50	0.55	0.55	0.010	0.065
2007190248	2007191198	Fine	Fine	TOS	TOS	0.265	1.067	3.69	0.20	331.60	268.90	0.55	0.55	0.010	0.195
2007190248	2007191198	Coarse	Coarse	BOS	BOS	0.015	0.070	2.94	2.04	299.00	264.80	0.55	0.55	0.010	0.076
2007190248	2007191198	Fine	Fine	BOS	BOS	0.567	0.380	3.08	2.25	310.40	310.50	0.55	0.55	0.010	0.164
2007190256	2007190875	Coarse	Coarse	TOS	TOS	0.015	0.051	7.80	6.54	1230.00	1050.00	0.55	0.55	0.074	0.095
2007190256	2007190875	Fine	Fine	TOS	TOS	0.078	0.297	4.46	7.81	684.60	1069.00	1.62	1.20	0.136	0.186
2007190256	2007190875	Coarse	Coarse	BOS	BOS	0.015	0.057	4.62	5.33	615.10	684.80	1.45	0.55	0.116	0.099
2007190256	2007190875	Fine	Fine	BOS	BOS	0.066	0.239	5.28	5.76	628.90	690.10	1.14	1.11	0.140	0.158
2007190258	2007191176	Coarse	Coarse	TOS	TOS	0.015	0.015	5.46	3.30	433.98	380.10	1.76	1.30	0.166	0.170
2007190258	2007191176	Fine	Fine	TOS	TOS	0.080	0.015	7.84	4.20	514.18	442.80	2.03	2.00	0.288	0.250
2007190258	2007191176	Coarse	Coarse	BOS	BOS	0.060	0.015	5.40	2.80	393.88	385.90	1.75	1.80	0.107	0.160
2007190258	2007191176	Fine	Fine	BOS	BOS	0.192	0.015	7.71	6.00	480.62	468.30	2.42	2.70	0.237	0.300
2007190266	2007191458	Coarse	Coarse	TOS	TOS	0.015	0.015	3.45	3.52	803.60	870.00	1.22	0.55	0.077	0.098
2007190266	2007191458	Fine	Fine	TOS	TOS	0.015	0.176	6.64	6.21	808.60	717.90	1.53	1.44	0.173	0.234
2007190266	2007191458	Coarse	Coarse	BOS	BOS	0.015	0.015	1.58	1.50	841.10	1065.00	0.55	0.55	0.026	0.031
2007190266	2007191458	Fine	Fine	BOS	BOS	0.037	0.223	5.89	4.68	604.30	814.40	1.80	1.71	0.160	0.219
2007190285	2007190406	Coarse	Coarse	TOS	TOS	0.015	0.082	4.94	5.00	201.30	154.80	1.59	0.55	0.240	0.292
2007190285	2007190406	Fine	Fine	TOS	TOS	0.015	0.121	5.38	4.56	209.50	166.20	1.68	0.55	0.265	0.296
2007190285	2007190406	Coarse	Coarse	BOS	BOS	0.015	0.099	4.99	5.00	213.30	234.10	1.35	1.55	0.227	0.255
2007190285	2007190406	Fine	Fine	BOS	BOS	0.060	0.129	5.03	5.10	243.20	327.00	1.71	1.49	0.274	0.282
2007190296	2007190758	Coarse	Coarse	TOS	TOS	0.015	0.015	1.30	1.50	84.60	63.60	0.55	0.55	0.150	0.180
2007190296	2007190758	Fine	Fine	TOS	TOS	0.015	0.015	3.10	2.50	265.50	242.70	0.55	1.30	0.290	0.330
2007190296	2007190758	Coarse	Coarse	BOS	BOS	0.015	0.015	1.50	2.10	81.60	73.00	0.55	0.55	0.160	0.190
2007190296	2007190758	Fine	Fine	BOS	BOS	0.015	0.015	3.60	2.80	254.10	234.50	0.55	0.55	0.310	0.370
2007190311	2007191259	Coarse	Coarse	TOS	TOS	0.015	0.057	1.04	1.29	123.39	74.72	0.55	0.55	0.048	0.029
2007190311	2007191259	Fine	Fine	TOS	TOS	0.236	0.310	3.23	2.62	586.24	606.50	0.55	0.55	0.097	0.086
2007190311	2007191259	Coarse	Coarse	BOS	BOS	0.061	0.015	1.76	1.30	149.65	72.77	0.55	0.55	0.119	0.010
2007190311	2007191259	Fine	Fine	BOS	BOS	0.159	0.085	4.55	2.57	388.00	268.90	0.55	0.55	0.184	0.091
2007190328	2007191598	Coarse	Coarse	TOS	TOS	0.015	0.383	1.61	1.34	30.07	28.45	0.55			

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	Ag (ppm)	Ag (ppm)	As (ppm)	As (ppm)	Ba (ppm)	Ba (ppm)	Be (ppm)	Be (ppm)	Bi (ppm)	Bi (ppm)
METHOD:	METHOD:	SIZE	SIZE			ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0.030	0.030	0.40	0.40	0.50	0.50	1.10	1.10	0.020	0.020
2007190349	2007191436	Coarse	Coarse	TOS	TOS	0.015	0.015	9.76	7.76	388.12	369.60	1.88	1.40	0.250	0.275
2007190349	2007191436	Fine	Fine	TOS	TOS	0.137	0.015	13.58	11.30	391.37	365.90	1.48	1.43	0.443	0.432
2007190349	2007191436	Coarse	Coarse	BOS	BOS	0.031	0.015	10.43	8.48	384.17	376.60	2.00	1.28	0.225	0.291
2007190349	2007191436	Fine	Fine	BOS	BOS	0.080	0.015	16.01	13.40	412.84	386.60	2.16	1.83	0.569	0.419
2007190352	2007190611	Coarse	Coarse	TOS	TOS	0.066	0.042	8.19	9.41	185.48	211.65	1.98	2.66	0.196	0.237
2007190352	2007190611	Fine	Fine	TOS	TOS	0.073	0.073	10.70	15.15	185.82	215.31	3.31	2.68	0.245	0.221
2007190352	2007190611	Coarse	Coarse	BOS	BOS	0.068	0.015	22.64	22.59	228.30	196.09	1.12	1.84	0.239	0.241
2007190352	2007190611	Fine	Fine	BOS	BOS	0.037	0.038	31.57	27.16	244.21	202.89	1.41	1.50	0.241	0.255
2007190355	2007191257	Coarse	Coarse	TOS	TOS	0.015	0.069	6.47	6.70	336.49	266.00	1.15	1.12	0.298	0.299
2007190355	2007191257	Fine	Fine	TOS	TOS	0.040	0.105	7.12	8.43	289.20	243.40	1.31	2.07	0.347	0.383
2007190355	2007191257	Coarse	Coarse	BOS	BOS	0.015	0.015	13.11	14.72	209.67	201.00	1.24	1.72	0.278	0.347
2007190355	2007191257	Fine	Fine	BOS	BOS	0.045	0.015	13.94	16.82	177.58	190.70	1.30	1.75	0.361	0.383
2007190357	2007190856	Coarse	Coarse	TOS	TOS	0.111	0.053	1.07	1.11	40.28	45.33	0.55	0.55	0.065	0.102
2007190357	2007190856	Fine	Fine	TOS	TOS	0.150	0.133	2.36	1.70	147.30	144.90	0.55	0.55	0.176	0.213
2007190357	2007190856	Coarse	Coarse	BOS	BOS	0.069	0.076	1.31	1.35	170.30	334.40	0.55	0.55	0.123	0.145
2007190357	2007190856	Fine	Fine	BOS	BOS	0.192	0.124	2.66	3.03	589.50	1616.00	1.88	1.28	0.268	0.297
2007190361	2007191094	Coarse	Coarse	TOS	TOS	0.015	0.015	2.44	1.80	197.90	195.20	1.16	1.40	0.227	0.310
2007190361	2007191094	Fine	Fine	TOS	TOS	0.055	0.015	2.98	1.90	199.50	222.70	0.55	1.40	0.244	0.290
2007190361	2007191094	Fine	Fine	BOS	BOS	0.015	0.015	6.25	5.70	160.60	168.00	0.55	2.00	0.156	0.250
2007190383	2007191416	Coarse	Coarse	TOS	TOS	0.057	0.015	2.11	1.80	320.20	223.60	0.55	0.55	0.204	0.210
2007190383	2007191416	Fine	Fine	TOS	TOS	0.099	0.015	2.56	3.20	393.60	358.10	0.55	2.20	0.220	0.370
2007190383	2007191416	Coarse	Coarse	BOS	BOS	0.041	0.015	2.47	1.80	301.40	319.60	1.55	1.70	0.169	0.290
2007190383	2007191416	Fine	Fine	BOS	BOS	0.062	0.015	4.09	2.50	358.40	389.10	1.57	2.10	0.222	0.380
2007190393	2007191050	Coarse	Coarse	TOS	TOS	0.054	0.088	3.49	3.24	525.60	528.20	2.23	3.20	0.315	0.450
2007190393	2007191050	Fine	Fine	TOS	TOS	0.069	0.094	3.40	3.33	572.00	505.36	2.31	2.54	0.347	0.417
2007190393	2007191050	Coarse	Coarse	BOS	BOS	0.053	0.066	6.15	2.67	471.80	529.85	2.06	3.04	0.350	0.452
2007190393	2007191050	Fine	Fine	BOS	BOS	0.062	0.072	4.87	2.55	483.00	642.56	1.72	3.05	0.287	0.400
2007190414	2007191386	Coarse	Coarse	TOS	TOS	0.066	0.015	8.37	10.30	359.34	367.00	1.32	3.20	0.300	0.360
2007190414	2007191386	Fine	Fine	TOS	TOS	0.082	0.015	6.11	10.10	352.37	355.00	1.34	2.20	0.300	0.330
2007190414	2007191386	Coarse	Coarse	BOS	BOS	0.117	0.015	4.95	8.10	348.79	353.60	2.08	2.60	0.304	0.350
2007190414	2007191386	Fine	Fine	BOS	BOS	0.127	0.015	5.65	9.90	389.79	406.60	1.66	2.50	0.340	0.420
2007190419	2007190974	Coarse	Coarse	TOS	TOS	0.054	0.176	2.06	1.05	188.70	149.00	0.55	0.55	0.165	0.186
2007190419	2007190974	Fine	Fine	TOS	TOS	0.113	0.110	2.32	2.30	204.40	219.80	0.55	1.38	0.225	0.263
2007190419	2007190974	Coarse	Coarse	BOS	BOS	0.067	0.096	2.20	1.06	145.90	139.50	0.55	1.18	0.155	0.257
2007190419	2007190974	Fine	Fine	BOS	BOS	0.070	0.196	3.21	1.73	238.10	208.60	0.55	1.67	0.243	0.600
2007190425	2007190768	Coarse	Coarse	TOS	TOS	0.162	0.015	4.99	3.50	342.30	350.00	2.78	2.40	0.335	0.350
2007190425	2007190768	Fine	Fine	TOS	TOS	0.159	0.015	4.94	3.10	327.70	317.40	2.53	1.90	0.289	0.290
2007190425	2007190768	Coarse	Coarse	BOS	BOS	0.163	0.015	4.94	4.60	306.10	317.80	2.45	1.80	0.288	0.300
2007190425	2007190768	Fine	Fine	BOS	BOS	0.160	0.015	4.29	4.20	310.10	355.90	2.28	2.00	0.291	0.280
2007190434	2007191027	Coarse	Coarse	TOS	TOS	0.015	0.015	2.97	1.60	256.00	251.10	1.65	1.40	0.132	0.110
2007190434	2007191027	Fine	Fine	TOS	TOS	0.015	0.015	6.31	4.20	287.20	278.60	3.05	3.40	0.338	0.270
2007190434	2007191027	Coarse	Coarse	BOS	BOS	0.015	0.015	4.92	2.50	225.60	240.50	0.55	0.55	0.140	0.140
2007190434	2007191027	Fine	Fine	BOS	BOS	0.015	0.015	7.63	5.60	229.70	247.90	2.81	2.60	0.217	0.280
2007190457	2007191004	Coarse	Coarse	TOS	TOS	0.050	0.051	2.35	2.09	450.90	364.50	2.39	2.26	0.104	0.066
2007190457	2007191004	Fine	Fine	TOS	TOS	0.078	0.082	2.80	1.75	499.70	474.10	2.86	2.43	0.140	0.126
2007190457	2007191004	Coarse	Coarse	BOS	BOS	0.045	0.061	1.01	1.36	354.20	397.20	1.13	2.05	0.083	0.076
2007190457	2007191004	Fine	Fine	BOS	BOS	0.098	0.072	1.25	1.13	548.40	576.10	1.91	2.61	0.118	0.121
2007190458	2007190774	Coarse	Coarse	TOS	TOS	0.108	0.015	5.04	4.30	363.00	345.20	1.58	1.80	0.185	0.210
2007190458	2007190774	Fine	Fine	TOS	TOS	0.115	0.015	4.21	4.30	358.00	358.00	1.58	1.80	0.153	0.210
2007190458	2007190774	Coarse	Coarse	BOS	BOS	0.108	0.015	5.10	3.50	363.00	342.50	1.51	1.40	0.212	0.170
2007190458	2007190774	Fine	Fine	BOS	BOS	0.163	0.015	5.29	4.40	377.20	371.80	1.58	1.90	0.226	0.220
2007190472	2007191312	Coarse	Coarse	TOS	TOS	0.084	0.140	3.53	2.29	243.84	216.90	1.16	1.15	0.273	0.278
2007190472	2007191312	Fine	Fine	TOS	TOS	0.089	0.194	3.92	2.39	228.84	219.30	1.24	1.38	0.293	0.312
2007190472	2007191312	Coarse	Coarse	BOS	BOS	0.144	0.143	8.83	2.75	224.44	229.30	1.19	0.55	0.227	0.277
2007190472	2007191312	Fine	Fine	BOS	BOS	0.084	0.355	5.19	3.48	227.92	217.20	1.49	2.48	0.273	0.344
2007190481	2007191594	Coarse	Coarse	TOS	TOS	0.110	0.456	3.26	3.14	166.70	205.60	0.55	0.55	0.164	0.156
2007190481	2007191594	Fine	Fine	TOS	TOS	0.191	0.439	3.13	2.57	229.30	230.20	0.55	0.55	0.187	0.169
2007190481	2007191594	Coarse	Coarse	BOS	BOS	0.135	0.410	3.53	2.80	236.40	211.60	0.55	0.55	0.192	0.168
2007190481	2007191594	Fine	Fine	BOS	BOS	0.090	0.433	3.39	2.72	249.40	235.30	0.55	0.55	0.177	0.168
2007190495	2007191318	Fine	Fine	BOS	BOS	0.015	0.015	3.10	3.60	88.40	103.50	1.60	2.40	0.080	0.100
2007190497	2007190586	Coarse	Coarse	TOS	TOS	0.015	0.095	2.40	2.47	111.59	111.20	0.55	0.55	0.173	0.136
2007190497	2007190586	Fine	Fine	TOS	TOS	0.055	0.171	3.92	3.67	213.40	235.70	1.26	0.55	0.289	0.257
2007190497	2007190586	Coarse	Coarse	BOS	BOS	0.015	0.078	3.18	2.81	106.41	98.07	0.55	0.55	0.233	0.172
2007190497	2007190586	Fine	Fine	BOS	BOS	0.042	0.197	6.04	5.16	208.87	194.90	1.83	1.17	0.347	0.679
2007190506	2007190631	Coarse	Coarse	TOS	TOS	0.072	0.104	2.27	3.20	347.70	356.70	1.32	1.79	0.251	0.192
2007190506	2007190631	Fine	Fine	TOS	TOS	0.092	0.167	2.58	2.51	313.60	321.60	1.38	0.55	0.209	0.181
2007190506	2007190631	Coarse	Coarse	BOS	BOS	0.060	0.127	2.21	3.10	355.10	368.00	1.42	1.38	0.240	0.197
2007190506	2007190631	Fine	Fine	BOS	BOS	0.181	0.109	2.59	4.08	438.80	436.60	1.65	1.31	0.256	0.228
2007190508	2007191119	Coarse	Coarse	TOS	TOS	0.091	0.015	3.99	3.54	319.30	347.37	1.86	2.24	0.200	0.532
2007190508	2007191119	Fine	Fine	TOS	TOS	0.068	0.015	4.02	3.39	350.30	365.39	1.89	2.57	0.193	0.273
2007190508	2007191119	Coarse	Coarse	BOS	BOS	0.050	0.015	5.53	6.06	418.20	416.23	1.96	2.23	0.264	0.349
2007190508	2007191119	Fine	Fine	BOS	BOS	0.092	0.015	5.38	5.30	434.80	417.97	1.96	3.05	0.295	0.342
2007190526	2007191599	Coarse	Coarse	TOS	TOS	0.096	0.462	9.48	7.06	552.90	510.90	2.14	2.35	0.363	0.375
2007190526	2007191599	Fine	Fine	TOS	TOS	0.103	0.418	10.07	8.06	560.50	487.60	2.55	2.34	0.412	0.433
2007190526	2007191599	Coarse	Coarse	BOS	BOS	0.081	0.413	12.01	8.85	5					

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	Ag (ppm)	Ag (ppm)	As (ppm)	As (ppm)	Ba (ppm)	Ba (ppm)	Be (ppm)	Be (ppm)	Bi (ppm)	Bi (ppm)
METHOD:	METHOD:	SIZE	SIZE			ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
L.L.D.	L.L.D.					0.030	0.030	0.40	0.40	0.50	0.50	1.10	1.10	0.020	0.020
2007190534	2007191522	Coarse	Coarse	BOS	BOS	0.064	0.324	2.82	0.20	435.40	367.10	0.55	0.55	0.111	0.033
2007190534	2007191522	Fine	Fine	BOS	BOS	0.259	0.719	5.37	2.03	648.00	559.50	2.00	1.60	0.239	0.229
2007190536	2007190909	Coarse	Coarse	TOS	TOS	0.062	0.102	2.42	2.12	308.30	293.20	0.55	0.55	0.099	0.089
2007190536	2007190909	Fine	Fine	TOS	TOS	0.604	0.577	3.17	2.97	327.90	314.40	0.55	0.55	0.210	0.215
2007190536	2007190909	Coarse	Coarse	BOS	BOS	0.072	0.105	3.56	3.19	305.80	299.40	0.55	0.55	0.115	0.107
2007190536	2007190909	Fine	Fine	BOS	BOS	0.465	0.527	7.04	6.47	335.90	349.40	0.55	1.41	0.245	0.218
2007190548	2007191236	Coarse	Coarse	TOS	TOS	0.227	0.040	3.66	0.68	925.40	858.20	3.00	1.48	0.231	0.270
2007190548	2007191236	Fine	Fine	TOS	TOS	0.261	0.118	4.76	0.76	932.00	853.80	3.42	1.46	0.303	0.392
2007190548	2007191236	Coarse	Coarse	BOS	BOS	0.197	0.045	3.91	0.91	865.50	802.50	3.17	1.96	0.269	0.307
2007190548	2007191236	Fine	Fine	BOS	BOS	0.279	0.105	6.18	2.79	892.80	837.50	3.18	2.53	0.432	0.792
2007190549	2007191507	Coarse	Coarse	TOS	TOS	0.015	0.061	3.33	2.85	142.64	177.50	0.55	0.55	0.121	0.143
2007190549	2007191507	Fine	Fine	TOS	TOS	0.235	0.209	5.19	4.58	157.07	143.70	0.55	0.55	0.292	0.332
2007190549	2007191507	Coarse	Coarse	BOS	BOS	0.015	0.062	3.25	3.01	180.14	205.90	0.55	0.55	0.124	0.153
2007190549	2007191507	Fine	Fine	BOS	BOS	0.222	0.258	5.86	5.14	297.69	161.70	0.55	1.11	0.319	0.304
2007190552	2007190675	Coarse	Coarse	TOS	TOS	0.030	0.085	1.05	0.59	152.80	159.20	0.55	0.55	0.066	0.056
2007190552	2007190675	Fine	Fine	TOS	TOS	0.245	0.196	2.64	3.18	350.60	341.10	3.25	3.16	0.273	0.267
2007190552	2007190675	Coarse	Coarse	BOS	BOS	0.052	0.078	2.03	1.30	144.90	164.90	3.39	2.78	0.161	0.152
2007190552	2007190675	Fine	Fine	BOS	BOS	0.294	0.158	7.56	4.73	204.90	218.60	11.06	9.15	0.639	0.402
2007190554	2007190752	Coarse	Coarse	TOS	TOS	0.054	0.015	1.97	2.60	37.60	69.40	0.55	0.55	0.114	0.200
2007190554	2007190752	Fine	Fine	TOS	TOS	0.189	0.015	3.83	4.10	83.81	115.90	1.26	2.00	0.376	0.570
2007190554	2007190752	Coarse	Coarse	BOS	BOS	0.052	0.015	1.53	5.50	27.26	87.10	0.55	1.90	0.084	0.290
2007190554	2007190752	Fine	Fine	BOS	BOS	0.140	0.015	4.16	7.10	81.79	140.80	1.54	2.90	0.355	0.480
2007190583	2007191063	Coarse	Coarse	TOS	TOS	0.093	0.084	2.23	3.09	200.60	192.50	1.73	0.55	0.202	0.250
2007190583	2007191063	Fine	Fine	TOS	TOS	0.127	0.144	2.78	3.18	277.60	232.40	2.25	1.12	0.317	0.318
2007190583	2007191063	Coarse	Coarse	BOS	BOS	0.068	0.087	4.46	4.99	263.40	262.30	2.69	2.37	0.300	0.378
2007190583	2007191063	Fine	Fine	BOS	BOS	0.120	0.110	5.57	5.40	318.00	290.00	2.64	2.29	0.406	0.452
2007190618	2007191166	Coarse	Coarse	TOS	TOS	0.015	0.015	2.38	1.70	371.31	369.30	1.31	1.40	0.091	0.120
2007190618	2007191166	Fine	Fine	TOS	TOS	0.035	0.015	3.60	1.50	337.44	352.30	1.10	1.50	0.088	0.160
2007190618	2007191166	Coarse	Coarse	BOS	BOS	0.015	0.015	3.26	1.30	403.81	397.80	1.49	1.30	0.084	0.120
2007190618	2007191166	Fine	Fine	BOS	BOS	0.015	0.015	3.46	2.00	363.92	350.90	1.84	1.40	0.121	0.150
2007190647	2007191525	Coarse	Coarse	TOS	TOS	0.235	0.053	6.86	5.22	286.50	199.00	0.55	0.55	0.720	0.234
2007190647	2007191525	Fine	Fine	TOS	TOS	0.175	0.212	9.38	9.04	397.90	355.70	1.82	1.46	0.627	0.602
2007190647	2007191525	Coarse	Coarse	BOS	BOS	0.150	0.099	7.35	5.06	284.40	210.80	1.39	0.55	0.481	0.262
2007190647	2007191525	Fine	Fine	BOS	BOS	0.227	0.176	10.36	8.47	398.80	381.20	2.76	1.24	0.719	0.564
2007190659	2007190739	Coarse	Coarse	TOS	TOS	0.015	0.015	0.65	0.50	59.13	42.20	0.55	1.50	0.108	0.100
2007190659	2007190739	Fine	Fine	TOS	TOS	0.015	0.015	2.52	1.00	200.93	193.60	1.63	2.30	0.276	0.290
2007190659	2007190739	Coarse	Coarse	BOS	BOS	0.015	0.015	1.87	0.70	70.42	54.20	0.55	1.40	0.164	0.090
2007190659	2007190739	Fine	Fine	BOS	BOS	0.015	0.015	5.01	2.50	131.28	163.10	1.92	4.30	0.323	0.300
2007190661	2007191334	Coarse	Coarse	TOS	TOS	0.015	0.050	0.20	1.57	245.95	248.80	0.55	0.55	0.071	0.126
2007190661	2007191334	Fine	Fine	TOS	TOS	0.059	0.248	1.34	1.39	344.89	342.60	0.55	2.36	0.119	0.120
2007190661	2007191334	Coarse	Coarse	BOS	BOS	0.015	0.015	1.01	2.07	260.86	229.00	0.55	1.29	0.082	0.071
2007190661	2007191334	Fine	Fine	BOS	BOS	0.040	0.148	1.70	2.91	345.25	306.90	1.62	1.85	0.147	0.138
2007190686	2007191430	Coarse	Coarse	TOS	TOS	0.120	0.063	0.20	1.46	87.43	99.65	1.24	1.66	0.287	0.311
2007190686	2007191430	Fine	Fine	TOS	TOS	0.272	0.293	0.55	0.20	276.40	270.80	3.03	2.15	0.685	0.704
2007190686	2007191430	Coarse	Coarse	BOS	BOS	0.132	0.049	1.05	1.89	75.77	95.36	0.55	0.55	0.306	0.422
2007190686	2007191430	Fine	Fine	BOS	BOS	0.161	0.172	1.61	2.64	177.80	180.20	1.59	1.68	0.741	0.866
2007190695	2007190924	Coarse	Coarse	TOS	TOS	0.073	0.060	2.53	2.60	71.95	69.90	0.55	0.55	0.161	0.142
2007190695	2007190924	Fine	Fine	TOS	TOS	0.163	0.191	5.56	4.67	175.10	171.90	0.55	0.55	0.324	0.260
2007190695	2007190924	Coarse	Coarse	BOS	BOS	0.066	0.065	5.48	5.59	93.82	99.86	1.31	0.55	0.267	0.218
2007190695	2007190924	Fine	Fine	BOS	BOS	0.137	0.129	10.22	9.58	165.90	175.80	1.72	2.04	0.401	0.339
2007190698	2007190813	Coarse	Coarse	TOS	TOS	0.091	0.015	4.69	3.40	381.73	320.60	2.52	2.40	0.378	0.350
2007190698	2007190813	Fine	Fine	TOS	TOS	0.093	0.015	4.16	3.40	384.08	316.50	2.35	2.20	0.339	0.350
2007190698	2007190813	Coarse	Coarse	BOS	BOS	0.048	0.015	5.59	4.90	477.19	516.00	2.75	2.60	0.448	0.460
2007190698	2007190813	Fine	Fine	BOS	BOS	0.077	0.015	5.01	4.70	529.15	545.00	2.78	2.90	0.404	0.460
2007190732	2007191450	Coarse	Coarse	TOS	TOS	0.015	0.015	2.40	2.90	296.60	276.90	0.55	1.30	0.190	0.110
2007190732	2007191450	Fine	Fine	TOS	TOS	0.015	0.015	2.40	2.90	309.80	299.70	0.55	1.60	2.280	0.140
2007190732	2007191450	Coarse	Coarse	BOS	BOS	0.015	0.015	2.40	2.70	359.70	323.50	0.55	0.55	0.200	0.070
2007190732	2007191450	Fine	Fine	BOS	BOS	0.015	0.015	3.70	3.60	476.10	511.10	1.20	1.80	0.230	0.150
2007190735	2007191549	Coarse	Coarse	TOS	TOS	0.015	0.015	3.70	2.90	339.70	370.70	1.10	4.30	0.300	0.270
2007190735	2007191549	Fine	Fine	TOS	TOS	0.015	0.015	3.70	3.10	321.60	344.60	3.20	3.70	0.210	0.240
2007190735	2007191549	Coarse	Coarse	BOS	BOS	0.015	0.015	3.60	3.00	365.70	369.30	3.60	4.30	0.230	0.270
2007190735	2007191549	Fine	Fine	BOS	BOS	0.015	0.015	3.00	2.80	372.40	381.70	6.00	4.40	0.230	0.240
2007190743	2007190906	Coarse	Coarse	TOS	TOS	0.054	0.096	5.04	5.55	367.20	395.10	0.55	1.56	0.278	0.287
2007190743	2007190906	Fine	Fine	TOS	TOS	0.115	0.162	6.35	6.99	404.30	412.80	2.19	2.08	0.395	0.392
2007190743	2007190906	Coarse	Coarse	BOS	BOS	0.085	0.106	7.44	6.91	452.60	416.70	0.55	1.67	0.279	0.298
2007190743	2007190906	Fine	Fine	BOS	BOS	0.105	0.147	8.64	8.74	625.80	588.90	2.56	2.70	0.452	0.375
2007190746	2007191241	Coarse	Coarse	TOS	TOS	0.067	0.601	1.39	2.38	219.30	257.00	0.55	1.50	0.070	0.094
2007190746	2007191241	Fine	Fine	TOS	TOS	0.320	0.791	2.07	2.41	313.80	316.00	0.55	1.72	0.128	0.136
2007190746	2007191241	Coarse	Coarse	BOS	BOS	0.113	0.668	1.79	2.43	226.10	263.70	0.55	1.79	0.086	0.424
2007190746	2007191241	Fine	Fine	BOS	BOS	0.241	0.711	3.13	2.66	302.20	319.50	0.55	1.77	0.164	0.143
2007190753	2007191299	Coarse	Coarse	TOS	TOS	0.015	0.015	3.90	3.80	401.70	347.50	2.00	1.80	0.280	0.480
2007190753	2007191299	Fine	Fine	TOS	TOS	0.015	0.015	4.50	3.70	389.70	341.40	1.80	2.40	0.320	0.440
2007190753	2007191299	Coarse	Coarse	BOS	BOS	0.015	0.015	3.40	4.30	378.90	356.60	1.80	2.10	0.290	0.260
2007190753	2007191299	Fine	Fine	BOS	BOS	0.015	0.015	4.30	3.80	449.10	357.60	1.80	2.70	0.290	0.280
2007190798	2007191229	Coarse	Coarse	TOS	TOS	0.086	0.098	0.55	0.20	35.37	40.59	0.55	0.5		

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	Ag (ppm)	Ag (ppm)	As (ppm)	As (ppm)	Ba (ppm)	Ba (ppm)	Be (ppm)	Be (ppm)	Bi (ppm)	Bi (ppm)
METHOD:	METHOD:	SIZE	SIZE			ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:					0.030	0.030	0.40	0.40	0.50	0.50	1.10	1.10	0.020	0.020
2007190826	2007191052	Coarse	Coarse	TOS	TOS	0.073	0.031	1.54	1.12	110.00	127.70	0.55	0.55	0.150	0.172
2007190826	2007191052	Fine	Fine	TOS	TOS	0.186	0.165	2.56	3.13	250.80	258.20	0.55	0.55	0.300	0.330
2007190826	2007191052	Coarse	Coarse	BOS	BOS	0.100	0.015	1.82	1.63	104.00	104.20	0.55	0.55	0.275	0.164
2007190826	2007191052	Fine	Fine	BOS	BOS	0.163	0.181	4.32	2.92	245.60	247.00	1.19	1.53	0.351	0.321
2007190834	2007190889	Coarse	Coarse	TOS	TOS	0.015	0.015	1.88	1.80	353.00	370.90	0.55	0.55	0.052	0.070
2007190834	2007190889	Fine	Fine	TOS	TOS	0.251	0.015	9.23	9.40	608.00	507.90	0.55	1.30	0.234	0.230
2007190834	2007190889	Coarse	Coarse	BOS	BOS	0.015	0.015	1.05	0.70	363.50	342.10	0.55	0.55	0.031	0.020
2007190834	2007190889	Fine	Fine	BOS	BOS	0.369	0.015	6.90	6.90	639.00	576.80	0.55	1.40	0.501	0.220
2007190849	2007191277	Coarse	Coarse	TOS	TOS	0.015	0.070	3.50	3.53	230.80	284.20	1.50	1.16	0.200	0.194
2007190849	2007191277	Fine	Fine	TOS	TOS	0.015	0.148	4.00	2.97	226.90	313.50	1.90	1.67	0.220	0.226
2007190849	2007191277	Coarse	Coarse	BOS	BOS	0.015	0.086	3.30	3.68	356.00	364.70	1.30	0.55	0.190	0.185
2007190849	2007191277	Fine	Fine	BOS	BOS	0.015	0.102	4.10	4.37	361.70	387.70	1.80	1.73	0.220	0.213
2007190853	2007190939	Coarse	Coarse	TOS	TOS	0.092	0.015	3.75	2.40	363.80	372.60	0.55	0.55	0.182	0.110
2007190853	2007190939	Fine	Fine	TOS	TOS	0.119	0.015	5.77	5.30	474.40	623.60	0.55	1.10	0.271	0.270
2007190853	2007190939	Coarse	Coarse	BOS	BOS	0.086	0.015	1.68	2.00	493.80	429.10	0.55	0.55	0.052	0.120
2007190853	2007190939	Fine	Fine	BOS	BOS	0.086	0.015	6.39	6.10	397.20	398.80	1.13	1.60	0.249	0.300
2007190865	2007191183	Coarse	Coarse	TOS	TOS	0.015	0.470	1.47	0.87	238.50	236.30	0.55	0.55	0.031	0.031
2007190865	2007191183	Fine	Fine	TOS	TOS	0.273	0.840	5.44	3.92	419.70	389.00	1.40	0.55	0.209	0.249
2007190865	2007191183	Coarse	Coarse	BOS	BOS	0.015	0.485	1.41	0.96	238.40	236.80	0.55	0.55	0.052	0.049
2007190865	2007191183	Fine	Fine	BOS	BOS	0.443	0.903	4.00	3.31	383.90	403.80	0.55	1.16	0.221	0.244
2007190874	2007191297	Coarse	Coarse	TOS	TOS	0.049	0.161	2.76	3.86	126.90	145.80	0.55	1.23	0.179	0.423
2007190874	2007191297	Fine	Fine	TOS	TOS	0.134	0.171	3.63	4.35	262.20	240.00	1.52	1.76	0.294	0.550
2007190874	2007191297	Coarse	Coarse	BOS	BOS	0.074	0.098	4.19	3.41	102.70	169.10	0.55	0.55	0.204	0.477
2007190874	2007191297	Fine	Fine	BOS	BOS	0.171	0.207	4.17	3.31	256.10	264.60	1.31	1.41	0.339	0.635
2007190887	2007191058	Coarse	Coarse	TOS	TOS	0.133	0.109	5.19	3.66	468.50	470.50	2.80	3.03	0.432	0.568
2007190887	2007191058	Fine	Fine	TOS	TOS	0.110	0.146	4.61	3.21	421.40	443.10	2.64	2.70	0.422	0.518
2007190887	2007191058	Coarse	Coarse	BOS	BOS	0.098	0.094	3.22	3.49	437.40	457.70	2.41	3.73	0.441	0.644
2007190887	2007191058	Fine	Fine	BOS	BOS	0.123	0.091	3.47	3.17	404.50	438.80	2.50	3.48	0.408	0.571
2007190895	2007190947	Coarse	Coarse	TOS	TOS	0.074	0.015	2.94	1.90	306.10	344.60	2.32	1.40	0.207	0.210
2007190895	2007190947	Fine	Fine	TOS	TOS	0.105	0.015	3.14	1.70	334.35	327.40	2.06	1.40	0.197	0.250
2007190895	2007190947	Coarse	Coarse	BOS	BOS	0.082	0.015	2.78	2.40	350.15	374.60	2.55	1.70	0.192	0.220
2007190895	2007190947	Fine	Fine	BOS	BOS	0.084	0.015	2.42	2.50	365.95	442.80	1.97	1.20	0.181	0.200
2007190896	2007191441	Coarse	Coarse	TOS	TOS	0.045	0.389	2.49	4.17	590.44	530.70	1.20	1.57	0.191	0.317
2007190896	2007191441	Fine	Fine	TOS	TOS	0.172	0.443	6.19	7.82	506.11	364.20	3.04	2.14	0.483	0.565
2007190896	2007191441	Coarse	Coarse	BOS	BOS	0.015	0.344	2.50	4.44	606.79	538.00	1.48	0.55	0.185	0.333
2007190896	2007191441	Fine	Fine	BOS	BOS	0.165	0.412	6.17	7.46	550.51	343.30	2.60	2.62	0.460	0.593
2007190922	2007191082	Coarse	Coarse	TOS	TOS	0.037	0.015	8.98	1.20	153.80	68.20	0.55	0.55	0.055	0.120
2007190922	2007191082	Fine	Fine	TOS	TOS	0.240	0.015	40.74	14.50	324.20	203.10	1.40	1.90	0.188	0.230
2007190922	2007191082	Coarse	Coarse	BOS	BOS	0.051	0.015	34.56	35.30	202.40	191.90	0.55	0.55	0.095	0.110
2007190922	2007191082	Fine	Fine	BOS	BOS	0.110	0.015	62.66	78.00	318.60	250.90	1.22	1.80	0.210	0.250
2007190927	2007191444	Coarse	Coarse	TOS	TOS	0.081	0.424	12.95	15.62	500.42	514.50	2.53	1.76	0.329	0.310
2007190927	2007191444	Fine	Fine	TOS	TOS	0.157	0.448	20.00	19.70	532.46	532.10	2.73	2.20	0.445	0.388
2007190927	2007191444	Coarse	Coarse	BOS	BOS	0.092	0.436	14.71	16.73	504.17	520.20	2.24	1.68	0.508	0.367
2007190927	2007191444	Fine	Fine	BOS	BOS	0.158	0.471	18.91	19.37	521.10	531.50	2.22	2.04	0.580	0.609
2007190949	2007191504	Coarse	Coarse	TOS	TOS	0.106	0.015	4.00	3.80	738.65	794.30	2.62	2.10	0.274	0.270
2007190949	2007191504	Fine	Fine	TOS	TOS	0.164	0.015	4.22	3.70	448.85	453.10	3.17	3.30	0.609	0.350
2007190949	2007191504	Coarse	Coarse	BOS	BOS	0.015	0.015	4.17	4.10	738.18	685.90	2.59	2.20	0.243	0.250
2007190949	2007191504	Fine	Fine	BOS	BOS	0.063	0.015	4.59	4.20	378.62	361.90	2.56	3.10	0.290	0.260
2007190968	2007191437	Coarse	Coarse	TOS	TOS	0.162	0.015	1.36	0.62	602.70	667.40	0.55	0.55	0.094	0.121
2007190968	2007191437	Fine	Fine	TOS	TOS	0.223	0.015	2.38	1.26	339.90	311.90	0.55	0.55	0.177	0.195
2007190968	2007191437	Coarse	Coarse	BOS	BOS	0.130	0.015	3.52	1.87	745.40	647.60	0.55	0.55	0.142	0.207
2007190968	2007191437	Fine	Fine	BOS	BOS	0.148	0.149	5.37	2.88	1139.00	453.10	1.36	1.99	0.212	0.590
2007190970	2007191245	Coarse	Coarse	TOS	TOS	0.015	1.080	112.70	229.50	161.70	169.40	7.30	14.40	8.790	15.590
2007190970	2007191245	Fine	Fine	TOS	TOS	0.015	0.830	80.30	176.00	161.30	192.70	9.60	16.40	7.000	14.700
2007190970	2007191245	Coarse	Coarse	BOS	BOS	0.015	0.015	41.60	4.80	178.80	89.50	2.40	0.55	3.280	0.210
2007190970	2007191245	Fine	Fine	BOS	BOS	0.015	0.015	42.20	8.80	186.00	184.80	2.30	1.40	3.710	0.410
2007190986	2007191592	Coarse	Coarse	TOS	TOS	0.085	0.361	1.36	0.69	499.50	488.60	1.67	0.55	0.114	0.127
2007190986	2007191592	Fine	Fine	TOS	TOS	0.425	0.677	0.79	0.20	405.50	367.90	1.72	0.55	0.233	0.226
2007190986	2007191592	Coarse	Coarse	BOS	BOS	0.083	0.407	1.20	0.20	533.20	513.30	1.86	1.70	0.098	0.142
2007190986	2007191592	Fine	Fine	BOS	BOS	0.254	0.517	1.11	0.45	478.00	452.40	1.53	1.64	0.207	0.232
2007190990	2007191537	Coarse	Coarse	TOS	TOS	0.097	0.133	3.81	3.13	348.80	325.10	2.21	2.54	0.664	0.849
2007190990	2007191537	Fine	Fine	TOS	TOS	0.140	0.183	3.58	2.69	328.00	317.80	2.83	2.38	0.675	0.720
2007190990	2007191537	Coarse	Coarse	BOS	BOS	0.098	0.101	2.27	2.20	235.60	183.20	1.67	0.55	0.443	0.367
2007190990	2007191537	Fine	Fine	BOS	BOS	0.138	0.214	2.25	2.23	305.60	261.50	2.16	1.79	0.639	0.669
2007191007	2007191551	Coarse	Coarse	TOS	TOS	0.080	0.332	2.07	0.20	272.70	266.00	1.20	0.55	0.066	0.012
2007191007	2007191551	Fine	Fine	TOS	TOS	0.216	0.433	2.72	0.20	408.60	379.60	1.86	0.55	0.128	0.091
2007191007	2007191551	Coarse	Coarse	BOS	BOS	0.076	0.330	2.31	0.51	265.40	277.60	1.34	0.55	0.076	0.010
2007191007	2007191551	Fine	Fine	BOS	BOS	0.209	0.398	3.35	1.68	372.00	379.10	2.30	0.55	0.200	0.090
2007191028	2007191531	Coarse	Coarse	TOS	TOS	0.052	0.347	3.54	1.24	111.38	89.64	0.55	0.55	0.190	0.071
2007191028	2007191531	Fine	Fine	TOS	TOS	0.112	0.441	5.49	2.56	182.12	157.90	1.51	1.11	0.342	0.234
2007191028	2007191531	Coarse	Coarse	BOS	BOS	0.078	0.311	3.77	0.82	146.33	90.63	0.55	0.55	0.202	0.065
2007191028	2007191531	Fine	Fine	BOS	BOS	0.091	0.401	4.49	3.15	195.27	177.80	1.34	1.23	0.357	0.271
2007191051	2007191331	Coarse	Coarse	TOS	TOS	0.096	0.154	1.77	3.03	349.70	356.80	0.55	2.26	0.158	0.171
2007191051	2007191331	Fine	Fine	TOS	TOS	0.194	0.165	1.70	2.84	339.07	355.10	1.66	1.39	0.424	0.165
2007191051	2007191331	Coarse	Coarse	BOS	BOS	0.077	0.109	2.13							

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	GRAIN	GRAIN	DEPTH	DEPTH	Ag (ppm)	Ag (ppm)	As (ppm)	As (ppm)	Ba (ppm)	Ba (ppm)	Be (ppm)	Be (ppm)	Bi (ppm)	Bi (ppm)
METHOD:	METHOD:	SIZE	SIZE			ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
L1D:	L1D:					0.030	0.030	0.40	0.40	0.50	0.50	1.10	1.10	0.020	0.020
2007191134	2007191282	Coarse	Coarse	BOS	BOS	0.054	0.015	2.20	0.20	225.70	386.20	1.55	1.60	0.080	0.090
2007191134	2007191282	Fine	Fine	BOS	BOS	0.057	0.015	2.71	2.10	203.30	363.20	1.98	3.20	0.100	0.180
2007191152	2007191578	Coarse	Coarse	TOS	TOS	0.015	0.392	2.73	0.42	227.55	211.30	0.55	0.55	0.192	0.170
2007191152	2007191578	Fine	Fine	TOS	TOS	0.075	0.502	4.70	1.37	258.54	243.80	0.55	1.10	0.320	0.295
2007191152	2007191578	Coarse	Coarse	BOS	BOS	0.015	0.127	5.26	3.21	165.00	193.70	0.55	1.39	0.235	0.276
2007191152	2007191578	Fine	Fine	BOS	BOS	0.015	0.173	6.11	4.98	207.18	196.50	1.51	1.91	0.409	0.365
2007191168	2007191195	Coarse	Coarse	TOS	TOS	0.082	0.040	1.99	3.11	286.00	272.60	1.48	1.31	0.258	0.223
2007191168	2007191195	Fine	Fine	TOS	TOS	0.111	0.146	3.95	5.39	378.90	350.80	1.87	2.15	0.392	0.342
2007191168	2007191195	Coarse	Coarse	BOS	BOS	0.088	0.074	3.29	4.16	295.90	301.50	1.30	2.06	0.269	0.238
2007191168	2007191195	Fine	Fine	BOS	BOS	0.157	0.106	5.44	6.66	413.60	417.00	1.98	2.69	0.424	0.375
2007191192	2007191339	Coarse	Coarse	TOS	TOS	0.080	0.042	3.84	2.84	529.50	546.10	2.35	2.53	0.303	0.331
2007191192	2007191339	Fine	Fine	TOS	TOS	0.115	0.110	5.06	4.39	516.20	515.60	3.13	3.06	0.448	0.395
2007191192	2007191339	Coarse	Coarse	BOS	BOS	0.015	0.064	5.00	3.84	550.00	546.50	2.55	2.76	0.365	0.355
2007191192	2007191339	Fine	Fine	BOS	BOS	0.118	0.078	7.42	5.65	514.40	527.50	2.89	3.32	0.450	0.481
2007191215	2007191281	Coarse	Coarse	TOS	TOS	0.106	0.161	1.20	2.03	277.50	259.00	0.55	0.55	0.092	0.293
2007191215	2007191281	Fine	Fine	TOS	TOS	0.204	0.275	1.72	2.63	409.00	376.70	0.55	0.55	0.206	0.399
2007191215	2007191281	Coarse	Coarse	BOS	BOS	0.074	0.128	2.11	2.14	258.50	253.20	0.55	0.55	0.107	0.289
2007191215	2007191281	Fine	Fine	BOS	BOS	0.241	0.288	2.77	2.62	366.90	354.80	0.55	0.55	0.227	0.363
2007191216	2007191385	Coarse	Coarse	TOS	TOS	0.033	0.129	1.73	2.83	112.10	158.00	0.55	1.30	0.150	0.190
2007191216	2007191385	Fine	Fine	TOS	TOS	0.123	0.176	2.62	4.31	264.20	319.30	0.55	1.93	0.226	0.295
2007191216	2007191385	Coarse	Coarse	BOS	BOS	0.057	0.184	2.63	2.90	110.50	117.60	0.55	1.16	0.135	0.190
2007191216	2007191385	Fine	Fine	BOS	BOS	0.076	0.250	3.76	6.13	245.60	257.00	0.55	1.95	0.239	0.386
2007191264	2007191486	Coarse	Coarse	TOS	TOS	0.105	0.015	1.43	1.20	356.20	342.60	0.55	0.55	0.163	0.170
2007191264	2007191486	Fine	Fine	TOS	TOS	0.361	0.015	1.56	0.20	371.00	388.80	1.21	1.10	0.294	0.310
2007191264	2007191486	Coarse	Coarse	BOS	BOS	0.015	0.015	1.96	0.20	326.10	388.30	0.55	1.30	0.146	0.260
2007191264	2007191486	Fine	Fine	BOS	BOS	0.407	0.015	1.04	3.10	388.40	336.20	0.55	1.10	0.273	0.070
2007191275	2007191590	Coarse	Coarse	TOS	TOS	0.064	0.481	2.85	3.62	344.80	303.10	0.55	1.87	0.137	0.533
2007191275	2007191590	Fine	Fine	TOS	TOS	0.088	0.416	5.39	6.39	233.60	244.50	0.55	2.24	0.345	0.456
2007191275	2007191590	Coarse	Coarse	BOS	BOS	0.034	0.379	4.22	4.10	290.10	301.20	0.55	1.20	0.110	0.250
2007191275	2007191590	Fine	Fine	BOS	BOS	0.094	0.440	6.18	7.08	176.40	229.90	0.55	3.07	0.229	0.466
2007191293	2007191518	Coarse	Coarse	TOS	TOS	0.206	0.038	1.10	1.34	348.20	354.20	1.26	0.55	0.187	0.068
2007191293	2007191518	Fine	Fine	TOS	TOS	0.238	0.053	1.84	1.31	302.80	305.30	2.27	0.55	0.200	0.096
2007191293	2007191518	Coarse	Coarse	BOS	BOS	0.167	0.015	3.07	2.73	389.30	386.40	1.32	0.55	0.419	0.119
2007191293	2007191518	Fine	Fine	BOS	BOS	0.217	0.036	3.01	2.58	353.40	354.30	2.07	1.14	0.238	0.148
2007191295	2007191498	Coarse	Coarse	TOS	TOS	0.059	0.015	1.54	1.90	332.18	330.30	0.55	0.55	0.081	0.070
2007191295	2007191498	Fine	Fine	TOS	TOS	0.706	0.015	3.34	2.10	326.61	327.50	0.55	0.55	0.478	0.210
2007191295	2007191498	Coarse	Coarse	BOS	BOS	0.032	0.015	1.87	1.60	326.60	337.10	0.55	0.55	0.069	0.070
2007191295	2007191498	Fine	Fine	BOS	BOS	0.593	0.740	2.97	2.80	326.09	343.30	1.20	0.55	0.203	0.270
2007191346	2007191429	Coarse	Coarse	TOS	TOS	0.130	0.015	3.46	2.85	563.20	543.00	2.38	2.59	0.287	0.427
2007191346	2007191429	Fine	Fine	TOS	TOS	0.131	0.015	2.71	2.36	560.10	554.90	2.43	1.17	0.296	0.384
2007191346	2007191429	Coarse	Coarse	BOS	BOS	0.082	0.015	2.49	1.21	499.20	520.60	1.44	1.86	0.172	0.274
2007191346	2007191429	Fine	Fine	BOS	BOS	0.199	0.015	2.75	1.65	539.50	542.50	2.19	1.81	0.329	0.585
2007191372	2007191445	Coarse	Coarse	TOS	TOS	0.110	0.295	3.21	0.46	221.70	248.10	0.55	0.55	0.076	0.010
2007191372	2007191445	Fine	Fine	TOS	TOS	0.222	0.469	4.06	0.56	350.80	448.50	0.55	0.55	0.095	0.010
2007191372	2007191445	Coarse	Coarse	BOS	BOS	0.120	0.339	2.59	0.20	173.90	255.80	0.55	0.55	0.056	0.010
2007191372	2007191445	Fine	Fine	BOS	BOS	0.267	0.573	4.60	0.97	344.30	481.30	0.55	0.55	0.117	0.010
2007191382	2007191509	Coarse	Coarse	TOS	TOS	0.015	0.015	3.90	2.30	560.50	739.90	1.80	3.30	0.270	0.280
2007191382	2007191509	Fine	Fine	TOS	TOS	0.015	0.015	4.10	2.70	340.00	565.60	2.70	4.30	0.420	0.540
2007191382	2007191509	Coarse	Coarse	BOS	BOS	0.015	0.015	7.60	6.40	425.80	376.40	1.60	4.70	0.310	0.300
2007191382	2007191509	Fine	Fine	BOS	BOS	0.015	0.015	9.20	7.00	266.90	279.00	2.70	5.20	0.400	0.380
2007191473	2007191510	Coarse	Coarse	TOS	TOS	0.151	0.118	4.17	3.65	277.70	267.20	0.55	1.60	0.279	0.274
2007191473	2007191510	Fine	Fine	TOS	TOS	0.150	0.114	4.81	4.18	201.10	195.80	1.27	1.97	0.329	0.290
2007191473	2007191510	Coarse	Coarse	BOS	BOS	0.057	0.086	9.85	8.10	247.80	230.30	1.20	1.35	0.219	0.242
2007191473	2007191510	Fine	Fine	BOS	BOS	0.112	0.105	9.85	7.71	181.20	179.10	1.13	1.21	0.221	0.258

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Cd (ppm)	Cd (ppm)	Ce (ppm)	Ce (ppm)	Co (ppm)	Co (ppm)	Cr (ppm)	Cr (ppm)	Cs (ppm)	Cs (ppm)	Cu (ppm)	Cu (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.10	0.10	0.50	0.50	0.10	0.10	0.20	0.20
2007190003	2007190213	0.05	0.05	45.673	47.001	6.15	5.72	40.91	45.21	2.85	2.88	13.45	14.41
2007190003	2007190213	0.31	0.05	114.789	107.174	13.31	11.87	85.12	79.10	4.87	4.88	29.44	27.17
2007190003	2007190213	0.10	0.05	43.482	44.700	6.16	6.32	38.74	43.20	3.01	2.99	14.76	15.01
2007190003	2007190213	0.12	0.11	74.745	83.607	11.55	11.66	71.55	77.91	4.84	5.05	27.61	28.18
2007190005	2007191059	0.34	0.05	47.360	48.100	14.26	15.89	62.47	63.00	1.84	2.14	10.63	12.17
2007190005	2007191059	0.43	0.05	64.710	63.300	23.97	22.84	104.50	105.80	2.36	2.45	20.13	17.94
2007190005	2007191059	0.36	0.05	44.880	45.720	9.87	14.89	50.81	61.50	1.64	2.08	8.19	10.49
2007190005	2007191059	0.48	0.05	98.090	80.270	25.02	27.28	109.20	144.70	2.71	2.32	15.26	17.88
2007190032	2007190632	0.32	0.17	72.122	71.540	13.47	14.63	88.82	86.12	4.94	4.84	15.84	17.29
2007190032	2007190632	0.49	0.17	90.424	83.070	13.63	15.67	106.35	105.60	5.85	5.57	18.21	19.74
2007190032	2007190632	0.30	0.05	70.826	72.250	16.72	18.91	98.54	105.70	5.62	5.94	16.26	21.98
2007190032	2007190632	0.34	0.05	88.458	84.440	18.44	18.97	122.16	121.20	7.22	6.67	19.11	23.82
2007190035	2007190876	0.17	0.05	44.481	48.620	6.01	5.40	33.19	36.08	2.39	2.62	7.00	8.86
2007190035	2007190876	0.05	0.05	82.306	102.100	8.98	10.06	54.30	58.88	3.42	3.43	9.68	12.53
2007190035	2007190876	0.05	0.05	52.743	52.640	9.42	7.47	44.73	43.86	4.52	4.43	16.07	16.64
2007190035	2007190876	0.05	0.05	88.603	83.890	17.82	12.49	68.73	64.52	7.47	6.21	29.27	23.23
2007190039	2007190984	0.05	0.05	49.968	24.130	7.61	3.71	76.97	53.12	1.56	0.73	16.54	8.57
2007190039	2007190984	0.13	0.20	98.549	77.970	14.94	12.86	129.15	116.00	2.62	2.51	33.71	23.79
2007190039	2007190984	0.05	0.05	63.290	74.960	13.03	14.98	104.17	109.50	3.47	3.89	30.96	33.45
2007190039	2007190984	0.22	0.05	92.288	97.620	17.76	22.32	133.99	131.70	5.65	4.80	41.89	38.91
2007190050	2007191481	0.05	0.05	18.351	20.450	3.22	3.70	57.00	65.30	4.34	4.49	6.77	5.70
2007190050	2007191481	0.21	0.05	64.402	68.990	11.77	12.40	178.03	191.50	4.07	4.03	21.03	20.70
2007190050	2007191481	0.05	0.05	22.854	23.310	4.37	4.10	72.61	81.80	4.77	4.65	8.67	8.10
2007190050	2007191481	0.05	0.05	66.162	68.730	10.90	10.60	210.48	217.10	4.76	4.74	22.00	19.30
2007190067	2007191121	0.32	0.05	11.594	9.617	5.44	4.29	375.61	374.60	1.00	0.97	10.36	6.92
2007190067	2007191121	0.34	0.10	31.841	26.220	14.33	12.10	783.53	755.80	1.60	1.62	21.29	17.01
2007190067	2007191121	0.35	0.05	13.926	11.180	7.81	6.31	409.43	468.10	1.25	1.18	19.32	13.03
2007190067	2007191121	0.39	0.05	34.199	28.690	16.50	14.60	552.98	626.40	2.40	2.17	41.27	29.54
2007190071	2007190289	0.32	0.05	22.556	17.803	1.48	1.28	12.68	11.86	0.17	0.20	3.55	4.24
2007190071	2007190289	0.43	0.05	130.371	109.156	6.04	4.24	38.79	36.45	0.64	0.72	6.61	8.76
2007190071	2007190289	0.26	0.05	91.404	193.375	19.43	19.23	40.04	38.16	1.00	0.99	14.31	14.16
2007190071	2007190289	0.33	0.05	241.900	558.066	56.88	56.72	92.40	95.91	2.24	2.67	34.79	33.67
2007190074	2007190389	0.05	0.05	30.858	22.595	4.88	2.18	47.89	35.85	1.71	0.89	23.05	6.61
2007190074	2007190389	0.29	0.52	79.376	87.520	8.02	6.92	75.52	66.50	2.58	2.42	17.56	15.92
2007190074	2007190389		0.05	11.726	31.883	1.33	3.71	28.77	40.36	0.80	1.06	8.92	9.53
2007190074	2007190389	0.39	0.22	61.622	63.908	5.94	7.48	57.83	60.47	2.17	2.74	14.58	19.84
2007190091	2007191053	0.05	0.05	19.100	44.630	3.34	8.37	13.11	45.05	0.88	1.81	2.16	2.79
2007190091	2007191053	0.05	0.25	114.300	105.900	16.81	15.05	109.00	112.30	2.38	2.42	12.73	9.48
2007190091	2007191053	0.05	0.05	40.540	35.800	7.20	5.19	39.77	27.74	1.54	1.38	6.45	0.58
2007190091	2007191053	0.05	0.05	118.400	41.240	12.23	10.09	93.87	35.68	2.48	2.59	12.07	6.18
2007190107	2007190913	0.05	0.05	15.574	18.824	2.25	2.58	33.13	21.26	1.01	1.10	6.48	6.60
2007190107	2007190913	0.30	0.41	72.314	75.467	10.77	10.21	76.09	69.49	2.76	3.41	18.88	25.85
2007190107	2007190913	0.05	0.05	14.306	23.223	2.60	3.74	26.37	24.12	0.94	1.64	7.44	10.14
2007190107	2007190913	0.13	0.22	62.660	83.207	8.06	13.79	72.51	78.56	1.94	5.35	19.72	26.70
2007190110	2007191182	0.05	0.16	44.259	46.630	7.06	7.90	38.17	44.40	4.37	4.75	9.70	12.90
2007190110	2007191182	0.05	0.16	85.347	89.500	11.05	13.00	72.29	80.20	4.46	5.58	15.91	20.00
2007190110	2007191182	0.11	0.10	94.988	58.490	20.86	9.10	110.37	50.10	7.06	6.01	26.93	13.60
2007190110	2007191182	0.05	0.20	98.971	98.220	19.78	14.70	117.15	75.60	5.84	7.16	30.34	22.40
2007190114	2007191045	0.14	0.05	61.432	58.001	21.98	17.44	84.81	77.15	4.63	4.33	22.69	22.19
2007190114	2007191045	0.17	0.05	66.288	60.808	18.93	16.68	90.75	92.04	4.70	4.13	25.38	19.49
2007190114	2007191045	0.10	0.05	54.345	53.536	17.52	16.44	90.32	80.65	4.18	4.25	19.83	18.58
2007190114	2007191045	0.12	0.05	65.737	59.729	18.82	16.85	96.29	80.76	4.47	4.46	22.24	21.20
2007190118	2007191552	0.05	0.05	87.583	84.200	22.29	20.76	90.10	85.29	5.33	4.44	30.95	29.62
2007190118	2007191552	0.17	0.05	84.575	74.660	20.61	17.81	87.12	73.62	4.71	3.79	30.25	24.57
2007190118	2007191552	0.12	0.05	112.898	100.600	23.68	20.55	103.53	101.90	6.38	6.01	41.53	37.89
2007190118	2007191552	0.05	0.05	97.433	78.840	20.38	14.39	96.38	92.71	5.70	5.34	33.95	32.31
2007190121	2007191545	0.05	0.05	9.846	16.980	2.13	3.80	45.57	47.20	0.66	1.22	5.29	9.00
2007190121	2007191545	0.19	0.05	42.875	59.410	7.70	12.80	74.53	92.60	2.55	4.36	16.34	24.80
2007190121	2007191545	0.05	0.05	10.786	18.510	2.46	4.20	44.94	38.00	0.79	1.55	23.49	10.10
2007190121	2007191545	0.17	0.17	44.800	47.140	7.52	10.50	73.14	68.00	2.66	4.06	15.73	21.20
2007190125	2007191532	0.14	0.05	66.467	56.660	14.05	12.10	48.53	42.21	1.97	1.39	33.55	27.04
2007190125	2007191532	0.11	0.05	90.984	103.800	15.76	16.40	62.79	62.56	2.13	1.55	38.01	37.55
2007190125	2007191532	0.14	0.05	75.390	65.240	14.59	13.81	52.05	45.45	1.97	1.57	33.14	32.18
2007190125	2007191532	0.17	0.05	108.701	108.100	16.33	18.14	68.64	63.64	2.12	1.96	41.41	45.39
2007190145	2007191105	0.05	1.22	50.375	51.940	10.77	10.60	73.72	71.70	3.23	3.36	20.91	23.00
2007190145	2007191105	0.19	1.13	52.009	50.120	11.37	10.50	78.68	78.50	3.38	3.68	21.96	24.10
2007190145	2007191105	0.05	1.10	50.637	47.680	11.53	11.00	68.42	63.00	3.15	2.90	22.82	21.20
2007190145	2007191105	0.05	1.12	50.193	47.270	11.15	10.20	79.72	72.90	3.48	3.29	23.79	21.90
2007190154	2007190568	0.05	0.05	24.970	32.830	12.18	10.12	84.59	91.13	1.03	1.22	5.92	4.40
2007190154	2007190568	0.05	0.12	27.350	36.170	10.88	9.82	80.09	88.64	0.93	1.29	5.19	3.02
2007190154	2007190568	0.05	0.13	24.220	25.170	11.28	12.83	119.00	124.00	1.20	2.33	3.52	3.40
2007190154	2007190568	0.05	0.11	28.510	27.240	11.29	13.10	115.70	130.80	1.15	1.96	3.98	3.17
2007190155	2007191031	0.05	0.05	39.810	40.172	8.26	9.03	45.68	48.55	2.78	2.73	19.21	17.48
2007190155	2007191031	0.13	0.17	58.980	63.769	11.69	13.20	65.06	67.50	3.78	3.95	26.93	27.31
2007190155	2007191031	0.10	0.12	39.010	31.643	8.40	7.13	48.41	41.45	2.84	2.03	18.37	14.69
2007190155	2007191031	0.19	0.16	63.700	65.007	13.50	17.87	82.54	116.19	4.11	4.08	29.13	29.78
2007190161	2007191413	0.05	0.05	26.257	24.560	12.66	12.07	178.24	125.10	1.87	1.80	32.17	26.84
2007190161	2007191413	0.12	0.05	43.085	40.480	19.98	18.13						

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Cd (ppm)	Cd (ppm)	Ce (ppm)	Ce (ppm)	Co (ppm)	Co (ppm)	Cr (ppm)	Cr (ppm)	Cs (ppm)	Cs (ppm)	Cu (ppm)	Cu (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.10	0.10	0.50	0.50	0.10	0.10	0.20	0.20
2007190181	2007191396	0.05	0.05	44.080	43.820	15.99	16.80	68.59	72.40	3.81	3.97	28.48	23.60
2007190181	2007191396	0.05	0.05	56.086	56.200	21.53	22.00	96.75	90.90	4.33	4.20	35.01	29.50
2007190183	2007190471	0.05	0.12	16.122	16.150	1.43	2.08	19.57	25.54	0.88	0.81	6.42	2.63
2007190183	2007190471	0.21	0.31	80.972	73.370	4.41	5.46	46.93	43.76	2.15	2.35	11.49	7.49
2007190183	2007190471	0.05	0.05	75.385	49.900	13.07	8.78	49.00	47.88	5.83	3.47	12.87	5.87
2007190183	2007190471	0.05	0.05	86.100	81.640	13.85	14.25	55.22	50.85	6.55	5.87	14.58	8.61
2007190185	2007191253	0.14	0.05	53.292	48.460	16.92	14.99	114.67	121.50	5.43	4.75	42.05	35.67
2007190185	2007191253	0.18	0.05	67.731	66.950	19.10	17.16	123.61	130.20	5.99	5.04	46.15	40.50
2007190185	2007191253	0.05	0.05	63.194	52.500	21.67	18.25	133.19	126.00	7.08	5.45	51.20	40.26
2007190185	2007191253	0.05	0.05	68.932	64.280	23.14	21.09	133.84	124.90	6.95	5.86	49.31	47.72
2007190189	2007191542	0.05	0.05	59.737	60.190	15.75	17.08	70.46	75.94	4.72	4.79	26.57	23.84
2007190189	2007191542	0.13	0.05	57.122	58.670	14.07	14.21	71.12	73.76	4.34	4.26	25.36	22.73
2007190189	2007191542	0.05	0.05	58.662	60.910	15.31	16.45	68.97	76.39	4.66	5.16	25.13	22.74
2007190189	2007191542	0.05	0.05	57.339	58.900	14.33	15.57	71.71	75.18	4.61	4.34	26.08	23.13
2007190193	2007190788	0.05	0.05	78.985	95.620	10.04	10.90	59.07	62.80	4.93	7.68	20.64	21.30
2007190193	2007190788	0.15	0.05	83.423	90.750	8.03	9.20	56.47	55.20	4.79	6.36	19.12	17.40
2007190193	2007190788	0.05	0.05	87.564	98.560	12.31	13.60	67.77	65.00	7.12	7.29	18.42	17.50
2007190193	2007190788	0.05	0.15	83.668	108.000	8.60	13.20	62.30	65.80	6.73	7.25	18.56	18.80
2007190194	2007190704	0.05	0.05	54.805	51.090	6.19	5.62	51.47	48.74	3.63	3.26	21.24	17.14
2007190194	2007190704	0.05	0.16	57.464	52.120	6.26	5.22	57.36	50.71	3.28	3.11	20.72	16.01
2007190194	2007190704	0.05	0.05	74.503	69.000	12.83	13.42	56.63	59.32	3.86	4.35	23.28	19.23
2007190194	2007190704	0.05	0.10	77.497	67.680	11.30	13.38	57.22	62.88	3.70	3.98	24.72	18.95
2007190197	2007190962	0.05	0.05	13.539	14.050	1.16	1.49	31.11	32.12	0.59	0.68	3.51	3.92
2007190197	2007190962	0.14	0.13	63.020	71.580	3.58	5.47	29.62	30.64	2.14	2.86	6.30	8.54
2007190197	2007190962	0.05	0.05	36.839	28.420	11.20	6.52	41.46	39.34	2.69	2.56	7.51	8.12
2007190197	2007190962	0.05	0.11	140.466	94.930	35.29	14.73	67.78	63.30	9.00	6.43	19.33	13.28
2007190208	2007191593	0.05	0.55	16.090	17.510	1.43	2.30	18.04	19.76	1.01	1.02	3.73	4.26
2007190208	2007191593	0.05	0.55	23.900	24.170	2.21	2.73	15.05	15.59	1.23	1.31	3.79	4.11
2007190208	2007191593	0.05	0.59	28.390	25.870	2.53	2.28	24.34	18.33	3.39	2.28	3.32	4.11
2007190208	2007191593	0.05	0.60	35.520	33.320	2.07	2.20	32.48	19.39	3.78	2.25	6.50	4.77
2007190209	2007191254	0.05	0.05	52.290	40.840	12.63	10.74	43.07	35.79	2.41	1.75	19.67	12.79
2007190209	2007191254	0.05	0.05	59.499	52.860	13.54	11.42	49.01	47.55	2.86	2.27	18.87	17.48
2007190209	2007191254	0.05	0.05	46.227	32.970	11.02	8.11	37.98	34.84	2.05	1.37	13.64	12.99
2007190209	2007191254	0.05	0.05	68.545	63.210	18.08	16.76	54.61	62.06	3.07	2.31	19.00	18.44
2007190212	2007190747	0.05	0.05	18.850	14.080	1.14	1.02	19.37	18.47	0.80	0.45	6.22	2.83
2007190212	2007190747	0.23	0.36	109.500	159.500	8.58	8.85	46.70	51.32	3.44	3.28	17.91	20.20
2007190212	2007190747	0.05	0.05	48.610	14.740	11.09	1.45	47.19	17.24	3.08	0.70	21.89	5.77
2007190212	2007190747	0.15	0.29	82.180	101.100	7.00	5.78	42.15	40.19	2.88	2.50	12.71	13.45
2007190218	2007191348	0.05	0.05	14.587	19.370	2.14	3.10	84.26	83.10	1.17	1.77	9.14	12.20
2007190218	2007191348	0.12	0.05	48.960	57.180	7.24	8.50	105.03	125.60	4.10	5.66	21.97	28.20
2007190218	2007191348	0.05	0.05	21.594	34.680	6.55	8.00	93.04	94.50	1.45	2.63	10.26	17.50
2007190218	2007191348	0.05	0.05	67.224	77.500	19.85	17.10	111.33	128.60	4.44	5.94	22.32	27.60
2007190241	2007190978	0.05	0.12	68.790	49.712	25.98	22.33	275.40	241.80	1.26	1.16	25.65	20.39
2007190241	2007190978	0.05	0.12	76.560	73.011	46.16	45.20	606.90	608.29	1.57	1.55	43.45	44.25
2007190241	2007190978	0.05	0.05	43.990	48.570	22.80	22.41	186.20	206.43	1.42	1.40	25.45	24.48
2007190241	2007190978	0.05	0.19	68.060	73.042	41.89	41.12	396.30	462.23	1.93	2.05	48.05	46.58
2007190248	2007191198	0.05	0.05	15.220	16.530	1.56	2.04	23.55	29.67	0.63	0.69	4.58	5.29
2007190248	2007191198	0.12	0.99	64.390	173.000	7.26	11.43	131.50	356.20	1.71	1.00	13.26	7.92
2007190248	2007191198	0.05	0.05	19.920	16.430	2.06	2.54	41.03	35.86	0.71	0.85	8.28	6.69
2007190248	2007191198	0.51	0.34	127.300	89.890	9.01	8.90	222.10	160.10	1.36	1.85	9.14	12.35
2007190256	2007190875	0.05	0.05	19.590	14.500	3.97	2.36	27.47	21.70	0.62	0.38	6.60	6.11
2007190256	2007190875	0.17	0.29	62.950	77.690	8.03	11.05	67.42	79.93	2.29	2.88	11.39	16.11
2007190256	2007190875	0.05	0.05	35.030	20.430	7.76	4.27	40.14	24.10	2.37	1.03	12.49	8.52
2007190256	2007190875	0.05	0.05	56.970	63.000	8.38	7.66	63.41	69.63	2.62	2.21	11.94	11.04
2007190258	2007191176	0.05	0.05	44.750	54.100	12.55	9.90	65.97	83.50	4.09	3.30	9.53	10.20
2007190258	2007191176	0.05	0.21	63.445	80.720	16.66	14.50	95.62	125.50	5.25	3.98	13.33	12.80
2007190258	2007191176	0.05	0.05	42.617	44.930	7.47	8.40	43.06	65.70	2.78	3.73	5.68	9.90
2007190258	2007191176	0.19	0.15	100.049	79.460	14.98	15.10	99.02	114.20	4.09	5.01	11.16	16.20
2007190266	2007191458	0.05	0.05	25.840	22.680	5.25	3.41	25.46	17.32	2.87	2.07	9.26	5.27
2007190266	2007191458	0.05	0.05	43.170	51.970	8.52	8.98	42.95	42.93	4.55	4.84	14.73	14.56
2007190266	2007191458	0.05	0.05	21.310	9.532	3.04	1.01	19.72	6.68	2.04	0.73	5.74	2.16
2007190266	2007191458	0.13	0.26	52.770	77.480	9.56	7.33	47.94	49.12	6.42	4.27	16.25	12.09
2007190285	2007190406	0.05	0.05	59.550	58.210	31.64	29.19	153.30	146.60	3.38	3.40	24.55	24.73
2007190285	2007190406	0.05	0.05	61.260	63.480	30.15	30.99	161.50	155.80	3.59	3.59	26.04	26.29
2007190285	2007190406	0.05	0.05	59.860	59.480	32.77	30.79	157.30	147.60	3.21	3.20	25.07	25.63
2007190285	2007190406	0.05	0.05	67.610	63.170	36.29	33.28	173.90	163.90	3.60	3.57	29.17	27.92
2007190296	2007190758	0.05	0.05	14.720	12.010	2.40	2.10	39.40	46.40	1.05	0.89	5.10	6.00
2007190296	2007190758	0.15	0.05	47.390	46.650	6.50	6.50	40.00	44.30	2.51	2.56	12.30	13.40
2007190296	2007190758	0.05	0.05	14.600	12.960	2.90	2.50	41.80	46.30	1.26	1.20	5.10	6.50
2007190296	2007190758	0.17	0.19	47.260	42.950	7.00	6.10	50.40	43.20	2.86	2.70	10.80	11.80
2007190311	2007191259	0.05	0.05	5.328	7.399	0.46	0.51	11.54	14.04	0.10	0.20	4.82	2.84
2007190311	2007191259	0.26	0.05	51.920	65.380	1.81	1.78	48.29	46.01	0.85	1.09	4.82	1.68
2007190311	2007191259	0.05	0.05	16.073	3.612	1.20	0.59	25.94	13.69	0.86	0.86	5.54	1.61
2007190311	2007191259	0.21	0.05	68.096	30.950	4.57	2.39	84.99	87.43	3.64	6.20	4.93	1.60
2007190328	2007191598	0.05	0.53	13.920	13.660	1.65	1.93	26.17	33.20	0.56	0.56	2.99	3.55
2007190328	2007191598	0.17	0.74	61.910	68.560	4.55	4.65	43.58	57.12	1.73	2.09	13.31	11.20
2007190328	2007191598	0.05	0.56	16.820	14.770	2.33	2.61	33.36	32.18	1.13	1.05	4.42	5.97
2007190328	2007191598	0.05	0.69	66.530	64.140	6.19	7.07	56.52	60.53	3.34	3.42	10.60	14.47

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Cd (ppm)	Cd (ppm)	Ce (ppm)	Ce (ppm)	Co (ppm)	Co (ppm)	Cr (ppm)	Cr (ppm)	Cs (ppm)	Cs (ppm)	Cu (ppm)	Cu (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.10	0.10	0.50	0.50	0.10	0.10	0.20	0.20
2007190349	2007191436	0.12	0.05	40.352	37.290	21.42	18.00	187.27	175.10	3.57	3.37	43.60	35.73
2007190349	2007191436	0.16	0.21	68.981	67.180	28.30	25.33	257.72	250.00	3.86	3.33	55.46	50.99
2007190349	2007191436	0.05	0.15	41.353	36.470	20.48	19.63	180.15	179.80	3.74	3.55	42.10	40.67
2007190349	2007191436	0.05	0.25	57.325	56.710	30.44	27.38	270.34	276.40	4.68	3.94	66.65	60.66
2007190352	2007190611	0.12	0.12	70.109	71.532	9.55	9.69	52.69	60.37	4.33	5.15	19.95	25.63
2007190352	2007190611	0.12	0.05	80.490	79.483	10.57	10.14	52.80	59.85	4.17	5.44	22.25	27.47
2007190352	2007190611	0.05	0.05	43.851	48.700	7.38	9.20	81.86	77.67	5.61	6.49	15.35	18.56
2007190352	2007190611	0.05	0.05	48.456	52.355	6.79	8.19	88.63	79.11	5.61	6.01	15.41	20.11
2007190355	2007191257	0.05	0.05	47.749	47.600	25.58	23.53	236.22	231.00	2.88	3.16	43.97	45.86
2007190355	2007191257	0.05	0.05	68.810	63.210	32.42	30.97	306.72	308.40	3.62	3.71	56.48	57.89
2007190355	2007191257	0.05	0.05	49.308	55.960	26.08	29.41	226.50	260.00	3.11	3.67	44.91	52.36
2007190355	2007191257	0.05	0.05	66.266	70.550	37.10	39.87	236.33	263.20	3.33	3.73	48.19	54.12
2007190357	2007190856	0.05	0.05	11.480	12.160	1.37	1.61	23.87	18.08	0.55	0.69	4.28	4.22
2007190357	2007190856	0.05	0.05	33.360	28.650	4.60	5.19	26.92	28.37	2.41	2.52	7.70	8.49
2007190357	2007190856	0.05	0.05	35.130	32.740	4.87	8.08	24.17	29.54	1.81	2.51	6.07	7.40
2007190357	2007190856	0.11	0.19	96.810	73.320	14.92	19.51	42.67	46.63	4.53	5.64	11.98	11.39
2007190361	2007191094	0.20	0.24	52.570	50.790	13.29	13.00	108.40	119.70	3.56	3.42	26.07	26.20
2007190361	2007191094	0.11	0.27	48.450	47.970	11.45	12.00	118.90	125.60	3.45	3.34	29.25	28.70
2007190361	2007191094	0.13	0.11	29.740	32.340	8.27	9.70	76.68	80.60	2.16	2.24	24.87	34.30
2007190383	2007191416	0.05	0.05	58.460	33.390	11.84	6.50	47.75	31.20	2.89	1.81	19.98	6.50
2007190383	2007191416	0.05	0.05	69.010	78.130	13.73	15.80	60.70	80.50	3.33	4.69	13.47	16.50
2007190383	2007191416	0.05	0.05	62.830	60.100	18.02	12.30	47.35	48.50	2.99	3.04	11.75	11.70
2007190383	2007191416	0.05	0.12	86.820	89.230	27.51	19.80	63.22	70.50	3.84	4.08	16.71	16.70
2007190393	2007191050	0.13	0.05	75.140	81.407	8.86	9.97	70.53	79.97	8.13	8.42	20.65	20.43
2007190393	2007191050	0.13	0.05	75.730	81.175	7.53	8.85	67.51	76.00	7.73	7.11	19.14	19.45
2007190393	2007191050	0.05	0.05	90.590	89.683	11.85	10.33	74.45	91.25	8.14	8.80	14.50	19.50
2007190393	2007191050	0.05	0.05	86.870	91.632	9.51	8.72	65.65	73.56	6.57	7.23	14.14	17.53
2007190414	2007191386	0.05	0.05	85.308	85.930	11.96	13.30	58.60	63.30	4.45	4.54	13.63	14.20
2007190414	2007191386	0.05	0.05	88.287	87.620	8.94	11.50	57.06	61.40	4.06	4.28	12.38	12.90
2007190414	2007191386	0.05	0.05	89.556	87.440	16.04	14.50	60.98	64.10	4.75	4.89	15.01	14.40
2007190414	2007191386	0.05	0.05	97.529	101.110	13.99	16.00	63.04	73.70	4.94	5.56	15.75	17.20
2007190419	2007190974	0.11	0.05	58.200	46.530	14.57	10.59	41.44	37.42	2.26	1.75	15.50	13.85
2007190419	2007190974	0.05	0.05	65.930	68.050	15.88	16.73	45.69	44.72	2.45	2.41	17.76	17.61
2007190419	2007190974	0.05	0.05	47.890	45.490	12.11	10.71	40.89	39.70	1.90	2.07	14.66	13.36
2007190419	2007190974	0.05	0.05	85.700	83.620	26.60	24.22	56.23	57.06	3.23	3.08	19.50	20.83
2007190425	2007190768	0.05	0.20	62.160	64.060	8.52	9.30	61.63	67.70	4.08	4.10	24.28	20.70
2007190425	2007190768	0.13	0.05	60.550	58.380	7.26	7.60	54.69	61.30	3.57	3.45	20.54	20.10
2007190425	2007190768	0.15	0.05	50.040	61.400	6.52	11.50	59.29	426.80	4.11	4.01	20.68	21.00
2007190425	2007190768	0.18	0.05	57.570	62.200	5.95	9.60	59.85	61.50	3.86	3.70	18.45	20.80
2007190434	2007191027	0.05	0.05	43.430	35.060	9.37	7.30	111.80	93.80	2.01	1.49	18.92	14.60
2007190434	2007191027	0.05	0.12	99.000	90.300	21.44	18.20	246.60	228.60	4.86	4.07	41.79	39.90
2007190434	2007191027	0.05	0.05	44.500	41.880	9.39	8.70	100.50	105.50	1.78	1.74	22.76	23.20
2007190434	2007191027	0.05	0.13	74.130	76.120	16.55	16.30	178.40	190.40	3.10	3.15	40.18	43.10
2007190457	2007191004	0.05	0.05	62.180	66.680	5.76	3.62	40.58	29.72	2.73	1.65	8.00	4.16
2007190457	2007191004	0.05	0.05	77.810	98.940	5.74	5.95	43.73	41.21	3.02	2.56	8.29	4.76
2007190457	2007191004	0.05	0.05	38.780	44.420	1.88	1.92	23.04	26.92	1.20	1.37	3.92	0.25
2007190457	2007191004	0.05	0.18	86.580	76.380	2.36	2.73	36.30	37.14	1.88	1.95	3.73	0.89
2007190458	2007190774	0.05	0.18	54.930	51.580	16.67	16.30	61.46	56.70	3.01	2.67	21.70	20.70
2007190458	2007190774	0.05	0.26	57.840	63.090	15.73	16.20	67.68	73.10	2.67	2.73	19.37	22.40
2007190458	2007190774	0.05	0.10	53.010	49.210	16.84	14.70	58.50	56.00	2.87	2.61	20.71	19.20
2007190458	2007190774	0.05	0.20	60.720	61.390	20.65	20.10	71.92	75.70	2.88	2.85	20.77	22.90
2007190472	2007191312	0.05	0.05	46.917	45.320	9.58	9.09	54.67	53.64	3.58	3.60	27.04	25.49
2007190472	2007191312	0.13	0.05	47.960	51.280	9.14	9.92	57.65	61.37	3.66	4.12	30.25	29.76
2007190472	2007191312	0.14	0.05	41.597	46.760	8.03	8.67	59.56	53.52	2.99	3.60	23.06	25.84
2007190472	2007191312	0.05	0.05	48.556	49.790	9.15	10.17	66.01	62.99	3.72	3.90	27.78	29.22
2007190481	2007191594	0.40	0.55	29.770	33.320	7.39	8.26	33.91	35.26	1.71	1.91	10.09	11.95
2007190481	2007191594	0.42	0.69	35.780	34.960	8.69	8.93	36.50	32.76	2.09	1.88	12.50	11.29
2007190481	2007191594	0.43	0.57	38.460	35.790	10.59	9.85	41.86	37.49	2.45	2.22	15.92	13.08
2007190481	2007191594	0.43	0.57	37.860	35.530	9.77	9.82	37.30	35.48	2.28	2.07	10.46	10.62
2007190495	2007191318	0.22	0.17	13.850	17.490	2.80	2.20	30.30	41.60	0.65	1.02	3.10	3.90
2007190497	2007190586	0.13	0.05	31.152	30.950	8.51	8.32	36.44	32.93	1.65	1.56	14.22	13.46
2007190497	2007190586	0.05	0.20	59.681	64.080	14.19	14.40	53.70	49.80	3.09	3.52	25.22	24.26
2007190497	2007190586	0.11	0.05	33.813	31.930	9.41	8.19	44.20	39.96	2.42	2.36	15.62	12.77
2007190497	2007190586	0.22	0.16	77.541	78.190	20.76	18.96	68.87	65.53	4.36	4.60	24.90	22.43
2007190506	2007190631	0.27	0.05	58.710	59.790	12.87	14.05	46.17	48.80	3.06	3.18	22.02	21.80
2007190506	2007190631	0.47	0.11	53.880	48.200	9.96	9.29	45.98	46.68	2.47	2.33	18.34	17.45
2007190506	2007190631	0.35	0.11	58.760	58.870	13.46	14.27	49.92	53.04	3.12	3.06	22.05	23.36
2007190506	2007190631	0.39	0.05	64.980	61.200	15.63	16.24	61.94	59.46	3.14	3.09	23.40	22.76
2007190508	2007191119	0.05	0.05	53.040	57.897	26.15	25.83	118.00	116.67	4.66	4.86	35.18	35.50
2007190508	2007191119	0.05	0.05	54.140	59.484	22.61	22.06	107.50	112.29	5.01	5.23	34.22	36.12
2007190508	2007191119	0.05	0.05	67.210	69.914	18.86	20.52	80.70	91.39	6.92	6.50	31.93	33.24
2007190508	2007191119	0.12	0.05	67.510	65.756	18.41	17.95	84.64	88.19	7.23	6.56	33.51	34.09
2007190526	2007191599	0.14	0.63	86.460	72.010	14.32	13.84	58.67	54.35	7.93	6.25	17.50	19.68
2007190526	2007191599	0.15	0.72	100.800	85.660	15.90	15.18	66.43	62.06	8.54	6.84	21.93	21.10
2007190526	2007191599	0.05	0.57	97.650	80.760	14.25	13.71	71.26	63.07	9.32	7.51	21.29	23.36
2007190526	2007191599	0.05	0.67	107.100	91.540	13.53	12.15	75.96	69.58	9.57	7.86	23.59	22.51
2007190527	2007190609	0.11	0.24	79.370	68.251	16.09	15.83	49.83	47.00	2.92	2.51	24.22	21.75
2007190527	2007190609	0.05	0.16	74.960	64.507	16.04	12.40						

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Cd (ppm)	Cd (ppm)	Ce (ppm)	Ce (ppm)	Co (ppm)	Co (ppm)	Cr (ppm)	Cr (ppm)	Cs (ppm)	Cs (ppm)	Cu (ppm)	Cu (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.10	0.10	0.50	0.50	0.10	0.10	0.20	0.20
2007190534	2007191522	0.05	0.05	40.820	39.330	6.02	4.46	27.22	23.44	2.53	1.90	7.52	6.94
2007190534	2007191522	0.17	0.32	162.800	214.400	13.12	9.53	85.85	105.90	4.87	3.83	15.26	11.43
2007190536	2007190909	0.05	0.05	16.560	15.030	1.99	1.63	24.88	22.03	0.90	0.80	48.27	4.45
2007190536	2007190909	0.51	0.34	95.530	93.020	5.60	5.77	89.61	86.84	1.62	1.69	10.22	10.35
2007190536	2007190909	0.05	0.05	19.900	19.290	2.54	2.44	25.11	24.65	1.15	1.16	7.35	8.88
2007190536	2007190909	0.42	0.31	96.810	88.460	7.10	6.54	94.73	90.06	2.39	2.32	15.36	14.75
2007190548	2007191236	0.12	0.10	82.370	72.040	13.71	11.24	61.23	59.88	3.54	2.75	22.57	20.34
2007190548	2007191236	0.22	0.05	134.500	131.000	15.92	13.25	72.77	72.74	3.57	2.80	28.19	26.92
2007190548	2007191236	0.21	0.05	85.420	72.380	13.19	10.62	55.72	50.75	3.49	2.70	22.81	20.60
2007190548	2007191236	0.18	0.18	141.400	148.500	16.95	16.01	75.25	74.49	4.43	3.84	32.43	30.65
2007190549	2007191507	0.05	0.05	5.877	6.790	1.15	1.36	41.42	45.53	0.61	0.72	7.96	6.39
2007190549	2007191507	0.05	0.13	26.794	27.940	4.73	4.06	79.28	83.00	2.05	2.18	15.54	14.70
2007190549	2007191507	0.05	0.05	7.736	9.314	1.98	2.58	46.67	49.71	0.93	1.08	8.99	7.53
2007190549	2007191507	0.05	0.18	30.101	31.670	7.26	7.36	82.63	88.51	2.69	2.88	18.59	16.50
2007190552	2007190675	0.05	0.05	30.170	21.620	2.84	3.58	14.71	17.27	0.85	0.95	3.15	4.75
2007190552	2007190675	0.36	0.46	187.500	121.000	15.67	18.52	47.08	46.32	3.75	3.59	15.26	16.99
2007190552	2007190675	0.05	0.05	85.710	49.870	10.20	11.05	31.45	28.67	3.01	2.83	8.99	9.24
2007190552	2007190675	0.05	0.05	281.200	166.000	32.13	38.23	83.19	80.65	9.96	8.98	22.58	29.91
2007190554	2007190752	0.05	0.13	27.328	44.760	7.13	10.70	30.35	29.00	1.34	2.59	5.22	8.80
2007190554	2007190752	0.05	0.32	91.517	84.950	21.54	20.80	51.37	44.60	4.35	5.20	13.18	14.50
2007190554	2007190752	0.05	0.05	15.200	57.830	2.70	13.60	30.13	38.90	0.61	3.93	5.23	12.50
2007190554	2007190752	0.13	0.14	85.641	110.280	16.54	23.90	89.27	60.60	3.97	7.16	15.48	20.50
2007190583	2007191063	0.05	0.05	38.910	40.860	4.84	3.75	31.39	27.55	1.87	2.11	9.28	9.97
2007190583	2007191063	0.21	0.05	65.650	52.940	7.16	4.27	37.69	28.76	2.61	2.63	12.12	11.37
2007190583	2007191063	0.05	0.05	63.620	67.260	11.16	9.75	47.81	44.48	5.25	5.23	20.97	20.31
2007190583	2007191063	0.05	0.05	82.520	78.300	14.12	11.26	55.44	52.08	6.49	5.61	23.42	22.31
2007190618	2007191166	0.34	0.37	37.239	36.910	25.23	25.70	67.03	68.60	2.28	2.34	32.68	34.40
2007190618	2007191166	0.43	0.21	41.854	43.380	27.74	30.10	74.47	83.20	2.28	2.39	34.10	36.40
2007190618	2007191166	0.05	0.05	43.531	44.670	28.93	27.00	72.64	77.10	2.70	2.71	38.10	32.80
2007190618	2007191166	0.13	0.05	50.250	53.060	33.82	33.40	87.80	95.20	2.83	2.89	45.73	42.10
2007190647	2007191525	0.05	0.05	66.390	41.380	4.91	1.96	27.65	19.01	4.33	2.65	8.04	4.35
2007190647	2007191525	0.05	0.15	99.180	108.100	5.75	5.97	33.84	30.05	7.63	6.58	12.08	10.99
2007190647	2007191525	0.05	0.05	68.420	46.310	3.95	1.61	27.39	20.84	5.81	2.84	11.10	5.85
2007190647	2007191525	0.05	0.05	110.100	109.000	6.67	3.78	42.94	32.81	9.65	7.03	16.68	10.56
2007190659	2007190739	0.05	0.05	13.103	15.230	2.82	3.10	39.40	38.40	1.24	1.24	3.40	0.10
2007190659	2007190739	0.05	0.12	50.720	59.080	10.78	9.10	132.77	117.80	4.77	4.31	4.99	0.10
2007190659	2007190739	0.05	0.05	32.600	12.190	6.44	3.70	74.40	45.50	2.92	1.61	2.85	0.10
2007190659	2007190739	0.05	0.05	77.108	41.670	15.36	13.40	164.70	143.30	6.18	5.41	6.01	4.80
2007190661	2007191334	0.05	0.05	28.826	30.160	7.87	8.16	71.06	72.66	1.10	1.11	7.12	7.57
2007190661	2007191334	0.05	0.21	68.091	64.980	19.39	21.92	216.51	188.00	1.40	1.69	14.51	16.22
2007190661	2007191334	0.05	0.11	36.261	32.610	12.74	9.65	81.22	76.81	1.41	1.47	9.07	7.97
2007190661	2007191334	0.05	0.14	62.895	66.670	27.23	25.53	182.02	172.80	2.06	2.43	15.24	15.20
2007190686	2007191430	0.05	0.05	49.550	54.180	1.76	1.93	24.68	25.29	3.44	3.88	3.45	1.35
2007190686	2007191430	0.05	0.13	159.400	177.000	4.89	5.02	41.84	45.77	10.92	9.78	4.70	4.58
2007190686	2007191430	0.05	0.05	61.400	63.310	3.16	3.42	29.14	32.29	6.08	6.73	3.09	1.47
2007190686	2007191430	0.05	0.13	158.400	133.700	7.68	7.31	57.22	57.36	15.47	14.07	4.53	4.22
2007190695	2007190924	0.05	0.05	18.000	18.590	2.30	2.63	27.66	29.15	0.87	0.98	7.02	7.20
2007190695	2007190924	0.13	0.12	47.170	44.910	6.38	5.65	39.66	39.23	2.17	2.46	15.52	14.07
2007190695	2007190924	0.05	0.05	26.480	26.910	6.52	6.89	47.48	52.61	3.83	3.81	16.27	15.26
2007190695	2007190924	0.16	0.12	52.610	51.750	13.58	12.13	78.87	76.76	7.08	6.66	30.63	26.27
2007190698	2007190813	0.66	0.05	83.992	70.460	13.49	12.70	69.89	64.20	6.79	5.25	20.79	11.30
2007190698	2007190813	0.78	0.11	76.159	79.350	12.17	12.30	66.83	64.10	5.11	4.61	19.47	10.30
2007190698	2007190813	0.67	0.05	77.301	73.940	14.11	13.10	75.65	71.50	5.72	6.14	20.56	13.20
2007190698	2007190813	0.65	0.05	78.640	78.500	14.04	16.00	69.53	76.30	5.87	6.12	20.46	14.60
2007190732	2007191450	0.11	0.05	45.280	47.960	9.70	10.70	54.20	61.80	1.56	2.10	11.20	10.50
2007190732	2007191450	0.12	0.05	51.600	56.880	8.80	10.50	73.50	76.70	1.65	2.38	39.80	12.10
2007190732	2007191450	0.11	0.05	46.630	41.640	11.00	9.10	54.00	49.80	1.89	1.69	12.50	10.50
2007190732	2007191450	0.27	0.05	61.760	60.530	16.50	14.00	86.20	80.70	2.62	2.61	15.70	14.80
2007190735	2007191549	0.05	0.17	49.030	54.580	14.00	15.00	67.90	73.40	3.90	4.66	13.30	24.00
2007190735	2007191549	0.05	0.28	46.290	50.780	11.30	11.10	67.50	69.80	3.08	3.63	9.40	17.10
2007190735	2007191549	0.11	0.19	53.480	54.910	15.20	14.80	67.60	75.80	4.16	4.68	12.80	21.70
2007190735	2007191549	0.15	0.19	52.410	51.680	19.70	15.10	68.90	79.70	3.73	4.05	12.10	20.20
2007190743	2007190906	0.05	0.05	42.120	44.200	9.10	9.71	45.43	49.47	3.41	3.87	19.23	21.37
2007190743	2007190906	0.05	0.13	61.200	58.540	12.15	11.66	69.37	66.63	5.80	5.53	29.56	28.31
2007190743	2007190906	0.05	0.05	42.550	41.790	10.05	9.34	47.76	45.96	3.70	3.56	21.77	21.59
2007190743	2007190906	0.05	0.14	59.600	60.660	12.71	13.17	70.12	70.79	5.62	5.59	30.60	32.02
2007190746	2007191241	0.05	0.05	9.929	12.150	1.03	1.23	19.01	22.52	0.41	0.57	3.69	1.13
2007190746	2007191241	0.05	0.19	42.040	45.910	3.35	3.90	67.27	68.61	1.24	1.51	8.12	6.13
2007190746	2007191241	0.05	0.05	12.050	13.870	1.66	2.96	20.89	21.19	0.70	0.83	8.90	3.33
2007190746	2007191241	0.18	0.26	42.730	44.100	4.23	3.99	61.21	61.83	1.76	1.73	9.15	6.35
2007190753	2007191299	0.05	0.67	63.050	50.690	14.40	14.90	60.30	70.40	4.89	3.54	23.40	25.90
2007190753	2007191299	0.05	0.61	62.620	54.160	15.30	17.60	63.50	62.20	4.63	3.63	23.80	23.70
2007190753	2007191299	0.14	0.16	58.180	52.370	14.80	14.70	65.70	63.20	4.26	3.57	23.90	22.80
2007190753	2007191299	0.05	0.10	67.260	58.060	15.70	16.40	65.10	78.80	5.10	3.85	25.20	24.20
2007190798	2007191229	0.05	0.18	9.492	9.893	1.12	1.38	15.86	21.07	0.38	0.43	0.10	2.78
2007190798	2007191229	1.94	0.83	43.261	35.346	2.50	3.22	26.62	33.37	1.44	1.43	1.26	3.88
2007190798	2007191229	0.05	0.05	9.149	9.033	1.16	1.16	16.51	13.86	0.29	0.28	2.14	5.27
2007190798	2007191229	0.50	0.76	38.996	34.710	2.59	2.33	34.19	34.31	1.42	1.46	1.75	8.08
2007190818													

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Cd (ppm)	Cd (ppm)	Ce (ppm)	Ce (ppm)	Co (ppm)	Co (ppm)	Cr (ppm)	Cr (ppm)	Cs (ppm)	Cs (ppm)	Cu (ppm)	Cu (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.10	0.10	0.50	0.50	0.10	0.10	0.20	0.20
2007190826	2007191052	0.05	0.05	16.130	22.300	1.84	3.16	26.84	35.35	1.09	1.43	4.75	7.05
2007190826	2007191052	0.05	0.05	58.140	61.150	5.10	6.76	39.61	48.20	2.52	2.94	10.10	14.06
2007190826	2007191052	0.05	0.05	17.310	17.920	2.51	2.63	32.25	30.39	1.38	1.35	7.01	6.45
2007190826	2007191052	0.05	0.05	65.020	69.620	7.42	6.43	51.72	51.86	4.07	3.32	14.14	14.32
2007190834	2007190889	0.05	0.05	10.980	13.460	1.44	1.80	19.52	22.80	0.29	0.29	4.14	3.80
2007190834	2007190889	0.38	0.27	101.700	81.350	7.36	7.60	78.11	82.10	1.68	1.05	19.49	14.90
2007190834	2007190889	0.05	0.05	6.296	5.850	1.56	0.90	13.20	13.80	0.17	0.18	4.22	2.50
2007190834	2007190889	0.17	0.19	64.680	67.980	7.95	6.40	63.69	72.80	0.87	0.80	13.45	12.70
2007190849	2007191277	0.05	0.05	53.120	41.690	16.30	12.89	49.40	45.20	3.58	2.55	19.90	12.13
2007190849	2007191277	0.11	0.05	56.510	52.490	17.90	16.46	62.50	63.21	3.66	3.27	24.10	16.18
2007190849	2007191277	0.05	0.05	63.020	57.020	19.50	20.83	47.40	49.78	2.73	2.64	18.80	11.76
2007190849	2007191277	0.05	0.05	74.480	69.430	33.80	37.29	57.90	59.14	2.90	3.31	19.20	15.09
2007190853	2007190939	0.05	0.05	34.870	23.060	8.69	4.20	40.99	24.20	3.36	1.92	17.40	9.60
2007190853	2007190939	0.05	0.13	52.610	62.910	12.09	9.50	53.77	53.80	4.51	4.10	21.71	84.00
2007190853	2007190939	0.05	0.05	14.060	18.070	2.25	3.40	14.92	21.30	1.00	1.89	6.03	8.40
2007190853	2007190939	0.15	0.05	55.210	54.920	13.18	12.30	56.85	59.20	5.89	6.28	24.20	23.20
2007190865	2007191183	0.05	0.05	4.043	4.014	0.59	0.68	12.06	11.58	0.18	0.28	2.88	4.69
2007190865	2007191183	0.05	0.23	49.030	45.610	8.47	5.66	57.11	55.51	3.16	2.33	21.11	29.94
2007190865	2007191183	0.05	0.05	4.913	4.342	1.06	0.68	15.61	9.72	0.25	0.33	5.03	4.68
2007190865	2007191183	0.40	0.47	43.820	52.190	5.44	5.24	54.18	56.79	2.08	2.11	10.70	13.98
2007190874	2007191297	0.05	0.55	25.320	31.560	7.64	10.63	51.46	52.58	1.82	2.40	11.23	15.60
2007190874	2007191297	0.05	0.73	50.740	46.700	15.02	15.65	56.84	51.80	3.91	3.71	19.90	20.77
2007190874	2007191297	0.05	0.52	20.330	35.150	7.32	12.80	72.33	54.39	1.32	2.81	10.02	15.06
2007190874	2007191297	0.05	0.51	45.760	53.200	14.59	17.04	51.97	51.84	3.60	4.23	18.84	21.09
2007190887	2007191058	0.05	0.05	112.500	104.000	22.76	18.47	75.04	76.89	10.63	10.54	24.83	22.73
2007190887	2007191058	0.10	0.05	106.100	98.740	19.41	16.08	62.39	79.57	8.96	9.12	19.11	20.27
2007190887	2007191058	0.05	0.05	104.900	105.800	14.68	19.10	75.23	92.36	10.71	12.89	22.63	27.26
2007190887	2007191058	0.05	0.05	100.900	104.900	12.42	17.50	66.12	84.82	9.49	11.04	19.75	24.78
2007190895	2007190947	0.05	0.05	52.601	54.920	12.66	14.00	62.86	69.40	2.86	3.33	18.36	21.40
2007190895	2007190947	0.14	0.05	52.794	48.160	11.95	10.80	61.52	67.60	2.68	2.82	17.49	20.60
2007190895	2007190947	0.05	0.05	54.786	57.090	11.96	13.80	63.54	70.00	2.91	3.42	17.60	21.10
2007190895	2007190947	0.05	0.05	55.800	54.350	12.24	12.00	70.22	69.00	2.76	3.13	18.53	20.00
2007190896	2007191441	0.05	0.05	30.748	51.760	4.37	9.71	92.21	112.90	1.57	2.89	12.02	24.38
2007190896	2007191441	0.20	0.13	101.526	102.000	11.51	20.18	161.85	169.90	4.18	5.31	29.56	43.94
2007190896	2007191441	0.05	0.05	38.525	55.730	6.23	10.01	91.23	147.60	1.63	2.94	13.55	23.55
2007190896	2007191441	0.39	0.12	119.826	92.870	17.37	16.59	162.55	203.50	4.79	5.25	30.58	41.20
2007190922	2007191082	0.05	0.05	13.730	10.950	1.49	3.30	16.29	24.20	1.04	1.41	2.23	8.70
2007190922	2007191082	0.59	0.15	139.500	38.110	8.16	8.20	70.95	73.90	3.11	2.75	7.17	14.40
2007190922	2007191082	0.05	0.05	19.890	23.450	8.29	9.30	29.66	33.20	2.10	1.91	4.05	5.00
2007190922	2007191082	0.23	0.13	50.220	58.910	18.02	20.90	58.83	70.50	3.36	3.73	6.67	6.90
2007190927	2007191444	0.22	0.11	33.553	38.420	8.25	9.38	40.36	49.42	4.80	5.35	14.79	18.32
2007190927	2007191444	0.10	0.05	53.469	54.550	12.23	12.00	58.39	60.96	5.61	6.21	22.30	25.10
2007190927	2007191444	0.14	0.12	35.148	37.550	8.52	9.42	45.78	50.04	5.03	5.69	17.70	17.40
2007190927	2007191444	0.17	0.13	56.730	57.650	11.31	12.35	65.33	70.21	5.58	6.32	20.56	21.84
2007190949	2007191504	0.05	0.05	79.772	78.210	11.30	11.50	53.32	51.80	4.29	4.20	39.89	18.40
2007190949	2007191504	0.05	0.05	86.944	89.580	15.05	13.50	68.75	67.20	4.51	4.72	23.48	23.20
2007190949	2007191504	0.12	0.05	65.827	66.310	10.01	9.40	49.99	47.90	3.99	4.03	22.42	19.10
2007190949	2007191504	0.05	0.05	70.129	69.120	11.89	10.90	62.98	62.20	4.51	4.21	27.77	22.60
2007190968	2007191437	0.05	0.15	16.390	11.090	3.88	1.81	26.54	20.87	0.80	0.44	9.29	5.46
2007190968	2007191437	0.16	0.19	38.330	29.920	8.14	4.60	55.68	52.41	1.98	1.49	15.55	10.78
2007190968	2007191437	0.05	0.11	27.940	28.540	7.37	7.02	34.12	35.81	2.06	2.00	15.30	16.95
2007190968	2007191437	0.05	0.11	49.380	49.060	14.15	14.18	70.53	63.54	3.35	3.56	25.56	25.77
2007190970	2007191245	0.91	0.37	59.780	62.220	10.40	10.80	112.50	107.30	3.64	4.85	51.00	94.70
2007190970	2007191245	0.58	0.47	69.730	75.630	8.30	6.90	128.20	118.20	3.51	5.39	38.00	79.10
2007190970	2007191245	1.00	0.05	71.650	40.270	20.90	5.90	152.50	143.30	3.77	1.61	21.80	6.00
2007190970	2007191245	1.05	0.34	96.230	121.300	18.70	13.90	202.10	313.90	3.83	3.44	23.00	14.80
2007190986	2007191592	0.20	0.56	99.550	62.640	10.76	9.76	64.10	56.51	1.41	1.38	11.49	10.75
2007190986	2007191592	0.19	0.87	353.700	256.700	14.93	13.14	107.60	95.15	1.75	1.38	18.74	15.06
2007190986	2007191592	0.05	0.62	95.790	95.830	13.11	13.03	67.29	66.76	1.33	1.67	12.72	16.70
2007190986	2007191592	0.20	0.72	247.700	142.600	16.96	15.47	101.20	84.08	2.36	2.31	24.27	26.35
2007190990	2007191537	0.05	0.05	97.840	98.730	10.03	8.72	44.30	50.88	6.72	6.38	11.77	11.09
2007190990	2007191537	0.10	0.05	99.260	96.860	8.76	7.85	41.85	49.02	5.79	5.65	11.02	10.06
2007190990	2007191537	0.05	0.05	63.600	47.910	4.93	2.73	30.56	24.67	4.08	2.40	7.81	4.92
2007190990	2007191537	0.05	0.21	108.800	119.700	6.83	4.76	42.01	42.58	5.73	4.21	9.16	8.31
2007191007	2007191551	0.05	0.05	38.180	39.570	6.52	6.72	52.90	51.60	1.54	1.30	2.73	8.32
2007191007	2007191551	0.23	0.05	89.730	79.780	15.18	15.19	109.60	87.23	2.66	2.16	9.48	14.14
2007191007	2007191551	0.05	0.05	34.140	38.440	6.49	6.87	45.91	44.96	1.77	1.92	2.27	9.14
2007191007	2007191551	0.17	0.05	83.690	74.000	15.26	14.38	102.60	89.67	3.01	2.84	9.19	14.25
2007191028	2007191531	0.05	0.05	35.816	24.720	7.18	4.67	34.39	25.09	1.40	0.86	9.77	10.32
2007191028	2007191531	0.16	0.05	68.828	51.820	12.70	9.18	61.53	46.16	2.75	2.18	18.74	16.17
2007191028	2007191531	0.05	0.05	45.307	26.590	8.96	5.26	39.84	24.96	1.86	0.93	12.66	10.73
2007191028	2007191531	0.05	0.05	64.590	68.370	11.82	12.85	57.99	52.61	2.69	2.26	18.64	18.09
2007191051	2007191331	0.05	0.05	45.028	46.740	15.14	14.15	54.43	64.57	2.15	2.26	19.39	17.69
2007191051	2007191331	0.05	0.11	41.262	45.740	13.71	11.18	54.78	73.66	1.98	2.01	16.28	15.86
2007191051	2007191331	0.05	0.05	45.066	47.880	15.45	15.99	57.94	54.27	1.99	2.33	19.25	18.67
2007191051	2007191331	0.20	0.12	50.266	48.440	17.96	15.46	63.38	67.54	2.13	2.44	17.86	19.10
2007191066	2007191379	0.05	0.05	44.530	27.570	9.64	6.91	42.46	38.06	4.15	2.16	18.19	13.23
2007191066	2007191379	0.05	0.05	64.080	51.610	13.18	10.98	57.72	65.33	5.80</			

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Cd (ppm)	Cd (ppm)	Ce (ppm)	Ce (ppm)	Co (ppm)	Co (ppm)	Cr (ppm)	Cr (ppm)	Cs (ppm)	Cs (ppm)	Cu (ppm)	Cu (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.10	0.10	0.50	0.50	0.10	0.10	0.20	0.20
2007191134	2007191282	0.05	0.05	117.200	92.740	9.84	7.50	27.34	30.10	1.15	0.89	12.50	8.70
2007191134	2007191282	0.05	0.05	171.300	252.800	15.80	19.40	37.87	61.10	1.49	1.95	17.26	18.40
2007191152	2007191578	0.35	0.10	17.476	14.550	2.19	2.23	31.44	29.75	1.10	0.72	6.05	5.71
2007191152	2007191578	0.42	0.28	62.118	48.900	4.88	4.82	43.41	38.45	2.47	1.89	12.88	11.89
2007191152	2007191578	0.28	0.12	24.790	19.290	6.86	5.06	48.77	49.06	3.51	2.94	14.64	16.37
2007191152	2007191578	0.31	0.22	50.258	43.210	13.17	10.38	69.02	68.57	5.63	5.56	24.20	24.62
2007191168	2007191195	0.05	0.16	64.130	59.820	9.10	6.99	41.37	39.53	2.31	2.50	17.64	15.62
2007191168	2007191195	0.05	0.16	122.600	95.680	16.45	11.48	66.81	60.32	4.42	4.34	30.43	24.43
2007191168	2007191195	0.05	0.05	61.360	66.910	8.98	8.24	41.48	44.05	2.69	2.90	18.81	18.09
2007191168	2007191195	0.05	0.05	105.000	98.500	15.20	14.37	73.10	71.62	4.75	5.46	33.15	34.04
2007191192	2007191339	0.05	0.14	61.980	68.060	8.87	9.77	66.66	73.28	3.17	3.72	18.72	22.38
2007191192	2007191339	0.21	0.20	88.680	90.820	11.50	10.78	82.09	82.13	3.80	3.84	26.12	24.04
2007191192	2007191339	0.05	0.05	72.870	70.200	12.21	12.16	81.32	82.29	3.87	3.90	26.95	26.58
2007191192	2007191339	0.14	0.15	84.920	87.570	13.55	14.46	94.97	95.95	4.51	4.44	32.83	33.20
2007191215	2007191281	0.10	0.59	32.820	32.840	8.13	9.01	36.91	34.11	1.98	2.06	13.10	13.69
2007191215	2007191281	0.26	0.73	76.270	86.340	19.19	18.41	85.15	100.20	3.47	3.46	29.35	23.83
2007191215	2007191281	0.05	0.54	33.420	32.040	8.30	7.93	38.61	32.32	2.36	2.05	11.78	12.46
2007191215	2007191281	0.05	0.60	83.500	91.970	17.31	13.22	99.74	96.53	3.77	3.05	22.05	19.75
2007191216	2007191385	0.10	0.05	18.800	28.530	2.80	5.62	35.08	50.35	1.05	1.65	8.61	11.85
2007191216	2007191385	0.14	0.15	48.660	62.300	6.16	10.83	47.23	62.03	2.13	3.48	14.36	23.04
2007191216	2007191385	0.05	0.05	20.950	25.310	3.26	5.10	35.73	45.61	1.04	1.73	8.46	11.52
2007191216	2007191385	0.21	0.05	49.840	64.760	7.46	12.38	49.24	73.00	2.21	4.19	15.88	20.93
2007191264	2007191486	0.05	0.05	34.850	30.070	4.12	4.10	41.03	37.40	1.66	1.58	6.06	9.30
2007191264	2007191486	0.05	0.45	144.800	138.200	7.54	8.20	77.48	80.90	1.90	2.21	10.53	16.50
2007191264	2007191486	0.05	0.34	29.580	145.100	3.68	7.70	39.65	75.40	1.48	2.06	6.31	14.90
2007191264	2007191486	0.05	0.05	183.700	28.760	9.80	5.30	90.17	35.80	2.38	1.55	14.50	10.00
2007191275	2007191590	0.05	0.63	23.570	48.050	3.40	10.70	38.42	75.18	1.49	3.15	5.08	17.60
2007191275	2007191590	0.05	0.61	65.700	77.730	9.40	14.52	102.00	127.40	3.28	5.43	16.71	32.34
2007191275	2007191590	0.05	0.55	22.260	46.330	4.40	9.18	34.61	80.18	1.31	3.18	5.27	18.77
2007191275	2007191590	0.05	0.61	42.750	70.500	8.15	15.16	71.96	134.30	2.33	5.70	15.13	33.88
2007191293	2007191518	0.53	0.12	47.210	37.980	11.43	9.84	51.25	48.06	2.11	1.49	18.13	14.98
2007191293	2007191518	0.50	0.05	49.320	43.800	9.22	9.45	64.87	55.90	2.38	1.84	16.50	16.11
2007191293	2007191518	0.51	0.05	53.550	46.420	13.15	12.28	67.70	52.23	2.61	2.23	20.93	18.43
2007191293	2007191518	0.42	0.05	57.430	51.700	13.75	12.52	65.75	63.90	2.74	2.48	20.75	20.42
2007191295	2007191498	0.05	0.05	17.096	16.140	2.05	2.10	19.01	40.30	0.69	0.62	4.41	5.60
2007191295	2007191498	0.76	0.73	130.587	113.730	9.20	7.00	163.76	153.50	1.26	1.13	9.73	9.10
2007191295	2007191498	0.05	0.05	16.646	17.000	2.15	2.40	17.92	17.50	0.68	0.61	7.09	6.70
2007191295	2007191498	0.69	1.07	111.888	152.320	7.70	9.80	152.67	196.60	1.12	1.28	9.18	9.70
2007191346	2007191429	0.05	0.05	61.760	77.310	8.30	10.86	41.23	53.40	5.17	6.28	16.04	21.15
2007191346	2007191429	0.05	0.15	65.420	65.480	8.10	8.55	42.07	44.81	4.81	5.34	15.02	23.34
2007191346	2007191429	0.05	0.16	38.390	46.730	4.70	5.07	23.65	30.93	2.80	3.40	8.64	12.11
2007191346	2007191429	0.05	0.20	81.720	71.970	8.02	8.17	46.02	42.09	4.53	4.42	17.00	13.85
2007191372	2007191445	0.05	0.05	46.740	71.090	5.47	4.05	69.34	30.68	0.62	0.30	14.61	4.92
2007191372	2007191445	0.05	0.15	78.180	167.100	7.68	10.38	94.53	59.93	0.99	0.89	22.11	11.70
2007191372	2007191445	0.05	0.05	58.900	74.760	5.04	4.98	59.31	33.07	0.41	0.43	10.50	6.13
2007191372	2007191445	0.05	0.13	111.900	191.100	8.55	12.10	98.04	65.24	0.80	1.16	17.43	15.19
2007191382	2007191509	0.11	0.29	68.870	77.230	12.40	6.30	99.00	82.70	3.33	1.62	32.90	16.90
2007191382	2007191509	0.11	0.33	105.100	139.300	16.90	11.20	149.60	137.20	4.71	3.41	45.80	27.60
2007191382	2007191509	0.05	0.17	73.520	73.830	13.40	13.40	116.50	120.80	3.72	4.00	37.30	35.20
2007191382	2007191509	0.05	0.26	91.740	109.300	16.80	19.00	151.20	181.20	5.37	6.02	44.80	48.70
2007191473	2007191510	0.05	0.19	63.730	62.250	15.64	16.05	84.29	85.28	3.08	3.13	25.73	23.21
2007191473	2007191510	0.05	0.16	47.890	47.990	8.49	9.23	98.60	95.41	3.35	3.45	26.06	25.42
2007191473	2007191510	0.05	0.19	44.700	51.410	12.07	14.14	62.19	69.40	2.07	2.40	30.74	28.05
2007191473	2007191510	0.05	0.05	34.300	39.040	8.13	8.69	83.40	79.76	2.25	2.63	34.08	30.98

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Dy (ppm)	Dy (ppm)	Er (ppm)	Er (ppm)	Eu (ppm)	Eu (ppm)	Ga (ppm)	Ga (ppm)	Gd (ppm)	Gd (ppm)	Ge (ppm)	Ge (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.030	0.030	0.10	0.10	0.030	0.030	0.040	0.040
2007190003	2007190213	2.67	2.80	1.567	1.561	0.633	0.558	8.54	9.25	2.858	2.848	0.583	0.588
2007190003	2007190213	7.13	6.66	4.166	3.963	1.570	1.341	15.62	15.41	7.261	6.760	0.827	0.761
2007190003	2007190213	2.35	2.24	1.339	1.322	0.574	0.525	8.31	10.89	2.525	2.488	0.624	0.655
2007190003	2007190213	4.85	5.38	2.979	3.298	1.134	1.114	14.75	16.51	5.089	5.397	0.759	0.762
2007190005	2007191059	3.13	3.09	1.612	1.810	0.916	1.204	11.29	12.57	3.577	3.966	0.458	0.555
2007190005	2007191059	4.72	4.39	2.476	2.570	1.497	1.702	19.01	17.52	5.819	5.674	0.525	0.570
2007190005	2007191059	2.64	2.90	1.353	1.823	0.663	1.115	8.83	12.03	2.943	3.583	0.399	0.657
2007190005	2007191059	5.76	4.99	3.118	2.981	1.584	1.851	17.53	18.14	7.434	6.436	0.530	0.668
2007190032	2007190632	4.98	4.78	2.735	2.895	1.267	1.241	12.70	12.11	5.300	5.496	0.520	0.458
2007190032	2007190632	6.34	6.01	3.569	3.546	1.583	1.591	12.76	16.35	6.575	6.611	0.416	0.490
2007190032	2007190632	5.00	5.13	2.788	3.061	1.258	1.499	11.90	14.88	5.283	6.178	0.512	0.573
2007190032	2007190632	6.77	6.54	3.814	3.800	1.746	1.713	17.49	17.87	7.066	7.318	0.596	0.584
2007190035	2007190876	4.19	4.43	2.923	3.050	0.678	0.674	5.93	6.77	3.624	4.002	0.463	0.712
2007190035	2007190876	8.26	9.07	5.740	6.163	1.093	1.354	6.71	9.82	7.131	8.200	0.270	0.903
2007190035	2007190876	4.72	4.87	2.937	3.310	0.809	0.824	12.69	12.98	4.367	4.504	0.634	0.836
2007190035	2007190876	7.31	7.52	4.617	4.979	1.267	1.274	16.73	17.12	6.624	7.072	0.678	0.963
2007190039	2007190984	2.89	1.44	1.766	0.949	0.594	0.328	9.21	5.78	2.787	1.417	0.365	0.410
2007190039	2007190984	6.35	5.57	4.059	3.711	1.249	1.038	17.13	15.08	5.620	4.831	0.364	0.542
2007190039	2007190984	3.13	3.70	1.868	2.101	0.834	1.017	19.79	22.77	3.605	4.079	0.678	0.611
2007190039	2007190984	4.67	4.82	2.597	2.588	1.207	1.286	29.86	28.38	4.849	5.083	1.069	0.886
2007190050	2007191481	1.68	1.72	1.129	1.140	0.258	0.285	8.48	10.40	1.476	1.680	0.020	0.400
2007190050	2007191481	5.91	5.97	3.893	4.170	0.817	0.834	13.61	12.60	5.014	5.530	0.020	0.400
2007190050	2007191481	2.03	1.92	1.304	1.390	0.323	0.294	10.81	11.20	1.675	1.780	0.020	0.300
2007190050	2007191481	6.27	5.32	4.099	3.850	0.850	0.733	15.88	15.10	5.127	5.100	0.020	0.300
2007190067	2007191121	0.88	0.95	0.532	0.421	0.221	0.199	5.36	4.00	0.846	0.722	0.295	0.391
2007190067	2007191121	3.67	3.05	2.432	1.961	0.772	0.701	11.28	9.55	3.092	2.695	0.312	0.505
2007190067	2007191121	1.05	1.14	0.596	0.534	0.264	0.274	7.84	5.29	1.059	1.025	0.293	0.416
2007190067	2007191121	2.76	2.74	1.625	1.732	0.677	0.779	12.73	11.03	2.806	2.774	0.365	0.512
2007190071	2007190289	0.97	0.73	0.532	0.445	0.325	0.091	3.67	2.89	0.942	0.715	0.215	0.248
2007190071	2007190289	5.81	4.92	3.620	3.082	1.466	0.891	8.65	8.07	5.965	4.696	0.316	0.154
2007190071	2007190289	4.45	7.80	2.485	3.862	1.419	2.698	8.49	3.87	5.164	9.745	0.229	0.076
2007190071	2007190289	10.12	21.66	5.758	10.523	3.011	7.591	17.43	7.21	11.146	27.138	0.165	0.020
2007190074	2007190389	2.37	1.12	1.491	0.761	0.662	0.356	8.76	4.31	2.317	1.287	0.492	0.474
2007190074	2007190389	5.72	5.49	4.119	4.114	0.990	0.948	13.56	11.03	5.607	5.551	0.568	0.623
2007190074	2007190389	0.67	1.53	0.466	1.065	0.358	0.407	4.70	4.92	0.798	1.738	0.341	0.455
2007190074	2007190389	4.70	4.81	3.588	3.445	0.825	0.964	10.84	10.66	4.357	4.833	0.593	0.644
2007190091	2007191053	1.22	2.82	0.738	1.815	0.323	0.758	7.60	8.11	1.335	3.237	0.239	0.336
2007190091	2007191053	7.24	6.74	4.857	4.494	1.367	1.458	13.90	12.82	8.056	7.664	0.447	0.378
2007190091	2007191053	2.51	2.08	1.625	1.438	0.615	0.542	8.83	5.47	2.820	2.472	0.343	0.375
2007190091	2007191053	7.71	3.97	5.354	2.653	1.298	0.791	12.30	7.25	8.227	3.964	0.356	0.414
2007190107	2007190913	1.07	1.32	0.681	0.782	0.309	0.304	4.31	4.93	1.344	1.416	0.313	0.480
2007190107	2007190913	6.72	7.12	4.732	4.609	1.413	1.715	13.93	14.59	6.933	7.948	0.639	0.683
2007190107	2007190913	0.96	1.61	0.722	0.971	0.292	0.421	3.96	5.78	1.358	1.970	0.392	0.571
2007190107	2007190913	6.60	6.62	4.651	4.021	1.293	1.686	11.05	21.71	6.309	7.439	0.473	0.734
2007190110	2007191182	3.15	3.55	1.896	2.100	0.641	0.733	11.46	12.70	3.048	3.510	0.466	0.400
2007190110	2007191182	6.78	6.86	4.152	4.390	0.908	1.055	12.14	14.00	6.230	6.950	0.480	0.400
2007190110	2007191182	7.13	4.59	3.998	2.670	1.503	0.923	18.55	13.80	7.269	4.630	0.640	0.500
2007190110	2007191182	7.90	7.42	4.520	4.380	1.558	1.357	17.24	16.10	7.729	7.900	0.494	0.400
2007190114	2007191045	5.14	5.43	2.963	3.178	1.371	1.511	13.63	15.74	5.292	5.852	0.551	0.458
2007190114	2007191045	5.98	5.31	3.427	3.370	1.637	1.418	15.39	14.41	6.289	5.861	0.587	0.576
2007190114	2007191045	4.58	4.97	2.749	3.021	1.239	1.278	12.25	13.89	4.613	5.263	0.448	0.458
2007190114	2007191045	5.82	5.58	3.494	3.371	1.530	1.587	13.55	16.10	5.733	6.251	0.494	0.491
2007190118	2007191552	6.59	6.31	3.710	3.707	1.324	1.142	17.32	14.22	6.446	6.276	0.622	0.508
2007190118	2007191552	6.81	6.09	3.980	3.670	1.214	1.056	15.10	12.72	6.381	5.788	0.535	0.561
2007190118	2007191552	7.21	6.93	3.878	3.874	1.610	1.540	21.20	21.04	7.767	7.646	0.631	0.514
2007190118	2007191552	7.21	6.81	4.057	3.782	1.575	1.398	18.68	18.41	7.815	7.051	0.566	0.542
2007190121	2007191545	0.83	1.37	0.664	0.843	0.169	0.267	4.12	6.00	0.929	1.340	0.337	0.430
2007190121	2007191545	4.37	4.60	3.377	3.210	0.776	1.009	11.77	18.00	3.680	4.773	0.606	0.660
2007190121	2007191545	0.84	1.40	0.709	0.877	0.159	0.262	4.50	7.00	0.949	1.393	0.402	0.480
2007190121	2007191545	4.68	3.55	3.521	2.349	0.777	0.801	11.84	16.10	4.205	3.727	0.499	0.580
2007190125	2007191532	5.47	4.65	3.501	3.128	1.092	1.084	13.67	11.53	5.213	4.369	0.490	0.465
2007190125	2007191532	7.25	8.43	4.643	5.634	1.463	1.830	14.70	11.89	6.858	7.872	0.571	0.538
2007190125	2007191532	5.87	5.21	3.835	3.555	1.198	1.192	14.79	12.52	5.636	5.025	0.492	0.480
2007190125	2007191532	9.20	9.38	5.702	6.259	1.696	1.858	16.28	14.01	8.386	8.454	0.556	0.492
2007190145	2007191105	3.81	3.84	2.288	2.332	0.994	0.893	13.26	13.30	4.307	4.510	0.484	0.540
2007190145	2007191105	3.83	3.58	2.481	2.256	1.003	0.862	14.71	15.20	4.257	4.250	0.411	0.560
2007190145	2007191105	3.51	3.37	2.105	2.156	0.932	0.782	13.83	13.00	4.205	4.275	0.436	0.470
2007190145	2007191105	3.65	3.33	2.214	2.078	0.947	0.783	15.10	12.60	4.187	4.053	0.401	0.420
2007190154	2007190568	4.03	4.26	2.943	3.350	0.714	0.716	29.93	32.40	3.236	3.481	0.460	0.426
2007190154	2007190568	4.30	4.79	3.069	3.701	0.798	0.819	26.25	32.07	3.428	4.026	0.501	0.412
2007190154	2007190568	5.54	5.14	4.046	4.336	1.088	0.671	42.82	44.54	4.375	3.515	0.957	0.914
2007190154	2007190568	6.18	5.57	4.467	4.564	1.264	0.754	42.32	44.38	5.112	3.908	0.829	0.948
2007190155	2007191031	3.30	4.04	2.158	2.201	0.898	0.938	12.75	9.99	3.648	4.107	0.435	0.492
2007190155	2007191031	4.99	5.88	3.263	3.453	1.302	1.377	17.57	17.00	5.472	6.412	0.508	0.564
2007190155	2007191031	3.37	3.05	2.038	1.648	0.874	0.699	13.51	7.17	3.736	3.071	0.508	0.406
2007190155	2007191031	5.24	6.25	3.586	3.603	1.367	1.490	17.34	17.15	6.044	6.557	0.622	0.548
2007190161	2007191413	1.98	1.55	1.130	0.952	0.541	0.516	13.41	12.50	1.996	1.930	0.408	0.365
2007190161	2007191413	3.26	2.65	1.947	1.658	0.885							

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Dy (ppm)	Dy (ppm)	Er (ppm)	Er (ppm)	Eu (ppm)	Eu (ppm)	Ga (ppm)	Ga (ppm)	Gd (ppm)	Gd (ppm)	Ge (ppm)	Ge (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.030	0.030	0.10	0.10	0.030	0.030	0.040	0.040
2007190181	2007191396	4.03	3.95	2.307	2.370	1.011	0.972	14.13	14.30	4.050	4.060	0.609	0.500
2007190181	2007191396	4.84	4.82	2.792	2.980	1.249	1.192	16.10	16.30	5.111	5.210	0.547	0.500
2007190183	2007190471	1.15	1.35	0.702	0.705	0.302	0.297	4.45	3.85	1.210	1.162	0.411	0.404
2007190183	2007190471	6.45	5.60	4.556	3.944	0.886	0.927	8.29	9.44	5.930	5.191	0.480	0.578
2007190183	2007190471	4.63	3.46	2.519	1.899	1.030	0.790	14.34	10.67	5.026	3.683	0.498	0.408
2007190183	2007190471	5.65	5.48	3.210	3.285	1.194	1.227	16.49	13.85	5.890	6.142	0.572	0.537
2007190185	2007191253	4.02	3.78	2.235	2.250	0.914	0.902	13.49	13.15	3.950	3.785	1.031	1.027
2007190185	2007191253	5.06	5.23	3.032	3.206	1.160	1.118	16.05	15.08	4.940	5.066	0.882	0.993
2007190185	2007191253	4.27	3.95	2.470	2.285	1.038	0.952	17.53	15.37	4.410	3.971	0.994	1.242
2007190185	2007191253	4.94	4.74	2.856	2.833	1.180	1.123	18.27	17.08	4.957	4.798	0.931	1.119
2007190189	2007191542	4.78	4.42	2.722	2.903	1.172	1.266	16.20	15.56	5.004	5.222	0.610	0.595
2007190189	2007191542	4.84	4.46	2.932	2.860	1.095	1.188	15.48	14.31	4.796	5.187	0.599	0.646
2007190189	2007191542	4.77	4.49	2.766	2.771	1.160	1.279	16.00	15.60	4.952	5.158	0.570	0.592
2007190189	2007191542	4.97	4.50	2.841	2.899	1.167	1.327	15.29	14.07	4.955	5.281	0.563	0.692
2007190193	2007190788	5.88	6.70	3.255	3.970	1.122	1.511	11.57	16.80	5.808	7.560	0.547	0.600
2007190193	2007190788	6.10	6.43	3.620	3.820	1.092	1.345	10.35	13.80	6.005	7.140	0.484	0.500
2007190193	2007190788	6.30	6.72	3.717	4.080	1.339	1.447	13.83	15.40	6.444	7.300	0.610	0.600
2007190193	2007190788	6.92	7.93	4.108	4.860	1.310	1.557	13.48	15.00	6.721	8.840	0.600	0.500
2007190194	2007190704	4.38	3.90	2.487	2.522	0.973	0.919	9.99	9.80	4.446	4.297	0.553	0.416
2007190194	2007190704	4.82	4.26	3.017	2.854	0.955	0.839	9.52	9.48	4.716	4.335	0.497	0.452
2007190194	2007190704	5.50	5.18	3.081	3.223	1.359	1.251	10.90	12.04	5.581	5.559	0.537	0.521
2007190194	2007190704	6.17	5.23	3.721	3.459	1.446	1.202	10.57	10.60	6.202	5.615	0.521	0.560
2007190197	2007190962	1.17	1.10	0.747	0.850	0.187	0.211	1.88	2.15	1.066	1.163	0.405	0.417
2007190197	2007190962	6.06	6.93	3.897	4.739	0.897	1.268	5.55	6.79	5.255	6.493	0.515	0.520
2007190197	2007190962	1.78	1.62	1.081	1.019	0.388	0.331	6.86	7.92	1.836	1.693	0.417	0.577
2007190197	2007190962	6.60	6.67	4.152	4.412	1.322	1.299	22.26	16.86	6.457	6.359	0.774	0.662
2007190208	2007191593	2.57	2.66	2.122	2.329	0.191	0.277	2.13	1.69	1.660	1.884	0.502	0.532
2007190208	2007191593	3.95	3.94	3.458	3.542	0.334	0.415	2.92	1.81	2.617	2.730	0.559	0.552
2007190208	2007191593	3.35	3.30	2.379	2.613	0.424	0.531	12.79	8.82	2.683	2.542	0.565	0.569
2007190208	2007191593	4.37	4.61	3.355	3.636	0.569	0.685	15.41	7.45	3.494	3.522	0.621	0.561
2007190209	2007191254	3.89	3.24	2.276	1.929	0.905	0.749	10.29	7.14	3.962	3.316	0.604	0.378
2007190209	2007191254	5.03	4.88	2.983	3.054	1.089	1.179	12.60	11.42	5.040	4.684	0.621	0.619
2007190209	2007191254	3.42	2.64	1.901	1.550	0.756	0.650	9.90	7.40	3.517	2.672	0.511	0.591
2007190209	2007191254	4.94	5.19	2.869	3.149	1.132	1.296	14.79	12.21	5.006	5.083	0.531	0.483
2007190212	2007190747	1.44	1.18	0.860	0.690	0.196	0.169	3.40	1.17	1.327	1.031	0.351	0.416
2007190212	2007190747	7.92	12.53	5.403	8.105	1.369	1.996	11.53	9.33	8.765	12.020	0.408	0.457
2007190212	2007190747	4.13	1.14	2.448	0.720	1.046	0.206	12.20	2.72	4.846	1.029	0.404	0.471
2007190212	2007190747	6.85	8.73	5.117	5.844	1.081	1.399	10.62	7.56	6.940	8.161	0.391	0.519
2007190218	2007191348	1.02	1.83	0.718	1.040	0.131	0.335	8.93	11.90	0.958	1.520	0.433	0.500
2007190218	2007191348	4.46	4.56	2.869	2.900	0.797	0.984	19.36	23.90	3.706	4.240	0.687	0.800
2007190218	2007191348	1.27	2.34	0.827	1.440	0.152	0.466	10.13	14.20	1.001	2.140	0.411	0.600
2007190218	2007191348	4.42	5.10	2.938	3.220	0.762	1.148	21.58	24.80	3.801	5.010	0.717	0.900
2007190241	2007190978	4.05	3.79	2.209	2.318	1.081	0.963	10.11	8.28	4.972	4.114	0.490	0.469
2007190241	2007190978	5.97	6.09	3.624	3.634	1.682	1.777	17.31	16.30	6.644	6.683	0.546	0.489
2007190241	2007190978	3.50	3.84	2.036	2.273	1.018	1.083	10.24	9.83	3.845	4.234	0.446	0.534
2007190241	2007190978	5.54	6.27	3.207	3.467	1.865	1.841	17.41	15.25	6.433	6.830	0.508	0.505
2007190248	2007191198	1.42	1.44	0.793	0.925	0.239	0.388	2.41	2.99	1.393	1.525	0.475	0.653
2007190248	2007191198	5.02	14.31	3.946	11.840	0.769	1.500	7.39	0.05	5.129	12.340	0.467	0.275
2007190248	2007191198	1.93	1.39	1.237	0.882	0.328	0.344	2.85	3.02	1.772	1.418	0.433	0.564
2007190248	2007191198	9.08	7.35	7.822	5.799	1.089	1.118	5.32	5.81	9.257	6.754	0.518	0.628
2007190256	2007190875	1.99	1.47	1.066	0.766	0.502	0.359	3.52	2.72	2.160	1.629	0.435	0.390
2007190256	2007190875	4.91	5.55	3.595	4.045	1.025	1.115	9.52	12.17	5.005	6.097	0.478	0.485
2007190256	2007190875	2.89	1.65	1.759	0.985	0.796	0.482	9.72	5.06	3.216	1.937	0.520	0.417
2007190256	2007190875	4.60	4.77	3.178	3.379	1.031	0.987	9.88	10.33	4.762	5.101	0.560	0.524
2007190258	2007191176	3.47	4.02	2.148	2.480	0.943	0.785	10.44	12.30	3.471	3.870	0.655	0.500
2007190258	2007191176	5.46	5.85	3.249	3.780	1.284	1.101	14.55	13.10	5.230	6.020	0.580	0.500
2007190258	2007191176	3.00	3.50	1.801	2.060	0.641	0.790	10.81	12.00	2.908	3.440	0.600	0.400
2007190258	2007191176	6.80	6.51	4.449	4.210	1.334	1.240	14.72	15.30	6.895	6.380	0.707	0.500
2007190266	2007191458	2.14	2.03	1.205	0.941	0.516	0.398	6.75	5.19	2.177	1.868	0.800	0.917
2007190266	2007191458	3.83	4.47	2.498	2.838	0.917	0.965	11.38	9.22	3.896	4.468	0.852	1.424
2007190266	2007191458	1.65	1.03	0.915	0.499	0.348	0.130	3.95	1.52	1.694	0.826	0.643	0.721
2007190266	2007191458	4.24	5.53	2.800	3.640	0.995	1.052	12.16	8.55	4.514	5.975	1.159	1.176
2007190285	2007190406	4.88	4.76	2.814	2.762	1.302	1.236	14.70	14.30	5.213	4.942	0.498	0.638
2007190285	2007190406	5.45	5.31	3.208	3.248	1.402	1.414	15.29	16.08	5.660	5.667	0.566	0.608
2007190285	2007190406	4.76	4.96	2.790	2.804	1.273	1.333	14.07	13.24	5.026	5.293	0.543	0.668
2007190285	2007190406	5.30	5.53	3.154	3.290	1.322	1.490	14.84	15.99	5.335	5.965	0.510	0.678
2007190296	2007190758	1.70	1.45	0.990	0.870	0.208	0.178	4.60	3.30	1.390	1.080	0.400	0.600
2007190296	2007190758	4.79	5.29	3.270	3.510	0.850	0.853	10.90	11.40	4.510	4.490	0.600	0.600
2007190296	2007190758	1.64	1.43	0.970	0.950	0.185	0.202	5.50	4.90	1.290	1.030	0.400	0.500
2007190296	2007190758	4.84	4.93	3.520	3.380	0.766	0.753	12.10	12.10	4.470	3.980	0.600	0.800
2007190311	2007191259	0.33	0.44	0.220	0.340	0.015	0.015	1.08	1.27	0.265	0.444	0.224	0.287
2007190311	2007191259	2.47	3.11	1.848	2.531	0.365	0.450	4.75	6.54	2.448	3.472	0.338	0.364
2007190311	2007191259	0.85	0.17	0.561	0.150	0.192	0.015	2.78	1.44	1.017	0.203	0.323	0.337
2007190311	2007191259	4.11	1.53	2.487	1.219	0.918	0.267	9.43	12.41	4.389	1.729	0.526	0.778
2007190328	2007191598	1.47	1.19	0.811	0.855	0.132	0.165	2.12	2.83	0.969	0.948	0.323	0.393
2007190328	2007191598	5.96	7.08	4.578	4.959	0.791	1.018	7.23	8.16	4.899	5.429	0.443	0.553
2007190328	2007191598	1.40	1.14	0.902	0.798	0.180	0.169	4.41	4.18	1.028	0.904	0.337	0.513
2007190328	2007191598	5.61	6.00	4.300	4.301	0.811	0.886	13.03	15.				

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Dy (ppm)	Dy (ppm)	Er (ppm)	Er (ppm)	Eu (ppm)	Eu (ppm)	Ga (ppm)	Ga (ppm)	Gd (ppm)	Gd (ppm)	Ge (ppm)	Ge (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.030	0.030	0.10	0.10	0.030	0.030	0.040	0.040
2007190349	2007191436	3.85	3.59	2.326	2.150	0.788	0.589	14.99	13.65	3.441	3.128	0.437	0.448
2007190349	2007191436	7.52	7.07	4.733	4.603	1.401	1.242	16.36	15.61	6.056	6.157	0.463	0.501
2007190349	2007191436	3.87	3.46	2.662	2.101	0.857	0.595	14.24	13.97	3.378	3.048	0.439	0.491
2007190349	2007191436	5.65	5.95	3.862	3.933	1.244	1.052	18.73	19.70	5.099	5.186	0.600	0.604
2007190352	2007190611	4.89	5.20	2.934	2.723	1.447	1.598	13.62	18.16	5.605	5.779	0.399	0.345
2007190352	2007190611	5.53	5.56	3.081	2.927	1.634	1.751	13.00	15.97	6.333	6.331	0.395	0.396
2007190352	2007190611	3.51	4.24	2.479	2.327	0.979	1.181	18.33	26.18	3.575	4.322	0.598	0.662
2007190352	2007190611	3.95	4.22	2.665	2.366	1.092	1.299	17.64	24.12	4.098	4.630	0.558	0.458
2007190355	2007191257	3.26	3.00	2.254	1.844	0.898	0.966	20.22	22.20	3.400	3.576	0.702	0.648
2007190355	2007191257	4.73	3.97	3.085	2.648	1.255	1.326	25.08	26.55	4.437	4.846	0.663	0.754
2007190355	2007191257	2.73	2.90	1.946	1.830	0.742	0.942	19.80	22.84	2.664	3.378	0.627	0.747
2007190355	2007191257	2.69	3.03	1.968	1.890	0.716	0.983	21.70	24.94	2.683	3.513	0.574	0.690
2007190357	2007190856	0.65	0.88	0.340	0.560	0.082	0.174	1.90	1.66	0.709	0.883	0.353	0.426
2007190357	2007190856	3.62	3.79	2.472	2.732	0.596	0.672	5.50	6.13	3.349	3.285	0.520	0.456
2007190357	2007190856	1.95	2.02	1.176	1.342	0.390	0.430	4.10	6.12	1.956	2.080	0.420	0.482
2007190357	2007190856	6.16	4.89	4.102	3.440	1.264	1.014	10.14	12.26	6.074	4.832	0.753	0.549
2007190361	2007191094	3.19	3.66	1.894	2.070	0.916	0.922	15.76	18.00	3.810	3.980	0.470	0.400
2007190361	2007191094	3.21	3.71	1.999	2.130	0.876	0.917	16.31	18.10	3.690	3.840	0.528	0.400
2007190361	2007191094	1.91	2.27	1.191	1.340	0.492	0.596	10.87	10.30	2.267	2.554	0.301	0.840
2007190383	2007191416	4.08	2.46	2.290	1.530	1.112	0.579	11.05	9.70	4.398	2.560	0.511	0.400
2007190383	2007191416	5.09	5.66	3.175	3.450	1.286	1.476	13.26	17.20	5.585	6.250	0.543	0.500
2007190383	2007191416	4.37	4.04	2.424	2.430	1.145	1.033	12.49	13.60	4.867	4.660	0.512	0.500
2007190383	2007191416	5.79	5.99	3.462	3.490	1.679	1.616	15.12	16.90	6.656	6.870	0.498	0.500
2007190393	2007191050	5.00	5.87	3.010	3.365	1.152	1.251	16.49	16.19	5.579	6.316	0.543	0.623
2007190393	2007191050	5.16	5.56	3.239	3.388	1.163	1.089	14.88	15.15	5.532	6.085	0.573	0.605
2007190393	2007191050	6.14	6.46	3.692	3.803	1.227	1.340	13.86	17.50	6.498	7.054	0.621	0.662
2007190393	2007191050	5.99	6.66	3.766	3.864	1.187	1.388	13.35	14.65	6.333	7.261	0.527	0.603
2007190414	2007191386	5.94	5.89	3.426	3.697	1.191	1.209	8.76	11.60	5.918	6.262	0.584	0.580
2007190414	2007191386	7.06	6.57	4.080	4.028	1.202	1.220	7.56	9.70	6.237	6.654	0.390	0.500
2007190414	2007191386	6.43	5.95	3.539	3.516	1.279	1.248	10.65	10.60	6.203	6.682	0.456	0.570
2007190414	2007191386	7.62	7.47	4.421	4.578	1.402	1.541	10.32	13.80	6.856	8.009	0.452	0.500
2007190419	2007190974	4.20	3.30	2.495	2.093	0.985	0.889	10.27	7.75	4.373	3.479	0.542	0.554
2007190419	2007190974	4.66	5.21	2.990	3.046	1.159	1.311	11.47	11.25	5.091	5.325	0.545	0.594
2007190419	2007190974	3.65	3.70	2.168	2.088	0.859	0.907	9.24	9.53	3.757	3.706	0.522	0.610
2007190419	2007190974	5.79	6.12	3.573	3.633	1.522	1.625	14.68	13.53	6.440	6.201	0.583	0.731
2007190425	2007190768	5.39	5.41	3.269	3.190	1.183	1.027	12.53	12.90	5.270	5.050	0.644	0.500
2007190425	2007190768	5.54	5.36	3.368	3.350	1.112	0.889	11.43	13.20	5.237	4.990	0.610	0.500
2007190425	2007190768	4.48	5.48	2.814	3.220	0.912	1.004	11.80	14.60	4.237	5.160	0.656	0.600
2007190425	2007190768	5.08	5.79	3.313	3.720	0.991	1.038	11.55	14.10	4.998	5.470	0.647	0.600
2007190434	2007191027	2.24	2.28	1.258	1.060	0.740	0.543	11.42	10.20	2.770	2.260	0.397	0.300
2007190434	2007191027	5.45	5.35	2.956	2.790	1.680	1.415	23.53	19.80	6.383	6.240	0.710	0.400
2007190434	2007191027	2.44	2.69	1.350	1.290	0.761	0.665	9.92	11.90	3.077	2.910	0.360	0.300
2007190434	2007191027	4.13	4.62	2.241	2.350	1.334	1.239	16.35	17.30	5.014	5.270	0.517	0.400
2007190457	2007191004	3.95	3.13	2.395	1.915	0.878	0.774	10.95	6.37	4.239	3.965	0.552	0.400
2007190457	2007191004	4.67	5.02	2.928	3.276	1.146	1.317	13.04	10.62	5.258	6.191	0.556	0.399
2007190457	2007191004	2.46	2.66	1.456	1.736	0.493	0.562	5.83	6.55	2.527	2.908	0.402	0.340
2007190457	2007191004	5.46	4.75	3.310	3.364	1.086	1.013	10.80	10.72	5.788	5.219	0.525	0.395
2007190458	2007190774	4.38	3.99	2.705	2.580	1.109	0.979	13.50	13.30	4.589	4.410	0.525	0.500
2007190458	2007190774	4.77	5.00	3.005	3.300	1.143	1.130	11.58	13.60	4.816	5.310	0.574	0.500
2007190458	2007190774	4.27	4.26	2.605	2.710	1.057	0.963	12.83	12.80	4.367	4.260	0.548	0.400
2007190458	2007190774	4.84	4.80	3.030	3.150	1.151	1.119	13.15	13.40	5.075	5.110	0.583	0.500
2007190472	2007191312	4.39	4.09	2.348	2.462	1.005	1.054	17.93	16.61	3.978	4.146	0.622	0.503
2007190472	2007191312	4.46	4.86	2.628	2.892	1.121	1.206	15.60	17.36	4.471	4.841	0.598	0.562
2007190472	2007191312	3.74	3.92	1.976	2.486	0.885	1.029	13.38	17.08	3.575	3.994	0.412	0.615
2007190472	2007191312	4.43	4.65	2.564	2.850	1.054	1.199	16.06	16.81	4.276	4.702	0.469	0.757
2007190481	2007191594	3.65	4.29	2.265	2.837	0.628	0.768	5.17	6.16	3.113	3.611	0.601	0.571
2007190481	2007191594	4.96	4.82	3.185	3.094	0.831	0.836	6.65	6.94	4.032	3.966	0.587	0.548
2007190481	2007191594	4.81	4.19	2.955	2.694	0.890	0.784	8.24	7.36	4.051	3.663	0.558	0.576
2007190481	2007191594	4.88	4.64	3.092	2.953	0.936	0.872	7.26	6.17	4.082	3.913	0.598	0.593
2007190495	2007191318	1.13	1.30	0.778	0.925	0.218	0.315	3.50	4.50	1.095	1.494	0.210	0.360
2007190497	2007190586	2.63	2.41	1.597	1.682	0.549	0.639	5.53	6.12	2.597	2.634	0.564	0.427
2007190497	2007190586	5.83	4.89	3.613	3.326	1.296	1.238	10.72	11.51	5.974	5.493	0.637	0.620
2007190497	2007190586	2.86	2.45	1.686	1.705	0.571	0.603	8.77	8.27	2.673	2.602	0.590	0.537
2007190497	2007190586	5.17	4.69	3.163	3.187	1.134	1.144	16.05	15.62	5.242	4.944	0.715	0.699
2007190506	2007190631	4.58	4.48	2.697	2.734	1.041	1.172	12.10	12.49	4.586	4.824	0.664	0.453
2007190506	2007190631	4.63	4.18	3.050	2.780	1.008	0.962	10.05	10.21	4.561	4.299	0.622	0.460
2007190506	2007190631	4.57	4.32	2.695	2.673	1.092	1.121	12.24	12.55	4.665	4.870	0.695	0.523
2007190506	2007190631	5.11	4.56	3.102	2.903	1.217	1.128	12.11	12.86	5.116	4.977	0.707	0.462
2007190508	2007191119	4.16	4.52	2.453	2.727	1.250	1.312	16.85	16.86	4.878	5.016	0.625	0.615
2007190508	2007191119	4.59	5.04	2.761	3.021	1.288	1.281	17.53	15.65	5.309	5.627	0.565	0.564
2007190508	2007191119	4.62	5.18	2.729	3.104	1.209	1.366	15.61	15.65	5.353	5.747	0.555	0.638
2007190508	2007191119	5.01	5.24	3.059	3.320	1.248	1.297	17.71	15.96	5.576	5.938	0.620	0.584
2007190526	2007191599	6.34	6.34	3.953	3.657	1.343	1.408	16.43	11.94	7.238	6.497	0.579	0.587
2007190526	2007191599	7.60	7.57	4.816	4.398	1.624	1.570	18.35	16.64	8.553	7.755	0.613	0.652
2007190526	2007191599	7.31	7.25	4.490	4.155	1.561	1.554	18.45	15.32	8.341	7.516	0.667	0.708
2007190526	2007191599	8.41	8.46	5.240	4.926	1.746	1.702	19.71	17.84	9.409	8.429	0.633	0.607
2007190527	2007190609	5.77	5.81	3.845	3.527	1.519	1.411	13.47	11.19	6.503	5.616	0.508	0.438
2007190527	2007190609	6.23	5.54	4.232	3.294								

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Dy (ppm)	Dy (ppm)	Er (ppm)	Er (ppm)	Eu (ppm)	Eu (ppm)	Ga (ppm)	Ga (ppm)	Gd (ppm)	Gd (ppm)	Ge (ppm)	Ge (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.030	0.030	0.10	0.10	0.030	0.030	0.040	0.040
2007190534	2007191522	2.48	2.36	1.708	1.630	0.557	0.555	7.51	5.65	2.836	2.410	0.432	0.391
2007190534	2007191522	9.51	14.31	6.596	9.496	1.670	1.864	15.09	7.25	11.330	14.250	0.516	0.447
2007190536	2007190909	1.30	1.31	0.866	0.846	0.273	0.291	3.97	3.13	1.257	1.186	0.429	0.479
2007190536	2007190909	7.39	7.28	5.375	5.306	1.147	1.173	7.31	7.97	6.967	6.960	0.560	0.482
2007190536	2007190909	1.59	1.56	1.003	0.954	0.367	0.359	5.11	5.00	1.509	1.463	0.403	0.499
2007190536	2007190909	6.72	6.78	4.706	4.649	1.197	1.135	11.41	10.97	6.796	6.498	0.591	0.619
2007190548	2007191236	4.63	4.70	2.930	2.780	1.083	1.062	19.89	16.05	5.488	4.806	0.557	0.461
2007190548	2007191236	7.61	8.36	5.228	5.032	1.612	1.647	23.13	19.83	9.106	8.817	0.594	0.369
2007190548	2007191236	4.86	4.59	3.166	2.789	1.062	0.984	18.37	16.43	5.652	4.842	0.539	0.482
2007190548	2007191236	7.89	9.06	5.136	5.145	1.661	1.771	23.85	20.75	9.615	9.854	0.650	0.458
2007190549	2007191507	0.49	0.66	0.406	0.516	0.047	0.074	3.27	4.21	0.388	0.544	0.373	0.508
2007190549	2007191507	4.44	3.58	3.551	3.148	0.494	0.488	9.18	8.51	2.833	2.804	0.596	0.520
2007190549	2007191507	0.67	0.78	0.533	0.602	0.102	0.116	4.24	4.74	0.481	0.715	0.428	0.537
2007190549	2007191507	4.57	3.74	3.671	2.966	0.556	0.605	12.54	12.95	2.857	3.001	0.578	0.755
2007190552	2007190675	1.56	1.34	0.860	0.686	0.408	0.290	2.75	2.48	1.776	1.343	0.350	0.301
2007190552	2007190675	11.34	7.74	5.979	4.367	2.792	1.719	9.73	9.88	13.050	7.860	0.382	0.441
2007190552	2007190675	4.86	3.15	2.270	1.689	1.416	0.849	6.40	7.46	6.059	3.294	0.388	0.337
2007190552	2007190675	15.09	9.77	6.832	4.952	4.276	2.607	20.97	21.81	18.190	10.630	0.721	0.920
2007190554	2007190752	1.89	3.75	1.207	2.281	0.265	0.465	3.02	6.00	1.639	2.798	0.347	0.430
2007190554	2007190752	8.10	7.41	5.558	4.950	1.117	0.977	10.08	10.50	6.785	5.905	0.463	0.640
2007190554	2007190752	0.79	4.64	0.540	2.720	0.146	0.796	2.08	10.60	0.885	4.174	0.316	0.550
2007190554	2007190752	8.18	8.46	5.283	5.185	1.512	1.578	9.88	18.80	7.763	7.895	0.538	0.810
2007190583	2007191063	3.89	3.68	2.655	2.499	0.686	0.748	4.96	5.46	3.782	3.769	0.467	0.644
2007190583	2007191063	7.90	5.79	5.597	4.106	1.234	1.065	7.61	6.79	7.191	5.523	0.539	0.702
2007190583	2007191063	4.67	4.92	3.195	3.218	1.032	1.193	14.99	13.29	5.091	5.495	0.642	0.929
2007190583	2007191063	6.43	6.16	4.281	4.098	1.286	1.425	18.13	15.09	6.565	6.644	0.694	0.893
2007190618	2007191166	3.62	3.86	2.031	2.220	0.921	0.909	13.46	14.50	3.429	3.690	0.416	0.500
2007190618	2007191166	3.96	4.35	2.280	2.530	1.021	1.069	13.12	16.20	3.876	4.330	0.465	0.400
2007190618	2007191166	4.15	4.32	2.515	2.430	1.135	1.022	16.80	16.00	4.230	4.140	0.485	0.500
2007190618	2007191166	5.12	5.24	2.979	3.240	1.316	1.224	17.96	18.40	5.165	5.280	0.347	0.600
2007190647	2007191525	4.13	2.79	2.333	1.574	0.545	0.322	6.32	2.58	4.410	2.707	0.635	0.572
2007190647	2007191525	7.65	7.40	4.709	4.878	1.006	0.999	10.60	6.48	7.116	7.105	0.624	0.683
2007190647	2007191525	4.54	3.01	2.716	1.805	0.645	0.367	7.69	3.76	4.675	3.058	0.714	0.571
2007190647	2007191525	8.25	7.63	5.210	5.029	1.155	0.991	12.93	7.74	7.885	7.307	0.711	0.513
2007190659	2007190739	0.89	1.16	0.616	0.640	0.131	0.265	4.72	4.70	0.890	1.210	0.415	0.600
2007190659	2007190739	3.90	4.33	2.462	2.610	0.688	0.981	19.81	16.50	3.565	4.470	0.532	0.700
2007190659	2007190739	1.88	1.04	1.029	0.610	0.451	0.214	10.03	7.90	2.031	1.020	0.427	0.600
2007190659	2007190739	4.30	3.16	2.508	1.860	1.122	0.673	26.02	21.60	4.677	3.010	0.677	0.700
2007190661	2007191334	2.21	2.52	1.375	1.528	0.547	0.746	4.14	4.97	2.248	2.533	0.365	0.434
2007190661	2007191334	5.86	5.39	4.036	3.598	1.123	1.389	8.24	9.60	5.394	5.406	0.493	0.488
2007190661	2007191334	2.97	2.81	1.751	1.505	0.812	0.840	8.30	7.67	3.071	2.754	0.437	0.435
2007190661	2007191334	5.03	5.43	3.251	3.359	1.419	1.474	12.95	16.96	5.085	5.772	0.464	0.409
2007190686	2007191430	3.10	3.46	1.972	2.156	0.327	0.331	5.56	4.85	2.944	3.431	0.328	0.737
2007190686	2007191430	9.54	11.03	6.023	7.507	1.235	1.207	18.62	13.17	9.188	11.670	0.625	0.708
2007190686	2007191430	3.46	3.44	2.038	2.091	0.584	0.483	12.50	15.40	3.436	3.678	0.607	0.922
2007190686	2007191430	7.73	6.98	4.420	4.466	1.489	1.188	33.79	32.01	8.241	8.040	1.063	0.992
2007190695	2007190924	1.31	1.29	0.928	0.900	0.314	0.275	3.72	4.47	1.392	1.343	0.334	0.438
2007190695	2007190924	4.39	3.93	3.129	2.707	0.915	0.816	9.38	8.83	4.060	3.792	0.449	0.421
2007190695	2007190924	1.87	1.88	1.231	1.262	0.428	0.389	14.07	14.11	1.849	1.783	0.574	0.559
2007190695	2007190924	3.67	3.38	2.527	2.421	0.821	0.810	27.96	27.07	3.575	3.489	1.073	0.791
2007190698	2007190813	5.80	5.47	3.207	3.210	1.295	1.178	15.17	14.30	5.847	5.680	0.617	0.500
2007190698	2007190813	6.03	6.07	3.416	3.730	1.344	1.204	13.47	13.50	6.074	6.450	0.616	0.500
2007190698	2007190813	5.97	5.77	3.410	3.420	1.285	1.172	15.61	15.90	6.098	6.100	0.588	0.600
2007190698	2007190813	6.32	6.32	3.541	3.710	1.289	1.286	14.39	16.20	6.057	6.720	0.664	0.600
2007190732	2007191450	4.06	4.10	2.412	2.472	0.738	0.789	7.60	10.10	3.788	3.649	0.480	0.670
2007190732	2007191450	5.19	5.47	3.163	3.574	0.933	1.107	8.20	11.50	4.622	5.040	0.500	0.620
2007190732	2007191450	4.09	3.39	2.422	2.041	0.842	0.678	9.70	9.40	3.862	3.118	0.500	0.570
2007190732	2007191450	5.45	5.05	3.334	3.152	1.116	1.099	13.00	13.00	5.257	4.844	0.600	0.670
2007190735	2007191549	4.20	4.42	2.570	2.710	1.108	1.107	14.10	17.80	4.540	4.620	0.600	0.400
2007190735	2007191549	4.19	4.11	2.750	2.730	0.964	0.897	11.10	14.10	4.380	4.130	0.500	0.300
2007190735	2007191549	4.40	4.48	2.580	2.730	1.232	1.112	14.60	17.80	4.920	4.710	0.600	0.400
2007190735	2007191549	4.38	4.37	2.590	2.700	1.128	0.998	14.20	15.10	4.740	4.520	0.800	0.400
2007190743	2007190906	3.35	3.46	1.955	1.928	0.868	0.945	12.72	14.11	3.491	3.738	0.515	0.778
2007190743	2007190906	5.00	4.96	2.981	2.920	1.288	1.195	20.01	20.38	5.094	5.036	0.763	0.840
2007190743	2007190906	3.26	3.47	2.012	1.903	0.894	0.910	13.57	12.79	3.602	3.488	0.582	0.601
2007190743	2007190906	5.10	5.05	2.879	2.848	1.287	1.324	18.19	19.75	5.018	5.021	0.800	0.850
2007190746	2007191241	1.00	0.97	0.617	0.658	0.176	0.144	1.17	2.09	0.845	0.973	0.423	0.492
2007190746	2007191241	4.51	3.93	3.252	2.942	0.726	0.671	3.99	5.50	3.599	3.660	0.530	0.599
2007190746	2007191241	1.20	1.04	0.649	0.629	0.236	0.148	2.06	3.65	0.964	1.055	0.419	0.483
2007190746	2007191241	3.71	3.83	2.580	2.665	0.726	0.647	6.37	5.12	3.414	3.564	0.518	0.600
2007190753	2007191299	4.82	4.58	2.650	2.632	1.221	1.291	19.80	18.20	5.040	4.551	0.700	0.680
2007190753	2007191299	5.04	4.92	2.790	2.889	1.224	1.358	19.70	19.50	5.040	4.829	0.600	0.730
2007190753	2007191299	4.86	4.28	2.730	2.458	1.258	1.260	19.60	15.60	5.000	4.560	0.700	0.720
2007190753	2007191299	5.12	4.64	2.880	2.793	1.250	1.413	19.80	18.20	5.040	4.971	0.600	0.810
2007190798	2007191229	1.30	1.35	0.928	1.052	0.119	0.219	1.13	0.97	1.071	1.294	0.358	0.369
2007190798	2007191229	15.77	13.82	12.345	11.135	1.727	1.709	3.68	3.39	11.452	9.980	0.534	0.640
2007190798	2007191229	0.75	0.86	0.487	0.571	0.057	0.115	0.88	0.97	0.703	0.820	0.347	0.359
2007190798	2007191229	8.25	11.03	5.780	8.524	1.089	1.380						

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Dy (ppm)	Dy (ppm)	Er (ppm)	Er (ppm)	Eu (ppm)	Eu (ppm)	Ga (ppm)	Ga (ppm)	Gd (ppm)	Gd (ppm)	Ge (ppm)	Ge (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.030	0.030	0.10	0.10	0.030	0.030	0.040	0.040
2007190826	2007191052	1.62	2.08	1.010	1.388	0.161	0.282	3.53	3.91	1.276	1.728	0.551	0.483
2007190826	2007191052	6.21	5.76	4.403	3.866	0.696	0.827	8.52	10.75	5.107	5.019	0.540	0.555
2007190826	2007191052	1.48	1.62	0.984	1.023	0.228	0.232	4.62	4.05	1.343	1.400	0.634	0.537
2007190826	2007191052	6.07	6.26	4.090	4.253	0.766	0.814	12.06	10.19	5.271	5.594	0.615	0.432
2007190834	2007190889	0.54	1.14	0.263	0.390	0.150	0.207	4.34	4.40	0.518	0.660	0.357	0.300
2007190834	2007190889	3.52	4.66	2.283	2.840	1.047	1.049	16.67	13.10	3.797	4.340	0.531	0.400
2007190834	2007190889	0.29	0.79	0.159	0.170	0.115	0.122	3.45	3.00	0.244	0.260	0.276	0.200
2007190834	2007190889	3.42	4.05	2.221	2.530	0.916	0.897	11.74	11.50	3.225	3.740	0.369	0.300
2007190849	2007191277	3.98	3.46	2.360	2.292	1.038	0.991	14.50	10.34	4.360	4.058	0.600	0.723
2007190849	2007191277	4.97	4.78	2.970	3.244	1.339	1.352	17.40	13.73	5.520	5.356	0.600	0.624
2007190849	2007191277	5.46	4.22	3.250	2.534	1.430	1.341	13.70	12.01	6.250	5.351	0.500	0.452
2007190849	2007191277	5.81	5.20	3.560	3.104	1.470	1.647	15.20	14.50	6.400	6.349	0.600	0.564
2007190853	2007190939	2.77	1.79	1.787	1.120	0.784	0.421	9.43	7.80	3.066	2.030	0.498	0.400
2007190853	2007190939	4.15	4.90	2.668	3.290	1.116	1.078	13.43	12.90	4.531	5.240	0.527	0.500
2007190853	2007190939	1.22	1.44	0.756	0.860	0.293	0.333	1.95	7.30	1.223	1.630	0.340	0.400
2007190853	2007190939	4.32	4.43	2.825	2.760	1.128	1.027	14.35	15.70	4.865	4.940	0.459	0.500
2007190865	2007191183	0.37	0.60	0.223	0.270	0.035	0.051	0.39	1.41	0.436	0.373	0.418	0.429
2007190865	2007191183	4.53	6.07	3.448	4.672	0.925	0.868	13.04	7.82	4.504	4.683	0.530	0.405
2007190865	2007191183	0.46	0.63	0.265	0.278	0.071	0.042	0.93	1.92	0.501	0.419	0.459	0.313
2007190865	2007191183	5.58	6.55	4.772	4.934	0.799	0.905	7.97	7.87	4.631	5.084	0.468	0.383
2007190874	2007191297	2.23	3.00	1.404	1.910	0.431	0.642	9.47	8.50	2.201	2.764	0.488	0.517
2007190874	2007191297	5.27	5.13	3.593	3.338	1.010	0.978	14.70	11.03	5.078	4.636	0.596	0.664
2007190874	2007191297	1.64	3.41	1.071	2.062	0.315	0.729	11.77	10.00	1.722	3.101	0.490	0.663
2007190874	2007191297	4.88	5.73	3.419	3.732	0.963	1.220	13.96	10.64	5.025	5.221	0.634	0.590
2007190887	2007191058	6.94	7.36	4.228	4.231	1.593	1.592	22.96	24.07	7.832	7.305	0.657	0.736
2007190887	2007191058	6.86	7.25	4.288	4.181	1.498	1.549	19.99	21.71	7.568	7.118	0.617	0.643
2007190887	2007191058	6.42	6.86	3.913	3.877	1.511	1.735	24.84	28.27	7.171	7.095	0.698	0.727
2007190887	2007191058	6.27	7.38	3.880	4.077	1.461	1.726	21.44	26.30	7.070	7.471	0.581	0.492
2007190895	2007190947	4.29	4.24	2.654	2.570	1.127	1.178	13.72	16.30	4.872	4.920	0.558	0.600
2007190895	2007190947	4.36	4.00	2.616	2.580	1.117	1.048	13.59	13.90	4.869	4.360	0.491	0.500
2007190895	2007190947	4.27	4.51	2.545	2.800	1.113	1.221	14.26	16.60	4.944	5.050	0.483	0.500
2007190895	2007190947	4.55	4.42	2.936	2.770	1.173	1.191	13.00	15.70	5.130	4.910	0.534	0.500
2007190896	2007191441	1.55	2.90	0.848	1.653	0.376	0.811	10.53	16.39	1.666	3.049	0.397	0.538
2007190896	2007191441	5.84	6.00	3.684	3.397	1.340	1.627	23.18	28.93	6.068	6.391	0.627	0.887
2007190896	2007191441	1.73	2.91	1.008	1.633	0.425	0.808	10.27	17.49	1.960	3.062	0.378	0.632
2007190896	2007191441	5.87	5.61	3.740	3.272	1.346	1.599	24.92	29.58	6.185	5.977	0.656	0.898
2007190922	2007191082	1.01	1.33	0.669	0.490	0.202	0.159	2.88	7.10	1.034	0.770	0.398	0.020
2007190922	2007191082	8.90	3.02	5.897	1.630	1.736	0.582	10.63	10.50	9.959	2.680	0.474	0.400
2007190922	2007191082	1.35	2.06	0.868	1.140	0.387	0.424	7.38	9.40	1.558	1.990	0.418	0.400
2007190922	2007191082	3.13	4.62	1.806	2.680	0.850	1.017	12.41	15.20	3.874	4.800	0.388	0.400
2007190927	2007191444	3.27	3.88	2.124	2.209	0.751	0.913	14.29	14.92	3.439	3.650	0.555	0.693
2007190927	2007191444	5.01	5.13	3.182	2.996	1.013	1.163	16.22	15.65	5.175	5.022	0.489	0.738
2007190927	2007191444	3.51	4.03	2.228	2.505	0.773	0.889	15.30	16.42	3.490	3.795	0.567	0.663
2007190927	2007191444	5.20	5.54	3.567	3.511	1.004	1.149	14.07	16.77	5.217	5.361	0.573	0.653
2007190949	2007191504	5.84	6.06	3.571	3.675	1.392	1.440	18.59	16.40	6.572	6.557	0.623	0.550
2007190949	2007191504	5.75	6.07	3.617	3.931	1.504	1.559	23.57	19.80	6.770	6.968	0.702	0.670
2007190949	2007191504	5.06	4.92	3.004	2.986	1.230	1.171	17.26	16.40	5.664	5.353	0.593	0.520
2007190949	2007191504	5.06	4.92	3.033	2.857	1.254	1.249	21.42	20.40	5.647	5.628	0.649	0.620
2007190968	2007191437	1.18	0.76	0.873	0.421	0.358	0.015	3.66	2.71	1.386	0.885	0.466	0.349
2007190968	2007191437	3.50	2.77	2.456	1.886	0.784	0.386	7.68	6.47	3.352	2.575	0.513	0.515
2007190968	2007191437	2.41	2.26	1.445	1.200	0.710	0.418	8.52	10.73	2.670	2.418	0.490	0.523
2007190968	2007191437	4.27	4.10	2.694	2.402	1.210	0.952	16.66	17.50	4.616	4.366	0.678	0.631
2007190970	2007191245	4.79	5.23	2.690	2.900	0.868	0.877	10.20	14.60	4.590	4.760	0.800	0.900
2007190970	2007191245	5.58	6.01	3.170	3.320	0.978	0.882	9.90	15.80	5.350	5.270	0.900	1.200
2007190970	2007191245	5.12	3.14	2.800	1.570	0.925	0.522	12.70	7.60	4.720	2.850	0.600	0.400
2007190970	2007191245	6.70	8.79	3.920	5.060	1.264	1.630	12.20	11.80	6.470	8.610	0.600	0.500
2007190986	2007191592	6.42	4.85	4.120	2.867	1.276	1.121	14.05	12.52	7.552	4.891	0.491	0.578
2007190986	2007191592	17.75	14.98	10.950	8.670	3.098	2.460	14.29	9.50	23.590	17.490	0.452	0.380
2007190986	2007191592	6.76	6.72	4.262	3.968	1.289	1.330	15.59	12.89	7.457	7.254	0.487	0.516
2007190986	2007191592	13.04	10.17	8.166	6.013	2.444	1.835	17.47	15.86	16.970	10.900	0.496	0.642
2007190990	2007191537	8.25	8.35	5.491	5.964	1.124	1.229	14.09	14.27	7.660	8.042	0.570	0.528
2007190990	2007191537	8.39	8.69	6.078	6.107	1.139	1.223	14.15	11.05	7.962	8.326	0.537	0.535
2007190990	2007191537	5.47	3.87	3.805	2.820	0.706	0.469	8.82	5.12	5.027	3.818	0.503	0.487
2007190990	2007191537	9.67	10.02	6.898	7.375	1.181	1.040	11.60	7.89	9.079	9.819	0.571	0.541
2007191007	2007191551	2.49	2.48	1.714	1.735	0.589	0.616	4.17	4.16	2.805	2.662	0.436	0.422
2007191007	2007191551	5.69	5.73	4.037	3.921	1.276	1.137	7.96	7.64	6.542	5.591	0.492	0.438
2007191007	2007191551	2.24	2.60	1.558	1.819	0.539	0.700	5.24	6.06	2.504	2.620	0.409	0.463
2007191007	2007191551	6.12	5.54	4.512	3.682	1.182	1.264	9.35	8.54	6.687	5.476	0.494	0.502
2007191028	2007191531	3.24	1.91	1.731	1.354	0.635	0.461	5.48	4.13	2.951	1.863	0.416	0.503
2007191028	2007191531	6.20	5.51	3.943	3.841	1.310	1.212	11.53	8.80	6.229	5.084	0.579	0.431
2007191028	2007191531	3.85	1.97	2.097	1.305	0.778	0.532	8.02	5.02	3.729	1.906	0.411	0.406
2007191028	2007191531	5.28	5.56	3.158	3.691	1.096	1.413	11.66	10.75	5.262	5.474	0.536	0.526
2007191051	2007191331	4.15	4.52	2.493	2.801	0.978	1.109	10.78	11.21	4.211	4.440	0.447	0.598
2007191051	2007191331	4.13	4.63	2.643	3.193	0.831	1.079	10.27	10.23	3.828	4.391	0.542	0.648
2007191051	2007191331	4.16	4.45	2.562	2.660	1.000	1.181	11.73	11.79	4.272	4.491	0.460	0.519
2007191051	2007191331	4.59	4.59	3.033	2.991	1.072	1.237	11.95	10.29	4.754	4.653	0.443	0.434
2007191066	2007191379	3.55	2.15	2.030	1.227	0.915	0.537	10.97	7.07	3.627	2.333	0.576	0.507
2007191066	2007191379	5.08	3.96	2.906	2.401	1.266							

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Dy (ppm)	Dy (ppm)	Er (ppm)	Er (ppm)	Eu (ppm)	Eu (ppm)	Ga (ppm)	Ga (ppm)	Gd (ppm)	Gd (ppm)	Ge (ppm)	Ge (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.030	0.030	0.030	0.030	0.10	0.10	0.030	0.030	0.040	0.040
2007191134	2007191282	4.74	3.40	2.713	1.780	1.413	0.764	9.03	13.20	6.654	3.730	0.391	0.400
2007191134	2007191282	6.64	7.00	3.881	3.880	1.949	1.817	12.39	21.10	9.200	8.460	0.348	0.600
2007191152	2007191578	1.68	1.56	1.216	1.063	0.154	0.154	3.13	3.62	1.471	1.251	0.391	0.619
2007191152	2007191578	5.75	5.14	4.172	3.658	0.704	0.689	7.91	7.51	5.179	4.262	0.441	0.630
2007191152	2007191578	1.92	1.66	1.374	1.127	0.315	0.354	11.78	11.32	1.903	1.593	0.497	0.568
2007191152	2007191578	3.61	3.77	2.571	2.582	0.614	0.670	18.20	19.36	3.566	3.211	0.580	0.779
2007191168	2007191195	4.38	3.62	2.367	2.262	1.050	0.964	12.79	10.54	4.587	4.520	0.419	0.588
2007191168	2007191195	8.20	5.97	4.580	3.798	1.763	1.517	15.00	15.54	8.526	7.243	0.588	0.697
2007191168	2007191195	4.20	4.01	2.280	2.475	0.998	1.011	12.70	12.37	4.481	4.877	0.653	0.612
2007191168	2007191195	7.00	5.97	4.150	3.605	1.645	1.616	18.07	19.80	7.694	7.452	0.410	0.726
2007191192	2007191339	3.80	4.74	2.498	2.764	0.988	1.135	13.54	15.52	4.396	4.896	0.743	0.674
2007191192	2007191339	5.59	6.07	3.687	3.648	1.422	1.438	17.32	16.57	6.415	6.393	0.815	0.817
2007191192	2007191339	3.98	4.48	2.622	2.477	1.162	1.079	17.06	16.95	4.938	4.729	0.664	0.535
2007191192	2007191339	5.09	5.64	3.178	3.256	1.386	1.410	19.15	21.09	6.072	6.088	0.903	0.772
2007191215	2007191281	2.55	2.76	1.619	1.851	0.537	0.637	4.07	4.86	2.547	2.537	0.640	0.413
2007191215	2007191281	6.07	7.57	3.746	4.831	1.228	1.383	8.05	9.06	5.873	7.251	0.604	0.425
2007191215	2007191281	2.63	2.74	1.631	1.839	0.543	0.579	6.18	3.54	2.582	2.570	0.679	0.498
2007191215	2007191281	6.98	7.68	4.277	5.107	1.216	1.287	10.67	7.41	6.582	7.349	0.630	0.491
2007191216	2007191385	1.66	2.14	0.994	1.341	0.317	0.525	4.97	8.01	1.421	2.241	0.618	0.584
2007191216	2007191385	4.18	5.22	2.753	3.238	0.910	1.309	11.07	16.08	4.209	5.437	0.708	0.687
2007191216	2007191385	1.59	1.83	0.983	1.263	0.366	0.435	6.59	7.84	1.638	1.896	0.624	0.601
2007191216	2007191385	4.01	4.95	2.657	3.142	0.956	1.100	14.10	19.39	4.199	4.785	0.717	0.825
2007191264	2007191486	2.24	2.32	1.599	1.490	0.572	0.471	8.22	7.70	2.739	2.410	0.490	0.400
2007191264	2007191486	8.85	9.24	6.185	6.290	1.627	1.448	6.09	9.10	10.630	9.940	0.379	0.300
2007191264	2007191486	2.05	8.43	1.431	5.640	0.481	1.455	7.28	8.40	2.289	9.830	0.554	0.400
2007191264	2007191486	10.38	2.00	6.909	1.330	1.901	0.455	6.39	6.80	12.510	2.000	0.381	0.400
2007191275	2007191590	1.34	3.02	0.893	1.720	0.386	0.844	6.07	15.31	1.565	3.147	0.537	0.627
2007191275	2007191590	4.26	5.33	2.926	3.207	0.966	1.340	13.81	24.31	4.659	5.458	0.523	0.797
2007191275	2007191590	1.37	2.92	0.868	1.651	0.347	0.790	5.79	14.71	1.512	3.009	0.378	0.624
2007191275	2007191590	2.86	5.32	1.952	3.122	0.692	1.380	10.62	27.03	3.286	5.348	0.462	0.868
2007191293	2007191518	3.53	3.52	2.315	2.204	1.023	0.748	11.57	8.07	4.154	3.333	0.550	0.548
2007191293	2007191518	3.96	3.89	2.625	2.399	1.064	0.844	10.97	8.37	4.403	3.665	0.531	0.508
2007191293	2007191518	3.92	3.73	2.468	2.212	1.175	0.981	14.52	11.56	4.652	3.822	0.577	0.594
2007191293	2007191518	4.49	4.33	2.949	2.624	1.312	1.052	13.67	12.14	4.971	4.192	0.590	0.549
2007191295	2007191498	1.51	1.47	1.108	0.939	0.375	0.318	3.78	3.00	1.565	1.526	0.387	0.430
2007191295	2007191498	10.26	9.46	8.046	7.354	1.327	1.213	6.40	6.20	10.121	8.862	0.315	0.370
2007191295	2007191498	1.48	1.36	0.987	0.908	0.344	0.325	4.05	3.10	1.508	1.404	0.359	0.390
2007191295	2007191498	9.41	11.64	7.390	9.671	1.301	1.539	6.22	7.30	9.053	11.723	0.355	0.460
2007191346	2007191429	4.18	5.42	2.644	3.028	1.174	1.107	13.17	17.07	4.783	5.691	0.621	0.710
2007191346	2007191429	4.70	4.74	3.180	2.815	1.151	0.869	12.50	14.39	5.381	5.047	0.434	0.582
2007191346	2007191429	2.66	3.50	1.730	2.033	0.720	0.514	7.26	9.90	3.102	3.487	0.442	0.560
2007191346	2007191429	6.00	5.77	4.173	3.430	1.241	0.942	12.04	12.43	6.411	5.638	0.424	0.503
2007191372	2007191445	2.30	2.10	1.276	0.857	0.772	0.267	14.88	6.04	2.937	3.223	0.567	0.282
2007191372	2007191445	3.90	5.38	2.104	2.597	1.233	0.945	21.73	13.24	4.788	7.825	0.675	0.451
2007191372	2007191445	2.35	2.28	1.227	1.072	0.673	0.339	13.04	5.58	3.163	3.416	0.502	0.320
2007191372	2007191445	4.97	6.81	2.667	3.457	1.496	1.268	24.78	12.92	6.507	9.425	0.635	0.407
2007191382	2007191509	3.47	3.71	1.990	2.270	0.802	0.782	21.30	14.20	3.850	4.160	0.500	0.400
2007191382	2007191509	5.58	7.56	3.410	5.030	1.194	1.462	25.30	18.50	5.950	7.820	0.600	0.020
2007191382	2007191509	3.64	3.46	2.110	2.070	0.843	0.951	23.80	21.60	3.970	4.000	0.600	0.500
2007191382	2007191509	4.23	4.90	2.420	2.840	1.058	1.241	27.90	31.90	4.800	5.670	0.700	0.800
2007191473	2007191510	3.64	3.46	2.051	2.222	0.974	0.973	12.99	13.76	3.915	4.014	0.420	0.424
2007191473	2007191510	3.91	3.69	2.363	2.492	0.887	1.029	13.37	14.39	3.902	4.188	0.542	0.555
2007191473	2007191510	2.78	2.89	1.647	1.795	0.671	0.805	9.62	11.36	3.020	3.357	0.235	0.409
2007191473	2007191510	2.93	3.14	1.762	1.990	0.708	0.853	10.31	12.04	3.067	3.524	0.408	0.361

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Hf (ppm)	Hf (ppm)	Ho (ppm)	Ho (ppm)	La (ppm)	La (ppm)	Lu (ppm)	Lu (ppm)	Mo (ppm)	Mo (ppm)	Nb (ppm)	Nb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.040	0.040	0.020	0.020	0.10	0.10	0.020	0.020	0.30	0.30	0.030	0.030
2007190003	2007190213	7.000	7.916	0.554	0.499	24.73	25.67	0.265	0.178	0.69	0.37	7.993	8.074
2007190003	2007190213	24.590	22.625	1.484	1.323	60.22	56.67	0.766	0.590	0.72	0.75	18.928	17.858
2007190003	2007190213	4.908	5.315	0.464	0.422	23.99	24.33	0.220	0.143	0.53	0.45	6.716	6.766
2007190003	2007190213	15.440	18.050	1.047	1.108	41.44	46.10	0.535	0.486	0.65	0.41	14.741	15.995
2007190005	2007191059	5.745	5.810	0.489	0.670	23.28	22.87	0.121	0.254	0.15	0.42	12.280	14.450
2007190005	2007191059	9.511	9.505	0.821	0.921	32.34	30.51	0.243	0.369	0.77	0.68	23.230	23.540
2007190005	2007191059	6.117	6.404	0.381	0.627	22.20	21.99	0.106	0.262	0.15	0.45	9.253	13.430
2007190005	2007191059	16.660	15.790	1.045	1.059	48.40	38.24	0.403	0.447	0.50	0.95	24.280	28.880
2007190032	2007190632	8.278	8.294	0.992	1.009	36.33	38.85	0.408	0.405	0.66	0.70	16.154	16.780
2007190032	2007190632	12.459	12.300	1.278	1.259	45.33	46.03	0.532	0.526	0.76	0.80	20.482	20.990
2007190032	2007190632	8.089	8.137	0.985	1.095	34.99	39.63	0.380	0.427	0.67	0.80	15.593	18.320
2007190032	2007190632	11.290	10.390	1.364	1.397	45.78	47.05	0.525	0.519	0.91	1.15	20.446	22.150
2007190035	2007190876	11.868	13.400	0.980	1.016	24.28	26.08	0.535	0.535	0.41	0.49	8.930	11.370
2007190035	2007190876	27.884	33.240	1.819	1.993	43.63	52.81	1.111	1.177	0.71	0.39	17.581	20.520
2007190035	2007190876	10.250	11.680	1.021	1.081	28.01	29.05	0.503	0.531	0.59	0.55	11.070	11.680
2007190035	2007190876	18.378	21.460	1.496	1.672	44.45	45.02	0.715	0.896	0.54	0.61	17.654	18.440
2007190039	2007190984	9.741	9.230	0.565	0.300	24.49	11.63	0.245	0.158	0.93	0.72	10.279	6.243
2007190039	2007190984	26.122	36.580	1.396	1.157	50.93	37.25	0.624	0.731	1.49	1.11	22.874	18.790
2007190039	2007190984	5.571	6.121	0.622	0.726	32.40	38.34	0.198	0.315	1.40	1.63	10.176	14.700
2007190039	2007190984	9.420	7.255	0.966	0.924	48.94	47.90	0.376	0.411	2.07	1.89	15.973	17.520
2007190050	2007191481	3.045	3.290	0.367	0.410	9.47	10.82	0.175	0.180	0.15	0.30	3.519	4.000
2007190050	2007191481	17.811	18.220	1.315	1.390	32.97	35.08	0.695	0.730	0.69	0.50	14.215	14.700
2007190050	2007191481	3.695	3.540	0.470	0.470	11.28	11.91	0.197	0.220	0.38	0.40	4.746	4.700
2007190050	2007191481	18.376	19.460	1.381	1.310	34.13	34.28	0.770	0.680	0.77	0.50	15.538	14.800
2007190067	2007191121	1.942	1.662	0.161	0.133	6.17	5.16	0.063	0.048	0.40	0.41	2.489	2.347
2007190067	2007191121	11.160	9.783	0.769	0.652	18.27	15.24	0.372	0.308	0.74	0.53	11.906	11.640
2007190067	2007191121	1.696	1.603	0.212	0.166	7.58	6.65	0.069	0.064	0.45	0.55	2.775	2.379
2007190067	2007191121	5.106	5.860	0.564	0.557	18.47	16.42	0.232	0.228	0.66	0.58	7.271	7.517
2007190071	2007190289	4.654	5.066	0.176	0.134	10.11	10.84	0.069	0.055	0.15	0.68	2.796	2.970
2007190071	2007190289	41.363	44.510	1.186	1.028	56.61	57.02	0.661	0.539	0.83	0.93	16.137	17.413
2007190071	2007190289	3.871	4.840	0.904	1.465	37.01	90.63	0.320	0.462	0.55	0.74	4.558	4.800
2007190071	2007190289	11.597	12.582	2.138	4.071	78.64	251.80	0.742	1.231	0.81	1.13	10.822	12.167
2007190074	2007190389	15.620	13.733	0.514	0.206	17.39	13.02	0.273	0.103	0.63	0.37	8.962	10.235
2007190074	2007190389	69.065	79.323	1.263	1.188	40.91	44.47	0.884	0.858	1.20	0.61	20.149	20.761
2007190074	2007190389	6.088	18.491	0.135	0.311	7.39	17.51	0.084	0.174	0.52	0.81	4.926	16.807
2007190074	2007190389	61.225	41.509	1.047	1.070	32.43	33.37	0.745	0.613	0.50	0.76	18.089	15.503
2007190091	2007191053	3.816	10.160	0.264	0.639	9.32	22.87	0.116	0.255	0.15	0.46	3.807	11.440
2007190091	2007191053	42.830	31.740	1.637	1.503	64.28	54.69	0.877	0.753	0.77	0.70	26.660	27.520
2007190091	2007191053	10.610	8.902	0.559	0.455	20.12	18.92	0.283	0.231	0.39	0.39	8.663	7.672
2007190091	2007191053	44.930	10.990	1.843	0.909	59.98	20.25	1.004	0.405	0.85	0.37	24.150	9.462
2007190107	2007190913	6.841	6.687	0.228	0.214	9.54	11.38	0.135	0.081	1.09	0.69	6.122	6.891
2007190107	2007190913	56.740	50.968	1.484	1.525	37.85	45.40	0.901	0.727	1.19	0.91	20.022	19.591
2007190107	2007190913	6.601	6.512	0.229	0.301	9.10	13.64	0.123	0.111	1.07	0.87	5.897	7.050
2007190107	2007190913	61.089	24.224	1.469	1.281	36.50	46.45	0.879	0.574	1.24	1.66	20.365	15.501
2007190110	2007191182	4.959	5.300	0.610	0.740	22.63	24.63	0.249	0.310	0.35	0.60	9.029	9.500
2007190110	2007191182	16.013	16.460	1.391	1.530	43.66	46.08	0.684	0.750	0.69	0.80	17.497	18.700
2007190110	2007191182	8.631	5.490	1.383	0.960	48.93	32.38	0.565	0.390	0.70	0.50	27.459	11.200
2007190110	2007191182	10.934	12.500	1.555	1.580	51.08	53.95	0.640	0.700	0.68	0.70	28.076	18.000
2007190114	2007191045	7.167	7.477	1.046	1.083	25.94	28.38	0.469	0.436	1.13	0.78	11.876	13.419
2007190114	2007191045	10.075	12.448	1.235	1.134	31.53	29.10	0.559	0.505	1.13	1.09	15.003	17.056
2007190114	2007191045	8.836	8.452	0.953	0.975	23.93	25.44	0.459	0.437	1.16	0.92	11.847	12.947
2007190114	2007191045	14.371	8.476	1.203	1.129	29.89	29.30	0.604	0.470	1.27	0.87	16.207	14.547
2007190118	2007191552	11.171	11.110	1.353	1.195	43.54	42.74	0.587	0.473	1.20	1.17	19.634	20.570
2007190118	2007191552	13.947	13.290	1.399	1.167	42.30	37.76	0.661	0.500	1.13	1.02	21.977	21.320
2007190118	2007191552	8.514	8.270	1.419	1.285	59.64	57.66	0.567	0.502	1.03	0.67	18.249	18.960
2007190118	2007191552	10.298	10.150	1.470	1.236	59.11	52.61	0.616	0.459	0.97	0.85	19.388	20.330
2007190121	2007191545	7.725	6.720	0.198	0.276	5.74	9.56	0.098	0.132	0.87	3.30	4.817	5.500
2007190121	2007191545	52.784	25.870	1.024	1.016	22.60	31.32	0.749	0.525	0.88	0.70	20.072	16.600
2007190121	2007191545	8.820	6.670	0.215	0.266	6.14	10.17	0.121	0.093	0.75	0.50	4.961	5.400
2007190121	2007191545	51.109	15.040	1.127	0.697	24.89	24.60	0.698	0.315	1.09	0.70	19.861	11.000
2007190125	2007191532	12.261	11.760	1.214	0.927	34.68	30.03	0.616	0.541	0.69	0.49	18.723	16.300
2007190125	2007191532	19.606	28.680	1.590	1.788	47.01	55.19	0.827	1.029	0.92	0.62	24.632	25.850
2007190125	2007191532	14.079	12.420	1.311	1.073	39.05	35.03	0.663	0.619	0.77	0.43	21.045	18.710
2007190125	2007191532	25.869	25.930	1.937	1.933	58.77	57.07	1.019	1.123	0.81	0.63	29.146	26.400
2007190145	2007191105	6.838	7.400	0.780	0.731	25.23	26.03	0.339	0.264	0.78	0.60	8.941	9.000
2007190145	2007191105	10.532	8.940	0.822	0.721	26.29	24.78	0.356	0.278	0.93	0.70	10.846	10.600
2007190145	2007191105	5.656	6.370	0.741	0.693	25.41	23.63	0.321	0.239	0.66	0.40	8.284	7.900
2007190145	2007191105	7.793	7.980	0.742	0.670	24.89	23.25	0.347	0.218	0.62	0.40	9.578	9.300
2007190154	2007190568	15.470	21.720	0.916	1.043	11.45	14.84	0.488	0.567	2.00	3.36	20.100	24.700
2007190154	2007190568	18.540	25.660	0.936	1.161	12.22	16.01	0.527	0.592	1.65	3.02	19.120	25.740
2007190154	2007190568	20.530	32.300	1.281	1.313	9.85	12.31	0.739	0.797	2.81	4.74	27.660	35.560
2007190154	2007190568	22.160	30.560	1.402	1.408	10.85	12.39	0.814	0.802	3.00	4.51	28.080	32.580
2007190155	2007191031	9.467	8.201	0.761	0.725	20.90	21.95	0.339	0.242	0.42	0.75	6.129	6.676
2007190155	2007191031	22.700	21.672	1.123	1.135	30.18	33.51	0.579	0.514	0.51	0.40	10.640	11.746
2007190155	2007191031	8.084	8.203	0.759	0.518	20.48	17.44	0.329	0.236	0.93	0.74	6.355	5.454
2007190155	2007191031	16.850	20.759	1.225	1.163	32.13	34.04	0.548	0.544	2.64	5.45	9.824	11.129
2007190161													

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Hf (ppm)	Hf (ppm)	Ho (ppm)	Ho (ppm)	La (ppm)	La (ppm)	Lu (ppm)	Lu (ppm)	Mo (ppm)	Mo (ppm)	Nb (ppm)	Nb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.040	0.040	0.020	0.020	0.10	0.10	0.020	0.020	0.30	0.30	0.030	0.030
2007190181	2007191396	7.264	7.780	0.737	0.840	20.81	21.56	0.308	0.360	0.50	0.50	13.420	13.100
2007190181	2007191396	9.799	10.230	0.965	1.030	26.04	26.57	0.370	0.450	0.77	0.70	16.126	16.000
2007190183	2007190471	10.013	7.883	0.207	0.191	8.73	9.52	0.080	0.095	0.43	0.38	5.363	8.954
2007190183	2007190471	68.746	52.100	1.401	1.239	40.71	38.53	0.926	0.779	0.80	0.66	18.316	17.110
2007190183	2007190471	4.892	6.037	0.901	0.673	36.49	26.00	0.300	0.243	1.94	0.79	11.660	12.420
2007190183	2007190471	6.357	7.899	1.128	1.134	43.02	42.09	0.428	0.419	1.81	1.17	13.829	15.440
2007190185	2007191253	6.700	6.352	0.811	0.685	27.39	25.54	0.299	0.260	0.90	0.36	11.509	11.290
2007190185	2007191253	10.969	13.000	0.990	1.052	33.74	34.81	0.405	0.451	0.80	0.54	14.699	15.200
2007190185	2007191253	5.559	6.024	0.855	0.704	31.65	27.69	0.330	0.251	0.88	0.91	11.821	10.840
2007190185	2007191253	8.461	8.934	0.985	0.939	34.12	31.83	0.364	0.352	1.04	0.48	13.953	13.290
2007190189	2007191542	8.306	8.296	0.940	0.969	28.80	27.77	0.364	0.416	0.45	0.43	15.128	14.300
2007190189	2007191542	11.724	10.690	0.977	0.986	27.77	27.68	0.440	0.424	0.39	0.38	14.622	13.980
2007190189	2007191542	8.459	8.582	0.961	0.999	28.58	28.74	0.397	0.404	0.47	0.66	15.130	16.000
2007190189	2007191542	10.173	9.566	0.965	1.049	27.61	28.17	0.409	0.424	0.54	0.77	14.916	14.550
2007190193	2007190788	10.833	8.120	1.148	1.440	38.00	45.65	0.460	0.570	0.79	0.90	13.419	15.300
2007190193	2007190788	14.450	10.380	1.279	1.400	39.96	43.65	0.570	0.580	0.61	0.80	13.897	14.300
2007190193	2007190788	9.671	9.660	1.321	1.480	42.08	45.06	0.553	0.610	0.94	0.80	14.919	15.200
2007190193	2007190788	11.969	13.690	1.436	1.760	42.01	51.51	0.646	0.720	0.49	0.80	15.335	16.900
2007190194	2007190704	11.104	11.380	0.869	0.917	25.56	25.86	0.382	0.389	0.54	0.59	11.329	11.460
2007190194	2007190704	18.699	19.390	1.040	0.971	26.77	27.26	0.492	0.482	0.47	0.35	13.011	12.710
2007190194	2007190704	10.298	10.430	1.113	1.147	32.20	33.05	0.467	0.483	0.80	0.61	13.103	13.620
2007190194	2007190704	13.675	13.820	1.292	1.163	34.71	33.74	0.546	0.522	0.65	0.52	14.658	14.740
2007190197	2007190962	5.975	5.914	0.239	0.262	6.69	7.58	0.103	0.128	0.15	0.48	3.015	3.284
2007190197	2007190962	31.901	34.060	1.288	1.502	31.75	38.30	0.760	0.874	0.37	0.39	15.312	15.500
2007190197	2007190962	4.465	5.876	0.372	0.316	14.02	11.73	0.160	0.162	0.67	0.59	5.612	5.253
2007190197	2007190962	19.603	30.370	1.404	1.438	48.51	41.12	0.685	0.810	1.34	2.70	20.884	17.600
2007190208	2007191593	15.910	17.040	0.556	0.642	7.50	8.58	0.427	0.573	1.18	1.85	9.461	10.180
2007190208	2007191593	28.870	28.260	0.945	0.950	11.08	11.71	0.830	0.918	0.89	1.47	15.580	16.040
2007190208	2007191593	11.680	14.870	0.694	0.752	12.82	12.41	0.458	0.610	1.56	1.73	10.480	11.540
2007190208	2007191593	19.570	23.850	0.937	1.054	15.87	14.64	0.698	0.896	1.99	1.46	13.820	15.340
2007190209	2007191254	12.305	11.800	0.759	0.571	24.36	19.37	0.293	0.229	0.33	0.15	8.987	7.043
2007190209	2007191254	19.267	25.830	1.018	0.918	28.64	26.19	0.447	0.450	0.35	0.15	11.486	10.840
2007190209	2007191254	11.135	10.650	0.622	0.426	20.81	15.80	0.274	0.178	0.43	0.31	7.971	5.821
2007190209	2007191254	19.206	24.450	0.985	0.969	28.98	27.47	0.437	0.455	0.94	0.56	11.780	10.900
2007190212	2007190747	7.709	7.438	0.236	0.194	10.59	7.85	0.099	0.110	0.15	0.33	2.788	2.023
2007190212	2007190747	54.950	102.500	1.783	2.606	54.75	78.95	1.009	1.644	0.46	0.38	14.760	18.490
2007190212	2007190747	10.850	6.016	0.796	0.204	26.56	8.31	0.311	0.109	0.64	0.71	6.573	2.296
2007190212	2007190747	48.500	72.960	1.603	1.837	41.48	51.84	0.927	1.251	0.15	0.33	13.460	15.140
2007190218	2007191348	5.910	6.580	0.179	0.350	7.79	10.72	0.057	0.180	0.62	0.80	5.304	6.500
2007190218	2007191348	24.031	17.340	0.908	0.980	24.99	30.24	0.486	0.510	1.12	1.70	15.850	16.400
2007190218	2007191348	6.911	7.780	0.200	0.490	9.03	15.47	0.081	0.240	0.80	1.10	6.001	8.100
2007190218	2007191348	23.449	15.530	0.953	1.100	26.34	34.98	0.512	0.530	1.32	1.40	16.689	17.000
2007190241	2007190978	11.680	9.614	0.787	0.784	35.76	25.39	0.285	0.276	0.64	0.58	28.870	24.981
2007190241	2007190978	15.560	15.530	1.256	1.227	39.15	36.89	0.476	0.516	1.27	1.01	57.650	56.040
2007190241	2007190978	6.211	7.910	0.690	0.809	23.58	24.96	0.241	0.286	0.45	0.43	27.380	24.911
2007190241	2007190978	8.544	12.798	1.140	1.240	37.45	38.63	0.376	0.446	0.94	1.14	54.240	48.512
2007190248	2007191198	8.806	10.890	0.180	0.279	8.22	8.87	0.063	0.144	0.15	0.15	3.833	4.286
2007190248	2007191198	76.710	313.300	1.110	3.339	32.42	85.23	0.909	3.339	1.02	1.13	17.310	52.530
2007190248	2007191198	18.040	11.960	0.302	0.258	10.61	8.65	0.176	0.143	0.15	0.81	6.253	5.216
2007190248	2007191198	181.600	113.700	2.210	1.685	63.06	44.72	2.015	1.409	0.15	0.33	32.000	23.070
2007190256	2007190875	5.521	2.868	0.348	0.247	11.06	8.68	0.103	0.071	0.54	0.50	3.923	2.809
2007190256	2007190875	40.740	53.060	1.097	1.295	31.66	39.11	0.637	0.749	0.38	0.72	13.820	15.980
2007190256	2007190875	9.207	4.423	0.580	0.323	17.81	11.02	0.242	0.108	0.33	0.66	6.871	3.839
2007190256	2007190875	29.910	45.480	0.994	1.064	28.15	32.25	0.527	0.624	0.32	0.44	13.680	15.110
2007190258	2007191176	7.483	14.480	0.709	0.840	21.98	26.37	0.316	0.440	0.78	0.60	9.205	11.300
2007190258	2007191176	13.985	28.360	1.085	1.300	31.09	39.36	0.528	0.740	0.92	0.90	14.544	17.600
2007190258	2007191176	9.186	10.300	0.581	0.720	20.44	22.33	0.281	0.360	0.57	0.60	8.487	9.200
2007190258	2007191176	34.586	28.530	1.454	1.440	48.98	39.14	0.825	0.790	1.05	0.90	19.591	17.600
2007190266	2007191458	5.058	4.968	0.391	0.297	13.52	11.60	0.137	0.107	0.33	0.37	4.818	3.718
2007190266	2007191458	14.850	21.230	0.788	0.907	21.78	25.10	0.370	0.519	0.66	0.46	9.735	10.560
2007190266	2007191458	5.164	1.660	0.294	0.122	11.66	5.41	0.099	0.025	0.32	0.47	3.500	1.512
2007190266	2007191458	23.250	46.400	0.931	1.165	26.82	37.46	0.458	0.706	0.47	0.40	10.800	13.770
2007190285	2007190406	7.474	8.178	0.959	0.962	27.41	27.02	0.343	0.382	0.67	1.16	19.990	19.960
2007190285	2007190406	10.050	12.380	1.081	1.130	29.46	30.07	0.397	0.471	0.84	1.31	23.170	22.760
2007190285	2007190406	7.621	7.643	0.947	0.985	26.55	27.67	0.328	0.373	0.96	1.13	20.470	20.800
2007190285	2007190406	10.950	10.880	1.060	1.117	27.75	30.67	0.416	0.447	1.18	1.25	24.020	23.300
2007190296	2007190758	6.420	6.170	0.330	0.260	9.02	7.45	0.130	0.150	0.40	0.40	4.600	4.000
2007190296	2007190758	28.950	29.680	1.040	1.140	28.42	26.60	0.560	0.670	0.40	0.70	12.800	11.500
2007190296	2007190758	6.360	7.220	0.280	0.270	9.16	7.47	0.140	0.160	0.50	1.00	4.900	4.000
2007190296	2007190758	29.070	31.600	1.120	1.090	29.56	23.85	0.610	0.680	0.60	0.60	13.900	13.100
2007190311	2007191259	8.092	14.710	0.041	0.076	4.38	3.90	0.030	0.056	0.88	0.82	7.083	8.274
2007190311	2007191259	37.455	45.320	0.556	0.728	27.46	33.30	0.379	0.493	2.64	1.85	39.505	33.850
2007190311	2007191259	8.932	5.717	0.173	0.021	8.91	2.37	0.087	0.010	0.88	0.59	10.419	3.525
2007190311	2007191259	25.581	19.200	0.888	0.363	39.57	17.34	0.418	0.214	2.16	1.55	35.162	21.150
2007190328	2007191598	6.935	7.818	0.225	0.250	7.48	7.45	0.102	0.136	0.36	0.77	3.953	4.558
2007190328	2007191598	46.840	45.860	1.388	1.570	29.13	32.85	0.852	0.965	0.59	0.95	16.350	16.680
2007190328													

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Hf (ppm)	Hf (ppm)	Ho (ppm)	Ho (ppm)	La (ppm)	La (ppm)	Lu (ppm)	Lu (ppm)	Mo (ppm)	Mo (ppm)	Nb (ppm)	Nb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.040	0.040	0.020	0.020	0.10	0.10	0.020	0.020	0.30	0.30	0.030	0.030
2007190349	2007191436	8.796	8.357	0.813	0.500	21.90	20.60	0.274	0.087	0.50	0.56	10.639	10.620
2007190349	2007191436	24.284	25.970	1.604	1.299	37.17	37.31	0.831	0.601	0.79	0.67	18.073	17.710
2007190349	2007191436	7.894	7.909	0.805	0.471	21.88	20.43	0.349	0.080	0.89	0.50	10.902	10.160
2007190349	2007191436	13.240	20.950	1.222	1.066	32.50	32.85	0.563	0.437	1.87	1.10	15.776	15.540
2007190352	2007190611	3.744	4.498	0.968	0.970	35.81	35.36	0.313	0.310	3.47	3.55	9.161	10.803
2007190352	2007190611	4.299	4.548	1.059	1.070	40.68	39.17	0.332	0.375	4.26	3.78	9.307	10.631
2007190352	2007190611	6.412	4.683	0.723	0.832	22.04	23.04	0.325	0.335	3.93	3.32	11.775	12.033
2007190352	2007190611	7.708	5.046	0.782	0.820	23.97	24.61	0.345	0.332	3.96	3.12	13.048	12.065
2007190355	2007191257	4.551	4.408	0.656	0.644	24.85	24.26	0.286	0.247	1.18	1.47	9.633	9.307
2007190355	2007191257	8.702	8.451	0.956	0.895	26.75	31.09	0.415	0.380	1.31	1.68	14.120	12.810
2007190355	2007191257	4.047	4.045	0.535	0.623	23.20	25.68	0.238	0.250	2.72	3.54	9.001	10.160
2007190355	2007191257	4.337	4.372	0.554	0.644	24.32	26.93	0.259	0.274	3.66	4.00	9.844	10.540
2007190357	2007190856	1.793	2.556	0.063	0.176	6.24	6.53	0.010	0.086	0.15	0.38	1.542	1.620
2007190357	2007190856	16.440	22.690	0.778	0.870	14.86	14.08	0.358	0.514	0.47	0.44	8.908	8.377
2007190357	2007190856	6.352	5.234	0.359	0.461	11.38	13.98	0.125	0.201	0.61	0.56	4.157	4.619
2007190357	2007190856	25.190	17.550	1.315	1.147	25.78	26.85	0.638	0.595	1.46	0.50	12.990	11.550
2007190361	2007191094	4.606	5.320	0.643	0.750	26.54	24.90	0.184	0.310	0.37	2.00	8.654	8.400
2007190361	2007191094	5.492	6.360	0.643	0.770	26.08	24.75	0.215	0.320	0.15	2.10	9.451	9.500
2007190361	2007191094	3.493	3.420	0.350	0.467	15.88	15.54	0.112	0.189	0.15	0.50	5.957	6.400
2007190383	2007191416	7.142	5.800	0.844	0.510	26.75	16.02	0.305	0.240	0.59	0.15	10.090	5.800
2007190383	2007191416	14.400	13.090	1.094	1.260	31.80	37.74	0.454	0.530	0.50	0.50	12.730	14.600
2007190383	2007191416	6.336	6.400	0.872	0.890	28.17	27.10	0.320	0.350	0.48	0.50	10.200	9.500
2007190383	2007191416	9.190	9.790	1.222	1.280	37.56	39.29	0.478	0.520	0.64	0.80	13.640	13.900
2007190393	2007191050	6.487	8.994	1.029	1.179	38.30	41.42	0.363	0.474	0.57	0.55	14.330	15.444
2007190393	2007191050	9.251	11.193	1.099	1.115	39.07	41.07	0.431	0.463	0.51	0.56	14.520	14.473
2007190393	2007191050	10.660	8.155	1.279	1.268	46.20	44.84	0.497	0.481	0.67	1.23	17.560	16.677
2007190393	2007191050	12.260	9.831	1.266	1.344	44.26	45.09	0.506	0.509	0.46	0.60	16.780	15.671
2007190414	2007191386	13.025	11.580	1.155	1.222	39.14	40.04	0.518	0.480	1.34	0.60	14.818	15.300
2007190414	2007191386	19.097	15.590	1.405	1.362	41.54	40.86	0.685	0.545	0.39	0.90	16.728	16.600
2007190414	2007191386	11.737	11.510	1.265	1.215	40.10	39.17	0.537	0.477	0.69	0.40	13.967	14.400
2007190414	2007191386	18.103	16.470	1.503	1.583	44.87	47.28	0.694	0.645	0.43	0.80	16.351	17.400
2007190419	2007190974	10.530	10.070	0.842	0.702	26.22	20.80	0.338	0.344	0.44	0.59	9.435	7.515
2007190419	2007190974	16.580	20.230	0.980	1.026	28.86	28.31	0.449	0.552	0.50	0.15	10.920	11.390
2007190419	2007190974	9.082	9.996	0.738	0.734	22.55	21.68	0.289	0.357	0.49	0.15	8.496	8.267
2007190419	2007190974	17.170	18.870	1.238	1.233	36.42	35.73	0.534	0.592	0.74	0.39	13.350	13.570
2007190425	2007190768	11.290	13.070	1.125	1.140	31.76	31.35	0.519	0.490	0.65	1.00	13.790	13.600
2007190425	2007190768	13.950	17.230	1.121	1.130	31.06	28.70	0.549	0.560	0.64	0.50	13.660	13.500
2007190425	2007190768	12.360	13.230	0.935	1.120	25.65	29.16	0.468	0.510	0.58	0.60	13.970	12.900
2007190425	2007190768	15.550	17.940	1.082	1.240	28.74	30.42	0.568	0.630	0.64	0.70	14.680	13.600
2007190434	2007191027	2.505	2.190	0.415	0.390	21.58	17.60	0.096	0.150	0.72	0.40	4.929	4.000
2007190434	2007191027	6.408	5.680	1.055	1.040	48.13	45.80	0.366	0.380	0.87	0.90	12.680	10.000
2007190434	2007191027	2.148	2.220	0.456	0.460	22.69	21.45	0.115	0.160	1.00	0.60	4.284	4.200
2007190434	2007191027	3.795	4.240	0.793	0.900	36.85	37.75	0.240	0.320	1.59	0.80	7.862	8.000
2007190457	2007191004	9.015	10.510	0.821	0.685	31.46	33.88	0.312	0.293	0.51	0.15	10.040	7.870
2007190457	2007191004	13.710	17.730	1.013	1.143	40.26	50.18	0.400	0.509	0.47	0.52	12.560	13.210
2007190457	2007191004	7.243	8.875	0.479	0.570	20.57	23.30	0.191	0.274	0.50	0.49	7.285	8.331
2007190457	2007191004	18.260	15.170	1.179	1.160	45.67	39.80	0.518	0.522	0.42	0.35	16.070	16.120
2007190458	2007190774	8.872	9.780	0.933	0.890	26.09	23.57	0.328	0.380	0.89	0.70	11.310	10.500
2007190458	2007190774	14.210	15.860	0.990	1.160	27.44	28.73	0.443	0.550	0.74	0.70	12.590	13.000
2007190458	2007190774	9.558	8.890	0.887	0.980	25.07	22.84	0.343	0.410	0.91	0.80	11.240	9.800
2007190458	2007190774	12.820	14.630	1.014	1.080	27.51	27.30	0.434	0.510	1.05	1.10	12.730	12.700
2007190472	2007191312	8.334	9.082	0.802	0.811	26.20	24.81	0.354	0.380	0.15	0.66	8.788	8.983
2007190472	2007191312	12.287	13.390	0.919	0.982	28.13	28.27	0.437	0.480	0.15	0.64	9.929	11.190
2007190472	2007191312	7.589	8.578	0.734	0.843	23.89	25.38	0.339	0.402	1.71	0.73	7.695	9.410
2007190472	2007191312	10.633	11.810	0.899	0.975	27.23	28.09	0.412	0.482	0.41	0.50	9.616	10.220
2007190481	2007191594	10.170	13.200	0.748	0.883	15.66	17.05	0.385	0.467	0.49	0.83	9.769	11.600
2007190481	2007191594	14.800	14.860	1.036	1.034	18.27	17.45	0.516	0.491	0.34	0.67	13.820	12.870
2007190481	2007191594	11.530	11.010	0.990	0.887	19.64	18.24	0.481	0.443	0.54	0.78	13.480	11.070
2007190481	2007191594	12.590	12.710	1.035	0.975	18.91	18.24	0.514	0.495	0.15	0.74	14.160	12.340
2007190495	2007191318	7.120	4.790	0.235	0.277	6.45	8.14	0.133	0.134	0.30	0.40	3.600	4.000
2007190497	2007190586	9.965	9.238	0.540	0.597	15.22	15.66	0.158	0.282	0.40	0.47	6.940	6.712
2007190497	2007190586	18.827	21.810	1.201	1.150	33.24	32.54	0.436	0.553	0.73	0.49	13.691	13.280
2007190497	2007190586	9.388	8.948	0.564	0.568	16.41	16.03	0.157	0.278	0.62	0.48	7.650	6.997
2007190497	2007190586	18.673	18.830	1.071	1.093	31.26	30.59	0.400	0.509	0.56	1.20	13.861	13.230
2007190506	2007190631	12.420	10.220	0.927	0.979	28.64	31.26	0.387	0.428	0.15	0.38	11.300	10.310
2007190506	2007190631	22.160	18.110	0.961	0.949	27.67	25.69	0.493	0.460	0.40	0.46	12.060	10.590
2007190506	2007190631	11.290	9.301	0.914	0.928	28.95	30.44	0.395	0.398	0.84	1.00	10.750	10.060
2007190506	2007190631	15.060	13.030	1.014	1.036	31.43	31.52	0.452	0.452	1.13	1.58	12.100	11.140
2007190508	2007191119	5.956	6.306	0.876	0.853	27.78	29.10	0.288	0.198	0.64	0.15	15.110	15.102
2007190508	2007191119	8.025	8.646	0.969	0.926	30.22	31.08	0.353	0.246	0.55	0.94	15.580	15.481
2007190508	2007191119	7.262	7.262	0.985	0.965	34.46	35.60	0.349	0.258	0.47	0.37	14.350	14.394
2007190508	2007191119	8.757	8.216	1.022	0.981	36.61	36.12	0.419	0.268	0.57	0.47	15.290	15.192
2007190526	2007191599	11.020	9.003	1.360	1.245	45.08	39.39	0.525	0.538	0.93	1.36	15.720	13.200
2007190526	2007191599	15.350	13.620	1.655	1.524	52.76	46.03	0.647	0.664	0.96	1.38	18.520	16.070
2007190526	2007191599	10.460	9.933	1.595	1.451	51.84	44.74	0.571	0.640	1.25	1.48	17.390	14.590
2007190526	2007191599	15.140	13.330	1.858	1.652	57.31	50.40	0.690	0.709	1.17	1.38	19.450	17.560
2007190527													

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Hf (ppm)	Hf (ppm)	Ho (ppm)	Ho (ppm)	La (ppm)	La (ppm)	Lu (ppm)	Lu (ppm)	Mo (ppm)	Mo (ppm)	Nb (ppm)	Nb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.040	0.040	0.020	0.020	0.10	0.10	0.020	0.020	0.30	0.30	0.030	0.030
2007190534	2007191522	8.622	11.660	0.515	0.448	21.44	19.98	0.217	0.334	0.33	0.40	8.031	7.277
2007190534	2007191522	53.190	92.970	2.131	2.973	83.62	108.20	1.090	1.875	0.80	0.62	19.300	23.770
2007190536	2007190909	8.716	8.539	0.253	0.275	9.35	8.20	0.145	0.157	0.35	0.15	4.126	3.538
2007190536	2007190909	89.560	89.980	1.635	1.619	48.85	48.19	1.234	1.223	1.39	0.41	20.440	20.190
2007190536	2007190909	8.917	8.508	0.304	0.306	10.72	10.91	0.155	0.161	0.34	0.40	4.074	4.130
2007190536	2007190909	80.050	74.650	1.473	1.477	50.04	46.00	1.059	1.073	0.99	0.94	18.800	17.400
2007190548	2007191236	11.050	10.490	0.982	0.946	42.21	36.01	0.429	0.416	0.57	0.15	13.750	11.430
2007190548	2007191236	23.420	26.430	1.751	1.620	68.85	67.16	0.797	0.842	0.42	0.15	18.800	17.060
2007190548	2007191236	10.940	10.410	1.107	0.885	43.14	37.09	0.435	0.412	0.89	0.15	14.600	11.610
2007190548	2007191236	23.840	28.440	1.759	1.753	76.30	76.23	0.772	0.846	1.09	0.72	19.740	18.640
2007190549	2007191507	4.866	5.812	0.096	0.125	3.08	3.91	0.054	0.088	0.15	0.45	3.227	3.886
2007190549	2007191507	52.245	40.650	1.076	0.895	13.63	13.80	0.743	0.642	0.58	0.77	17.841	15.840
2007190549	2007191507	6.935	6.040	0.125	0.169	4.02	5.06	0.074	0.099	0.37	0.40	3.995	4.396
2007190549	2007191507	58.588	37.440	1.073	0.908	15.34	15.67	0.787	0.607	0.60	0.82	17.882	15.960
2007190552	2007190675	3.697	3.007	0.268	0.239	11.03	9.45	0.083	0.099	0.49	0.39	2.795	2.183
2007190552	2007190675	27.360	22.000	2.183	1.520	70.54	48.82	0.907	0.663	1.13	0.95	14.820	12.900
2007190552	2007190675	4.184	3.613	0.853	0.576	29.47	19.92	0.292	0.280	1.03	0.62	4.059	3.711
2007190552	2007190675	10.420	7.921	2.642	1.814	86.70	61.51	0.968	0.806	1.12	1.14	11.400	12.270
2007190554	2007190752	7.237	14.320	0.395	0.673	9.64	16.21	0.180	0.320	0.38	0.50	5.512	10.800
2007190554	2007190752	38.957	29.580	1.791	1.509	29.07	29.42	0.925	0.779	0.75	0.90	20.659	22.400
2007190554	2007190752	2.644	11.890	0.153	0.847	6.63	27.58	0.051	0.351	0.58	0.60	2.357	13.200
2007190554	2007190752	30.487	21.580	1.777	1.663	34.94	50.21	0.844	0.736	0.95	1.20	18.535	25.600
2007190583	2007191063	13.220	11.690	0.872	0.855	21.72	20.70	0.439	0.397	0.64	0.35	9.800	9.768
2007190583	2007191063	32.130	22.180	1.835	1.353	35.79	26.56	0.930	0.689	0.57	0.30	19.040	15.120
2007190583	2007191063	9.807	10.180	1.043	1.126	32.71	32.93	0.472	0.495	1.33	0.88	12.020	12.490
2007190583	2007191063	15.090	14.190	1.427	1.421	41.05	37.45	0.653	0.649	1.66	1.23	16.540	15.290
2007190618	2007191166	5.078	5.670	0.692	0.790	18.93	18.83	0.272	0.320	0.87	0.50	9.532	9.300
2007190618	2007191166	7.471	6.570	0.770	0.890	20.74	21.73	0.349	0.380	1.13	0.90	11.008	11.600
2007190618	2007191166	5.621	6.130	0.836	0.880	22.14	22.80	0.334	0.380	0.70	0.60	10.305	10.200
2007190618	2007191166	6.275	7.370	1.031	1.120	25.56	26.95	0.402	0.490	0.74	0.60	12.470	12.900
2007190647	2007191525	8.225	5.089	0.755	0.540	33.46	19.14	0.312	0.221	0.62	0.35	9.202	5.777
2007190647	2007191525	19.020	18.200	1.550	1.655	49.14	46.76	0.731	0.764	0.15	0.35	16.610	16.510
2007190647	2007191525	9.255	5.522	0.842	0.599	34.93	21.55	0.402	0.246	0.62	0.69	10.310	6.484
2007190647	2007191525	19.280	18.150	1.709	1.695	53.19	48.00	0.809	0.811	0.42	0.72	16.840	18.720
2007190659	2007190739	7.432	5.170	0.130	0.230	6.60	7.26	0.043	0.110	0.31	0.40	4.357	3.900
2007190659	2007190739	12.979	11.430	0.766	0.870	26.49	29.11	0.351	0.400	0.55	0.80	12.328	13.900
2007190659	2007190739	4.692	5.460	0.327	0.200	13.82	6.40	0.114	0.120	0.45	0.60	5.823	5.000
2007190659	2007190739	5.797	8.200	0.816	0.660	31.16	20.13	0.335	0.300	0.76	0.90	12.558	14.200
2007190661	2007191334	11.119	10.600	0.394	0.468	13.76	13.80	0.176	0.257	0.37	0.72	10.711	11.010
2007190661	2007191334	43.652	35.330	1.264	1.122	31.89	29.27	0.761	0.656	0.99	0.78	38.641	34.400
2007190661	2007191334	10.307	10.360	0.541	0.510	16.40	14.84	0.245	0.241	1.14	0.65	13.124	10.440
2007190661	2007191334	23.932	26.650	1.012	1.099	28.08	29.89	0.519	0.571	1.54	1.02	30.203	28.170
2007190686	2007191430	13.190	15.170	0.628	0.676	23.05	24.89	0.344	0.342	0.45	0.31	7.194	10.480
2007190686	2007191430	43.190	55.720	1.988	2.450	73.29	79.94	1.103	1.377	0.71	0.36	19.970	25.570
2007190686	2007191430	10.450	11.530	0.680	0.647	27.50	31.00	0.387	0.297	0.34	0.32	7.864	11.490
2007190686	2007191430	22.790	24.070	1.507	1.453	70.05	64.59	0.796	0.742	0.69	0.68	20.680	22.190
2007190695	2007190924	7.304	6.103	0.287	0.295	9.21	9.81	0.165	0.142	0.15	0.43	3.312	3.925
2007190695	2007190924	29.080	28.540	0.990	0.918	23.53	22.78	0.638	0.534	0.67	0.54	9.912	12.120
2007190695	2007190924	6.281	5.581	0.416	0.401	14.12	14.56	0.240	0.206	0.54	0.73	5.847	6.686
2007190695	2007190924	12.660	14.200	0.789	0.772	26.34	26.81	0.430	0.406	0.84	1.33	12.330	12.340
2007190698	2007190813	8.823	8.480	1.199	1.190	40.16	34.57	0.448	0.490	0.56	0.15	13.756	11.500
2007190698	2007190813	10.695	13.900	1.246	1.310	38.00	38.18	0.503	0.580	0.66	0.50	12.933	13.300
2007190698	2007190813	7.004	7.400	1.188	1.210	38.69	37.87	0.447	0.480	0.55	0.40	12.911	12.800
2007190698	2007190813	9.971	9.980	1.264	1.330	38.28	40.92	0.474	0.550	0.87	0.80	14.330	14.300
2007190732	2007191450	13.070	13.230	0.763	0.715	20.98	23.55	0.357	0.344	0.40	0.40	9.300	10.800
2007190732	2007191450	21.810	23.170	0.993	1.074	24.69	29.81	0.530	0.564	0.50	0.40	12.200	14.200
2007190732	2007191450	10.380	9.650	0.759	0.573	22.32	19.86	0.294	0.263	0.80	0.60	9.100	8.300
2007190732	2007191450	17.050	17.200	1.081	0.982	29.45	29.19	0.528	0.446	2.00	1.40	12.900	12.700
2007190735	2007191549	9.290	9.910	0.890	0.950	23.80	25.49	0.380	0.430	0.60	0.40	13.900	14.500
2007190735	2007191549	16.400	16.240	0.900	0.950	22.59	24.73	0.480	0.430	0.30	0.40	14.100	13.700
2007190735	2007191549	7.680	9.050	0.930	1.020	26.07	26.31	0.410	0.440	0.80	0.60	14.100	14.300
2007190735	2007191549	10.180	11.520	0.900	0.970	24.84	24.98	0.450	0.440	0.80	0.50	14.400	14.100
2007190743	2007190906	6.310	5.723	0.648	0.703	22.39	23.20	0.327	0.333	0.49	0.50	7.253	8.510
2007190743	2007190906	10.370	9.639	1.052	1.013	32.70	30.97	0.496	0.461	0.48	0.66	11.910	11.910
2007190743	2007190906	5.357	5.291	0.707	0.687	22.34	22.02	0.316	0.281	0.45	0.67	8.041	8.161
2007190743	2007190906	8.408	8.382	1.006	1.001	30.69	31.66	0.462	0.450	0.85	0.75	11.580	11.810
2007190746	2007191241	5.454	6.973	0.175	0.141	5.53	6.90	0.092	0.032	0.49	0.34	2.173	3.022
2007190746	2007191241	42.950	42.860	0.970	0.846	21.76	23.54	0.709	0.530	0.34	0.15	13.130	13.160
2007190746	2007191241	4.878	6.680	0.202	0.167	6.74	7.89	0.094	0.031	0.59	0.15	2.547	3.224
2007190746	2007191241	35.230	36.520	0.809	0.813	22.31	23.34	0.544	0.515	0.66	0.15	12.090	13.130
2007190753	2007191299	7.310	6.320	0.960	0.922	29.97	25.28	0.400	0.417	0.70	1.50	12.400	10.000
2007190753	2007191299	9.320	9.560	1.000	0.959	29.69	26.63	0.430	0.470	0.60	0.40	12.500	11.500
2007190753	2007191299	5.900	6.490	1.010	0.900	29.00	26.44	0.400	0.393	0.70	0.50	11.400	10.400
2007190753	2007191299	7.950	8.670	1.030	0.961	31.19	28.87	0.420	0.451	0.60	0.50	12.700	11.300
2007190798	2007191229	15.225	15.065	0.219	0.316	4.78	4.87	0.107	0.176	1.15	0.42	4.336	5.309
2007190798	2007191229	230.241	198.998	3.650	3.319	18.87	15.05	2.786	2.357	1.21	0.52	28.787	27.484
2007190798	2007												

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Hf (ppm)	Hf (ppm)	Ho (ppm)	Ho (ppm)	La (ppm)	La (ppm)	Lu (ppm)	Lu (ppm)	Mo (ppm)	Mo (ppm)	Nb (ppm)	Nb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.040	0.040	0.020	0.020	0.10	0.10	0.020	0.020	0.30	0.30	0.030	0.030
2007190826	2007191052	7.251	8.829	0.309	0.422	8.92	12.00	0.169	0.246	0.58	0.52	3.384	4.780
2007190826	2007191052	33.420	29.060	1.391	1.225	30.93	32.59	0.842	0.711	0.15	0.15	11.820	11.470
2007190826	2007191052	6.360	6.614	0.295	0.323	9.76	9.87	0.160	0.181	0.41	0.15	3.741	3.994
2007190826	2007191052	30.780	33.310	1.319	1.372	34.78	36.21	0.747	0.814	0.33	0.15	12.380	11.820
2007190834	2007190889	3.806	5.830	0.063	0.140	6.46	8.05	0.024	0.080	0.78	1.10	2.977	3.800
2007190834	2007190889	43.820	47.090	0.747	0.970	46.44	45.42	0.395	0.590	3.24	2.80	17.740	15.100
2007190834	2007190889	2.172	2.090	0.024	0.060	3.77	3.62	0.010	0.030	0.80	0.60	2.071	2.100
2007190834	2007190889	42.770	48.440	0.719	0.830	34.27	39.28	0.437	0.520	2.21	2.70	14.620	14.600
2007190849	2007191277	9.750	10.900	0.850	0.740	23.20	18.71	0.350	0.341	0.80	1.06	9.700	8.779
2007190849	2007191277	14.830	20.750	1.100	1.115	26.11	24.35	0.480	0.526	0.90	1.11	11.600	12.520
2007190849	2007191277	8.110	8.547	1.160	0.913	27.58	24.72	0.470	0.372	0.70	0.98	9.400	9.287
2007190849	2007191277	13.330	13.850	1.280	1.151	28.92	27.60	0.540	0.452	0.90	1.41	11.400	11.590
2007190853	2007190939	4.694	5.980	0.620	0.420	17.67	12.53	0.244	0.130	0.60	0.40	6.089	5.200
2007190853	2007190939	12.140	30.420	0.954	1.170	25.96	32.23	0.412	0.550	0.99	1.00	10.380	15.000
2007190853	2007190939	2.283	2.200	0.261	0.310	7.94	9.86	0.103	0.080	0.32	0.50	2.393	3.100
2007190853	2007190939	10.440	9.740	0.958	1.000	27.61	28.08	0.415	0.350	1.16	1.10	9.773	10.100
2007190865	2007191183	1.377	1.687	0.040	0.050	2.19	2.34	0.010	0.010	0.32	0.47	0.817	0.814
2007190865	2007191183	55.420	99.860	1.111	1.355	24.97	24.13	0.696	1.047	0.62	0.50	15.310	18.010
2007190865	2007191183	1.792	2.448	0.050	0.051	2.77	2.51	0.010	0.010	0.64	0.61	0.998	0.889
2007190865	2007191183	101.000	108.800	1.447	1.490	23.14	27.24	1.109	1.199	0.66	0.47	20.720	18.000
2007190874	2007191297	7.493	6.274	0.449	0.593	14.50	17.31	0.191	0.298	0.15	0.15	5.733	5.635
2007190874	2007191297	22.230	19.610	1.199	1.089	26.54	23.60	0.569	0.585	0.48	0.59	13.160	11.190
2007190874	2007191297	5.339	7.141	0.344	0.677	12.22	19.39	0.128	0.336	0.52	0.46	4.966	6.447
2007190874	2007191297	24.220	19.930	1.135	1.203	24.16	26.94	0.547	0.630	0.41	0.48	12.240	11.050
2007190887	2007191058	10.790	11.270	1.529	1.470	54.93	49.95	0.606	0.665	0.52	0.45	19.000	20.140
2007190887	2007191058	12.710	12.250	1.501	1.420	52.37	47.67	0.620	0.671	0.52	0.56	17.990	18.790
2007190887	2007191058	9.541	8.138	1.418	1.345	51.53	50.14	0.529	0.582	0.46	0.52	18.010	19.160
2007190887	2007191058	11.140	10.370	1.388	1.461	50.07	48.91	0.571	0.630	0.53	0.15	17.300	19.270
2007190895	2007190947	11.286	9.230	0.846	0.960	25.30	27.00	0.347	0.330	0.61	0.40	12.741	13.100
2007190895	2007190947	15.570	12.270	0.875	0.920	25.69	23.90	0.399	0.360	0.66	0.50	13.225	12.700
2007190895	2007190947	12.444	9.470	0.829	0.990	26.32	28.27	0.352	0.390	0.64	0.70	13.263	13.900
2007190895	2007190947	15.823	11.300	0.954	1.000	26.84	26.57	0.430	0.410	0.88	0.60	14.589	14.000
2007190896	2007191441	5.185	5.599	0.253	0.528	17.77	30.88	0.108	0.226	1.24	2.76	7.084	10.660
2007190896	2007191441	25.626	11.180	1.185	1.181	53.59	59.52	0.526	0.525	2.38	4.28	22.124	20.550
2007190896	2007191441	5.114	5.421	0.328	0.540	18.03	31.54	0.119	0.213	1.32	2.64	7.325	10.390
2007190896	2007191441	26.412	10.530	1.244	1.121	54.44	57.99	0.506	0.488	2.77	3.91	22.473	20.210
2007190922	2007191082	3.945	2.570	0.203	0.170	6.91	5.61	0.079	0.090	0.56	0.40	3.015	2.800
2007190922	2007191082	39.340	6.490	2.006	0.560	70.87	19.21	0.967	0.260	1.05	0.90	17.300	7.400
2007190922	2007191082	3.177	3.130	0.271	0.410	10.54	11.23	0.104	0.180	0.48	0.50	3.134	3.600
2007190922	2007191082	8.397	6.790	0.643	0.980	26.73	25.74	0.275	0.410	0.67	1.00	6.372	6.800
2007190927	2007191444	5.151	5.820	0.695	0.738	18.32	21.16	0.295	0.360	0.87	1.18	8.209	8.824
2007190927	2007191444	12.924	9.418	1.092	0.997	27.93	29.37	0.494	0.483	0.80	1.11	11.242	10.910
2007190927	2007191444	8.049	7.344	0.756	0.775	18.58	20.67	0.347	0.399	1.15	1.06	9.878	10.090
2007190927	2007191444	18.302	16.200	1.135	1.125	28.39	29.58	0.601	0.619	0.96	1.05	12.851	13.000
2007190949	2007191504	7.772	10.640	1.253	1.194	42.04	41.25	0.473	0.482	0.52	0.80	13.364	13.800
2007190949	2007191504	11.449	14.400	1.244	1.267	43.67	45.91	0.491	0.512	0.85	1.00	14.673	16.200
2007190949	2007191504	6.785	7.910	1.043	0.991	35.49	34.88	0.396	0.412	0.86	0.60	10.829	11.200
2007190949	2007191504	7.341	7.910	1.012	0.942	37.09	35.29	0.415	0.388	0.89	0.70	11.885	10.900
2007190968	2007191437	7.280	5.263	0.276	0.010	7.98	6.05	0.157	0.010	0.37	0.15	3.653	2.389
2007190968	2007191437	28.160	23.200	0.793	0.344	18.72	15.98	0.532	0.122	0.41	0.15	11.090	8.787
2007190968	2007191437	5.913	4.920	0.508	0.214	14.19	15.19	0.211	0.010	0.52	0.57	5.034	4.664
2007190968	2007191437	15.000	12.510	0.941	0.595	24.06	25.74	0.470	0.123	0.94	0.74	9.427	9.211
2007190970	2007191245	6.220	6.340	0.970	1.020	29.97	30.05	0.380	0.410	2.40	2.90	14.800	14.800
2007190970	2007191245	8.570	9.350	1.150	1.200	34.54	34.65	0.470	0.480	1.80	2.00	17.800	19.400
2007190970	2007191245	7.790	4.400	1.010	0.600	33.35	19.67	0.370	0.200	4.30	0.80	17.500	10.500
2007190970	2007191245	12.700	18.230	1.420	1.840	46.06	59.95	0.560	0.710	3.40	1.50	22.600	26.900
2007190986	2007191592	15.360	9.797	1.422	0.964	52.67	33.32	0.564	0.409	0.15	0.82	10.630	7.975
2007190986	2007191592	74.010	58.590	3.822	3.035	181.80	131.30	1.678	1.534	0.31	0.87	23.450	18.820
2007190986	2007191592	11.070	11.980	1.515	1.413	51.04	50.50	0.615	0.609	0.30	0.78	10.450	10.830
2007190986	2007191592	43.070	29.510	2.825	2.059	129.00	75.24	1.236	0.966	0.37	0.89	18.810	14.700
2007190990	2007191537	13.340	15.930	1.878	2.004	46.35	46.22	0.849	0.901	0.50	0.68	22.120	20.650
2007190990	2007191537	17.340	19.130	1.970	2.130	46.33	44.40	0.948	0.980	0.43	0.77	21.390	20.430
2007190990	2007191537	12.680	11.370	1.260	0.887	30.69	22.92	0.568	0.482	0.46	0.42	14.210	9.323
2007190990	2007191537	24.060	36.670	2.279	2.446	52.73	56.02	1.095	1.287	0.38	0.71	21.650	19.060
2007191007	2007191551	12.610	14.440	0.574	0.465	19.64	20.47	0.265	0.334	0.30	0.40	7.855	7.888
2007191007	2007191551	32.530	31.740	1.324	1.160	45.13	39.45	0.717	0.754	0.55	0.38	18.440	17.250
2007191007	2007191551	10.350	11.810	0.472	0.500	17.48	19.77	0.236	0.341	0.52	0.31	7.034	9.435
2007191007	2007191551	36.840	25.480	1.477	1.150	42.61	36.99	0.804	0.723	0.51	0.31	18.570	16.650
2007191028	2007191531	10.501	12.660	0.560	0.347	17.77	12.04	0.257	0.269	0.15	0.42	6.670	4.952
2007191028	2007191531	24.344	34.270	1.247	1.157	35.22	27.78	0.621	0.760	0.15	0.44	14.612	13.000
2007191028	2007191531	9.237	9.970	0.667	0.344	23.00	13.07	0.283	0.237	0.15	0.41	7.837	4.693
2007191028	2007191531	17.302	27.380	1.019	1.135	29.17	31.14	0.462	0.723	0.48	0.66	12.967	13.390
2007191051	2007191331	11.741	17.260	0.846	0.912	20.78	20.98	0.355	0.465	0.59	0.42	9.421	10.980
2007191051	2007191331	16.525	29.440	0.839	1.026	19.26	20.67	0.432	0.612	0.45	0.34	9.958	13.320
2007191051	2007191331	12.925	12.300	0.836	0.918	21.24	20.65	0.382	0.433	1.33	0.54	9.344	9.611
2007191051	2007191331	20.617	17.380	0.972	0.955	22.61	20.97	0.506	0.482	1.47	1.09	11.043	10.880
2007191066	20												

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Hf (ppm)	Hf (ppm)	Ho (ppm)	Ho (ppm)	La (ppm)	La (ppm)	Lu (ppm)	Lu (ppm)	Mo (ppm)	Mo (ppm)	Nb (ppm)	Nb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.040	0.040	0.020	0.020	0.10	0.10	0.020	0.020	0.30	0.30	0.030	0.030
2007191134	2007191282	5.045	7.130	0.992	0.640	58.64	40.70	0.335	0.270	0.32	0.50	8.031	9.500
2007191134	2007191282	7.800	17.770	1.415	1.380	83.87	102.20	0.480	0.610	0.33	0.70	9.659	18.700
2007191152	2007191578	8.711	7.887	0.274	0.303	9.62	8.34	0.093	0.140	0.66	0.42	4.514	4.120
2007191152	2007191578	37.263	33.090	1.225	1.139	31.32	25.08	0.647	0.651	1.03	0.52	13.594	12.030
2007191152	2007191578	5.715	5.971	0.298	0.361	15.23	12.29	0.125	0.205	0.96	0.50	6.234	5.671
2007191152	2007191578	14.354	16.690	0.666	0.856	26.73	23.81	0.325	0.498	1.41	0.93	10.815	11.180
2007191168	2007191195	6.741	6.403	0.837	0.778	32.33	29.63	0.332	0.330	0.15	0.15	9.928	9.261
2007191168	2007191195	15.500	13.600	1.594	1.279	59.76	46.69	0.676	0.586	0.15	0.35	16.470	13.970
2007191168	2007191195	6.579	5.834	0.817	0.860	31.69	33.17	0.363	0.359	0.38	0.31	9.947	10.370
2007191168	2007191195	12.260	9.432	1.393	1.236	52.46	48.51	0.630	0.509	0.61	0.42	14.800	12.920
2007191192	2007191339	10.770	11.480	0.847	0.965	31.53	35.31	0.367	0.412	0.73	0.58	13.490	15.330
2007191192	2007191339	17.440	17.140	1.252	1.240	44.82	46.18	0.581	0.616	0.80	0.79	19.010	18.920
2007191192	2007191339	8.659	8.452	0.886	0.866	36.36	34.68	0.375	0.388	0.94	0.61	14.080	14.040
2007191192	2007191339	11.430	12.060	1.138	1.131	43.45	44.78	0.469	0.499	0.98	0.78	17.830	18.180
2007191215	2007191281	8.311	8.776	0.503	0.572	17.14	17.58	0.239	0.286	0.37	0.52	9.044	8.701
2007191215	2007191281	26.220	32.160	1.217	1.585	37.62	44.42	0.639	0.880	0.94	0.66	22.480	23.990
2007191215	2007191281	8.186	8.531	0.515	0.601	16.69	17.08	0.223	0.310	0.55	0.56	8.786	8.947
2007191215	2007191281	33.400	40.350	1.415	1.635	41.75	48.28	0.780	0.953	0.76	0.81	23.460	26.400
2007191216	2007191385	9.020	8.657	0.289	0.437	9.99	15.22	0.138	0.213	0.34	0.15	5.138	6.278
2007191216	2007191385	27.630	18.890	0.907	1.080	25.76	34.11	0.566	0.531	0.30	0.34	10.700	12.370
2007191216	2007191385	8.742	8.778	0.300	0.381	11.58	12.90	0.147	0.189	0.53	0.15	5.228	5.867
2007191216	2007191385	22.800	18.590	0.839	1.004	26.93	31.09	0.477	0.523	0.36	0.39	10.490	13.090
2007191264	2007191486	11.650	10.910	0.500	0.550	18.62	16.21	0.244	0.260	0.82	0.40	6.667	6.000
2007191264	2007191486	70.590	71.850	2.035	2.110	72.93	70.47	1.160	1.190	0.68	0.50	20.900	19.900
2007191264	2007191486	10.160	69.820	0.478	1.950	15.96	74.26	0.205	1.080	0.93	0.40	5.952	17.900
2007191264	2007191486	79.920	8.560	2.341	0.450	91.68	14.16	1.286	0.210	0.96	0.80	21.470	7.200
2007191275	2007191590	5.116	5.399	0.285	0.572	11.46	23.07	0.125	0.257	1.04	1.50	4.595	8.669
2007191275	2007191590	22.040	10.770	0.950	1.087	30.91	38.25	0.488	0.506	1.70	1.96	13.210	15.050
2007191275	2007191590	4.781	5.393	0.285	0.561	11.05	22.52	0.105	0.236	0.89	1.38	4.958	8.068
2007191275	2007191590	12.670	9.983	0.644	1.058	21.53	38.75	0.280	0.498	1.26	1.77	8.581	14.160
2007191293	2007191518	10.980	16.030	0.844	0.622	22.51	18.21	0.344	0.268	0.39	0.15	9.345	8.599
2007191293	2007191518	20.740	22.450	0.931	0.733	23.49	21.01	0.498	0.382	0.15	0.15	11.640	10.840
2007191293	2007191518	9.694	10.750	0.906	0.697	24.91	22.70	0.388	0.270	0.83	0.69	10.470	9.677
2007191293	2007191518	15.040	15.260	1.018	0.792	27.16	24.74	0.471	0.343	0.66	0.97	11.810	10.910
2007191295	2007191498	9.118	7.910	0.322	0.271	9.09	8.80	0.163	0.123	0.47	0.90	4.001	3.600
2007191295	2007191498	168.504	147.200	2.438	2.132	66.55	57.11	1.908	1.647	0.88	0.60	32.083	31.300
2007191295	2007191498	8.132	7.720	0.325	0.266	8.76	8.86	0.149	0.124	1.23	0.80	3.720	3.800
2007191295	2007191498	155.489	216.220	2.186	2.830	57.63	76.44	1.828	2.292	1.12	0.70	32.264	39.900
2007191346	2007191429	7.606	6.924	0.882	0.844	31.26	40.80	0.369	0.192	0.36	0.15	10.300	12.740
2007191346	2007191429	11.940	8.409	1.112	0.789	34.26	35.42	0.504	0.159	0.15	0.15	12.400	12.220
2007191346	2007191429	8.812	9.610	0.608	0.496	20.10	26.36	0.294	0.073	0.15	0.15	6.888	8.979
2007191346	2007191429	25.130	15.890	1.426	1.011	41.88	38.69	0.724	0.347	0.15	0.15	14.910	13.870
2007191372	2007191445	19.210	16.890	0.433	0.252	23.15	35.27	0.183	0.052	1.43	0.73	18.500	9.201
2007191372	2007191445	36.410	58.670	0.733	0.859	36.31	83.45	0.339	0.420	2.30	0.99	23.580	20.300
2007191372	2007191445	21.910	19.410	0.429	0.293	27.85	38.59	0.195	0.078	1.67	0.70	16.110	10.220
2007191372	2007191445	48.760	70.780	0.918	1.118	52.50	97.93	0.497	0.582	3.33	1.17	25.160	21.930
2007191382	2007191509	5.960	8.850	0.730	0.810	38.58	40.74	0.280	0.360	1.00	1.50	11.600	14.800
2007191382	2007191509	13.540	31.520	1.170	1.730	59.49	73.58	0.520	0.880	1.30	1.80	18.100	29.400
2007191382	2007191509	4.860	4.800	0.750	0.740	39.05	40.13	0.310	0.280	1.40	1.60	12.100	11.900
2007191382	2007191509	6.280	6.360	0.890	1.050	48.70	56.76	0.320	0.390	1.60	3.50	15.300	16.900
2007191473	2007191510	8.052	8.676	0.740	0.764	24.13	24.36	0.297	0.324	0.34	0.51	8.985	9.299
2007191473	2007191510	12.310	11.130	0.807	0.844	22.43	23.71	0.366	0.356	0.43	0.50	10.650	10.730
2007191473	2007191510	5.998	6.181	0.535	0.628	17.82	20.16	0.235	0.261	0.40	0.41	6.989	7.520
2007191473	2007191510	8.679	8.280	0.600	0.685	17.73	20.91	0.269	0.314	0.41	0.50	7.530	8.267

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Nd (ppm)	Nd (ppm)	Ni (ppm)	Ni (ppm)	Pb (ppm)	Pb (ppm)	Pr (ppm)	Pr (ppm)	Rb (ppm)	Rb (ppm)	Sb (ppm)	Sb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.50	0.50	0.10	0.10	0.020	0.020	0.20	0.20	0.40	0.40
2007190003	2007190213	18.85	19.48	12.72	17.54	18.81	18.76	5.138	5.280	90.03	87.97	0.95	0.20
2007190003	2007190213	48.18	43.92	27.29	23.90	25.50	23.25	12.750	11.898	118.13	112.42	1.26	1.15
2007190003	2007190213	18.42	18.40	14.02	17.38	19.23	18.92	4.935	4.921	89.37	91.02	0.49	0.20
2007190003	2007190213	32.40	35.80	24.03	26.82	23.29	23.92	8.670	9.599	112.09	116.44	1.16	1.24
2007190005	2007191059	20.56	22.57	17.86	17.98	9.70	10.85	5.402	5.521	46.85	51.71	0.20	1.25
2007190005	2007191059	31.21	30.45	32.81	27.65	13.20	13.17	7.762	7.401	53.80	53.71	0.20	1.39
2007190005	2007191059	18.32	21.06	17.67	19.93	8.69	10.30	4.979	5.248	50.86	53.76	0.20	1.12
2007190005	2007191059	44.52	37.67	27.57	30.81	15.82	14.01	11.380	9.229	61.84	53.96	0.20	1.19
2007190032	2007190632	31.59	32.20	27.26	28.18	22.38	26.74	8.129	8.400	81.52	78.06	1.48	1.80
2007190032	2007190632	38.66	36.80	32.81	30.71	27.34	31.70	10.164	9.709	91.40	91.41	1.36	1.84
2007190032	2007190632	31.16	32.96	33.62	39.51	15.45	15.77	7.944	8.680	83.88	85.89	0.85	1.62
2007190032	2007190632	40.36	38.74	40.80	44.62	19.47	18.20	10.333	10.190	102.09	98.56	0.57	1.45
2007190035	2007190876	19.34	21.73	5.84	13.01	13.68	13.77	5.091	5.572	97.62	98.34	0.20	0.20
2007190035	2007190876	35.28	45.69	11.03	12.26	16.00	17.10	9.273	11.900	95.06	101.30	0.45	0.20
2007190035	2007190876	23.01	24.84	15.48	12.38	19.13	18.23	6.064	6.452	112.79	113.00	0.20	0.41
2007190035	2007190876	36.45	39.25	22.66	19.39	24.91	23.45	9.673	10.030	132.03	125.40	0.93	0.71
2007190039	2007190984	16.70	8.77	13.50	11.46	19.87	12.70	4.743	2.320	58.37	38.51	0.20	0.20
2007190039	2007190984	34.07	28.27	30.27	26.98	31.62	27.48	9.475	7.436	92.44	81.63	0.20	0.41
2007190039	2007190984	23.80	27.45	35.37	37.24	24.14	26.91	6.360	7.480	85.83	92.48	0.20	0.57
2007190039	2007190984	31.80	33.92	43.93	45.99	30.30	33.31	9.061	9.119	119.69	109.50	0.53	0.58
2007190050	2007191481	7.35	8.00	14.35	13.60	20.69	20.73	1.982	2.200	186.92	187.20	0.20	0.20
2007190050	2007191481	25.41	26.00	39.45	37.80	20.10	19.47	6.898	7.560	116.51	114.40	0.20	0.20
2007190050	2007191481	8.75	8.87	22.27	19.80	21.31	20.84	2.376	2.540	190.02	194.40	0.20	0.20
2007190050	2007191481	25.70	25.94	44.52	43.40	20.72	19.66	7.098	7.400	129.81	130.00	0.74	1.00
2007190067	2007191121	5.22	3.96	30.63	30.40	7.77	7.71	1.357	1.068	17.34	16.84	0.20	3.33
2007190067	2007191121	15.62	12.70	77.55	56.34	16.08	15.15	3.986	3.354	42.80	40.95	0.20	3.47
2007190067	2007191121	6.46	5.67	49.39	36.23	8.98	8.86	1.668	1.437	22.15	18.69	0.20	3.28
2007190067	2007191121	15.83	14.43	102.47	77.65	13.90	13.31	4.070	3.731	42.34	37.74	0.20	3.45
2007190071	2007190289	7.09	5.63	7.00	4.04	15.03	11.80	1.933	1.571	20.65	19.51	0.20	0.20
2007190071	2007190289	41.97	34.53	14.13	12.49	50.56	39.42	11.706	10.009	68.35	65.15	0.20	0.42
2007190071	2007190289	32.83	73.85	26.47	23.33	39.55	65.06	8.526	19.795	37.94	33.45	0.20	0.20
2007190071	2007190289	73.21	206.64	67.11	62.09	100.30	179.19	19.079	56.274	74.79	81.12	0.20	0.20
2007190074	2007190389	13.49	8.89	12.54	7.24	15.55	15.16	3.522	2.389	68.16	77.18	0.86	0.20
2007190074	2007190389	33.05	35.63	25.42	44.64	17.44	17.57	8.622	9.491	69.51	71.15	0.78	0.20
2007190074	2007190389	4.88	12.92	10.80	10.00	14.22	14.78	1.296	3.473	77.34	73.09		0.20
2007190074	2007190389	25.69	27.99	14.64	17.89	15.99	16.90	6.814	7.091	65.67	75.39	0.20	0.20
2007190091	2007191053	7.87	19.24	4.76	11.17	5.74	10.44	2.159	5.068	29.29	49.59	0.20	0.81
2007190091	2007191053	46.02	43.96	21.44	24.05	15.04	14.06	12.740	11.990	53.06	55.58	0.20	0.71
2007190091	2007191053	16.45	14.54	16.73	7.74	9.38	9.43	4.531	3.991	44.63	47.82	0.20	0.61
2007190091	2007191053	47.82	17.50	21.95	13.09	14.23	10.25	13.320	4.614	57.05	71.16	0.20	0.74
2007190107	2007190913	5.25	9.49	8.64	8.82	8.64	8.83	1.961	2.429	51.98	52.18	0.20	0.20
2007190107	2007190913	34.01	45.34	23.86	29.15	21.04	20.87	9.022	11.195	73.64	78.76	0.20	0.74
2007190107	2007190913	5.03	12.10	11.59	13.68	7.97	9.70	1.874	3.088	47.12	58.30	0.20	0.20
2007190107	2007190913	33.02	43.07	17.58	34.19	18.04	21.90	8.692	10.849	61.85	104.57	0.72	0.98
2007190110	2007191182	18.53	19.16	12.64	13.50	19.68	20.03	4.870	5.400	136.67	139.20	0.20	0.20
2007190110	2007191182	36.13	37.12	23.36	22.30	20.09	21.55	9.545	10.320	119.11	133.70	0.20	0.20
2007190110	2007191182	40.52	25.09	39.97	16.60	24.27	23.35	10.615	7.030	136.36	156.30	0.20	0.20
2007190110	2007191182	42.34	42.63	42.46	28.90	23.46	26.23	11.100	11.660	125.01	143.10	0.20	0.20
2007190114	2007191045	26.50	28.54	26.91	26.98	21.52	19.27	6.451	6.881	82.19	83.41	1.57	1.13
2007190114	2007191045	32.24	28.47	28.65	23.96	20.59	17.78	7.874	6.975	80.52	73.62	1.21	1.49
2007190114	2007191045	23.43	25.42	20.81	26.64	19.91	17.55	5.867	6.157	81.61	76.91	1.36	2.17
2007190114	2007191045	29.75	29.52	25.81	28.65	21.90	19.15	7.170	7.086	74.72	81.85	1.40	1.68
2007190118	2007191552	36.85	36.63	35.37	36.39	22.14	21.42	9.720	9.395	122.69	111.30	0.99	1.52
2007190118	2007191552	34.87	32.98	36.70	26.01	21.23	18.78	9.467	8.428	113.07	97.82	1.30	1.46
2007190118	2007191552	47.26	47.55	44.90	48.50	25.82	23.64	12.642	12.470	150.43	157.40	1.32	1.96
2007190118	2007191552	46.98	43.72	40.27	41.86	23.42	18.51	12.502	11.300	138.32	145.90	0.92	1.85
2007190121	2007191545	1.73	4.53	6.64	10.50	5.84	7.46	1.005	1.930	16.06	32.30	0.20	0.20
2007190121	2007191545	15.34	22.51	18.89	30.20	17.48	21.56	4.532	6.360	73.68	114.00	0.50	1.20
2007190121	2007191545	1.96	4.76	11.60	11.30	5.84	7.81	1.078	2.010	17.74	39.30	0.20	0.20
2007190121	2007191545	17.94	17.48	19.21	23.80	15.91	16.24	5.118	4.990	76.01	103.50	0.59	0.20
2007190125	2007191532	28.27	25.74	18.17	19.25	9.36	5.32	7.419	6.542	107.69	97.06	0.20	0.20
2007190125	2007191532	38.26	45.36	22.79	20.63	10.78	6.90	10.188	11.770	100.42	79.86	0.49	0.20
2007190125	2007191532	31.80	28.84	20.45	21.23	6.40	5.31	8.360	7.503	114.43	104.70	0.56	0.20
2007190125	2007191532	46.92	48.57	23.48	29.12	7.41	7.10	12.426	12.550	105.25	90.59	0.57	0.20
2007190145	2007191105	20.51	21.47	25.04	26.90	16.29	16.51	5.533	5.670	64.32	67.20	0.89	0.90
2007190145	2007191105	20.14	19.75	25.60	26.70	17.12	17.09	5.587	5.430	70.43	72.60	0.70	0.20
2007190145	2007191105	19.09	19.05	25.52	24.20	15.17	13.93	5.397	5.170	62.26	59.10	0.70	0.20
2007190145	2007191105	19.38	18.24	28.22	30.30	16.06	14.65	5.407	5.080	68.93	63.50	0.68	0.20
2007190154	2007190568	10.81	13.62	30.11	28.79	14.55	12.20	2.865	3.577	2.62	3.83	0.20	0.20
2007190154	2007190568	12.51	15.25	24.62	24.74	13.28	12.35	3.263	3.942	2.67	3.86	0.20	0.20
2007190154	2007190568	13.55	10.68	35.99	40.06	23.83	15.81	3.227	2.793	3.40	6.06	0.20	2.52
2007190154	2007190568	16.82	12.82	35.91	41.14	24.36	16.66	3.901	3.161	3.12	6.16	0.57	1.17
2007190155	2007191031	18.93	17.06	16.38	17.78	10.41	11.03	4.847	4.863	50.51	53.99	0.54	0.20
2007190155	2007191031	27.80	28.65	21.46	26.62	13.88	14.80	7.225	7.568	66.93	69.78	0.53	0.20
2007190155	2007191031	18.57	13.28	18.42	16.59	10.73	9.55	4.733	3.876	48.48	42.25	0.20	0.20
2007190155	2007191031	30.30	29.66	30.96	50.95	15.21	16.97	7.850	7.712	67.74	73.37	0.48	0.54
2007190161	2007191413	11.75	10.15	44.92	35.81	10.14	9.54	3.069	2.813	32.52	29.35	0.20	0.50
2007190161	2007191413	19.87											

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Nd (ppm)	Nd (ppm)	Ni (ppm)	Ni (ppm)	Pb (ppm)	Pb (ppm)	Pr (ppm)	Pr (ppm)	Rb (ppm)	Rb (ppm)	Sb (ppm)	Sb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.50	0.50	0.10	0.10	0.020	0.020	0.20	0.20	0.40	0.40
2007190181	2007191396	20.46	19.52	28.98	27.50	12.36	11.80	5.112	5.000	65.63	66.40	0.20	0.20
2007190181	2007191396	24.92	23.97	70.94	35.00	14.46	13.46	6.205	6.250	69.45	68.60	0.20	0.20
2007190183	2007190471	6.81	7.19	4.15	7.20	11.43	11.71	1.903	1.885	54.94	49.92	0.20	0.57
2007190183	2007190471	33.30	30.85	10.89	13.64	18.00	18.48	9.142	8.347	84.21	88.11	0.20	0.62
2007190183	2007190471	30.72	21.21	20.43	19.45	19.66	17.94	8.277	5.732	127.85	91.66	0.20	0.50
2007190183	2007190471	36.76	35.22	25.14	24.11	20.15	21.79	9.692	9.326	143.95	133.20	0.20	0.76
2007190185	2007191253	22.16	21.43	38.43	44.62	17.10	17.53	6.062	5.572	92.36	81.07	1.18	2.37
2007190185	2007191253	28.16	29.67	40.67	36.06	17.83	19.15	7.425	7.435	97.34	81.40	1.06	2.11
2007190185	2007191253	25.54	23.58	44.07	38.14	19.51	19.98	6.888	6.059	113.57	93.75	1.32	2.47
2007190185	2007191253	27.99	27.68	43.51	41.97	19.39	19.67	7.522	6.998	111.89	94.96	1.63	2.57
2007190189	2007191542	26.36	26.94	28.09	26.60	16.29	16.25	6.755	6.760	86.84	81.88	0.20	1.15
2007190189	2007191542	25.11	26.49	30.16	25.29	15.77	15.28	6.566	6.728	80.29	73.66	0.20	0.69
2007190189	2007191542	26.21	27.41	27.94	25.69	16.11	16.46	6.695	6.753	84.15	82.96	0.20	0.88
2007190189	2007191542	25.63	26.76	26.89	23.54	15.60	15.88	6.494	6.645	80.68	75.10	0.20	0.44
2007190193	2007190788	33.24	38.55	22.03	19.40	41.60	29.14	8.568	10.450	104.03	130.20	0.20	0.90
2007190193	2007190788	33.96	36.93	18.57	18.10	39.27	26.56	8.988	10.160	96.43	112.50	0.20	0.90
2007190193	2007190788	36.39	37.94	27.26	20.20	24.00	27.00	9.591	10.450	133.36	132.60	0.20	0.20
2007190193	2007190788	35.90	44.75	20.32	19.00	19.60	26.18	9.486	11.980	125.85	127.70	0.20	0.90
2007190194	2007190704	23.34	22.14	17.38	13.83	17.12	16.28	5.902	5.789	80.13	75.39	0.20	1.25
2007190194	2007190704	24.14	22.73	21.10	14.22	17.48	15.43	6.182	5.931	68.05	63.95	0.20	0.82
2007190194	2007190704	30.93	28.95	20.53	21.01	19.81	18.48	7.727	7.486	83.39	87.66	0.61	1.12
2007190194	2007190704	33.13	28.42	19.41	22.30	18.60	17.84	8.317	7.382	74.72	79.40	0.50	1.03
2007190197	2007190962	5.78	6.57	5.96	4.81	3.15	3.39	1.498	1.731	11.31	11.42	0.20	0.20
2007190197	2007190962	27.63	35.34	7.67	14.02	12.09	13.53	7.372	9.139	56.99	58.70	0.20	0.20
2007190197	2007190962	11.29	9.24	11.30	12.23	8.81	7.87	3.025	2.430	32.70	29.60	0.20	0.20
2007190197	2007190962	38.67	36.05	37.21	27.88	29.84	21.03	10.224	9.342	116.48	84.38	0.20	0.20
2007190208	2007191593	5.48	8.12	2.34	5.79	7.99	7.32	1.686	2.041	12.95	14.48	0.64	1.14
2007190208	2007191593	8.98	11.27	2.35	3.19	10.43	8.74	2.630	2.851	18.15	19.36	0.64	1.39
2007190208	2007191593	10.81	11.84	7.42	6.47	14.91	10.55	2.969	2.878	36.84	25.18	0.44	1.19
2007190208	2007191593	14.06	15.78	11.40	8.21	18.55	12.03	3.829	3.832	43.53	25.52	0.20	0.93
2007190209	2007191254	22.44	18.85	17.93	14.21	15.09	14.03	5.533	4.468	34.98	27.09	0.41	0.20
2007190209	2007191254	26.42	25.55	21.65	17.14	17.47	17.41	6.628	6.263	42.51	38.94	0.61	0.60
2007190209	2007191254	19.49	15.22	13.19	16.12	13.35	11.45	4.750	3.737	31.91	19.76	0.20	0.20
2007190209	2007191254	26.79	27.55	18.79	28.98	20.03	19.87	6.727	6.678	45.54	36.21	0.64	0.73
2007190212	2007190747	6.61	6.10	5.72	4.12	7.33	3.93	2.123	1.557	24.03	13.62	0.20	0.20
2007190212	2007190747	46.75	69.80	15.77	15.13	20.31	20.67	12.460	18.040	96.44	89.86	0.20	0.83
2007190212	2007190747	25.15	6.39	21.99	4.21	15.27	4.66	6.375	1.628	63.55	19.86	0.20	0.20
2007190212	2007190747	34.76	45.51	12.07	12.45	18.42	17.46	9.228	11.680	94.09	83.78	0.20	0.66
2007190218	2007191348	5.65	8.08	10.44	16.80	8.23	10.09	1.520	2.230	16.05	23.30	0.57	0.20
2007190218	2007191348	19.77	22.75	29.52	33.20	19.44	23.11	5.232	6.480	59.91	71.60	0.20	1.10
2007190218	2007191348	5.96	11.74	12.76	24.50	9.80	12.55	1.611	3.270	18.56	34.70	0.20	0.20
2007190218	2007191348	20.32	26.83	34.98	38.20	20.90	23.12	5.313	7.410	63.38	76.80	0.70	1.10
2007190241	2007190978	29.82	20.20	55.68	49.22	7.38	6.92	7.968	5.476	30.55	28.17	0.69	1.48
2007190241	2007190978	33.40	30.69	88.18	94.16	10.31	11.53	8.590	8.069	38.53	40.38	0.50	1.26
2007190241	2007190978	20.25	19.89	53.20	58.41	6.58	7.51	5.177	5.476	30.50	32.62	0.48	1.36
2007190241	2007190978	32.10	33.34	94.98	97.62	9.08	11.08	8.082	8.567	37.22	39.14	0.68	1.34
2007190248	2007191198	6.73	8.90	3.48	8.56	4.77	4.96	1.959	2.135	14.10	17.78	0.20	0.20
2007190248	2007191198	29.04	76.85	14.56	14.87	10.38	11.67	7.521	19.840	34.50	23.28	0.76	0.20
2007190248	2007191198	9.06	8.81	5.24	11.46	5.35	5.06	2.526	2.131	15.73	15.70	0.20	0.20
2007190248	2007191198	56.04	42.10	10.74	13.95	11.13	10.67	14.840	10.510	28.93	36.20	0.20	0.20
2007190256	2007190875	10.87	8.34	6.96	5.06	8.75	7.32	2.722	2.051	19.09	16.01	0.46	0.48
2007190256	2007190875	28.51	34.02	10.12	15.41	12.87	15.97	7.375	8.991	53.29	60.73	0.20	0.20
2007190256	2007190875	17.00	10.08	10.26	6.74	11.61	8.60	4.290	2.576	52.50	30.78	0.20	0.20
2007190256	2007190875	25.54	28.55	11.28	12.89	13.74	13.05	6.633	7.321	57.55	55.16	0.20	0.20
2007190258	2007191176	19.48	22.93	17.36	16.00	14.59	12.79	5.009	6.250	91.06	74.00	1.44	1.40
2007190258	2007191176	28.07	33.55	25.72	20.50	18.56	16.64	7.184	9.270	103.55	87.00	1.27	2.50
2007190258	2007191176	17.67	19.39	10.06	16.00	12.53	12.97	4.660	5.310	89.58	87.60	4.27	1.40
2007190258	2007191176	41.29	34.16	18.94	19.90	19.04	17.80	10.833	9.300	98.46	92.30	5.13	2.10
2007190266	2007191458	12.00	10.91	10.19	6.90	9.12	8.02	3.083	2.740	51.73	45.64	0.20	0.94
2007190266	2007191458	20.02	23.50	13.56	14.09	13.11	14.25	5.136	5.955	66.99	68.99	0.20	1.25
2007190266	2007191458	9.87	4.76	9.59	7.30	7.15	5.45	2.580	1.130	47.25	34.07	0.20	1.03
2007190266	2007191458	24.13	35.31	13.81	12.25	13.72	13.42	6.249	8.905	84.97	63.17	0.74	1.23
2007190285	2007190406	23.92	24.25	48.01	44.46	16.92	17.95	6.149	6.316	44.01	43.88	0.85	0.86
2007190285	2007190406	26.07	27.29	51.77	47.17	18.38	19.34	6.798	6.897	48.77	48.21	0.87	0.73
2007190285	2007190406	23.62	24.72	51.41	48.90	16.28	17.71	6.009	6.250	40.76	40.07	0.59	0.65
2007190285	2007190406	24.64	28.08	56.23	51.58	18.20	19.02	6.370	7.091	45.19	45.18	1.15	0.65
2007190296	2007190758	6.73	5.70	6.30	8.30	5.89	5.29	1.850	1.470	21.80	18.60	0.20	0.20
2007190296	2007190758	22.98	23.25	10.50	13.20	14.74	13.89	6.080	5.790	55.90	54.20	0.80	0.20
2007190296	2007190758	6.70	5.66	6.50	6.90	6.19	5.70	1.850	1.520	23.80	21.80	0.20	0.20
2007190296	2007190758	22.55	19.66	25.70	13.00	14.16	13.33	6.160	5.110	62.10	59.60	1.00	0.90
2007190311	2007191259	1.83	3.06	2.51	2.79	3.68	3.37	0.527	0.791	5.95	5.64	0.51	0.93
2007190311	2007191259	19.28	25.35	4.83	3.58	22.92	22.93	5.314	6.731	63.64	67.76	0.20	1.18
2007190311	2007191259	6.48	1.59	7.84	3.05	6.88	2.04	1.789	0.393	31.19	11.78	0.20	0.86
2007190311	2007191259	28.31	12.71	9.70	9.21	25.48	13.77	7.727	3.431	140.84	99.43	0.20	1.22
2007190328	2007191598	5.10	5.38	5.66	15.26	4.10	4.29	1.367	1.406	8.68	9.44	0.20	0.75
2007190328	2007191598	23.67	27.32	17.93	43.76	13.61	13.92	6.288	7.196	30.59	35.89	0.20	0.76
2007190328	2007191598	5.70	5.49	9.65	8.25	5.80	5.83	1.588	1.523	15.47	14.64	0.20	0.87
2007190328	2007191598	24.65	24.70	19.49	18.34	15.57	16.07	6.610	6.580	48.99	52.18		

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Nd (ppm)	Nd (ppm)	Ni (ppm)	Ni (ppm)	Pb (ppm)	Pb (ppm)	Pr (ppm)	Pr (ppm)	Rb (ppm)	Rb (ppm)	Sb (ppm)	Sb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.50	0.50	0.10	0.10	0.020	0.020	0.20	0.20	0.40	0.40
2007190349	2007191436	16.66	16.28	63.23	61.57	60.39	12.21	4.401	4.120	92.40	87.84	3.78	0.78
2007190349	2007191436	29.49	31.11	85.17	77.09	16.35	14.21	8.042	7.842	78.52	71.43	1.57	0.91
2007190349	2007191436	17.29	16.42	67.31	66.95	14.41	13.70	4.818	4.086	87.07	88.96	1.71	0.82
2007190349	2007191436	25.94	26.81	101.25	88.17	17.78	15.52	6.890	6.808	81.79	79.61	2.54	1.08
2007190352	2007190611	30.57	32.09	25.77	27.24	15.70	21.96	7.899	8.034	63.68	83.42	0.76	0.97
2007190352	2007190611	34.79	36.08	29.86	25.37	18.67	25.47	8.949	8.932	62.75	81.15	0.66	0.47
2007190352	2007190611	19.89	23.41	22.97	24.30	13.88	18.05	5.054	5.756	87.09	96.94	0.97	0.70
2007190352	2007190611	22.50	25.41	21.14	25.87	15.13	18.93	5.713	6.224	87.23	93.00	1.48	0.82
2007190355	2007191257	19.38	20.60	87.08	81.61	16.48	16.00	5.238	5.212	58.55	58.67	1.26	1.68
2007190355	2007191257	25.88	26.75	108.48	102.40	19.63	19.44	6.590	6.846	54.44	67.05	2.04	1.91
2007190355	2007191257	16.55	20.70	91.90	108.90	16.10	17.20	4.584	5.383	58.33	59.40	1.54	1.64
2007190355	2007191257	16.88	21.89	103.28	114.20	17.19	18.21	4.760	5.663	59.85	61.52	1.73	1.62
2007190357	2007190856	4.50	5.07	21.40	6.31	2.92	3.20	1.144	1.315	8.55	10.41	0.20	0.63
2007190357	2007190856	13.64	12.87	7.57	8.94	8.64	8.46	3.512	3.279	41.95	45.74	0.48	0.89
2007190357	2007190856	10.41	11.46	7.21	10.26	5.84	7.06	2.684	3.015	27.00	36.04	0.20	0.20
2007190357	2007190856	26.41	23.93	12.94	15.53	15.52	15.27	6.743	6.205	73.30	82.62	0.64	0.79
2007190361	2007191094	22.40	21.10	42.09	46.40	16.61	16.61	5.894	5.780	64.60	64.40	1.00	0.20
2007190361	2007191094	21.32	20.60	44.09	47.30	16.40	16.46	5.654	5.660	67.10	68.50	0.52	0.20
2007190361	2007191094	13.08	13.90	32.13	38.70	9.69	10.40	3.353	3.740	41.30	42.90	0.73	1.00
2007190383	2007191416	24.29	13.35	13.66	9.90	16.39	10.05	6.287	3.630	51.79	33.20	1.14	0.20
2007190383	2007191416	28.92	32.77	22.14	21.50	18.92	21.66	7.462	8.830	59.25	81.00	0.60	1.20
2007190383	2007191416	25.67	23.74	14.28	16.10	17.08	16.25	6.714	6.370	51.84	53.40	0.60	0.20
2007190383	2007191416	36.19	34.31	18.53	26.50	24.49	23.71	9.261	9.200	68.75	74.80	0.59	0.20
2007190393	2007191050	31.30	33.60	22.70	24.37	19.85	24.63	8.473	8.999	146.90	145.84	1.75	1.62
2007190393	2007191050	31.77	33.25	20.50	24.87	18.97	25.65	8.483	8.895	137.90	125.22	2.06	1.82
2007190393	2007191050	37.78	37.46	20.62	39.46	19.57	21.03	10.220	9.866	128.10	148.42	1.36	0.92
2007190393	2007191050	36.70	38.87	16.43	22.06	17.11	19.99	9.900	10.063	112.40	132.84	1.94	1.05
2007190414	2007191386	33.70	32.39	18.68	25.00	20.26	20.96	8.651	8.810	85.55	84.60	1.43	1.10
2007190414	2007191386	34.99	33.73	12.47	15.50	18.94	19.95	9.311	8.950	72.19	81.00	0.45	0.20
2007190414	2007191386	34.71	33.68	17.82	18.30	21.02	21.53	9.277	8.890	85.46	88.70	0.93	0.20
2007190414	2007191386	38.93	40.75	22.15	18.10	21.35	24.09	10.415	10.720	89.18	101.90	1.15	1.40
2007190419	2007190974	23.68	19.92	13.65	12.88	17.76	14.09	6.059	4.854	38.38	24.77	0.67	0.20
2007190419	2007190974	26.31	27.94	15.07	15.33	20.50	22.14	6.769	6.945	43.47	32.76	0.20	0.62
2007190419	2007190974	20.44	20.64	12.39	13.59	15.10	14.41	5.217	5.185	21.81	22.32	0.51	0.20
2007190419	2007190974	34.15	34.11	18.78	20.14	28.03	25.38	8.624	8.315	34.21	33.89	0.61	0.20
2007190425	2007190768	29.10	26.32	18.07	23.20	16.68	17.20	7.324	7.240	88.58	85.60	1.32	1.00
2007190425	2007190768	28.28	24.88	16.30	15.20	15.79	15.73	7.127	6.690	78.88	76.20	0.99	0.20
2007190425	2007190768	23.07	25.45	17.75	519.00	15.67	15.69	5.752	6.810	87.89	86.90	1.26	1.00
2007190425	2007190768	26.22	26.68	15.05	18.00	14.91	14.87	6.597	7.150	83.52	83.90	1.04	0.20
2007190434	2007191027	18.67	14.32	52.41	40.00	15.37	12.92	4.828	3.990	58.86	51.10	0.20	0.20
2007190434	2007191027	43.83	39.26	118.60	104.00	26.54	22.97	11.240	10.870	113.90	103.30	0.83	0.90
2007190434	2007191027	20.54	18.47	52.96	49.20	13.12	12.84	5.219	5.120	53.00	50.70	0.20	0.20
2007190434	2007191027	34.80	32.53	92.84	90.60	18.08	20.12	8.823	9.220	79.54	81.70	0.20	0.20
2007190457	2007191004	25.19	26.62	10.46	8.48	15.18	11.77	6.911	7.321	92.72	63.72	0.20	0.20
2007190457	2007191004	31.82	40.14	9.71	8.71	16.61	16.84	8.690	10.990	102.20	92.82	0.20	0.20
2007190457	2007191004	15.63	18.03	6.09	4.16	9.05	9.77	4.277	4.872	53.84	61.42	0.20	0.20
2007190457	2007191004	35.41	30.92	7.06	9.21	13.08	13.76	9.770	8.373	86.49	90.93	0.20	0.69
2007190458	2007190774	23.68	21.09	20.78	18.50	14.79	13.25	6.111	5.690	61.90	56.70	0.20	0.20
2007190458	2007190774	24.93	26.06	18.56	20.40	13.94	14.13	6.444	6.900	57.68	59.00	0.20	0.20
2007190458	2007190774	22.77	20.44	20.22	20.70	14.17	12.90	5.880	5.430	60.44	56.30	0.20	0.20
2007190458	2007190774	25.42	24.82	20.86	25.30	15.91	21.49	6.472	6.530	61.39	60.80	0.20	0.20
2007190472	2007191312	21.88	22.57	20.74	20.36	16.19	15.44	5.841	5.806	62.91	64.26	0.20	1.01
2007190472	2007191312	23.92	26.08	18.83	24.88	16.78	16.79	6.099	6.572	61.19	74.23	0.51	0.93
2007190472	2007191312	19.47	22.99	23.18	22.15	14.29	15.49	4.985	5.793	52.65	65.62	0.74	1.07
2007190472	2007191312	22.74	25.55	39.85	23.17	16.41	16.96	5.893	6.398	64.38	67.86	0.20	0.20
2007190481	2007191594	13.71	15.34	11.05	29.28	7.89	8.64	3.494	3.879	47.90	53.78	0.59	0.96
2007190481	2007191594	16.69	16.77	12.18	11.52	9.39	9.30	4.188	4.034	63.40	61.64	1.17	1.29
2007190481	2007191594	17.81	16.88	14.81	16.12	10.03	9.50	4.388	4.126	69.37	61.76	0.94	1.19
2007190481	2007191594	17.76	16.81	12.26	13.86	9.80	9.64	4.431	4.165	69.24	65.01	0.66	0.85
2007190495	2007191318	5.82	7.62	8.00	11.40	4.40	5.00	1.550	1.890	18.80	25.00	0.20	1.30
2007190497	2007190586	13.86	13.60	13.28	10.67	9.33	9.28	3.381	3.574	38.83	37.64	0.56	0.55
2007190497	2007190586	30.32	29.25	19.43	16.81	17.23	17.08	7.515	7.601	80.88	78.21	0.53	1.08
2007190497	2007190586	13.77	13.21	23.21	12.94	10.67	10.07	3.440	3.554	50.45	43.16	0.61	0.99
2007190497	2007190586	27.49	26.19	24.50	23.66	20.33	19.53	6.936	6.941	91.75	83.73	0.44	0.84
2007190506	2007190631	26.16	26.21	15.76	18.23	14.53	15.10	6.748	6.804	65.59	64.69	1.54	1.08
2007190506	2007190631	25.02	21.69	13.49	13.23	12.71	12.31	6.328	5.721	53.96	54.44	1.17	0.81
2007190506	2007190631	27.00	25.70	17.38	19.48	14.61	15.21	6.686	6.721	65.76	67.12	1.32	0.87
2007190506	2007190631	29.07	26.34	21.30	22.28	16.11	15.96	7.141	7.004	64.78	63.65	1.01	0.81
2007190508	2007191119	24.71	26.41	59.09	54.93	12.88	13.67	6.126	6.340	84.37	87.76	0.77	0.82
2007190508	2007191119	26.81	28.13	50.25	48.32	13.55	14.27	6.704	6.874	93.48	98.48	1.10	0.20
2007190508	2007191119	29.30	30.72	36.86	39.11	16.92	16.79	7.539	7.614	119.80	113.32	1.08	0.41
2007190508	2007191119	30.58	30.49	35.53	34.52	17.23	16.16	7.968	7.486	121.30	115.13	1.15	0.74
2007190526	2007191599	38.71	35.84	18.70	21.83	22.32	19.71	10.220	8.930	149.20	131.80	1.64	1.66
2007190526	2007191599	45.53	43.18	21.52	20.15	24.68	20.99	12.160	10.710	158.30	134.80	2.29	1.87
2007190526	2007191599	44.57	40.89	24.07	23.46	23.76	21.67	11.930	10.290	161.70	139.30	2.43	1.94
2007190526	2007191599	49.05	46.35	24.96	21.91	23.00	20.33	13.160	11.550	160.30	146.00	2.17	2.17
2007190527	2007190609	34.44	29.59	17.29	13.70	14.72	13.45	8.817	7.661	54.36	52.87	1.15	0.69
2007190527	2007190609	33											

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Nd (ppm)	Nd (ppm)	Ni (ppm)	Ni (ppm)	Pb (ppm)	Pb (ppm)	Pr (ppm)	Pr (ppm)	Rb (ppm)	Rb (ppm)	Sb (ppm)	Sb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.50	0.50	0.10	0.10	0.020	0.020	0.20	0.20	0.40	0.40
2007190534	2007191522	17.03	17.02	10.93	7.52	11.63	8.88	4.582	4.387	56.80	42.06	0.75	0.20
2007190534	2007191522	69.48	94.34	16.64	12.86	21.49	18.50	18.870	24.320	83.60	70.17	0.94	0.20
2007190536	2007190909	7.52	6.93	6.18	7.23	7.69	6.96	1.952	1.848	32.41	29.08	0.51	0.20
2007190536	2007190909	42.24	41.34	12.98	11.95	11.38	11.45	11.030	10.900	42.56	42.25	0.70	0.20
2007190536	2007190909	9.42	9.03	6.56	9.17	7.95	7.91	2.368	2.285	33.31	33.18	0.20	0.20
2007190536	2007190909	42.26	38.95	17.02	16.95	12.17	11.94	10.990	10.200	46.93	47.10	0.62	0.20
2007190548	2007191236	33.73	32.69	20.95	19.97	28.07	27.81	9.004	8.334	136.10	116.70	1.06	0.20
2007190548	2007191236	56.19	59.46	24.01	24.24	33.40	31.02	15.060	15.370	135.20	117.80	1.15	0.20
2007190548	2007191236	35.31	33.05	21.06	21.84	27.52	25.95	9.332	8.382	130.20	109.80	1.03	0.20
2007190548	2007191236	59.47	67.24	27.41	26.22	33.89	32.88	16.000	17.510	148.00	123.30	1.46	0.20
2007190549	2007191507	1.92	2.57	7.85	6.87	4.46	5.39	0.518	0.715	11.81	13.35	0.20	0.59
2007190549	2007191507	10.30	11.17	21.95	16.61	11.62	12.02	2.775	2.962	36.58	36.72	0.42	0.99
2007190549	2007191507	2.62	3.70	9.21	9.43	5.27	6.34	0.714	0.965	15.60	17.41	0.20	0.60
2007190549	2007191507	11.73	12.96	17.07	20.27	12.35	14.01	3.108	3.292	43.16	49.11	0.20	0.71
2007190552	2007190675	11.60	8.24	6.76	8.03	8.42	9.36	2.991	2.246	33.13	32.30	0.20	0.20
2007190552	2007190675	83.20	48.96	21.41	20.09	29.51	33.60	20.760	12.500	98.05	100.40	0.41	0.20
2007190552	2007190675	39.14	21.61	21.87	16.87	14.32	18.35	9.544	5.440	67.18	68.95	0.20	0.20
2007190552	2007190675	117.30	69.03	55.64	47.61	36.15	50.87	29.410	17.200	186.40	183.00	0.71	0.20
2007190554	2007190752	7.74	9.35	8.48	8.90	6.83	10.87	1.970	3.250	7.40	9.20	0.20	0.20
2007190554	2007190752	27.05	21.74	20.04	16.50	17.71	19.27	6.641	6.230	26.11	22.90	0.20	0.90
2007190554	2007190752	4.92	18.36	5.87	17.30	5.11	14.97	1.257	5.530	3.84	14.70	0.20	0.20
2007190554	2007190752	34.96	37.41	14.62	27.80	19.87	25.52	8.617	10.430	23.46	31.70	0.20	0.20
2007190583	2007191063	17.32	18.55	7.68	6.51	9.04	9.84	4.561	4.699	50.83	50.32	1.05	1.64
2007190583	2007191063	29.28	23.92	7.69	5.62	11.92	11.69	7.757	6.087	68.73	63.11	1.23	1.49
2007190583	2007191063	25.78	29.02	18.05	14.89	15.79	16.06	6.848	7.447	105.80	98.04	0.97	1.59
2007190583	2007191063	33.13	33.92	20.57	17.88	17.65	18.88	8.763	8.675	127.50	105.00	1.38	1.70
2007190618	2007191166	17.40	16.67	33.99	37.80	11.47	22.90	4.357	4.360	56.48	53.30	0.20	0.20
2007190618	2007191166	19.52	19.04	40.40	40.20	11.75	25.60	4.859	5.100	53.11	50.40	0.20	0.20
2007190618	2007191166	20.60	20.40	44.79	35.50	10.64	11.20	5.106	5.400	54.90	54.90	0.44	0.20
2007190618	2007191166	24.43	24.13	49.08	47.00	10.48	12.31	6.063	6.450	51.29	50.10	0.20	0.20
2007190647	2007191525	28.38	16.10	7.93	3.87	17.29	12.77	7.391	4.226	82.10	61.28	1.03	0.73
2007190647	2007191525	41.41	38.51	13.88	6.08	24.98	26.63	10.970	10.520	128.60	112.10	1.35	1.72
2007190647	2007191525	29.31	17.86	11.42	5.77	19.85	12.58	7.758	4.865	93.29	65.51	1.08	0.74
2007190647	2007191525	45.24	39.58	12.45	11.62	28.72	24.79	11.940	10.660	139.90	124.70	1.06	1.84
2007190659	2007190739	5.40	7.15	12.90	13.00	6.22	5.69	1.388	1.780	30.87	29.80	0.20	0.20
2007190659	2007190739	20.87	25.64	42.01	34.30	22.66	22.42	5.538	6.520	122.23	112.90	0.20	0.20
2007190659	2007190739	12.33	5.24	25.62	16.00	11.61	7.67	3.177	1.320	61.77	37.10	0.20	0.20
2007190659	2007190739	28.05	17.24	53.66	45.70	25.87	23.56	7.199	4.430	139.59	124.10	0.20	1.10
2007190661	2007191334	12.32	13.52	12.66	10.08	6.44	6.68	3.092	3.353	32.79	31.44	0.20	1.28
2007190661	2007191334	28.50	28.43	22.77	19.72	10.48	11.08	7.266	6.991	43.11	41.33	0.20	1.50
2007190661	2007191334	16.05	15.18	22.09	14.93	7.70	7.20	3.845	3.762	39.35	36.76	0.20	1.51
2007190661	2007191334	26.83	29.75	41.92	33.71	11.53	11.92	6.569	7.412	51.29	57.06	0.20	1.01
2007190686	2007191430	19.29	22.10	5.40	4.62	10.10	11.47	5.123	5.705	32.29	39.42	0.20	1.55
2007190686	2007191430	61.59	71.83	8.50	8.11	31.34	29.17	16.640	18.940	107.70	107.30	0.20	1.46
2007190686	2007191430	23.97	25.57	9.34	9.61	12.46	14.37	6.198	6.737	46.14	57.49	0.20	1.38
2007190686	2007191430	60.63	54.41	15.31	14.90	29.42	29.85	15.900	14.330	117.60	119.70	0.20	1.47
2007190695	2007190924	7.79	7.57	5.75	7.39	6.25	6.52	1.958	1.985	17.60	19.38	0.20	0.20
2007190695	2007190924	21.51	19.18	11.89	9.55	14.49	13.44	5.292	5.168	49.83	52.79	0.20	0.20
2007190695	2007190924	10.40	9.95	15.66	16.77	10.48	10.61	2.778	2.789	64.02	67.14	0.20	0.42
2007190695	2007190924	20.37	19.54	27.41	29.77	18.92	18.20	5.389	5.303	121.20	118.60	0.20	0.89
2007190698	2007190813	34.07	28.93	27.66	22.70	21.42	19.44	8.921	7.810	121.40	108.50	0.20	0.90
2007190698	2007190813	33.52	32.65	24.71	21.20	19.85	18.77	8.522	8.780	101.17	99.40	0.20	0.90
2007190698	2007190813	33.14	30.97	29.66	27.40	21.44	20.27	8.685	8.440	110.64	116.10	0.20	0.20
2007190698	2007190813	33.92	32.87	26.76	29.20	20.17	21.21	8.610	9.070	107.81	116.00	0.49	1.00
2007190732	2007191450	15.55	20.71	10.30	22.70	14.06	14.63	4.720	5.230	31.00	43.40	0.20	0.20
2007190732	2007191450	20.06	27.41	9.90	13.90	17.24	14.93	5.710	6.820	32.30	49.80	0.20	0.20
2007190732	2007191450	16.76	18.54	20.70	13.70	14.84	12.84	4.980	4.490	29.50	33.40	0.20	0.20
2007190732	2007191450	23.41	27.51	23.10	23.50	18.79	17.52	6.540	6.720	42.70	46.50	0.20	0.20
2007190735	2007191549	23.63	23.66	25.80	23.40	13.67	14.45	5.780	6.210	62.80	77.30	1.30	1.00
2007190735	2007191549	22.34	21.45	18.60	17.70	12.33	12.79	5.340	5.810	53.20	71.40	1.30	0.20
2007190735	2007191549	25.10	23.55	25.20	29.40	14.34	14.20	5.980	6.290	68.40	73.30	1.30	0.20
2007190735	2007191549	24.42	21.82	28.00	30.80	15.18	13.92	5.690	5.790	62.70	67.70	1.00	0.20
2007190743	2007190906	19.17	20.42	16.48	18.39	12.99	14.39	4.975	5.273	61.85	65.88	0.20	0.20
2007190743	2007190906	29.07	27.90	24.75	24.16	17.98	17.70	7.416	7.080	97.33	90.02	0.20	0.20
2007190743	2007190906	20.27	19.43	18.77	17.66	14.36	12.81	4.940	4.922	64.57	60.68	0.20	0.20
2007190743	2007190906	28.19	28.64	23.22	25.72	18.04	18.26	7.112	7.046	90.63	92.51	1.04	0.20
2007190746	2007191241	4.92	5.76	4.51	8.56	3.40	4.32	1.251	1.473	9.43	12.99	0.20	0.20
2007190746	2007191241	20.14	20.76	8.76	7.39	8.18	8.44	5.103	5.234	31.32	35.88	0.20	0.20
2007190746	2007191241	5.70	6.31	6.85	7.43	4.15	4.83	1.503	1.574	13.72	16.35	0.20	0.20
2007190746	2007191241	20.30	19.40	7.40	7.89	8.99	8.71	5.170	5.091	35.87	38.50	0.20	0.20
2007190753	2007191299	27.20	26.05	24.60	28.10	16.27	16.19	7.150	6.120	70.00	55.50	1.10	5.20
2007190753	2007191299	26.56	27.02	24.70	27.20	16.14	16.32	6.990	6.570	69.10	56.50	1.30	0.20
2007190753	2007191299	26.00	24.91	24.60	32.70	16.32	15.90	6.810	6.120	65.80	55.90	0.20	0.20
2007190753	2007191299	27.65	27.51	26.40	50.50	16.93	17.61	7.470	6.680	71.90	62.20	0.80	0.20
2007190798	2007191229	1.07	1.21	3.89	3.35	2.97	3.61	0.964	1.080	1.56	5.42	0.20	0.20
2007190798	2007191229	20.04	16.52	4.10	8.65	10.70	9.74	4.889	4.062	27.20	25.19	0.20	0.20
2007190798	2007191229	0.55	0.50	21.39	4.51	2.67	2.83	0.887	1.016	0.95	3.83	0.20	0.20
2007190798	2007191229	15.41	15.07	26.99	23.82	9.87	10.24	4.298	3				

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Nd (ppm)	Nd (ppm)	Ni (ppm)	Ni (ppm)	Pb (ppm)	Pb (ppm)	Pr (ppm)	Pr (ppm)	Rb (ppm)	Rb (ppm)	Sb (ppm)	Sb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.50	0.50	0.10	0.10	0.020	0.020	0.20	0.20	0.40	0.40
2007190826	2007191052	6.78	9.64	9.12	12.66	5.83	7.44	1.857	2.450	25.04	32.35	0.20	0.20
2007190826	2007191052	24.87	27.30	10.97	16.76	13.16	14.91	6.595	7.077	63.95	67.42	0.66	0.41
2007190826	2007191052	7.35	7.89	7.42	9.19	6.42	6.33	1.888	2.098	28.59	29.35	0.53	0.20
2007190826	2007191052	28.06	30.44	16.08	16.62	15.34	15.04	7.360	7.779	76.39	73.14	0.86	0.74
2007190834	2007190889	4.01	4.53	4.45	9.30	8.40	9.38	1.057	1.390	32.64	35.60	0.20	0.20
2007190834	2007190889	30.30	27.69	23.32	21.90	23.76	23.85	8.747	8.410	72.65	62.70	2.36	0.20
2007190834	2007190889	2.20	1.87	4.87	7.10	7.06	6.90	0.577	0.560	29.75	30.20	0.20	0.20
2007190834	2007190889	22.67	23.46	16.58	19.70	21.29	22.51	6.259	7.190	60.56	61.60	0.20	0.20
2007190849	2007191277	21.58	19.16	20.50	15.07	15.08	13.36	5.810	4.635	65.20	42.77	0.20	1.70
2007190849	2007191277	26.05	25.88	22.90	19.73	16.87	16.12	6.690	6.120	73.50	50.97	0.20	1.60
2007190849	2007191277	27.49	26.90	22.60	17.36	15.24	17.49	7.040	6.394	44.60	42.28	0.20	1.38
2007190849	2007191277	28.25	30.82	32.20	21.59	20.69	26.31	7.150	7.405	49.50	49.69	0.20	1.31
2007190853	2007190939	16.61	10.22	20.20	10.20	14.92	9.48	4.194	2.770	56.82	38.10	0.81	0.20
2007190853	2007190939	24.03	26.82	20.47	26.80	20.35	23.44	6.292	7.330	75.87	72.30	1.19	0.20
2007190853	2007190939	6.70	8.03	7.24	11.30	4.11	5.95	1.814	2.140	18.11	26.40	0.20	0.20
2007190853	2007190939	25.83	24.16	22.15	26.60	17.00	18.39	6.675	6.500	77.46	81.10	0.20	0.20
2007190865	2007191183	2.03	2.21	7.56	5.95	1.59	1.85	0.462	0.492	4.12	4.98	0.20	0.20
2007190865	2007191183	22.33	21.74	15.62	66.01	15.23	13.15	5.718	5.349	67.17	54.53	1.02	0.20
2007190865	2007191183	2.39	2.20	7.20	6.00	1.98	1.97	0.570	0.528	6.66	5.30	0.20	0.20
2007190865	2007191183	19.80	23.88	10.19	11.87	12.99	13.25	5.218	6.026	56.25	56.27	0.46	0.20
2007190874	2007191297	11.22	15.17	10.68	11.98	7.84	8.45	2.936	3.818	32.35	39.23	1.05	0.20
2007190874	2007191297	22.99	22.27	19.93	17.22	12.50	11.10	5.873	5.500	71.39	62.40	0.86	0.20
2007190874	2007191297	9.03	16.99	10.49	15.05	8.89	9.29	2.439	4.353	23.11	43.68	0.62	0.20
2007190874	2007191297	21.87	25.92	15.68	18.28	11.87	11.96	5.457	6.436	67.73	69.24	1.25	0.20
2007190887	2007191058	44.70	43.04	23.72	25.56	33.36	32.71	11.940	11.220	152.50	150.20	1.53	1.27
2007190887	2007191058	41.76	41.01	17.50	36.81	27.89	29.43	11.280	10.730	130.80	136.70	1.58	1.36
2007190887	2007191058	40.45	43.81	21.22	31.67	30.42	35.07	11.070	11.340	152.70	166.30	1.36	1.34
2007190887	2007191058	39.47	44.18	18.05	24.42	28.38	32.12	10.890	11.280	136.60	156.70	1.18	1.60
2007190895	2007190947	24.19	24.32	24.65	28.80	13.13	14.10	5.962	6.380	53.40	61.90	0.42	0.20
2007190895	2007190947	24.66	21.63	20.91	26.80	13.08	12.58	6.000	5.680	51.61	54.90	0.20	0.20
2007190895	2007190947	24.69	25.26	23.92	27.00	12.71	14.01	6.200	6.630	51.82	61.10	0.20	0.20
2007190895	2007190947	25.65	24.21	23.87	23.80	13.57	13.80	6.341	6.320	51.74	57.10	0.20	0.20
2007190896	2007191441	11.70	21.63	17.87	30.37	15.76	23.29	3.327	5.887	65.11	84.53	0.20	0.94
2007190896	2007191441	39.25	42.48	32.35	57.02	29.05	35.95	10.777	11.620	97.90	105.50	0.76	1.25
2007190896	2007191441	13.26	22.16	18.56	80.81	16.88	23.06	3.580	6.198	64.05	85.05	0.20	1.25
2007190896	2007191441	41.11	41.67	47.12	103.30	29.62	32.47	11.023	11.390	101.11	107.60	1.27	1.40
2007190922	2007191082	5.93	3.82	3.69	8.70	6.55	4.26	1.553	1.140	31.81	24.60	0.20	0.20
2007190922	2007191082	60.31	14.97	18.43	24.80	21.75	12.38	16.200	4.180	72.06	59.60	0.83	0.90
2007190922	2007191082	9.32	9.53	10.63	14.50	8.05	7.94	2.362	2.510	45.40	44.30	0.20	0.20
2007190922	2007191082	23.66	23.58	22.15	33.00	11.58	11.76	6.126	6.190	61.41	66.90	1.09	1.20
2007190927	2007191444	14.07	19.34	15.79	19.14	15.97	20.00	4.095	4.832	97.49	102.20	14.48	23.32
2007190927	2007191444	22.72	27.86	21.47	24.69	23.84	25.27	6.302	6.769	95.65	104.00	28.90	34.39
2007190927	2007191444	14.26	19.09	18.42	18.39	14.19	14.95	4.191	4.797	98.16	103.70	21.32	30.57
2007190927	2007191444	24.14	28.33	19.38	23.11	16.67	17.41	6.426	6.965	99.00	102.50	18.61	26.10
2007190949	2007191504	33.56	34.27	19.72	20.50	23.73	23.32	9.156	9.100	124.09	128.10	0.46	0.90
2007190949	2007191504	35.51	37.25	27.84	26.40	26.02	25.48	9.379	9.890	103.54	109.10	0.66	1.30
2007190949	2007191504	28.60	27.90	19.82	21.60	21.34	18.44	7.694	7.680	112.47	113.10	0.20	0.20
2007190949	2007191504	29.82	27.66	24.77	26.70	22.30	17.93	8.006	7.760	94.35	85.30	1.04	0.20
2007190968	2007191437	7.60	5.85	13.20	9.46	5.06	3.36	1.902	1.295	14.09	9.61	0.20	0.20
2007190968	2007191437	17.96	14.99	13.94	13.43	10.14	8.28	4.590	3.531	37.67	32.43	0.20	0.20
2007190968	2007191437	14.21	14.35	14.74	18.82	8.52	8.16	3.526	3.299	28.03	32.44	0.20	0.20
2007190968	2007191437	24.00	24.84	27.07	25.02	13.56	13.84	5.846	5.885	51.54	57.75	0.20	0.20
2007190970	2007191245	24.02	24.76	25.80	17.90	86.93	184.00	6.710	6.910	56.30	70.70	12.80	22.50
2007190970	2007191245	27.77	28.00	23.20	16.80	63.46	131.60	7.820	7.890	54.70	76.10	11.10	23.90
2007190970	2007191245	26.90	16.63	35.60	14.50	20.60	5.91	7.490	4.610	54.00	25.60	7.20	0.20
2007190970	2007191245	37.85	48.62	29.50	34.50	21.39	12.38	10.410	13.580	52.90	50.80	7.10	1.60
2007190986	2007191592	42.81	28.73	17.90	29.62	15.01	14.23	11.550	7.246	86.79	82.67	0.20	0.48
2007190986	2007191592	147.20	114.80	23.17	18.75	18.94	16.45	40.190	29.540	74.36	62.36	0.20	0.82
2007190986	2007191592	41.43	44.48	21.09	20.75	15.03	15.32	11.270	11.340	92.72	96.01	0.20	0.56
2007190986	2007191592	105.20	64.99	26.98	26.48	17.92	16.15	28.670	16.640	100.30	97.38	0.20	0.86
2007190990	2007191537	38.11	40.15	11.87	10.87	36.21	36.02	10.720	10.600	110.20	106.10	0.90	1.09
2007190990	2007191537	39.27	39.31	10.51	9.76	37.23	34.03	10.730	10.450	102.50	105.00	1.35	1.16
2007190990	2007191537	25.44	19.86	7.78	3.92	22.82	16.04	7.012	5.331	76.00	55.70	1.19	0.77
2007190990	2007191537	43.72	50.37	9.53	12.00	32.28	26.34	12.070	13.280	98.84	82.63	0.99	1.04
2007191007	2007191551	16.53	17.63	14.88	10.31	7.76	7.09	4.366	4.552	38.46	34.57	0.87	0.20
2007191007	2007191551	38.19	35.17	41.89	15.30	12.61	11.51	10.200	8.940	57.05	49.95	0.85	0.46
2007191007	2007191551	14.89	17.88	9.79	15.88	8.33	8.75	3.927	4.425	42.11	39.34	1.01	0.20
2007191007	2007191551	36.31	33.41	18.46	17.39	13.41	12.71	9.431	8.444	61.87	54.96	1.13	0.20
2007191028	2007191531	12.38	10.58	15.54	10.72	18.70	13.47	3.908	2.703	36.64	18.54	0.20	0.20
2007191028	2007191531	28.74	26.29	23.58	14.78	32.53	26.06	7.782	6.472	74.11	49.61	0.55	0.20
2007191028	2007191531	17.04	11.58	17.42	10.36	23.48	15.00	4.944	2.942	36.77	10.84	0.20	0.20
2007191028	2007191531	23.94	29.44	23.78	20.42	30.30	33.10	6.641	7.295	59.88	35.39	0.20	0.20
2007191051	2007191331	18.16	22.20	14.71	10.36	13.22	13.48	4.945	5.381	25.41	28.25	0.40	0.97
2007191051	2007191331	16.69	21.36	14.97	13.84	12.47	12.62	4.488	5.051	24.03	26.10	0.43	1.36
2007191051	2007191331	18.70	21.84	16.03	15.72	13.56	13.82	4.929	5.327	25.34	27.92	0.54	1.61
2007191051	2007191331	21.24	22.24	14.91	13.06	14.29	14.46	5.402	5.421	27.32	28.06	0.20	1.43
2007191066	2007191379	20.44	13.20	19.24	24.98	16.21	11.01	5.215	3.275	79.54	39.12	0.67	0.20
2007191066	2007191379	29.92	24.63										

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Nd (ppm)	Nd (ppm)	Ni (ppm)	Ni (ppm)	Pb (ppm)	Pb (ppm)	Pr (ppm)	Pr (ppm)	Rb (ppm)	Rb (ppm)	Sb (ppm)	Sb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.10	0.10	0.50	0.50	0.10	0.10	0.020	0.020	0.20	0.20	0.40	0.40
2007191134	2007191282	44.34	26.46	10.14	13.40	18.04	17.87	12.260	7.960	66.59	94.70	2.56	0.20
2007191134	2007191282	61.56	65.87	20.80	26.20	23.72	33.60	16.960	19.710	69.05	124.00	2.71	0.20
2007191152	2007191578	4.31	6.49	7.00	8.01	6.61	5.39	1.814	1.608	23.63	18.42	0.20	0.20
2007191152	2007191578	24.13	21.26	12.78	50.81	14.90	13.69	6.508	5.498	61.93	51.59	0.20	0.67
2007191152	2007191578	7.80	8.61	17.08	26.27	9.71	8.80	2.728	2.265	59.77	46.11	0.20	0.20
2007191152	2007191578	16.83	17.10	29.12	24.82	15.30	14.85	4.949	4.504	96.50	87.15	0.20	0.20
2007191168	2007191195	28.61	26.72	19.54	18.74	19.10	22.26	7.376	6.879	60.88	58.63	0.20	2.35
2007191168	2007191195	53.30	42.47	27.63	21.85	25.74	29.86	13.880	10.950	104.10	91.52	0.83	2.60
2007191168	2007191195	28.45	29.77	23.47	16.68	18.91	19.60	7.313	7.735	64.84	61.89	0.20	2.51
2007191168	2007191195	47.18	44.27	30.96	28.27	24.99	24.00	12.180	11.480	104.00	102.20	0.20	2.30
2007191192	2007191339	26.15	29.57	20.57	19.08	20.79	21.26	6.971	7.650	91.55	101.10	3.36	1.37
2007191192	2007191339	37.36	38.98	20.99	21.35	23.50	22.80	9.996	10.280	99.58	99.82	3.19	1.77
2007191192	2007191339	30.29	29.68	25.82	22.77	23.35	23.31	8.040	7.744	102.60	104.30	3.56	1.35
2007191192	2007191339	35.68	37.73	27.95	27.91	24.74	25.54	9.485	9.671	105.10	113.20	3.59	1.57
2007191215	2007191281	14.54	15.15	16.41	14.05	8.83	9.03	3.750	3.844	50.14	48.03	0.20	0.20
2007191215	2007191281	34.92	40.82	29.50	28.40	13.06	12.85	9.007	10.320	80.15	77.75	0.20	0.20
2007191215	2007191281	14.93	14.96	16.59	10.61	9.29	8.91	3.839	3.886	52.02	48.27	0.20	0.20
2007191215	2007191281	38.11	42.45	29.87	24.41	12.88	11.54	9.672	11.080	77.86	66.03	0.96	0.20
2007191216	2007191385	9.04	13.44	9.76	19.18	7.06	11.27	2.230	3.231	18.51	26.92	0.20	0.20
2007191216	2007191385	23.90	30.91	17.32	20.57	13.79	20.17	5.876	7.672	46.95	62.62	0.20	0.20
2007191216	2007191385	10.12	11.06	14.18	17.88	7.59	10.84	2.509	2.784	21.09	27.24	0.20	0.20
2007191216	2007191385	23.95	27.39	17.95	27.30	14.63	21.69	6.065	6.812	47.29	70.67	0.20	0.20
2007191264	2007191486	15.71	12.77	9.82	8.70	11.19	10.23	4.084	3.550	52.37	53.70	1.66	0.20
2007191264	2007191486	62.19	56.06	13.65	14.50	14.29	14.04	16.180	15.510	55.73	66.20	1.37	0.20
2007191264	2007191486	13.13	57.85	18.76	15.40	10.55	13.91	3.441	16.250	48.43	64.50	1.14	0.20
2007191264	2007191486	78.41	11.36	17.97	5.70	15.63	10.29	20.370	3.170	65.54	46.40	1.43	0.20
2007191275	2007191590	9.23	19.02	11.35	26.60	13.05	18.76	2.390	5.031	49.93	76.92	1.66	1.28
2007191275	2007191590	26.12	32.58	25.23	42.75	17.68	25.41	6.883	8.495	66.04	103.30	1.93	1.28
2007191275	2007191590	9.02	18.56	10.20	31.19	11.25	18.45	2.357	4.863	43.11	76.32	1.66	0.96
2007191275	2007191590	18.31	32.91	20.90	49.85	12.38	24.87	4.795	8.492	46.03	107.10	1.65	1.32
2007191293	2007191518	21.61	17.90	11.72	10.07	14.23	11.20	5.267	4.285	36.54	29.17	1.34	0.51
2007191293	2007191518	22.59	20.33	13.87	12.12	12.73	11.69	5.433	4.960	41.45	34.13	1.12	0.69
2007191293	2007191518	24.94	21.41	15.43	17.81	15.95	13.15	5.823	5.226	39.32	34.61	1.32	1.05
2007191293	2007191518	25.82	23.20	16.26	17.43	15.67	13.15	6.429	5.789	44.52	38.42	1.56	0.79
2007191295	2007191498	6.26	5.61	7.49	47.50	5.85	5.71	2.117	1.980	27.74	25.90	0.42	0.20
2007191295	2007191498	56.24	47.06	9.94	8.40	11.50	10.26	14.787	12.720	32.17	29.30	0.45	0.80
2007191295	2007191498	5.99	5.08	5.08	10.70	5.87	5.81	2.024	1.940	27.81	26.80	0.66	0.80
2007191295	2007191498	47.54	65.16	9.35	10.70	10.83	12.03	12.774	17.070	30.33	28.60	0.20	1.10
2007191346	2007191429	28.75	35.06	18.61	25.05	21.34	22.23	7.153	8.802	122.50	138.50	0.76	0.20
2007191346	2007191429	30.71	30.18	16.69	18.38	20.49	19.99	7.762	7.635	119.20	129.40	1.19	0.20
2007191346	2007191429	17.85	21.66	10.41	13.93	15.54	16.42	4.489	5.415	85.65	100.80	0.69	0.20
2007191346	2007191429	37.14	32.92	18.23	16.54	20.89	19.17	9.702	8.413	110.20	115.30	1.21	0.20
2007191372	2007191445	19.65	27.66	26.35	15.04	15.83	9.80	5.006	7.356	13.62	14.08	0.20	0.20
2007191372	2007191445	31.90	64.30	33.57	24.74	24.14	22.24	8.027	17.210	23.34	27.84	0.20	0.20
2007191372	2007191445	23.67	29.20	22.29	14.75	14.43	10.57	6.170	7.895	11.11	15.06	0.20	0.20
2007191372	2007191445	46.38	75.94	35.22	24.06	26.45	23.98	11.900	20.370	24.07	32.39	0.20	0.20
2007191382	2007191509	24.56	26.35	37.60	18.20	25.28	24.97	7.220	7.910	136.20	133.40	0.20	0.20
2007191382	2007191509	36.89	47.40	49.90	30.80	32.39	36.94	10.930	14.020	123.50	121.10	0.20	0.20
2007191382	2007191509	24.70	25.95	40.00	38.20	24.71	25.69	7.270	7.900	123.90	125.40	0.20	0.20
2007191382	2007191509	30.55	36.36	54.10	64.20	26.21	31.87	9.090	10.950	119.00	139.30	0.90	0.20
2007191473	2007191510	21.34	22.59	29.92	28.04	23.63	23.17	5.557	5.593	54.90	54.77	0.78	0.93
2007191473	2007191510	20.96	22.03	29.83	29.13	15.98	15.55	5.297	5.555	58.64	62.38	0.20	1.04
2007191473	2007191510	16.41	18.85	22.33	26.90	15.61	18.64	4.119	4.701	35.89	41.22	0.68	0.59
2007191473	2007191510	16.18	19.00	26.15	26.39	10.90	12.18	4.011	4.792	37.75	44.54	0.64	0.85

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Sc (ppm)	Sc (ppm)	Sm (ppm)	Sm (ppm)	Sn (ppm)	Sn (ppm)	Sr (ppm)	Sr (ppm)	Ta (ppm)	Ta (ppm)	Tb (ppm)	Tb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.30	0.30	0.040	0.040	0.20	0.20	0.20	0.20	0.020	0.020	0.020	0.020
2007190003	2007190213	7.61	7.79	3.791	3.941	1.35	1.04	69.75	76.19	0.795	0.627	0.508	0.421
2007190003	2007190213	17.87	16.85	9.545	8.898	2.30	2.28	95.76	96.63	2.116	1.650	1.294	1.111
2007190003	2007190213	7.16	7.34	3.355	3.500	1.32	1.52	67.20	75.00	0.656	0.525	0.424	0.350
2007190003	2007190213	14.37	15.50	6.514	7.014	1.93	2.18	89.07	97.78	1.506	1.373	0.890	0.920
2007190005	2007191059	6.71	7.42	4.245	4.776	0.74	0.67	184.80	206.40	0.659	0.861	0.440	0.463
2007190005	2007191059	11.44	10.54	6.667	6.499	1.16	1.04	286.80	273.90	1.301	1.393	0.788	0.722
2007190005	2007191059	5.39	7.05	3.701	4.275	0.62	0.67	166.10	215.70	0.479	0.808	0.354	0.404
2007190005	2007191059	12.16	12.28	8.990	7.864	1.31	1.27	255.00	294.80	1.373	1.687	1.050	0.878
2007190032	2007190632	8.89	9.31	6.571	6.795	2.63	2.30	85.78	98.80	1.276	1.109	0.883	0.973
2007190032	2007190632	10.65	11.12	8.094	8.146	3.15	2.89	117.97	133.90	1.644	1.393	1.126	1.149
2007190032	2007190632	9.90	11.63	6.390	7.115	2.55	2.31	91.28	120.20	1.210	1.176	0.886	1.032
2007190032	2007190632	12.28	13.12	8.567	8.664	3.23	2.74	136.54	154.00	1.703	1.366	1.202	1.302
2007190035	2007190876	5.31	5.87	4.295	4.677	3.59	3.37	84.51	90.75	0.898	1.474	0.686	0.752
2007190035	2007190876	9.73	11.33	7.449	9.654	5.44	6.57	124.97	133.90	1.404	2.104	1.378	1.534
2007190035	2007190876	9.26	8.82	5.009	5.141	3.75	4.11	81.02	84.78	0.871	1.488	0.798	0.855
2007190035	2007190876	14.83	13.43	7.788	8.683	7.72	5.42	115.01	113.00	1.502	1.966	1.207	1.309
2007190039	2007190984	7.76	4.00	3.717	1.317	1.21	0.32	48.76	38.96	0.858	0.423	0.454	0.219
2007190039	2007190984	14.11	13.27	7.065	5.208	2.75	1.61	67.71	59.26	2.218	1.255	1.017	0.897
2007190039	2007190984	13.75	13.21	4.685	5.099	2.89	1.84	59.03	69.23	0.843	0.955	0.575	0.662
2007190039	2007190984	16.64	16.93	6.552	6.259	3.61	2.49	79.29	80.46	1.296	1.160	0.834	0.838
2007190050	2007191481	2.87	2.70	1.622	1.210	0.70	0.70	43.35	45.40	0.436	0.520	0.277	0.320
2007190050	2007191481	10.91	9.00	5.654	5.670	2.34	2.10	79.55	81.90	1.970	2.980	1.010	1.120
2007190050	2007191481	3.71	3.40	1.942	1.510	1.45	1.10	46.51	48.00	0.609	0.580	0.329	0.370
2007190050	2007191481	12.08	9.50	5.613	5.670	3.93	2.20	75.01	82.90	1.762	2.290	1.037	1.020
2007190067	2007191121	4.49	3.70	0.989	0.838	0.31	0.10	52.02	50.47	0.204	0.201	0.127	0.010
2007190067	2007191121	12.27	9.98	3.383	2.811	1.16	0.53	111.25	112.40	1.705	1.257	0.592	0.299
2007190067	2007191121	6.27	4.99	1.245	1.222	0.54	0.10	55.65	57.29	0.210	0.205	0.159	0.010
2007190067	2007191121	10.04	12.26	3.034	3.169	1.39	0.62	88.90	105.10	0.646	0.629	0.495	0.294
2007190071	2007190289	1.99	2.29	1.155	0.895	0.25	0.35	50.28	43.92	0.192	0.219	0.153	0.112
2007190071	2007190289	9.67	9.75	7.818	6.016	1.16	1.10	140.79	126.96	1.283	1.602	1.038	0.805
2007190071	2007190289	6.25	6.33	6.388	13.766	0.58	0.63	66.45	49.79	0.307	0.364	0.807	1.540
2007190071	2007190289	14.81	16.06	14.847	38.853	1.66	1.72	99.63	81.01	0.857	0.960	1.886	4.223
2007190074	2007190389	6.74	4.41	2.531	1.437	1.45	1.27	116.07	114.88	0.663	0.583	0.405	0.170
2007190074	2007190389	17.53	20.94	6.699	6.874	2.38	3.54	110.84	116.45	1.466	1.520	0.992	0.906
2007190074	2007190389	2.27	6.62	0.817	2.005	0.67	2.40	100.65	112.52	0.297	0.975	0.138	0.244
2007190074	2007190389	14.84	14.89	5.013	5.422	2.34	2.31	98.13	125.45	1.321	1.139	0.793	0.776
2007190091	2007191053	2.28	5.58	1.056	4.148	0.33	0.99	55.39	108.90	0.262	0.683	0.239	0.533
2007190091	2007191053	13.72	11.12	9.495	9.622	2.21	3.54	182.50	182.30	1.810	1.683	1.419	1.315
2007190091	2007191053	4.61	3.86	2.874	3.113	0.82	0.61	78.39	72.61	0.622	0.453	0.509	0.413
2007190091	2007191053	12.19	7.08	9.689	4.275	3.07	1.17	133.50	210.10	1.745	0.651	1.530	0.735
2007190107	2007190913	3.03	4.06	0.573	1.029	0.83	0.90	23.30	25.86	0.450	0.511	0.203	0.179
2007190107	2007190913	17.24	17.40	6.775	8.894	4.29	2.67	81.43	94.90	1.620	1.514	1.198	1.255
2007190107	2007190913	2.81	5.00	0.442	1.651	0.96	0.90	22.84	35.49	0.422	0.505	0.206	0.261
2007190107	2007190913	16.12	16.43	6.625	8.315	2.41	2.80	74.84	123.93	1.668	1.150	1.090	1.159
2007190110	2007191182	6.30	7.00	3.927	3.850	2.48	2.60	91.68	99.30	1.435	0.820	0.490	0.650
2007190110	2007191182	10.63	12.20	7.302	7.960	3.37	3.40	96.27	104.80	2.135	1.560	1.114	1.290
2007190110	2007191182	14.62	9.00	8.663	5.480	4.73	2.90	135.12	113.80	2.714	0.990	1.214	0.830
2007190110	2007191182	14.98	13.50	8.939	9.360	4.00	4.10	140.42	124.60	2.781	1.580	1.363	1.470
2007190114	2007191045	12.28	11.57	5.931	5.809	1.93	2.20	156.46	194.91	0.885	0.970	0.924	0.946
2007190114	2007191045	14.83	11.34	7.128	5.430	2.15	2.12	183.30	192.53	1.120	1.208	1.105	0.933
2007190114	2007191045	11.71	10.84	5.262	4.872	1.96	1.50	160.10	174.46	0.888	0.888	0.835	0.841
2007190114	2007191045	14.72	11.15	6.445	6.035	2.00	1.55	193.48	195.60	1.212	0.996	1.027	1.031
2007190118	2007191552	16.11	13.53	7.783	7.746	3.93	2.47	35.47	32.76	1.654	1.254	1.191	0.999
2007190118	2007191552	16.27	12.68	7.521	7.198	3.60	3.02	34.22	30.28	1.745	1.295	1.220	0.935
2007190118	2007191552	18.48	17.24	9.684	10.020	4.01	3.26	44.06	56.09	1.497	1.168	1.330	1.171
2007190118	2007191552	18.14	15.81	9.423	8.976	3.98	3.06	43.12	51.44	1.593	1.244	1.317	1.090
2007190121	2007191545	2.98	3.70	0.020	0.020	0.94	1.10	17.31	43.60	0.371	0.490	0.133	0.193
2007190121	2007191545	15.35	14.80	2.741	4.113	2.89	2.70	71.13	134.30	1.470	1.360	0.705	0.762
2007190121	2007191545	3.25	4.00	0.020	0.020	1.07	0.90	29.43	151.20	0.365	0.470	0.145	0.180
2007190121	2007191545	15.13	11.50	3.196	2.681	2.55	2.00	135.14	431.30	1.512	0.860	0.773	0.564
2007190125	2007191532	12.25	9.18	5.839	5.250	2.78	0.90	74.36	63.62	1.638	1.835	0.965	0.756
2007190125	2007191532	15.90	14.04	8.134	9.447	3.83	2.49	76.46	64.08	2.114	2.607	1.268	1.392
2007190125	2007191532	13.55	10.72	6.414	5.853	2.77	1.30	75.65	66.81	1.832	2.011	1.050	0.863
2007190125	2007191532	17.54	15.04	9.888	10.350	3.36	1.94	75.51	67.32	2.500	2.574	1.575	1.493
2007190145	2007191105	10.84	9.70	3.927	4.700	2.02	1.60	192.21	169.30	0.700	0.620	0.703	0.870
2007190145	2007191105	13.56	10.70	3.477	4.382	2.14	1.70	176.96	153.50	0.876	0.750	0.705	0.880
2007190145	2007191105	9.50	8.60	3.617	4.397	1.84	1.50	245.91	275.30	0.662	0.540	0.680	0.800
2007190145	2007191105	16.85	9.50	3.434	4.286	2.30	1.60	259.37	281.60	0.784	0.650	0.695	0.795
2007190154	2007190568	18.97	16.64	2.953	3.358	2.53	3.15	10.79	25.83	1.447	1.700	0.589	0.709
2007190154	2007190568	20.42	18.07	3.455	3.828	2.08	3.47	10.49	24.55	1.446	1.790	0.639	0.823
2007190154	2007190568	33.55	23.11	4.766	2.731	4.74	6.60	8.38	14.68	2.048	2.495	0.867	0.794
2007190154	2007190568	37.72	28.50	5.770	3.366	4.68	5.44	8.78	14.15	2.089	2.259	1.017	0.870
2007190155	2007191031	9.44	8.28	4.114	3.671	0.97	1.09	120.40	112.75	0.512	0.484	0.697	0.641
2007190155	2007191031	14.62	14.61	6.201	6.022	1.69	1.91	169.00	167.32	0.834	0.840	0.996	0.968
2007190155	2007191031	9.38	5.86	3.969	2.462	1.05	1.03	129.40	88.84	0.528	0.377	0.688	0.473
2007190155	2007191031	14.41	14.91	6.632	6.173	1.68	1.91	190.00	172.54	0.802	0.797	1.108	1.032
2007190161	2007191413	11.32	8.40	2.315	2.471	1.08	0.69	67.01	150.50	0.408	0.307	0.319	0.251
2007190161	2007191413	19											

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Sc (ppm)	Sc (ppm)	Sm (ppm)	Sm (ppm)	Sn (ppm)	Sn (ppm)	Sr (ppm)	Sr (ppm)	Ta (ppm)	Ta (ppm)	Tb (ppm)	Tb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.30	0.30	0.040	0.040	0.20	0.20	0.20	0.20	0.020	0.020	0.020	0.020
2007190181	2007191396	11.79	11.70	4.352	4.380	2.54	1.60	135.85	145.60	0.867	0.950	0.772	0.720
2007190181	2007191396	14.53	13.40	5.283	5.710	2.41	2.20	153.98	162.40	1.094	1.110	0.927	0.920
2007190183	2007190471	4.22	4.36	1.120	1.425	0.68	1.02	122.26	95.54	0.312	0.514	0.273	0.151
2007190183	2007190471	20.98	15.41	6.567	6.474	1.95	2.05	184.83	167.60	1.364	1.203	1.145	0.953
2007190183	2007190471	10.18	7.42	6.042	4.358	2.59	1.63	755.78	412.80	0.871	0.820	0.883	0.590
2007190183	2007190471	12.11	10.61	7.504	7.692	2.99	2.84	511.65	1072.00	1.014	1.081	1.104	1.016
2007190185	2007191253	13.95	11.76	4.499	4.416	1.87	1.20	54.06	53.67	0.907	0.948	0.755	0.547
2007190185	2007191253	17.54	15.00	5.865	5.695	1.97	1.68	60.39	60.12	1.206	1.245	0.978	0.852
2007190185	2007191253	16.40	12.98	5.178	4.686	2.30	1.58	66.54	60.34	0.977	0.955	0.822	0.600
2007190185	2007191253	17.92	15.91	5.428	5.685	2.09	1.81	70.44	69.93	1.234	1.141	0.936	0.722
2007190189	2007191542	12.83	10.95	5.735	5.825	2.29	2.03	136.91	150.40	1.012	0.889	0.954	0.885
2007190189	2007191542	12.92	10.34	5.237	5.725	2.17	1.84	132.73	137.30	1.044	0.831	0.929	0.892
2007190189	2007191542	12.94	10.86	5.798	5.758	2.99	2.22	146.12	165.40	1.069	0.974	0.918	0.911
2007190189	2007191542	12.72	10.64	5.414	5.789	2.14	1.75	143.83	154.80	1.078	0.862	0.914	0.885
2007190193	2007190788	10.19	10.80	6.783	8.870	5.08	4.50	97.35	80.00	1.143	1.390	1.111	1.340
2007190193	2007190788	10.18	10.30	7.326	8.510	4.60	4.10	77.48	73.80	1.233	1.300	1.054	1.300
2007190193	2007190788	11.57	10.90	7.900	8.670	3.98	3.70	87.75	78.00	1.358	1.390	1.177	1.360
2007190193	2007190788	11.53	11.90	8.022	10.400	3.85	4.00	87.90	84.20	1.376	1.540	1.186	1.620
2007190194	2007190704	9.61	7.59	4.922	4.808	2.23	2.28	67.09	65.26	0.912	0.797	0.761	0.768
2007190194	2007190704	11.14	8.77	5.311	4.776	2.51	1.95	62.62	59.65	1.047	0.923	0.828	0.811
2007190194	2007190704	10.16	9.96	6.810	6.573	2.06	2.15	85.76	83.34	1.074	0.985	1.002	0.969
2007190194	2007190704	11.49	10.16	7.285	6.107	2.22	1.86	89.74	84.98	1.175	1.039	1.151	0.994
2007190197	2007190962	3.33	2.64	1.148	1.384	0.46	0.39	9.51	7.16	0.251	0.212	0.185	0.209
2007190197	2007190962	12.79	10.06	5.896	7.617	1.80	3.28	34.31	32.53	1.265	1.123	0.969	1.180
2007190197	2007190962	5.64	4.87	2.242	1.932	1.41	1.25	19.93	14.85	0.480	0.349	0.298	0.269
2007190197	2007190962	18.53	13.12	7.829	7.871	4.46	3.13	59.98	41.28	1.725	1.230	1.191	1.187
2007190208	2007191593	3.85	3.97	1.388	1.788	0.74	0.91	9.13	16.06	0.635	0.651	0.277	0.381
2007190208	2007191593	6.86	5.96	2.312	2.585	1.13	1.32	17.36	25.06	1.112	0.980	0.476	0.578
2007190208	2007191593	6.47	5.74	2.520	2.838	1.62	1.58	14.09	20.71	0.719	0.748	0.437	0.499
2007190208	2007191593	8.60	6.87	3.380	3.831	1.81	1.60	21.75	26.35	0.978	0.968	0.612	0.700
2007190209	2007191254	10.19	6.88	4.819	4.032	1.23	1.27	82.00	50.24	0.641	0.656	0.638	0.468
2007190209	2007191254	13.30	10.05	6.043	5.345	1.74	1.32	97.46	72.51	0.803	0.931	0.811	0.743
2007190209	2007191254	9.18	6.24	4.195	3.016	0.97	0.86	80.28	42.00	0.508	0.577	0.537	0.380
2007190209	2007191254	13.84	10.79	5.658	6.401	1.79	1.33	121.22	78.51	0.796	0.959	0.838	0.768
2007190212	2007190747	2.89	1.61	1.199	1.003	0.48	0.46	15.97	10.31	0.218	0.795	0.165	0.164
2007190212	2007190747	15.08	19.63	9.893	14.910	2.18	2.56	73.68	77.83	1.253	1.974	1.455	2.197
2007190212	2007190747	9.47	1.97	5.354	1.280	1.18	0.62	156.90	14.92	0.454	0.831	0.719	0.171
2007190212	2007190747	13.24	13.86	7.324	9.588	1.60	2.08	63.77	62.61	1.207	1.768	1.189	1.517
2007190218	2007191348	5.97	7.20	1.213	1.670	0.94	1.10	17.70	13.30	0.335	0.560	0.115	0.310
2007190218	2007191348	19.53	18.10	4.329	5.040	2.46	2.70	39.02	39.10	1.232	1.380	0.631	0.850
2007190218	2007191348	7.19	9.10	1.145	2.340	1.14	1.60	20.04	21.20	0.372	0.690	0.144	0.410
2007190218	2007191348	20.68	19.60	4.342	6.030	2.95	3.00	43.80	46.80	1.218	1.470	0.700	0.960
2007190241	2007190978	13.91	9.73	6.210	4.110	1.11	1.05	464.80	416.80	1.587	1.374	0.743	0.649
2007190241	2007190978	10.35	21.03	7.286	6.499	1.59	2.27	345.70	406.52	3.165	3.022	1.152	1.086
2007190241	2007190978	12.85	10.23	4.239	3.974	1.13	1.08	356.00	351.59	1.533	1.372	0.637	0.685
2007190241	2007190978	10.47	22.58	7.338	6.745	1.73	1.73	363.00	396.41	2.955	2.722	1.059	1.091
2007190248	2007191198	2.93	2.10	1.472	1.962	0.10	0.76	64.25	77.34	0.188	0.244	0.125	0.185
2007190248	2007191198	15.49	25.79	5.683	15.660	2.94	11.69	129.70	101.50	1.203	3.118	0.806	2.225
2007190248	2007191198	4.41	2.73	1.678	1.750	1.06	1.69	69.57	70.53	0.343	0.284	0.193	0.203
2007190248	2007191198	29.19	13.74	11.050	8.360	8.00	4.08	117.70	167.40	2.160	1.391	1.531	1.177
2007190256	2007190875	3.84	1.88	2.280	1.314	0.36	0.10	138.00	95.00	0.244	0.164	0.311	0.238
2007190256	2007190875	14.38	13.53	6.033	7.051	2.57	3.29	217.80	222.30	0.935	0.952	0.848	1.033
2007190256	2007190875	8.12	3.31	3.557	1.976	0.91	0.38	186.40	120.10	0.436	0.236	0.514	0.280
2007190256	2007190875	13.09	10.77	5.571	5.914	1.47	1.47	213.40	203.00	1.103	0.991	0.829	0.857
2007190258	2007191176	9.54	8.10	4.298	4.790	1.68	1.60	162.24	146.20	0.716	0.980	0.581	0.720
2007190258	2007191176	13.84	12.50	6.183	7.080	2.73	2.20	185.99	174.60	1.125	1.460	0.900	1.120
2007190258	2007191176	7.63	7.30	3.648	4.090	1.85	1.70	156.96	159.30	0.824	0.780	0.467	0.640
2007190258	2007191176	18.63	13.30	8.761	7.630	3.44	3.20	202.59	184.70	1.741	1.470	1.180	1.220
2007190266	2007191458	5.69	2.99	2.285	2.408	0.65	0.71	194.80	187.90	0.328	0.218	0.333	0.174
2007190266	2007191458	11.01	8.67	4.281	5.184	1.49	1.10	251.10	297.30	0.663	0.612	0.649	0.668
2007190266	2007191458	4.05	0.65	1.778	0.970	0.48	0.10	156.20	135.30	0.235	0.033	0.246	0.010
2007190266	2007191458	13.71	9.44	5.210	7.193	1.43	1.79	261.20	289.50	0.741	0.917	0.759	0.869
2007190285	2007190406	13.76	12.87	5.834	5.760	1.78	2.02	89.74	63.15	1.347	1.328	0.818	0.853
2007190285	2007190406	15.17	14.85	6.279	6.433	2.21	2.12	98.79	68.01	1.546	1.516	0.951	0.977
2007190285	2007190406	13.60	12.97	5.820	5.791	1.89	1.82	101.70	73.74	1.429	1.351	0.821	0.832
2007190285	2007190406	15.75	14.84	5.855	6.730	2.18	2.08	112.50	85.52	1.651	1.604	0.930	0.998
2007190296	2007190758	4.60	2.80	1.610	1.120	0.70	0.70	11.80	8.40	0.400	0.920	0.230	0.190
2007190296	2007190758	14.10	10.60	5.050	4.890	2.00	2.40	34.70	34.40	1.050	1.380	0.820	0.840
2007190296	2007190758	5.20	3.40	1.430	0.970	1.00	1.00	12.10	10.70	0.460	0.830	0.230	0.200
2007190296	2007190758	14.60	13.00	4.850	4.040	2.30	1.90	36.60	36.90	1.160	0.930	0.800	0.790
2007190311	2007191259	1.50	2.29	0.211	0.325	0.52	0.10	13.61	8.83	0.512	0.578	0.010	0.010
2007190311	2007191259	10.97	7.03	3.544	4.516	3.63	2.48	88.11	71.54	2.942	2.299	0.432	0.447
2007190311	2007191259	4.37	1.84	1.243	0.020	0.33	0.10	19.09	5.76	0.795	0.211	0.156	0.010
2007190311	2007191259	12.21	8.59	5.403	2.031	1.98	1.06	56.72	40.17	2.616	1.406	0.770	0.099
2007190328	2007191598	2.98	3.03	0.854	1.143	0.43	0.80	6.27	6.32	0.346	0.330	0.138	0.161
2007190328	2007191598	17.01	12.78	5.397	6.098	1.82	1.86	19.92	24.24	1.285	1.162	0.939	1.097
2007190328	2007191598	4.93	3.81	1.235	1.103	0.84	0.95	8.11	8.61	0.414	0.331	0.161	0.154
2007190328	2007191598	18.12	14.11										

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Sc (ppm)	Sc (ppm)	Sm (ppm)	Sm (ppm)	Sn (ppm)	Sn (ppm)	Sr (ppm)	Sr (ppm)	Ta (ppm)	Ta (ppm)	Tb (ppm)	Tb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.30	0.30	0.040	0.040	0.20	0.20	0.20	0.20	0.020	0.020	0.020	0.020
2007190349	2007191436	12.37	10.51	3.640	3.478	30.70	0.83	94.52	93.60	1.825	0.676	0.526	0.256
2007190349	2007191436	17.12	17.75	6.782	6.971	3.97	2.18	92.03	94.21	1.868	1.234	1.182	0.860
2007190349	2007191436	11.99	11.49	3.873	3.567	2.03	0.76	91.20	93.68	1.016	0.659	0.616	0.241
2007190349	2007191436	19.13	19.03	5.864	5.887	2.97	2.41	96.41	94.01	1.608	0.970	0.925	0.676
2007190352	2007190611	9.74	12.07	6.311	6.917	1.45	1.68	75.60	80.15	0.605	0.676	0.918	0.970
2007190352	2007190611	10.36	12.45	7.066	7.773	1.14	2.08	80.12	86.83	0.576	0.675	1.049	1.048
2007190352	2007190611	13.82	15.36	4.386	5.162	2.10	1.95	86.02	69.44	0.758	0.769	0.610	0.691
2007190352	2007190611	14.12	15.10	4.912	5.741	1.84	2.03	104.96	76.85	0.811	0.743	0.662	0.777
2007190355	2007191257	18.07	17.62	4.085	4.143	2.06	1.50	64.58	51.53	0.674	0.664	0.566	0.435
2007190355	2007191257	5.55	21.86	5.309	5.492	2.62	1.57	66.95	55.59	1.033	0.918	0.791	0.656
2007190355	2007191257	19.56	19.83	3.217	3.985	1.80	1.54	79.03	70.31	0.664	0.739	0.457	0.413
2007190355	2007191257	20.47	20.85	3.339	4.003	2.08	1.59	80.42	78.11	0.693	0.762	0.472	0.440
2007190357	2007190856	0.35	2.12	0.802	0.662	0.22	0.52	10.42	12.39	0.111	0.130	0.034	0.154
2007190357	2007190856	6.46	7.61	3.455	3.228	1.34	1.24	24.67	27.76	0.752	0.743	0.605	0.675
2007190357	2007190856	3.05	5.20	2.374	2.263	0.48	0.93	18.34	29.65	0.323	0.380	0.284	0.370
2007190357	2007190856	11.80	11.31	6.905	5.354	1.69	2.41	42.42	65.95	1.085	1.096	1.100	0.911
2007190361	2007191094	11.83	11.80	4.909	4.590	1.41	1.50	148.50	158.10	0.649	0.700	0.580	0.990
2007190361	2007191094	12.92	13.10	4.666	4.620	1.73	1.70	149.00	163.00	0.728	0.760	0.592	0.990
2007190361	2007191094	7.34	8.30	2.618	2.755	0.94	1.30	344.30	327.30	0.446	0.500	0.300	0.366
2007190383	2007191416	8.71	5.70	4.982	2.770	1.39	1.30	88.18	52.20	0.792	0.460	0.760	0.460
2007190383	2007191416	10.82	12.40	6.521	7.280	1.48	2.20	124.10	126.00	0.997	1.130	0.937	1.130
2007190383	2007191416	8.72	8.40	5.569	5.000	1.49	1.90	93.49	94.50	0.817	0.780	0.805	0.820
2007190383	2007191416	11.29	11.30	7.906	7.610	2.05	2.00	133.60	146.60	1.071	1.070	1.126	1.230
2007190393	2007191050	11.19	10.78	6.697	6.848	3.13	3.48	76.95	58.96	1.210	1.276	0.950	1.040
2007190393	2007191050	10.71	10.12	6.820	6.736	2.86	3.26	72.89	55.22	1.243	1.234	0.964	1.025
2007190393	2007191050	11.13	11.22	8.041	7.558	3.59	3.70	56.09	50.20	1.510	1.383	1.148	1.131
2007190393	2007191050	10.28	10.25	7.831	7.993	2.78	3.29	53.27	50.35	1.411	1.348	1.118	1.204
2007190414	2007191386	9.66	8.00	6.928	7.243	2.26	2.30	62.90	59.10	1.124	1.240	1.085	1.043
2007190414	2007191386	8.40	8.40	7.329	7.892	1.98	2.30	57.72	57.40	1.285	1.360	1.150	1.141
2007190414	2007191386	8.65	8.10	7.394	7.597	2.48	2.50	65.73	62.80	1.066	1.150	1.105	1.085
2007190414	2007191386	9.41	10.00	8.198	9.404	2.53	3.00	72.66	75.70	1.240	1.420	1.271	1.362
2007190419	2007190974	9.78	7.57	5.217	4.210	1.27	1.11	49.97	40.68	0.691	0.517	0.723	0.627
2007190419	2007190974	12.00	10.59	5.851	5.865	1.46	1.60	55.58	53.83	0.826	0.772	0.846	0.905
2007190419	2007190974	8.98	7.80	4.343	4.090	1.40	1.07	41.40	41.59	0.621	0.518	0.602	0.633
2007190419	2007190974	14.52	11.99	7.622	7.331	2.04	1.81	63.43	63.88	1.019	0.872	1.073	1.088
2007190425	2007190768	10.55	10.60	6.015	5.850	2.47	2.70	80.96	81.10	1.058	1.140	0.963	0.980
2007190425	2007190768	10.53	10.90	6.031	5.720	2.44	2.00	74.76	72.00	1.063	1.170	0.958	0.950
2007190425	2007190768	10.78	10.90	4.917	6.060	2.52	2.20	73.13	75.00	1.097	1.040	0.808	0.950
2007190425	2007190768	11.31	12.20	5.517	6.300	2.43	2.20	74.41	78.10	1.106	1.150	0.915	1.070
2007190434	2007191027	7.88	6.50	3.799	2.490	0.83	0.40	63.60	80.80	0.539	0.340	0.416	0.370
2007190434	2007191027	16.96	16.70	8.570	7.820	2.55	1.50	81.00	121.40	1.092	0.840	1.038	1.050
2007190434	2007191027	7.26	7.30	4.144	3.300	0.89	0.40	123.50	138.60	0.364	0.430	0.422	0.470
2007190434	2007191027	12.89	14.10	6.971	6.390	1.46	1.10	148.80	176.80	0.740	0.830	0.789	0.880
2007190457	2007191004	8.43	4.89	5.113	5.616	1.49	0.98	72.23	55.14	0.760	0.536	0.701	0.640
2007190457	2007191004	10.28	8.12	6.558	8.375	1.54	2.11	84.58	74.84	0.933	0.860	0.862	1.049
2007190457	2007191004	5.02	4.51	3.273	3.925	0.90	1.20	53.35	59.35	0.542	0.558	0.395	0.470
2007190457	2007191004	10.36	8.41	7.257	6.657	1.81	2.03	84.68	85.95	1.155	1.103	0.990	0.904
2007190458	2007190774	11.54	9.90	5.431	4.690	1.19	1.30	128.20	121.00	0.812	0.800	0.778	0.800
2007190458	2007190774	12.24	11.40	5.553	5.840	1.34	1.30	129.90	132.90	0.936	0.980	0.814	0.990
2007190458	2007190774	11.43	9.50	5.189	4.350	1.43	1.10	123.90	119.80	0.774	0.750	0.738	0.780
2007190458	2007190774	12.97	11.80	5.908	5.430	1.31	1.70	140.20	140.20	0.922	0.970	0.840	0.940
2007190472	2007191312	11.98	11.44	4.816	5.076	2.19	1.95	77.10	84.19	0.635	0.645	0.718	0.744
2007190472	2007191312	12.87	12.63	5.038	5.839	2.32	2.39	81.04	98.55	0.734	0.785	0.786	0.888
2007190472	2007191312	10.68	10.79	3.990	5.406	1.78	2.02	99.36	81.62	0.587	0.689	0.625	0.734
2007190472	2007191312	13.23	13.63	4.839	5.399	2.25	2.38	98.51	85.57	0.720	0.709	0.757	0.833
2007190481	2007191594	7.03	7.07	3.080	3.663	1.13	1.15	146.60	142.80	1.436	0.831	0.590	0.688
2007190481	2007191594	9.17	7.74	4.027	3.912	1.30	1.34	215.00	157.20	1.756	0.920	0.825	0.783
2007190481	2007191594	9.44	8.15	3.948	3.904	1.48	1.31	194.30	180.00	1.746	0.773	0.811	0.700
2007190481	2007191594	9.36	7.91	4.074	4.079	1.38	1.28	214.60	211.40	1.772	0.888	0.784	0.740
2007190495	2007191318	4.30	4.70	1.127	1.415	0.50	0.50	1687.20	1474.00	0.210	0.240	0.148	0.197
2007190497	2007190586	7.01	6.79	2.942	2.996	1.05	0.96	26.41	24.91	0.556	0.493	0.400	0.466
2007190497	2007190586	13.13	11.88	6.627	6.211	2.35	2.21	53.83	51.66	1.053	1.230	0.972	0.999
2007190497	2007190586	8.91	8.18	3.250	2.720	1.70	1.36	31.97	26.95	0.565	0.521	0.430	0.489
2007190497	2007190586	15.26	13.63	5.887	5.743	2.44	2.80	57.27	52.38	1.069	1.020	0.879	0.890
2007190506	2007190631	10.02	10.98	5.808	5.582	1.78	1.69	96.67	98.50	1.546	0.714	0.724	0.826
2007190506	2007190631	10.86	10.21	5.378	4.874	1.59	1.56	87.85	84.50	1.617	0.743	0.725	0.794
2007190506	2007190631	10.15	11.10	5.886	5.540	1.81	1.68	108.90	104.40	1.547	0.673	0.732	0.861
2007190506	2007190631	11.66	11.19	6.209	5.893	1.81	1.99	118.40	114.60	1.585	0.753	0.867	0.875
2007190508	2007191119	13.51	12.01	5.844	5.148	2.01	1.52	139.30	138.48	1.059	0.947	0.787	0.599
2007190508	2007191119	12.73	11.96	6.429	5.705	1.79	1.72	152.30	141.08	1.066	1.054	0.838	0.719
2007190508	2007191119	11.90	11.28	6.339	6.102	2.45	1.80	136.20	144.32	1.093	0.975	0.848	0.664
2007190508	2007191119	12.42	10.96	6.899	5.899	2.62	2.31	142.70	148.67	1.175	1.004	0.928	0.706
2007190526	2007191599	12.53	12.15	8.634	8.047	3.71	3.82	93.62	104.30	1.295	0.919	1.233	1.139
2007190526	2007191599	14.70	14.24	10.150	9.256	4.08	3.58	92.52	97.69	1.520	1.152	1.423	1.342
2007190526	2007191599	13.74	11.91	10.370	9.066	4.25	3.41	75.27	75.64	1.408	1.064	1.406	1.282
2007190526	2007191599	15.54	13.62	11.010	10.190	4.46	3.78	70.83	73.18	1.595	1.234	1.614	1.516
2007190527	2007190609	11.33	10.34	7.702	6.524	1.59	1.44	209.70	182.95	1.127	0.938	1.087	0.974
2007190527	2007190609	11.											

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Sc (ppm)	Sc (ppm)	Sm (ppm)	Sm (ppm)	Sn (ppm)	Sn (ppm)	Sr (ppm)	Sr (ppm)	Ta (ppm)	Ta (ppm)	Tb (ppm)	Tb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.30	0.30	0.040	0.040	0.20	0.20	0.20	0.20	0.020	0.020	0.020	0.020
2007190534	2007191522	5.66	4.40	3.272	3.268	0.98	0.10	71.47	57.56	0.561	1.129	0.405	0.369
2007190534	2007191522	17.19	17.43	15.190	18.690	2.41	2.38	131.00	99.54	1.450	2.252	1.833	2.442
2007190536	2007190909	3.83	3.34	1.356	1.204	1.49	0.34	49.30	43.93	1.112	0.597	0.202	0.186
2007190536	2007190909	17.47	17.79	8.686	8.597	3.36	2.30	97.11	95.15	2.279	1.791	1.283	1.263
2007190536	2007190909	4.55	4.51	1.662	1.681	1.57	0.45	56.62	57.73	1.127	0.625	0.242	0.270
2007190536	2007190909	18.29	17.88	8.553	8.246	3.09	1.76	118.30	128.50	2.178	1.534	1.182	1.149
2007190548	2007191236	11.23	13.85	6.816	6.593	2.29	1.51	282.90	308.10	0.870	0.733	0.905	0.776
2007190548	2007191236	15.65	14.18	11.700	11.720	2.75	2.13	310.70	310.20	1.282	1.150	1.528	1.429
2007190548	2007191236	10.48	13.99	6.965	6.416	3.02	2.04	263.80	317.10	0.981	0.708	0.932	0.802
2007190548	2007191236	14.13	14.62	12.570	13.380	3.67	3.65	277.80	296.10	1.301	1.261	1.611	1.609
2007190549	2007191507	2.96	2.93	0.468	0.406	0.59	0.73	8.31	9.68	0.258	0.218	0.043	0.062
2007190549	2007191507	15.80	10.51	2.704	2.566	2.32	1.44	20.64	18.98	1.292	1.042	0.613	0.598
2007190549	2007191507	4.13	3.59	0.605	0.698	0.70	0.72	11.11	11.56	0.252	0.263	0.061	0.104
2007190549	2007191507	17.45	11.39	2.831	2.958	1.90	2.20	26.34	24.68	1.329	1.127	0.626	0.610
2007190552	2007190675	2.38	1.98	2.142	1.581	1.24	0.24	25.54	27.72	1.080	0.687	0.279	0.231
2007190552	2007190675	10.66	10.09	16.800	10.130	2.65	1.88	102.00	111.20	2.058	1.081	2.182	1.406
2007190552	2007190675	5.75	5.17	7.869	4.390	1.67	0.90	46.21	43.78	1.169	0.724	1.017	0.566
2007190552	2007190675	15.79	15.75	23.320	14.400	3.61	2.48	119.40	112.90	1.753	1.525	3.075	1.847
2007190554	2007190752	3.13	7.80	1.778	2.295	0.70	0.10	5.84	9.00	0.403	0.850	0.291	0.500
2007190554	2007190752	15.31	14.80	6.421	5.258	2.62	0.50	12.26	15.10	1.713	1.830	1.301	1.102
2007190554	2007190752	1.07	10.20	1.118	4.097	0.50	0.10	4.41	11.90	0.152	1.050	0.129	0.676
2007190554	2007190752	15.74	18.00	8.306	8.174	3.35	1.60	12.14	19.60	1.493	1.950	1.408	1.417
2007190583	2007191063	5.78	6.42	3.743	3.999	1.76	1.01	26.99	26.19	0.710	0.796	0.697	0.513
2007190583	2007191063	11.63	9.69	6.790	5.305	2.38	1.64	35.99	31.60	1.433	1.287	1.429	0.884
2007190583	2007191063	10.92	10.33	5.399	6.051	2.38	1.90	45.34	47.11	0.887	1.055	0.912	0.813
2007190583	2007191063	13.48	12.07	7.391	7.349	2.87	3.24	54.63	50.43	1.174	1.277	1.171	1.006
2007190618	2007191166	16.55	17.10	3.875	3.730	1.04	1.30	114.03	125.50	0.532	0.600	0.592	0.680
2007190618	2007191166	19.18	17.90	4.170	4.270	1.19	1.50	131.97	139.80	0.643	0.730	0.637	0.790
2007190618	2007191166	18.77	16.60	4.575	4.460	1.45	1.20	125.06	126.20	0.619	0.700	0.714	0.780
2007190618	2007191166	23.63	24.00	5.486	5.670	1.30	1.30	134.54	144.00	0.733	0.840	0.891	0.990
2007190647	2007191525	4.22	2.23	5.496	3.256	10.32	8.65	33.15	17.48	1.669	0.389	0.692	0.476
2007190647	2007191525	8.35	6.15	8.812	8.307	8.58	7.83	52.27	33.50	2.300	1.220	1.267	1.337
2007190647	2007191525	5.55	2.60	5.994	3.502	9.29	6.52	27.51	17.34	1.744	0.473	0.771	0.515
2007190647	2007191525	9.69	6.13	9.885	8.486	5.83	6.68	44.95	32.55	2.320	1.385	1.400	1.397
2007190659	2007190739	4.59	5.70	1.033	1.080	1.00	0.20	13.11	15.80	0.321	0.260	0.037	0.200
2007190659	2007190739	15.32	16.80	4.274	5.070	2.71	1.70	50.19	69.10	0.931	1.160	0.563	0.790
2007190659	2007190739	8.05	6.70	2.760	0.890	1.44	0.40	27.39	19.50	0.401	0.350	0.265	0.180
2007190659	2007190739	17.79	18.30	5.985	3.450	2.98	2.10	63.35	60.20	0.970	1.110	0.723	0.550
2007190661	2007191334	4.45	3.60	2.443	3.062	0.96	0.36	71.52	76.53	0.614	1.254	0.304	0.360
2007190661	2007191334	12.30	9.65	5.852	6.211	2.93	1.90	121.18	131.50	2.266	2.784	0.923	0.859
2007190661	2007191334	6.23	4.63	3.788	3.480	1.07	0.71	93.91	73.76	0.740	1.279	0.418	0.384
2007190661	2007191334	12.44	11.35	5.901	6.267	2.45	1.45	142.94	126.70	1.787	2.307	0.826	0.905
2007190686	2007191430	4.04	3.57	3.735	4.706	2.85	5.85	6.94	8.83	0.907	0.870	0.545	0.497
2007190686	2007191430	13.02	11.42	12.180	14.790	5.43	5.72	24.13	23.83	1.127	2.185	1.674	1.986
2007190686	2007191430	6.86	6.38	4.575	4.963	2.61	4.17	8.99	9.78	0.887	0.877	0.595	0.506
2007190686	2007191430	16.86	14.88	11.840	10.980	7.84	5.26	21.70	21.06	2.004	1.673	1.407	1.251
2007190695	2007190924	3.34	3.24	1.344	1.338	0.77	0.67	12.65	13.51	0.087	0.314	0.255	0.243
2007190695	2007190924	10.18	9.77	4.484	3.933	2.00	1.64	32.08	31.07	0.305	0.845	0.762	0.661
2007190695	2007190924	8.70	8.81	2.110	1.965	1.93	1.90	24.99	23.80	0.190	0.471	0.340	0.334
2007190695	2007190924	16.08	16.38	4.258	3.729	3.51	3.13	43.47	41.61	0.759	0.879	0.636	0.636
2007190698	2007190813	11.48	10.70	7.327	6.420	2.77	2.80	95.54	82.50	1.212	0.980	1.005	1.040
2007190698	2007190813	12.37	10.80	7.375	7.480	1.78	2.30	87.01	85.00	1.019	1.120	1.037	1.140
2007190698	2007190813	12.70	11.60	7.375	6.930	1.96	2.90	110.36	113.80	1.006	1.090	1.092	1.080
2007190698	2007190813	11.94	12.60	7.427	7.730	2.47	3.00	111.91	121.60	1.099	1.200	1.109	1.170
2007190732	2007191450	7.90	8.80	3.728	4.399	0.10	0.50	80.50	89.00	0.700	0.640	0.583	0.572
2007190732	2007191450	10.30	11.30	4.361	5.702	0.10	1.00	92.20	104.60	1.010	0.830	0.781	0.816
2007190732	2007191450	8.00	7.20	3.747	3.707	0.10	0.40	102.20	91.00	0.680	0.440	0.600	0.441
2007190732	2007191450	11.70	11.00	5.351	5.800	0.60	0.70	139.30	133.20	0.940	0.720	0.881	0.788
2007190735	2007191549	12.30	11.80	5.270	4.880	1.40	2.00	137.50	145.20	0.920	1.060	0.800	0.860
2007190735	2007191549	12.60	10.40	4.610	4.340	1.80	1.80	122.50	124.20	0.960	1.040	0.780	0.790
2007190735	2007191549	14.50	12.40	5.090	5.070	1.70	2.10	154.60	149.40	0.920	1.010	0.820	0.880
2007190735	2007191549	15.20	11.50	4.920	4.330	1.60	1.70	157.30	145.40	0.980	1.020	0.820	0.810
2007190743	2007190906	8.78	9.84	4.134	4.239	1.66	1.52	103.50	116.80	0.143	0.941	0.618	0.635
2007190743	2007190906	14.03	13.35	6.288	5.853	2.66	2.26	158.50	156.20	0.422	1.154	0.920	0.892
2007190743	2007190906	9.28	9.28	3.909	4.328	1.97	1.43	140.10	128.60	0.416	0.913	0.616	0.635
2007190743	2007190906	13.20	13.47	5.925	6.102	2.46	2.26	198.90	200.00	1.409	1.116	0.885	0.870
2007190746	2007191241	1.41	2.63	0.850	1.095	0.34	0.47	24.53	36.70	0.793	0.127	0.142	0.095
2007190746	2007191241	7.88	8.30	3.908	4.190	1.74	4.18	86.42	92.93	1.535	0.730	0.688	0.591
2007190746	2007191241	2.25	2.89	1.052	0.969	0.72	0.32	33.57	43.64	0.805	0.152	0.164	0.105
2007190746	2007191241	8.35	8.30	4.043	4.159	1.72	1.35	97.91	105.80	1.571	0.775	0.627	0.554
2007190753	2007191299	12.40	13.20	5.820	5.582	2.30	1.30	145.90	125.00	0.970	0.710	0.910	0.787
2007190753	2007191299	12.80	13.40	5.550	5.846	1.80	2.80	147.40	130.70	0.950	0.740	0.910	0.851
2007190753	2007191299	13.50	12.20	5.900	5.457	1.70	1.70	149.10	131.70	0.850	0.670	0.910	0.776
2007190753	2007191299	13.30	13.50	6.040	5.919	2.20	2.00	172.40	143.40	0.990	0.740	0.930	0.862
2007190798	2007191229	4.81	3.52	0.234	0.660	0.32	0.33	5.84	2.29	0.236	0.366	0.135	0.207
2007190798	2007191229	53.85	43.10	7.415	6.864	2.63	3.21	18.76	13.50	2.145	2.023	2.392	2.166
2007190798	2007191229	2.75	1.49	0.020	0.361	0.44	0.45	6.62	1.88	0.145	0.187	0.055	0.125
2007190798	2007191229	20.49	30										

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Sc (ppm)	Sc (ppm)	Sm (ppm)	Sm (ppm)	Sn (ppm)	Sn (ppm)	Sr (ppm)	Sr (ppm)	Ta (ppm)	Ta (ppm)	Tb (ppm)	Tb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.30	0.30	0.040	0.040	0.20	0.20	0.20	0.20	0.020	0.020	0.020	0.020
2007190826	2007191052	3.40	4.22	0.987	1.599	0.53	0.68	21.50	23.33	0.854	0.380	0.212	0.320
2007190826	2007191052	10.38	9.72	5.058	5.820	1.49	2.00	64.76	53.37	1.488	0.844	0.972	0.921
2007190826	2007191052	3.70	3.96	1.124	1.383	0.86	0.67	19.74	22.00	0.845	0.275	0.227	0.239
2007190826	2007191052	11.64	10.54	5.691	6.052	2.10	1.89	57.31	61.45	1.642	0.903	0.976	1.047
2007190834	2007190889	2.34	2.90	0.287	0.020	0.10	0.10	53.39	64.80	0.775	0.280	0.046	0.110
2007190834	2007190889	11.03	17.60	4.894	5.220	1.92	1.00	111.90	109.70	1.978	1.110	0.643	0.840
2007190834	2007190889	1.65	1.60	0.042	0.020	0.30	0.10	51.90	52.80	0.888	0.150	0.028	0.050
2007190834	2007190889	12.04	15.80	3.929	4.330	0.82	0.90	126.20	123.60	1.812	1.170	0.583	0.720
2007190849	2007191277	9.20	7.44	4.680	4.348	1.80	0.87	104.60	74.28	0.720	0.558	0.770	0.584
2007190849	2007191277	12.20	10.42	5.790	5.748	1.50	1.67	112.90	90.79	0.880	0.819	1.000	0.860
2007190849	2007191277	9.10	8.43	6.030	5.805	1.10	0.80	139.90	132.80	0.710	0.614	1.080	0.806
2007190849	2007191277	10.50	9.96	6.190	7.100	1.90	1.07	152.40	144.00	0.840	0.777	1.140	0.990
2007190853	2007190939	7.98	4.60	3.599	1.600	1.36	0.80	291.30	111.70	0.480	0.410	0.549	0.360
2007190853	2007190939	10.75	12.80	5.511	5.610	1.93	2.30	524.40	256.30	0.796	1.190	0.769	0.970
2007190853	2007190939	2.51	3.50	1.076	1.110	0.42	0.50	51.69	73.70	0.206	0.230	0.222	0.290
2007190853	2007190939	11.40	11.20	5.990	4.950	2.12	1.80	121.70	223.90	0.757	0.800	0.847	0.870
2007190865	2007191183	0.47	1.06	0.020	0.267	0.10	0.10	15.29	11.92	0.042	0.010	0.036	0.010
2007190865	2007191183	13.07	13.85	4.636	4.568	4.22	2.84	123.10	94.06	1.036	0.602	0.795	0.859
2007190865	2007191183	0.69	1.10	0.020	0.224	0.34	0.10	15.91	11.60	0.051	0.010	0.045	0.021
2007190865	2007191183	14.82	14.56	4.519	5.133	3.43	3.76	86.96	89.93	1.429	0.439	0.900	0.959
2007190874	2007191297	8.32	9.00	2.048	3.046	0.84	1.44	13.73	17.04	0.390	0.460	0.374	0.496
2007190874	2007191297	15.24	12.97	5.431	5.106	1.97	1.90	26.98	28.12	0.902	0.835	0.921	0.891
2007190874	2007191297	9.86	9.96	1.689	3.773	0.88	1.65	10.44	19.56	0.324	0.495	0.268	0.560
2007190874	2007191297	14.63	13.32	5.079	5.825	2.04	2.11	25.95	28.61	0.935	0.840	0.885	0.987
2007190874	2007191058	18.79	18.16	9.720	8.720	4.66	4.34	44.48	40.77	1.553	1.548	1.383	1.307
2007190887	2007191058	16.89	16.57	9.080	8.674	4.12	3.81	38.55	40.09	1.507	1.508	1.342	1.280
2007190887	2007191058	18.01	20.44	8.824	9.209	4.85	4.95	44.84	43.49	1.426	1.489	1.226	1.232
2007190887	2007191058	17.25	19.37	8.513	8.997	4.04	4.26	41.67	42.88	1.393	1.454	1.266	1.305
2007190895	2007190947	11.30	11.40	4.506	5.070	1.61	1.80	111.47	150.00	0.880	0.940	0.741	0.870
2007190895	2007190947	11.17	10.60	4.588	4.300	1.66	1.70	109.15	135.60	0.916	0.920	0.751	0.800
2007190895	2007190947	10.76	11.60	4.822	5.140	1.61	1.60	120.15	169.00	0.896	1.000	0.749	0.910
2007190895	2007190947	11.41	11.20	4.912	5.060	1.55	1.50	121.58	171.10	0.977	1.000	0.817	0.890
2007190896	2007191441	5.55	9.87	1.629	4.014	0.85	1.69	47.83	65.22	0.828	0.766	0.230	0.505
2007190896	2007191441	15.64	19.45	6.832	8.079	2.82	3.22	58.47	73.24	2.083	1.463	0.973	1.053
2007190896	2007191441	6.12	9.89	1.747	3.955	1.03	1.78	50.99	67.16	0.729	0.747	0.283	0.503
2007190896	2007191441	15.92	19.06	7.001	7.866	2.97	2.89	66.28	74.13	2.596	1.365	0.934	1.020
2007190922	2007191082	1.44	2.80	0.855	0.020	0.52	0.40	26.12	331.50	0.214	0.190	0.150	0.160
2007190922	2007191082	11.50	5.80	12.940	2.660	2.34	1.50	108.10	143.70	1.271	0.710	1.747	0.510
2007190922	2007191082	3.89	5.20	1.679	2.150	0.90	0.80	187.40	216.90	0.205	0.260	0.255	0.360
2007190922	2007191082	9.70	9.60	4.950	5.420	1.64	2.20	559.90	663.60	0.454	0.490	0.613	0.900
2007190927	2007191444	7.70	9.08	2.803	3.893	2.11	2.49	156.97	168.90	0.704	0.572	0.545	0.640
2007190927	2007191444	10.91	11.69	4.885	5.839	2.50	2.58	148.64	163.80	0.934	0.725	0.850	0.893
2007190927	2007191444	8.59	10.15	2.502	4.197	2.78	2.60	158.36	173.50	0.890	0.716	0.584	0.637
2007190927	2007191444	12.30	13.19	5.030	5.982	2.64	2.71	134.91	153.70	1.049	0.884	0.890	0.922
2007190949	2007191504	11.47	11.00	6.746	6.529	2.16	2.20	121.14	101.60	0.963	1.090	1.047	1.045
2007190949	2007191504	14.51	14.60	6.673	6.805	2.57	3.30	124.90	110.30	1.052	1.210	1.083	1.112
2007190949	2007191504	10.69	11.20	5.696	4.912	2.06	2.20	145.39	131.80	0.791	0.900	0.926	0.869
2007190949	2007191504	13.64	16.60	5.699	4.959	2.75	2.30	152.94	149.00	0.868	0.840	0.913	0.831
2007190968	2007191437	3.54	2.84	1.641	0.892	0.45	0.10	51.17	44.65	0.227	0.010	0.234	0.010
2007190968	2007191437	8.52	8.31	3.881	3.124	1.32	0.21	99.98	82.90	0.697	0.305	0.609	0.144
2007190968	2007191437	6.57	7.31	3.032	2.902	0.75	0.10	119.00	119.40	0.294	0.055	0.462	0.065
2007190968	2007191437	11.35	13.19	5.328	4.962	1.58	0.85	206.70	191.70	0.576	0.330	0.753	0.395
2007190970	2007191245	6.70	7.10	5.000	5.070	406.10	630.80	54.50	53.20	1.270	1.260	0.850	0.880
2007190970	2007191245	7.00	6.70	5.990	5.630	532.50	959.80	49.10	54.40	1.550	1.740	1.000	1.020
2007190970	2007191245	6.70	4.20	5.630	3.270	85.00	4.90	47.10	23.00	1.280	0.760	0.880	0.500
2007190970	2007191245	7.80	10.20	7.910	10.060	125.80	17.30	48.70	48.10	1.670	2.000	1.180	1.650
2007190986	2007191592	13.33	9.75	8.877	5.792	1.93	1.75	78.33	79.36	0.677	0.474	1.237	0.842
2007190986	2007191592	21.71	17.41	31.840	23.460	3.54	3.06	72.82	69.77	1.581	1.225	3.755	2.868
2007190986	2007191592	14.77	12.54	8.803	9.065	2.13	2.33	82.81	85.97	0.653	0.617	1.275	1.235
2007190986	2007191592	20.53	16.24	21.940	13.470	3.04	2.82	84.53	85.53	1.240	0.956	2.696	1.871
2007190990	2007191537	10.93	9.45	8.823	8.937	6.12	6.92	26.35	29.74	1.880	1.625	1.507	1.594
2007190990	2007191537	10.00	9.20	8.881	9.105	5.29	6.93	25.69	27.75	1.851	1.626	1.574	1.590
2007190990	2007191537	7.18	4.12	5.285	4.139	4.74	5.02	17.57	15.06	1.191	0.716	0.985	0.728
2007190990	2007191537	10.90	8.84	10.140	10.920	7.98	9.64	22.83	20.45	1.848	1.877	1.700	1.890
2007191007	2007191551	4.44	4.47	3.629	3.297	1.41	1.77	86.35	82.56	0.491	1.144	0.452	0.405
2007191007	2007191551	10.87	9.67	8.637	7.479	2.71	1.56	169.00	147.20	1.121	1.679	1.093	0.915
2007191007	2007191551	4.57	5.05	3.295	3.579	1.61	0.35	82.82	82.82	0.460	1.361	0.419	0.415
2007191007	2007191551	11.46	9.71	8.189	6.940	6.09	1.33	164.20	143.90	1.151	1.680	1.154	0.900
2007191028	2007191531	5.94	4.94	2.481	2.102	0.64	0.10	16.24	9.29	0.510	1.004	0.479	0.273
2007191028	2007191531	12.88	11.56	5.623	5.685	2.28	0.92	33.25	24.15	1.097	1.567	1.026	0.910
2007191028	2007191531	6.93	4.93	3.117	2.377	1.11	0.10	36.87	10.28	0.609	0.941	0.550	0.308
2007191028	2007191531	11.56	11.98	5.022	6.354	2.30	0.93	45.64	27.47	0.981	1.560	0.847	0.930
2007191051	2007191331	9.79	9.25	4.044	5.063	1.50	1.00	131.39	131.60	0.651	1.366	0.687	0.722
2007191051	2007191331	9.58	9.53	3.647	4.728	1.00	1.74	119.03	117.60	0.761	1.479	0.660	0.703
2007191051	2007191331	9.69	9.06	3.930	5.157	1.29	1.06	122.46	138.30	0.697	1.293	0.680	0.725
2007191051	2007191331	11.18	9.71	4.649	5.444	1.48	1.23	128.16	140.10	0.795	1.376	0.792	0.740
2007191066	2007191379	7.33	5.70	4.290	2.684	1.27	0.10	100.20	144.20	0.552	0.323	0.609	0.358
2007191066	2007191379	8.4											

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Sc (ppm)	Sc (ppm)	Sm (ppm)	Sm (ppm)	Sn (ppm)	Sn (ppm)	Sr (ppm)	Sr (ppm)	Ta (ppm)	Ta (ppm)	Tb (ppm)	Tb (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.30	0.30	0.040	0.040	0.20	0.20	0.20	0.20	0.020	0.020	0.020	0.020
2007191134	2007191282	5.05	6.60	8.432	4.960	0.67	1.00	207.20	62.10	0.628	0.820	0.851	0.630
2007191134	2007191282	7.35	14.30	11.690	12.240	0.88	2.20	300.50	97.90	0.714	1.600	1.273	1.440
2007191152	2007191578	2.91	3.46	0.975	1.246	1.04	0.10	17.80	14.86	0.161	0.836	0.405	0.168
2007191152	2007191578	11.30	9.73	5.287	4.996	2.41	0.74	38.09	36.57	0.928	1.395	1.118	0.751
2007191152	2007191578	6.70	6.39	1.474	1.726	1.71	1.71	43.00	30.30	0.289	0.326	0.455	0.294
2007191152	2007191578	12.54	13.16	3.429	3.873	3.29	3.18	61.45	53.67	0.703	0.817	0.767	0.615
2007191168	2007191195	7.04	7.29	5.860	5.409	0.95	0.84	71.88	70.67	0.680	0.678	0.748	0.555
2007191168	2007191195	12.62	11.85	11.300	8.635	3.11	1.62	101.80	94.55	1.178	1.031	1.487	1.072
2007191168	2007191195	7.93	8.54	5.678	6.179	1.65	1.08	92.87	94.42	0.687	0.819	0.728	0.633
2007191168	2007191195	13.42	14.34	9.698	9.417	2.54	1.95	136.90	153.50	0.975	0.930	1.328	1.076
2007191192	2007191339	10.15	10.78	5.035	5.998	1.44	1.52	93.56	100.30	1.100	1.785	0.589	0.774
2007191192	2007191339	14.02	13.28	7.411	8.091	1.87	2.10	103.50	101.60	1.581	2.090	0.958	1.034
2007191192	2007191339	11.96	11.30	5.981	5.820	1.98	2.14	114.80	109.10	1.172	1.677	0.667	0.700
2007191192	2007191339	13.84	14.57	7.175	7.516	2.17	2.24	125.00	122.50	1.403	1.985	0.872	0.999
2007191215	2007191281	3.82	4.02	3.155	3.094	1.11	2.04	77.20	51.12	0.527	0.651	0.400	0.440
2007191215	2007191281	8.73	9.86	7.022	8.750	2.57	4.17	159.40	102.30	1.421	1.511	1.025	1.301
2007191215	2007191281	4.34	4.19	3.036	3.130	1.35	0.91	83.89	51.90	0.532	0.569	0.444	0.478
2007191215	2007191281	9.84	9.57	8.098	8.990	4.55	4.92	200.10	100.70	1.404	1.643	1.157	1.349
2007191216	2007191385	3.82	6.35	1.756	2.732	0.91	0.49	21.43	29.70	0.327	0.388	0.241	0.336
2007191216	2007191385	7.61	13.40	4.826	6.685	1.68	1.62	52.07	63.03	0.737	0.780	0.752	0.885
2007191216	2007191385	3.71	6.62	2.124	2.329	0.91	0.61	28.99	26.35	0.307	0.366	0.254	0.293
2007191216	2007191385	8.97	14.72	4.864	5.811	1.50	1.79	68.22	63.42	0.675	0.860	0.693	0.836
2007191264	2007191486	4.96	5.60	3.097	2.410	0.74	1.00	65.98	67.00	0.498	0.490	0.381	0.440
2007191264	2007191486	13.04	13.80	12.550	11.860	1.79	2.20	79.09	93.90	1.778	1.600	1.709	1.860
2007191264	2007191486	4.47	13.10	2.503	12.230	0.71	2.60	61.55	89.60	0.443	1.440	0.317	1.770
2007191264	2007191486	14.52	3.50	15.980	2.100	2.92	1.20	89.62	139.30	1.548	0.520	2.029	0.360
2007191275	2007191590	3.66	9.75	1.693	3.986	0.20	1.67	54.85	66.18	0.318	0.595	0.197	0.523
2007191275	2007191590	13.62	16.92	5.416	6.884	1.18	2.94	95.69	87.92	1.028	0.995	0.739	0.970
2007191275	2007191590	4.02	9.50	1.594	3.736	0.26	1.51	109.00	60.50	0.339	0.585	0.174	0.517
2007191275	2007191590	9.02	17.74	3.575	6.950	0.97	3.07	207.00	85.33	0.637	1.013	0.482	0.940
2007191293	2007191518	8.35	8.46	4.444	3.856	1.05	1.07	107.80	80.55	0.620	0.450	0.665	0.483
2007191293	2007191518	9.23	9.38	4.677	4.504	1.66	0.90	106.40	84.61	0.711	0.592	0.686	0.552
2007191293	2007191518	9.54	9.72	5.130	4.652	1.42	1.22	145.80	118.90	0.694	0.512	0.712	0.577
2007191293	2007191518	10.09	10.68	5.635	5.265	1.54	1.06	156.50	130.80	0.781	0.597	0.809	0.663
2007191295	2007191498	2.59	2.50	1.078	0.434	0.54	0.40	59.52	61.60	0.306	0.350	0.260	0.197
2007191295	2007191498	28.91	33.00	11.053	8.962	2.31	3.00	106.10	100.10	2.500	2.410	1.739	1.538
2007191295	2007191498	2.49	2.10	1.015	0.020	0.44	0.80	60.23	57.30	0.264	0.430	0.243	0.184
2007191295	2007191498	26.87	46.80	9.728	12.820	2.82	5.20	100.68	107.60	2.623	2.930	1.564	2.006
2007191346	2007191429	7.61	10.41	6.077	7.127	1.90	2.09	94.48	112.40	1.495	0.698	0.789	0.673
2007191346	2007191429	8.45	9.28	6.512	6.179	1.87	1.43	102.20	107.20	1.655	0.638	0.881	0.553
2007191346	2007191429	4.76	6.95	3.797	4.233	0.97	0.77	67.22	84.62	1.178	0.418	0.442	0.268
2007191346	2007191429	8.90	9.84	7.486	6.748	1.70	1.52	98.75	103.00	1.877	0.780	1.139	0.632
2007191372	2007191445	15.85	5.09	3.883	4.829	0.29	0.10	53.54	47.97	1.064	0.439	0.437	0.348
2007191372	2007191445	25.40	14.92	6.556	12.030	1.13	0.74	78.59	99.22	1.392	1.123	0.749	1.050
2007191372	2007191445	14.49	6.33	4.645	5.180	0.35	0.10	25.36	47.23	1.086	0.486	0.471	0.364
2007191372	2007191445	29.71	18.70	9.283	14.090	1.19	0.76	51.14	96.97	1.473	1.240	1.014	1.312
2007191382	2007191509	12.20	7.20	4.530	4.740	1.90	1.40	49.40	49.20	0.910	1.220	0.670	0.730
2007191382	2007191509	18.90	14.80	7.430	9.280	2.70	2.90	65.10	74.30	1.420	2.420	1.100	1.520
2007191382	2007191509	9.00	14.40	4.710	4.850	2.30	2.10	63.90	50.70	0.960	0.970	0.690	0.740
2007191382	2007191509	11.90	21.10	5.630	6.800	2.90	3.50	71.80	71.40	1.290	1.380	0.850	0.970
2007191473	2007191510	9.76	7.15	4.768	4.570	1.49	1.28	61.45	66.38	0.616	0.632	0.635	0.672
2007191473	2007191510	10.77	7.16	4.584	4.583	1.45	1.54	61.92	61.71	0.710	0.753	0.682	0.713
2007191473	2007191510	6.99	7.21	3.508	3.979	1.12	1.02	134.40	123.10	0.413	0.437	0.502	0.569
2007191473	2007191510	7.61	7.78	3.507	4.004	1.00	1.03	143.20	136.00	0.461	0.505	0.507	0.592

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Th (ppm)	Th (ppm)	U (ppm)	U (ppm)	V (ppm)	V (ppm)	W (ppm)	W (ppm)	Y (ppm)	Y (ppm)	Yb (ppm)	Yb (ppm)	Zn (ppm)	Zn (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.020	0.020	0.020	0.020	0.10	0.10	0.10	0.10	0.050	0.050	0.040	0.040	0.90	0.90
2007190003	2007190213	11.918	12.016	2.361	2.264	49.93	51.84	1.13	1.10	17.086	19.187	1.697	1.709	29.23	29.77
2007190003	2007190213	29.341	25.853	5.714	5.010	109.78	102.08	2.46	2.00	45.791	45.808	4.728	4.334	61.98	60.80
2007190003	2007190213	10.602	10.814	2.324	2.096	49.50	52.53	1.10	1.04	14.998	15.877	1.355	1.377	25.75	25.88
2007190003	2007190213	20.059	21.259	4.633	4.444	96.51	103.25	1.99	1.88	32.750	38.780	3.222	3.591	49.35	54.02
2007190005	2007191059	6.594	5.958	1.220	1.359	61.10	69.13	0.94	0.87	18.070	20.280	1.560	1.823	53.82	60.89
2007190005	2007191059	8.477	8.402	1.756	1.853	114.20	110.90	0.92	1.12	28.420	27.850	2.464	2.535	99.75	99.24
2007190005	2007191059	6.513	6.040	1.171	1.360	42.47	65.54	0.61	0.87	15.120	19.120	1.462	1.837	33.47	51.37
2007190005	2007191059	16.580	12.120	2.784	2.413	111.00	135.50	1.29	1.30	34.290	31.730	3.212	3.167	88.32	107.80
2007190032	2007190632	11.739	11.110	3.045	2.949	79.45	75.72	2.12	2.24	30.174	32.880	2.660	2.877	48.05	47.66
2007190032	2007190632	15.074	13.160	3.877	3.620	97.70	90.85	2.78	2.70	39.323	40.550	3.563	3.482	58.06	53.53
2007190032	2007190632	11.345	11.270	3.194	3.271	82.91	94.12	2.17	2.34	30.281	35.230	2.735	3.066	49.44	54.12
2007190032	2007190632	14.962	13.250	4.374	3.939	107.27	107.10	2.59	2.68	41.024	45.310	3.669	3.618	66.70	69.25
2007190035	2007190876	14.587	17.590	2.604	2.827	34.17	32.76	1.34	1.83	31.813	33.400	3.371	3.591	16.81	23.08
2007190035	2007190876	26.837	30.440	5.107	5.910	57.69	60.74	2.42	2.64	62.566	64.920	7.061	7.452	37.77	37.90
2007190035	2007190876	17.801	18.870	3.090	3.458	66.70	61.43	1.61	1.84	34.177	36.860	3.547	3.828	43.85	38.52
2007190035	2007190876	17.680	21.900	4.906	5.117	110.69	95.45	2.64	2.94	39.156	46.210	4.998	5.721	67.49	63.46
2007190039	2007190984	15.637	7.980	3.223	1.993	69.79	42.74	1.09	0.32	17.879	9.717	1.925	1.106	32.77	13.53
2007190039	2007190984	31.663	29.340	6.689	6.502	118.50	96.10	2.13	1.32	38.413	36.320	4.515	4.372	55.47	43.76
2007190039	2007190984	17.943	21.590	4.028	7.330	114.20	122.20	1.21	1.16	20.667	22.260	1.923	2.110	57.01	61.52
2007190039	2007190984	19.265	33.880	5.507	9.140	142.50	147.20	2.28	1.71	22.517	31.190	2.528	2.766	94.47	78.23
2007190050	2007191481	6.373	7.090	1.492	1.720	14.71	18.10	0.30	0.40	12.033	12.600	1.225	1.380	12.24	10.60
2007190050	2007191481	20.552	18.880	4.574	4.920	54.95	54.50	1.20	1.30	42.554	43.100	4.401	4.970	39.23	37.20
2007190050	2007191481	7.812	7.960	1.877	1.890	22.10	22.40	0.34	0.50	14.153	14.000	1.504	1.670	14.73	9.90
2007190050	2007191481	22.304	19.040	5.171	5.200	63.86	58.50	1.32	1.70	44.894	36.100	5.047	4.550	35.62	35.10
2007190067	2007191121	4.104	3.423	0.781	0.555	66.81	62.52	0.55	0.82	5.456	4.359	0.559	0.453	20.64	8.35
2007190067	2007191121	14.488	12.160	2.467	1.939	125.30	114.00	1.74	1.96	24.087	19.670	2.685	2.274	66.29	54.91
2007190067	2007191121	4.928	4.086	1.516	1.014	88.05	94.02	0.60	0.98	6.388	5.707	0.687	0.548	28.47	13.77
2007190067	2007191121	9.777	9.779	3.446	2.678	126.80	127.40	1.24	1.58	16.950	17.570	1.613	1.721	69.49	54.82
2007190071	2007190289	6.752	5.684	0.861	0.713	9.45	6.26	0.05	0.19	5.253	4.758	0.591	0.506	4.03	3.48
2007190071	2007190289	44.598	40.180	5.407	4.637	37.27	34.03	0.70	0.82	35.326	32.785	4.100	3.772	19.88	18.39
2007190071	2007190289	19.312	19.053	1.316	1.422	22.48	21.34	0.25	0.33	29.030	43.266	2.085	3.251	9.69	8.12
2007190071	2007190289	49.709	52.279	3.355	3.810	58.30	61.23	0.82	1.02	65.017	117.747	5.194	8.748	21.80	24.13
2007190074	2007190389	6.696	6.351	1.241	0.600	64.46	52.86	0.84	0.56	15.338	7.500	1.806	0.950	37.65	13.39
2007190074	2007190389	20.398	25.578	3.803	3.984	100.55	107.55	1.55	1.50	40.404	40.082	5.346	5.565	65.30	51.42
2007190074	2007190389	3.001	8.876	0.415	0.831	35.10	79.51	0.55	0.55	4.680	11.089	0.586	1.341	12.72	26.04
2007190074	2007190389	15.518	15.778	3.223	2.936	89.12	93.05	1.26	1.48	34.173	35.600	4.657	4.173	49.97	48.04
2007190091	2007191053	2.960	7.753	0.661	1.767	13.86	41.73	0.33	0.79	7.561	21.140	0.810	1.991	10.30	30.46
2007190091	2007191053	22.000	19.530	4.947	4.582	94.44	98.13	1.51	1.49	48.350	47.020	5.766	4.728	60.05	60.59
2007190091	2007191053	7.026	6.296	1.638	1.408	25.47	25.58	0.62	0.47	17.770	16.560	1.827	1.451	22.05	17.48
2007190091	2007191053	24.210	8.845	5.470	2.195	67.54	45.69	1.72	0.93	55.590	29.260	6.519	2.894	49.31	22.78
2007190107	2007190913	3.818	4.106	0.656	0.681	20.89	23.61	0.90	0.51	7.275	8.289	0.821	0.842	13.92	8.07
2007190107	2007190913	16.483	11.437	3.880	3.595	83.99	85.29	1.69	1.73	45.063	37.210	5.546	5.259	57.54	56.84
2007190107	2007190913	3.717	5.054	0.639	0.728	18.63	29.28	0.62	0.67	6.976	10.357	0.774	0.969	10.36	14.17
2007190107	2007190913	16.829	11.653	3.936	2.477	69.04	101.55	1.87	1.77	45.241	36.306	5.485	4.030	40.20	69.83
2007190110	2007191182	9.152	10.110	2.089	2.390	37.95	46.40	1.56	1.70	20.947	22.200	1.965	2.280	43.25	50.40
2007190110	2007191182	19.125	19.460	4.269	4.840	63.52	79.90	2.91	3.10	44.149	45.900	4.518	4.870	64.80	81.80
2007190110	2007191182	16.957	12.000	5.839	3.460	100.84	58.80	3.35	2.30	44.309	27.700	3.943	2.740	86.69	63.20
2007190110	2007191182	18.066	20.040	6.055	6.330	100.20	85.50	3.44	3.60	49.323	48.200	4.497	4.720	82.33	95.70
2007190114	2007191045	8.769	8.195	2.241	2.347	110.13	95.07	1.70	1.83	32.233	36.104	3.314	3.284	63.20	68.80
2007190114	2007191045	10.045	8.912	2.678	2.549	107.08	100.58	2.01	2.03	37.905	35.240	3.576	3.700	72.34	53.71
2007190114	2007191045	8.832	8.280	2.211	2.216	107.96	101.35	1.61	1.42	28.902	32.579	2.967	3.089	52.36	50.79
2007190114	2007191045	9.909	8.080	2.844	2.377	110.77	95.01	2.13	1.93	37.352	36.892	3.887	3.340	68.69	64.92
2007190118	2007191552	23.338	21.840	6.120	6.977	101.24	91.39	2.97	2.87	40.812	39.900	4.055	3.886	42.59	43.32
2007190118	2007191552	22.856	20.600	6.376	6.522	94.22	77.27	3.19	2.79	42.494	39.250	4.245	4.004	40.75	35.05
2007190118	2007191552	22.593	21.870	6.340	9.052	116.43	112.60	2.77	2.75	43.892	42.200	3.905	3.873	55.34	54.99
2007190118	2007191552	22.985	19.890	6.338	8.321	104.67	98.87	2.86	2.94	44.875	39.260	4.225	3.760	51.14	49.36
2007190121	2007191545	3.478	4.630	0.574	0.600	34.86	42.40	1.10	0.05	5.937	9.200	0.758	1.137	14.57	17.00
2007190121	2007191545	14.266	14.300	3.065	2.270	91.86	113.30	1.51	0.90	33.180	32.600	4.434	3.845	51.23	82.00
2007190121	2007191545	3.667	4.620	0.635	0.790	38.10	48.90	0.60	0.05	6.529	9.100	0.871	1.165	13.42	19.70
2007190121	2007191545	14.710	10.470	3.114	2.040	96.27	103.90	1.99	0.50	34.256	24.200	4.662	2.628	48.04	62.40
2007190125	2007191532	18.310	15.910	4.141	4.217	96.56	86.54	1.74	2.17	36.024	31.010	3.939	3.356	35.62	19.36
2007190125	2007191532	23.274	26.520	5.429	7.160	121.32	133.10	2.37	3.29	48.654	56.390	5.299	6.633	40.85	29.37
2007190125	2007191532	19.582	19.000	4.470	5.128	109.68	95.38	2.06	2.17	40.119	35.470	4.287	4.118	28.98	28.51
2007190125	2007191532	28.398	31.400	6.532	8.190	144.36	135.60	2.54	3.12	60.236	62.340	6.566	7.271	36.02	30.51
2007190145	2007191105	9.675	9.570	1.188	1.160	50.29	51.80	1.22	0.05	25.868	25.300	2.300	2.541	67.67	66.40
2007190145	2007191105	11.412	10.270	1.521	1.320	55.15	56.40	1.28	0.05	25.685	25.300	2.543	2.466	72.23	69.60
2007190145	2007191105	9.486	8.590	1.842	1.850	51.37	53.40	0.99							

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Th (ppm)	Th (ppm)	U (ppm)	U (ppm)	V (ppm)	V (ppm)	W (ppm)	W (ppm)	Y (ppm)	Y (ppm)	Yb (ppm)	Yb (ppm)	Zn (ppm)	Zn (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.020	0.020	0.020	0.020	0.10	0.10	0.10	0.10	0.050	0.050	0.040	0.040	0.90	0.90
2007190181	2007191396	7.216	7.800	1.762	1.780	85.08	82.00	1.17	1.20	25.431	24.200	2.509	2.630	55.10	55.30
2007190181	2007191396	9.074	9.460	2.135	2.180	102.43	101.00	1.41	1.50	31.287	31.400	3.187	3.180	78.84	67.00
2007190183	2007190471	4.889	4.921	0.903	0.678	28.49	36.37	0.27	0.41	8.288	7.729	1.051	0.808	12.50	15.35
2007190183	2007190471	23.546	20.240	5.169	4.066	74.48	65.32	1.25	1.19	46.117	41.650	6.115	4.843	39.61	36.23
2007190183	2007190471	13.511	10.660	2.058	1.576	82.30	87.91	1.22	1.18	29.535	22.170	2.655	1.906	60.85	46.88
2007190183	2007190471	15.868	15.000	2.390	2.483	93.46	98.96	1.54	1.44	36.868	36.920	3.379	3.246	70.70	77.08
2007190185	2007191253	12.063	11.710	2.451	2.305	144.31	143.40	1.55	1.11	26.077	24.240	2.644	2.297	70.63	71.30
2007190185	2007191253	15.270	16.270	2.973	3.120	153.75	150.50	1.81	1.58	34.174	35.320	3.310	3.566	81.12	83.57
2007190185	2007191253	13.670	12.370	2.764	2.612	161.60	145.80	1.83	1.32	27.880	25.210	2.685	2.292	83.73	79.79
2007190185	2007191253	15.161	14.770	3.095	3.132	158.28	141.50	1.86	1.49	33.104	31.190	3.205	3.034	84.74	83.21
2007190189	2007191542	10.542	5.653	1.877	1.769	94.26	92.98	1.52	1.51	31.915	21.300	3.078	3.041	66.25	77.91
2007190189	2007191542	10.594	10.250	2.038	1.935	87.31	85.51	1.38	1.54	32.580	29.980	3.345	2.967	64.58	67.89
2007190189	2007191542	10.265	7.646	2.014	2.053	96.40	95.70	1.45	1.69	31.486	25.280	3.104	2.899	65.49	74.55
2007190189	2007191542	10.522	10.080	2.126	2.073	90.63	88.40	1.47	1.41	31.883	30.670	3.292	3.042	63.47	70.92
2007190193	2007190788	15.481	15.030	2.583	5.560	55.16	67.70	2.38	3.20	38.390	41.500	3.743	3.990	103.45	64.40
2007190193	2007190788	16.618	16.550	3.036	5.380	47.65	61.20	2.56	2.70	39.490	42.200	4.110	4.010	98.39	52.40
2007190193	2007190788	17.325	17.240	2.768	3.750	72.38	69.00	3.01	3.30	40.408	43.700	3.980	4.260	54.78	48.10
2007190193	2007190788	17.889	19.480	2.998	4.520	66.22	70.00	2.90	3.30	44.593	51.600	4.396	5.010	54.15	46.60
2007190194	2007190704	9.808	9.286	1.950	2.002	60.69	52.21	1.62	1.52	27.488	29.070	2.816	2.636	48.68	42.29
2007190194	2007190704	11.375	11.440	2.505	2.549	62.48	53.83	1.66	1.54	32.646	31.730	3.557	3.125	49.23	43.97
2007190194	2007190704	11.780	11.920	2.128	2.229	64.71	75.45	1.82	1.86	34.016	36.520	3.290	3.314	47.69	44.99
2007190194	2007190704	12.782	12.820	2.564	2.518	63.45	73.48	1.98	1.84	40.041	37.790	3.946	3.492	47.74	42.23
2007190197	2007190962	3.710	3.832	0.778	0.791	19.95	20.48	0.37	0.50	7.814	8.104	1.012	0.987	3.09	2.60
2007190197	2007190962	17.838	19.020	3.728	4.086	31.25	33.39	1.48	1.64	40.317	46.960	4.503	5.236	14.02	14.30
2007190197	2007190962	6.115	5.495	1.168	1.162	44.24	39.20	0.84	0.63	11.574	10.520	1.348	1.263	7.28	5.77
2007190197	2007190962	21.841	19.960	3.939	4.155	99.21	73.00	2.54	2.09	42.537	43.940	4.586	4.967	20.54	16.75
2007190208	2007191593	4.808	5.011	1.726	1.981	19.93	20.80	1.62	1.23	19.090	20.900	2.983	3.293	7.10	6.60
2007190208	2007191593	7.249	6.952	2.818	3.002	17.94	17.62	2.28	2.03	30.980	32.000	5.097	5.126	9.71	9.28
2007190208	2007191593	7.349	6.362	2.272	2.285	34.76	27.41	1.77	1.50	23.470	24.520	3.175	3.610	22.98	16.54
2007190208	2007191593	9.204	7.734	3.019	3.104	38.88	23.54	2.14	2.10	31.520	33.220	4.439	5.044	26.65	14.96
2007190209	2007191254	8.218	7.397	1.322	1.310	60.58	42.69	0.97	0.50	25.935	19.940	2.454	2.038	36.35	26.89
2007190209	2007191254	9.948	10.460	1.856	2.293	69.03	58.30	1.22	1.01	34.014	31.800	3.275	3.458	39.90	39.73
2007190209	2007191254	6.990	6.326	1.222	1.078	52.49	40.85	0.83	0.52	22.832	16.990	2.061	1.765	28.46	24.07
2007190209	2007191254	10.404	10.700	1.910	2.158	73.51	69.32	1.43	1.62	33.431	31.310	3.172	3.534	41.96	43.08
2007190212	2007190747	4.774	3.726	0.858	0.812	16.47	9.20	0.50	0.36	8.901	6.705	0.956	0.752	6.69	6.13
2007190212	2007190747	28.030	43.840	5.771	9.348	68.46	67.69	1.96	2.21	56.090	81.330	6.481	9.687	32.40	53.53
2007190212	2007190747	8.895	3.699	1.663	0.756	117.90	13.28	0.90	0.41	25.980	7.238	2.478	0.769	63.31	6.96
2007190212	2007190747	22.810	29.460	4.918	6.738	59.60	49.47	1.82	1.93	49.890	58.530	6.042	7.135	24.99	26.60
2007190218	2007191348	6.595	7.760	0.767	1.090	62.34	58.20	0.46	0.80	8.259	10.200	0.826	1.210	12.09	15.60
2007190218	2007191348	17.246	17.090	2.650	2.880	106.78	121.70	1.47	2.10	31.236	26.200	3.464	3.410	33.83	49.70
2007190218	2007191348	7.701	7.990	0.891	1.390	70.44	72.80	0.42	1.20	9.166	12.600	1.041	1.620	13.95	21.30
2007190218	2007191348	18.449	17.840	2.814	3.030	117.92	126.70	1.58	2.10	33.075	30.300	3.563	3.570	32.38	46.20
2007190241	2007190978	12.950	7.657	2.034	1.547	121.40	103.23	0.15	0.05	26.190	24.268	2.154	2.283	55.44	48.79
2007190241	2007190978	7.756	9.020	2.465	2.286	233.30	219.56	0.30	0.05	31.810	39.678	3.463	3.645	105.40	113.12
2007190241	2007190978	5.876	7.163	1.397	1.654	97.02	96.69	0.05	0.05	23.320	25.035	1.960	2.283	48.64	43.13
2007190241	2007190978	7.158	9.399	1.878	2.399	179.90	183.48	0.19	0.05	31.160	40.563	2.877	3.441	94.01	88.22
2007190248	2007191198	2.552	2.652	0.606	0.765	21.54	22.13	0.58	0.58	8.791	10.270	0.904	1.171	8.67	12.26
2007190248	2007191198	15.340	49.510	4.287	15.310	85.03	197.10	1.88	4.25	37.390	113.100	5.294	17.630	42.01	61.68
2007190248	2007191198	3.573	2.751	1.041	0.789	32.38	31.31	0.95	0.61	12.990	9.603	1.509	1.062	12.17	15.93
2007190248	2007191198	34.110	21.950	9.311	6.361	139.30	119.60	2.68	2.09	72.780	54.830	11.440	7.772	41.34	56.10
2007190256	2007190875	3.662	2.767	0.981	0.701	72.16	53.89	0.05	0.22	12.870	9.797	1.043	0.759	21.83	15.31
2007190256	2007190875	13.200	16.620	3.435	4.083	77.19	108.40	0.50	1.08	36.960	43.880	4.022	4.979	44.26	62.57
2007190256	2007190875	5.641	3.228	1.550	0.857	71.21	50.56	0.05	0.25	20.050	11.860	1.902	1.004	42.54	21.55
2007190256	2007190875	11.530	13.550	3.036	3.498	80.56	78.84	0.53	1.10	34.040	35.730	3.711	4.016	48.89	42.89
2007190258	2007191176	10.811	15.180	2.843	3.570	59.52	54.60	1.71	1.70	24.103	25.000	2.310	3.030	47.28	40.80
2007190258	2007191176	19.580	25.460	4.470	5.950	84.41	80.30	1.93	2.70	35.850	37.900	3.635	4.560	65.22	57.50
2007190258	2007191176	11.487	12.680	2.815	3.070	46.11	50.10	1.24	1.50	20.541	21.200	1.991	2.350	25.13	35.10
2007190258	2007191176	30.685	29.820	7.567	6.760	95.72	88.80	4.00	2.60	50.616	43.100	5.418	5.040	53.72	61.60
2007190266	2007191458	4.908	4.366	1.272	0.904	47.02	29.21	0.05	0.32	14.170	10.320	1.300	1.057	37.03	22.71
2007190266	2007191458	8.385	10.380	2.341	2.430	87.29	88.28	0.23	1.06	27.330	30.010	2.725	3.302	64.52	66.32
2007190266	2007191458	4.327	2.078	0.911	0.435	26.89	6.63	0.05	0.05	10.860	5.387	0.951	0.489	20.61	2.30
2007190266	2007191458	10.300	17.980	2.583	3.873	91.69	79.61	0.45	1.17	30.190	38.450	3.182	4.517	69.80	64.08
2007190285	2007190406	9.399	9.368	1.898	2.123	107.50	103.80	1.09	1.70	31.660	29.890	2.687	2.763	48.45	45.51
2007190285	2007190406	10.080	10.770	2.250	2.572	117.80	115.20	1.43	2.10	35.370	35.100	3.164	3.250	52.90	46.82
2007190285	2007190406	9.138	9.100	1.949	2.033	105.60	105.30	1.07	1.72	31.000	30.970	2.694	2.894	50.26	43.58
2007190285	2007190406	9.438	10.770	2.319	2.449	122.00	118.40	1.65	2.28	33.490	36.320	3.195	3.275	55.80	51.07
2007190296	2007190758	5.830	5.220	1.190	1.080	24.40	21.90	0.80	0.80	10.700					

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Th (ppm)	Th (ppm)	U (ppm)	U (ppm)	V (ppm)	V (ppm)	W (ppm)	W (ppm)	Y (ppm)	Y (ppm)	Yb (ppm)	Yb (ppm)	Zn (ppm)	Zn (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.020	0.020	0.020	0.020	0.10	0.10	0.10	0.10	0.050	0.050	0.040	0.040	0.90	0.90
2007190349	2007191436	8.975	8.324	2.375	1.910	106.52	90.59	1.18	1.12	25.498	23.940	2.717	2.357	57.67	50.43
2007190349	2007191436	15.662	16.300	4.117	4.074	134.03	122.60	2.19	1.88	50.190	49.590	5.222	5.180	74.49	68.35
2007190349	2007191436	8.914	8.410	2.076	1.887	105.92	96.91	1.35	1.16	24.573	24.050	2.633	2.278	52.34	52.30
2007190349	2007191436	13.737	15.790	3.141	3.570	157.85	139.90	2.22	1.87	37.384	41.680	4.020	4.513	81.79	71.22
2007190352	2007190611	6.437	8.129	3.350	3.904	90.23	108.64	0.77	1.00	31.694	32.511	2.412	2.396	55.41	73.68
2007190352	2007190611	7.036	8.398	3.653	4.304	107.24	122.65	0.85	0.97	34.801	34.648	2.514	2.724	57.24	71.96
2007190352	2007190611	9.245	10.317	3.708	3.929	136.63	142.68	1.12	1.00	21.812	25.376	2.392	2.444	55.08	74.06
2007190352	2007190611	9.885	9.945	3.959	4.195	156.66	151.91	1.11	1.12	24.968	26.146	2.569	2.475	51.35	65.92
2007190355	2007191257	10.630	10.770	3.399	3.471	141.05	140.60	1.25	1.38	19.733	19.350	2.027	1.984	73.59	82.86
2007190355	2007191257	9.126	15.860	4.709	4.804	174.71	167.10	1.92	1.67	23.727	26.700	2.953	2.806	89.48	96.06
2007190355	2007191257	11.005	11.610	2.079	1.982	238.52	268.90	1.27	1.58	16.091	18.320	1.869	1.989	73.33	83.95
2007190355	2007191257	11.734	12.440	2.235	2.042	261.34	289.30	1.40	1.74	15.731	18.340	1.928	2.058	81.79	87.62
2007190357	2007190856	2.148	2.518	0.489	0.662	14.88	16.10	0.36	0.32	4.952	5.826	0.382	0.553	4.02	3.14
2007190357	2007190856	7.901	8.939	2.762	2.997	40.97	43.83	1.31	1.31	26.890	28.590	2.825	3.273	8.54	10.25
2007190357	2007190856	4.670	5.962	1.273	1.312	25.97	33.41	0.60	0.91	12.770	14.450	1.287	1.450	4.58	9.71
2007190357	2007190856	12.790	13.160	4.119	3.225	56.78	68.78	2.11	1.90	41.540	36.070	4.592	3.802	11.93	18.48
2007190361	2007191094	11.700	11.720	0.987	1.040	53.87	53.50	0.93	0.70	23.000	21.500	1.827	2.010	58.32	69.60
2007190361	2007191094	12.330	12.430	1.069	1.190	57.06	56.10	1.05	0.90	23.830	22.000	1.914	2.320	61.77	68.70
2007190361	2007191094	7.412	7.120	0.946	0.920	68.80	57.80	0.75	0.80	14.340	13.000	1.228	1.384	33.89	32.10
2007190383	2007191416	9.138	5.840	1.985	1.340	63.41	41.30	1.63	0.80	27.020	15.600	2.410	1.680	40.22	20.30
2007190383	2007191416	11.630	13.910	2.859	3.030	76.66	99.90	1.87	1.80	34.460	36.100	3.367	3.660	47.13	53.90
2007190383	2007191416	9.839	9.530	2.237	2.010	69.33	66.60	1.53	1.20	28.210	26.600	2.374	2.570	40.59	41.50
2007190383	2007191416	12.840	13.460	3.036	2.930	91.94	94.90	2.08	1.80	38.630	39.300	3.348	3.650	52.38	54.00
2007190393	2007191050	13.690	15.208	3.345	3.530	74.74	83.55	2.89	2.86	32.910	38.990	2.945	3.587	70.10	70.14
2007190393	2007191050	13.560	15.164	3.512	3.655	70.86	75.63	2.89	2.69	35.330	37.065	3.212	3.467	64.78	61.87
2007190393	2007191050	17.430	16.135	3.934	3.607	77.72	89.68	3.05	3.04	40.950	40.859	3.703	3.679	54.21	59.55
2007190393	2007191050	17.060	16.254	3.861	3.895	65.76	77.38	3.09	2.69	42.050	42.356	3.682	3.906	42.23	48.01
2007190414	2007191386	14.524	13.590	2.901	2.810	60.22	62.20	1.94	2.30	39.264	39.800	3.588	3.567	33.36	38.40
2007190414	2007191386	16.225	14.450	3.454	3.180	55.81	59.70	2.35	2.50	43.659	43.500	4.353	4.138	32.74	36.80
2007190414	2007191386	13.949	13.670	2.440	2.560	68.01	70.20	2.11	2.30	37.863	38.700	3.525	3.846	35.52	32.40
2007190414	2007191386	16.294	16.660	3.042	3.170	71.54	81.20	2.53	2.80	46.397	48.800	4.494	4.697	41.35	42.40
2007190419	2007190974	8.450	7.115	1.449	1.244	53.84	44.06	1.32	0.96	26.490	21.370	2.436	2.178	34.46	25.77
2007190419	2007190974	9.880	10.290	1.896	2.052	61.23	65.90	1.56	1.23	31.280	32.110	3.021	3.413	37.96	37.03
2007190419	2007190974	7.724	7.819	1.302	1.282	50.42	48.27	1.24	1.13	22.660	21.980	2.203	2.305	19.84	24.05
2007190419	2007190974	12.280	12.490	2.185	2.206	81.26	79.62	1.85	1.71	38.880	36.510	3.775	3.928	33.12	36.35
2007190425	2007190768	12.350	9.750	2.840	2.810	68.93	65.20	2.40	1.80	34.970	29.100	3.352	3.300	58.91	48.00
2007190425	2007190768	12.320	12.510	2.905	2.990	64.01	60.00	2.32	1.80	36.080	34.200	3.680	3.770	48.82	48.20
2007190425	2007190768	12.230	11.910	2.595	2.950	67.36	72.50	2.29	1.70	28.890	33.100	3.011	3.520	53.23	42.80
2007190425	2007190768	13.920	13.130	2.966	3.170	64.09	67.10	2.42	1.80	33.700	37.500	3.584	4.180	49.26	42.10
2007190434	2007191027	13.090	9.920	1.353	0.880	37.35	26.90	1.55	0.70	13.090	11.500	1.271	1.040	28.23	23.80
2007190434	2007191027	26.360	25.180	2.547	1.900	85.12	72.40	2.52	1.60	28.380	30.900	2.983	2.680	69.42	64.10
2007190434	2007191027	12.790	11.500	1.652	1.200	40.94	35.20	1.42	0.80	15.380	14.600	1.332	1.190	25.19	26.60
2007190434	2007191027	21.820	21.350	2.418	2.030	70.28	65.70	1.79	1.20	24.990	27.500	2.139	2.250	48.91	49.50
2007190457	2007191004	11.740	12.570	2.451	2.406	43.39	29.30	0.92	0.61	27.170	22.560	2.494	2.005	22.41	14.64
2007190457	2007191004	15.430	17.960	3.099	3.623	50.77	48.30	1.13	0.95	33.650	34.740	3.052	3.529	24.13	23.87
2007190457	2007191004	7.407	8.566	1.592	1.738	22.24	24.74	0.68	0.63	17.140	19.330	1.559	1.871	9.17	10.49
2007190457	2007191004	16.260	15.180	3.329	3.101	41.12	43.77	1.58	1.33	38.700	35.330	3.732	3.662	13.83	16.03
2007190458	2007190774	9.107	8.390	2.716	2.580	103.70	87.60	1.32	1.20	29.720	26.600	2.725	2.780	57.06	50.80
2007190458	2007190774	10.320	10.620	3.120	3.280	97.90	95.00	1.43	1.60	33.110	33.300	3.221	3.630	49.83	53.90
2007190458	2007190774	8.926	8.240	2.635	2.430	99.03	86.50	1.31	1.30	29.260	29.700	2.683	2.900	52.19	49.20
2007190458	2007190774	10.130	9.860	3.040	3.050	108.50	102.20	1.52	1.70	33.930	32.200	3.085	3.560	56.54	57.50
2007190472	2007191312	9.322	9.515	1.208	1.324	82.84	103.00	1.08	1.53	24.757	24.510	2.470	2.600	47.41	41.32
2007190472	2007191312	10.879	9.400	1.445	1.603	84.17	116.60	1.07	1.69	28.150	26.600	2.850	3.161	46.96	52.94
2007190472	2007191312	8.693	7.980	1.115	1.193	96.38	97.57	0.80	1.51	22.325	22.090	2.221	2.599	35.68	44.46
2007190472	2007191312	10.710	11.600	1.385	1.548	93.79	108.10	1.10	1.41	27.717	29.140	2.864	3.040	45.36	46.31
2007190481	2007191594	7.169	8.391	1.938	2.373	37.58	42.39	2.16	1.26	24.090	28.520	2.550	3.054	17.54	16.56
2007190481	2007191594	9.349	9.448	2.655	2.640	48.79	45.56	2.38	1.37	32.030	31.410	3.512	3.461	21.93	18.59
2007190481	2007191594	9.579	8.683	2.413	2.246	55.83	49.66	2.43	1.23	30.370	27.750	3.242	2.912	21.36	19.24
2007190481	2007191594	9.782	9.101	2.526	2.406	53.47	48.92	2.28	1.22	31.930	30.540	3.468	3.234	22.66	19.30
2007190495	2007191318	3.150	3.380	0.890	0.840	14.80	21.00	0.20	0.30	8.400	10.600	0.864	0.896	11.10	16.30
2007190497	2007190586	5.967	6.166	1.323	1.526	41.78	43.28	0.97	0.97	17.560	17.990	1.842	1.812	12.91	12.32
2007190497	2007190586	11.967	8.756	2.735	3.049	75.22	77.32	1.68	2.02	38.256	27.730	3.862	3.532	26.17	26.19
2007190497	2007190586	6.651	6.851	1.238	1.347	58.37	63.96	0.99	1.03	18.554	17.680	1.821	1.823	17.38	17.18
2007190497	2007190586	11.957	9.629	2.354	2.475	105.18	114.80	1.88	2.12	34.247	27.240	3.542	3.449	33.10	31.68
2007190506	2007190631	8.078	10.700	2.358	2.596	66.30	68.51	2.45	1.41	24.070	30.360	2.902	2.881	44.39	48.53
2007190506	2007190631	9.998	8.867	2.705	2.647	62.90	60.38	2.43	1.32	30.920	29.660	3.543	3.140	40.62	36.04
2007190506	2007190631	8.109	9.808	2.353	2.913	67.83	70.25	2.41	1.35	26.20					

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Th (ppm)	Th (ppm)	U (ppm)	U (ppm)	V (ppm)	V (ppm)	W (ppm)	W (ppm)	Y (ppm)	Y (ppm)	Yb (ppm)	Yb (ppm)	Zn (ppm)	Zn (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.020	0.020	0.020	0.020	0.10	0.10	0.10	0.10	0.050	0.050	0.040	0.040	0.90	0.90
2007190534	2007191522	7.679	8.186	1.862	2.160	29.31	22.56	1.22	1.35	19.340	16.350	1.851	1.892	28.29	23.88
2007190534	2007191522	31.400	49.980	7.619	10.770	65.23	56.07	2.43	3.20	67.630	94.340	7.469	11.150	59.68	50.23
2007190536	2007190909	4.216	3.809	0.891	0.837	31.10	27.86	0.99	0.41	8.633	8.829	1.019	1.012	17.36	9.70
2007190536	2007190909	26.520	24.590	6.017	5.999	79.36	80.01	2.54	1.93	52.120	51.170	7.015	6.881	34.22	37.71
2007190536	2007190909	4.732	4.397	0.915	0.882	42.63	42.59	1.06	0.40	9.973	10.010	1.182	1.179	16.98	17.14
2007190536	2007190909	25.260	22.440	5.446	5.279	110.10	106.40	2.34	1.63	46.180	46.630	6.126	6.043	45.54	45.32
2007190548	2007191236	14.480	16.270	3.132	3.098	84.92	75.32	1.89	1.25	32.510	30.110	2.973	2.906	74.65	73.56
2007190548	2007191236	27.140	28.160	5.568	5.658	104.80	98.58	2.08	1.59	58.090	53.210	5.459	5.576	88.71	85.92
2007190548	2007191236	15.110	17.050	3.281	3.048	84.52	73.85	1.94	1.20	32.310	30.100	3.322	2.906	69.40	65.20
2007190548	2007191236	27.240	27.520	6.010	6.298	108.50	105.30	2.65	2.15	56.290	48.350	5.394	5.526	91.04	97.49
2007190549	2007191507	2.830	3.319	0.470	0.558	27.59	31.25	0.33	0.28	4.037	4.549	0.543	0.649	1.37	6.09
2007190549	2007191507	13.819	13.230	3.375	2.882	79.00	76.62	1.62	1.40	35.498	28.550	4.757	4.072	19.56	21.75
2007190549	2007191507	3.450	3.924	0.592	0.655	33.33	35.98	0.49	0.41	4.925	5.806	0.664	0.723	3.22	7.69
2007190549	2007191507	14.923	12.940	3.666	2.999	84.84	90.01	1.74	1.51	34.644	28.170	4.910	3.910	26.56	26.91
2007190552	2007190675	3.495	3.616	0.602	0.644	9.52	10.89	0.79	0.33	8.303	7.277	0.796	0.731	6.97	4.57
2007190552	2007190675	24.130	20.170	3.936	3.470	53.17	52.39	2.23	1.55	62.670	44.650	5.988	4.404	37.10	38.70
2007190552	2007190675	6.029	6.250	0.803	1.131	32.25	27.66	1.01	0.53	21.320	16.050	2.138	1.749	22.22	20.67
2007190552	2007190675	11.460	18.950	2.119	3.266	98.43	91.79	2.29	1.67	48.850	49.370	6.291	5.153	73.89	74.22
2007190554	2007190752	4.778	8.760	1.534	2.770	34.47	43.30	0.77	0.20	12.216	23.500	1.369	2.658	0.45	0.45
2007190554	2007190752	16.711	17.130	6.119	5.600	75.28	70.30	2.60	1.70	56.414	48.900	6.338	5.555	4.88	2.70
2007190554	2007190752	2.689	11.730	0.890	3.460	33.89	57.60	0.39	0.50	5.973	28.700	0.535	2.951	0.45	0.45
2007190554	2007190752	16.529	21.530	6.452	6.190	129.65	89.70	2.53	2.20	53.395	53.700	5.846	5.467	4.13	3.50
2007190583	2007191063	9.772	9.787	2.662	2.430	33.10	35.54	1.63	1.61	30.380	26.110	2.970	2.765	7.29	2.03
2007190583	2007191063	17.520	14.690	5.334	3.900	45.06	43.60	2.95	2.49	61.860	41.320	6.270	4.624	11.99	4.80
2007190583	2007191063	13.840	14.110	3.482	3.418	75.14	70.76	2.05	2.13	35.420	33.750	3.132	3.397	18.36	13.05
2007190583	2007191063	16.470	16.600	4.622	4.232	92.75	79.69	2.56	2.56	46.980	42.390	4.411	4.440	23.19	15.76
2007190618	2007191166	6.125	5.710	1.800	2.010	126.13	125.90	0.52	0.70	22.802	23.400	2.123	2.340	84.83	81.10
2007190618	2007191166	6.982	6.620	2.104	2.280	148.35	148.40	0.64	0.70	25.758	26.300	2.276	2.680	92.29	95.60
2007190618	2007191166	6.573	7.150	1.647	1.850	145.35	134.90	0.52	0.70	25.718	25.300	2.401	2.550	92.98	80.90
2007190618	2007191166	7.601	8.050	1.983	2.230	173.20	168.90	0.57	0.90	33.950	33.500	3.095	3.370	119.86	102.40
2007190647	2007191525	14.510	8.811	2.790	1.712	25.53	13.28	3.33	1.18	26.040	16.620	2.457	1.607	24.77	6.48
2007190647	2007191525	23.210	21.250	5.380	4.828	42.39	35.16	5.07	3.56	48.570	51.220	5.137	5.324	41.78	24.12
2007190647	2007191525	14.890	10.070	2.846	1.902	31.09	14.80	3.45	1.55	28.860	18.910	2.891	1.963	20.11	6.84
2007190647	2007191525	22.520	23.120	5.197	5.212	47.54	35.39	6.07	4.08	55.040	53.420	5.639	5.636	34.21	20.75
2007190659	2007190739	4.878	5.840	0.461	0.560	16.66	16.10	0.61	0.05	6.881	8.000	0.631	0.780	5.76	10.00
2007190659	2007190739	19.263	22.580	1.653	2.050	63.75	52.60	1.44	0.60	26.144	28.400	2.699	2.650	19.88	16.80
2007190659	2007190739	9.646	6.410	0.496	0.610	37.10	20.70	0.80	0.05	11.504	7.100	1.059	0.790	11.37	5.30
2007190659	2007190739	22.041	18.740	1.013	1.480	83.80	64.90	1.61	0.70	26.570	20.200	2.502	2.080	24.03	22.00
2007190661	2007191334	4.465	4.527	1.066	1.111	37.80	39.33	0.64	1.03	14.689	16.100	1.518	1.673	18.39	21.64
2007190661	2007191334	13.998	11.090	3.648	3.021	128.59	115.30	1.46	1.73	42.005	35.020	4.918	4.278	52.79	52.61
2007190661	2007191334	4.875	4.694	1.136	1.109	60.82	46.28	0.82	1.07	20.066	16.820	1.869	1.662	32.71	25.98
2007190661	2007191334	9.469	10.890	2.485	2.576	128.05	123.30	1.28	1.61	34.093	33.210	3.633	3.840	61.30	68.88
2007190686	2007191430	13.090	15.560	3.299	3.572	19.80	22.94	1.51	1.99	19.830	22.200	2.197	2.518	4.09	5.04
2007190686	2007191430	41.530	48.870	10.580	11.700	41.96	41.34	4.34	5.17	61.650	77.850	6.933	8.959	17.69	20.03
2007190686	2007191430	14.310	17.180	3.445	3.892	28.92	36.47	2.06	2.54	21.390	22.640	2.311	2.335	5.10	8.74
2007190686	2007191430	35.360	43.340	7.994	8.460	58.32	65.66	5.06	4.97	45.790	52.560	5.079	4.994	19.19	35.79
2007190695	2007190924	4.303	4.256	0.895	0.865	30.27	30.62	0.61	0.62	9.372	10.200	1.070	1.027	2.11	6.62
2007190695	2007190924	10.990	10.850	2.763	2.784	64.93	64.13	1.66	1.66	30.450	29.240	3.689	3.336	14.56	16.39
2007190695	2007190924	7.050	6.967	1.259	1.236	75.43	76.41	1.10	1.02	12.490	13.530	1.412	1.400	17.70	20.65
2007190695	2007190924	12.890	12.510	2.312	2.374	139.80	130.40	2.14	1.86	25.440	25.310	2.781	2.837	36.08	39.37
2007190698	2007190813	5.615	13.090	2.235	2.070	83.17	65.50	2.74	2.10	19.247	34.800	3.343	3.440	56.02	46.30
2007190698	2007190813	15.184	14.790	2.379	2.480	76.17	60.00	1.91	2.30	39.436	39.100	3.683	3.970	51.57	41.10
2007190698	2007190813	17.282	13.410	2.340	2.530	89.56	82.30	2.23	2.30	40.656	36.500	3.389	3.470	57.02	51.00
2007190698	2007190813	11.889	15.270	2.461	2.920	83.49	85.50	2.31	2.50	33.830	40.400	3.690	3.830	53.95	55.00
2007190732	2007191450	7.190	8.540	1.860	2.020	49.00	60.50	0.05	1.10	26.400	26.500	2.670	2.791	19.20	29.50
2007190732	2007191450	9.470	11.020	2.640	2.960	53.00	70.80	0.20	1.50	33.700	36.600	3.718	3.998	19.10	36.90
2007190732	2007191450	7.230	7.090	1.620	1.600	56.90	53.70	0.05	1.10	24.400	22.400	2.423	2.332	24.90	27.60
2007190732	2007191450	9.690	10.240	2.320	2.510	75.70	78.70	0.40	1.70	34.500	33.200	3.696	3.479	36.80	40.50
2007190735	2007191549	8.980	8.260	1.880	1.780	74.80	88.20	0.30	1.40	28.100	27.000	2.660	2.920	59.60	65.80
2007190735	2007191549	9.680	7.930	2.200	2.030	65.10	72.50	0.30	1.30	30.600	26.800	2.950	3.140	47.80	49.80
2007190735	2007191549	9.170	8.610	1.920	1.950	77.40	85.30	0.40	1.30	29.200	28.500	2.710	2.940	64.80	65.00
2007190735	2007191549	9.530	8.380	2.020	2.020	76.20	80.50	0.40	1.30	29.700	27.100	2.900	2.980	68.80	55.10
2007190743	2007190906	8.310	8.769	1.619	1.714	79.65	87.42	1.14	1.22	21.380	21.630	1.990	2.099	47.50	53.77
2007190743	2007190906	12.330	12.070	2.410	2.374	113.90	115.00	1.78	1.55	31.840	29.550	3.137	2.912	73.06	77.06
2007190743	2007190906	8.130	8.032	2.344	2.516	94.01	88.63	1.20	1.43	21.630	20.870	2.030	1.963	75.64	49.14
2007190743	2007190906	11.770	12.190	3.157	3.476	126.60	128.40	1.81	1.56	30.930	30.290	2.999	2.994	75.05	75.90
2007190746	2007191241	2.387	2.888	0.654	0.638	20.18	33.74	0.46	0.28	5.863	7.290	0.667	0.80		

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Th (ppm)	Th (ppm)	U (ppm)	U (ppm)	V (ppm)	V (ppm)	W (ppm)	W (ppm)	Y (ppm)	Y (ppm)	Yb (ppm)	Yb (ppm)	Zn (ppm)	Zn (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.020	0.020	0.020	0.020	0.10	0.10	0.10	0.10	0.050	0.050	0.040	0.040	0.90	0.90
2007190826	2007191052	5.478	7.447	1.148	1.403	18.94	24.32	0.56	0.49	10.110	13.890	1.162	1.632	7.94	13.54
2007190826	2007191052	21.150	19.560	4.368	3.930	45.33	51.22	1.52	1.20	45.470	39.500	5.296	4.407	21.55	28.69
2007190826	2007191052	5.634	6.462	1.157	1.178	24.18	22.83	0.68	0.28	9.606	11.460	1.111	1.275	8.32	10.87
2007190826	2007191052	20.580	23.430	4.434	4.601	56.52	51.15	1.99	1.23	41.550	42.590	4.734	5.000	23.27	23.00
2007190834	2007190889	3.483	4.280	0.560	0.710	17.40	19.90	0.39	0.40	3.123	4.100	0.296	0.500	4.97	3.10
2007190834	2007190889	12.190	26.870	3.850	4.690	89.58	90.30	1.45	1.00	15.860	29.000	2.636	3.590	28.83	20.00
2007190834	2007190889	1.914	1.840	0.372	0.350	12.88	8.60	0.30	0.30	1.620	1.700	0.179	0.220	1.75	1.00
2007190834	2007190889	17.680	23.020	3.842	3.990	71.25	74.90	1.63	1.10	20.570	24.700	2.850	3.310	16.72	21.30
2007190849	2007191277	5.050	6.587	1.460	1.690	72.60	64.57	1.10	1.53	20.200	23.830	2.580	2.574	55.10	39.71
2007190849	2007191277	8.280	9.011	1.960	2.499	85.80	84.82	1.40	1.83	31.000	33.310	3.210	3.606	68.30	51.09
2007190849	2007191277	7.290	7.346	2.100	1.973	73.40	81.02	1.00	1.54	35.500	28.330	3.200	2.707	54.40	50.19
2007190849	2007191277	7.810	8.743	2.520	2.439	87.30	93.83	1.30	1.82	37.700	33.230	3.570	3.708	52.80	58.43
2007190853	2007190939	7.484	4.750	2.444	1.380	65.95	34.30	0.94	0.90	18.990	12.400	1.828	1.260	51.64	21.30
2007190853	2007190939	11.240	12.990	3.725	4.030	87.89	87.10	1.40	1.90	28.540	35.100	2.757	3.820	66.67	85.00
2007190853	2007190939	3.202	3.690	1.343	1.180	18.20	26.10	0.35	0.50	8.297	9.700	0.799	0.890	11.15	15.70
2007190853	2007190939	11.460	11.000	6.674	4.210	101.10	93.60	1.27	1.30	29.970	29.600	2.896	2.760	68.28	58.90
2007190865	2007191183	1.039	1.041	0.237	0.187	7.96	9.81	0.05	0.05	3.378	2.884	0.243	0.235	2.30	2.17
2007190865	2007191183	11.940	13.540	3.387	4.648	79.92	68.40	1.41	1.54	36.200	44.440	4.329	6.219	53.88	40.40
2007190865	2007191183	1.154	1.155	0.227	0.225	8.75	9.88	0.05	0.05	3.676	3.184	0.293	0.302	4.13	4.34
2007190865	2007191183	13.590	16.000	4.996	5.147	63.28	67.97	1.69	1.61	47.460	47.190	6.623	6.701	34.95	39.75
2007190874	2007191297	7.435	7.888	1.169	1.305	103.60	84.83	0.77	0.94	16.420	18.010	1.523	1.880	14.82	17.30
2007190874	2007191297	13.150	11.980	2.801	2.525	114.60	106.20	1.68	1.72	40.470	33.740	3.925	3.545	28.87	27.99
2007190874	2007191297	8.207	8.928	0.994	1.466	173.20	98.63	0.64	1.08	11.990	20.350	1.160	2.015	10.23	20.59
2007190874	2007191297	12.330	12.650	2.782	2.674	105.50	100.00	1.56	1.80	38.260	35.890	3.740	3.909	24.92	32.97
2007190887	2007191058	24.870	25.310	6.754	6.632	87.36	87.61	3.17	3.59	48.340	44.710	4.243	4.184	33.52	35.91
2007190887	2007191058	23.780	23.990	6.392	6.322	73.52	77.93	2.92	3.20	49.340	43.770	4.318	4.139	28.09	34.52
2007190887	2007191058	23.460	24.480	6.215	6.727	82.16	96.62	2.91	3.14	43.770	40.360	3.852	3.708	31.36	41.25
2007190887	2007191058	22.870	24.900	6.250	7.078	74.86	87.68	2.92	3.12	44.460	41.720	3.965	4.084	31.04	35.80
2007190895	2007190947	7.743	8.770	1.641	1.600	88.13	90.10	1.18	1.30	27.863	27.900	2.717	2.700	58.33	66.00
2007190895	2007190947	8.082	8.330	1.894	1.730	81.80	78.60	1.24	1.20	28.184	27.000	3.092	2.810	55.60	57.00
2007190895	2007190947	7.430	9.320	1.829	1.840	86.06	100.40	1.53	1.40	24.748	29.400	2.690	2.940	52.11	68.10
2007190895	2007190947	8.404	8.940	2.113	1.940	87.50	91.40	1.17	1.50	30.034	28.700	3.115	3.030	51.50	58.80
2007190896	2007191441	10.832	17.280	1.942	4.633	45.74	75.93	1.01	1.15	9.506	16.760	0.965	1.644	14.14	43.19
2007190896	2007191441	20.794	32.750	6.182	9.299	107.70	138.00	2.18	2.41	27.874	35.500	3.981	3.446	56.75	84.11
2007190896	2007191441	11.050	17.680	1.975	4.185	48.42	76.51	0.68	1.24	10.582	17.500	1.109	1.714	15.25	41.64
2007190896	2007191441	20.040	30.520	5.932	8.280	108.50	136.60	2.66	2.30	26.416	34.330	3.912	3.360	58.41	78.98
2007190922	2007191082	2.828	2.860	0.659	1.000	20.15	24.40	0.42	0.40	7.629	4.900	0.744	0.550	6.85	12.30
2007190922	2007191082	27.270	8.290	5.920	2.460	100.50	80.90	2.22	1.10	64.060	16.700	6.399	1.690	39.74	35.70
2007190922	2007191082	4.788	4.900	0.579	0.600	57.69	56.10	0.60	0.90	9.843	12.100	0.888	1.270	11.95	12.20
2007190922	2007191082	10.640	10.380	1.320	1.200	117.90	127.40	1.16	1.60	20.530	27.100	1.975	2.830	24.47	27.20
2007190927	2007191444	7.182	8.334	2.061	2.240	65.27	70.08	3.35	3.15	22.393	24.570	2.276	2.316	69.26	78.67
2007190927	2007191444	11.114	11.150	3.282	3.203	83.48	82.63	8.85	7.59	34.498	32.770	3.447	3.190	94.86	95.15
2007190927	2007191444	7.918	8.868	2.365	2.550	70.76	72.08	8.06	6.66	24.319	26.400	2.495	2.728	68.89	71.23
2007190927	2007191444	12.865	14.080	3.903	4.051	90.90	92.50	8.97	11.11	36.979	36.490	3.912	3.895	85.79	87.26
2007190949	2007191504	15.586	15.870	2.216	2.360	79.19	69.70	1.35	0.60	38.918	40.100	3.541	3.844	72.61	61.90
2007190949	2007191504	15.318	16.060	2.093	2.460	87.97	83.10	1.45	1.00	39.054	40.000	3.702	4.059	87.21	78.10
2007190949	2007191504	13.137	13.360	2.705	2.580	72.77	71.60	0.89	0.40	33.203	32.500	2.988	3.160	64.43	56.10
2007190949	2007191504	12.629	15.770	2.615	2.510	86.64	76.00	1.32	0.40	32.827	36.800	2.967	2.995	80.45	67.40
2007190968	2007191437	2.780	2.344	0.749	0.380	25.87	22.86	0.52	0.05	9.030	6.902	1.001	0.455	15.56	10.25
2007190968	2007191437	7.267	6.501	2.214	1.772	54.50	48.73	1.09	0.58	24.370	20.290	2.966	2.229	35.47	31.38
2007190968	2007191437	4.491	4.803	1.054	0.956	61.47	59.07	0.68	0.29	16.040	14.990	1.592	1.159	40.73	44.14
2007190968	2007191437	8.131	8.447	1.982	1.868	100.20	98.60	1.17	0.95	28.450	26.860	2.927	2.582	68.65	74.74
2007190970	2007191245	7.070	6.620	3.100	3.360	54.70	55.30	8.80	12.80	29.700	29.600	2.800	2.940	172.30	145.20
2007190970	2007191245	8.150	4.760	3.050	3.220	53.10	51.60	10.40	26.60	34.700	25.000	3.260	3.360	135.40	86.30
2007190970	2007191245	6.400	4.020	3.650	1.490	58.90	26.60	3.70	1.20	29.000	17.900	2.790	1.530	216.30	27.40
2007190970	2007191245	9.270	12.070	4.180	4.010	61.60	68.00	4.40	2.90	41.500	55.200	3.930	5.010	191.00	62.60
2007190986	2007191592	23.250	13.990	2.452	1.625	81.17	62.56	0.59	0.41	44.410	29.460	4.153	2.954	47.03	38.21
2007190986	2007191592	86.260	62.220	10.170	7.401	142.20	119.40	1.70	1.10	119.500	92.480	11.110	9.185	78.46	63.40
2007190986	2007191592	21.970	22.490	2.073	2.173	90.27	82.54	0.65	0.58	46.670	42.040	4.198	4.091	51.37	52.83
2007190986	2007191592	60.250	33.470	6.572	4.232	132.40	104.90	1.27	1.03	92.470	62.120	8.063	6.074	78.10	70.88
2007190990	2007191537	27.260	28.050	5.699	5.653	56.25	55.65	4.43	4.39	62.160	61.300	5.846	6.406	23.65	23.52
2007190990	2007191537	27.800	28.000	6.176	5.924	57.10	56.04	4.44	4.24	64.480	64.760	6.532	6.904	22.74	23.79
2007190990	2007191537	17.780	13.960	3.913	2.733	35.31	25.97	2.79	1.89	40.740	29.540	4.169	3.185	12.11	10.92
2007190990	2007191537	30.160	35.320	6.855	7.012	46.84	40.89	4.44	3.92	73.110	77.090	7.625	8.647	19.53	19.88
2007191007	2007191551	7.825	9.281	1.669	2.039	36.57	34.46	0.63	1.21	19.040	16.780	1.975	1.998	16.90	15.69
2007191007	2007191551	17.010	17.450	4.126	4.151	80.61	66.13	1.50	1.90	42.070	38.380	4.524	4.645	35.84	33.04
2007191007	2007191551	7.184	8.430	1.536	2.042	37.76	42.48	0.75	1.26	15.720	17.400	1.			

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Th (ppm)	Th (ppm)	U (ppm)	U (ppm)	V (ppm)	V (ppm)	W (ppm)	W (ppm)	Y (ppm)	Y (ppm)	Yb (ppm)	Yb (ppm)	Zn (ppm)	Zn (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
LLD:	LLD:	0.020	0.020	0.020	0.020	0.10	0.10	0.10	0.10	0.050	0.050	0.040	0.040	0.90	0.90
2007191134	2007191282	25.690	25.030	2.372	2.020	38.52	36.50	0.69	0.70	33.890	17.600	2.279	1.890	0.45	7.30
2007191134	2007191282	35.030	49.150	3.412	4.340	51.39	82.20	0.82	1.40	47.940	35.800	3.227	4.170	3.11	17.20
2007191152	2007191578	5.834	5.213	1.704	1.606	29.83	26.28	1.01	0.85	12.281	11.080	1.252	1.267	5.12	6.62
2007191152	2007191578	17.569	16.310	5.254	5.086	56.27	48.31	1.47	1.92	41.669	36.150	4.832	4.263	17.07	22.08
2007191152	2007191578	7.061	6.435	1.441	1.807	65.37	56.47	1.01	1.25	13.337	10.380	1.424	1.340	22.59	20.53
2007191152	2007191578	12.217	13.470	2.671	3.802	101.61	93.13	1.43	1.94	25.696	25.110	2.725	3.184	37.77	39.79
2007191168	2007191195	12.870	11.970	2.062	1.748	52.84	52.20	1.10	1.08	26.190	24.740	2.514	2.362	60.02	59.59
2007191168	2007191195	24.950	18.670	4.090	2.877	88.63	86.24	1.94	1.76	49.150	39.680	4.663	3.916	90.52	84.11
2007191168	2007191195	12.710	13.330	1.973	1.877	64.44	65.14	1.04	1.22	24.630	26.950	2.270	2.489	61.81	63.12
2007191168	2007191195	21.250	19.480	3.323	2.647	108.40	110.10	1.93	1.84	42.990	38.470	4.096	3.567	93.10	90.17
2007191192	2007191339	15.730	17.780	2.712	3.192	77.18	87.40	1.64	2.01	26.510	28.380	2.644	2.895	40.97	49.50
2007191192	2007191339	23.800	23.820	4.042	4.217	103.90	106.00	2.04	2.47	38.530	40.250	3.972	4.133	59.40	57.39
2007191192	2007191339	17.880	17.100	3.131	2.992	100.40	100.00	1.75	2.19	27.110	26.720	2.582	2.648	53.50	57.66
2007191192	2007191339	20.650	22.060	3.685	3.852	115.60	120.40	2.11	2.42	33.890	35.840	3.236	3.472	74.33	66.18
2007191215	2007191281	6.150	6.585	1.307	1.479	31.09	29.34	0.85	0.90	17.260	16.840	1.850	1.752	45.30	29.07
2007191215	2007191281	15.770	17.840	3.333	4.140	76.74	87.05	1.79	2.02	40.120	49.980	4.060	5.273	112.40	67.18
2007191215	2007191281	6.346	6.556	1.374	1.564	34.08	30.23	0.92	0.95	16.940	16.970	1.859	1.793	33.95	20.25
2007191215	2007191281	17.780	20.900	3.906	4.766	94.29	93.31	1.95	2.08	46.640	48.550	5.013	5.671	75.96	49.60
2007191216	2007191385	4.482	5.939	0.944	1.446	28.10	44.92	0.64	1.09	11.130	15.190	1.222	1.539	13.01	19.48
2007191216	2007191385	11.340	12.410	2.586	2.841	52.90	80.62	1.37	1.77	29.590	35.340	3.435	3.562	28.98	40.83
2007191216	2007191385	4.385	5.762	0.935	1.364	37.27	50.46	0.74	1.08	10.630	13.400	1.154	1.489	15.14	14.56
2007191216	2007191385	9.867	13.100	2.266	2.727	69.05	106.00	1.47	2.04	26.800	33.060	3.085	3.594	28.28	35.61
2007191264	2007191486	8.974	7.890	1.708	1.520	44.72	44.60	1.21	0.60	16.050	15.600	1.978	1.760	22.80	23.70
2007191264	2007191486	38.870	35.270	7.137	7.280	81.87	81.60	2.43	2.00	61.080	63.800	7.615	7.690	44.39	47.70
2007191264	2007191486	8.049	35.250	1.510	6.950	41.11	76.10	1.18	1.60	15.280	57.200	1.870	6.990	18.20	40.80
2007191264	2007191486	47.330	4.890	8.153	1.310	93.26	29.10	2.66	0.70	70.230	13.600	8.569	1.520	53.06	17.20
2007191275	2007191590	6.345	11.260	0.933	1.244	30.86	67.67	1.05	1.05	9.545	18.360	1.291	1.792	19.15	61.98
2007191275	2007191590	18.830	19.520	2.523	2.166	78.63	113.60	2.03	1.53	30.680	33.530	3.469	3.394	57.42	101.30
2007191275	2007191590	5.757	10.930	1.210	1.219	41.37	67.40	1.00	0.78	9.620	17.810	1.166	1.843	16.03	51.14
2007191275	2007191590	12.520	19.160	2.323	2.219	75.41	122.70	1.42	1.69	20.440	33.300	2.368	3.222	36.28	91.58
2007191293	2007191518	7.452	6.323	1.509	1.715	63.43	57.53	1.03	0.97	23.660	22.610	2.508	2.446	46.41	32.24
2007191293	2007191518	8.316	7.519	2.023	2.184	65.54	60.11	1.26	1.26	28.420	25.450	3.051	2.837	45.77	38.40
2007191293	2007191518	7.919	7.341	1.823	1.659	96.85	78.74	1.21	1.11	27.910	24.050	2.663	2.392	49.72	43.42
2007191293	2007191518	9.066	8.148	2.176	2.020	100.20	86.05	1.31	1.44	31.150	27.970	3.084	2.871	53.03	50.91
2007191295	2007191498	3.319	3.240	0.842	0.770	23.10	22.20	0.25	0.05	10.513	10.100	1.194	1.252	10.13	13.10
2007191295	2007191498	33.436	28.890	9.427	8.310	115.85	105.60	2.53	2.40	77.983	72.100	11.082	10.161	44.47	34.60
2007191295	2007191498	3.054	3.410	0.819	0.770	22.41	23.10	0.31	0.05	10.357	10.200	1.132	1.208	12.13	2.30
2007191295	2007191498	30.184	38.450	8.689	11.530	111.68	144.90	2.72	2.90	72.918	93.000	10.392	13.568	41.65	41.20
2007191346	2007191429	13.460	16.310	2.532	3.035	55.26	69.76	1.13	1.37	28.220	34.180	2.702	2.943	45.75	58.13
2007191346	2007191429	15.210	14.760	3.005	2.758	56.97	58.36	1.50	1.15	33.770	32.000	3.434	2.848	45.76	49.33
2007191346	2007191429	8.952	11.360	1.664	2.002	31.70	40.94	0.84	0.65	18.470	23.610	2.015	2.156	21.19	31.67
2007191346	2007191429	21.590	17.770	3.989	3.316	59.55	55.25	1.69	1.55	43.380	39.110	4.598	3.824	46.27	47.38
2007191372	2007191445	13.740	19.530	2.813	2.477	124.60	31.11	0.79	0.57	12.320	10.450	1.382	0.926	20.50	11.37
2007191372	2007191445	21.240	45.910	4.645	7.214	178.40	70.63	1.13	0.98	20.510	29.920	2.334	3.015	26.77	30.26
2007191372	2007191445	20.000	20.820	3.265	2.698	98.40	34.74	0.73	0.59	12.980	12.820	1.335	1.160	17.01	13.38
2007191372	2007191445	34.380	51.770	6.181	8.291	170.00	76.24	1.10	1.11	27.630	37.700	2.918	4.063	25.92	30.46
2007191382	2007191509	21.350	19.640	10.100	8.350	74.80	67.40	1.20	1.20	21.000	21.200	2.100	2.380	62.20	33.00
2007191382	2007191509	36.180	41.780	16.370	16.160	107.10	104.40	1.80	2.70	39.200	48.900	3.680	5.850	90.60	57.90
2007191382	2007191509	17.270	22.530	9.620	5.220	128.00	103.90	1.40	1.20	19.200	20.800	2.190	2.050	68.20	73.10
2007191382	2007191509	16.130	27.940	12.340	7.330	148.70	135.60	1.90	1.80	18.000	28.600	2.280	2.880	87.60	101.40
2007191473	2007191510	11.170	9.936	1.196	1.181	62.87	65.61	0.89	0.94	21.010	21.580	2.244	2.283	60.39	54.68
2007191473	2007191510	12.650	10.730	1.528	1.404	66.72	69.17	0.92	1.03	23.810	21.820	2.599	2.492	67.77	62.47
2007191473	2007191510	8.061	8.189	1.216	1.097	84.83	84.71	0.78	0.87	16.280	18.680	1.738	1.832	36.97	43.83
2007191473	2007191510	8.690	9.547	1.480	1.302	88.19	84.88	0.81	0.75	18.510	21.020	1.931	2.151	38.24	47.11

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS
D1	D2	D1	D2
LLD:	LLD:	0.20	0.20
2007190003	2007190213	269.35	308.82
2007190003	2007190213	962.64	894.30
2007190003	2007190213	188.58	212.52
2007190003	2007190213	608.09	705.88
2007190005	2007191059	225.20	239.80
2007190005	2007191059	382.30	398.60
2007190005	2007191059	244.00	264.10
2007190005	2007191059	661.50	669.50
2007190032	2007190632	313.94	334.20
2007190032	2007190632	471.65	494.40
2007190032	2007190632	306.58	335.30
2007190032	2007190632	421.03	426.00
2007190035	2007190876	436.49	508.80
2007190035	2007190876	1058.11	1271.00
2007190035	2007190876	382.69	438.60
2007190035	2007190876	674.91	793.00
2007190039	2007190984	363.20	359.80
2007190039	2007190984	977.41	1409.00
2007190039	2007190984	196.79	214.50
2007190039	2007190984	319.87	263.30
2007190050	2007191481	109.03	117.40
2007190050	2007191481	672.19	691.00
2007190050	2007191481	132.50	122.50
2007190050	2007191481	710.85	732.70
2007190067	2007191121	68.80	62.19
2007190067	2007191121	425.36	385.70
2007190067	2007191121	63.22	60.65
2007190067	2007191121	190.82	236.80
2007190071	2007190289	176.01	197.51
2007190071	2007190289	1583.69	1804.45
2007190071	2007190289	144.83	186.00
2007190071	2007190289	427.31	492.91
2007190074	2007190389	622.61	543.39
2007190074	2007190389	2768.40	2974.86
2007190074	2007190389	239.81	743.04
2007190074	2007190389	2478.38	1645.61
2007190091	2007191053	154.50	444.50
2007190091	2007191053	1761.00	1357.00
2007190091	2007191053	429.40	388.80
2007190091	2007191053	1832.00	462.50
2007190107	2007190913	277.56	274.79
2007190107	2007190913	2298.80	1984.77
2007190107	2007190913	271.66	267.79
2007190107	2007190913	2495.26	926.35
2007190110	2007191182	185.93	194.70
2007190110	2007191182	614.26	614.70
2007190110	2007191182	329.03	192.00
2007190110	2007191182	411.03	457.10
2007190114	2007191045	284.62	295.14
2007190114	2007191045	406.37	505.11
2007190114	2007191045	361.99	347.36
2007190114	2007191045	580.81	339.80
2007190118	2007191552	404.55	400.30
2007190118	2007191552	529.88	477.90
2007190118	2007191552	307.32	294.20
2007190118	2007191552	376.41	359.90
2007190121	2007191545	306.59	270.00
2007190121	2007191545	2127.33	1003.70
2007190121	2007191545	352.14	261.90
2007190121	2007191545	2056.85	569.10
2007190125	2007191532	484.60	437.00
2007190125	2007191532	787.38	1114.00
2007190125	2007191532	568.68	466.90
2007190125	2007191532	1023.44	988.60
2007190145	2007191105	265.53	272.80
2007190145	2007191105	405.21	339.60
2007190145	2007191105	216.64	239.10
2007190145	2007191105	306.11	296.80
2007190154	2007190568	577.40	828.30
2007190154	2007190568	711.00	943.50
2007190154	2007190568	759.10	1219.00
2007190154	2007190568	819.00	1216.00
2007190155	2007191031	375.70	335.74
2007190155	2007191031	911.00	879.54
2007190155	2007191031	324.00	328.12
2007190155	2007191031	673.30	846.52
2007190161	2007191413	101.63	77.40
2007190161	2007191413	164.80	132.90
2007190161	2007191413	101.50	95.58
2007190161	2007191413	142.45	126.40
2007190176	2007191566	102.66	137.50
2007190176	2007191566	936.30	995.10
2007190176	2007191566	154.03	164.30
2007190176	2007191566	1120.91	1079.00
2007190181	2007191396	308.12	334.20
2007190181	2007191396	388.40	439.70

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS
D1	D2	D1	D2
LLD:	LLD:	0.20	0.20
2007190181	2007191396	283.08	307.20
2007190181	2007191396	395.12	406.90
2007190183	2007190471	399.16	336.20
2007190183	2007190471	2634.52	2167.00
2007190183	2007190471	181.04	239.60
2007190183	2007190471	236.76	318.50
2007190185	2007191253	250.34	232.30
2007190185	2007191253	424.29	469.80
2007190185	2007191253	202.93	206.30
2007190185	2007191253	316.53	320.10
2007190189	2007191542	318.59	301.60
2007190189	2007191542	459.05	417.00
2007190189	2007191542	323.99	320.20
2007190189	2007191542	385.89	374.00
2007190193	2007190788	413.52	307.60
2007190193	2007190788	563.97	404.50
2007190193	2007190788	363.99	370.60
2007190193	2007190788	464.22	536.80
2007190194	2007190704	447.16	475.80
2007190194	2007190704	736.93	812.60
2007190194	2007190704	403.37	427.30
2007190194	2007190704	535.95	571.00
2007190197	2007190962	236.89	233.00
2007190197	2007190962	1269.62	1293.00
2007190197	2007190962	168.98	221.60
2007190197	2007190962	761.18	1167.00
2007190208	2007191593	668.60	720.90
2007190208	2007191593	1230.00	1202.00
2007190208	2007191593	477.80	616.50
2007190208	2007191593	815.20	1006.00
2007190209	2007191254	499.27	443.90
2007190209	2007191254	797.39	976.80
2007190209	2007191254	455.50	405.60
2007190209	2007191254	791.54	921.70
2007190212	2007190747	295.30	284.60
2007190212	2007190747	2014.00	3955.00
2007190212	2007190747	411.60	220.90
2007190212	2007190747	1809.00	2809.00
2007190218	2007191348	240.00	254.70
2007190218	2007191348	961.87	664.00
2007190218	2007191348	285.19	297.80
2007190218	2007191348	959.29	603.00
2007190241	2007190978	521.70	383.87
2007190241	2007190978	657.10	642.96
2007190241	2007190978	270.30	319.73
2007190241	2007190978	379.50	525.13
2007190248	2007191198	362.60	447.70
2007190248	2007191198	2978.00	12340.00
2007190248	2007191198	738.20	491.10
2007190248	2007191198	7000.00	4625.00
2007190256	2007190875	229.20	128.50
2007190256	2007190875	1736.00	2312.00
2007190256	2007190875	384.90	193.20
2007190256	2007190875	1256.00	1992.00
2007190258	2007191176	302.34	571.50
2007190258	2007191176	568.56	1115.00
2007190258	2007191176	377.50	397.00
2007190258	2007191176	1431.68	1108.00
2007190266	2007191458	214.30	207.90
2007190266	2007191458	615.50	889.00
2007190266	2007191458	220.90	68.35
2007190266	2007191458	989.90	1979.00
2007190285	2007190406	310.70	333.30
2007190285	2007190406	422.30	510.40
2007190285	2007190406	316.50	312.00
2007190285	2007190406	449.60	452.80
2007190296	2007190758	252.10	230.80
2007190296	2007190758	1165.00	1122.00
2007190296	2007190758	251.10	259.70
2007190296	2007190758	1175.00	1212.00
2007190311	2007191259	340.92	638.30
2007190311	2007191259	1540.06	1858.00
2007190311	2007191259	367.81	240.20
2007190311	2007191259	1018.69	777.90
2007190328	2007191598	278.60	296.80
2007190328	2007191598	1928.00	1749.00
2007190328	2007191598	290.30	281.70
2007190328	2007191598	1787.00	1478.00
2007190335	2007190692	311.50	288.20
2007190335	2007190692	470.30	486.40
2007190335	2007190692	266.60	260.10
2007190335	2007190692	338.70	382.10
2007190342	2007190989	254.18	255.80
2007190342	2007190989	539.18	342.40
2007190342	2007190989	199.65	187.50
2007190342	2007190989	336.44	256.70

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS
D1	D2	D1	D2
LLD:	LLD:	0.20	0.20
2007190349	2007191436	338.63	327.40
2007190349	2007191436	962.13	1002.00
2007190349	2007191436	303.23	310.30
2007190349	2007191436	531.44	799.30
2007190352	2007190611	139.80	172.03
2007190352	2007190611	170.68	171.02
2007190352	2007190611	254.32	178.86
2007190352	2007190611	302.23	185.16
2007190355	2007191257	177.72	164.10
2007190355	2007191257	339.72	335.80
2007190355	2007191257	156.15	148.40
2007190355	2007191257	163.30	161.90
2007190357	2007190856	72.49	97.90
2007190357	2007190856	660.00	874.30
2007190357	2007190856	260.10	197.80
2007190357	2007190856	1035.00	658.90
2007190361	2007191094	178.60	199.40
2007190361	2007191094	221.30	245.60
2007190361	2007191094	142.60	131.40
2007190383	2007191416	291.50	231.00
2007190383	2007191416	594.10	524.40
2007190383	2007191416	256.80	247.70
2007190383	2007191416	364.40	382.90
2007190393	2007191050	255.30	326.09
2007190393	2007191050	358.90	425.95
2007190393	2007191050	410.40	299.80
2007190393	2007191050	479.10	368.45
2007190414	2007191386	513.88	447.40
2007190414	2007191386	749.73	607.10
2007190414	2007191386	453.53	448.60
2007190414	2007191386	701.93	638.60
2007190419	2007190974	434.30	393.90
2007190419	2007190974	687.30	787.10
2007190419	2007190974	378.90	382.20
2007190419	2007190974	725.10	736.30
2007190425	2007190768	429.40	496.00
2007190425	2007190768	533.90	666.20
2007190425	2007190768	474.20	515.20
2007190425	2007190768	595.20	701.70
2007190434	2007191027	92.33	81.80
2007190434	2007191027	223.30	210.80
2007190434	2007191027	78.36	81.20
2007190434	2007191027	139.40	160.90
2007190457	2007191004	358.50	418.10
2007190457	2007191004	539.80	707.90
2007190457	2007191004	289.30	356.70
2007190457	2007191004	729.50	602.10
2007190458	2007190774	362.70	393.50
2007190458	2007190774	595.30	648.20
2007190458	2007190774	396.50	356.30
2007190458	2007190774	538.90	587.80
2007190472	2007191312	323.09	341.00
2007190472	2007191312	473.40	502.30
2007190472	2007191312	299.05	318.90
2007190472	2007191312	418.74	444.80
2007190481	2007191594	383.40	484.10
2007190481	2007191594	565.50	554.20
2007190481	2007191594	436.10	408.60
2007190481	2007191594	469.90	465.40
2007190495	2007191318	302.60	201.10
2007190497	2007190586	408.25	374.90
2007190497	2007190586	747.34	840.60
2007190497	2007190586	375.19	358.10
2007190497	2007190586	759.36	728.30
2007190506	2007190631	462.90	416.20
2007190506	2007190631	873.40	744.20
2007190506	2007190631	426.80	375.30
2007190506	2007190631	582.90	538.20
2007190508	2007191119	225.20	242.86
2007190508	2007191119	313.00	326.01
2007190508	2007191119	269.50	265.35
2007190508	2007191119	328.20	313.00
2007190526	2007191599	413.20	327.50
2007190526	2007191599	586.10	507.00
2007190526	2007191599	393.70	355.90
2007190526	2007191599	583.80	490.10
2007190527	2007190609	527.30	463.87
2007190527	2007190609	788.30	643.69
2007190527	2007190609	287.00	388.57
2007190527	2007190609	1094.00	1248.60
2007190531	2007190703	215.90	239.90
2007190531	2007190703	275.80	280.60
2007190531	2007190703	227.70	242.30
2007190531	2007190703	250.10	245.50
2007190534	2007191522	451.30	374.90
2007190534	2007191522	1093.00	871.60

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS
D1	D2	D1	D2
LLD:	LLD:	0.20	0.20
2007190534	2007191522	352.30	444.80
2007190534	2007191522	2196.00	3512.00
2007190536	2007190909	345.00	336.50
2007190536	2007190909	3487.00	3499.00
2007190536	2007190909	347.50	324.90
2007190536	2007190909	3079.00	2845.00
2007190548	2007191236	411.60	356.10
2007190548	2007191236	884.50	892.70
2007190548	2007191236	399.10	350.50
2007190548	2007191236	895.30	938.50
2007190549	2007191507	195.38	232.50
2007190549	2007191507	2147.70	1638.00
2007190549	2007191507	284.65	232.50
2007190549	2007191507	2405.66	1484.00
2007190552	2007190675	143.30	118.40
2007190552	2007190675	1060.00	856.60
2007190552	2007190675	160.20	141.30
2007190552	2007190675	369.60	291.00
2007190554	2007190752	279.81	546.80
2007190554	2007190752	1516.60	1140.00
2007190554	2007190752	97.86	448.20
2007190554	2007190752	1180.24	824.00
2007190583	2007191063	554.60	466.90
2007190583	2007191063	1332.00	884.00
2007190583	2007191063	398.50	392.30
2007190583	2007191063	604.50	555.70
2007190618	2007191166	196.80	221.00
2007190618	2007191166	289.86	259.00
2007190618	2007191166	216.38	231.40
2007190618	2007191166	251.54	281.80
2007190647	2007191525	301.00	196.80
2007190647	2007191525	700.70	707.20
2007190647	2007191525	340.80	209.10
2007190647	2007191525	707.00	704.20
2007190659	2007190739	324.18	230.30
2007190659	2007190739	526.51	479.10
2007190659	2007190739	191.00	229.70
2007190659	2007190739	221.91	321.80
2007190661	2007191334	476.14	451.80
2007190661	2007191334	1850.71	1490.00
2007190661	2007191334	440.43	434.50
2007190661	2007191334	1019.17	1126.00
2007190686	2007191430	498.00	600.70
2007190686	2007191430	1599.00	2169.00
2007190686	2007191430	394.90	444.50
2007190686	2007191430	836.10	947.10
2007190695	2007190924	286.70	253.40
2007190695	2007190924	1143.00	1182.00
2007190695	2007190924	230.90	225.90
2007190695	2007190924	475.20	579.30
2007190698	2007190813	302.81	333.70
2007190698	2007190813	412.78	553.10
2007190698	2007190813	262.73	282.60
2007190698	2007190813	368.63	392.70
2007190732	2007191450	526.50	512.60
2007190732	2007191450	867.40	911.70
2007190732	2007191450	405.20	376.40
2007190732	2007191450	671.80	667.00
2007190735	2007191549	380.70	386.60
2007190735	2007191549	681.70	644.50
2007190735	2007191549	306.20	359.20
2007190735	2007191549	420.40	456.50
2007190743	2007190906	244.90	215.20
2007190743	2007190906	394.00	374.70
2007190743	2007190906	193.80	202.30
2007190743	2007190906	306.80	310.30
2007190746	2007191241	216.00	281.80
2007190746	2007191241	1745.00	1788.00
2007190746	2007191241	195.00	282.70
2007190746	2007191241	1429.00	1541.00
2007190753	2007191299	255.40	230.20
2007190753	2007191299	342.20	358.90
2007190753	2007191299	223.80	244.20
2007190753	2007191299	296.70	330.50
2007190798	2007191229	635.98	616.63
2007190798	2007191229	9000.71	7767.80
2007190798	2007191229	288.82	305.59
2007190798	2007191229	3159.07	5441.74
2007190818	2007191157	336.10	174.90
2007190818	2007191157	1470.00	1437.00
2007190818	2007191157	121.00	226.90
2007190818	2007191157	1231.00	1015.00
2007190825	2007191214	522.10	503.80
2007190825	2007191214	963.70	844.60
2007190825	2007191214	470.20	433.00
2007190825	2007191214	679.30	632.50

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS
D1	D2	D1	D2
LLD:	LLD:	0.20	0.20
2007190826	2007191052	270.50	326.50
2007190826	2007191052	1277.00	1070.00
2007190826	2007191052	244.60	240.60
2007190826	2007191052	1169.00	1218.00
2007190834	2007190889	145.70	239.90
2007190834	2007190889	1528.00	1954.00
2007190834	2007190889	78.84	82.60
2007190834	2007190889	1661.00	1970.00
2007190849	2007191277	374.70	453.30
2007190849	2007191277	593.40	889.30
2007190849	2007191277	326.90	346.10
2007190849	2007191277	542.40	572.10
2007190853	2007190939	175.10	250.60
2007190853	2007190939	455.20	1279.00
2007190853	2007190939	85.45	87.70
2007190853	2007190939	394.90	399.40
2007190865	2007191183	59.45	67.37
2007190865	2007191183	2439.00	4153.00
2007190865	2007191183	74.73	96.91
2007190865	2007191183	4236.00	4495.00
2007190874	2007191297	320.60	222.80
2007190874	2007191297	938.90	726.90
2007190874	2007191297	219.70	258.10
2007190874	2007191297	1016.00	732.30
2007190887	2007191058	420.70	393.80
2007190887	2007191058	488.20	432.90
2007190887	2007191058	364.50	281.60
2007190887	2007191058	426.40	360.90
2007190895	2007190947	447.35	368.00
2007190895	2007190947	622.86	498.40
2007190895	2007190947	489.21	376.90
2007190895	2007190947	640.92	457.80
2007190896	2007191441	198.19	213.50
2007190896	2007191441	924.71	419.80
2007190896	2007191441	201.03	205.10
2007190896	2007191441	907.75	396.40
2007190922	2007191082	161.10	97.30
2007190922	2007191082	1632.00	248.60
2007190922	2007191082	128.50	120.90
2007190922	2007191082	335.10	258.50
2007190927	2007191444	200.11	214.00
2007190927	2007191444	488.57	353.30
2007190927	2007191444	310.10	279.60
2007190927	2007191444	718.01	619.40
2007190949	2007191504	298.01	418.80
2007190949	2007191504	450.35	573.70
2007190949	2007191504	269.57	300.00
2007190949	2007191504	290.98	311.50
2007190968	2007191437	295.00	218.40
2007190968	2007191437	1124.00	948.80
2007190968	2007191437	227.60	195.30
2007190968	2007191437	595.60	496.30
2007190970	2007191245	243.10	241.80
2007190970	2007191245	336.30	334.70
2007190970	2007191245	308.10	171.90
2007190970	2007191245	505.10	737.80
2007190986	2007191592	598.80	352.20
2007190986	2007191592	2946.00	2164.00
2007190986	2007191592	432.20	433.40
2007190986	2007191592	1718.00	1078.00
2007190990	2007191537	497.90	571.20
2007190990	2007191537	646.00	689.90
2007190990	2007191537	483.20	422.10
2007190990	2007191537	920.10	1381.00
2007191007	2007191551	544.20	567.40
2007191007	2007191551	1393.00	1232.00
2007191007	2007191551	453.20	453.40
2007191007	2007191551	1596.00	995.30
2007191028	2007191531	418.86	504.70
2007191028	2007191531	989.27	1347.00
2007191028	2007191531	372.99	390.00
2007191028	2007191531	688.85	1067.00
2007191051	2007191331	462.81	702.20
2007191051	2007191331	675.96	1234.00
2007191051	2007191331	519.33	496.00
2007191051	2007191331	843.60	711.80
2007191066	2007191379	197.80	156.60
2007191066	2007191379	279.90	370.70
2007191066	2007191379	204.90	88.11
2007191066	2007191379	295.50	212.10
2007191092	2007191211	407.00	283.10
2007191092	2007191211	780.30	468.40
2007191092	2007191211	439.40	273.10
2007191092	2007191211	667.60	359.20
2007191134	2007191282	375.30	263.40
2007191134	2007191282	1944.00	1995.00

Appendix 15. Field duplicates analysis by ICP-MS

SITEID	SITEID	Zr (ppm)	Zr (ppm)
METHOD:	METHOD:	ICP-MS	ICP-MS
D1	D2	D1	D2
LLD:	LLD:	0.20	0.20
2007191134	2007191282	202.50	279.10
2007191134	2007191282	317.80	664.90
2007191152	2007191578	341.67	302.60
2007191152	2007191578	1455.74	1261.00
2007191152	2007191578	222.02	222.50
2007191152	2007191578	565.49	619.10
2007191168	2007191195	245.90	245.20
2007191168	2007191195	574.30	528.80
2007191168	2007191195	240.80	226.00
2007191168	2007191195	449.00	363.90
2007191192	2007191339	415.10	433.60
2007191192	2007191339	662.10	664.90
2007191192	2007191339	326.60	321.90
2007191192	2007191339	437.20	454.50
2007191215	2007191281	309.30	332.60
2007191215	2007191281	1008.00	1254.00
2007191215	2007191281	313.20	326.30
2007191215	2007191281	1306.00	1581.00
2007191216	2007191385	344.10	327.30
2007191216	2007191385	1045.00	724.20
2007191216	2007191385	333.60	340.30
2007191216	2007191385	873.60	722.60
2007191264	2007191486	474.40	425.90
2007191264	2007191486	2857.00	2877.00
2007191264	2007191486	408.50	2814.00
2007191264	2007191486	3266.00	351.30
2007191275	2007191590	215.70	204.40
2007191275	2007191590	922.90	398.60
2007191275	2007191590	196.50	196.40
2007191275	2007191590	528.50	365.00
2007191293	2007191518	453.20	635.30
2007191293	2007191518	879.00	876.20
2007191293	2007191518	400.70	414.30
2007191293	2007191518	629.50	589.10
2007191295	2007191498	370.13	321.30
2007191295	2007191498	6620.85	5716.90
2007191295	2007191498	327.73	321.90
2007191295	2007191498	6093.06	8506.10
2007191346	2007191429	287.90	260.80
2007191346	2007191429	456.80	315.00
2007191346	2007191429	349.60	370.20
2007191346	2007191429	975.90	594.50
2007191372	2007191445	744.50	657.10
2007191372	2007191445	1419.00	2237.00
2007191372	2007191445	856.10	761.70
2007191372	2007191445	1869.00	2597.00
2007191382	2007191509	217.50	327.30
2007191382	2007191509	520.10	1181.00
2007191382	2007191509	173.00	170.00
2007191382	2007191509	223.10	228.00
2007191473	2007191510	313.90	324.80
2007191473	2007191510	481.40	419.50
2007191473	2007191510	240.40	235.20
2007191473	2007191510	340.50	314.50

Appendix 16. QC samples analysis by Total digestion ICP-MS

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
Brazil001a	039SMPL.D		16/06/2010	0.117	5.42	116.84	1.45	0.213	0.05
Brazil002B	040SMPL.D		16/06/2010	0.160	5.80	132.16	1.62	0.129	0.05
Brazil003C	041SMPL.D		16/06/2010	0.093	8.57	139.33	1.42	0.126	0.10
Brazil004D	042SMPL.D		16/06/2010	0.146	6.64	135.41	1.72	0.100	0.05
Brazil005E	043SMPL.D		16/06/2010	0.065	4.64	110.14	2.05	0.120	0.16
Brazil006F	044SMPL.D		16/06/2010	0.133	7.44	122.69	1.29	0.107	0.05
Average				0.1190	6.4213	126.0954	1.5913	0.1324	0.0771
RSD				30%	22%	9%	17%	31%	60%
LOESS-1	029SMPL.D#	NGSA032A	9/06/2009	0.101	6.78	209.30	1.16	0.167	0.05
MRIS	034SMPL.D#	NGSA030B	4/06/2009	0.080	4.16	461.20	2.05	0.256	0.17
MRIS	073SMPL.D#	ngsa041b	26/06/2009	0.108	4.23	474.70	1.77	0.288	0.30
MRIS	089SMPL.D#	NGSA051b	11/08/2009	0.084	3.50	445.70	2.14	0.394	0.28
MRIS	042SMPL.D#		11/08/2009	0.052	3.17	452.60	2.05	0.341	0.19
MRIS	011SMPL.D#	NGSA064B	6/11/2009	0.165	4.53	543.80	2.12	0.338	0.17
MRIS	009SMPL.D	ngsa082a	23/02/2010	0.116	4.24	463.04	3.17	0.356	0.36
MRIS2	039SMPL.D#	ngsa047b	30/07/2009	0.101	2.77	473.30	2.59	0.372	0.27
MRIS2-A	009SMPL.D		3/03/2010	0.086	4.61	466.45	2.40	0.339	0.27
MRIS2-B	011SMPL.D		3/03/2010	0.092	4.40	464.87	2.42	0.324	0.20
MRIS2-C	013SMPL.D		3/03/2010	0.072	4.38	472.48	1.89	0.320	0.15
Average				0.0956	3.9973	471.8141	2.2593	0.3327	0.2372
RSD				32%	16%	6%	18%	12%	30%
NIM-G	008SMPL.D#	NGSA043A	23/07/2009	0.040	15.52	116.70	8.97	0.335	0.05
NIM-G	039SMPL.D#	NGSA043A	23/07/2009	0.015	15.45	115.60	10.01	0.340	0.05
NIM-G	008SMPL.D#	NGSA043B	22/07/2009	0.015	16.03	115.40	9.72	0.333	0.05
NIM-G	041SMPL.D#	NGSA043B	22/07/2009	0.050	16.40	115.50	8.38	0.328	0.11
NIM-G	008SMPL.D#	NGSA044A	23/07/2009	0.015	16.09	112.30	9.35	0.344	0.11
NIM-G	039SMPL.D#	NGSA044A	23/07/2009	0.030	14.44	114.20	10.16	0.342	0.15
Average				0.0276	15.6550	114.9500	9.4303	0.3370	0.0874
RSD				55%	4%	1%	7%	2%	50%
ORIS	035SMPL.D#	NGSA030B	4/06/2009	0.036	6.62	372.80	1.70	0.248	0.16
ORIS	074SMPL.D#	ngsa041b	26/06/2009	0.108	7.33	376.00	2.23	0.268	0.27
ORIS	088SMPL.D#	NGSA050b	11/08/2009	0.044	5.48	362.00	2.10	0.361	0.10
ORIS	041SMPL.D#		11/08/2009	0.037	6.81	369.10	1.80	0.337	0.11
ORIS	012SMPL.D#	NGSA064B	6/11/2009	0.112	6.90	379.90	2.15	0.304	0.05
ORIS	010SMPL.D	ngsa082a	23/02/2010	0.102	7.43	371.44	3.79	0.363	0.05
ORIS	015SMPL.D		3/03/2010	0.078	7.31	371.28	1.99	0.298	0.05
ORIS2	040SMPL.D#	ngsa047b	30/07/2009	0.015	6.14	386.20	2.92	0.334	0.05
Average				0.0665	6.7521	373.5901	2.3335	0.3139	0.1049
RSD				57%	10%	2%	30%	13%	73%
SARM042	033SMPL.D#	NGSA030B	4/06/2009	0.069	1.50	203.00	0.55	0.078	0.61
SARM042	015SMPL.D	NGSA08B	9/06/2010	0.108	0.95	207.53	0.55	0.089	1.31
SARM-42	012SMPL.D	ngsa082a	23/02/2010	0.080	1.27	201.08	2.40	0.075	0.49
Average				0.0858	1.2428	203.8728	1.1677	0.0807	0.8045
RSD				24%	22%	2%	92%	9%	55%
TILL-1	039SMPL.D#	NGSA025B	18/03/2009	0.069	15.03	713.30	2.13	2.057	0.05
TILL-1	071SMPL.D#	NGSA025B	18/03/2009	0.087	16.06	703.20	2.05	2.016	0.05
TILL-1	007SMPL.D#	NGSA026A	19/03/2009	0.100	16.00	712.50	1.52	2.044	0.25
TILL-1	037SMPL.D#	NGSA026A	19/03/2009	0.072	14.24	691.30	1.65	2.080	0.29
TILL-1	007SMPL.D#	NGSA026B	28/05/2009	0.181	17.66	721.30	1.53	1.694	0.28
TILL-1	039SMPL.D#	NGSA026B	28/05/2009	0.138	17.34	727.60	1.92	1.692	0.26
TILL-1C	007SMPL.D#	NGSA027B	29/05/2009	0.153	17.40	733.20	1.73	1.752	0.22
TILL-1C	028SMPL.D#	NGSA027B	29/05/2009	0.108	16.57	731.10	1.92	1.698	0.26
TILL-1C	041SMPL.D#	NGSA027B	29/05/2009	0.112	15.78	744.60	1.96	1.703	0.26
TILL-1	007SMPL.D#	NGSA027A	29/05/2009	0.135	16.05	736.50	1.83	1.753	0.20
TILL-1	007SMPL.D#	NGSA028A	1/06/2009	0.145	16.50	730.30	2.11	1.761	0.18
TILL-1	039SMPL.D#	NGSA028A	1/06/2009	0.115	16.69	751.90	1.81	1.740	0.36
TILL-1	007SMPL.D#	NGSA029A	2/06/2009	0.184	17.58	732.20	1.57	1.786	0.23
TILL-1	039SMPL.D#	NGSA029A	2/06/2009	0.177	16.23	735.80	1.89	1.712	0.14
TILL-1	007SMPL.D#	NGSA029B	3/06/2009	0.161	16.86	724.90	1.71	1.730	0.18
TILL-1	037SMPL.D#	NGSA029B	3/06/2009	0.166	16.13	738.80	1.59	1.704	0.22
TILL-1	007SMPL.D#	NGSA030A	4/06/2009	0.247	16.86	729.40	1.30	1.781	0.27
TILL-1	039SMPL.D#	NGSA030A	4/06/2009	0.136	17.26	741.70	1.45	1.745	0.34
TILL-1	007SMPL.D#	NGSA030B	4/06/2009	0.231	17.43	720.60	1.68	1.765	0.29
TILL-1	037SMPL.D#	NGSA030B	4/06/2009	0.238	17.19	729.60	1.66	1.737	0.20
TILL-1	007SMPL.D#	NGSA031A	5/06/2009	0.188	15.76	728.20	1.80	1.844	0.23
TILL-1	039SMPL.D#	NGSA031A	5/06/2009	0.209	17.83	754.30	1.47	1.802	0.31
TILL-1	041SMPL.D#	NGSA031A	5/06/2009	0.210	17.10	761.50	1.37	1.762	0.33
TILL-1	013SMPL.D#	NGSA031a	5/06/2009	0.201	16.27	713.30	1.71	1.807	0.33
TILL-1	040SMPL.D#	NGSA031a	5/06/2009	0.199	16.14	712.20	1.30	1.818	0.36
TILL-1	007SMPL.D#	NGSA050a	8/06/2009	0.296	15.49	671.60	1.99	2.051	0.38
TILL-1	037SMPL.D#	NGSA050a	8/06/2009	0.345	14.71	692.20	1.39	2.001	0.32
TILL-1	045SMPL.D#	NGSA RPT 080309	8/06/2009	0.323	16.90	695.00	1.45	2.083	0.37
TILL-1	069SMPL.D#	NGSA RPT 080309	8/06/2009	0.219	16.15	701.90	0.55	2.026	0.28
TILL-1	007SMPL.D#	NGSA032A	9/06/2009	0.166	16.41	722.70	2.13	1.754	0.37
TILL-1	039SMPL.D#	NGSA032A	9/06/2009	0.171	17.48	729.60	2.00	1.720	0.20
TILL-1	007SMPL.D#	NGSA032B	9/06/2009	0.157	16.63	702.20	0.55	1.738	0.46
TILL-1	037SMPL.D#	NGSA032B	9/06/2009	0.184	16.10	703.30	2.29	1.699	0.28
TILL-1	007SMPL.D#	NGSA033A	10/06/2009	0.158	16.30	717.80	1.69	1.700	0.41
TILL-1	021SMPL.D#	NGSA033A	10/06/2009	0.158	16.83	726.30	1.64	1.659	0.36
TILL-1	041SMPL.D#	NGSA033A	10/06/2009	0.169	16.93	735.10	1.43	1.683	0.26
TILL-1	010SMPL.D#	ngsa034a	11/06/2009	0.222	16.80	714.20	1.31	1.725	0.22

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
Brazil001a	145.831	20.15	158.65	2.79	154.18	5.79	2.959	1.902	27.32	7.243
Brazil002B	166.979	19.65	161.12	3.63	154.17	5.95	2.959	1.768	34.19	7.218
Brazil003C	173.277	19.51	175.17	3.71	160.96	5.88	2.837	1.860	37.95	7.383
Brazil004D	160.259	20.71	168.22	3.32	159.09	5.98	2.922	1.698	36.50	6.809
Brazil005E	139.792	20.11	165.83	2.14	151.03	6.15	2.686	1.859	21.90	7.438
Brazil006F	152.625	20.56	162.88	2.92	155.64	6.23	2.971	1.821	30.60	6.968
Average	156.4605	20.1168	165.3128	3.0844	155.8445	5.9961	2.8891	1.8181	31.4094	7.1765
RSD	8%	2%	4%	19%	2%	3%	4%	4%	19%	3%
LOESS-1	50.560	5.94	111.50	2.78	12.17	3.89	2.449	0.799	7.36	4.278
MRIS	69.690	11.72	126.40	4.24	14.59	5.34	3.253	1.024	12.59	5.588
MRIS	70.900	12.18	114.90	4.37	14.01	5.17	3.236	1.018	13.78	5.798
MRIS	70.150	12.15	130.90	4.23	14.50	5.06	3.299	1.044	11.65	5.658
MRIS	69.740	12.03	131.10	4.22	13.73	5.18	3.485	1.087	11.51	5.900
MRIS	83.760	12.39	114.10	5.23	14.88	5.46	3.276	1.091	11.50	5.604
MRIS	72.787	12.35	128.84	4.06	14.18	5.69	3.628	1.031	11.57	6.095
MRIS2	72.650	12.63	131.40	4.48	15.05	5.62	3.363	1.099	13.27	6.032
MRIS2-A	74.370	12.70	128.74	4.01	14.78	5.67	3.514	0.940	11.66	6.138
MRIS2-B	70.949	12.46	125.33	3.96	15.75	5.79	3.546	1.006	12.29	6.162
MRIS2-C	72.058	12.48	130.96	4.11	14.75	5.42	3.367	1.032	11.91	5.964
Average	72.7055	12.3086	126.2669	4.2913	14.6221	5.4383	3.3968	1.0371	12.1726	5.8938
RSD	6%	2%	5%	9%	4%	5%	4%	5%	7%	4%
NIM-G	203.200	0.42	13.55	1.04	10.29	17.15	13.070	0.328	29.76	15.010
NIM-G	200.200	0.50	14.05	1.00	10.13	17.01	12.900	0.306	29.22	14.870
NIM-G	205.300	0.47	14.00	0.98	10.31	17.41	13.340	0.322	29.06	15.210
NIM-G	203.700	0.41	14.43	1.01	10.71	17.11	13.190	0.327	28.38	15.100
NIM-G	200.100	0.40	13.06	1.02	10.61	17.25	13.020	0.326	29.66	14.980
NIM-G	199.900	0.39	12.77	0.99	10.20	16.62	12.560	0.319	27.66	14.470
Average	202.0667	0.4334	13.6433	1.0038	10.3750	17.0917	13.0133	0.3211	28.9567	14.9400
RSD	1%	10%	5%	2%	2%	2%	2%	3%	3%	2%
ORIS	61.300	8.14	45.26	5.80	13.79	4.45	2.742	0.851	10.90	4.596
ORIS	62.850	8.13	42.22	5.89	13.29	4.41	2.733	0.786	11.95	4.764
ORIS	60.440	7.62	50.78	5.59	14.30	4.34	2.699	0.885	10.42	4.725
ORIS	61.950	7.95	66.89	5.85	12.26	4.39	2.789	0.883	10.86	4.909
ORIS	61.980	7.72	43.10	5.90	14.86	4.68	2.610	0.836	11.34	4.617
ORIS	63.804	7.97	48.50	5.43	15.66	4.64	2.762	0.815	10.76	4.870
ORIS	63.790	8.09	47.63	5.40	16.09	4.64	2.826	0.825	10.83	5.027
ORIS2	64.930	8.13	50.01	5.81	13.80	4.75	2.824	0.921	9.93	4.974
Average	62.6305	7.9680	49.2990	5.7089	14.2557	4.5365	2.7481	0.8502	10.8748	4.8102
RSD	2%	3%	16%	4%	9%	3%	3%	5%	5%	3%
SARM042	27.280	33.67	4366.00	1.17	16.93	1.90	1.156	0.490	10.52	1.888
SARM042	27.305	32.73	4701.68	1.19	17.10	1.85	1.069	0.489	9.64	1.840
SARM-42	28.505	33.36	4825.32	1.06	17.15	1.80	1.214	0.468	10.06	2.043
Average	27.6967	33.2539	4631.0003	1.1393	17.0623	1.8498	1.1464	0.4823	10.0735	1.9237
RSD	3%	1%	5%	6%	1%	3%	6%	3%	4%	6%
TILL-1	68.980	17.88	64.76	1.03	46.03	5.72	3.568	1.383	19.12	5.723
TILL-1	67.680	18.23	64.76	1.05	45.52	5.51	3.567	1.409	18.10	5.705
TILL-1	69.090	18.15	64.58	1.11	44.71	5.53	3.609	1.415	17.98	5.807
TILL-1	67.140	18.12	66.18	0.95	44.31	5.53	3.609	1.416	17.11	5.648
TILL-1	68.790	18.62	62.67	1.16	44.01	5.67	3.614	1.504	17.12	5.715
TILL-1	68.110	18.53	62.37	1.08	44.16	5.77	3.538	1.454	17.95	5.761
TILL-1C	69.220	18.39	63.31	1.02	48.33	5.54	3.562	1.426	18.00	5.688
TILL-1C	68.940	18.27	65.24	1.09	47.31	5.65	3.539	1.503	18.10	5.708
TILL-1C	68.990	18.40	64.10	1.07	47.17	5.60	3.503	1.485	18.06	5.671
TILL-1	68.750	18.10	64.44	1.10	43.76	5.62	3.591	1.452	17.85	5.750
TILL-1	70.860	18.39	62.37	1.08	43.41	5.82	3.521	1.452	16.62	5.841
TILL-1	70.930	18.78	64.62	1.11	43.44	5.89	3.509	1.452	16.54	5.825
TILL-1	70.860	18.63	63.51	1.03	45.46	5.71	3.495	1.501	17.28	5.763
TILL-1	70.750	18.43	65.29	1.03	45.83	5.90	3.532	1.435	16.31	5.823
TILL-1	70.400	18.46	64.74	1.00	45.48	5.68	3.549	1.476	17.17	5.825
TILL-1	71.010	19.11	65.94	1.05	45.56	5.64	3.620	1.466	17.91	5.894
TILL-1	69.420	17.98	62.49	1.03	45.24	5.24	3.412	1.401	17.33	5.646
TILL-1	69.230	18.34	64.17	1.04	44.38	5.21	3.329	1.473	18.84	5.596
TILL-1	70.320	18.27	63.59	1.08	44.82	5.42	3.585	1.489	17.48	5.705
TILL-1	69.030	18.61	63.52	1.11	45.72	5.32	3.486	1.469	17.81	5.651
TILL-1	70.420	18.31	68.37	1.05	45.09	5.64	3.471	1.484	17.42	5.702
TILL-1	70.800	18.62	69.14	1.09	43.64	5.72	3.517	1.422	17.06	5.941
TILL-1	70.890	19.01	69.16	1.11	43.73	5.61	3.489	1.458	17.47	5.802
TILL-1	67.770	18.55	67.04	0.96	44.76	5.57	3.526	1.484	18.10	5.629
TILL-1	67.220	18.43	68.06	0.97	44.71	5.58	3.566	1.464	17.04	5.765
TILL-1	68.640	17.60	66.03	1.00	45.79	5.59	3.446	1.616	17.95	5.796
TILL-1	68.580	16.55	64.98	1.07	45.15	5.73	3.389	1.527	16.59	5.737
TILL-1	68.220	17.41	65.17	1.06	44.16	5.70	3.552	1.545	17.23	5.879
TILL-1	68.720	16.66	65.63	1.17	43.03	5.58	3.474	1.625	19.20	5.835
TILL-1	69.030	18.37	62.23	1.06	44.57	5.59	3.608	1.469	16.65	5.731
TILL-1	68.590	18.64	63.85	1.04	44.58	5.71	3.524	1.551	17.74	5.786
TILL-1	68.700	18.28	60.48	1.03	43.99	5.69	3.496	1.531	17.95	5.750
TILL-1	69.550	18.16	62.40	0.98	42.97	5.72	3.650	1.460	17.83	5.775
TILL-1	68.420	17.91	59.99	0.99	41.69	5.79	3.513	1.444	17.56	5.662
TILL-1	68.640	18.59	62.48	1.04	41.22	5.64	3.554	1.409	16.37	5.788
TILL-1	69.490	18.42	61.02	1.07	39.91	5.68	3.514	1.472	16.43	5.760
TILL-1	68.000	18.61	64.43	0.97	46.15	5.39	3.522	1.492	16.43	5.789

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
Brazil001a	0.624	12.463	1.072	65.11	0.383	1.86	30.667	53.61	44.27	24.42
Brazil002B	0.317	15.011	1.100	69.59	0.304	1.93	36.888	56.33	42.29	23.72
Brazil003C	0.534	15.601	1.118	71.44	0.316	2.18	38.990	58.94	107.13	24.96
Brazil004D	0.506	15.020	1.108	64.96	0.331	1.72	37.730	55.99	44.80	24.66
Brazil005E	0.430	11.450	1.076	62.86	0.422	1.60	29.849	51.88	44.54	24.32
Brazil006F	0.653	13.714	1.141	65.35	0.351	0.98	33.196	55.31	41.82	25.13
Average	0.5107	13.8766	1.1025	66.5503	0.3509	1.7118	34.5532	55.3440	54.1435	24.5353
RSD	24%	12%	2%	5%	13%	24%	11%	4%	48%	2%
LOESS-1	0.447	8.896	0.816	25.99	0.314	1.41	8.820	22.41	37.18	11.30
MRIS	0.538	8.973	1.139	35.66	0.448	0.39	11.570	29.43	30.57	20.84
MRIS	0.464	9.534	1.143	37.00	0.486	0.38	11.840	30.87	30.13	20.34
MRIS	0.586	9.355	1.126	33.93	0.494	0.53	10.880	31.66	58.86	20.76
MRIS	0.669	9.465	1.230	34.86	0.512	0.50	10.560	31.13	36.65	21.18
MRIS	0.759	11.910	1.139	38.75	0.481	0.39	13.530	33.39	31.43	20.17
MRIS	0.463	10.245	1.199	37.04	0.518	0.46	11.626	31.75	30.70	20.10
MRIS2	0.577	9.617	1.187	35.17	0.507	0.47	11.630	31.77	37.82	21.17
MRIS2-A	0.576	10.159	1.169	37.99	0.517	0.42	11.992	32.66	35.89	20.61
MRIS2-B	0.529	9.845	1.176	35.98	0.482	0.48	11.839	30.51	32.29	20.56
MRIS2-C	0.519	10.307	1.173	36.61	0.495	0.36	11.892	31.78	38.06	20.60
Average	0.5679	9.9410	1.1682	36.2989	0.4939	0.4388	11.7359	31.4952	36.2400	20.6343
RSD	16%	8%	3%	4%	4%	13%	7%	4%	24%	2%
NIM-G	0.916	12.480	4.272	111.00	2.078	2.42	55.830	72.72	7.50	38.53
NIM-G	0.913	12.320	4.226	108.50	2.053	2.59	54.380	72.08	7.52	38.16
NIM-G	1.009	12.560	4.269	110.10	2.085	2.59	56.300	72.73	4.36	38.68
NIM-G	0.993	12.670	4.260	109.60	2.092	2.57	55.680	72.15	3.44	38.79
NIM-G	0.904	12.520	4.213	109.20	2.053	2.45	54.780	69.77	4.33	37.98
NIM-G	0.952	12.020	4.034	107.80	1.983	2.58	53.640	69.88	3.64	37.76
Average	0.9477	12.4283	4.2123	109.3667	2.0573	2.5313	55.1017	71.5550	5.1307	38.3167
RSD	5%	2%	2%	1%	2%	3%	2%	2%	37%	1%
ORIS	0.520	8.417	0.912	32.32	0.317	1.15	11.530	25.83	17.30	16.07
ORIS	0.563	8.444	0.946	32.85	0.397	1.04	12.020	26.60	16.70	15.86
ORIS	0.674	8.211	0.983	30.44	0.384	1.75	10.810	27.18	24.66	16.00
ORIS	0.552	8.392	0.975	31.95	0.385	1.14	10.640	27.46	47.84	16.22
ORIS	0.707	9.323	0.881	32.43	0.383	1.12	12.020	26.96	18.23	15.50
ORIS	0.454	9.200	0.989	32.71	0.393	0.95	11.602	26.96	23.95	15.67
ORIS	0.564	8.748	0.936	32.39	0.395	1.22	11.541	27.59	17.34	15.38
ORIS2	0.707	9.163	0.934	32.09	0.418	1.17	11.730	28.09	18.42	16.51
Average	0.5926	8.7373	0.9445	32.1481	0.3838	1.1905	11.4867	27.0834	23.0544	15.9009
RSD	16%	5%	4%	2%	8%	20%	4%	3%	45%	2%
SARM042	0.390	5.247	0.355	14.09	0.142	0.33	5.881	10.51	113.10	9.49
SARM042	0.425	5.408	0.394	14.10	0.179	0.42	5.397	10.94	129.45	9.56
SARM-42	0.415	5.308	0.393	14.11	0.173	0.38	5.806	11.22	125.72	9.37
Average	0.4100	5.3210	0.3807	14.0987	0.1646	0.3739	5.6946	10.8924	122.7592	9.4722
RSD	4%	2%	6%	0%	12%	13%	5%	3%	7%	1%
TILL-1	0.500	12.770	1.264	27.02	0.572	0.85	11.100	27.01	23.33	21.20
TILL-1	0.514	12.820	1.288	27.00	0.572	0.82	10.530	27.14	24.53	21.30
TILL-1	0.568	12.870	1.291	27.94	0.571	1.17	10.860	27.35	21.04	21.38
TILL-1	0.401	13.030	1.290	26.38	0.589	0.85	10.120	26.31	23.32	21.39
TILL-1	0.507	12.470	1.243	27.38	0.518	1.01	11.130	28.35	21.98	22.02
TILL-1	0.563	12.530	1.212	27.19	0.498	0.89	10.850	28.41	21.71	21.85
TILL-1C	0.559	12.530	1.213	27.74	0.484	0.73	11.170	28.14	24.49	22.10
TILL-1C	0.582	12.460	1.191	27.80	0.482	0.84	11.230	28.21	24.70	22.12
TILL-1C	0.564	12.550	1.200	28.00	0.475	0.88	11.500	28.00	25.19	21.94
TILL-1	0.556	12.300	1.190	27.73	0.482	0.78	11.070	28.38	22.16	22.06
TILL-1	0.527	12.670	1.209	28.19	0.446	0.87	11.250	28.57	25.18	22.29
TILL-1	0.515	12.550	1.203	28.69	0.455	0.64	11.320	28.40	25.10	22.12
TILL-1	0.535	12.810	1.176	29.28	0.487	1.10	11.200	29.54	22.85	22.11
TILL-1	0.546	12.570	1.177	28.96	0.497	1.08	11.230	28.87	24.56	21.95
TILL-1	0.523	12.290	1.224	28.96	0.504	1.03	11.190	28.88	23.56	22.41
TILL-1	0.581	12.200	1.239	29.18	0.508	0.84	11.260	28.73	24.29	22.12
TILL-1	0.584	12.170	1.128	27.99	0.440	0.71	11.170	27.98	23.91	21.73
TILL-1	0.520	12.340	1.120	28.65	0.454	0.72	11.010	28.19	23.76	22.07
TILL-1	0.507	12.490	1.201	28.22	0.485	0.93	11.330	28.49	23.43	22.23
TILL-1	0.557	12.740	1.199	28.20	0.513	0.86	11.380	28.23	22.11	22.28
TILL-1	0.514	12.770	1.163	27.79	0.500	1.06	11.490	28.34	22.97	22.35
TILL-1	0.605	12.660	1.184	28.72	0.478	1.05	11.680	27.93	22.72	21.95
TILL-1	0.590	12.560	1.217	28.82	0.490	1.03	11.750	28.48	22.28	21.96
TILL-1	0.514	11.930	1.184	27.97	0.510	0.84	10.940	27.88	22.76	22.01
TILL-1	0.554	12.080	1.171	27.74	0.516	0.97	10.970	27.90	23.00	22.13
TILL-1	0.456	12.410	1.185	25.80	0.519	0.98	10.500	28.65	22.51	22.37
TILL-1	0.445	12.330	1.208	26.34	0.520	0.85	10.250	28.98	19.89	22.51
TILL-1	0.595	12.160	1.211	26.61	0.543	0.78	11.220	28.98	22.53	22.33
TILL-1	0.494	12.180	1.234	26.29	0.543	0.71	10.770	28.21	21.62	22.20
TILL-1	0.572	12.330	1.239	27.58	0.466	1.10	10.890	28.21	21.23	21.88
TILL-1	0.610	12.190	1.245	27.67	0.488	0.93	11.100	28.17	21.45	22.14
TILL-1	0.562	12.260	1.192	27.42	0.504	0.96	10.860	27.72	20.80	22.15
TILL-1	0.556	11.950	1.158	27.76	0.493	0.91	10.930	28.10	20.92	22.34
TILL-1	0.541	12.250	1.224	27.17	0.511	0.88	11.140	27.65	21.50	22.26
TILL-1	0.573	12.260	1.216	27.70	0.496	0.88	11.140	28.21	22.06	22.19
TILL-1	0.579	12.120	1.208	27.68	0.494	0.86	11.240	27.97	21.62	21.71
TILL-1	0.488	12.130	1.180	27.59	0.466	0.98	10.830	28.15	26.58	22.47

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
Brazil001a	14.255	22.05	0.20	30.20	10.700	2.47	19.08	1.937	1.126	24.468
Brazil002B	15.654	27.74	0.91	28.53	11.520	3.18	18.05	2.331	1.129	13.567
Brazil003C	15.843	27.32	1.56	27.78	11.171	3.41	20.86	2.499	1.149	11.718
Brazil004D	14.794	25.10	0.89	27.90	9.959	3.38	19.78	2.337	1.139	11.868
Brazil005E	13.807	20.73	0.20	32.44	10.409	2.25	15.07	1.817	1.155	31.684
Brazil006F	14.337	22.57	0.20	31.61	10.856	2.84	18.40	2.126	1.130	18.740
Average	14.7815	24.2536	0.6602	29.7425	10.7691	2.9205	18.5411	2.1745	1.1381	18.6741
RSD	6%	12%	85%	7%	5%	17%	11%	12%	1%	43%
LOESS-1	5.852	54.26	0.20	6.52	5.248	2.12	293.90	0.692	0.709	8.063
MRIS	7.848	118.90	0.55	10.13	6.131	2.98	91.09	1.007	0.957	13.810
MRIS	8.277	123.00	0.65	11.16	6.519	2.83	91.43	0.871	0.986	14.650
MRIS	8.131	111.20	1.12	8.84	6.576	2.65	88.09	0.740	0.993	13.590
MRIS	8.047	118.50	0.84	9.84	6.663	2.82	89.15	0.744	1.031	14.760
MRIS	8.637	134.10	1.49	8.48	6.518	3.18	104.60	1.604	0.945	9.860
MRIS	8.007	115.46	0.20	9.37	6.722	3.16	89.47	0.993	1.004	14.019
MRIS2	8.067	120.80	1.00	8.82	7.138	3.07	93.36	1.521	0.981	14.820
MRIS2-A	8.239	124.17	0.42	9.23	7.005	3.08	90.61	0.975	1.009	14.495
MRIS2-B	7.752	121.98	0.20	9.34	6.607	3.07	89.51	0.968	1.006	13.855
MRIS2-C	7.894	121.12	0.45	9.02	6.568	2.97	92.18	0.978	1.010	13.932
Average	8.0899	120.9221	0.6910	9.4244	6.6447	2.9815	91.9486	1.0401	0.9922	13.7791
RSD	3%	5%	61%	8%	4%	6%	5%	28%	3%	10%
NIM-G	20.770	321.60	1.99	1.77	15.520	4.34	8.47	4.763	2.964	51.150
NIM-G	20.510	325.60	1.85	1.63	15.520	4.25	8.20	4.691	2.935	52.390
NIM-G	20.840	322.40	4.23	1.99	15.670	4.41	8.43	4.790	3.016	50.770
NIM-G	20.770	319.70	3.89	1.87	15.850	4.15	8.73	4.784	2.971	51.210
NIM-G	20.330	314.70	3.58	1.64	15.620	4.32	7.87	4.780	2.963	50.430
NIM-G	20.360	306.60	3.58	1.44	15.480	4.20	7.65	4.687	2.829	50.920
Average	20.5967	318.4333	3.1848	1.7218	15.6100	4.2767	8.2245	4.7492	2.9463	51.1450
RSD	1%	2%	32%	11%	1%	2%	5%	1%	2%	1%
ORIS	7.056	114.10	1.50	7.72	5.420	2.87	38.42	1.071	0.776	11.940
ORIS	7.215	119.60	1.59	7.53	5.369	2.67	40.29	0.959	0.820	12.390
ORIS	7.006	106.60	1.10	6.22	5.588	2.61	36.57	0.785	0.860	12.460
ORIS	7.073	112.00	1.29	6.54	5.605	2.57	38.04	0.787	0.864	12.980
ORIS	7.013	115.00	1.39	6.69	5.368	3.40	39.16	1.488	0.771	11.660
ORIS	7.071	108.76	0.87	6.52	5.672	2.95	37.81	1.078	0.857	11.923
ORIS	7.015	114.43	0.86	6.20	5.778	2.99	37.27	1.053	0.845	11.900
ORIS2	7.388	118.30	1.68	6.03	5.970	2.45	38.83	1.639	0.801	12.900
Average	7.1047	113.5983	1.2857	6.6825	5.5962	2.8139	38.2997	1.1076	0.8241	12.2691
RSD	2%	4%	24%	9%	4%	11%	3%	28%	5%	4%
SARM042	2.823	22.00	0.91	10.45	1.950	0.83	37.65	0.389	0.303	4.053
SARM042	2.897	20.29	0.20	10.04	2.098	0.85	38.27	0.355	0.314	4.454
SARM-42	2.941	20.33	0.20	9.34	2.002	0.88	36.28	0.416	0.306	4.191
Average	2.8872	20.8738	0.4355	9.9416	2.0166	0.8501	37.3994	0.3867	0.3078	4.2325
RSD	2%	5%	94%	6%	4%	3%	3%	8%	2%	5%
TILL-1	6.896	44.94	9.11	12.83	6.044	1.95	319.10	0.685	1.098	5.522
TILL-1	6.884	45.86	8.79	13.00	5.887	2.11	322.90	0.669	1.101	5.575
TILL-1	6.897	44.98	8.61	13.74	5.891	1.57	329.50	0.642	1.111	5.800
TILL-1	6.815	43.31	8.69	13.44	6.038	1.88	308.00	0.670	1.079	5.753
TILL-1	7.047	44.59	10.50	14.02	6.063	1.82	306.60	0.676	1.017	4.740
TILL-1	7.033	44.40	10.06	13.65	6.416	1.78	310.60	0.643	0.993	4.827
TILL-1C	7.061	44.67	9.91	14.04	6.389	1.75	311.10	0.630	0.996	4.660
TILL-1C	7.057	45.68	10.56	14.27	6.263	1.82	316.00	0.639	1.019	4.841
TILL-1C	6.992	46.72	10.13	14.39	6.240	1.71	321.40	0.629	0.962	4.864
TILL-1	7.020	47.48	9.81	9.55	6.238	1.88	280.90	0.613	1.007	5.325
TILL-1	7.189	44.74	10.17	13.79	6.738	1.83	303.10	0.689	1.002	4.411
TILL-1	7.022	46.01	10.98	13.54	6.676	1.92	313.60	0.680	1.029	4.012
TILL-1	7.182	44.26	10.15	13.16	6.666	1.92	318.40	0.694	1.023	5.016
TILL-1	7.135	44.40	10.28	13.39	6.426	1.83	314.60	0.694	1.005	5.129
TILL-1	7.238	43.79	9.96	14.47	6.912	1.46	303.10	0.668	1.022	5.918
TILL-1	7.122	45.43	9.80	14.68	6.700	1.80	317.70	0.663	1.005	5.974
TILL-1	6.907	44.15	9.68	12.85	6.552	1.68	304.50	0.627	0.924	5.435
TILL-1	6.997	44.90	9.97	13.22	6.317	1.84	317.00	0.632	0.935	5.452
TILL-1	7.088	44.89	10.83	13.58	6.247	1.74	307.90	0.676	1.007	5.106
TILL-1	7.081	45.41	10.99	13.58	6.175	2.13	314.50	0.668	1.005	4.935
TILL-1	7.035	44.87	11.36	14.65	6.339	1.74	310.90	0.659	0.980	4.616
TILL-1	7.063	47.64	10.95	14.34	6.439	1.68	327.20	0.673	1.007	4.744
TILL-1	7.112	47.91	10.83	14.38	6.393	1.51	326.60	0.646	1.000	4.775
TILL-1	6.922	43.61	9.64	13.87	6.384	1.51	298.20	0.616	0.981	5.636
TILL-1	6.856	42.77	9.90	13.93	6.162	1.76	306.20	0.615	0.975	5.812
TILL-1	6.901	42.63	8.20	11.76	6.581	1.47	283.40	0.493	1.081	5.436
TILL-1	6.962	42.25	8.38	11.38	6.620	1.45	290.40	0.509	1.050	5.546
TILL-1	7.040	43.71	7.90	12.09	6.595	1.50	298.30	0.502	1.039	5.501
TILL-1	7.025	45.71	9.20	12.41	6.449	1.52	297.50	0.477	1.067	5.517
TILL-1	6.973	44.27	10.02	14.56	6.596	1.54	304.00	0.616	0.997	5.661
TILL-1	7.093	45.19	9.12	14.98	6.135	1.62	314.60	0.610	1.018	5.710
TILL-1	7.033	42.56	10.45	13.85	6.572	1.62	305.40	0.629	1.006	5.458
TILL-1	7.145	43.06	9.98	14.60	6.336	1.63	299.50	0.638	0.995	5.578
TILL-1	6.965	43.95	10.13	13.89	6.434	1.80	300.70	0.632	0.992	5.736
TILL-1	7.023	43.59	10.28	13.59	6.557	1.66	304.60	0.618	0.995	5.400
TILL-1	6.971	46.27	9.77	13.70	6.458	1.92	311.70	0.610	0.981	5.530
TILL-1	6.895	42.75	9.81	13.79	6.587	1.73	302.90	0.644	0.969	5.686

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
BrazilI001a	3.025	466.07	0.88	30.847	2.730	83.77	445.22	1-25 redo	NGSA_131
BrazilI002B	3.039	471.14	1.07	20.150	2.664	93.30	496.80	1-25 redo	NGSA_131
BrazilI003C	3.034	481.20	1.33	19.070	2.797	104.20	511.56	1-25 redo	NGSA_131
BrazilI004D	2.926	474.77	1.20	20.883	2.754	98.46	504.32	1-25 redo	NGSA_131
BrazilI005E	3.018	470.07	0.80	36.297	2.757	86.95	402.05	1-25 redo	NGSA_131
BrazilI006F	3.091	470.64	0.98	24.806	2.860	94.67	472.01	1-25 redo	NGSA_131
Average	3.0220	472.3147	1.0440	25.3422	2.7603	93.5599	471.9932		
RSD	2%	1%	19%	27%	2%	8%	9%		
LOESS-1	3.059	35.47	1.67	28.620	2.537	33.83	343.30	26-50	ngsa032a_edtdate
MRIS	4.630	63.32	2.22	36.780	3.329	59.51	351.90	26-50	NGSA030b
MRIS	4.598	64.03	1.75	38.800	3.402	61.23	374.00	26-50	ngsa041b_ngsa042a
MRIS	4.365	62.80	1.72	33.820	3.368	64.27	345.10	26-50	ngsa050bb
MRIS	4.482	66.66	1.75	37.680	3.596	67.02	352.50	26-50	ngsa051z
MRIS	4.534	61.85	2.66	28.470	3.525	66.79	402.10	51-75	ngsa064b
MRIS	4.566	63.23	2.10	38.783	3.688	67.50	382.81	76-86	ngsa082aa
MRIS2	4.490	66.22	2.47	37.380	3.565	61.51	372.70	26-50	NGSA047B
MRIS2-A	4.633	65.70	2.25	37.968	3.583	62.22	378.78	76-86	NGSA084Aa
MRIS2-B	4.578	66.32	2.21	38.720	3.635	63.93	367.24	76-86	NGSA084Aa
MRIS2-C	4.583	65.65	2.16	36.743	3.561	61.10	381.38	76-86	NGSA084Aa
Average	4.5460	64.5784	2.1305	36.5143	3.5252	63.5087	370.8522		
RSD	2%	3%	15%	9%	3%	4%	5%		
NIM-G	17.580	0.05	1.79	143.300	14.310	48.95	285.90	26-50	NGSA043A
NIM-G	18.200	0.05	1.68	144.100	14.300	51.24	282.40	26-50	NGSA043A
NIM-G	17.930	0.05	1.89	145.000	14.790	48.92	289.30	26-50	ngsa043b
NIM-G	17.920	0.05	1.77	145.300	14.760	49.71	288.20	26-50	ngsa043b
NIM-G	17.400	0.05	1.77	142.800	14.510	46.14	281.50	26-50	NGSA044A
NIM-G	17.600	0.05	1.70	140.100	14.210	47.62	278.10	26-50	NGSA044A
Average	17.7717	0.0500	1.7657	143.4333	14.4800	48.7633	284.2333		
RSD	2%	0%	4%	1%	2%	4%	2%		
ORIS	3.316	45.33	2.76	30.970	2.692	59.36	326.90	26-50	NGSA030b
ORIS	3.234	45.71	2.61	30.400	2.676	53.35	336.90	26-50	ngsa041b_ngsa042a
ORIS	3.159	45.80	2.14	29.320	2.797	57.37	300.80	26-50	ngsa050bb
ORIS	3.117	49.19	2.37	29.930	2.886	63.25	313.10	26-50	ngsa051z
ORIS	3.252	45.37	2.62	28.170	2.713	59.05	340.10	51-75	ngsa064b
ORIS	3.301	45.32	2.46	30.088	2.862	57.96	339.62	76-86	ngsa082aa
ORIS	3.261	45.88	2.92	31.169	2.834	50.37	337.04	76-86	NGSA084Aa
ORIS2	3.212	48.30	3.16	30.530	2.928	52.37	343.80	26-50	NGSA047B
Average	3.2315	46.3632	2.6301	30.0721	2.7985	56.6349	329.7824		
RSD	2%	3%	12%	3%	3%	8%	5%		
SARM042	1.261	95.17	0.77	12.080	1.076	46.39	210.20	26-50	NGSA030b
SARM042	1.297	99.40	0.57	12.003	1.242	42.64	209.76	1-25 redo	NGSA_123
SARM-42	1.262	95.28	0.68	12.642	1.239	47.04	213.36	76-86	ngsa082aa
Average	1.2734	96.6176	0.6703	12.2418	1.1855	45.3566	211.1051		
RSD	2%	2%	15%	3%	8%	5%	1%		
TILL-1	2.096	102.40	1.14	36.400	3.917	87.99	517.50	26-50	ngsa025b
TILL-1	2.155	102.30	0.86	36.580	3.819	92.27	514.60	26-50	ngsa025b
TILL-1	2.088	102.90	0.81	39.080	3.936	91.34	544.50	26-50	NGSA026A
TILL-1	2.195	101.40	0.38	35.430	3.972	94.35	509.90	26-50	NGSA026A
TILL-1	2.140	104.00	1.15	34.120	3.605	93.14	511.40	26-50	NGSA026B
TILL-1	2.134	103.90	0.44	35.260	3.621	92.01	515.30	26-50	NGSA026B
TILL-1C	2.077	104.90	0.78	35.110	3.555	96.05	508.20	26-50	NGSA027B
TILL-1C	2.045	108.30	0.20	35.290	3.648	96.39	513.00	26-50	NGSA027B
TILL-1C	2.056	107.30	0.17	35.850	3.568	96.42	514.60	26-50	NGSA027B
TILL-1	2.173	107.30	0.65	36.400	3.586	96.55	508.20	26-50	NGSA027A
TILL-1	2.228	104.30	0.87	32.260	3.650	95.82	511.70	26-50	NGSA028a
TILL-1	2.208	105.90	0.35	30.480	3.567	94.55	520.20	26-50	NGSA028a
TILL-1	2.212	105.30	1.95	34.440	3.528	94.48	517.10	26-50	NGSA029a
TILL-1	2.203	107.30	1.25	34.780	3.593	94.14	517.30	26-50	NGSA029a
TILL-1	2.256	103.20	1.42	38.120	3.691	98.14	507.40	26-50	NGSA029b
TILL-1	2.235	109.70	0.93	39.540	3.712	95.37	517.50	26-50	NGSA029b
TILL-1	2.045	105.40	1.17	37.320	3.429	94.60	510.50	26-50	NGSA030a
TILL-1	2.062	107.90	0.71	37.720	3.430	96.15	514.00	26-50	NGSA030a
TILL-1	2.152	106.80	1.59	34.620	3.527	96.19	514.50	26-50	NGSA030b
TILL-1	2.100	105.10	1.14	34.600	3.521	95.98	519.90	26-50	NGSA030b
TILL-1	2.003	103.90	1.35	34.030	3.520	98.11	514.30	26-50	NGSA031A
TILL-1	2.036	108.40	1.03	35.830	3.626	92.06	529.40	26-50	NGSA031A
TILL-1	2.025	107.90	1.13	34.680	3.628	94.14	525.60	26-50	NGSA031A
TILL-1	2.052	103.40	1.04	37.190	3.493	93.41	499.80	26-50	NGSA031B
TILL-1	2.054	104.00	1.06	37.840	3.584	94.89	501.60	26-50	NGSA031B
TILL-1	1.942	101.50	0.79	34.380	3.664	102.20	499.40	26-50	ngsa050a_and rpts
TILL-1	1.936	103.60	0.55	35.110	3.745	98.55	501.80	26-50	ngsa050a_and rpts
TILL-1	1.899	104.30	0.86	35.220	3.655	101.00	501.30	26-50	ngsa050a_and rpts
TILL-1	1.873	103.40	0.57	36.680	3.669	99.23	505.60	26-50	ngsa050a_and rpts
TILL-1	2.117	105.60	0.97	39.620	3.661	92.28	505.30	26-50	ngsa032a_edtdate
TILL-1	2.153	108.60	0.63	40.260	3.643	92.81	513.10	26-50	ngsa032a_edtdate
TILL-1	2.067	103.50	1.06	37.620	3.628	94.58	505.80	26-50	ngsa032b_edtdate
TILL-1	2.126	104.00	0.73	38.740	3.497	98.65	509.50	26-50	ngsa032b_edtdate
TILL-1	2.062	103.10	1.02	37.940	3.580	92.80	511.20	26-50	ngsa033a_edtdate
TILL-1	2.073	105.10	0.84	38.420	3.595	93.23	515.10	26-50	ngsa033a_edtdate
TILL-1	2.067	105.40	0.69	39.090	3.617	92.72	520.10	26-50	ngsa033a_edtdate
TILL-1	2.106	105.50	0.94	38.940	3.645	95.49	502.00	26-50	ngsa034a_edtdate

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-1	026SMPL.D#	ngsa034a	11/06/2009	0.184	16.72	720.10	1.89	1.710	0.28
TILL-1	043SMPL.D#	ngsa034a	11/06/2009	0.236	17.02	724.60	1.72	1.699	0.12
TILL-1	009SMPL.D#	NGSA034B	12/06/2009	0.197	17.14	717.80	1.32	1.815	0.14
TILL-1	036SMPL.D#	NGSA034B	12/06/2009	0.195	15.93	731.80	1.16	1.743	0.13
TILL-1	044SMPL.D#	ngsa033b	12/06/2009	0.155	17.45	727.70	1.58	1.726	0.29
TILL-1	074SMPL.D#	ngsa033b	12/06/2009	0.177	16.93	740.40	1.70	1.679	0.26
TILL-1	009SMPL.D#	NGSA035B	15/06/2009	0.250	17.25	739.90	1.21	1.841	0.45
TILL-1	039SMPL.D#	NGSA035B	15/06/2009	0.270	15.91	741.60	1.62	1.820	0.23
TILL-1	007SMPL.D#	NGSA035A	16/06/2009	0.359	15.98	697.60	1.89	1.845	0.33
TILL-1	039SMPL.D#	NGSA035A	16/06/2009	0.222	16.87	712.80	2.38	1.754	0.49
TILL-1	047SMPL.D#	NGSA036A	16/06/2009	0.244	16.25	739.00	2.30	1.782	0.36
TILL-1	077SMPL.D#	NGSA036A	16/06/2009	0.227	17.00	745.90	2.02	1.776	0.36
TILL-1	007SMPL.D#	NGSA036B	17/06/2009	0.218	16.37	713.80	1.27	1.740	0.32
TILL-1	039SMPL.D#	NGSA036B	17/06/2009	0.203	17.28	735.30	1.23	1.702	0.35
TILL-1	007SMPL.D#	NGSA037A	18/06/2009	0.305	17.00	716.40	1.58	1.982	0.22
TILL-1	037SMPL.D#	NGSA037A	18/06/2009	0.270	16.91	740.50	1.39	1.915	0.34
TILL-1	045SMPL.D#	NGSA037B	18/06/2009	0.227	16.30	723.30	2.34	1.767	0.30
TILL-1	007SMPL.D#	ngsa037z	19/06/2009	0.238	15.90	726.90	1.72	1.748	0.25
TILL-1	019SMPL.D#	ngsa037z	19/06/2009	0.214	16.43	731.50	2.02	1.720	0.32
TILL-1	027SMPL.D#	NGSA038A	19/06/2009	0.218	17.35	719.80	2.17	1.767	0.19
TILL-1	057SMPL.D#	NGSA038A	19/06/2009	0.277	17.13	743.00	1.71	1.731	0.45
TILL-1	065SMPL.D#	ngsa038b	19/06/2009	0.182	16.88	709.80	2.03	1.740	0.28
TILL-1	097SMPL.D#	ngsa038b	19/06/2009	0.258	16.61	715.20	1.69	1.757	0.19
TILL-1	007SMPL.D#	NGSA039A	22/06/2009	0.259	14.26	688.90	1.13	1.899	0.27
TILL-1	010SMPL.D#	NGSA039A	22/06/2009	0.267	15.15	690.00	1.46	1.889	0.15
TILL-1	039SMPL.D#	NGSA039A	22/06/2009	0.278	15.38	718.10	1.72	1.835	0.23
TILL-1	007SMPL.D#	ngsa039b	24/06/2009	0.239	16.35	689.50	0.55	1.852	0.21
TILL-1	039SMPL.D#	ngsa039b	24/06/2009	0.206	17.04	720.50	0.55	1.776	0.28
TILL-1	007SMPL.D#	ngsa040a	25/06/2009	0.185	16.12	730.50	1.92	1.890	0.25
TILL-1	009SMPL.D#	ngsa040a	25/06/2009	0.185	17.24	730.20	1.75	1.880	0.25
TILL-1	037SMPL.D#	ngsa040a	25/06/2009	0.215	17.89	747.50	1.71	1.895	0.19
TILL-1	045SMPL.D#	ngsa040b	25/06/2009	0.234	16.40	696.80	1.70	1.803	0.18
TILL-1	077SMPL.D#	ngsa040b	25/06/2009	0.224	16.36	702.60	1.60	1.840	0.13
TILL-1	007SMPL.D#	ngsa041a	26/06/2009	0.223	16.79	714.50	1.74	1.741	0.35
TILL-1	036SMPL.D#	ngsa041a	26/06/2009	0.198	16.87	753.40	1.70	1.752	0.26
TILL-1	044SMPL.D#	ngsa041b	26/06/2009	0.275	16.33	711.80	1.54	1.748	0.32
TILL-1	082SMPL.D#	ngsa041b	26/06/2009	0.235	16.69	728.00	1.81	1.761	0.23
TILL-1	007SMPL.D#	ngsa042a	29/06/2009	0.235	17.85	708.20	2.25	1.766	0.28
TILL-1	037SMPL.D#	ngsa042a	29/06/2009	0.215	16.99	723.70	1.93	1.808	0.27
TILL-1	007SMPL.D#	ngsa042b	30/06/2009	0.210	16.08	713.90	2.27	1.826	0.23
TILL-1	013SMPL.D#	ngsa042b	30/06/2009	0.200	17.12	730.30	2.58	1.757	0.27
TILL-1	007SMPL.D#	NGSA043B	22/07/2009	0.262	16.80	707.00	2.20	2.151	0.25
TILL-1	040SMPL.D#	NGSA043B	22/07/2009	0.306	16.91	711.10	2.09	2.124	0.16
TILL-1	007SMPL.D#	NGSA043A	23/07/2009	0.275	17.06	706.10	1.72	2.012	0.22
TILL-1	038SMPL.D#	NGSA043A	23/07/2009	0.274	16.81	694.30	2.01	2.016	0.20
TILL-1	007SMPL.D#	NGSA044A	23/07/2009	0.263	16.99	721.80	1.86	2.167	0.29
TILL-1	038SMPL.D#	NGSA044A	23/07/2009	0.285	16.65	708.50	1.79	2.140	0.41
TILL-1	007SMPL.D#	NGSA044B	24/07/2009	0.292	17.60	720.30	2.22	2.116	0.17
TILL-1	039SMPL.D#	NGSA044B	24/07/2009	0.292	17.33	718.00	2.36	2.099	0.05
TILL-1	007SMPL.D#	NGSA045A	24/07/2009	0.280	16.64	706.60	2.25	2.174	0.29
TILL-1	038SMPL.D#	NGSA045A	24/07/2009	0.269	16.39	706.50	2.71	2.126	0.17
TILL-1	007SMPL.D#	NGSA045B	27/07/2009	0.306	16.47	704.50	1.55	2.119	0.14
TILL-1	039SMPL.D#	NGSA045B	27/07/2009	0.268	14.92	706.40	1.64	2.132	0.15
TILL-1	007SMPL.D#	NGSA046A	27/07/2009	0.251	16.38	700.10	1.67	2.152	0.24
TILL-1	037SMPL.D#	NGSA046A	27/07/2009	0.239	16.93	698.60	1.51	2.101	0.18
TILL-1	007SMPL.D#	ngsa047a	28/07/2009	0.367	16.62	721.00	2.38	2.083	0.57
TILL-1	037SMPL.D#	ngsa047a	28/07/2009	0.293	17.05	726.70	1.72	2.061	0.68
TILL-1	007SMPL.D#	ngsa046b	29/07/2009	0.273	16.52	706.90	1.38	2.423	0.05
TILL-1	043SMPL.D#	ngsa046b	29/07/2009	0.222	17.34	737.70	1.43	2.350	0.05
TILL-1	007SMPL.D#	ngsa047b	30/07/2009	0.360	15.74	718.80	2.71	2.177	0.22
TILL-1	042SMPL.D#	ngsa047b	30/07/2009	0.235	14.98	730.80	2.61	2.135	0.05
TILL-1	050SMPL.D#	NGSA048A	30/07/2009	0.362	16.83	711.60	2.48	2.079	0.05
TILL-1	080SMPL.D#	NGSA048A	30/07/2009	0.403	17.84	708.20	2.48	2.062	0.05
TILL-1	007SMPL.D#	NGSA048B	31/07/2009	0.333	16.86	713.50	1.73	2.080	0.14
TILL-1	039SMPL.D#	NGSA048B	31/07/2009	0.254	16.58	739.20	1.71	2.072	0.40
TILL-1	047SMPL.D#	NGSA049A	31/07/2009	0.262	16.84	707.10	2.02	2.057	0.15
TILL-1	077SMPL.D#	NGSA049A	31/07/2009	0.258	16.54	694.40	1.82	2.061	0.12
TILL-1	007SMPL.D#	NGSA049B	3/08/2009	0.289	15.24	704.60	2.53	2.107	0.17
TILL-1	039SMPL.D#	NGSA049B	3/08/2009	0.282	16.61	713.80	1.74	2.073	0.21
TILL-1	040SMPL.D#	NGSA051a	5/08/2009	0.248	17.87	692.70	1.62	2.114	0.27
TILL-1	049SMPL.D#	NGSA051a	5/08/2009	0.271	17.14	690.90	1.75	2.047	0.23
TILL-1	007SMPL.D#	NGSA050b	7/08/2009	0.465	14.79	718.00	2.04	2.107	0.26
TILL-1	013SMPL.D#	NGSA050b	7/08/2009	0.467	16.32	734.90	1.46	2.023	0.26
TILL-1	041SMPL.D#	NGSA050b	7/08/2009	0.503	15.85	735.30	1.15	2.047	0.24
Till 1A	007SMPL.D#	ngsa051a	11/08/2009	0.301	17.28	716.70	2.32	2.297	0.30
Till 1A	043SMPL.D#	ngsa051a	11/08/2009	0.290	15.29	711.90	2.12	2.253	0.19
Till 1A	051SMPL.D#	NGSA050b	11/08/2009	0.355	16.13	707.20	1.69	2.396	0.32
Till 1A	053SMPL.D#	ngsa051a	11/08/2009	0.382	15.82	713.80	1.53	2.280	0.27
Till 1A	073SMPL.D#	ngsa051a	11/08/2009	0.352	15.39	703.90	1.89	2.334	0.29
Till 1A	090SMPL.D#	NGSA050b	11/08/2009	0.368	15.96	689.50	0.55	2.243	0.15
Till 1A	092SMPL.D#	ngsa051a	11/08/2009	0.341	14.99	702.70	1.21	2.312	0.22
TILL-1	007SMPL.D#	NGSA053a	8/09/2009	0.163	17.76	719.50	1.82	2.061	0.67
TILL-1	037SMPL.D#	NGSA053b	8/09/2009	0.154	19.01	750.00	1.50	2.078	0.73
TILL-1	007SMPL.D#	NGSA053b	8/09/2009	0.183	17.60	715.40	1.28	2.047	0.45
TILL-1	039SMPL.D#	NGSA053a	8/09/2009	0.187	18.21	712.80	1.68	2.027	0.49
TILL-1	007SMPL.D#	NGSA054a	9/09/2009	0.218	16.29	728.40	1.72	1.681	0.24
TILL-1	037SMPL.D#	NGSA054b	9/09/2009	0.229	15.76	745.50	1.72	1.631	0.19

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-1	68.190	18.12	64.41	1.02	45.56	5.37	3.563	1.532	17.81	5.791
TILL-1	68.310	18.52	65.33	1.04	45.69	5.30	3.494	1.502	17.10	5.776
TILL-1	68.230	18.80	65.43	1.07	43.63	5.28	3.477	1.403	18.07	5.848
TILL-1	68.770	19.16	65.01	1.01	44.33	5.34	3.530	1.481	16.92	5.866
TILL-1	70.160	18.17	61.25	1.04	44.63	5.43	3.456	1.451	16.88	5.653
TILL-1	69.790	18.08	61.91	1.15	43.48	5.46	3.502	1.429	18.26	5.779
TILL-1	70.570	18.48	65.04	1.03	45.65	5.37	3.550	1.543	16.89	5.850
TILL-1	69.750	18.65	65.63	1.06	46.21	5.32	3.509	1.488	16.88	5.811
TILL-1	67.430	18.28	63.62	1.00	44.10	5.33	3.541	1.399	17.54	5.799
TILL-1	68.240	18.21	64.10	1.13	44.21	5.51	3.484	1.453	18.11	5.819
TILL-1	70.560	19.13	65.40	1.05	46.79	5.80	3.648	1.565	18.30	5.921
TILL-1	69.930	18.92	65.10	1.01	46.31	5.84	3.736	1.547	18.30	6.045
TILL-1	68.930	17.59	63.18	1.06	44.02	5.75	3.573	1.567	18.05	5.767
TILL-1	69.200	18.50	62.72	0.99	42.57	5.78	3.498	1.522	18.30	5.849
TILL-1	69.740	17.96	71.28	1.10	45.63	5.62	3.642	1.530	18.26	5.819
TILL-1	70.980	18.52	73.20	1.13	47.26	5.72	3.611	1.591	17.20	6.003
TILL-1	68.880	19.02	65.79	1.03	45.38	5.84	3.698	1.486	18.31	5.842
TILL-1	69.690	19.00	65.70	0.98	43.56	5.73	3.572	1.539	19.06	5.846
TILL-1	69.610	18.86	66.11	1.03	43.30	5.61	3.671	1.523	17.26	5.790
TILL-1	68.660	18.92	63.79	0.98	45.06	5.54	3.621	1.531	17.66	5.852
TILL-1	69.780	18.57	64.03	1.07	44.19	5.80	3.632	1.542	17.03	5.833
TILL-1	67.350	18.36	64.51	1.01	44.64	5.73	3.513	1.527	16.70	5.716
TILL-1	68.340	18.40	63.42	0.93	43.78	5.87	3.530	1.496	18.31	5.839
TILL-1	67.020	18.98	67.63	0.89	46.95	5.42	3.611	1.499	16.63	5.713
TILL-1	67.690	18.55	67.81	0.92	46.81	5.29	3.645	1.608	15.60	5.817
TILL-1	68.880	18.55	67.95	0.94	46.87	5.67	3.598	1.528	17.21	5.836
TILL-1	67.090	19.37	66.75	0.98	47.72	5.46	3.652	1.550	18.45	5.710
TILL-1	67.590	18.84	67.87	0.99	47.15	5.50	3.750	1.572	18.32	5.780
TILL-1	70.310	18.69	63.05	1.04	44.01	5.43	3.567	1.465	18.22	5.875
TILL-1	69.970	19.18	64.91	0.99	44.41	5.51	3.600	1.483	20.04	5.809
TILL-1	70.740	19.75	65.85	1.10	45.24	5.60	3.596	1.535	20.31	5.895
TILL-1	67.850	18.17	62.00	1.01	42.35	5.51	3.470	1.441	17.33	5.641
TILL-1	67.780	18.07	63.32	1.01	42.40	5.43	3.556	1.480	17.96	5.551
TILL-1	68.730	17.83	63.70	1.02	44.18	5.32	3.492	1.404	16.63	5.711
TILL-1	69.300	18.32	62.55	1.11	43.89	5.35	3.463	1.443	17.80	5.821
TILL-1	68.460	18.07	62.11	1.11	43.87	5.37	3.630	1.503	17.16	5.810
TILL-1	68.860	18.06	62.85	1.06	44.36	5.48	3.599	1.496	18.63	5.910
TILL-1	68.880	18.50	63.37	1.04	43.60	5.45	3.639	1.515	17.40	5.880
TILL-1	68.950	18.38	62.14	1.10	43.20	5.44	3.679	1.587	18.18	5.838
TILL-1	69.740	18.88	63.71	1.12	41.89	5.64	3.648	1.581	18.11	5.900
TILL-1	69.630	18.53	65.63	1.00	40.95	5.37	3.674	1.559	17.07	5.854
TILL-1	72.630	17.84	65.11	1.11	45.36	5.72	3.608	1.625	17.02	6.146
TILL-1	71.900	17.88	65.52	1.16	45.72	5.73	3.587	1.625	16.93	5.974
TILL-1	70.380	17.42	64.12	1.14	44.27	5.41	3.465	1.556	16.78	5.893
TILL-1	69.780	17.68	63.84	1.15	43.60	5.33	3.391	1.586	16.86	5.829
TILL-1	72.670	18.27	63.69	1.17	45.96	5.81	3.692	1.623	17.56	6.151
TILL-1	71.800	18.32	63.40	1.13	44.43	5.63	3.600	1.618	16.50	5.879
TILL-1	72.220	17.69	65.54	1.18	44.44	5.65	3.653	1.611	16.67	6.186
TILL-1	70.810	17.86	67.22	1.15	45.12	5.50	3.736	1.601	17.27	6.200
TILL-1	69.240	17.84	63.54	1.18	44.65	5.50	3.652	1.567	16.68	6.114
TILL-1	69.120	18.08	65.26	1.15	44.88	5.59	3.595	1.597	17.10	6.008
TILL-1	68.820	17.35	62.97	1.12	44.34	5.39	3.594	1.592	16.37	6.043
TILL-1	68.850	17.85	65.86	1.16	44.55	5.40	3.566	1.654	17.34	5.974
TILL-1	69.650	17.39	63.33	1.17	44.58	5.30	3.520	1.619	17.45	6.004
TILL-1	68.880	17.42	62.68	1.07	44.23	5.36	3.543	1.599	17.43	5.854
TILL-1	69.910	17.40	65.84	1.06	44.29	5.27	3.514	1.635	18.64	6.078
TILL-1	68.970	17.15	65.45	0.96	43.74	5.27	3.479	1.594	18.87	6.056
TILL-1	69.910	17.79	69.17	1.07	42.33	5.53	3.574	1.559	17.36	6.014
TILL-1	70.080	17.89	72.31	1.08	41.83	5.79	3.664	1.648	19.21	6.108
TILL-1	70.150	18.04	67.42	1.11	45.53	5.98	3.622	1.596	17.70	6.079
TILL-1	69.310	18.04	66.56	1.03	43.51	6.03	3.557	1.615	18.86	5.999
TILL-1	69.320	18.23	67.30	1.10	44.43	5.49	3.490	1.562	17.92	5.956
TILL-1	68.970	18.19	66.85	1.15	44.30	5.29	3.513	1.525	17.39	6.035
TILL-1	69.830	17.42	64.79	1.08	42.34	5.26	3.427	1.526	16.70	6.048
TILL-1	69.470	17.45	65.79	1.19	42.13	5.37	3.517	1.546	18.22	5.917
TILL-1	68.540	17.12	63.94	1.10	45.60	5.39	3.567	1.556	17.56	6.027
TILL-1	67.250	17.50	64.43	0.97	44.87	5.38	3.544	1.576	15.87	5.938
TILL-1	68.460	17.61	65.94	1.02	43.77	5.75	3.554	1.589	19.06	5.843
TILL-1	67.830	17.08	67.39	1.07	43.22	5.97	3.461	1.564	16.49	5.856
TILL-1	67.800	16.88	64.42	1.00	43.99	5.51	3.508	1.583	18.96	5.801
TILL-1	67.850	17.57	65.43	1.01	45.51	5.61	3.507	1.595	16.91	5.806
TILL-1	68.760	18.20	66.95	1.06	44.33	5.55	3.492	1.520	16.94	5.920
TILL-1	70.160	17.97	67.89	1.07	46.16	5.54	3.609	1.557	18.09	5.980
TILL-1	69.960	17.29	67.84	1.21	43.93	5.57	3.424	1.585	16.26	6.032
Till 1A	70.360	17.52	66.21	1.09	46.54	5.37	3.501	1.577	17.83	6.069
Till 1A	68.480	17.87	68.80	1.04	44.52	5.52	3.569	1.583	16.22	5.953
Till 1A	70.680	17.25	67.90	1.06	44.12	5.38	3.535	1.613	16.99	5.958
Till 1A	71.090	17.32	66.54	0.97	45.76	5.49	3.597	1.619	18.04	5.891
Till 1A	69.530	17.64	67.80	1.07	45.50	5.34	3.647	1.530	17.63	5.785
Till 1A	69.620	17.54	70.34	1.00	44.44	5.35	3.594	1.521	16.73	5.942
Till 1A	69.480	17.98	66.20	1.10	46.62	5.44	3.613	1.550	17.96	5.876
TILL-1	69.250	18.18	63.76	1.06	47.39	5.91	3.539	1.424	17.79	6.079
TILL-1	69.750	18.41	64.94	1.07	46.56	5.97	3.639	1.446	18.67	6.134
TILL-1	69.440	18.03	65.26	1.01	47.60	5.81	3.672	1.479	17.15	6.020
TILL-1	68.870	18.46	65.19	0.98	47.55	5.85	3.554	1.433	17.42	5.950
TILL-1	70.180	18.91	65.36	1.05	45.85	5.66	3.574	1.485	17.54	6.109
TILL-1	69.510	18.51	65.60	1.08	45.03	5.69	3.643	1.468	17.40	6.101

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-1	0.591	11.970	1.186	27.85	0.496	0.91	10.920	28.03	25.81	22.03
TILL-1	0.607	12.110	1.159	28.14	0.481	0.82	11.120	27.69	26.60	22.38
TILL-1	0.528	12.430	1.161	27.76	0.447	0.88	11.200	28.07	25.13	22.37
TILL-1	0.567	12.400	1.184	28.83	0.446	0.94	11.390	28.45	24.27	22.46
TILL-1	0.481	12.740	1.174	28.24	0.462	1.07	10.990	28.03	22.12	21.91
TILL-1	0.547	12.720	1.189	28.11	0.452	1.10	11.030	28.59	21.79	21.88
TILL-1	0.597	12.690	1.256	28.46	0.560	0.92	11.230	28.59	24.25	22.17
TILL-1	0.547	12.790	1.236	28.64	0.547	0.96	10.810	28.90	24.74	22.39
TILL-1	0.499	11.740	1.162	28.37	0.472	0.84	10.740	27.87	22.09	22.06
TILL-1	0.478	11.550	1.192	28.28	0.496	0.95	10.610	27.49	21.78	21.85
TILL-1	0.517	12.490	1.299	28.97	0.569	1.17	11.140	28.87	25.18	22.85
TILL-1	0.492	12.660	1.288	29.66	0.558	0.88	11.700	29.12	24.66	22.68
TILL-1	0.533	12.130	1.243	27.86	0.555	0.96	10.900	27.99	26.68	21.74
TILL-1	0.530	12.020	1.261	28.35	0.531	1.02	10.730	27.59	26.05	21.78
TILL-1	0.548	12.590	1.278	28.83	0.549	2.52	10.970	28.74	25.16	22.37
TILL-1	0.547	12.860	1.264	29.28	0.530	1.92	11.390	28.29	26.94	22.31
TILL-1	0.545	12.530	1.310	28.37	0.524	0.84	10.790	28.17	24.90	22.79
TILL-1	0.465	12.400	1.261	28.71	0.541	0.75	10.990	28.76	23.86	22.52
TILL-1	0.582	12.240	1.245	28.92	0.556	0.76	10.980	28.43	24.74	22.54
TILL-1	0.531	12.360	1.278	27.84	0.544	0.82	10.810	28.59	23.30	22.31
TILL-1	0.455	12.080	1.282	28.75	0.535	0.95	11.330	28.34	22.80	22.16
TILL-1	0.528	12.200	1.243	27.65	0.519	0.89	10.910	28.06	23.81	22.00
TILL-1	0.550	12.280	1.256	27.83	0.552	0.90	11.000	28.15	24.48	22.05
TILL-1	0.499	12.910	1.266	26.64	0.543	1.02	10.540	28.11	26.33	22.69
TILL-1	0.453	12.980	1.257	26.64	0.517	0.87	10.220	28.10	24.78	22.80
TILL-1	0.559	12.780	1.251	27.62	0.548	1.07	10.720	28.67	25.11	22.62
TILL-1	0.483	13.120	1.298	26.69	0.582	0.82	10.520	27.79	24.74	22.94
TILL-1	0.500	12.840	1.255	27.12	0.545	0.81	10.630	28.64	24.70	22.44
TILL-1	0.557	12.320	1.197	28.15	0.498	0.93	10.980	28.67	22.83	27.57
TILL-1	0.564	12.400	1.251	28.18	0.513	0.90	10.930	28.67	23.89	27.59
TILL-1	0.606	12.190	1.210	28.62	0.508	1.19	11.320	28.83	23.83	27.33
TILL-1	0.595	11.860	1.206	26.99	0.493	0.90	10.540	27.52	23.00	26.72
TILL-1	0.563	11.840	1.207	27.47	0.517	0.89	10.840	27.27	22.93	26.72
TILL-1	0.593	12.050	1.243	28.03	0.486	0.89	10.800	27.90	23.83	22.10
TILL-1	0.507	12.180	1.234	28.58	0.468	0.66	11.340	28.25	24.21	22.21
TILL-1	0.545	12.370	1.242	27.43	0.505	0.55	11.240	28.06	21.96	22.15
TILL-1	0.550	12.240	1.202	28.02	0.514	0.66	11.230	28.44	22.97	22.06
TILL-1	0.440	12.470	1.245	28.08	0.547	0.90	11.110	28.33	21.82	22.24
TILL-1	0.454	12.080	1.252	27.63	0.532	0.81	10.930	28.66	21.52	22.50
TILL-1	0.451	12.310	1.280	27.94	0.517	0.83	10.750	29.01	21.22	22.59
TILL-1	0.478	12.260	1.253	28.18	0.541	1.02	11.190	29.26	21.63	22.75
TILL-1	0.627	12.450	1.254	27.77	0.535	0.68	11.370	30.00	24.00	22.69
TILL-1	0.688	12.350	1.237	27.77	0.552	0.68	11.300	30.07	23.82	22.76
TILL-1	0.707	12.120	1.196	27.77	0.510	0.56	11.070	29.60	23.10	22.26
TILL-1	0.645	11.960	1.198	26.89	0.505	0.73	10.750	29.88	23.13	22.10
TILL-1	0.659	12.600	1.281	28.35	0.555	0.85	11.310	29.56	21.89	22.52
TILL-1	0.732	12.340	1.235	27.53	0.541	0.71	10.990	29.63	21.46	22.48
TILL-1	0.770	12.520	1.272	28.12	0.551	0.66	11.240	29.68	23.21	22.74
TILL-1	0.570	12.460	1.251	27.34	0.557	0.58	11.120	29.65	22.92	22.56
TILL-1	0.654	12.570	1.269	26.80	0.542	0.98	10.960	29.01	22.66	22.41
TILL-1	0.646	12.770	1.236	26.71	0.545	0.98	10.890	28.93	23.00	22.42
TILL-1	0.688	12.640	1.233	26.93	0.529	0.81	11.110	28.33	22.25	22.34
TILL-1	0.645	12.630	1.239	26.85	0.572	0.63	10.870	28.98	22.76	22.15
TILL-1	0.652	12.490	1.220	27.04	0.546	0.76	11.070	30.00	22.67	22.60
TILL-1	0.628	12.480	1.232	26.79	0.537	0.83	10.710	29.52	22.64	22.53
TILL-1	0.464	12.030	1.253	27.64	0.556	0.73	11.120	29.48	22.63	22.78
TILL-1	0.488	12.170	1.258	27.48	0.483	0.55	11.030	28.90	21.73	22.60
TILL-1	0.575	12.590	1.292	27.16	0.547	1.61	11.200	29.69	23.21	22.57
TILL-1	0.613	12.390	1.273	27.40	0.516	1.56	10.850	29.75	21.62	22.81
TILL-1	0.659	12.240	1.236	26.61	0.554	0.87	11.210	29.50	20.43	22.82
TILL-1	0.436	12.310	1.219	26.82	0.555	0.94	10.960	29.65	21.76	22.92
TILL-1	0.539	12.650	1.217	27.05	0.534	0.89	11.540	30.02	22.20	22.38
TILL-1	0.439	12.500	1.232	26.62	0.569	0.50	10.510	29.31	21.16	22.38
TILL-1	0.678	12.530	1.173	26.91	0.482	0.86	10.760	29.18	24.86	22.50
TILL-1	0.580	12.270	1.203	27.29	0.466	0.73	10.980	29.01	26.60	22.13
TILL-1	0.607	12.360	1.170	26.72	0.525	1.07	11.020	28.54	23.12	22.21
TILL-1	0.527	12.290	1.218	25.86	0.523	0.95	10.710	28.37	24.88	22.10
TILL-1	0.794	12.450	1.158	26.63	0.495	0.97	10.010	29.30	25.03	22.33
TILL-1	0.814	12.570	1.215	26.12	0.505	0.62	11.010	29.26	25.77	22.52
TILL-1	0.538	12.220	1.179	25.64	0.493	1.32	10.350	28.20	21.38	22.61
TILL-1	0.625	12.340	1.175	26.45	0.488	1.16	10.620	28.01	24.87	22.67
TILL-1	0.547	12.510	1.211	26.62	0.502	0.73	10.960	29.21	24.99	22.71
TILL-1	0.501	12.690	1.238	26.87	0.555	0.75	10.850	28.86	23.01	22.62
TILL-1	0.501	12.230	1.258	26.83	0.502	0.72	10.670	28.47	22.84	22.66
Till 1A	0.517	12.660	1.222	27.31	0.552	1.03	10.860	29.69	23.23	24.10
Till 1A	0.647	12.540	1.244	27.21	0.529	0.93	10.380	29.11	23.47	24.12
Till 1A	0.541	12.830	1.264	26.99	0.514	1.07	11.210	29.39	39.69	23.93
Till 1A	0.596	12.770	1.246	27.07	0.543	1.08	10.800	29.90	24.10	24.18
Till 1A	0.498	12.820	1.228	26.81	0.544	1.10	10.430	30.32	22.92	24.13
Till 1A	0.534	12.800	1.234	26.55	0.517	1.26	10.670	29.64	42.15	23.98
Till 1A	0.573	12.870	1.218	26.78	0.517	0.86	10.820	29.77	24.20	24.08
TILL-1	0.548	12.530	1.138	28.19	0.455	0.35	10.890	28.70	24.26	21.81
TILL-1	0.515	12.600	1.157	28.91	0.460	0.15	11.200	28.38	25.02	21.81
TILL-1	0.520	12.540	1.238	28.22	0.517	0.15	10.100	28.45	24.81	22.22
TILL-1	0.502	12.600	1.206	28.25	0.519	0.15	10.060	28.46	23.43	22.20
TILL-1	0.481	12.720	1.193	28.45	0.510	0.60	11.050	28.99	22.53	22.67
TILL-1	0.503	12.540	1.185	28.63	0.542	0.49	11.140	28.75	24.36	22.49

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-1	6.947	44.86	10.62	14.29	6.578	1.91	307.50	0.642	0.965	5.833
TILL-1	7.014	44.91	10.15	14.29	6.705	1.83	315.60	0.619	1.004	5.850
TILL-1	6.970	43.73	10.96	13.65	6.396	1.69	306.20	0.645	0.935	5.416
TILL-1	7.032	45.73	10.75	14.21	6.817	1.89	313.80	0.661	0.947	5.443
TILL-1	6.924	44.76	10.52	13.14	6.458	1.74	304.00	0.635	1.004	5.215
TILL-1	7.001	44.67	10.20	13.13	6.437	1.81	309.40	0.623	0.971	5.162
TILL-1	7.248	45.18	10.75	13.61	6.375	1.66	311.20	0.634	1.085	5.088
TILL-1	7.128	44.42	10.88	13.62	6.638	1.72	317.70	0.630	1.089	5.099
TILL-1	6.868	41.06	8.85	13.29	6.389	2.01	295.10	0.569	1.041	5.731
TILL-1	6.796	46.42	9.52	13.59	6.440	1.80	309.80	0.566	1.004	5.820
TILL-1	7.253	45.14	10.28	14.55	6.622	1.96	312.10	0.579	1.088	5.827
TILL-1	7.280	44.01	10.42	14.33	6.199	1.99	318.40	0.585	1.112	5.860
TILL-1	7.104	41.70	9.63	13.74	6.567	1.67	302.20	0.552	1.055	5.658
TILL-1	6.961	43.66	10.20	13.99	6.569	1.73	304.60	0.565	1.037	5.669
TILL-1	7.083	45.62	10.04	13.26	6.433	1.80	309.20	0.583	1.068	5.176
TILL-1	7.328	47.84	11.15	14.16	6.164	1.88	322.00	0.575	1.114	5.045
TILL-1	7.088	44.55	10.45	13.62	6.727	1.66	310.00	0.573	1.076	5.665
TILL-1	7.216	44.31	9.64	13.48	6.536	1.76	314.70	0.588	1.073	5.659
TILL-1	7.130	46.07	9.98	13.13	6.602	1.97	318.50	0.584	1.081	5.761
TILL-1	7.034	43.99	10.12	14.08	6.502	1.58	305.80	0.580	1.050	5.868
TILL-1	7.092	45.38	9.80	14.25	6.611	1.72	322.00	0.579	1.075	5.779
TILL-1	6.973	43.45	9.83	14.05	6.454	1.60	300.30	0.598	1.073	5.805
TILL-1	7.086	44.52	9.95	14.12	6.315	1.59	308.30	0.592	1.081	5.708
TILL-1	6.998	40.78	9.58	12.39	6.563	1.73	283.70	0.626	1.050	5.959
TILL-1	7.052	38.42	9.50	12.13	6.660	1.83	281.10	0.638	1.039	5.995
TILL-1	7.056	42.37	10.34	13.15	6.399	1.79	307.60	0.601	1.073	5.891
TILL-1	7.034	42.92	10.09	13.44	6.493	1.86	303.30	0.629	1.061	6.147
TILL-1	7.095	45.72	9.92	14.35	6.418	1.92	322.70	0.620	1.031	5.940
TILL-1	7.073	44.01	10.43	12.67	6.540	2.03	309.40	0.595	1.045	5.838
TILL-1	6.984	45.24	10.39	12.76	6.454	1.75	309.90	0.590	1.047	5.956
TILL-1	7.153	47.48	11.23	13.67	6.278	1.63	328.40	0.601	1.035	5.747
TILL-1	6.907	43.35	9.59	11.64	6.011	2.00	292.70	0.596	1.005	5.631
TILL-1	6.910	43.24	9.47	12.79	6.009	1.70	298.60	0.582	0.992	5.617
TILL-1	6.943	43.90	9.31	12.90	6.329	1.37	304.70	0.612	0.988	5.500
TILL-1	6.989	46.50	9.63	13.37	5.989	1.89	322.00	0.581	0.966	5.468
TILL-1	7.127	43.54	10.12	10.43	6.337	1.53	287.50	0.604	1.018	5.618
TILL-1	7.042	44.23	9.20	12.00	6.178	1.34	299.90	0.583	1.075	5.632
TILL-1	7.162	44.11	9.55	13.42	6.429	1.87	306.20	0.595	1.032	5.376
TILL-1	6.931	44.27	9.09	13.99	6.549	1.42	300.00	0.572	1.065	6.429
TILL-1	7.136	44.77	8.81	7.68	7.003	1.53	270.80	0.579	1.096	5.963
TILL-1	7.107	45.63	10.59	7.74	6.733	1.56	278.40	0.586	1.043	5.831
TILL-1	7.331	43.51	11.21	12.74	6.503	1.66	301.00	0.673	0.908	5.756
TILL-1	7.255	42.92	11.78	12.93	6.540	1.49	305.90	0.668	0.892	5.815
TILL-1	7.160	43.17	9.50	12.75	6.603	1.19	299.80	0.657	0.893	5.703
TILL-1	7.074	44.10	9.87	13.04	6.473	1.42	300.20	0.626	0.832	5.835
TILL-1	7.299	42.88	11.37	12.61	6.832	1.42	300.70	0.694	0.925	5.992
TILL-1	7.323	42.80	11.49	12.40	6.764	1.47	295.00	0.670	0.891	6.090
TILL-1	7.308	44.47	10.06	12.19	6.575	1.52	304.00	0.664	0.922	5.891
TILL-1	7.289	44.95	10.00	12.71	6.452	1.33	315.80	0.654	0.947	5.974
TILL-1	6.997	42.85	11.40	12.35	6.339	1.26	300.90	0.641	0.932	5.755
TILL-1	6.978	43.06	11.77	12.38	6.444	1.43	298.40	0.626	0.936	5.785
TILL-1	6.903	42.89	10.71	12.13	6.360	1.33	298.60	0.593	0.902	5.548
TILL-1	7.025	44.81	10.50	12.94	6.269	1.35	313.60	0.576	0.929	5.579
TILL-1	6.922	43.51	9.17	12.33	6.433	1.41	293.90	0.619	0.904	5.638
TILL-1	7.027	43.05	9.78	12.46	6.448	1.59	288.80	0.599	0.889	5.707
TILL-1	6.959	44.43	8.95	11.49	6.402	1.46	306.50	0.592	0.997	5.560
TILL-1	6.960	46.17	9.57	12.46	6.202	1.37	311.40	0.573	1.037	5.649
TILL-1	7.113	43.92	9.06	11.86	6.668	1.57	303.10	0.611	1.047	5.740
TILL-1	7.101	44.90	9.63	12.17	6.399	1.72	311.10	0.594	1.002	5.809
TILL-1	6.948	42.44	8.99	11.84	6.733	1.43	303.00	1.245	0.982	5.863
TILL-1	7.024	45.66	10.36	11.95	6.604	1.54	317.50	1.229	1.001	5.772
TILL-1	7.168	44.25	9.12	11.76	6.687	1.38	304.00	1.260	0.999	5.715
TILL-1	7.147	43.76	9.17	11.66	6.801	1.55	297.30	1.236	1.004	5.815
TILL-1	6.792	42.31	9.46	11.76	6.607	1.22	301.20	0.539	0.956	5.504
TILL-1	6.962	46.20	9.58	12.41	6.468	1.50	314.20	0.522	0.968	5.603
TILL-1	7.094	43.55	8.28	11.74	6.421	1.32	298.70	0.562	0.995	5.595
TILL-1	6.870	43.21	8.79	12.07	6.390	1.27	296.10	0.572	0.987	5.487
TILL-1	6.972	44.08	10.47	11.47	6.554	1.44	303.70	0.534	0.964	5.524
TILL-1	6.905	45.21	10.16	12.20	6.124	1.47	306.60	0.526	0.948	5.561
TILL-1	6.932	40.93	8.66	10.68	6.237	1.33	279.40	0.596	0.958	5.623
TILL-1	6.989	40.99	9.74	11.00	6.630	1.20	277.30	0.610	0.946	5.509
TILL-1	6.947	45.48	8.12	12.46	5.982	1.39	300.10	0.594	1.056	5.659
TILL-1	7.037	43.72	8.89	12.34	6.268	1.52	306.00	0.600	1.078	5.558
TILL-1	7.053	45.12	8.66	12.24	6.097	1.48	310.20	0.582	1.070	5.635
Till 1A	7.077	44.36	9.10	11.94	6.170	1.57	298.40	0.495	1.064	5.187
Till 1A	7.098	44.56	9.10	12.50	6.419	1.54	303.30	0.495	1.030	5.448
Till 1A	7.178	42.43	8.79	9.36	6.341	1.47	276.60	0.483	1.047	4.795
Till 1A	7.070	43.00	8.88	11.61	6.479	1.58	299.40	0.498	1.079	5.029
Till 1A	7.115	43.16	8.86	11.91	6.481	1.52	299.80	0.498	1.059	5.040
Till 1A	7.111	42.07	9.00	10.41	6.468	1.62	282.30	0.489	1.087	4.811
Till 1A	7.175	44.05	8.82	11.92	6.415	2.00	298.20	0.493	1.054	4.963
TILL-1	7.165	43.94	9.31	13.32	6.385	1.45	311.20	0.560	0.942	5.584
TILL-1	7.190	46.72	10.26	13.60	6.198	1.65	335.30	0.540	0.956	5.479
TILL-1	7.159	42.94	9.35	13.35	6.556	1.72	308.00	0.619	1.046	5.764
TILL-1	7.143	43.74	9.94	13.22	6.678	1.64	307.30	0.621	1.008	5.687
TILL-1	7.214	43.31	10.59	13.42	6.504	1.43	313.50	0.623	1.007	5.972
TILL-1	7.168	43.85	9.98	12.79	6.412	1.51	316.40	0.606	0.997	5.942

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLO:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-1	2.121	107.90	0.93	39.340	3.550	94.56	509.00	26-50	ngsa034a_edtdate
TILL-1	2.062	108.20	0.90	39.370	3.577	95.34	511.00	26-50	ngsa034a_edtdate
TILL-1	2.080	104.50	1.02	37.640	3.675	91.57	512.00	26-50	ngsa034B_edtdate
TILL-1	2.088	108.20	0.98	38.350	3.602	94.22	519.40	26-50	ngsa034B_edtdate
TILL-1	2.112	101.50	1.10	36.240	3.539	93.41	511.70	26-50	ngsa033b_edtdate
TILL-1	2.070	102.70	0.70	36.110	3.533	94.15	515.70	26-50	ngsa033b_edtdate
TILL-1	2.123	105.10	0.98	35.050	3.660	96.33	513.80	26-50	ngsa035b
TILL-1	2.169	106.70	0.98	34.580	3.701	103.80	514.30	26-50	ngsa035b
TILL-1	2.043	102.80	1.26	38.770	3.647	92.73	484.10	26-50	ngsa035a
TILL-1	2.005	105.90	0.87	41.310	3.542	94.72	499.90	26-50	ngsa035a
TILL-1	2.180	106.20	1.28	39.820	3.761	98.24	521.60	26-50	ngsa036a
TILL-1	2.135	108.20	0.94	40.500	3.833	96.09	526.30	26-50	ngsa036a
TILL-1	2.104	102.80	1.34	38.900	3.559	91.51	504.60	26-50	ngsa036b
TILL-1	2.098	104.60	0.90	38.930	3.597	91.63	505.20	26-50	ngsa036b
TILL-1	2.165	105.30	1.38	36.410	3.727	96.15	513.70	26-50	ngsa037a
TILL-1	2.161	107.40	1.05	36.660	3.744	99.61	526.20	26-50	ngsa037a
TILL-1	2.178	106.50	1.27	39.040	3.854	98.87	516.90	26-50	ngsa037b
TILL-1	2.151	105.20	1.00	39.860	3.763	94.11	518.90	26-50	ngsa037z
TILL-1	2.171	107.90	0.71	39.710	3.823	95.62	517.60	26-50	ngsa037z
TILL-1	2.145	105.90	1.17	38.510	3.623	93.41	508.30	26-50	ngsa038a
TILL-1	2.099	106.30	0.92	39.780	3.669	96.13	516.40	26-50	ngsa038a
TILL-1	2.124	104.20	1.07	38.570	3.715	92.17	501.50	26-50	ngsa038b
TILL-1	2.107	105.00	0.88	38.750	3.596	91.61	509.20	26-50	ngsa038b
TILL-1	2.248	102.00	1.09	37.120	3.736	95.54	495.70	26-50	ngsa039a
TILL-1	2.281	101.90	0.89	35.970	3.657	96.76	492.60	26-50	ngsa039a
TILL-1	2.216	106.30	0.80	38.770	3.791	96.39	515.90	26-50	ngsa039a
TILL-1	2.353	106.70	1.13	38.180	3.879	106.70	499.30	26-50	ngsa039b
TILL-1	2.213	108.30	0.74	40.290	3.850	106.90	509.10	26-50	ngsa039b
TILL-1	2.097	105.30	1.08	38.810	3.598	99.02	506.90	26-50	ngsa040a
TILL-1	2.115	107.80	0.76	39.290	3.680	100.60	512.30	26-50	ngsa040a
TILL-1	2.063	110.70	0.73	39.860	3.648	97.10	528.70	26-50	ngsa040a
TILL-1	2.063	102.10	1.11	38.210	3.606	92.58	490.40	26-50	ngsa040b
TILL-1	2.032	101.80	0.89	38.930	3.638	93.96	489.90	26-50	ngsa040b
TILL-1	1.992	104.30	0.91	38.890	3.433	91.68	501.80	26-50	ngsa041a
TILL-1	1.966	108.20	0.57	39.990	3.414	94.12	512.70	26-50	ngsa041a
TILL-1	2.101	103.40	1.04	36.700	3.644	94.73	499.40	26-50	ngsa041b_ngsa042a
TILL-1	2.069	103.80	0.70	38.470	3.616	93.07	514.40	26-50	ngsa041b_ngsa042a
TILL-1	2.092	102.50	0.96	36.720	3.623	98.86	506.90	26-50	ngsa041b_ngsa042a
TILL-1	2.103	105.10	0.65	41.820	3.611	95.04	499.90	26-50	ngsa041b_ngsa042a
TILL-1	2.091	104.30	0.80	37.380	3.776	91.17	509.80	26-50	ngsa042b
TILL-1	2.127	107.80	0.58	37.670	3.829	99.15	509.00	26-50	ngsa042b
TILL-1	1.977	105.70	1.33	36.650	3.724	98.13	501.30	26-50	ngsa043b
TILL-1	1.977	107.20	0.97	36.960	3.818	99.32	504.20	26-50	ngsa043b
TILL-1	1.921	103.80	1.43	35.700	3.624	97.18	492.30	26-50	NGSA043A
TILL-1	1.962	106.80	1.07	35.400	3.539	98.93	489.80	26-50	NGSA043A
TILL-1	1.954	106.60	1.25	37.970	3.868	94.27	509.10	26-50	NGSA044A
TILL-1	2.031	105.60	0.95	37.360	3.689	93.92	502.90	26-50	NGSA044A
TILL-1	1.977	106.40	1.26	37.380	3.839	98.33	510.30	26-50	ngsa044b
TILL-1	1.973	108.90	0.91	38.300	3.787	96.00	510.30	26-50	ngsa044b
TILL-1	1.950	105.40	1.24	37.880	3.729	95.61	509.00	26-50	ngsa045a
TILL-1	1.978	106.30	0.90	37.430	3.715	101.20	505.70	26-50	ngsa045a
TILL-1	1.880	105.20	1.30	37.700	3.711	94.31	508.70	26-50	ngsa045b
TILL-1	1.893	108.60	1.04	38.610	3.789	97.79	517.20	26-50	ngsa045b
TILL-1	1.890	105.40	1.27	36.170	3.612	96.56	504.70	26-50	ngsa046a
TILL-1	1.916	104.00	0.89	36.540	3.749	99.42	502.50	26-50	ngsa046a
TILL-1	1.922	107.10	1.04	35.820	3.731	94.75	507.10	26-50	NGSA047A
TILL-1	1.913	107.90	0.66	37.920	3.729	107.00	504.50	26-50	NGSA047A
TILL-1	2.083	104.40	1.63	37.160	4.006	98.51	514.80	26-50	NGSA046B
TILL-1	2.083	108.00	1.36	38.490	4.067	100.20	508.40	26-50	NGSA046B
TILL-1	2.003	106.30	1.55	35.410	3.813	98.49	503.90	26-50	NGSA047B
TILL-1	2.003	109.10	1.20	37.650	3.698	104.00	498.70	26-50	NGSA047B
TILL-1	1.953	105.00	0.94	36.360	3.743	103.40	516.50	26-50	ngsa048a
TILL-1	1.952	105.40	0.69	36.800	3.685	103.10	511.40	26-50	ngsa048a
TILL-1	1.916	104.50	1.03	36.140	3.604	98.39	512.40	26-50	ngsa048b
TILL-1	1.867	108.20	0.68	37.810	3.654	105.30	524.30	26-50	ngsa048b
TILL-1	1.968	105.00	0.98	36.770	3.645	96.50	507.20	26-50	ngsa049a
TILL-1	1.893	108.80	0.70	36.680	3.711	98.73	500.80	26-50	ngsa049a
TILL-1	1.968	103.10	1.14	36.660	3.690	106.70	502.10	26-50	ngsa49b
TILL-1	1.929	106.70	0.72	38.300	3.750	100.30	501.20	26-50	ngsa49b
TILL-1	1.926	103.90	1.21	34.950	3.671	100.50	489.80	26-50	ngsa051a
TILL-1	1.887	105.70	0.92	34.850	3.645	105.90	488.30	26-50	ngsa051a
TILL-1	1.995	106.60	0.77	36.570	3.589	107.20	506.70	26-50	ngsa050b
TILL-1	1.982	106.90	0.65	38.060	3.628	109.10	508.20	26-50	ngsa050b
TILL-1	1.944	109.50	0.59	37.450	3.746	96.24	510.20	26-50	ngsa050b
Till 1A	1.990	107.00	0.97	34.160	3.745	107.30	511.10	26-50	ngsa051z
Till 1A	2.013	111.00	0.69	35.970	3.661	107.30	500.50	26-50	ngsa051z
Till 1A	1.954	102.80	0.92	33.260	3.762	100.20	502.40	26-50	ngsa050bb
Till 1A	1.976	106.50	0.77	33.540	3.719	105.60	510.30	26-50	ngsa050bb
Till 1A	2.049	104.50	0.67	33.210	3.682	103.30	501.30	26-50	ngsa050bb
Till 1A	1.944	107.00	0.67	33.510	3.699	103.30	496.50	26-50	ngsa050bb
Till 1A	1.994	107.20	0.71	32.940	3.764	105.40	497.10	26-50	ngsa050bb
TILL-1	1.904	108.10	1.18	37.260	3.703	94.75	486.50	51-75	ngsa053A
TILL-1	1.804	111.10	0.80	39.520	3.672	95.78	504.60	51-75	ngsa053A
TILL-1	1.973	109.10	1.48	37.860	3.764	98.78	486.50	51-75	ngsa053B
TILL-1	1.960	109.30	1.26	37.620	3.737	95.89	484.60	51-75	ngsa053B
TILL-1	2.140	109.70	1.35	37.720	3.821	95.56	490.40	51-75	ngsa054a
TILL-1	2.158	110.40	1.00	38.110	3.786	95.55	487.30	51-75	ngsa054a

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-1	007SMPL.D#	NGSA054b	10/09/2009	0.169	18.00	722.70	0.55	1.659	0.19
TILL-1	039SMPL.D#	NGSA054a	10/09/2009	0.158	17.17	723.50	0.55	1.598	0.27
TILL-1	007SMPL.D#	NGSA055A	10/09/2009	0.236	17.11	712.00	1.83	2.158	0.19
TILL-1	037SMPL.D#	ngsa055b	10/09/2009	0.198	17.31	711.40	1.93	2.141	0.28
TILL-1	007SMPL.D#	ngsa055b	11/09/2009	0.196	17.74	716.40	2.29	1.785	0.05
TILL-1	039SMPL.D#	ngsa055a	11/09/2009	0.165	16.77	712.90	2.23	1.778	0.18
TILL-1	007SMPL.D#	ngsa056a	11/09/2009	0.247	17.55	715.40	2.67	1.658	0.23
TILL-1	037SMPL.D#	ngsa055b	11/09/2009	0.178	16.64	723.40	2.06	1.623	0.32
TILL-1	007SMPL.D#	ngsa056b	14/09/2009	0.225	18.07	715.40	1.60	1.671	0.29
TILL-1	039SMPL.D#	ngsa056b	14/09/2009	0.178	17.15	712.30	1.79	1.607	0.27
TILL-1	007SMPL.D#	NGSA057A	15/10/2009	0.361	17.43	712.60	2.90	2.091	0.25
TILL-1	036SMPL.D#	iNT sTD	15/10/2009	0.305	17.73	722.20	2.55	2.264	0.39
TILL-1	007SMPL.D#	NGSA057B	16/10/2009	0.167	16.86	724.80	1.68	2.055	0.11
TILL-1	039SMPL.D#	NGSA057B	16/10/2009	0.202	17.56	752.10	1.79	2.078	0.05
TILL-1	041SMPL.D#	INT STD	16/10/2009	0.164	15.76	716.10	1.68	2.224	0.05
TILL-1	015SMPL.D#	Int Std	19/10/2009	0.085	15.83	702.30	1.76	2.283	0.15
TILL-1	038SMPL.D#	ngsa058b	19/10/2009	0.083	15.52	711.40	1.14	2.175	0.11
TILL-1	046SMPL.D#	ngsa058b	19/10/2009	0.288	16.89	697.00	1.70	2.111	0.68
TILL-1	074SMPL.D#	Int Std	19/10/2009	0.305	16.54	705.80	1.35	2.259	0.67
TILL-1	007SMPL.D#	ngsa059a	20/10/2009	0.317	17.08	708.10	1.50	2.113	0.37
TILL-1	036SMPL.D#	int Std	20/10/2009	0.260	16.43	692.30	1.65	2.238	0.61
TILL-1	038SMPL.D#	NGSA059B	20/10/2009	0.231	16.48	714.20	1.91	2.164	0.54
TILL-1	046SMPL.D#	NGSA059B	20/10/2009	0.341	17.72	735.20	1.70	2.140	0.24
TILL-1	078SMPL.D#	int Std	20/10/2009	0.297	16.25	710.00	1.35	2.203	0.11
TILL-1	080SMPL.D#	ngsa059a	20/10/2009	0.373	16.01	717.30	0.55	2.088	0.35
TILL-1	007SMPL.D#	NGSA060a	26/10/2009	0.218	17.69	746.10	1.58	2.071	0.28
TILL-1	024SMPL.D#	NGSA060b	26/10/2009	0.294	17.07	705.50	1.72	2.112	0.35
TILL-1	039SMPL.D#	NGSA060b	26/10/2009	0.244	17.59	710.60	1.45	2.093	0.28
TILL-1	041SMPL.D#		26/10/2009	0.305	16.96	713.80	1.71	2.268	0.13
TILL-1	007SMPL.D#	NGSA060b	28/10/2009	0.240	16.68	705.30	2.57	2.141	0.29
TILL-1	040SMPL.D#	NGSA061B	28/10/2009	0.220	16.54	715.20	2.58	2.030	0.25
TILL-1	048SMPL.D#	NGSA061B	28/10/2009	0.333	18.60	701.40	2.16	2.158	0.24
TILL-1	080SMPL.D#	NGSA060b	28/10/2009	0.312	17.73	708.00	1.74	2.099	0.17
TILL-1	007SMPL.D#	NGSA061A	29/10/2009	0.292	15.96	718.60	1.31	2.073	0.17
TILL-1	009SMPL.D#	NGSA062A	29/10/2009	0.279	16.70	704.10	1.55	2.216	0.23
TILL-1	039SMPL.D#	NGSA062A	29/10/2009	0.319	16.44	711.20	1.47	2.183	0.11
TILL-1	047SMPL.D#	NGSA062A	29/10/2009	0.298	17.38	718.50	1.66	2.143	0.25
TILL-1	077SMPL.D#	NGSA062A	29/10/2009	0.284	16.24	707.30	1.50	2.159	0.26
TILL-1	007SMPL.D#	NGSA062B	30/10/2009	0.317	16.20	702.40	1.35	2.063	0.30
TILL-1	039SMPL.D#	NGSA063A	30/10/2009	0.300	17.32	697.00	1.27	2.106	0.21
TILL-1	047SMPL.D#	NGSA063A	30/10/2009	0.317	17.52	698.50	1.84	2.086	0.26
TILL-1	077SMPL.D#	NGSA062B	30/10/2009	0.341	15.97	696.10	1.47	2.108	0.20
TILL-1	007SMPL.D#	NGSA063B	4/11/2009	0.373	17.14	700.10	1.53	2.090	0.25
TILL-1	007SMPL.D#	NGSA065A	5/11/2009	0.247	16.53	713.60	1.76	2.052	0.05
TILL-1	013SMPL.D#	64a	5/11/2009	0.289	16.07	708.30	1.67	2.102	0.22
TILL-1	028SMPL.D#	64b	5/11/2009	0.278	15.64	720.50	1.34	2.110	0.24
TILL-1	039SMPL.D#	std	5/11/2009	0.252	16.12	709.20	1.57	2.283	0.20
TILL-1	047SMPL.D#	NGSA064A	5/11/2009	0.310	16.80	707.40	1.44	2.180	0.48
TILL-1	075SMPL.D#	NGSA065A	5/11/2009	0.232	17.25	697.40	1.41	2.039	0.56
TILL-1	007SMPL.D#	NGSA064B	6/11/2009	0.282	16.01	714.00	1.63	2.191	0.20
TILL-1	039SMPL.D#	NGSA065B	6/11/2009	0.271	16.91	706.40	1.55	2.055	0.19
TILL-1	047SMPL.D#	NGSA065B	6/11/2009	0.278	15.55	705.10	1.54	2.162	0.05
TILL-1	079SMPL.D#	NGSA064B	6/11/2009	0.258	16.17	707.30	1.36	2.124	0.05
TILL-1	007SMPL.D#	NGSA066a	17/11/2009	0.337	15.57	683.10	1.40	2.081	0.22
TILL-1	037SMPL.D#	NGSA066a	17/11/2009	0.333	15.77	696.00	1.91	2.067	0.27
TILL-1	039SMPL.D#	NGSA066B	17/11/2009	0.326	15.63	687.20	1.81	2.060	0.33
TILL-1	007SMPL.D#	NGSA066b	18/11/2009	0.284	16.58	683.90	1.21	2.048	0.21
TILL-1	039SMPL.D#	NGSA066a	18/11/2009	0.308	15.53	713.70	1.68	2.065	0.35
TILL-1	047SMPL.D#	NGSA067a	18/11/2009	0.288	16.73	704.00	1.49	2.163	0.27
TILL-1	077SMPL.D#	NGSA066b	18/11/2009	0.307	16.23	696.40	1.44	2.082	0.28
TILL-1	007SMPL.D#	NGSA067b	19/11/2009	0.300	15.93	705.40	2.16	2.099	0.24
TILL-1	032SMPL.D#	NGSA068a	19/11/2009	0.247	16.58	726.30	1.87	2.155	0.27
TILL-1	040SMPL.D#	NGSA068a	19/11/2009	0.293	16.23	712.00	1.42	2.143	0.17
TILL-1	070SMPL.D#	NGSA067b	19/11/2009	0.231	14.81	699.10	1.63	2.092	0.26
TILL-1	007SMPL.D#	NGSA068b	20/11/2009	0.360	16.84	705.00	1.66	2.152	0.32
TILL-1	038SMPL.D#	ngsa069a	20/11/2009	0.284	16.66	720.20	2.18	2.080	0.23
TILL-1	049SMPL.D#	ngsa069a	20/11/2009	0.326	17.73	734.70	2.09	2.122	0.34
TILL-1	007SMPL.D#	NGSA069b	23/11/2009	0.334	16.34	704.90	1.36	2.081	0.05
TILL-1	024SMPL.D#	NGSA069b	23/11/2009	0.662	17.33	698.90	0.55	2.025	0.41
TILL-1	038SMPL.D#	NGSA069b	23/11/2009	0.299	15.40	678.70	1.29	2.079	0.05
TILL-1	014SMPL.D#	NGSA070a	24/11/2009	0.369	14.31	686.50	2.13	2.278	0.27
TILL-1	016SMPL.D#	NGSA070b	24/11/2009	0.260	15.45	698.50	2.11	2.326	0.29
TILL-1	018SMPL.D#	STD	24/11/2009	0.214	12.80	679.50	1.42	2.289	0.05
TILL-1	046SMPL.D#	NGSA070a	24/11/2009	0.267	14.91	690.30	2.03	2.253	0.35
TILL-1	054SMPL.D#	NGSA070a	24/11/2009	0.288	14.97	706.90	1.43	2.346	0.23
TILL-1	084SMPL.D#	NGSA070a	24/11/2009	0.340	13.82	682.90	1.51	2.357	0.32
TILL-1	086SMPL.D#	NGSA070b	24/11/2009	0.402	15.70	708.60	1.21	2.363	0.05
TILL-1	088SMPL.D#	STD	24/11/2009	0.168	18.32	695.00	1.18	2.276	0.40
TILL-1	007SMPL.D#	NGSA071a	25/11/2009	0.855	15.66	702.90	2.72	2.093	0.25
TILL-1	037SMPL.D#	NGSA071a	25/11/2009	0.738	18.47	744.70	2.77	2.142	0.29
TILL-1	038SMPL.D#	STD	25/11/2009	0.764	17.66	750.70	2.84	2.262	0.14
TILL-1	039SMPL.D#	NGSA072a	26/11/2009	0.161	16.17	697.20	1.79	2.315	0.05
TILL-1	041SMPL.D#	NGSA072a	26/11/2009	0.218	15.10	693.40	1.66	2.355	0.05
TILL-1	049SMPL.D#	NGSA072a	26/11/2009	0.321	18.11	696.00	0.55	2.267	0.76
TILL-1	079SMPL.D#	STd	26/11/2009	0.282	15.26	684.30	0.55	2.344	0.85
TILL-1	007SMPL.D#	NGSA073a	27/11/2009	0.301	16.83	706.90	0.55	2.104	0.35
TILL-1	012SMPL.D#	std	27/11/2009	0.270	14.44	693.40	1.20	2.090	0.27

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-1	69.960	18.70	65.56	1.05	46.28	5.87	3.541	1.423	16.94	6.067
TILL-1	69.500	18.39	67.30	1.06	45.34	5.91	3.570	1.481	17.76	6.043
TILL-1	69.290	17.84	65.92	1.13	48.72	5.87	3.584	1.459	17.49	6.116
TILL-1	68.500	17.73	65.42	1.03	48.34	5.70	3.624	1.441	17.43	6.003
TILL-1	69.300	18.09	65.91	1.11	47.98	5.74	3.666	1.459	17.54	6.070
TILL-1	68.170	18.59	65.71	1.04	48.66	5.81	3.593	1.425	16.45	6.029
TILL-1	70.660	18.05	65.66	1.09	45.99	5.68	3.613	1.387	16.71	6.147
TILL-1	68.920	17.55	65.84	1.05	48.85	5.65	3.657	1.422	16.30	6.000
TILL-1	70.320	17.99	65.61	1.04	45.34	5.55	3.695	1.500	16.83	6.048
TILL-1	69.690	18.05	64.31	1.00	44.00	5.62	3.539	1.532	15.83	6.066
TILL-1	68.020	17.72	70.93	1.04	48.68	5.84	3.626	1.584	16.27	5.779
TILL-1	68.070	17.86	66.21	0.99	46.57	5.84	3.624	1.537	16.17	5.669
TILL-1	70.590	17.67	67.54	1.06	48.48	5.86	3.465	1.538	18.43	5.673
TILL-1	70.430	17.83	66.43	1.11	47.19	5.81	3.472	1.549	17.52	5.685
TILL-1	68.270	17.81	60.81	1.03	44.93	5.82	3.581	1.594	18.12	5.730
TILL-1	67.860	17.66	63.38	0.96	45.41	5.79	3.500	1.439	16.51	5.569
TILL-1	67.600	18.33	65.00	1.01	46.11	5.82	3.426	1.426	16.02	5.489
TILL-1	67.710	17.34	66.29	0.92	46.00	5.83	3.586	1.637	17.12	5.769
TILL-1	67.880	17.84	65.86	1.02	45.81	5.94	3.575	1.534	17.73	5.672
TILL-1	68.490	17.66	63.59	1.04	46.10	5.78	3.563	1.467	16.92	5.631
TILL-1	67.550	17.38	63.41	1.08	44.94	5.84	3.549	1.488	17.72	5.572
TILL-1	68.070	18.23	64.61	1.07	45.77	5.99	3.643	1.505	17.58	5.681
TILL-1	69.490	18.14	66.80	1.11	46.33	5.98	3.670	1.604	19.00	5.744
TILL-1	67.930	17.61	64.87	1.05	45.68	5.83	3.548	1.544	17.62	5.611
TILL-1	67.870	17.38	65.65	1.12	46.09	5.89	3.566	1.586	18.69	5.716
TILL-1	70.860	18.17	63.39	1.21	50.97	5.92	3.704	1.537	17.71	5.781
TILL-1	67.170	17.49	62.96	1.01	46.49	5.86	3.563	1.538	17.50	5.609
TILL-1	67.620	18.02	63.84	1.04	47.80	5.89	3.559	1.577	16.44	5.563
TILL-1	68.070	17.83	63.96	1.03	46.09	5.89	3.665	1.529	17.84	5.689
TILL-1	67.710	17.72	63.12	0.69	55.09	5.73	3.614	1.494	16.99	5.623
TILL-1	68.240	17.79	61.77	0.70	45.76	5.87	3.611	1.509	16.78	5.638
TILL-1	68.430	17.83	63.78	1.11	46.97	5.96	3.707	1.502	17.96	5.690
TILL-1	67.750	17.58	63.89	1.06	56.83	5.85	3.519	1.525	18.57	5.578
TILL-1	69.440	17.47	63.77	1.03	48.41	5.94	3.569	1.558	16.32	5.680
TILL-1	69.570	17.81	67.03	1.01	46.14	5.98	3.703	1.560	16.23	5.856
TILL-1	69.010	17.56	70.16	1.03	47.20	6.08	3.685	1.583	16.69	5.741
TILL-1	69.460	18.29	71.30	1.05	48.13	6.17	3.743	1.544	17.13	5.793
TILL-1	68.290	18.13	68.40	1.01	48.07	6.27	3.619	1.613	17.30	5.700
TILL-1	68.740	17.63	62.80	1.08	47.32	5.91	3.641	1.613	18.71	5.759
TILL-1	67.100	17.90	65.12	1.03	47.02	5.63	3.475	1.596	17.24	5.557
TILL-1	67.410	17.43	65.42	1.05	47.65	5.79	3.567	1.631	16.82	5.597
TILL-1	67.200	17.53	65.88	1.02	45.63	6.07	3.536	1.567	15.99	5.623
TILL-1	67.680	17.60	63.95	0.96	45.59	5.82	3.548	1.599	17.14	5.588
TILL-1	67.870	17.93	63.37	0.98	47.24	5.82	3.498	1.566	15.38	5.663
TILL-1	68.860	18.10	62.80	1.07	44.96	5.99	3.467	1.563	16.55	5.713
TILL-1	68.760	17.96	62.70	1.00	45.04	5.94	3.576	1.571	17.27	5.577
TILL-1	67.930	18.65	64.48	1.01	45.53	5.84	3.618	1.541	16.70	5.731
TILL-1	68.550	17.63	64.33	1.05	45.44	5.84	3.509	1.531	18.08	5.613
TILL-1	66.510	17.64	64.91	1.03	48.30	5.82	3.553	1.529	16.94	5.636
TILL-1	68.660	17.62	60.86	1.06	45.74	5.79	3.556	1.549	18.06	5.733
TILL-1	66.300	17.77	64.14	1.04	46.94	5.83	3.620	1.547	16.72	5.550
TILL-1	67.020	17.53	61.14	1.06	46.82	5.60	3.522	1.546	16.91	5.614
TILL-1	68.370	17.37	63.34	1.08	45.93	5.49	3.512	1.579	17.39	5.572
TILL-1	67.370	17.40	62.65	1.03	46.81	6.07	3.654	1.597	16.88	5.710
TILL-1	67.440	17.21	62.79	1.06	46.34	5.88	3.595	1.585	17.46	5.740
TILL-1	66.930	17.91	63.49	1.00	46.52	5.92	3.597	1.573	17.98	5.572
TILL-1	66.210	16.85	61.80	1.00	46.16	5.89	3.471	1.552	16.83	5.498
TILL-1	65.990	17.96	66.07	1.00	46.38	5.73	3.503	1.542	17.90	5.555
TILL-1	67.430	17.43	62.29	1.06	46.17	5.80	3.565	1.608	17.43	5.577
TILL-1	66.810	17.39	63.10	0.95	46.57	5.77	3.792	1.520	18.77	5.556
TILL-1	67.400	18.18	64.75	1.00	47.25	5.81	3.529	1.530	18.41	5.593
TILL-1	68.980	18.11	67.20	1.04	47.89	6.02	3.614	1.613	17.98	5.798
TILL-1	69.100	18.55	65.89	1.01	46.19	5.97	3.665	1.597	18.12	5.839
TILL-1	66.370	17.69	67.18	1.04	46.03	5.87	3.522	1.531	18.75	5.439
TILL-1	67.210	17.23	63.63	0.90	46.08	5.58	3.545	1.587	17.81	5.615
TILL-1	67.270	18.48	70.77	0.97	47.66	5.67	3.659	1.516	17.98	5.642
TILL-1	67.390	17.95	66.55	1.02	46.90	6.09	3.650	1.526	16.69	5.719
TILL-1	65.800	17.11	62.90	1.00	48.84	5.81	3.465	1.504	16.78	5.527
TILL-1	64.110	18.10	67.00	1.04	46.51	6.01	3.433	1.417	18.18	5.515
TILL-1	64.780	17.68	63.59	0.99	47.11	5.87	3.422	1.550	18.55	5.449
TILL-1	65.370	17.94	62.32	0.97	44.93	6.06	3.808	1.598	19.48	5.753
TILL-1	66.430	19.62	65.35	1.06	46.76	6.29	3.782	1.559	19.16	5.684
TILL-1	65.920	17.33	62.63	0.99	45.03	6.04	3.653	1.532	17.67	5.631
TILL-1	64.820	17.97	62.10	0.94	43.79	5.99	3.647	1.650	17.65	5.315
TILL-1	67.040	18.09	61.21	1.04	45.29	5.98	3.676	1.553	18.09	5.682
TILL-1	64.970	19.27	65.41	1.01	47.75	5.76	3.656	1.515	16.82	5.610
TILL-1	66.330	18.73	65.67	0.97	46.65	6.25	3.629	1.643	19.83	5.744
TILL-1	67.560	17.95	63.77	0.90	46.27	5.88	3.614	1.533	20.88	5.674
TILL-1	68.540	17.61	63.60	1.11	44.41	5.92	3.574	1.534	16.40	5.645
TILL-1	70.270	18.29	63.80	1.26	42.06	6.03	3.473	1.474	20.32	5.812
TILL-1	70.990	17.44	62.80	1.17	42.00	6.22	3.611	1.503	20.10	5.793
TILL-1	66.490	18.00	64.46	0.98	46.19	5.84	3.517	1.583	19.54	5.435
TILL-1	65.370	17.61	64.40	0.96	43.39	5.74	3.466	1.423	16.66	5.484
TILL-1	67.060	18.20	62.23	1.08	49.16	6.12	3.737	1.503	15.49	5.838
TILL-1	66.260	19.25	65.10	1.05	45.30	6.13	3.734	1.577	18.56	5.761
TILL-1	68.240	17.79	64.35	0.96	48.61	5.76	3.670	1.613	17.18	5.595
TILL-1	66.580	17.97	63.12	0.96	48.69	5.84	3.519	1.561	18.12	5.697

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-1	0.503	12.570	1.205	27.84	0.504	1.03	10.870	28.34	24.52	24.15
TILL-1	0.516	12.580	1.192	28.16	0.490	1.27	10.790	28.78	24.11	23.88
TILL-1	0.521	12.920	1.216	27.96	0.526	0.94	11.010	28.24	25.69	22.21
TILL-1	0.439	12.920	1.239	27.31	0.510	0.98	10.910	28.53	24.32	22.08
TILL-1	0.578	12.830	1.194	27.88	0.512	0.77	10.950	28.30	25.55	22.16
TILL-1	0.547	12.730	1.193	27.96	0.462	0.30	10.530	28.39	26.72	22.06
TILL-1	0.527	13.090	1.200	28.32	0.499	0.69	10.600	28.69	23.05	21.89
TILL-1	0.534	12.930	1.206	27.12	0.529	0.43	10.470	28.40	25.42	21.86
TILL-1	0.513	12.890	1.248	27.89	0.575	0.34	10.950	28.40	24.75	22.14
TILL-1	0.442	12.840	1.244	27.84	0.560	0.44	10.880	28.53	24.60	21.84
TILL-1	0.601	13.320	1.224	27.43	0.573	1.18	11.160	29.30	25.63	21.90
TILL-1	0.673	13.290	1.213	27.88	0.593	1.28	11.070	29.50	23.93	23.25
TILL-1	0.656	14.130	1.213	28.16	0.502	0.97	11.570	29.51	30.23	21.52
TILL-1	0.660	13.940	1.213	28.65	0.481	1.04	11.710	29.26	29.98	21.63
TILL-1	0.610	12.910	1.200	27.51	0.537	0.75	10.980	29.33	23.42	23.21
TILL-1	0.720	12.870	1.083	27.40	0.395	0.77	11.000	29.34	23.83	23.13
TILL-1	0.691	12.510	1.076	27.76	0.415	1.03	11.030	29.18	25.91	21.38
TILL-1	0.628	12.660	1.184	27.48	0.560	1.65	11.040	29.26	25.78	21.90
TILL-1	0.625	13.160	1.232	26.91	0.594	0.86	11.060	29.48	24.20	23.15
TILL-1	0.567	13.400	1.168	27.29	0.516	0.90	11.260	29.30	25.07	21.56
TILL-1	0.683	12.970	1.180	27.00	0.515	0.84	10.760	29.15	23.54	23.15
TILL-1	0.732	13.480	1.171	27.20	0.527	0.75	11.150	29.56	22.77	22.38
TILL-1	0.539	13.530	1.273	27.85	0.574	1.18	11.280	29.49	22.87	21.89
TILL-1	0.624	13.220	1.225	27.32	0.558	1.03	11.040	29.12	23.99	23.14
TILL-1	0.650	13.720	1.212	26.97	0.556	1.57	11.310	29.29	25.02	21.68
TILL-1	0.771	14.490	1.249	28.35	0.504	1.11	11.880	30.01	25.04	21.75
TILL-1	0.616	12.980	1.223	26.89	0.550	1.09	11.350	28.93	29.43	21.56
TILL-1	0.653	13.030	1.166	26.98	0.543	1.10	11.090	29.23	29.86	21.50
TILL-1	0.670	13.160	1.230	27.40	0.548	1.07	11.050	28.99	24.24	22.97
TILL-1	0.576	13.050	1.174	26.35	0.485	0.95	10.970	28.92	29.17	21.46
TILL-1	0.492	13.170	1.196	26.51	0.508	0.74	11.340	28.95	23.41	21.55
TILL-1	0.666	13.220	1.204	27.44	0.513	0.90	11.030	29.33	23.05	21.65
TILL-1	0.602	12.990	1.178	26.71	0.524	0.77	11.370	29.06	29.65	21.73
TILL-1	0.699	13.530	1.261	27.84	0.579	0.88	11.190	29.30	34.15	21.65
TILL-1	0.689	13.130	1.250	27.71	0.540	0.98	10.870	29.46	24.33	22.03
TILL-1	0.543	13.180	1.242	27.37	0.590	0.69	10.850	29.90	24.22	21.83
TILL-1	0.665	13.100	1.250	27.58	0.611	1.05	10.820	29.69	27.46	22.00
TILL-1	0.624	13.340	1.267	27.16	0.626	0.93	10.690	30.02	27.63	21.73
TILL-1	0.506	13.020	1.254	27.63	0.587	0.84	10.180	29.57	24.86	21.64
TILL-1	0.555	12.680	1.245	27.62	0.603	1.08	10.710	29.02	26.92	21.70
TILL-1	0.537	12.570	1.204	27.43	0.594	0.87	11.000	29.66	26.27	21.56
TILL-1	0.565	13.010	1.214	27.15	0.595	0.90	10.100	29.35	23.15	21.85
TILL-1	0.662	12.980	1.234	27.81	0.585	0.93	10.750	29.18	21.89	22.27
TILL-1	0.612	12.960	1.194	26.86	0.569	0.92	10.900	28.70	23.64	21.30
TILL-1	0.628	13.530	1.216	27.19	0.572	0.95	11.070	29.42	25.01	21.44
TILL-1	0.613	13.260	1.179	27.25	0.588	0.90	11.000	29.34	27.61	21.74
TILL-1	0.636	12.990	1.201	27.22	0.561	0.80	10.900	29.47	24.53	23.30
TILL-1	0.649	13.350	1.204	27.28	0.565	0.90	11.120	29.28	24.24	21.65
TILL-1	0.686	12.590	1.203	26.36	0.587	0.86	10.850	28.31	23.28	21.70
TILL-1	0.704	13.350	1.254	27.48	0.617	1.01	11.240	29.44	27.25	21.66
TILL-1	0.597	13.090	1.193	26.49	0.572	0.73	11.010	28.78	22.02	21.37
TILL-1	0.873	13.340	1.195	26.73	0.549	0.93	10.830	28.77	22.09	21.51
TILL-1	0.809	13.380	1.182	27.12	0.559	1.01	11.190	29.35	27.97	21.70
TILL-1	0.645	13.450	1.267	27.01	0.609	0.86	11.200	28.93	23.81	21.61
TILL-1	0.576	13.170	1.242	26.80	0.595	0.79	10.980	28.96	24.19	21.71
TILL-1	0.578	12.950	1.237	26.54	0.573	0.72	11.130	28.60	24.94	21.42
TILL-1	0.563	12.970	1.017	26.43	0.611	0.81	10.750	28.92	24.55	21.45
TILL-1	0.556	12.870	1.013	27.20	0.639	0.82	10.580	28.59	25.14	21.56
TILL-1	0.477	13.330	1.195	27.16	0.577	0.94	11.140	29.40	26.19	21.57
TILL-1	0.573	12.990	1.236	26.90	0.587	0.76	10.780	28.15	25.61	21.39
TILL-1	0.692	13.190	1.193	27.18	0.568	0.68	11.280	28.72	29.91	21.75
TILL-1	0.544	13.090	1.215	27.68	0.577	0.51	11.580	29.37	27.94	22.29
TILL-1	0.631	13.050	1.223	27.30	0.558	0.69	11.510	29.42	27.58	22.29
TILL-1	0.631	13.320	1.190	26.32	0.586	0.54	10.820	28.66	28.71	21.72
TILL-1	0.712	12.470	1.214	27.34	0.530	1.45	11.240	29.91	24.96	21.70
TILL-1	0.531	12.950	1.208	26.78	0.556	1.29	11.080	29.36	26.69	21.68
TILL-1	0.626	13.200	1.197	27.21	0.555	0.92	11.020	29.50	28.10	21.92
TILL-1	0.522	12.740	1.190	26.38	0.549	0.99	10.950	28.44	27.05	21.28
TILL-1	0.513	12.490	1.175	26.25	0.487	0.73	10.110	27.60	24.83	21.41
TILL-1	0.498	12.930	1.181	25.71	0.545	0.88	10.130	28.09	27.69	21.45
TILL-1	0.428	13.110	1.213	25.87	0.528	0.50	10.830	28.64	24.77	22.08
TILL-1	0.475	13.360	1.251	26.45	0.566	0.55	10.560	29.49	24.42	22.43
TILL-1	0.537	13.270	1.195	26.42	0.521	0.62	10.150	29.11	23.41	23.01
TILL-1	0.502	13.060	1.171	25.25	0.536	0.15	10.210	28.21	26.16	21.96
TILL-1	0.634	13.240	1.239	26.79	0.497	0.98	11.570	28.87	26.37	21.82
TILL-1	0.884	13.430	1.264	25.71	0.554	0.85	10.840	28.18	29.24	22.08
TILL-1	0.668	13.550	1.240	26.06	0.594	0.87	11.110	29.22	26.94	22.42
TILL-1	0.662	13.390	1.211	26.67	0.580	0.66	10.640	29.10	25.73	23.29
TILL-1	0.527	12.850	1.168	27.36	0.489	0.67	10.550	29.12	26.32	21.43
TILL-1	0.651	12.740	1.192	28.67	0.481	0.78	11.520	29.17	24.47	21.72
TILL-1	0.690	12.740	1.196	29.14	0.516	0.86	11.730	29.43	23.90	22.98
TILL-1	0.479	13.320	1.091	27.02	0.466	0.15	10.730	29.20	26.86	22.88
TILL-1	0.555	13.290	1.111	26.77	0.428	0.15	10.690	28.72	28.17	22.85
TILL-1	0.467	13.210	1.261	27.40	0.577	1.02	11.190	29.30	25.21	21.64
TILL-1	0.411	13.230	1.246	26.21	0.619	0.83	10.120	29.69	23.95	23.10
TILL-1	0.642	13.620	1.254	27.08	0.567	0.76	11.730	28.71	26.31	21.85
TILL-1	0.509	12.860	1.233	26.51	0.592	0.74	11.090	28.52	25.92	21.75

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-1	7.140	42.72	9.37	13.35	6.608	1.71	312.00	0.584	0.992	5.743
TILL-1	7.223	43.04	9.48	13.32	6.712	1.49	317.50	0.609	1.023	5.870
TILL-1	7.087	44.49	9.19	13.61	6.402	1.92	309.90	0.598	1.012	5.871
TILL-1	7.056	42.58	9.56	13.22	6.348	1.72	311.40	0.610	0.989	5.675
TILL-1	6.980	42.68	9.61	13.33	6.470	1.60	314.00	0.595	1.003	5.832
TILL-1	7.074	42.52	9.73	13.29	6.402	1.71	317.20	0.570	0.949	5.819
TILL-1	7.328	43.36	10.06	13.11	6.261	1.58	308.30	0.636	1.035	5.475
TILL-1	7.190	42.88	9.87	13.95	6.178	1.88	312.50	0.596	0.979	5.664
TILL-1	7.136	42.47	10.01	13.54	6.415	1.77	307.80	0.657	1.064	5.726
TILL-1	7.014	40.35	9.45	13.09	6.389	1.56	306.10	0.650	1.031	5.899
TILL-1	7.013	44.12	10.15	13.63	6.281	2.20	313.20	0.664	1.047	5.629
TILL-1	7.045	44.96	10.11	13.84	6.238	1.92	318.70	0.621	1.056	5.651
TILL-1	7.069	44.02	10.66	12.45	6.417	1.96	315.70	0.705	1.033	4.632
TILL-1	7.013	45.46	10.60	12.44	6.454	1.91	327.60	0.682	0.997	4.703
TILL-1	6.909	43.50	10.08	12.60	6.463	1.83	312.30	0.631	1.011	5.726
TILL-1	6.761	42.65	9.88	13.20	6.348	1.64	307.00	1.356	0.847	5.544
TILL-1	6.639	44.76	9.93	13.21	6.252	1.81	317.90	1.378	0.829	5.669
TILL-1	6.919	44.04	10.04	13.07	6.452	1.89	309.10	1.346	1.065	5.748
TILL-1	6.935	44.33	10.13	13.74	6.614	1.86	314.70	1.319	1.001	5.592
TILL-1	6.958	42.27	9.91	12.86	6.612	1.65	316.60	1.327	0.995	5.144
TILL-1	6.946	43.55	10.50	13.29	6.684	1.88	310.50	1.318	0.963	5.622
TILL-1	7.016	44.20	10.30	13.31	6.879	1.72	312.80	1.343	0.987	5.571
TILL-1	7.141	44.77	10.27	13.23	6.524	2.64	319.00	1.487	1.039	5.671
TILL-1	6.985	43.95	9.59	12.97	6.494	2.57	312.70	1.457	1.030	5.424
TILL-1	6.916	44.96	10.61	12.59	6.274	2.58	314.90	1.459	1.044	5.321
TILL-1	7.273	42.61	10.64	12.40	6.687	1.97	326.60	0.690	1.019	3.351
TILL-1	6.887	41.63	8.87	12.92	6.720	1.78	313.80	0.614	0.988	5.371
TILL-1	6.883	41.13	9.48	13.09	6.543	1.99	314.60	0.630	0.997	5.409
TILL-1	7.000	40.50	8.82	13.02	6.508	1.98	310.90	0.630	1.017	5.420
TILL-1	6.876	39.98	9.13	12.98	6.464	1.62	311.10	0.582	0.974	6.064
TILL-1	6.970	39.50	10.59	12.03	6.658	1.67	311.40	0.599	0.961	6.132
TILL-1	7.000	43.57	9.93	12.95	6.282	1.82	313.70	1.486	0.992	5.201
TILL-1	6.982	42.56	9.01	12.95	6.592	1.72	314.40	1.453	1.023	5.415
TILL-1	7.134	44.40	10.32	12.30	6.479	1.84	317.00	1.200	1.037	5.117
TILL-1	7.062	43.73	9.58	13.08	6.497	1.64	328.50	1.054	1.073	5.871
TILL-1	7.147	43.03	9.72	13.22	6.483	1.49	336.30	1.072	1.063	5.988
TILL-1	7.197	45.85	8.51	13.04	6.619	1.90	330.00	1.128	1.081	5.809
TILL-1	7.161	44.45	8.62	13.03	6.492	1.57	330.50	1.137	1.075	5.921
TILL-1	7.222	44.77	7.40	12.86	6.538	1.92	313.00	0.162	1.016	5.787
TILL-1	7.053	43.71	9.15	13.52	6.229	1.88	316.60	0.576	1.069	5.612
TILL-1	6.917	42.68	9.43	12.74	6.555	1.53	307.50	1.202	1.071	5.625
TILL-1	6.990	40.47	7.77	12.42	6.497	1.75	309.10	0.790	1.075	5.835
TILL-1	6.998	42.60	8.97	13.17	6.604	1.68	304.80	0.402	1.015	5.594
TILL-1	6.941	42.49	8.62	13.15	6.301	1.59	309.10	1.317	1.031	5.645
TILL-1	6.975	43.17	9.71	12.72	6.366	1.49	302.20	1.335	1.030	5.711
TILL-1	7.071	42.39	9.57	13.52	6.517	1.63	318.70	1.348	1.012	5.854
TILL-1	6.977	43.19	9.03	13.09	6.280	1.92	315.40	1.330	1.013	5.659
TILL-1	7.021	43.60	10.62	13.16	6.460	1.82	314.30	1.158	1.011	5.710
TILL-1	6.851	43.86	10.61	12.53	6.381	1.59	305.30	1.155	1.006	5.675
TILL-1	6.948	42.77	9.65	13.36	6.108	1.56	318.40	1.134	1.033	5.649
TILL-1	6.684	44.24	9.50	12.71	6.159	1.52	314.60	1.131	0.986	5.134
TILL-1	6.867	43.32	9.65	12.21	6.242	1.68	304.50	1.134	1.030	5.180
TILL-1	7.056	43.11	9.45	13.08	6.639	1.81	318.40	1.144	1.002	5.753
TILL-1	6.987	40.87	8.00	10.76	6.202	1.71	295.90	0.925	1.028	5.720
TILL-1	6.952	44.10	9.31	11.75	6.554	1.85	309.40	0.928	1.029	5.729
TILL-1	6.916	44.16	8.18	12.94	6.285	1.60	314.90	0.897	1.041	5.598
TILL-1	6.876	41.60	8.97	12.61	6.682	1.54	302.30	0.964	0.830	5.715
TILL-1	6.835	42.87	9.19	12.32	6.450	1.56	316.00	0.987	0.837	5.843
TILL-1	6.881	42.44	8.77	12.42	6.335	1.92	312.50	0.561	1.037	5.221
TILL-1	6.815	42.84	8.90	12.92	6.543	1.76	312.00	0.541	1.038	5.603
TILL-1	6.926	44.31	10.51	12.35	6.346	1.50	312.70	0.535	0.998	5.602
TILL-1	7.066	44.27	9.93	13.30	6.622	1.52	323.80	0.527	1.023	6.082
TILL-1	7.108	43.68	9.71	13.12	6.179	1.22	317.80	0.539	1.036	5.990
TILL-1	6.793	42.81	9.23	12.61	6.091	1.38	315.70	0.545	1.001	5.605
TILL-1	6.827	43.05	10.32	12.44	6.263	1.49	308.80	0.559	1.016	5.807
TILL-1	6.885	43.55	10.42	8.90	6.451	1.85	304.40	0.538	0.964	5.028
TILL-1	6.959	39.54	8.56	8.86	6.383	0.33	306.20	0.941	1.057	5.014
TILL-1	6.904	42.73	10.26	12.36	6.180	1.63	310.70	0.540	0.988	5.691
TILL-1	6.634	40.42	9.56	12.52	6.179	1.36	309.60	0.536	0.938	5.538
TILL-1	6.729	41.93	9.83	11.96	6.178	1.82	305.90	0.533	0.996	5.520
TILL-1	6.746	39.41	7.57	11.75	6.264	1.61	301.80	0.557	1.000	5.740
TILL-1	6.837	40.87	8.77	11.87	6.466	1.84	301.70	0.544	1.028	5.681
TILL-1	6.934	38.70	8.45	12.87	6.640	1.32	301.10	0.529	0.969	5.576
TILL-1	6.620	37.36	8.05	12.68	6.336	1.76	304.40	0.557	0.993	5.741
TILL-1	6.784	43.94	8.87	11.92	6.559	1.78	308.50	0.522	0.992	5.522
TILL-1	6.766	44.71	9.16	12.75	6.373	1.73	317.80	0.544	1.004	5.645
TILL-1	6.748	44.29	9.30	11.89	6.563	1.71	313.50	0.553	1.000	5.423
TILL-1	6.999	42.64	9.71	12.15	6.848	2.58	313.00	0.524	1.000	5.584
TILL-1	6.906	44.56	9.11	12.71	6.061	1.40	311.20	0.489	0.968	5.579
TILL-1	7.004	49.19	10.19	13.72	6.104	1.61	340.30	0.471	0.963	5.588
TILL-1	6.987	48.16	10.92	13.24	6.201	2.09	337.60	0.479	0.955	5.347
TILL-1	6.970	40.69	10.12	11.74	6.503	1.24	313.70	0.732	0.903	6.237
TILL-1	6.848	42.01	9.62	11.69	6.543	1.79	309.20	0.718	0.912	6.399
TILL-1	7.043	42.45	8.93	12.37	6.516	1.83	310.20	0.578	1.060	5.811
TILL-1	6.897	43.74	9.29	13.33	6.606	2.06	313.20	0.579	1.003	5.581
TILL-1	6.995	43.19	10.56	11.52	6.263	1.84	305.20	0.581	1.078	5.162
TILL-1	6.975	40.41	9.34	13.03	6.512	1.66	309.90	0.568	1.043	5.665

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-1	1.937	109.70	1.44	36.870	3.701	96.57	484.10	51-75	ngsa054b
TILL-1	1.919	111.70	1.20	38.140	3.699	95.76	487.30	51-75	ngsa054b
TILL-1	1.966	110.30	1.09	37.350	3.850	95.86	494.30	51-75	ngsa055a
TILL-1	1.958	111.10	0.88	37.640	3.811	93.39	492.10	51-75	ngsa055a
TILL-1	1.978	109.80	1.26	37.540	3.794	94.79	495.70	51-75	ngsa055b
TILL-1	1.929	114.10	0.83	37.670	3.794	95.66	490.10	51-75	ngsa055b
TILL-1	1.915	110.10	1.23	35.130	3.691	95.73	492.70	51-75	ngsa056a
TILL-1	1.926	111.10	0.85	36.860	3.796	95.35	490.40	51-75	ngsa056a
TILL-1	2.024	109.70	1.16	36.820	3.768	95.86	488.90	51-75	ngsa056b
TILL-1	1.991	109.70	0.98	36.540	3.809	94.06	485.10	51-75	ngsa056b
TILL-1	2.150	104.20	1.80	36.120	3.668	99.92	523.50	51-75	ngsa057a
TILL-1	2.121	106.50	0.88	37.480	3.770	102.40	517.10	51-75	ngsa057a
TILL-1	2.273	102.40	2.49	30.880	3.791	100.40	534.40	51-75	NGSA057B
TILL-1	2.364	106.30	1.91	31.340	3.748	94.62	531.50	51-75	NGSA057B
TILL-1	2.305	104.80	1.36	37.700	3.992	96.57	505.30	51-75	NGSA057B
TILL-1	1.984	102.10	1.53	36.720	3.751	99.32	509.80	51-75	NGSA058A
TILL-1	1.985	105.70	1.54	37.670	3.703	101.90	504.40	51-75	NGSA058A
TILL-1	2.116	101.70	2.04	37.290	3.842	95.84	502.30	51-75	NGSA058B
TILL-1	2.086	104.30	1.39	37.720	3.802	104.60	518.40	51-75	NGSA058B
TILL-1	2.018	102.00	2.44	35.380	3.614	95.88	519.80	51-75	NGSA059a
TILL-1	2.040	102.20	1.84	37.480	3.840	99.33	503.30	51-75	NGSA059a
TILL-1	2.132	104.70	1.79	37.490	3.822	100.60	523.40	51-75	NGSA059a
TILL-1	2.128	105.10	1.91	37.610	3.887	102.80	536.60	51-75	ngsa059b
TILL-1	2.105	101.10	1.31	36.560	3.791	98.56	508.80	51-75	ngsa059b
TILL-1	2.106	101.50	1.31	34.770	3.747	97.01	524.40	51-75	ngsa059b
TILL-1	2.067	103.00	2.62	26.670	3.650	104.50	530.00	51-75	ngsa060a
TILL-1	2.069	100.70	1.49	36.680	3.814	103.90	504.00	51-75	ngsa060a
TILL-1	2.087	102.90	1.45	35.910	3.611	99.39	501.90	51-75	ngsa060a
TILL-1	2.095	104.10	1.69	37.450	3.808	99.89	508.80	51-75	ngsa060a
TILL-1	2.483	99.70	1.26	35.050	3.646	99.71	506.90	51-75	NGSA060B
TILL-1	2.536	102.90	0.79	34.350	3.773	95.85	504.00	51-75	NGSA060B
TILL-1	2.059	101.20	2.19	34.720	3.691	101.90	512.80	51-75	ngsa061b
TILL-1	2.028	101.90	1.74	35.940	3.667	95.71	507.60	51-75	ngsa061b
TILL-1	2.113	101.50	1.51	33.300	3.732	98.32	518.10	51-75	ngsa061a
TILL-1	2.142	103.10	0.95	36.590	3.903	97.41	519.10	51-75	ngsa061a
TILL-1	2.146	105.10	0.77	36.380	3.874	103.50	513.80	51-75	ngsa061a
TILL-1	2.097	104.50	1.45	38.050	3.932	98.64	518.00	51-75	ngsa062a
TILL-1	2.123	104.90	0.85	37.740	3.855	96.18	512.50	51-75	ngsa062a
TILL-1	2.154	103.20	1.43	37.600	3.855	96.92	519.70	51-75	ngsa062b
TILL-1	2.046	105.20	0.98	36.960	3.869	94.41	506.70	51-75	ngsa062b
TILL-1	2.029	101.70	1.60	36.400	3.576	100.30	506.50	51-75	ngsa063a
TILL-1	2.113	102.30	0.87	37.700	3.844	96.15	505.50	51-75	ngsa063a
TILL-1	2.007	99.65	1.40	36.310	3.630	118.10	494.30	51-75	NGSA063B
TILL-1	2.042	104.30	1.04	36.960	3.775	99.76	503.70	51-75	NGSA065A
TILL-1	2.119	104.30	0.79	36.040	3.747	96.93	521.40	51-75	NGSA065A
TILL-1	2.132	105.10	0.80	36.910	3.678	99.49	516.10	51-75	NGSA065A
TILL-1	2.136	105.40	0.85	36.830	3.766	99.28	507.90	51-75	NGSA065A
TILL-1	2.097	103.10	1.10	37.030	3.859	101.00	521.60	51-75	NGSA064A
TILL-1	2.096	103.90	0.91	36.540	3.806	103.10	497.00	51-75	NGSA064A
TILL-1	2.088	101.10	1.18	35.530	3.731	101.20	516.90	51-75	ngsa064b
TILL-1	2.020	100.80	0.72	34.620	3.676	100.90	505.10	51-75	ngsa064b
TILL-1	1.983	100.80	1.28	34.420	3.668	100.90	499.00	51-75	ngsa065b
TILL-1	2.079	102.60	0.80	37.020	3.758	95.99	516.60	51-75	ngsa065b
TILL-1	2.146	101.20	1.17	36.440	3.816	100.80	518.70	51-75	ngsa066a
TILL-1	2.103	104.00	0.73	37.540	3.856	99.62	518.10	51-75	ngsa066a
TILL-1	2.133	100.80	0.67	37.650	3.823	100.10	514.10	51-75	ngsa066a
TILL-1	2.348	100.20	0.98	36.690	3.662	100.40	507.90	51-75	ngsa066b
TILL-1	2.321	105.80	0.68	37.010	3.567	96.91	514.40	51-75	ngsa066b
TILL-1	2.019	98.95	1.11	35.530	3.745	97.77	520.00	51-75	ngsa067a
TILL-1	2.115	100.30	0.73	37.020	3.823	99.64	513.00	51-75	ngsa067a
TILL-1	2.054	101.30	0.98	36.820	3.705	103.80	521.20	51-75	ngsa067b
TILL-1	2.158	105.80	0.52	37.400	3.767	105.00	504.00	51-75	ngsa067b
TILL-1	2.119	106.80	0.86	36.910	3.772	98.37	499.10	51-75	ngsa068a
TILL-1	2.039	102.90	0.54	36.990	3.769	102.30	505.20	51-75	ngsa068a
TILL-1	2.080	101.20	1.10	36.190	3.676	101.80	484.80	51-75	ngsa068b
TILL-1	2.078	104.70	0.72	34.960	3.760	99.96	504.00	51-75	ngsa068b
TILL-1	2.063	101.80	1.30	34.790	3.696	98.85	509.90	51-75	ngsa069a
TILL-1	2.019	98.29	1.14	37.010	3.784	98.12	502.40	51-75	ngsa069b
TILL-1	2.072	105.60	0.67	36.760	3.517	94.89	491.20	51-75	ngsa069b
TILL-1	2.038	100.60	0.71	35.720	3.619	103.30	489.30	51-75	ngsa069a
TILL-1	2.045	100.30	0.84	38.060	3.861	101.60	495.90	51-75	ngsa070b
TILL-1	2.104	103.30	0.85	36.410	3.954	105.60	505.60	51-75	ngsa070b
TILL-1	2.101	100.30	0.54	37.310	3.793	107.90	496.40	51-75	ngsa070b
TILL-1	2.171	100.30	0.85	36.320	3.904	102.30	484.30	51-75	ngsa070b
TILL-1	2.051	99.41	1.50	38.010	3.945	102.10	508.00	51-75	NGSA070A
TILL-1	2.074	104.60	0.93	37.900	3.838	102.40	505.50	51-75	NGSA070A
TILL-1	2.058	103.50	1.13	36.700	3.801	108.90	515.20	51-75	NGSA070A
TILL-1	2.080	105.40	0.61	37.950	3.769	104.60	504.20	51-75	NGSA070A
TILL-1	1.983	100.40	1.01	36.190	3.769	102.30	511.30	51-75	NGSA071A
TILL-1	1.945	106.00	0.45	38.870	3.589	92.55	541.50	51-75	NGSA071A
TILL-1	1.945	105.70	0.55	39.710	3.733	92.12	536.60	51-75	NGSA071A
TILL-1	1.961	101.90	1.76	36.400	3.644	94.60	502.20	51-75	ngsa071b
TILL-1	2.016	99.93	0.87	35.200	3.662	102.60	490.40	51-75	ngsa071b
TILL-1	2.117	99.65	1.39	36.240	3.800	99.64	515.10	51-75	ngsa072a
TILL-1	2.141	103.50	0.77	36.830	3.826	97.67	492.40	51-75	ngsa072a
TILL-1	2.104	105.60	1.29	34.270	3.881	101.10	516.80	51-75	ngsa072b
TILL-1	2.060	103.20	0.78	36.790	3.672	98.42	493.10	51-75	ngsa072b

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-1	036SMPL.D#	std	27/11/2009	0.240	15.41	717.50	0.55	2.108	0.31
TILL-1	038SMPL.D#	NGSA072a	27/11/2009	0.305	17.06	718.30	1.63	2.123	0.54
TILL-1	046SMPL.D#	NGSA073a	27/11/2009	0.403	14.87	706.20	1.28	2.094	0.05
TILL-1	072SMPL.D#	std	27/11/2009	0.311	15.20	701.20	1.48	2.140	0.05
TILL-1	074SMPL.D#	std	27/11/2009	0.318	15.41	685.00	1.55	2.105	0.05
TILL-1	076SMPL.D#	ngsa073b	27/11/2009	0.331	15.49	692.10	2.33	2.085	0.05
TILL-1	007SMPL.D#	NGSA073b	30/11/2009	0.469	16.65	707.00	2.23	2.111	0.34
TILL-1	039SMPL.D#	NGSA073b	30/11/2009	0.533	16.18	701.40	2.43	2.098	0.26
TILL-1	042SMPL.D#	NGSA072c	30/11/2009	0.475	16.43	707.80	2.78	2.099	0.33
TILL-1	051SMPL.D#	NGSA073b	30/11/2009	0.459	16.19	712.00	2.61	2.126	0.23
TILL-1	009SMPL.D#	NGSA075a	1/12/2009	0.242	15.53	697.90	1.60	2.124	0.24
TILL-1	038SMPL.D#	NGSA075a	1/12/2009	0.244	15.34	709.60	1.89	2.147	0.21
TILL-1	046SMPL.D#	NGSA075a	1/12/2009	0.284	17.01	695.10	1.57	2.087	0.14
TILL-1	076SMPL.D#	NGSA075a	1/12/2009	0.295	15.62	682.60	1.80	2.086	0.23
TILL-1	011SMPL.D#	Std	2/12/2009	0.302	15.45	703.30	2.29	2.157	0.23
TILL-1	040SMPL.D#	Std	2/12/2009	0.293	17.30	718.90	2.00	2.113	0.24
TILL-1	048SMPL.D#	NGSA076a	2/12/2009	0.645	16.92	713.50	1.84	2.126	0.50
TILL-1	078SMPL.D#	Std	2/12/2009	0.503	15.53	716.40	1.63	2.096	0.34
TILL-1	007SMPL.D#	NGSA075b	3/12/2009	0.054	15.39	704.60	1.20	2.162	0.41
TILL-1	039SMPL.D#	ngsa076b	3/12/2009	0.043	14.84	704.70	1.37	2.071	0.22
TILL-1	047SMPL.D#	ngsa076b	3/12/2009	0.015	15.42	714.00	1.50	2.093	0.29
TILL-1	047SMPL.D#	ngsa076b	3/12/2009	0.459	15.64	698.30	1.81	1.987	0.17
TILL-1	053SMPL.D#	ngsa076b	3/12/2009	0.443	16.29	693.80	1.52	1.955	0.23
TILL-1	081SMPL.D#	NGSA075b	3/12/2009	0.493	17.42	699.30	1.96	2.019	0.05
TILL-1	007SMPL.D#	NGSA077a	4/12/2009	0.532	16.22	699.20	0.55	2.068	0.29
TILL-1	037SMPL.D#	NGSA077b	4/12/2009	0.552	16.33	724.50	1.43	2.088	0.52
TILL-1	045SMPL.D#	NGSA077b	4/12/2009	0.247	17.40	729.00	1.68	2.112	0.28
TILL-1	077SMPL.D#	NGSA077a	4/12/2009	0.224	16.27	698.20	1.49	1.995	0.20
TILL-1	007SMPL.D#	NGSA078a	7/12/2009	0.515	14.17	708.60	2.39	2.009	0.05
TILL-1	037SMPL.D#	NGSA078b	7/12/2009	0.443	13.54	726.00	1.22	2.067	0.05
TILL-1	045SMPL.D#	NGSA078b	7/12/2009	0.512	17.72	724.80	1.74	2.207	0.31
TILL-1	077SMPL.D#	NGSA078a	7/12/2009	0.446	17.04	721.50	1.25	2.259	0.11
TILL-1	007SMPL.D#	NGSA079b	8/12/2009	0.285	15.10	706.50	2.39	2.109	0.39
TILL-1	039SMPL.D#	NGSA079b	8/12/2009	0.319	15.66	714.90	1.88	2.121	0.32
TILL-1	007SMPL.D#	NGSA079a	9/12/2009	0.635	16.70	701.60	1.91	2.126	0.27
TILL-1	033SMPL.D#	NGSA080a	9/12/2009	0.603	15.91	708.10	1.76	2.046	0.43
TILL-1	041SMPL.D#	NGSA080a	9/12/2009	0.601	16.54	704.50	1.30	2.089	0.70
TILL-1	079SMPL.D#	NGSA079a	9/12/2009	0.574	15.80	699.10	1.53	2.080	0.70
TILL-1	007SMPL.D	NGSA081B	18/02/2010	0.230	17.12	728.11	2.02	2.114	0.16
TILL-1	036SMPL.D	NGSA081B	18/02/2010	0.265	17.05	728.26	1.68	2.241	0.17
TILL-1	007SMPL.D	ngsa081a	22/02/2010	0.229	16.42	725.79	1.70	2.205	0.36
TILL-1	036SMPL.D	ngsa081a	22/02/2010	0.294	17.05	707.08	1.86	2.157	0.18
TILL-1	007SMPL.D	ngsa082a	23/02/2010	0.266	17.17	715.22	3.05	2.215	0.21
TILL-1	037SMPL.D	ngsa082a	23/02/2010	0.243	15.07	685.07	3.46	2.117	0.28
TILL-1	007SMPL.D		23/02/2010	0.259	16.00	727.09	2.02	2.166	0.22
TILL-1	007SMPL.D		1/03/2010	0.184	17.53	724.81	1.68	2.067	0.32
TILL-1	034SMPL.D		1/03/2010	0.203	18.53	743.72	2.26	2.138	0.34
TILL-1	007SMPL.D		2/03/2010	0.221	16.72	736.25	1.82	2.063	0.39
TILL-1	037SMPL.D		2/03/2010	0.149	17.00	718.98	2.01	2.052	0.35
TILL-1	007SMPL.D		3/03/2010	0.203	17.29	716.69	1.35	2.141	0.44
TILL-1	037SMPL.D		3/03/2010	0.255	16.04	742.95	2.04	2.029	0.34
TILL-1	007SMPL.D		4/03/2010	0.174	15.08	719.29	1.42	2.128	0.27
TILL-1	039SMPL.D		4/03/2010	0.237	15.76	739.72	1.87	2.138	0.40
TILL-1	007SMPL.D		5/03/2010	0.232	17.66	726.85	1.47	2.202	0.29
TILL-1	037SMPL.D		5/03/2010	0.230	17.88	734.99	2.40	2.174	0.33
TILL-1	007SMPL.D		9/03/2010	0.204	17.90	744.88	2.52	2.190	0.23
TILL-1	039SMPL.D		9/03/2010	0.295	17.55	747.15	2.63	2.224	0.29
TILL-1	007SMPL.D		10/03/2010	0.270	17.56	709.77	1.32	2.097	0.41
TILL-1	036SMPL.D		10/03/2010	0.244	17.75	744.37	1.28	2.166	0.40
TILL-1	007SMPL.D		11/03/2010	0.218	16.45	728.96	2.14	2.168	0.22
TILL-1	037SMPL.D		11/03/2010	0.167	16.34	717.86	1.72	2.166	0.16
TILL-1	007SMPL.D		11/03/2010	0.231	17.24	724.20	1.30	2.156	0.23
TILL-1	039SMPL.D		11/03/2010	0.194	17.41	727.11	2.27	2.088	0.28
TILL-1	007SMPL.D		12/03/2010	0.202	17.76	732.48	1.65	2.170	0.18
TILL-1	037SMPL.D		12/03/2010	0.178	17.07	723.49	1.46	2.020	0.29
TILL-1	007SMPL.D		12/03/2010	0.273	15.80	716.97	0.55	2.189	0.26
TILL-1	039SMPL.D		12/03/2010	0.200	16.83	737.33	0.55	2.157	0.20
TILL-1	007SMPL.D		15/03/2010	0.193	15.62	717.18	1.70	2.136	0.18
TILL-1	037SMPL.D		15/03/2010	0.205	16.67	725.91	1.63	2.142	0.31
TILL-1	007SMPL.D		16/03/2010	0.140	18.08	728.10	2.09	2.085	0.54
TILL-1	035SMPL.D		16/03/2010	0.178	18.25	729.41	2.01	2.209	0.49
TILL-1	007SMPL.D		17/03/2010	0.043	17.01	731.22	1.16	2.156	0.10
TILL-1	037SMPL.D		17/03/2010	0.015	17.42	741.03	1.56	2.172	0.11
TILL-1	007SMPL.D		18/03/2010	0.126	16.74	740.65	1.73	2.242	0.31
TILL-1	037SMPL.D		18/03/2010	0.148	18.86	716.42	1.28	2.221	0.61
TILL-1	007SMPL.D		19/03/2010	0.207	17.16	719.85	1.55	2.187	0.21
TILL-1	039SMPL.D		19/03/2010	0.194	16.60	727.29	1.67	2.092	0.37
TILL-1	007SMPL.D		19/03/2010	0.218	17.82	726.09	1.84	2.123	0.25
TILL-1	034SMPL.D		19/03/2010	0.198	17.66	723.02	1.76	2.135	0.18
TILL-1	007SMPL.D	NGSA 090908B	13/05/2010	0.236	16.49	726.59	1.86	1.944	0.23
TILL-1	039SMPL.D	NGSA 090908B	13/05/2010	0.205	14.86	729.03	1.98	1.939	0.33
TILL-1	007SMPL.D	NGSA 090908A	14/05/2010	0.223	16.44	718.33	2.24	1.853	0.23
TILL-1	037SMPL.D	NGSA 08082008B	14/05/2010	0.200	17.64	769.48	1.70	1.896	0.16
TILL-1	007SMPL.D	NGSA 08082008B	14/05/2010	0.213	18.40	730.16	1.37	1.896	0.28
TILL-1	042SMPL.D	NGSA 090908A	14/05/2010	0.200	17.88	715.58	1.72	1.907	0.34
Till 1	007SMPL.D	NGSA08082008A	17/05/2010	0.217	16.16	708.72	1.82	1.962	0.34
Till 1	034SMPL.D	NGSA08082008A	17/05/2010	0.208	15.76	721.91	1.72	1.887	0.34

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-1	67.360	17.80	63.74	1.04	48.19	5.69	3.555	1.635	18.91	5.732
TILL-1	67.770	18.11	66.14	1.04	44.15	5.81	3.632	1.498	17.81	5.622
TILL-1	68.040	17.64	64.73	1.08	45.69	5.93	3.701	1.634	18.29	5.718
TILL-1	66.430	17.91	63.99	0.98	51.58	5.89	3.575	1.533	18.38	5.626
TILL-1	66.150	16.89	62.28	0.98	50.81	5.90	3.641	1.619	18.99	5.614
TILL-1	65.980	16.79	63.09	0.94	49.45	5.97	3.505	1.586	17.40	5.671
TILL-1	66.950	17.32	64.49	0.99	45.82	5.90	3.580	1.574	16.70	5.713
TILL-1	66.180	17.94	64.20	0.97	45.71	5.78	3.573	1.551	16.58	5.586
TILL-1	67.510	18.05	65.44	1.05	44.95	5.94	3.647	1.587	17.56	5.724
TILL-1	67.450	18.23	65.69	1.01	44.34	5.95	3.592	1.606	16.94	5.739
TILL-1	67.220	17.71	65.33	0.98	45.71	5.85	3.561	1.567	17.37	5.602
TILL-1	66.840	17.50	64.98	1.01	43.12	5.88	3.568	1.546	15.81	5.689
TILL-1	67.570	17.34	66.38	1.02	45.44	5.95	3.586	1.642	17.10	5.744
TILL-1	66.350	17.58	65.68	1.00	45.48	5.72	3.531	1.558	17.41	5.614
TILL-1	66.880	17.82	63.79	0.95	48.12	5.62	3.519	1.582	17.46	5.624
TILL-1	66.400	18.35	63.82	0.99	47.92	5.81	3.485	1.527	16.50	5.637
TILL-1	68.230	17.84	65.08	1.14	45.31	5.96	3.591	1.557	16.58	5.731
TILL-1	67.110	17.81	62.88	1.10	48.65	6.06	3.572	1.596	17.25	5.676
TILL-1	66.400	17.52	65.08	0.82	43.03	5.65	3.365	1.300	17.92	5.493
TILL-1	67.110	17.38	62.45	0.81	43.72	5.72	3.369	1.265	17.71	5.366
TILL-1	67.050	17.50	61.64	0.82	44.23	5.52	3.340	1.268	17.85	5.404
TILL-1	67.280	17.61	62.79	0.91	45.10	5.73	3.478	1.446	17.28	5.502
TILL-1	67.540	17.62	64.25	0.93	44.40	5.66	3.449	1.458	17.29	5.518
TILL-1	66.360	18.10	65.38	0.97	44.20	5.87	3.584	1.421	18.12	5.523
TILL-1	68.900	17.33	59.42	0.93	45.13	5.88	3.539	1.426	17.97	5.752
TILL-1	69.720	17.47	62.39	0.93	45.59	5.92	3.585	1.520	17.87	5.777
TILL-1	70.130	18.17	65.16	0.99	47.05	6.10	3.609	1.533	17.70	5.787
TILL-1	66.890	17.87	62.84	0.98	43.01	5.74	3.530	1.480	17.18	5.652
TILL-1	68.010	17.66	61.34	0.86	45.64	5.73	3.522	1.592	16.25	5.514
TILL-1	67.770	18.43	62.22	0.86	44.59	5.72	3.689	1.644	15.14	5.575
TILL-1	68.860	17.78	66.14	0.92	46.64	6.04	3.577	1.498	16.34	5.589
TILL-1	67.640	17.32	64.25	0.97	45.79	5.92	3.527	1.485	17.23	5.512
TILL-1	67.620	17.92	65.39	1.08	49.45	5.76	3.604	1.667	17.39	5.690
TILL-1	66.830	17.88	66.08	0.97	49.12	5.80	3.653	1.641	16.59	5.579
TILL-1	67.870	17.29	65.75	0.77	47.91	5.96	3.552	1.497	17.97	5.650
TILL-1	66.690	17.30	65.39	0.73	43.82	5.73	3.527	1.536	18.18	5.590
TILL-1	67.300	18.08	64.51	1.05	44.92	5.85	3.548	1.590	17.41	5.612
TILL-1	67.210	18.01	66.35	0.95	47.56	5.82	3.553	1.563	17.94	5.640
TILL-1	70.664	18.49	69.51	1.02	45.84	5.91	3.660	1.534	17.74	6.139
TILL-1	70.096	18.67	69.98	0.98	43.87	6.01	3.728	1.532	16.97	6.185
TILL-1	69.811	18.26	65.93	0.96	45.14	5.92	3.757	1.556	17.10	6.081
TILL-1	69.518	18.26	67.99	0.87	44.78	5.81	3.688	1.535	17.09	5.942
TILL-1	70.939	18.43	81.65	1.07	44.46	5.77	3.659	1.467	17.76	6.056
TILL-1	69.310	18.02	68.20	0.96	44.26	5.69	3.632	1.507	17.56	5.956
TILL-1	70.379	18.47	64.79	1.06	45.23	6.03	3.720	1.438	16.22	6.051
TILL-1	70.703	18.79	70.75	1.02	46.41	6.08	3.713	1.473	16.82	6.065
TILL-1	71.453	18.83	69.23	1.06	44.91	5.97	3.726	1.468	16.67	6.151
TILL-1	71.786	18.26	68.00	0.97	44.75	5.86	3.757	1.462	16.49	5.993
TILL-1	68.423	19.22	68.49	0.92	45.99	5.80	3.674	1.461	15.10	6.103
TILL-1	70.106	18.32	70.62	1.01	46.33	5.79	3.641	1.550	16.43	6.091
TILL-1	72.883	18.84	69.56	1.05	44.29	5.72	3.706	1.423	17.00	6.025
TILL-1	68.982	18.09	69.74	1.01	50.02	5.78	3.659	1.448	16.05	5.877
TILL-1	69.023	18.36	70.00	1.07	51.07	5.87	3.681	1.490	16.84	5.960
TILL-1	69.734	17.97	64.17	0.95	48.62	5.81	3.626	1.436	16.81	5.854
TILL-1	71.117	18.59	64.60	1.06	45.91	5.68	3.648	1.554	16.95	6.005
TILL-1	73.264	18.45	68.46	1.12	46.00	5.84	3.641	1.461	18.09	5.949
TILL-1	72.998	18.54	68.02	1.02	45.45	5.97	3.567	1.475	16.74	6.060
TILL-1	69.055	17.69	66.41	1.04	42.44	5.91	3.678	1.465	17.78	6.046
TILL-1	72.530	18.04	67.08	1.05	42.83	5.70	3.586	1.495	17.53	6.015
TILL-1	69.844	18.87	63.90	1.03	46.25	5.85	3.681	1.482	17.60	5.945
TILL-1	69.728	18.34	66.28	1.01	44.56	5.70	3.574	1.435	15.76	6.074
TILL-1	68.964	18.31	70.70	1.02	43.56	5.90	3.697	1.463	17.17	6.051
TILL-1	69.251	18.06	68.20	0.95	43.50	5.92	3.645	1.520	17.12	5.921
TILL-1	70.431	18.78	68.65	1.10	45.98	6.36	3.629	1.487	17.36	6.131
TILL-1	69.314	19.16	69.40	0.92	41.10	6.32	3.683	1.424	14.30	6.133
TILL-1	70.068	18.37	63.56	1.09	42.88	6.10	3.811	1.454	17.27	6.063
TILL-1	69.715	18.14	63.65	1.08	44.04	5.91	3.702	1.473	17.72	5.912
TILL-1	69.120	17.97	65.75	0.98	45.12	5.89	3.664	1.450	16.70	6.075
TILL-1	68.696	18.50	65.32	0.94	43.56	5.84	3.528	1.456	16.79	5.984
TILL-1	69.780	18.04	64.07	1.07	43.72	5.85	3.805	1.373	17.12	6.040
TILL-1	69.660	18.22	71.20	1.00	46.46	5.83	3.745	1.391	15.93	5.969
TILL-1	69.730	18.78	67.14	1.05	44.71	6.02	3.692	1.491	16.75	5.993
TILL-1	70.925	19.08	68.38	0.97	44.84	5.77	3.737	1.598	16.75	6.048
TILL-1	70.951	19.40	68.03	0.99	43.77	6.12	3.687	1.447	15.79	6.050
TILL-1	70.386	18.47	65.79	1.03	44.37	5.87	3.497	1.441	16.89	5.941
TILL-1	70.112	18.12	67.82	1.01	45.03	5.89	3.863	1.493	15.37	6.094
TILL-1	70.457	18.87	74.75	0.98	44.91	5.76	3.655	1.464	14.42	6.090
TILL-1	70.617	18.17	72.68	1.01	45.17	5.83	3.541	1.486	17.21	6.029
TILL-1	68.997	18.39	67.40	0.89	44.72	5.76	3.747	1.514	18.00	6.024
TILL-1	70.265	17.74	61.17	1.04	44.14	5.84	3.459	1.513	17.86	5.602
TILL-1	70.476	17.89	62.82	1.05	44.97	6.04	3.537	1.500	17.56	5.669
TILL-1	69.575	18.20	65.62	1.09	44.65	5.87	3.483	1.511	17.06	5.775
TILL-1	72.811	18.19	68.85	1.18	45.09	6.01	3.636	1.527	19.05	5.831
TILL-1	72.190	18.20	66.63	1.08	46.29	6.08	3.577	1.553	16.54	5.752
TILL-1	70.359	17.52	66.48	1.09	45.07	5.99	3.527	1.530	17.68	5.618
Till 1	67.599	17.20	61.53	0.96	44.07	5.61	3.496	1.423	17.10	5.539
Till 1	68.013	17.49	61.01	0.95	44.15	5.72	3.410	1.471	17.09	5.490

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-1	0.685	12.970	1.240	26.74	0.594	0.58	11.100	28.66	25.16	21.54
TILL-1	0.564	13.220	1.267	27.68	0.612	0.79	11.050	29.02	25.80	21.59
TILL-1	0.424	13.310	1.238	27.16	0.597	1.73	11.280	27.97	24.31	21.94
TILL-1	0.224	13.050	1.261	26.21	0.573	1.41	10.170	28.24	24.00	21.87
TILL-1	0.352	12.700	1.257	26.50	0.611	1.30	10.620	28.61	23.45	21.69
TILL-1	0.375	13.080	1.244	25.89	0.620	1.15	10.690	28.43	26.13	21.45
TILL-1	0.723	13.010	1.227	26.92	0.573	1.29	10.410	28.55	25.92	21.89
TILL-1	0.656	12.900	1.229	27.23	0.563	0.98	10.190	28.56	25.73	21.86
TILL-1	0.721	13.260	1.220	27.32	0.573	0.78	10.320	28.72	25.84	21.90
TILL-1	0.622	13.250	1.242	27.47	0.576	0.87	10.430	28.69	26.26	21.88
TILL-1	0.663	12.970	1.210	26.74	0.563	0.48	10.930	29.07	25.12	21.58
TILL-1	0.589	13.050	1.241	27.10	0.576	0.57	10.630	28.81	24.59	21.75
TILL-1	0.860	13.160	1.220	26.89	0.590	1.27	11.120	29.30	24.85	21.67
TILL-1	0.912	13.120	1.214	26.46	0.577	0.82	10.490	28.79	25.32	21.88
TILL-1	0.707	12.720	1.170	26.88	0.560	0.44	10.850	28.81	21.90	22.50
TILL-1	0.699	12.740	1.177	26.94	0.533	0.56	10.990	29.13	23.98	22.77
TILL-1	0.704	13.000	1.209	27.72	0.566	1.37	11.480	29.03	23.76	21.71
TILL-1	0.611	12.730	1.225	26.87	0.563	1.13	10.630	28.80	22.68	21.79
TILL-1	0.528	12.730	0.930	26.97	0.296	1.01	10.540	28.93	22.08	20.82
TILL-1	0.551	12.600	0.938	27.15	0.229	0.68	10.720	28.69	23.69	20.71
TILL-1	0.499	12.600	0.931	27.01	0.280	0.83	10.610	28.70	23.04	21.02
TILL-1	0.528	12.860	1.111	26.86	0.474	0.90	10.810	28.66	23.05	20.96
TILL-1	0.610	12.880	1.105	27.19	0.481	0.90	10.480	28.85	23.06	20.87
TILL-1	0.607	13.070	1.143	26.78	0.489	0.77	10.840	28.66	23.04	20.89
TILL-1	0.520	13.210	1.106	27.79	0.445	1.04	11.390	29.11	23.40	21.17
TILL-1	0.582	13.750	1.160	28.00	0.474	0.73	11.210	30.23	25.03	21.62
TILL-1	0.651	13.600	1.158	28.16	0.467	0.93	11.410	29.94	24.43	21.74
TILL-1	0.591	13.350	1.124	26.60	0.466	0.67	10.780	28.60	23.84	21.27
TILL-1	0.574	13.590	1.154	27.07	0.574	0.76	10.650	29.28	24.73	21.19
TILL-1	0.612	13.520	1.154	27.34	0.601	0.60	10.450	29.25	24.02	21.41
TILL-1	0.665	13.560	1.138	27.77	0.494	0.84	10.980	29.79	24.42	21.57
TILL-1	0.599	13.510	1.109	27.52	0.445	0.87	11.090	29.12	25.63	21.44
TILL-1	0.669	13.280	1.239	27.47	0.578	0.88	11.160	29.01	25.40	21.71
TILL-1	0.534	13.140	1.207	27.36	0.606	0.94	10.830	29.01	26.73	21.81
TILL-1	0.698	13.040	1.202	27.67	0.532	0.85	11.080	29.34	23.77	21.71
TILL-1	0.734	12.650	1.215	27.21	0.516	0.86	10.870	28.42	26.56	21.60
TILL-1	0.555	12.730	1.207	27.30	0.571	1.36	10.920	28.73	27.40	21.57
TILL-1	0.646	13.290	1.210	27.29	0.552	1.36	10.680	28.73	25.41	21.41
TILL-1	0.549	12.937	1.271	28.07	0.528	1.28	11.489	26.82	24.50	21.81
TILL-1	0.539	12.929	1.224	28.18	0.552	1.49	11.070	27.00	24.43	21.95
TILL-1	0.490	13.422	1.235	28.21	0.556	0.77	10.913	28.26	24.83	21.57
TILL-1	0.612	13.158	1.241	28.25	0.561	0.70	10.663	29.00	24.30	21.89
TILL-1	0.578	13.329	1.224	28.36	0.557	1.64	11.192	29.29	34.95	21.93
TILL-1	0.463	13.460	1.251	27.25	0.514	0.57	10.987	28.70	24.86	21.86
TILL-1	0.464	13.479	1.242	28.15	0.537	1.16	11.163	29.22	24.34	21.96
TILL-1	0.623	13.048	1.252	28.55	0.425	0.82	11.261	27.85	28.38	21.76
TILL-1	0.573	13.416	1.221	29.00	0.443	0.95	11.451	29.16	28.72	21.88
TILL-1	0.620	14.153	1.210	28.68	0.489	1.29	11.589	29.52	28.78	21.86
TILL-1	0.549	13.941	1.217	27.74	0.534	0.92	10.837	28.38	26.37	22.15
TILL-1	0.558	13.777	1.221	28.28	0.477	0.77	11.276	29.15	25.30	22.59
TILL-1	0.499	14.028	1.199	28.78	0.500	0.96	11.381	29.65	26.90	21.61
TILL-1	0.425	13.597	1.215	27.83	0.504	0.92	10.764	26.88	34.69	22.57
TILL-1	0.395	13.727	1.221	28.47	0.501	1.11	10.923	26.94	34.56	22.48
TILL-1	0.655	13.192	1.170	27.47	0.494	1.08	10.460	26.41	25.03	21.58
TILL-1	0.547	13.565	1.185	27.99	0.486	0.96	10.488	26.65	26.16	21.64
TILL-1	0.519	14.438	1.215	29.04	0.514	1.36	11.654	29.36	24.26	21.79
TILL-1	0.508	14.199	1.204	29.12	0.526	1.19	11.841	29.70	25.81	21.65
TILL-1	0.587	13.517	1.202	27.83	0.526	1.77	10.785	26.79	24.36	21.29
TILL-1	0.513	14.206	1.197	28.46	0.527	1.96	11.306	27.32	24.71	21.86
TILL-1	0.613	13.380	1.238	27.53	0.541	0.93	11.035	26.22	23.05	22.20
TILL-1	0.659	13.207	1.258	27.86	0.544	0.85	11.053	26.42	26.69	22.38
TILL-1	0.509	13.559	1.190	27.44	0.503	0.58	11.086	26.89	28.48	22.04
TILL-1	0.510	13.698	1.265	27.52	0.511	0.69	11.307	27.26	23.02	21.77
TILL-1	0.538	14.170	1.230	28.74	0.566	0.15	11.156	26.79	22.90	21.81
TILL-1	0.557	13.265	1.183	28.25	0.506	0.77	11.520	26.70	24.32	21.55
TILL-1	0.587	13.512	1.202	27.71	0.497	1.54	11.208	29.16	24.54	21.68
TILL-1	0.537	13.959	1.212	28.27	0.524	0.88	11.091	29.41	23.30	21.96
TILL-1	0.499	13.087	1.195	28.60	0.515	0.89	10.571	27.16	24.37	21.80
TILL-1	0.461	12.733	1.199	28.41	0.516	1.18	10.864	26.70	24.73	21.80
TILL-1	0.484	13.135	1.139	27.44	0.460	1.17	11.272	26.31	23.90	21.60
TILL-1	0.504	13.161	1.151	28.50	0.451	3.39	10.848	27.00	36.08	21.72
TILL-1	0.606	13.445	1.167	27.86	0.400	0.68	11.556	28.98	24.54	21.66
TILL-1	0.593	13.056	1.149	28.59	0.360	0.61	10.729	29.49	24.37	23.19
TILL-1	0.534	13.550	1.075	28.31	0.408	0.81	10.857	27.14	23.03	23.43
TILL-1	0.454	13.615	1.082	27.74	0.391	0.55	10.801	26.94	23.66	22.54
TILL-1	0.596	13.297	1.255	28.39	0.537	0.99	10.860	26.36	24.83	22.72
TILL-1	0.510	13.533	1.238	27.90	0.525	2.17	10.869	26.52	28.39	21.80
TILL-1	0.522	13.093	1.198	28.09	0.504	2.20	11.273	27.63	26.79	21.82
TILL-1	0.540	13.462	1.232	27.85	0.539	0.97	10.764	28.06	24.24	22.86
TILL-1	0.049	12.765	1.266	27.88	0.589	0.88	10.914	28.57	23.37	22.31
TILL-1	0.066	12.574	1.244	27.99	0.558	0.87	10.722	28.40	21.86	22.04
TILL-1	0.498	12.898	1.225	27.83	0.564	1.11	11.051	28.23	32.21	22.00
TILL-1	0.601	13.159	1.268	29.42	0.568	1.25	11.653	29.20	29.88	22.69
TILL-1	0.592	12.940	1.230	29.55	0.568	0.81	11.229	29.14	28.23	22.47
TILL-1	0.590	12.771	1.255	28.76	0.595	0.62	10.533	28.59	31.19	22.04
Till 1	0.578	12.265	1.219	27.12	0.554	0.96	10.527	28.04	21.30	22.05
Till 1	0.499	12.301	1.204	27.60	0.576	0.92	10.398	27.79	22.11	22.15

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-1	7.015	43.34	9.76	12.93	6.484	1.97	320.00	0.556	0.993	5.687
TILL-1	6.857	43.10	10.19	12.66	6.546	1.84	319.60	0.578	1.026	5.791
TILL-1	6.961	47.92	10.38	12.29	6.652	1.35	313.60	0.597	1.092	5.401
TILL-1	6.772	44.87	9.17	12.47	6.476	1.50	311.90	0.570	1.071	5.549
TILL-1	6.938	44.74	10.25	12.50	6.690	1.97	303.10	0.556	1.035	5.772
TILL-1	6.855	44.41	10.14	12.44	6.754	1.47	306.40	0.568	1.041	5.774
TILL-1	6.843	42.45	9.25	13.77	6.358	1.77	306.60	0.571	1.027	5.654
TILL-1	6.766	41.99	9.60	13.36	6.585	1.79	307.50	0.558	1.027	5.905
TILL-1	6.914	41.72	9.20	13.68	6.367	1.85	312.80	0.561	1.014	6.060
TILL-1	6.930	42.33	8.96	13.49	6.550	1.65	315.50	0.569	1.035	6.198
TILL-1	6.872	41.94	9.35	12.60	6.349	0.92	305.70	0.531	1.014	5.567
TILL-1	6.859	43.62	9.30	12.71	6.410	0.94	311.10	0.505	1.029	5.681
TILL-1	6.915	42.75	9.64	13.08	6.337	1.80	307.40	0.569	1.037	5.561
TILL-1	6.813	40.12	9.39	12.76	6.365	1.72	301.80	0.559	1.045	5.739
TILL-1	6.730	39.19	9.53	13.56	6.602	0.88	311.70	0.513	1.001	5.657
TILL-1	6.811	41.67	8.90	13.34	6.457	0.96	321.00	0.511	1.003	5.582
TILL-1	6.967	46.83	10.59	13.02	6.132	1.85	314.20	0.556	1.025	5.595
TILL-1	6.940	46.60	9.99	13.18	6.409	1.70	318.80	0.519	1.026	5.686
TILL-1	6.645	40.62	9.33	12.80	6.207	0.82	311.80	0.297	0.644	5.492
TILL-1	6.734	43.27	9.43	13.10	6.169	0.97	320.00	0.283	0.638	5.707
TILL-1	6.743	42.82	9.23	13.24	6.285	0.87	323.10	0.293	0.632	5.592
TILL-1	6.871	42.14	9.01	12.97	6.313	0.67	308.90	0.448	0.875	5.500
TILL-1	6.839	41.27	8.74	12.96	6.330	0.77	308.50	0.442	0.922	5.467
TILL-1	6.782	41.40	9.63	13.05	6.317	0.89	317.00	0.436	0.919	5.410
TILL-1	6.939	41.63	9.17	12.65	6.438	1.64	305.00	0.447	0.914	5.210
TILL-1	7.110	42.33	9.51	12.89	6.572	1.59	318.70	0.463	0.964	5.609
TILL-1	7.178	43.51	10.53	13.54	6.794	1.61	325.90	0.466	0.930	5.801
TILL-1	6.877	41.73	9.75	13.21	6.504	1.53	311.30	0.441	0.920	5.410
TILL-1	6.979	38.69	9.46	9.62	6.290	0.79	289.80	1.176	0.962	5.577
TILL-1	6.910	37.93	9.83	12.06	6.539	0.79	305.90	1.169	0.958	6.079
TILL-1	7.081	41.93	10.92	13.04	6.519	1.46	319.00	0.464	0.866	5.923
TILL-1	6.960	41.02	9.87	11.75	6.536	1.40	309.80	0.463	0.873	5.652
TILL-1	7.042	40.05	9.32	12.30	6.588	1.89	308.90	0.503	1.068	5.773
TILL-1	6.959	41.30	9.74	12.69	6.383	1.83	312.90	0.520	1.039	6.021
TILL-1	6.983	39.99	9.94	12.88	6.544	0.95	311.00	1.074	0.964	5.758
TILL-1	6.773	40.45	10.02	12.52	6.383	0.63	316.50	1.077	0.942	5.566
TILL-1	6.823	43.51	10.63	12.63	6.526	1.74	309.60	0.541	0.992	5.539
TILL-1	6.857	42.57	10.41	12.40	6.830	1.61	309.80	0.555	1.018	5.882
TILL-1	6.900	44.95	8.30	12.87	5.517	2.24	302.73	0.690	1.062	5.335
TILL-1	6.729	43.02	8.04	12.69	5.547	2.00	301.09	0.647	1.073	5.472
TILL-1	6.884	43.52	8.83	13.11	6.501	1.72	302.15	0.680	1.059	5.404
TILL-1	6.882	43.67	8.59	12.42	6.225	1.58	292.94	0.684	1.031	5.384
TILL-1	6.967	43.58	8.24	12.33	6.603	2.70	300.82	0.673	1.050	5.546
TILL-1	6.904	41.39	8.16	12.15	6.463	2.24	290.59	0.669	1.027	5.533
TILL-1	7.070	45.88	8.68	13.34	6.879	2.19	300.36	0.671	1.064	5.365
TILL-1	6.884	43.85	8.94	14.38	6.415	1.61	310.60	0.633	0.996	5.402
TILL-1	6.938	46.39	9.23	13.92	6.484	2.18	320.06	0.655	0.974	4.736
TILL-1	7.126	45.35	8.61	12.58	6.357	1.85	309.34	0.669	1.017	4.352
TILL-1	6.772	44.81	8.46	12.93	6.366	1.75	301.99	0.640	1.023	5.297
TILL-1	6.810	45.20	8.41	12.99	6.342	1.66	303.88	0.632	1.022	5.323
TILL-1	6.991	46.15	9.22	12.18	6.487	1.72	319.66	0.676	1.033	4.443
TILL-1	6.832	37.12	8.02	12.69	5.339	1.81	300.99	0.631	0.961	5.225
TILL-1	6.860	39.92	8.44	12.66	5.756	1.87	317.18	0.639	0.982	5.315
TILL-1	6.908	43.45	8.65	13.19	5.445	1.92	301.83	0.602	0.956	5.334
TILL-1	6.747	45.00	8.59	10.76	5.521	1.53	294.73	0.629	0.985	5.177
TILL-1	7.184	43.40	8.56	13.25	5.970	2.24	310.09	0.672	1.016	4.266
TILL-1	7.090	43.06	9.07	12.11	5.871	2.45	309.51	0.657	0.991	3.916
TILL-1	6.980	41.44	6.90	13.87	5.518	1.97	295.57	0.595	0.990	5.284
TILL-1	7.053	43.61	8.62	13.04	5.861	2.16	309.26	0.637	0.966	4.287
TILL-1	6.862	44.03	8.34	13.01	5.503	1.70	301.08	0.642	1.038	5.499
TILL-1	6.765	44.48	8.42	18.86	5.363	1.70	346.97	0.639	1.032	6.121
TILL-1	6.966	44.65	8.30	18.40	5.519	1.71	343.05	0.614	1.016	6.442
TILL-1	6.776	45.43	9.46	12.41	5.602	1.84	302.56	0.632	1.015	5.839
TILL-1	6.952	45.19	9.27	12.05	5.957	1.58	301.29	0.667	1.036	5.032
TILL-1	6.926	42.70	9.26	8.00	5.756	1.53	271.26	0.634	0.945	5.323
TILL-1	6.881	45.21	8.79	8.63	5.526	1.79	282.47	0.627	1.047	5.243
TILL-1	6.936	45.09	8.80	11.48	5.866	1.66	311.59	0.660	1.025	5.001
TILL-1	6.921	44.60	8.35	10.59	5.931	1.90	284.61	0.637	1.033	5.494
TILL-1	6.760	42.88	7.89	9.03	5.929	2.02	282.67	0.634	0.972	6.335
TILL-1	6.767	44.63	7.76	12.14	5.973	1.51	302.43	0.429	1.124	5.479
TILL-1	6.930	45.23	8.59	12.70	6.023	1.68	311.53	0.410	1.154	5.587
TILL-1	6.778	43.38	9.01	12.84	5.883	1.46	300.06	0.517	0.820	5.376
TILL-1	6.936	43.70	7.93	12.36	5.389	1.35	311.30	0.505	0.805	5.468
TILL-1	7.033	44.64	8.92	12.71	6.218	1.64	305.72	0.485	0.870	5.312
TILL-1	6.887	43.71	8.33	12.27	6.333	1.55	305.24	0.460	0.870	5.194
TILL-1	6.986	42.81	8.68	12.64	6.157	1.80	296.24	0.647	1.054	5.406
TILL-1	6.869	43.34	8.06	12.03	6.309	1.88	301.63	0.654	1.017	5.600
TILL-1	7.022	44.39	9.20	12.29	5.772	1.74	306.46	0.659	1.029	5.591
TILL-1	6.899	43.34	8.27	12.31	5.662	1.70	304.30	0.647	1.085	5.294
TILL-1	7.112	43.88	8.55	14.18	6.228	2.06	306.68	0.691	1.050	5.699
TILL-1	7.075	44.05	8.64	14.62	6.570	2.06	310.57	0.681	1.027	5.709
TILL-1	7.050	43.03	8.69	14.23	6.368	1.74	307.63	0.676	1.025	5.613
TILL-1	7.181	51.25	9.17	16.46	6.616	2.00	343.83	0.679	1.091	5.860
TILL-1	7.253	45.93	8.20	14.65	6.425	1.92	309.50	0.756	1.104	5.661
TILL-1	6.965	43.41	7.59	14.68	5.966	1.80	308.62	0.674	1.040	5.745
Till 1	6.798	44.46	8.45	12.34	5.991	1.94	290.87	0.642	1.032	5.573
Till 1	6.818	47.73	8.15	13.30	6.168	1.81	306.49	0.660	1.021	5.643

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLO:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-1	2.075	105.60	0.82	37.080	3.729	93.45	498.70	51-75	ngsa072b
TILL-1	2.099	106.40	0.83	36.950	3.819	99.33	516.20	51-75	ngsa072b
TILL-1	2.109	105.70	1.37	37.150	3.780	102.20	518.50	51-75	ngsa073a
TILL-1	2.073	103.20	0.93	36.340	3.777	101.40	490.50	51-75	ngsa073a
TILL-1	2.046	102.30	0.91	37.290	3.832	98.39	490.10	51-75	ngsa073a
TILL-1	2.124	103.00	0.78	37.620	3.672	102.00	498.60	51-75	ngsa073a
TILL-1	2.062	102.00	1.17	35.630	3.778	99.94	507.70	51-75	ngsa073b
TILL-1	2.144	104.90	0.75	36.430	3.795	98.74	505.70	51-75	ngsa073b
TILL-1	2.178	104.90	0.73	36.510	3.863	101.40	512.70	51-75	ngsa073b
TILL-1	2.212	105.00	0.80	36.840	3.833	100.30	519.70	51-75	ngsa073b
TILL-1	2.147	102.40	0.89	36.380	3.782	100.50	500.20	51-75	NGSA074A
TILL-1	2.119	104.60	0.78	38.000	3.736	99.32	504.20	51-75	NGSA074A
TILL-1	2.077	102.10	1.50	36.750	3.808	98.15	504.10	51-75	NGSA075A
TILL-1	2.218	101.30	0.96	36.160	3.682	102.20	496.40	51-75	NGSA075A
TILL-1	2.273	102.80	1.23	37.360	3.700	101.70	496.80	51-75	ngsa074b
TILL-1	2.241	105.20	1.14	38.540	3.677	98.73	499.20	51-75	ngsa074b
TILL-1	2.086	105.00	1.44	38.130	3.707	103.00	504.90	51-75	NGSA076A
TILL-1	2.027	101.20	0.89	37.530	3.712	97.17	498.60	51-75	NGSA076A
TILL-1	1.841	100.70	0.85	36.330	3.444	97.22	507.00	51-75	ngsa075b
TILL-1	1.828	102.70	0.34	36.840	3.487	96.33	503.90	51-75	ngsa075b
TILL-1	1.872	102.30	0.80	36.640	3.554	97.19	505.60	51-75	ngsa075b
TILL-1	2.027	101.50	1.20	36.330	3.775	98.22	500.30	51-75	NGSA076B
TILL-1	2.021	102.00	0.79	36.600	3.670	96.58	500.50	51-75	NGSA076B
TILL-1	1.986	103.30	0.73	37.720	3.657	97.58	507.30	51-75	NGSA076B
TILL-1	1.938	98.40	1.13	37.110	3.778	97.81	517.00	51-75	NGSA077A
TILL-1	2.031	103.30	0.77	37.610	3.882	102.20	524.00	51-75	NGSA077A
TILL-1	2.034	104.10	1.07	38.930	3.817	101.90	532.70	51-75	ngsa077b
TILL-1	2.036	101.80	0.75	37.180	3.650	99.71	505.60	51-75	ngsa077b
TILL-1	2.349	100.20	1.42	34.350	3.655	97.16	519.30	51-75	NGSA078A
TILL-1	2.441	101.20	1.07	36.520	3.851	96.47	515.40	51-75	NGSA078A
TILL-1	2.042	102.60	1.09	37.760	3.727	102.20	528.00	51-75	ngsa078b
TILL-1	1.983	102.60	0.78	35.360	3.818	101.50	520.10	51-75	ngsa078b
TILL-1	2.185	100.50	1.33	36.260	3.832	100.10	515.20	51-75	ngsa079b
TILL-1	2.207	103.90	0.97	36.880	3.779	97.89	507.10	51-75	ngsa079b
TILL-1	2.115	103.00	1.46	37.180	3.800	98.79	518.90	51-75	ngsa079a
TILL-1	2.028	102.10	0.99	37.460	3.629	95.34	495.30	51-75	ngsa079a
TILL-1	2.029	102.60	0.89	35.970	3.646	96.82	497.10	51-75	ngsa080a
TILL-1	2.154	102.70	0.61	37.150	3.858	102.30	514.20	51-75	ngsa080a
TILL-1	2.061	102.71	1.91	38.189	3.754	97.89	521.59	76-86	NGSA081b
TILL-1	2.026	103.99	0.96	38.544	3.785	93.32	515.85	76-86	NGSA081b
TILL-1	2.019	104.64	1.94	39.438	3.855	98.71	524.30	76-86	ngsa081aa
TILL-1	2.087	103.80	1.46	37.641	3.803	101.44	513.62	76-86	ngsa081aa
TILL-1	2.040	102.27	1.61	40.081	3.788	94.43	538.35	76-86	ngsa082aa
TILL-1	2.106	100.90	0.81	37.310	3.704	101.63	515.96	76-86	ngsa082aa
TILL-1	2.079	101.61	1.58	38.249	3.880	98.62	532.74	76-86	ngsa082bb
TILL-1	2.047	107.06	1.32	38.788	3.885	100.84	537.70	76-86	ngsa083bb
TILL-1	2.014	109.68	0.91	36.031	3.793	100.69	546.43	76-86	ngsa083bb
TILL-1	2.022	102.74	1.48	33.160	3.776	97.00	537.65	76-86	ngsa083AA
TILL-1	2.096	106.27	0.91	39.279	3.853	93.97	547.94	76-86	ngsa083AA
TILL-1	2.074	104.37	1.46	38.798	3.854	100.05	549.51	76-86	NGSA084Aa
TILL-1	2.042	107.19	1.05	33.599	3.752	97.80	540.14	76-86	NGSA084Aa
TILL-1	2.086	103.85	0.24	38.491	3.829	96.96	546.31	76-86	NGSA084B
TILL-1	2.028	108.66	0.05	39.909	3.679	94.87	555.61	76-86	NGSA084B
TILL-1	1.945	105.75	1.10	37.967	3.741	98.54	537.15	76-86	NGSA085Aa
TILL-1	1.991	109.76	0.35	36.355	3.762	100.97	544.54	76-86	NGSA085Aa
TILL-1	2.050	104.34	1.86	32.368	3.843	90.33	555.03	76-86	NGSA086Bb
TILL-1	1.994	107.06	0.91	31.312	3.869	98.32	555.74	76-86	NGSA086Bb
TILL-1	2.054	102.86	1.27	38.232	3.767	97.37	539.46	76-86	ngsa086aa
TILL-1	1.983	104.21	1.11	32.555	3.623	95.62	550.09	76-86	ngsa086aa
TILL-1	2.006	103.18	1.31	39.310	3.800	95.53	546.96	76-86	NGSA087aA
TILL-1	2.010	105.22	0.78	44.368	3.750	101.72	548.54	76-86	NGSA087aA
TILL-1	2.021	104.50	0.05	43.224	3.958	93.83	541.82	76-86	NGSA087bb
TILL-1	1.997	103.36	0.05	39.179	3.789	94.56	542.50	76-86	NGSA087bb
TILL-1	2.093	104.52	0.05	37.084	4.035	103.04	567.52	76-86	ngsa088aa
TILL-1	1.982	101.66	0.05	36.264	3.659	102.59	542.87	76-86	ngsa088aa
TILL-1	1.970	103.63	1.12	37.556	3.799	96.39	545.42	76-86	ngsa088bb
TILL-1	2.008	103.90	0.72	38.625	3.819	93.44	567.82	76-86	ngsa088bb
TILL-1	1.976	103.99	1.66	38.471	3.635	93.46	528.58	76-86	ngsa089aA
TILL-1	1.944	106.02	0.69	40.825	3.722	93.97	524.25	76-86	ngsa089aA
TILL-1	2.170	105.73	1.36	39.386	3.817	95.99	539.64	76-86	ngsa090bb
TILL-1	1.964	107.85	0.45	39.237	3.844	99.69	533.28	76-86	ngsa090bb
TILL-1	2.196	106.53	1.43	39.620	4.010	98.09	539.10	76-86	ngsa090aA
TILL-1	2.141	107.86	0.73	39.564	3.992	97.56	538.22	76-86	ngsa090aA
TILL-1	1.984	105.75	1.62	40.157	3.877	98.70	545.62	76-86	ngsa091aA
TILL-1	1.856	107.12	0.79	38.026	3.558	99.89	542.44	76-86	ngsa091aA
TILL-1	2.065	102.91	1.52	37.729	3.953	94.26	530.29	76-86	NGSA091bb
TILL-1	2.061	104.86	0.63	38.649	3.740	92.05	534.44	76-86	NGSA091bb
TILL-1	1.973	105.34	1.12	38.987	3.686	103.57	530.43	76-86	NGSA092AA
TILL-1	2.056	104.28	0.64	38.482	3.826	101.20	537.30	76-86	NGSA092AA
TILL-1	2.062	104.95	1.25	37.221	3.674	95.16	513.91	1-25 redo	NGSA100 Repeats
TILL-1	2.032	107.95	0.82	38.345	3.648	96.48	516.17	1-25 redo	NGSA100 Repeats
TILL-1	2.011	108.39	1.39	38.073	3.745	97.30	517.96	1-25 redo	NGSA101 Repeats
TILL-1	1.996	116.42	0.92	40.816	3.755	99.80	552.90	1-25 redo	NGSA101 Repeats
TILL-1	2.103	109.32	1.57	38.560	3.762	97.94	527.37	1-25 redo	NGSA102 Repeats
TILL-1	2.045	107.38	0.81	37.470	3.723	91.69	509.28	1-25 redo	NGSA102 Repeats
Till 1	1.944	101.54	1.14	36.127	3.556	91.03	498.97	1-25 redo	NGSA103 Repeats
Till 1	1.981	105.70	0.78	36.894	3.676	94.39	503.04	1-25 redo	NGSA103 Repeats

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLO:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-1	007SMPL.D	NGSA-01B	18/05/2010	0.169	18.56	708.73	1.97	1.956	0.25
TILL-1	039SMPL.D	NGSA-02A	18/05/2010	0.146	19.32	757.99	2.17	1.930	0.28
TILL-1	007SMPL.D	NGSA-02A	18/05/2010	0.229	16.77	719.30	1.47	1.924	0.29
TILL-1	038SMPL.D	NGSA-01B	18/05/2010	0.181	16.10	716.10	1.81	1.811	0.33
TILL-1	007SMPL.D	NGSA02B	19/05/2010	0.204	16.74	730.34	0.55	1.959	0.22
TILL-1	038SMPL.D	NGSA02B	19/05/2010	0.208	15.56	735.81	0.55	1.925	0.26
TILL-1	040SMPL.D	NGSA 03A	19/05/2010	0.181	16.44	735.99	0.55	1.937	0.13
TILL-1	007SMPL.D	NGSA 03A	19/05/2010	0.217	17.08	719.76	1.68	1.967	0.30
TILL-1	037SMPL.D	NGSA02B	19/05/2010	0.252	16.86	720.21	1.75	1.903	0.29
TILL-1	007SMPL.D	NGSA 03B	20/05/2010	0.162	16.85	715.05	1.41	1.900	0.33
TILL-1	039SMPL.D	09172008 NGSA 3 A	20/05/2010	0.163	16.04	747.66	2.58	1.930	0.15
TILL-1	007SMPL.D	09172008 NGSA 3 A	20/05/2010	0.266	15.74	708.50	1.86	1.978	0.05
TILL-1	037SMPL.D	NGSA 03B	20/05/2010	0.212	17.06	704.77	2.10	1.861	0.10
TILL-1	007SMPL.D	09172008 NGSA 3 B	21/05/2010	0.088	16.23	719.57	1.28	1.889	0.16
TILL-1	039SMPL.D	NGSA 04A	21/05/2010	0.112	16.79	755.42	1.28	1.907	0.13
TILL-1	007SMPL.D	NGSA 04A	21/05/2010	0.233	16.29	721.61	1.27	1.920	0.17
TILL-1	037SMPL.D	09172008 NGSA 3 B	21/05/2010	0.187	16.05	713.00	1.94	1.940	0.31
TILL-1	007SMPL.D	NGSA 4A	25/05/2010	0.171	16.89	736.11	1.85	1.938	0.28
TILL-1	037SMPL.D	NGSA 04B	25/05/2010	0.191	17.74	769.19	1.70	1.973	0.25
TILL-1	007SMPL.D	NGSA 04B	25/05/2010	0.240	16.21	738.06	2.07	1.932	0.35
TILL-1	039SMPL.D	NGSA 4A	25/05/2010	0.220	16.54	733.10	2.12	1.871	0.39
TILL-1	007SMPL.D	NGSA04 B	26/05/2010	0.191	15.75	728.21	1.87	1.959	0.24
TILL-1	039SMPL.D	NGSA 5 A	26/05/2010	0.221	17.03	748.31	2.37	1.921	0.22
TILL-1	007SMPL.D	NGSA 5 A	26/05/2010	0.216	16.98	727.32	2.53	1.962	0.26
TILL-1	037SMPL.D	NGSA04 B	26/05/2010	0.167	16.61	715.82	2.84	1.896	0.17
TILL-1	007SMPL.D	NGSA 5 B	27/05/2010	0.193	16.38	709.12	1.77	1.985	0.48
TILL-1	039SMPL.D	NGSA 5 B	27/05/2010	0.205	14.90	690.46	2.01	1.952	0.40
TILL-1	007SMPL.D	NGSA 05A	28/05/2010	0.203	17.43	715.71	1.30	1.921	0.12
TILL-1	041SMPL.D	NGSA 05A	28/05/2010	0.155	16.98	746.55	1.53	1.967	0.16
TILL-1	007SMPL.D	NGSA05B	1/06/2010	0.181	15.02	737.67	1.67	1.948	0.23
TILL-1	039SMPL.D	NGSA05B	1/06/2010	0.183	15.90	737.88	1.99	1.879	0.20
TILL-1	007SMPL.D	NGSA 06 A	3/06/2010	0.238	16.30	727.05	1.28	1.939	0.32
TILL-1	037SMPL.D	NGSA 06 A	3/06/2010	0.245	16.90	734.16	1.42	1.960	0.37
TILL-1	007SMPL.D	NGSA 06 B	4/06/2010	0.177	15.65	707.94	1.96	1.875	0.18
TILL-1	039SMPL.D	NGSA 06 B	4/06/2010	0.127	15.03	713.43	1.90	1.912	0.13
TILL-1	007SMPL.D	NGSA 07 A	7/06/2010	0.207	16.67	709.17	1.80	2.021	0.34
TILL-1	037SMPL.D	NGSA 07 A	7/06/2010	0.204	16.58	729.91	1.65	1.960	0.31
TILL-1	007SMPL.D	NGSA07B	8/06/2010	0.195	17.09	713.18	1.32	1.975	0.30
TILL-1	039SMPL.D	NGSA08B	8/06/2010	0.105	16.62	738.56	1.55	1.947	0.25
TILL-1	007SMPL.D	NGSA08B	8/06/2010	0.258	16.70	712.34	1.53	1.987	0.22
TILL-1	007SMPL.D	NGSA08B	9/06/2010	0.256	15.72	717.24	0.55	2.040	0.94
TILL-1	028SMPL.D	NGSA07B	9/06/2010	0.173	16.15	723.85	1.76	1.994	0.94
TILL-1	007SMPL.D	NGSA08A	9/06/2010	0.206	16.30	735.02	1.45	1.894	0.15
TILL-1	037SMPL.D	NGSA08A	9/06/2010	0.207	17.58	746.63	1.88	1.918	0.37
TILL-1	007SMPL.D	NGSA09A	10/06/2010	0.176	17.49	736.06	1.55	1.952	0.21
TILL-1	037SMPL.D	NGSA 09 B	10/06/2010	0.172	16.48	743.90	1.60	1.919	0.05
TILL-1	007SMPL.D	NGSA 09 B	10/06/2010	0.197	17.43	724.51	0.55	1.911	0.05
TILL-1	039SMPL.D	NGSA09A	10/06/2010	0.181	18.13	741.25	0.55	1.906	0.05
TILL-1	007SMPL.D	NGSA10A	11/06/2010	0.255	18.74	747.55	1.70	1.960	0.31
TILL-1	036SMPL.D	NGSA10B	11/06/2010	0.134	17.50	729.98	1.82	1.931	0.22
TILL-1	038SMPL.D	NGSA10B	11/06/2010	0.161	15.16	726.08	1.50	1.886	0.32
TILL-1	007SMPL.D	NGSA10B	11/06/2010	0.196	16.72	715.11	1.49	1.959	0.17
TILL-1	037SMPL.D	NGSA10A	11/06/2010	0.235	18.63	757.24	1.75	1.942	0.37
TILL-1	039SMPL.D	NGSA10B	11/06/2010	0.160	17.35	698.50	1.67	1.979	0.21
TILL-1	007SMPL.D	NGSA011A	15/06/2010	0.134	15.79	712.13	1.36	1.939	0.11
TILL-1	037SMPL.D	NGSA011B	15/06/2010	0.139	16.78	744.97	1.84	1.929	0.05
TILL-1	007SMPL.D	NGSA011B	15/06/2010	0.144	16.63	701.62	1.33	1.988	0.17
TILL-1	038SMPL.D	NGSA011A	15/06/2010	0.182	15.57	711.07	2.07	1.922	0.19
TILL-1	007SMPL.D	NGSA06Z	16/06/2010	0.203	18.69	715.21	1.50	1.999	0.23
TILL-1	037SMPL.D	NGSA012 A	16/06/2010	0.216	20.32	750.36	1.16	1.923	0.05
TILL-1	007SMPL.D	NGSA012 A	17/06/2010	0.221	17.27	749.24	1.39	2.007	0.90
TILL-1	038SMPL.D	NGSA06Z	17/06/2010	0.207	17.56	724.49	1.87	1.966	0.90
Average				0.2543	16.5870	717.6942	1.7035	2.0129	0.2685
SD				0.1100	0.9719	17.1241	0.4800	0.1740	0.1490
RSD				43%	6%	2%	28%	9%	56%
RV					18	702	2.4	2.5	
GeoPT					12%	7%	16%	22%	
GeoPT abs					2.1493	50.5719	0.3789	0.5385	
Bias					92%	102%	71%	81%	
Prec WRT GeoPT					0.4907	0.3312	1.7847	0.4013	
TILL-2	040SMPL.D#	NGSA025B	18/03/2009	0.070	23.18	534.70	4.10	5.389	0.05
TILL-2	072SMPL.D#	NGSA025B	18/03/2009	0.098	22.71	540.10	4.22	5.485	0.05
TILL-2	008SMPL.D#	NGSA026A	19/03/2009	0.117	24.84	539.10	3.84	5.265	0.36
TILL-2	038SMPL.D#	NGSA026A	19/03/2009	0.077	21.15	524.00	4.57	5.237	0.29
Till-2	008SMPL.D#	NGSA029A	2/06/2009	0.261	25.49	551.60	3.72	4.641	0.28
Till-2	040SMPL.D#	NGSA029A	2/06/2009	0.205	26.36	558.30	4.06	4.548	0.20
Till-2	008SMPL.D#	NGSA029B	3/06/2009	0.219	25.43	537.50	3.41	4.620	0.26
Till-2	038SMPL.D#	NGSA029B	3/06/2009	0.178	25.11	554.80	3.45	4.514	0.31
Till-2	008SMPL.D#	NGSA030A	4/06/2009	0.292	24.74	533.40	3.34	4.723	0.31
Till-2	040SMPL.D#	NGSA030A	4/06/2009	0.212	26.03	542.40	3.66	4.661	0.30
Till-2	008SMPL.D#	NGSA030B	4/06/2009	0.261	26.89	541.90	3.24	4.678	0.36
Till-2	038SMPL.D#	NGSA030B	4/06/2009	0.240	26.88	539.90	3.61	4.677	0.36
Till-2	008SMPL.D#	NGSA031A	5/06/2009	0.223	25.39	544.30	4.14	4.604	0.35
Till-2	040SMPL.D#	NGSA031A	5/06/2009	0.214	26.31	558.10	4.08	4.600	0.30
Till-2	042SMPL.D#	NGSA031A	5/06/2009	0.255	25.71	564.50	3.32	4.593	0.39
Till-2	008SMPL.D#	ngsa031b	5/06/2009	0.260	23.96	535.90	3.52	4.652	0.31

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-1	68.836	18.01	64.49	1.00	46.60	5.65	3.402	1.429	17.34	5.652
TILL-1	69.890	18.27	65.93	1.09	45.94	5.99	3.456	1.501	17.40	5.530
TILL-1	70.236	17.62	65.57	1.09	45.87	5.88	3.503	1.504	16.22	5.520
TILL-1	69.193	17.65	63.98	1.02	44.42	5.60	3.447	1.475	17.47	5.591
TILL-1	70.637	18.07	63.57	1.06	46.79	5.70	3.457	1.415	16.53	5.658
TILL-1	70.081	17.46	62.39	1.06	46.26	5.69	3.517	1.510	17.34	5.660
TILL-1	68.878	17.79	63.01	1.05	45.67	5.85	3.450	1.412	17.96	5.548
TILL-1	69.791	17.84	65.08	1.04	44.34	5.79	3.521	1.489	16.60	5.622
TILL-1	70.349	18.30	65.66	0.98	45.68	6.02	3.405	1.475	16.56	5.629
TILL-1	69.291	17.28	64.15	1.08	44.29	5.76	3.405	1.380	18.24	5.495
TILL-1	70.197	17.70	67.84	1.12	44.08	5.94	3.403	1.458	19.16	5.564
TILL-1	69.505	17.16	64.06	1.04	47.38	5.77	3.432	1.480	15.80	5.531
TILL-1	68.736	17.26	63.08	0.98	47.30	5.76	3.525	1.417	16.31	5.488
TILL-1	69.814	18.17	65.82	1.02	46.03	5.80	3.368	1.427	16.55	5.546
TILL-1	70.802	18.09	68.16	1.02	41.51	5.93	3.412	1.393	15.68	5.585
TILL-1	71.055	18.15	65.41	1.07	44.95	6.03	3.514	1.481	17.42	5.566
TILL-1	69.437	17.99	65.32	0.99	46.75	5.95	3.424	1.373	18.14	5.505
TILL-1	72.121	18.05	66.52	1.06	44.68	6.09	3.456	1.542	17.35	5.639
TILL-1	72.045	18.71	66.89	1.07	43.57	6.03	3.485	1.581	18.69	5.754
TILL-1	71.358	18.13	65.96	1.10	45.46	5.92	3.566	1.556	16.21	5.682
TILL-1	70.956	18.80	65.63	1.08	46.55	5.86	3.638	1.561	17.33	5.756
TILL-1	70.727	18.47	64.39	1.00	45.65	5.99	3.505	1.488	17.69	5.593
TILL-1	70.479	18.31	69.61	1.09	45.49	5.88	3.556	1.569	18.37	5.667
TILL-1	70.570	17.99	65.60	1.07	45.44	5.96	3.504	1.509	17.09	5.678
TILL-1	69.874	17.91	61.31	1.03	44.10	5.96	3.604	1.483	18.27	5.681
TILL-1	70.192	17.15	64.95	0.98	44.57	5.98	3.567	1.450	16.06	5.612
TILL-1	67.747	17.78	66.86	0.97	43.05	5.74	3.534	1.454	16.86	5.485
TILL-1	69.698	17.99	64.56	1.09	44.76	5.86	3.449	1.441	16.72	5.652
TILL-1	69.427	18.24	66.54	1.05	43.87	5.89	3.522	1.538	17.89	5.529
TILL-1	71.090	17.93	64.25	1.12	44.89	6.00	3.462	1.407	15.91	5.665
TILL-1	70.337	18.96	68.79	1.10	45.15	5.87	3.568	1.397	17.54	5.607
TILL-1	70.252	18.07	62.72	1.06	46.83	5.96	3.554	1.469	17.52	5.731
TILL-1	70.517	18.50	64.48	1.13	46.11	6.01	3.497	1.450	16.84	5.695
TILL-1	68.716	17.89	64.47	0.91	46.06	5.87	3.229	1.427	15.93	5.529
TILL-1	67.234	17.94	67.13	1.01	44.10	5.84	3.429	1.424	16.64	5.567
TILL-1	68.845	17.55	63.72	1.01	43.93	5.83	3.697	1.445	15.77	5.560
TILL-1	67.829	17.71	64.98	1.07	43.15	5.79	3.744	1.496	15.00	5.544
TILL-1	69.711	17.43	64.09	0.97	47.08	5.64	3.502	1.447	15.85	5.719
TILL1	68.710	18.52	66.90	0.98	44.04	5.80	3.406	1.457	17.21	5.849
TILL1	70.183	18.19	64.86	0.95	44.59	5.81	3.425	1.493	17.32	5.639
TILL1	68.676	18.13	67.60	1.07	43.96	5.58	3.478	1.426	17.40	5.630
TILL-1	67.537	17.96	66.04	1.07	45.33	5.88	3.387	1.481	17.23	5.565
TILL1	71.968	17.71	64.00	1.12	45.56	6.26	3.477	1.531	18.12	5.638
TILL1	71.603	18.34	65.06	1.17	43.73	6.24	3.494	1.591	20.31	5.575
TILL-1	72.558	18.42	64.06	1.07	43.92	5.91	3.556	1.526	17.10	5.735
TILL-1	68.862	17.84	64.20	0.95	40.58	5.82	3.489	1.477	16.56	5.554
TILL-1	68.281	17.46	63.22	0.99	46.32	5.66	3.381	1.424	16.90	5.477
TILL-1	71.483	17.57	64.98	1.15	47.07	5.90	3.516	1.514	18.57	5.682
TILL-1	71.624	17.79	64.23	1.09	44.91	5.76	3.491	1.424	18.44	5.518
TILL-1	67.054	18.25	65.01	1.10	45.79	5.71	3.502	1.449	18.42	5.419
TILL-1	66.510	17.30	62.93	1.00	44.41	5.78	3.537	1.478	16.55	5.507
TILL-1	68.317	17.53	62.47	1.09	44.52	5.62	3.342	1.491	17.05	5.287
TILL-1	71.798	17.60	62.88	1.13	44.27	5.74	3.445	1.373	16.62	5.573
TILL-1	68.168	18.03	64.42	1.12	44.63	5.72	3.350	1.419	17.60	5.467
TILL-1	68.809	17.35	63.21	1.03	44.82	5.63	3.375	1.424	17.59	5.546
TILL-1	68.062	17.96	65.15	1.04	41.68	5.57	3.437	1.395	17.28	5.515
TILL-1	67.793	17.85	64.28	1.03	45.17	5.86	3.388	1.366	15.80	5.548
TILL-1	68.080	17.54	63.17	1.08	44.36	5.73	3.426	1.416	17.21	5.500
TILL-1	69.266	17.33	65.17	0.99	44.43	5.88	3.319	1.367	16.85	5.515
TILL-1	69.847	20.15	66.52	0.96	44.62	5.69	3.569	1.524	18.55	5.668
TILL-1	72.119	17.86	66.63	1.04	46.47	5.94	3.446	1.519	16.46	5.568
TILL-1	69.790	17.49	66.65	1.10	44.77	5.75	3.516	1.444	16.81	5.440
Average	68.9493	18.0394	65.2229	1.0326	45.4122	5.7614	3.5641	1.5111	17.3752	5.7644
SD	1.5917	0.5342	2.4904	0.0745	1.9193	0.2170	0.0967	0.0696	0.9458	0.1913
RSD	2%	3%	4%	7%	4%	4%	3%	5%	5%	3%
RV	71	18	65	1	47	5.761433528	3.6	1.3	17.37518537	5.764375894
GeoPT	9%	12%	8%	14%	11%	13%	14%	16%	12%	13%
GeoPT abs	6.2158	2.1600	5.1656	0.1397	5.2361	0.7453	0.5048	0.2108	2.0658	0.7359
Bias	97%	100%	100%	103%	97%	100%	99%	116%	100%	100%
Prec WRT GeoPT	0.2637	0.2468	0.4805	0.5168	0.3794	0.2912	0.1934	0.2840	0.4579	0.2599
TILL-2	99.120	15.20	74.61	12.24	151.40	6.47	3.958	1.177	20.90	6.921
TILL-2	99.920	14.64	77.71	12.52	150.80	6.35	3.960	1.172	19.48	6.776
TILL-2	99.940	14.42	75.91	12.52	151.00	6.56	3.941	1.162	20.77	6.953
TILL-2	95.200	15.17	76.87	11.77	146.60	6.39	3.890	1.178	19.23	6.614
Till-2	102.700	15.13	75.76	12.52	150.00	6.46	3.762	1.236	20.06	6.854
Till-2	102.500	15.23	76.88	12.77	150.00	6.71	3.739	1.273	19.26	6.981
Till-2	102.000	14.71	74.82	12.22	149.80	6.34	3.855	1.264	19.19	6.943
Till-2	102.700	15.00	77.97	12.82	148.60	6.33	3.853	1.176	18.98	6.863
Till-2	100.100	15.08	74.35	11.86	148.20	6.08	3.740	1.187	19.14	6.804
Till-2	100.800	15.27	75.78	12.37	150.00	6.18	3.743	1.230	20.70	6.792
Till-2	102.500	15.09	74.37	12.38	149.20	6.25	3.793	1.284	20.66	6.875
Till-2	102.000	15.12	76.18	12.48	149.50	6.47	3.951	1.243	19.50	6.720
Till-2	102.800	15.27	75.90	12.44	147.80	6.45	3.742	1.214	20.22	6.975
Till-2	103.200	15.72	76.25	13.03	146.70	6.49	3.813	1.269	21.70	7.018
Till-2	103.900	15.84	76.80	12.88	145.80	6.47	3.735	1.226	20.74	6.863
Till-2	101.500	14.99	74.54	12.41	145.40	6.44	3.803	1.259	19.87	6.915

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-1	0.533	12.462	1.230	28.44	0.525	0.79	10.460	27.34	23.69	22.60
TILL-1	0.620	12.783	1.242	29.58	0.504	0.88	11.266	28.17	26.68	21.99
TILL-1	0.588	12.643	1.211	28.12	0.544	0.78	10.944	28.72	29.49	22.09
TILL-1	0.536	12.312	1.224	27.93	0.520	0.88	10.629	28.39	25.56	22.38
TILL-1	0.615	12.814	1.211	27.37	0.484	0.84	10.888	28.76	26.04	22.67
TILL-1	0.618	12.976	1.167	27.60	0.498	0.95	10.887	28.26	24.74	22.97
TILL-1	0.604	12.762	1.144	27.47	0.515	0.89	10.908	27.96	23.72	21.99
TILL-1	0.554	12.753	1.191	27.20	0.550	0.87	10.695	28.04	24.23	21.99
TILL-1	0.655	12.570	1.183	27.42	0.530	0.98	10.712	28.48	25.16	22.62
TILL-1	0.546	12.587	1.163	27.73	0.466	0.88	10.206	28.16	23.20	22.16
TILL-1	0.560	12.413	1.151	28.41	0.493	0.51	10.766	28.45	27.29	22.10
TILL-1	0.458	12.717	1.211	27.62	0.502	1.78	10.681	27.31	26.46	22.01
TILL-1	0.459	12.695	1.195	27.49	0.507	1.44	10.159	27.43	23.64	21.73
TILL-1	0.448	12.320	1.119	27.86	0.468	1.19	10.555	28.86	28.42	22.00
TILL-1	0.520	12.402	1.161	27.93	0.485	1.20	10.495	28.15	28.05	22.06
TILL-1	0.517	12.617	1.197	28.53	0.532	0.91	10.996	28.64	26.99	22.15
TILL-1	0.441	12.684	1.203	27.60	0.532	0.80	10.516	28.42	28.51	21.63
TILL-1	0.573	13.090	1.228	28.66	0.527	0.96	10.970	29.05	25.26	22.75
TILL-1	0.549	12.604	1.236	29.11	0.516	0.98	11.283	28.58	30.09	22.61
TILL-1	0.590	12.833	1.255	28.17	0.593	0.97	10.962	28.93	28.84	22.64
TILL-1	0.556	13.111	1.285	28.22	0.566	0.98	10.960	29.22	24.53	22.51
TILL-1	0.485	12.709	1.244	28.45	0.558	0.85	10.832	29.13	24.09	22.56
TILL-1	0.534	12.674	1.240	28.90	0.540	0.89	10.888	28.67	29.43	22.13
TILL-1	0.452	12.921	1.240	29.25	0.569	1.45	11.041	29.24	29.31	22.25
TILL-1	0.547	12.882	1.229	28.83	0.586	1.15	10.674	29.00	24.31	22.30
TILL-1	0.411	12.616	1.224	27.81	0.540	1.04	10.884	28.33	25.27	22.36
TILL-1	0.512	12.763	1.218	26.62	0.535	1.08	10.137	27.99	23.38	22.40
TILL-1	0.515	12.761	1.231	27.68	0.526	0.90	10.546	28.58	24.03	22.51
TILL-1	0.545	12.459	1.208	28.13	0.510	0.84	11.053	28.39	23.56	22.84
TILL-1	0.500	12.876	1.218	29.54	0.552	0.99	10.889	29.12	22.57	22.72
TILL-1	0.500	12.641	1.228	29.21	0.539	0.75	10.597	28.14	23.52	22.67
TILL-1	0.574	12.805	1.234	28.41	0.564	0.79	10.696	28.94	26.40	22.55
TILL-1	0.614	12.805	1.272	28.37	0.537	0.88	10.791	29.26	27.52	22.35
TILL-1	0.441	12.682	1.217	28.42	0.553	0.95	10.675	27.54	25.33	21.75
TILL-1	0.518	12.496	1.198	27.60	0.440	0.70	10.090	27.98	25.82	21.75
TILL-1	0.560	12.254	1.188	27.62	0.538	0.84	10.466	27.47	24.05	21.55
TILL-1	0.537	12.022	1.201	27.61	0.501	0.86	10.761	27.57	23.38	21.74
TILL-1	0.613	12.534	1.201	27.88	0.576	1.69	10.826	27.98	25.53	22.10
TILL1	0.544	12.182	1.170	28.31	0.528	1.54	10.528	28.37	24.07	22.36
TILL1	0.531	12.343	1.245	28.94	0.572	0.71	10.655	28.11	23.55	22.36
TILL1	0.508	12.558	1.259	28.39	0.545	0.92	10.643	29.00	24.79	22.30
TILL-1	0.429	12.429	1.197	27.41	0.507	0.69	10.187	28.06	24.57	22.14
TILL1	0.424	13.183	1.194	28.75	0.559	1.15	11.212	28.80	24.18	22.71
TILL1	0.452	12.946	1.205	28.69	0.557	0.94	10.999	28.33	24.80	22.64
TILL-1	0.561	12.764	1.189	28.33	0.524	0.95	10.770	29.76	26.41	22.33
TILL-1	0.595	12.168	1.106	26.87	0.480	1.03	11.123	27.95	23.11	22.02
TILL-1	0.485	12.501	1.146	27.31	0.507	0.70	11.039	27.38	23.70	21.77
TILL-1	0.559	12.723	1.197	28.44	0.520	0.69	10.938	29.39	25.74	22.37
TILL-1	0.452	13.611	1.190	28.93	0.561	1.09	11.138	28.16	24.50	21.95
TILL-1	0.546	12.169	1.160	27.15	0.618	1.03	10.412	26.95	23.40	21.97
TILL-1	0.452	12.053	1.178	27.61	0.573	0.95	10.309	27.17	22.62	21.77
TILL-1	0.451	12.181	1.175	28.02	0.504	1.19	10.809	27.65	24.44	21.86
TILL-1	0.403	13.627	1.183	28.68	0.492	0.78	11.376	28.26	23.48	22.13
TILL-1	0.478	12.384	1.177	27.09	0.516	1.09	10.549	27.61	24.66	21.94
TILL-1	0.619	12.443	1.171	27.45	0.502	0.87	11.002	27.49	23.56	22.03
TILL-1	0.445	12.465	1.143	27.75	0.470	1.01	10.575	27.47	23.47	21.94
TILL-1	0.451	12.411	1.145	27.46	0.474	0.92	10.670	27.76	24.46	21.60
TILL-1	0.407	12.463	1.172	27.00	0.485	0.89	10.122	27.43	24.41	21.74
TILL-1	0.386	13.045	1.206	29.04	0.506	0.96	11.150	27.86	25.56	22.09
TILL-1	0.453	13.445	1.209	28.03	0.476	0.91	10.367	28.54	21.83	22.56
TILL-1	0.633	13.059	1.227	29.23	0.515	1.05	11.229	28.44	24.66	22.18
TILL-1	0.599	12.892	1.190	28.13	0.497	0.92	10.810	28.27	27.96	21.68
Average	0.5609	12.8338	1.2083	27.6335	0.5259	0.9245	10.9240	28.5956	24.8510	22.2012
SD	0.0953	0.4929	0.0501	0.8045	0.0504	0.3233	0.3543	0.8002	2.6532	0.8194
RSD	17%	4%	4%	3%	10%	35%	3%	3%	11%	4%
RV	0.560944149	13	1.208279461	28	0.6	2	10	26	24	22
GeoPT	16%	11%	18%	10%	18%	15%	12%	10%	9%	11%
GeoPT abs	0.0918	1.4914	0.2114	2.7408	0.1103	0.3029	1.1614	2.5658	2.1803	2.4444
Bias	100%	99%	100%	99%	88%	46%	109%	110%	104%	101%
Prec WRT GeoPT	1.0380	0.3348	0.2369	0.2974	0.5215	2.3092	0.2793	0.2836	1.1752	0.3322
TILL-2	0.635	10.310	1.435	45.81	0.572	13.75	19.070	35.98	32.74	30.59
TILL-2	0.686	10.430	1.430	45.90	0.598	13.68	18.960	36.29	33.79	30.78
TILL-2	0.667	10.320	1.434	46.54	0.593	13.73	19.830	36.25	34.27	30.28
TILL-2	0.564	10.560	1.396	43.98	0.589	12.59	17.920	36.42	33.42	30.31
Till-2	0.772	10.190	1.331	47.47	0.506	13.79	19.720	39.90	32.86	31.99
Till-2	0.797	10.130	1.321	47.10	0.493	13.40	19.960	39.71	34.20	31.53
Till-2	0.760	9.845	1.343	47.16	0.497	13.75	19.490	38.84	34.32	32.00
Till-2	0.823	9.913	1.329	48.21	0.482	13.91	20.440	39.12	34.46	31.69
Till-2	0.766	9.600	1.307	46.55	0.454	12.67	18.810	38.93	32.91	31.76
Till-2	0.805	9.619	1.252	46.99	0.474	13.31	19.670	38.51	35.37	31.67
Till-2	0.687	9.995	1.341	47.34	0.478	14.25	19.830	39.57	35.43	32.03
Till-2	0.772	9.848	1.351	46.94	0.500	15.22	19.740	38.48	35.26	31.73
Till-2	0.882	9.902	1.325	46.85	0.505	13.25	19.880	38.82	32.97	31.41
Till-2	0.670	9.968	1.325	48.09	0.496	13.47	20.140	38.60	33.49	31.86
Till-2	0.732	9.855	1.302	48.48	0.500	14.32	20.610	39.11	33.87	31.44
Till-2	0.806	10.090	1.343	46.96	0.495	14.46	19.700	39.28	32.67	31.40

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-1	6.795	43.51	8.42	14.31	5.363	1.70	304.17	1.658	1.026	6.037
TILL-1	6.880	47.55	9.22	14.80	5.672	2.10	330.71	1.667	0.985	5.283
TILL-1	7.008	43.92	8.61	13.93	6.431	1.66	305.56	0.659	0.992	5.302
TILL-1	7.037	42.93	7.64	14.33	6.216	1.90	304.66	0.645	0.982	6.025
TILL-1	7.067	44.56	7.37	14.40	6.090	2.08	306.00	0.645	1.101	5.643
TILL-1	7.021	45.94	8.20	14.80	6.136	2.05	319.97	0.622	1.099	5.882
TILL-1	7.024	45.76	7.85	15.14	6.402	1.90	321.23	0.622	1.106	5.695
TILL-1	7.027	43.67	8.26	14.19	6.184	1.68	305.26	0.653	1.030	5.631
TILL-1	7.014	44.47	8.15	14.57	6.122	1.89	306.95	0.672	1.039	5.769
TILL-1	6.826	43.74	8.25	14.27	6.330	1.75	307.62	0.548	0.914	5.486
TILL-1	6.898	47.10	8.69	15.62	6.316	2.05	333.62	0.529	0.945	5.547
TILL-1	6.931	42.73	8.86	14.11	6.034	1.72	302.94	0.626	0.981	5.772
TILL-1	6.950	42.45	9.14	13.98	6.078	1.77	300.36	0.628	0.971	5.611
TILL-1	6.927	44.08	8.40	12.86	6.387	1.89	304.90	0.657	0.927	5.646
TILL-1	6.999	43.80	9.03	13.71	6.344	1.72	318.45	0.632	0.916	5.767
TILL-1	7.019	43.89	7.91	13.16	6.370	1.72	308.05	1.316	0.994	5.775
TILL-1	7.063	43.01	8.40	12.89	6.056	1.97	303.40	1.304	0.988	5.682
TILL-1	7.175	45.43	8.99	13.21	6.478	1.83	308.98	0.670	1.025	5.863
TILL-1	7.091	48.20	10.15	11.27	6.353	2.01	318.33	0.646	1.030	5.980
TILL-1	7.102	45.39	9.05	10.41	6.390	2.01	295.13	0.663	1.075	5.746
TILL-1	7.109	44.30	9.01	13.33	6.422	2.00	310.02	0.669	1.088	5.965
TILL-1	7.004	45.96	8.51	13.10	6.159	1.69	307.01	0.671	1.053	5.829
TILL-1	6.984	46.65	8.10	14.11	5.952	1.95	322.97	0.640	1.036	5.783
TILL-1	6.961	44.27	7.86	13.14	6.084	1.84	303.20	0.684	1.048	5.736
TILL-1	7.102	43.88	8.11	12.84	5.987	1.76	299.83	0.672	1.020	5.729
TILL-1	6.766	45.84	7.90	12.60	6.305	1.82	302.36	0.652	1.012	5.731
TILL-1	6.718	42.17	7.92	13.06	6.088	1.81	294.02	0.638	0.982	5.852
TILL-1	6.882	43.74	8.42	13.00	6.189	1.95	296.25	0.654	1.010	5.598
TILL-1	6.747	47.84	8.65	14.01	5.909	1.73	318.81	0.653	0.968	5.744
TILL-1	7.144	44.63	8.69	13.00	6.249	1.85	305.63	0.670	1.009	5.667
TILL-1	7.011	46.15	9.05	14.15	6.461	1.74	318.60	0.661	0.992	5.968
TILL-1	7.016	45.00	8.43	14.70	6.502	1.62	315.21	0.653	1.027	5.731
TILL-1	7.012	46.70	8.83	14.93	6.545	1.74	320.58	0.643	1.014	5.778
TILL-1	6.881	44.06	8.94	12.95	6.351	1.72	301.34	1.191	0.914	5.542
TILL-1	6.719	45.79	9.07	13.88	6.231	1.33	310.35	1.303	0.875	5.692
TILL-1	6.864	43.76	9.15	13.77	6.367	1.99	300.09	0.583	0.991	5.501
TILL-1	6.811	46.74	9.07	14.14	6.156	1.79	311.49	0.564	1.001	5.671
TILL-1	6.783	43.55	8.24	14.06	6.158	1.73	303.26	0.634	1.075	5.635
TILL1	6.927	47.77	8.47	14.90	6.253	1.79	325.93	0.560	1.065	5.756
TILL1	6.902	42.03	8.71	13.66	6.268	1.71	304.71	0.596	1.011	5.892
TILL1	6.938	42.77	8.54	12.93	6.305	1.62	313.71	0.613	1.035	5.801
TILL-1	6.861	43.20	7.86	13.02	6.278	1.93	309.72	0.593	0.980	5.746
TILL1	7.262	44.35	8.00	12.46	6.469	2.02	318.79	0.603	1.017	5.091
TILL1	7.187	46.68	8.54	13.24	6.390	1.75	323.31	0.597	1.031	5.173
TILL-1	7.216	44.05	8.90	14.05	6.130	1.79	306.78	0.564	0.989	6.040
TILL-1	6.737	45.29	8.89	13.78	5.929	1.66	318.83	0.563	0.959	5.668
TILL-1	6.803	43.61	7.98	13.43	6.198	1.54	299.96	0.567	0.983	5.773
TILL-1	7.151	45.46	8.79	14.07	6.519	1.59	316.75	0.582	0.988	5.932
TILL-1	6.975	44.12	9.11	11.73	6.242	1.99	313.62	0.588	0.963	3.381
TILL-1	6.614	43.18	7.98	13.34	5.940	1.64	318.13	0.538	0.962	5.806
TILL-1	6.701	46.29	8.83	13.24	6.260	1.83	319.14	0.543	0.945	5.611
TILL-1	6.989	43.68	8.88	12.38	6.166	1.78	305.28	0.580	0.972	5.702
TILL-1	7.028	47.02	8.76	11.65	6.218	1.93	323.74	0.644	0.977	3.728
TILL-1	6.717	43.59	9.00	12.48	6.148	1.82	309.86	0.562	0.961	5.782
TILL-1	6.828	44.71	8.52	13.00	6.219	1.60	301.85	0.549	0.911	5.538
TILL-1	6.628	44.82	8.49	13.45	6.378	1.50	319.36	0.528	0.903	5.490
TILL-1	6.860	43.76	8.69	12.87	6.003	1.40	307.78	0.542	1.022	5.540
TILL-1	6.723	42.24	8.44	12.20	5.716	1.79	311.42	0.521	1.021	5.566
TILL-1	6.948	39.02	9.47	12.51	6.259	1.88	304.88	0.597	0.948	4.902
TILL-1	6.755	44.53	8.77	13.47	6.257	2.14	326.92	0.623	0.993	4.707
TILL-1	7.002	45.45	8.61	14.12	6.341	1.15	314.43	0.610	0.996	4.331
TILL-1	6.790	43.76	8.84	13.94	6.194	0.64	308.91	0.599	0.971	5.078
Average	6.9773	43.7691	9.3583	12.9452	6.3405	1.6875	308.9384	0.6794	1.0021	5.5451
SD	0.1419	1.9025	0.8773	1.2127	0.2821	0.3033	10.8669	0.2377	0.0655	0.4114
RSD	2%	4%	9%	9%	4%	18%	4%	35%	7%	7%
RV	6.977273242	44	7.8	13	5.9		291	0.7	1.1	5.6
GeoPT	12%	9%	17%	12%	12%		7%	16%	17%	12%
GeoPT abs	0.8498	3.9531	1.3448	1.5784	0.7301		19.8528	0.1151	0.1857	0.6531
Bias	100%	99%	120%	100%	107%		106%	97%	91%	99%
Prec WRT GeoPT	0.1670	0.4838	0.5437	0.7715	0.3595		0.5156	2.1281	0.3870	0.6360
TILL-2	10.100	148.70	0.75	11.59	7.846	4.70	158.50	1.823	1.300	18.580
TILL-2	10.060	150.50	0.55	11.40	7.490	4.82	161.20	1.809	1.299	18.680
TILL-2	10.110	151.00	1.08	11.22	7.744	5.04	157.70	1.851	1.310	17.510
TILL-2	9.915	141.30	0.70	10.91	7.863	4.97	150.60	1.872	1.301	18.140
Till-2	10.650	147.40	1.36	11.45	8.496	5.03	154.80	1.861	1.196	17.300
Till-2	10.630	150.30	1.44	12.24	8.210	5.48	156.30	1.827	1.195	17.590
Till-2	10.430	145.90	1.43	12.60	8.490	5.41	151.00	1.809	1.167	18.270
Till-2	10.510	154.00	1.43	13.09	8.510	5.22	158.60	1.783	1.164	18.220
Till-2	10.330	142.70	1.35	11.28	8.670	5.02	147.80	1.725	1.147	19.300
Till-2	10.390	151.90	1.00	12.04	8.561	5.04	154.10	1.715	1.107	19.180
Till-2	10.460	146.20	1.79	11.98	8.562	5.48	152.60	1.880	1.204	18.300
Till-2	10.530	150.00	1.35	12.47	8.379	4.95	153.60	1.844	1.209	18.240
Till-2	10.470	147.00	1.73	13.08	8.172	5.15	153.70	1.722	1.194	18.940
Till-2	10.480	155.80	1.44	13.20	8.410	5.23	161.20	1.736	1.172	18.760
Till-2	10.590	159.60	1.91	13.33	8.519	5.19	161.80	1.770	1.196	18.300
Till-2	10.400	145.30	1.34	11.94	8.360	4.89	148.40	1.763	1.206	18.740

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-1	2.000	104.59	1.25	38.612	3.670	96.12	503.26	1-25 redo	NGSA104 Repeats
TILL-1	1.964	113.17	0.82	38.095	3.573	98.32	527.89	1-25 redo	NGSA104 Repeats
TILL-1	1.978	109.40	1.27	36.455	3.578	97.97	514.87	1-25 redo	NGSA105 Repeats
TILL-1	1.990	107.06	0.90	38.052	3.674	97.86	507.57	1-25 redo	NGSA105 Repeats
TILL-1	1.918	105.33	1.44	37.266	3.795	100.48	520.24	1-25 redo	NGSA106 Repeats
TILL-1	2.039	108.35	0.89	38.271	3.899	97.86	518.01	1-25 redo	NGSA106 Repeats
TILL-1	1.939	110.29	0.76	38.680	3.832	96.82	521.19	1-25 redo	NGSA106 Repeats
TILL-1	1.992	106.36	1.44	37.333	3.721	96.99	507.59	1-25 redo	NGSA107 Repeats
TILL-1	2.024	106.95	0.90	37.237	3.863	98.63	513.89	1-25 redo	NGSA107 Repeats
TILL-1	1.927	105.64	1.17	37.337	3.674	99.16	510.16	1-25 redo	NGSA108 Repeats
TILL-1	1.881	112.11	0.50	39.158	3.654	95.55	526.80	1-25 redo	NGSA108 Repeats
TILL-1	1.980	103.79	1.27	37.436	3.715	97.12	504.07	1-25 redo	NGSA109 Repeats
TILL-1	2.009	103.74	0.71	37.273	3.765	92.87	497.54	1-25 redo	NGSA109 Repeats
TILL-1	1.941	106.15	1.39	36.643	3.437	100.54	509.76	1-25 redo	ngsa_110
TILL-1	1.993	113.86	0.68	38.111	3.612	98.96	517.95	1-25 redo	ngsa_110
TILL-1	1.973	100.57	1.38	36.974	3.570	93.61	516.67	1-25 redo	NGSA_111
TILL-1	1.959	100.10	0.79	36.484	3.601	92.55	504.99	1-25 redo	NGSA_111
TILL-1	2.082	110.03	1.39	38.534	3.570	96.06	526.22	1-25 redo	NGSA_112
TILL-1	2.051	114.31	0.76	39.181	3.672	94.47	539.16	1-25 redo	NGSA_112
TILL-1	2.029	107.80	1.22	36.962	3.701	100.52	521.35	1-25 redo	NGSA_113
TILL-1	2.061	109.59	0.82	37.798	3.680	99.62	522.65	1-25 redo	NGSA_113
TILL-1	2.085	108.99	1.25	37.845	3.693	100.50	522.65	1-25 redo	NGSA_114
TILL-1	2.025	112.40	0.67	39.912	3.722	96.25	526.87	1-25 redo	NGSA_114
TILL-1	1.999	106.01	1.50	37.324	3.711	101.27	516.51	1-25 redo	NGSA_115
TILL-1	2.040	106.06	0.83	37.273	3.831	99.74	507.46	1-25 redo	NGSA_115
TILL-1	2.059	108.39	1.44	36.563	3.623	98.28	510.95	1-25 redo	NGSA_116
TILL-1	2.075	106.42	0.70	35.890	3.680	101.32	485.66	1-25 redo	NGSA_116
TILL-1	2.006	106.85	1.42	37.271	3.691	95.96	510.81	1-25 redo	NGSA_118
TILL-1	2.015	111.53	0.62	38.638	3.703	99.02	523.04	1-25 redo	NGSA_118
TILL-1	2.098	106.99	1.46	37.443	3.707	98.78	515.49	1-25 redo	NGSA_117
TILL-1	2.083	113.84	0.77	38.611	3.787	99.21	512.88	1-25 redo	NGSA_117
TILL-1	1.987	106.17	0.86	38.053	3.638	98.20	523.04	1-25 redo	NGSA_119
TILL-1	2.028	107.46	0.72	38.448	3.730	96.45	529.34	1-25 redo	NGSA_119
TILL-1	2.121	108.87	1.31	37.123	3.497	92.24	504.99	1-25 redo	NGSA_120
TILL-1	2.140	111.83	0.53	37.845	3.545	98.47	502.60	1-25 redo	NGSA_120
TILL-1	2.002	105.58	1.40	36.264	3.696	92.50	497.91	1-25 redo	NGSA_121
TILL-1	1.971	108.47	0.88	36.376	3.792	92.44	497.87	1-25 redo	NGSA_121
TILL-1	2.088	106.87	1.46	37.129	3.535	97.07	508.45	1-25 redo	NGSA_122
TILL1	2.058	111.37	0.72	38.717	3.546	92.43	500.38	1-25 redo	NGSA_122
TILL1	2.045	107.64	1.15	37.713	3.757	97.98	494.47	1-25 redo	NGSA_123
TILL1	2.027	110.20	1.38	36.750	3.682	92.39	497.18	1-25 redo	NGSA_124
TILL-1	2.450	110.13	0.91	37.259	3.666	93.50	485.00	1-25 redo	NGSA_125
TILL1	2.096	108.55	1.27	35.197	3.715	97.03	524.09	1-25 redo	NGSA_126
TILL1	1.993	110.24	0.83	35.348	3.654	98.84	528.23	1-25 redo	NGSA_127
TILL-1	2.059	108.69	1.09	37.321	3.720	99.61	506.11	1-25 redo	NGSA_128
TILL-1	2.005	111.64	0.56	37.840	3.532	97.12	508.27	1-25 redo	NGSA_129
TILL-1	2.025	106.99	1.13	36.668	3.585	94.90	502.78	1-25 redo	NGSA_130
TILL-1	2.023	109.44	0.71	37.860	3.641	94.04	521.43	1-25 redo	NGSA_131
TILL-1	2.107	104.69	1.77	27.093	3.486	104.64	526.12	1-25 redo	NGSA_132
TILL-1	2.140	109.32	0.88	38.298	3.585	99.71	501.82	1-25 redo	NGSA_133
TILL-1	2.146	109.08	0.96	38.690	3.635	96.15	490.84	1-25 redo	NGSA_134
TILL-1	1.914	104.70	1.47	35.635	3.590	98.90	498.50	1-25 redo	NGSA_135
TILL-1	1.951	104.57	1.06	27.472	3.477	101.21	522.55	1-25 redo	NGSA_136
TILL-1	1.923	102.37	0.73	35.838	3.573	99.72	491.80	1-25 redo	NGSA_137
TILL-1	1.954	103.29	1.59	37.340	3.452	96.19	502.45	1-25 redo	NGSA_138
TILL-1	1.899	111.68	0.85	38.114	3.521	93.23	509.63	1-25 redo	NGSA_139
TILL-1	1.920	102.78	1.40	36.535	3.586	98.87	502.27	1-25 redo	NGSA_140
TILL-1	1.949	107.60	0.87	36.330	3.625	96.45	496.20	1-25 redo	NGSA_141
TILL-1	2.002	105.13	1.66	32.054	3.668	101.26	505.23	1-25 redo	NGSA_142
TILL-1	2.103	112.62	0.93	33.899	3.599	108.25	495.13	1-25 redo	NGSA_143
TILL-1	2.028	109.93	1.62	31.867	3.614	97.25	518.43	1-25 redo	NGSA_144
TILL-1	2.084	108.91	0.93	33.532	3.523	95.24	504.11	1-25 redo	NGSA_145
Average	2.0572	105.3057	1.0371	37.0127	3.7147	98.0282	512.2383		
SD	0.1026	3.1492	0.3849	2.0257	0.1159	3.8800	15.2845		
RSD	5%	3%	37%	5%	3%	4%	3%		
RV	2.2	99	0.5	38	3.9	98	502		
GeoPT	14%	9%	15%	10%	14%	9%	7%		
GeoPT abs	0.3034	9.1725	0.0759	3.8033	0.5447	9.1163	36.7089		
Bias	94%	106%	207%	97%	95%	100%	102%		
Prec WRT GeoPT	0.3617	0.3228	2.4458	0.5468	0.2234	0.4255	0.4080		
TILL-2	5.673	76.64	5.21	41.340	4.072	118.80	394.50	26-50	ngsa025b
TILL-2	5.694	76.74	4.93	42.660	4.054	128.50	394.70	26-50	ngsa025b
TILL-2	5.520	79.65	5.11	41.820	4.030	128.30	412.60	26-50	NGSA026A
TILL-2	5.811	77.68	4.93	39.690	4.031	125.20	383.10	26-50	NGSA026A
Till-2	5.737	80.07	5.60	39.900	3.675	123.90	390.50	26-50	NGSA029a
Till-2	5.712	81.69	5.35	40.630	3.716	122.30	392.40	26-50	NGSA029a
Till-2	5.702	78.18	5.08	41.330	3.775	126.00	390.60	26-50	NGSA029b
Till-2	5.708	81.51	4.83	42.720	3.796	127.90	397.60	26-50	NGSA029b
Till-2	5.585	77.71	4.86	42.540	3.607	125.40	377.20	26-50	NGSA030a
Till-2	5.522	81.21	4.55	44.650	3.670	125.30	387.40	26-50	NGSA030a
Till-2	5.808	78.61	5.21	41.690	3.818	128.80	386.10	26-50	NGSA030b
Till-2	5.710	79.24	5.03	41.860	3.724	127.50	392.70	26-50	NGSA030b
Till-2	5.703	80.26	5.06	42.520	3.759	126.70	390.40	26-50	NGSA031A
Till-2	5.552	83.63	4.94	44.370	3.679	127.80	400.60	26-50	NGSA031A
Till-2	5.602	82.32	4.96	43.870	3.729	125.80	403.90	26-50	NGSA031A
Till-2	5.650	78.28	4.86	40.610	3.723	123.80	385.40	26-50	NGSA031B

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
Till-2	039SMPL.D#	ngsa031b	5/06/2009	0.238	24.44	540.50	3.52	4.659	0.46
Till-2	008SMPL.D#	NGSA032A	9/06/2009	0.224	25.27	545.90	4.12	4.669	0.14
Till-2	040SMPL.D#	NGSA032A	9/06/2009	0.276	24.14	548.40	4.33	4.496	0.17
Till-2	008SMPL.D#	NGSA032B	9/06/2009	0.239	24.51	534.60	3.79	4.654	0.34
Till-2	038SMPL.D#	NGSA032B	9/06/2009	0.312	25.90	531.00	4.49	4.603	0.48
Till-2	008SMPL.D#	NGSA033A	10/06/2009	0.229	26.02	546.20	3.42	4.597	0.36
Till-2	022SMPL.D#	NGSA033A	10/06/2009	0.242	25.86	545.50	3.72	4.615	0.31
Till-2	042SMPL.D#	NGSA033A	10/06/2009	0.241	25.76	554.20	3.65	4.609	0.36
Till-2	045SMPL.D#	ngsa033b	12/06/2009	0.302	26.34	559.00	4.15	4.553	0.32
Till-2	075SMPL.D#	ngsa033b	12/06/2009	0.242	25.98	564.90	4.08	4.633	0.43
Till-2	008SMPL.D#	ngsa034a	11/06/2009	0.227	24.36	543.80	4.21	4.715	0.21
Till-2	027SMPL.D#	ngsa034a	11/06/2009	0.261	24.65	548.60	3.68	4.578	0.22
Till-2	044SMPL.D#	ngsa034a	11/06/2009	0.236	25.50	559.20	3.66	4.616	0.34
Till-2	008SMPL.D#	NGSA034B	12/06/2009	0.242	24.69	536.00	4.16	4.695	0.32
Till-2	037SMPL.D#	NGSA034B	12/06/2009	0.213	25.23	543.00	3.19	4.586	0.19
Till-2	008SMPL.D#	NGSA035A	16/06/2009	0.366	25.65	547.70	4.47	4.714	0.30
Till-2	040SMPL.D#	NGSA035A	16/06/2009	0.204	25.60	566.00	4.33	4.523	0.32
Till-2	014SMPL.D#	NGSA035B	15/06/2009	0.244	24.60	534.00	3.65	4.610	0.37
Till-2	040SMPL.D#	NGSA035B	15/06/2009	0.266	23.77	537.60	3.77	4.599	0.30
Till-2	048SMPL.D#	NGSA036A	16/06/2009	0.288	24.98	538.80	3.55	4.607	0.25
Till-2	078SMPL.D#	NGSA036A	16/06/2009	0.248	25.15	549.10	4.33	4.684	0.39
Till-2	008SMPL.D#	NGSA036B	17/06/2009	0.283	25.72	536.50	2.94	4.533	0.32
Till-2	040SMPL.D#	NGSA036B	17/06/2009	0.247	25.36	549.30	3.69	4.503	0.39
Till-2	008SMPL.D#	NGSA037A	18/06/2009	0.240	22.98	527.80	3.67	4.609	0.36
Till-2	038SMPL.D#	NGSA037A	18/06/2009	0.265	24.20	539.60	3.12	4.556	0.27
Till-2	046SMPL.D#	NGSA037B	18/06/2009	0.224	24.42	527.40	4.58	4.580	0.37
Till-2	008SMPL.D#	ngsa037z	19/06/2009	0.242	23.78	529.70	3.95	4.631	0.23
Till-2	020SMPL.D#	ngsa037z	19/06/2009	0.248	24.68	542.60	3.52	4.618	0.35
Till-2	028SMPL.D#	NGSA038A	19/06/2009	0.237	26.23	541.70	4.05	4.639	0.33
Till-2	058SMPL.D#	NGSA038A	19/06/2009	0.241	28.50	567.90	3.94	4.636	0.24
Till-2	066SMPL.D#	ngsa038b	19/06/2009	0.283	24.26	534.50	3.45	4.543	0.27
Till-2	098SMPL.D#	ngsa038b	19/06/2009	0.275	25.90	538.80	3.51	4.542	0.30
Till-2	008SMPL.D#	NGSA039A	22/06/2009	0.261	25.55	542.10	3.35	4.982	0.18
Till-2	011SMPL.D#	NGSA039A	22/06/2009	0.275	24.45	554.10	4.00	4.908	0.30
Till-2	040SMPL.D#	NGSA039A	22/06/2009	0.250	26.70	580.80	4.24	4.882	0.45
Till-2	008SMPL.D#	ngsa039b	24/06/2009	0.221	24.31	503.60	3.16	4.602	0.32
Till-2	040SMPL.D#	ngsa039b	24/06/2009	0.195	25.41	521.70	2.75	4.448	0.40
Till-2	008SMPL.D#	ngsa040a	25/06/2009	0.201	25.04	530.10	3.94	4.539	0.15
Till-2	038SMPL.D#	ngsa040a	25/06/2009	0.206	26.35	551.80	3.47	4.526	0.05
Till-2	046SMPL.D#	ngsa040b	25/06/2009	0.240	24.92	525.10	4.03	4.478	0.33
Till-2	078SMPL.D#	ngsa040b	25/06/2009	0.241	25.38	529.80	3.76	4.515	0.42
Till-2	008SMPL.D#	ngsa042a	29/06/2009	0.206	25.86	530.90	3.78	4.479	0.16
Till-2	038SMPL.D#	ngsa042a	29/06/2009	0.239	25.37	530.80	4.15	4.484	0.36
Till-2	008SMPL.D#	ngsa042b	30/06/2009	0.198	24.52	538.90	4.22	4.514	0.30
Till-2	014SMPL.D#	ngsa042b	30/06/2009	0.234	24.32	543.70	4.67	4.618	0.22
Till-2	009SMPL.D#		23/07/2009	0.283	25.40	539.00	3.94	5.462	0.32
Till-2	040SMPL.D#		23/07/2009	0.274	25.23	534.50	4.11	5.515	0.34
Till-2	009SMPL.D#		22/07/2009	0.324	25.32	535.00	4.34	5.476	0.28
Till-2	042SMPL.D#		22/07/2009	0.322	25.62	534.40	4.16	5.461	0.34
Till-2	037SMPL.D#	NGSA044A	23/07/2009	0.243	24.95	531.80	4.79	5.562	0.41
Till-2	040SMPL.D#	NGSA044A	23/07/2009	0.275	24.31	532.70	4.26	5.510	0.30
Till-2	008SMPL.D#	NGSA044B	24/07/2009	0.313	25.67	536.70	4.56	5.484	0.36
Till-2	040SMPL.D#	NGSA044B	24/07/2009	0.323	24.91	537.80	4.47	5.426	0.35
Till-2	008SMPL.D#	NGSA045A	24/07/2009	0.255	26.33	536.20	4.18	5.524	0.33
Till-2	018SMPL.D#	NGSA045A	24/07/2009	0.248	25.25	528.40	5.01	5.529	0.29
Till-2	039SMPL.D#	NGSA045A	24/07/2009	0.269	24.00	529.50	4.75	5.504	0.35
Till-2	008SMPL.D#	NGSA045B	27/07/2009	0.270	24.94	535.60	4.23	5.518	0.30
Till-2	040SMPL.D#	NGSA045B	27/07/2009	0.286	24.65	540.70	4.49	5.445	0.40
Till-2	008SMPL.D#	NGSA046A	27/07/2009	0.240	24.25	527.60	4.07	5.481	0.25
Till-2	038SMPL.D#	NGSA046A	27/07/2009	0.291	23.89	523.30	4.13	5.424	0.25
Till-2	008SMPL.D#	ngsa046b	29/07/2009	0.327	25.45	548.50	5.06	5.727	0.05
Till-2	044SMPL.D#	ngsa046b	29/07/2009	0.313	24.23	566.70	3.24	5.691	0.05
Till-2	008SMPL.D#	ngsa047a	28/07/2009	0.227	24.50	541.20	4.28	5.441	0.67
Till-2	038SMPL.D#	ngsa047a	28/07/2009	0.321	24.29	549.70	4.18	5.526	0.64
Till-2	008SMPL.D#	ngsa047b	30/07/2009	0.313	24.20	538.10	4.87	5.490	0.31
Till-2	043SMPL.D#	ngsa047b	30/07/2009	0.383	24.28	546.30	4.34	5.481	0.20
Till-2	051SMPL.D#	NGSA048A	30/07/2009	0.283	24.11	533.40	4.48	5.486	0.05
Till-2	081SMPL.D#	NGSA048A	30/07/2009	0.218	24.40	533.70	3.81	5.499	0.05
Till-2	008SMPL.D#	NGSA048B	31/07/2009	0.279	24.10	540.20	3.87	5.607	0.27
Till-2	040SMPL.D#	NGSA048B	31/07/2009	0.250	26.73	569.60	4.29	5.446	0.21
Till-2	048SMPL.D#	NGSA049A	31/07/2009	0.345	24.50	532.20	4.53	5.419	0.17
Till-2	078SMPL.D#	NGSA049A	31/07/2009	0.238	22.92	523.30	3.96	5.390	0.19
Till-2	008SMPL.D#	NGSA049B	3/08/2009	0.190	24.36	536.60	3.99	5.474	0.28
Till-2	040SMPL.D#	NGSA049B	3/08/2009	0.287	25.05	539.90	3.96	5.535	0.18
Till-2	008SMPL.D#	NGSA050a	8/06/2009	0.354	23.26	507.90	3.90	5.475	0.22
Till-2	038SMPL.D#	NGSA050a	8/06/2009	0.283	24.61	523.90	4.78	5.445	0.23
Till-2	046SMPL.D#	NGSA RPT 080309	8/06/2009	0.355	24.95	528.30	4.09	5.466	0.38
Till-2	070SMPL.D#	NGSA RPT 080309	8/06/2009	0.301	23.65	529.70	4.47	5.470	0.54
Till-2	008SMPL.D#	NGSA050b	7/08/2009	0.550	28.46	573.20	3.87	5.475	0.31
Till-2	014SMPL.D#	NGSA050b	7/08/2009	0.505	23.29	578.40	3.22	5.513	0.31
Till-2	042SMPL.D#	NGSA050b	7/08/2009	0.495	25.52	576.50	3.22	5.444	0.27
Till-2	041SMPL.D#	NGSA051a	5/08/2009	0.284	23.80	517.80	4.15	5.438	0.51
Till-2	050SMPL.D#	NGSA051a	5/08/2009	0.242	23.12	519.90	3.84	5.436	0.31
Till-2	008SMPL.D#	NGSA053a	8/09/2009	0.185	25.23	544.80	4.22	5.572	0.67
Till-2	038SMPL.D#	NGSA053b	8/09/2009	0.170	26.85	569.50	3.47	5.593	0.74
Till-2	008SMPL.D#	NGSA053b	8/09/2009	0.230	26.04	541.00	5.07	5.563	0.51
Till-2	040SMPL.D#	NGSA053a	8/09/2009	0.208	25.83	537.50	4.18	5.607	0.58

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
Till-2	101.100	15.40	74.98	12.29	147.30	6.38	3.761	1.245	20.18	6.913
Till-2	102.400	15.05	75.83	12.22	148.80	6.33	3.680	1.230	19.43	6.938
Till-2	101.500	15.17	76.61	12.46	146.40	6.41	3.747	1.226	19.88	6.889
Till-2	101.600	15.15	74.89	12.16	147.50	6.55	3.812	1.261	20.93	6.817
Till-2	102.600	15.23	76.29	12.07	146.20	6.32	3.839	1.229	19.15	6.825
Till-2	101.500	15.16	74.34	12.51	145.00	6.47	3.743	1.217	19.64	6.924
Till-2	102.400	14.93	73.09	12.59	143.30	6.35	3.700	1.229	18.98	6.879
Till-2	101.700	15.04	73.87	12.63	141.90	6.48	3.795	1.239	19.72	7.153
Till-2	104.900	15.18	74.76	13.09	149.70	6.21	3.713	1.210	20.84	6.922
Till-2	104.300	15.11	75.54	13.11	148.50	6.37	3.787	1.251	19.81	6.863
Till-2	101.300	15.10	74.91	12.30	146.50	6.12	3.795	1.206	19.83	6.706
Till-2	102.800	14.97	76.39	12.26	146.60	6.06	3.700	1.250	19.64	6.933
Till-2	102.500	15.06	76.04	12.64	145.00	6.29	3.745	1.197	20.02	6.768
Till-2	100.200	14.89	74.68	12.20	143.40	6.07	3.787	1.230	19.51	6.851
Till-2	100.000	15.71	76.23	12.46	142.20	6.04	3.745	1.173	20.95	6.828
Till-2	102.200	15.07	75.09	12.82	144.10	6.03	3.864	1.247	20.88	6.838
Till-2	104.000	14.71	75.77	13.40	145.60	6.19	3.792	1.200	21.11	6.901
Till-2	99.990	15.33	78.48	11.80	149.90	6.16	3.860	1.285	19.96	6.864
Till-2	99.560	15.31	78.55	11.77	146.50	6.13	3.906	1.298	19.97	6.841
Till-2	98.990	14.94	75.50	12.16	150.10	6.38	3.802	1.273	20.48	6.937
Till-2	100.900	15.41	75.79	12.32	150.10	6.19	3.910	1.228	19.37	6.907
Till-2	100.400	15.16	75.53	12.10	144.50	6.44	3.807	1.286	20.37	6.891
Till-2	101.200	15.66	75.88	12.24	146.20	6.43	3.838	1.303	20.62	6.921
Till-2	100.300	15.10	74.20	12.12	146.40	6.49	3.902	1.323	19.71	6.902
Till-2	101.000	15.60	75.17	12.54	146.80	6.37	3.897	1.296	19.59	6.905
Till-2	98.990	15.25	75.66	11.88	146.70	6.37	3.855	1.229	20.67	6.863
Till-2	98.980	15.30	75.84	12.20	146.80	6.43	3.802	1.198	20.33	6.999
Till-2	99.110	15.45	76.62	11.96	146.50	6.28	3.835	1.265	20.01	6.849
Till-2	103.800	14.94	74.59	12.42	150.20	6.56	3.776	1.293	19.76	6.900
Till-2	104.200	15.50	75.60	13.20	149.90	6.57	3.800	1.348	21.04	7.061
Till-2	101.700	15.47	73.50	12.26	149.10	6.75	3.829	1.295	20.07	6.852
Till-2	101.400	15.24	73.45	12.49	148.30	6.56	3.915	1.323	20.05	6.916
Till-2	106.900	16.28	80.33	12.26	165.90	6.59	4.144	1.413	18.58	7.482
Till-2	107.000	16.84	82.51	11.87	167.10	6.59	4.075	1.438	20.24	7.372
Till-2	109.900	16.63	80.68	12.98	166.40	6.60	4.102	1.423	22.21	7.453
Till-2	97.160	14.76	73.27	10.92	149.20	6.09	3.737	1.293	18.17	6.745
Till-2	99.460	15.20	73.76	11.83	148.50	6.09	3.784	1.287	20.69	6.746
Till-2	101.500	15.28	72.41	12.06	142.00	6.14	3.718	1.218	21.84	6.839
Till-2	101.900	15.51	75.75	13.01	143.30	6.12	3.752	1.249	21.82	7.058
Till-2	100.800	15.08	71.91	11.81	142.50	6.08	3.740	1.250	20.93	6.755
Till-2	100.300	15.04	74.52	12.31	143.70	6.02	3.773	1.281	20.12	6.872
Till-2	99.760	15.33	71.57	11.88	146.70	6.08	3.740	1.249	18.55	6.741
Till-2	100.200	14.75	73.09	12.29	146.60	6.20	3.687	1.278	19.00	6.809
Till-2	102.600	15.45	73.24	12.44	142.50	6.06	3.804	1.256	20.34	6.881
Till-2	100.400	15.58	74.85	12.21	141.60	6.16	3.740	1.310	19.38	6.856
Till-2	103.700	14.54	73.67	12.59	149.50	6.30	3.778	1.390	19.28	7.210
Till-2	102.800	14.61	75.52	12.58	147.40	6.23	3.682	1.317	19.82	7.153
Till-2	104.600	14.66	74.01	12.62	151.70	6.43	3.819	1.385	19.69	7.301
Till-2	104.100	14.50	74.97	12.79	149.40	6.37	3.817	1.405	19.54	7.292
Till-2	99.770	14.61	76.29	12.36	149.30	6.24	3.672	1.368	18.37	6.731
Till-2	99.350	14.80	76.41	12.31	150.60	6.22	3.714	1.399	18.00	6.774
Till-2	101.500	14.74	75.94	12.82	150.80	6.24	3.829	1.340	19.60	7.040
Till-2	99.930	14.75	78.34	12.55	150.50	6.25	3.797	1.309	20.50	7.031
Till-2	103.600	14.74	81.80	12.44	149.40	6.24	3.660	1.324	19.43	7.228
Till-2	102.600	14.53	80.40	12.59	148.60	6.32	3.744	1.331	19.44	7.118
Till-2	101.300	14.87	82.89	12.13	149.00	6.16	3.732	1.347	18.73	7.093
Till-2	102.800	14.39	74.72	12.55	148.50	6.12	3.735	1.363	19.66	7.117
Till-2	102.700	14.76	75.37	12.59	145.40	6.04	3.740	1.333	19.20	7.159
Till-2	102.900	14.11	74.01	12.71	146.50	6.19	3.679	1.347	18.77	7.008
Till-2	102.500	14.24	75.34	12.40	148.40	6.14	3.634	1.342	18.72	7.128
Till-2	105.900	14.94	77.34	12.95	150.10	6.57	3.746	1.347	19.27	7.518
Till-2	104.600	14.88	79.60	13.06	145.50	6.43	3.915	1.483	18.73	7.358
Till-2	102.900	14.54	74.52	12.39	146.30	6.14	3.755	1.332	20.22	6.997
Till-2	103.100	14.11	74.46	12.80	144.90	6.04	3.797	1.369	19.55	7.038
Till-2	105.000	14.79	77.78	12.89	149.90	6.47	3.757	1.401	20.95	7.220
Till-2	101.800	14.87	80.18	13.05	146.30	6.53	3.789	1.347	19.65	7.153
Till-2	103.000	14.90	75.17	12.20	147.00	6.10	3.791	1.312	21.41	7.139
Till-2	102.600	15.09	72.90	12.21	143.70	6.02	3.628	1.340	17.18	7.085
Till-2	104.600	14.68	75.37	12.75	147.50	6.22	3.726	1.287	18.54	7.248
Till-2	105.400	14.46	77.62	13.00	146.50	6.10	3.755	1.292	19.72	7.302
Till-2	102.500	14.12	71.25	12.30	152.90	6.02	3.710	1.321	19.39	7.298
Till-2	101.000	14.34	72.24	12.30	148.20	6.00	3.680	1.332	19.05	7.283
Till-2	102.800	14.61	76.55	12.57	149.80	6.56	3.677	1.292	16.47	7.161
Till-2	102.700	14.35	75.23	12.26	144.90	6.59	3.696	1.369	18.80	7.151
Till-2	102.800	14.03	75.14	11.85	154.60	6.35	3.719	1.311	19.49	7.036
Till-2	101.500	14.88	77.82	12.11	153.30	6.45	3.714	1.315	18.58	7.139
Till-2	101.800	14.53	78.56	12.40	151.70	6.44	3.707	1.304	22.02	7.342
Till-2	103.200	14.55	80.25	12.53	150.20	6.53	3.622	1.312	20.11	7.196
Till-2	107.700	15.00	75.95	13.89	148.50	6.26	3.789	1.275	20.32	7.151
Till-2	109.000	15.03	79.07	13.42	153.10	6.22	3.799	1.339	20.48	7.308
Till-2	108.300	14.90	77.34	13.75	150.20	6.42	3.706	1.366	20.46	7.258
Till-2	101.000	14.41	74.54	11.89	146.10	6.27	3.751	1.343	19.65	6.947
Till-2	100.800	14.48	76.83	11.97	143.60	6.18	3.758	1.308	19.02	6.792
Till-2	98.950	14.83	75.60	12.55	151.30	6.45	3.728	1.130	19.80	7.120
Till-2	99.220	15.14	75.93	13.34	150.70	6.71	3.770	1.113	20.89	7.143
Till-2	98.970	15.18	75.96	12.42	151.50	6.33	3.870	1.208	19.80	7.127
Till-2	98.440	14.88	75.35	12.12	151.90	6.46	3.842	1.176	19.19	6.993

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
Till-2	0.745	9.908	1.305	46.89	0.505	14.09	19.760	39.00	33.33	32.15
Till-2	0.761	10.070	1.336	47.29	0.482	14.15	19.720	39.36	33.44	32.14
Till-2	0.787	10.130	1.347	47.00	0.491	14.51	19.900	39.15	33.81	32.11
Till-2	0.648	9.784	1.321	47.34	0.517	13.99	19.230	39.14	32.36	31.75
Till-2	0.760	9.789	1.319	47.00	0.487	13.98	19.970	38.77	32.51	32.47
Till-2	0.791	10.120	1.350	46.37	0.512	13.32	20.040	38.67	32.22	31.82
Till-2	0.759	10.100	1.306	47.08	0.474	13.82	20.540	38.93	33.24	31.57
Till-2	0.815	10.100	1.313	47.69	0.503	14.02	20.950	38.66	31.04	31.62
Till-2	0.791	10.310	1.304	48.19	0.500	13.87	20.130	40.03	34.74	31.86
Till-2	0.778	10.530	1.326	48.06	0.480	14.18	20.350	39.82	32.76	31.63
Till-2	0.741	10.050	1.294	46.51	0.477	14.35	19.830	38.56	33.48	31.90
Till-2	0.794	10.090	1.324	47.62	0.489	14.13	19.900	38.99	32.66	31.87
Till-2	0.763	10.040	1.339	47.50	0.490	13.73	19.970	38.69	33.11	31.86
Till-2	0.819	9.908	1.274	47.48	0.473	13.39	19.020	38.41	31.87	31.78
Till-2	0.799	9.985	1.269	47.34	0.457	13.47	19.780	38.86	32.07	32.01
Till-2	0.802	10.240	1.336	47.34	0.503	13.54	19.600	39.11	31.77	31.70
Till-2	0.675	10.080	1.321	49.44	0.553	13.76	20.030	39.35	32.94	31.61
Till-2	0.678	9.757	1.385	46.15	0.558	13.02	19.070	38.76	33.57	31.90
Till-2	0.754	9.876	1.381	46.74	0.553	13.69	18.590	38.82	32.92	32.18
Till-2	0.647	9.925	1.361	47.21	0.560	13.22	19.500	38.54	34.21	31.83
Till-2	0.730	9.888	1.359	47.84	0.540	13.76	19.340	38.54	33.95	31.69
Till-2	0.730	9.959	1.387	46.90	0.536	13.87	19.760	39.42	32.13	31.90
Till-2	0.749	9.903	1.357	46.80	0.523	13.26	19.950	39.04	31.62	31.62
Till-2	0.768	9.917	1.376	46.76	0.536	13.33	19.520	39.02	32.65	31.83
Till-2	0.783	9.804	1.363	47.77	0.532	13.91	19.330	38.50	33.00	31.91
Till-2	0.728	9.590	1.373	46.41	0.544	12.88	18.940	38.41	33.02	31.92
Till-2	0.732	9.485	1.381	47.69	0.548	12.96	18.900	38.21	31.78	31.91
Till-2	0.733	9.432	1.376	47.29	0.550	12.57	19.070	38.66	32.18	31.62
Till-2	0.650	9.989	1.385	48.40	0.537	14.15	19.970	39.30	29.53	32.95
Till-2	0.629	9.607	1.393	49.55	0.520	14.61	20.650	39.61	30.04	32.70
Till-2	0.604	9.940	1.326	47.24	0.542	13.66	19.410	39.23	31.78	32.16
Till-2	0.696	9.944	1.379	47.32	0.543	14.34	19.510	39.32	31.46	31.88
Till-2	0.599	10.740	1.496	48.50	0.585	15.41	19.750	41.63	34.77	34.88
Till-2	0.630	10.710	1.465	48.55	0.582	14.81	19.690	41.47	34.78	34.65
Till-2	0.699	10.850	1.494	50.76	0.607	15.17	21.020	42.21	33.87	34.72
Till-2	0.619	10.130	1.351	44.05	0.549	13.43	18.220	38.25	29.26	31.65
Till-2	0.557	9.907	1.348	45.18	0.535	13.81	18.690	39.11	30.37	31.28
Till-2	0.589	9.643	1.327	46.77	0.482	13.18	19.160	39.13	28.28	31.61
Till-2	0.643	9.434	1.328	47.82	0.449	13.49	19.540	38.47	30.99	31.31
Till-2	0.607	9.544	1.323	46.77	0.515	14.03	19.060	37.86	29.82	31.87
Till-2	0.674	9.589	1.304	46.95	0.485	13.97	19.270	38.22	30.28	31.66
Till-2	0.553	9.586	1.295	46.51	0.527	13.89	19.500	38.77	31.95	31.55
Till-2	0.635	9.533	1.319	47.06	0.494	13.48	19.380	39.17	30.80	31.56
Till-2	0.629	9.726	1.340	47.14	0.536	13.88	19.920	39.10	29.89	31.77
Till-2	0.589	9.364	1.372	47.15	0.523	13.06	19.820	38.71	29.55	31.73
Till-2	0.936	10.100	1.352	46.42	0.540	14.03	20.020	41.48	32.42	32.46
Till-2	0.794	9.993	1.326	45.75	0.543	13.49	19.630	41.24	32.44	32.31
Till-2	0.923	10.040	1.372	46.33	0.529	14.10	20.230	40.91	33.17	32.55
Till-2	0.908	10.040	1.360	45.93	0.554	14.19	20.050	40.78	33.30	32.53
Till-2	0.823	9.566	1.266	44.28	0.508	13.31	19.280	38.60	31.18	32.39
Till-2	0.875	9.572	1.316	44.03	0.538	13.86	19.380	38.64	30.69	32.35
Till-2	0.810	9.581	1.343	45.40	0.531	13.60	19.820	38.99	29.26	32.54
Till-2	0.826	9.696	1.325	44.10	0.528	13.21	19.230	38.63	30.46	32.45
Till-2	0.763	9.785	1.366	46.03	0.521	14.37	20.020	40.79	40.41	32.16
Till-2	0.772	9.957	1.323	45.81	0.531	14.47	19.490	40.42	40.80	32.28
Till-2	0.827	9.863	1.338	45.32	0.509	13.89	19.260	39.41	41.39	32.12
Till-2	0.811	9.903	1.332	46.35	0.537	13.67	19.860	40.68	29.27	32.36
Till-2	0.773	9.899	1.347	46.30	0.508	13.49	19.760	40.16	28.93	32.02
Till-2	0.825	9.806	1.292	46.25	0.509	13.52	19.460	41.31	30.78	32.46
Till-2	0.773	9.852	1.329	45.85	0.480	13.97	19.380	41.42	31.20	32.45
Till-2	0.717	10.250	1.363	48.44	0.548	15.14	20.620	41.68	34.00	33.65
Till-2	0.831	9.794	1.393	47.64	0.516	15.25	20.130	42.08	32.96	33.35
Till-2	0.638	9.790	1.345	46.52	0.525	14.18	19.660	41.11	28.86	32.17
Till-2	0.713	9.690	1.362	47.90	0.523	13.67	20.030	41.32	31.14	32.34
Till-2	0.749	9.852	1.325	46.38	0.551	13.26	19.190	40.82	29.21	32.82
Till-2	0.747	9.808	1.372	45.62	0.549	13.58	19.530	40.82	29.34	32.53
Till-2	0.742	9.875	1.328	45.92	0.519	12.86	18.940	41.32	33.15	32.58
Till-2	0.689	9.954	1.325	46.49	0.545	13.49	18.850	41.75	29.47	32.41
Till-2	0.724	9.892	1.309	47.07	0.462	13.37	19.920	41.56	31.12	32.70
Till-2	0.688	9.652	1.314	47.57	0.457	14.19	20.290	41.05	32.44	32.33
Till-2	0.817	9.752	1.334	46.44	0.503	13.47	19.490	40.27	30.17	32.26
Till-2	0.680	9.836	1.308	45.08	0.537	12.99	18.830	40.11	28.73	32.61
Till-2	0.839	9.826	1.273	45.99	0.509	13.70	19.760	41.09	29.65	32.25
Till-2	0.889	9.826	1.295	46.30	0.497	13.63	19.620	41.14	31.14	32.16
Till-2	0.622	10.000	1.340	44.71	0.519	13.46	19.170	40.62	43.73	32.43
Till-2	0.713	9.864	1.339	45.68	0.539	13.30	19.740	40.41	57.22	32.24
Till-2	0.645	9.657	1.328	45.88	0.545	13.20	19.750	39.97	33.46	32.32
Till-2	0.704	9.878	1.368	45.72	0.539	13.37	19.500	40.04	32.86	32.32
Till-2	0.534	10.810	1.314	47.59	0.495	14.47	20.940	42.12	35.94	32.52
Till-2	0.686	10.900	1.345	48.89	0.538	15.45	20.630	42.04	36.09	32.61
Till-2	0.596	10.760	1.369	48.08	0.498	14.37	21.330	42.58	36.19	32.39
Till-2	0.646	9.780	1.269	44.41	0.508	12.80	18.830	39.99	30.27	32.16
Till-2	0.502	9.869	1.313	44.63	0.493	13.65	19.210	39.88	31.14	31.83
Till-2	0.618	9.888	1.257	45.47	0.439	13.46	19.620	38.60	30.55	31.88
Till-2	0.689	9.907	1.261	46.76	0.445	13.36	20.240	38.73	31.11	31.91
Till-2	0.657	9.915	1.332	44.94	0.522	13.20	18.870	38.96	30.45	31.74
Till-2	0.619	9.936	1.325	45.21	0.517	13.51	19.130	38.88	29.50	31.81

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
Till-2	10.310	150.50	1.65	12.46	8.596	5.18	153.10	1.781	1.185	18.800
Till-2	10.480	149.10	1.56	12.60	8.246	5.54	151.30	1.801	1.209	18.000
Till-2	10.520	152.40	1.42	13.09	8.666	5.30	157.30	1.749	1.205	18.290
Till-2	10.500	147.70	1.47	12.09	8.784	5.06	150.80	1.806	1.172	18.710
Till-2	10.620	145.40	1.57	12.83	8.382	4.92	151.00	1.817	1.175	19.070
Till-2	10.420	149.10	1.59	12.57	8.400	5.50	152.60	1.744	1.199	18.030
Till-2	10.350	150.40	1.72	12.58	8.484	5.20	152.80	1.784	1.164	17.970
Till-2	10.480	153.30	1.53	12.45	8.362	5.47	156.20	1.782	1.201	17.870
Till-2	10.510	150.90	2.14	11.62	8.474	5.86	153.50	1.835	1.157	16.920
Till-2	10.690	154.20	1.67	11.55	8.596	5.47	155.90	1.826	1.200	16.320
Till-2	10.450	147.50	1.31	11.73	8.528	5.68	153.40	1.817	1.176	17.590
Till-2	10.410	151.30	1.79	12.38	8.761	5.24	156.70	1.789	1.170	17.710
Till-2	10.550	150.80	1.89	12.23	8.585	5.69	156.80	1.768	1.196	17.800
Till-2	10.420	146.40	1.32	11.94	8.716	5.34	151.80	1.766	1.140	18.560
Till-2	10.440	152.60	1.75	12.49	8.540	4.95	157.70	1.768	1.140	18.560
Till-2	10.610	148.00	1.38	10.91	8.276	5.14	152.50	1.655	1.206	17.810
Till-2	10.590	158.30	1.60	11.79	8.323	5.27	162.50	1.619	1.230	17.370
Till-2	10.400	143.50	1.71	12.54	8.517	5.31	149.30	1.629	1.256	19.440
Till-2	10.480	145.60	1.48	12.93	8.446	5.04	153.50	1.619	1.234	19.580
Till-2	10.300	146.00	1.72	12.39	8.419	4.89	149.70	1.554	1.242	18.940
Till-2	10.530	147.40	1.83	12.40	8.078	5.15	153.20	1.554	1.222	18.610
Till-2	10.430	147.20	1.39	12.38	8.465	5.09	152.50	1.562	1.230	18.560
Till-2	10.460	151.00	1.48	12.44	8.360	5.59	154.50	1.577	1.204	18.790
Till-2	10.460	147.70	1.35	12.04	8.406	5.10	149.60	1.578	1.207	18.410
Till-2	10.550	152.60	1.22	11.99	8.056	5.40	159.00	1.555	1.209	18.660
Till-2	10.290	141.80	1.06	11.71	8.412	4.77	149.40	1.558	1.260	20.110
Till-2	10.350	143.90	1.59	11.64	8.593	4.95	150.40	1.513	1.226	20.400
Till-2	10.330	148.50	1.58	11.66	8.279	5.20	154.40	1.539	1.268	20.230
Till-2	10.780	146.60	1.36	12.38	8.676	5.43	151.20	1.613	1.252	19.460
Till-2	10.710	157.90	1.67	12.86	8.680	5.27	162.90	1.603	1.271	18.970
Till-2	10.560	145.10	1.38	12.46	8.448	5.21	151.70	1.611	1.234	18.890
Till-2	10.520	149.50	1.34	12.87	8.441	5.13	157.60	1.609	1.258	18.900
Till-2	11.290	144.00	1.50	11.74	9.255	5.45	151.70	1.854	1.319	21.150
Till-2	11.190	144.20	1.38	12.04	9.230	5.45	153.30	1.850	1.346	21.060
Till-2	11.480	157.60	2.08	12.62	9.376	5.47	163.70	1.764	1.335	20.910
Till-2	10.200	135.70	0.99	11.72	8.528	5.04	145.00	1.707	1.175	19.690
Till-2	10.430	148.60	1.32	12.77	8.611	5.42	158.80	1.625	1.231	18.980
Till-2	10.370	145.80	0.91	11.24	8.320	5.24	151.10	1.608	1.158	18.820
Till-2	10.400	157.50	0.71	12.02	8.146	5.06	162.10	1.550	1.175	18.540
Till-2	10.370	146.20	0.41	11.05	8.111	5.05	149.30	1.621	1.196	18.860
Till-2	10.500	147.60	0.71	11.42	8.009	5.04	151.60	1.580	1.182	18.570
Till-2	10.380	149.00	1.30	11.35	8.662	5.03	148.70	1.616	1.250	19.760
Till-2	10.380	148.30	0.62	11.76	8.541	5.15	150.00	1.605	1.234	19.990
Till-2	10.390	146.00	1.59	11.01	8.656	4.82	153.60	1.640	1.216	18.010
Till-2	10.440	144.70	1.34	11.25	9.089	4.82	150.20	1.629	1.216	18.920
Till-2	10.670	145.40	1.98	11.14	8.547	4.82	152.50	1.828	1.082	18.860
Till-2	10.580	147.50	1.82	11.63	8.625	4.50	154.50	1.807	1.081	19.250
Till-2	10.610	146.30	3.64	11.31	8.430	4.71	151.40	1.829	1.123	18.560
Till-2	10.590	147.40	3.85	11.35	8.434	4.64	151.50	1.831	1.123	18.750
Till-2	10.200	142.90	3.60	10.95	8.576	4.92	148.00	1.819	0.998	18.640
Till-2	10.130	141.20	3.57	11.02	8.169	4.73	145.70	1.822	1.018	18.580
Till-2	10.260	146.50	3.42	10.44	8.108	4.86	152.50	1.821	1.087	18.260
Till-2	10.220	151.80	3.33	10.93	8.092	4.96	157.50	1.815	1.069	18.470
Till-2	10.570	143.20	3.76	10.88	8.339	4.93	148.90	1.758	1.115	18.790
Till-2	10.670	146.20	3.94	10.72	8.290	4.82	150.30	1.764	1.113	18.810
Till-2	10.500	142.40	3.82	11.18	8.254	4.95	147.50	1.772	1.109	18.690
Till-2	10.530	145.40	2.72	10.69	8.282	4.80	149.60	1.687	1.120	18.920
Till-2	10.510	149.20	2.66	11.35	8.542	4.73	158.30	1.678	1.108	18.800
Till-2	10.450	144.90	1.70	10.69	8.463	4.89	146.90	1.696	1.091	18.720
Till-2	10.380	143.00	1.82	11.01	8.286	4.45	145.80	1.673	1.071	18.910
Till-2	10.910	150.00	2.08	10.81	8.922	4.58	155.00	1.716	1.236	19.300
Till-2	10.830	155.30	1.91	11.20	8.716	4.86	159.10	1.728	1.207	19.490
Till-2	10.480	142.00	1.27	10.53	8.298	4.73	148.40	1.647	1.182	19.530
Till-2	10.360	148.90	1.48	10.57	8.428	4.38	151.20	1.629	1.198	19.430
Till-2	10.500	144.90	2.26	10.43	8.393	4.63	150.70	2.307	1.250	18.450
Till-2	10.470	152.80	1.45	11.27	8.569	5.27	156.50	2.270	1.147	18.710
Till-2	10.620	146.20	1.45	10.28	8.754	4.85	149.80	2.301	1.231	18.990
Till-2	10.740	144.00	1.96	10.48	8.713	4.16	151.10	2.297	1.189	19.160
Till-2	10.520	145.50	1.25	10.95	8.607	4.92	149.00	1.595	1.146	18.800
Till-2	10.590	158.30	1.63	11.26	8.844	4.69	160.40	1.574	1.179	18.710
Till-2	10.590	144.70	1.06	10.43	8.624	4.87	149.30	1.629	1.182	18.570
Till-2	10.480	140.10	1.21	10.52	8.538	4.83	148.20	1.637	1.192	18.720
Till-2	10.640	147.70	1.90	10.42	9.065	4.93	153.40	1.607	1.148	17.610
Till-2	10.640	150.90	1.75	10.55	8.386	4.50	153.20	1.567	1.186	17.710
Till-2	10.480	140.80	0.20	10.12	8.977	4.58	140.30	1.426	1.282	18.560
Till-2	10.520	141.00	0.69	10.79	8.524	4.81	147.00	1.416	1.234	18.750
Till-2	10.470	146.10	0.84	10.80	8.371	4.72	149.10	1.410	1.230	18.530
Till-2	10.620	150.40	0.90	10.99	8.311	4.59	152.70	1.387	1.264	18.770
Till-2	10.810	153.60	0.82	9.78	8.162	4.81	160.10	1.674	1.217	13.150
Till-2	11.080	158.60	0.20	10.29	8.153	5.23	162.10	1.669	1.290	13.600
Till-2	11.040	159.10	0.91	10.51	8.192	5.58	166.60	1.648	1.289	13.560
Till-2	10.300	133.90	1.20	9.91	8.637	4.85	138.20	1.649	1.173	17.250
Till-2	10.270	132.60	1.52	10.00	8.224	4.84	141.20	1.619	1.190	17.180
Till-2	10.320	150.60	0.95	11.85	8.044	5.29	158.30	1.732	1.130	18.510
Till-2	10.350	158.60	0.81	12.39	8.120	5.71	169.20	1.729	1.136	18.050
Till-2	10.310	144.50	1.27	11.52	8.018	5.49	154.60	1.805	1.169	18.620
Till-2	10.320	144.30	1.35	11.43	8.260	5.55	152.50	1.806	1.164	18.470

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
Till-2	5.629	79.81	5.10	42.200	3.844	127.40	390.00	26-50	NGSA031B
Till-2	5.664	79.75	5.09	41.750	3.736	128.00	389.60	26-50	ngsa032a_edtdate
Till-2	5.878	82.22	5.02	42.470	3.637	122.60	395.30	26-50	ngsa032a_edtdate
Till-2	5.684	77.65	4.97	41.500	3.599	126.30	384.10	26-50	ngsa032b_edtdate
Till-2	5.811	79.64	5.11	41.200	3.554	128.80	389.80	26-50	ngsa032b_edtdate
Till-2	5.610	78.43	5.09	41.900	3.768	121.80	396.00	26-50	ngsa033a_edtdate
Till-2	5.643	78.88	4.92	41.720	3.734	129.10	398.00	26-50	ngsa033a_edtdate
Till-2	5.559	80.27	5.08	42.520	3.797	124.40	402.00	26-50	ngsa033a_edtdate
Till-2	5.710	78.64	5.27	39.910	3.849	139.90	395.90	26-50	ngsa033b_edtdate
Till-2	5.753	79.54	5.27	39.250	3.566	131.90	403.50	26-50	ngsa033b_edtdate
Till-2	5.750	78.33	5.07	40.450	3.766	130.70	390.60	26-50	ngsa034a_edtdate
Till-2	5.725	80.49	4.88	41.220	3.685	128.20	394.60	26-50	ngsa034a_edtdate
Till-2	5.719	81.18	4.96	40.930	3.749	128.20	393.50	26-50	ngsa034a_edtdate
Till-2	5.649	78.44	5.05	42.230	3.808	125.70	385.80	26-50	ngsa034B_edtdate
Till-2	5.661	80.95	4.67	43.620	3.782	122.40	390.60	26-50	ngsa034B_edtdate
Till-2	5.691	79.17	4.73	41.410	3.777	123.40	389.30	26-50	ngsa035a
Till-2	5.553	79.22	4.60	42.070	3.688	126.60	399.60	26-50	ngsa035a
Till-2	5.865	80.88	4.48	42.920	3.793	129.90	387.20	26-50	ngsa035b
Till-2	5.864	80.74	4.45	43.580	3.823	130.80	385.90	26-50	ngsa035b
TILL-2	5.718	79.77	4.70	41.870	3.701	127.70	385.40	26-50	ngsa036a
TILL-2	5.709	79.07	4.64	43.140	3.733	121.40	390.00	26-50	ngsa036a
TILL-2	5.734	78.54	4.71	42.950	3.677	127.30	388.60	26-50	ngsa036b
TILL-2	5.718	81.94	4.50	44.000	3.797	127.70	393.80	26-50	ngsa036b
TILL-2	5.755	80.84	4.71	41.680	3.804	131.40	382.70	26-50	ngsa037a
TILL-2	5.709	79.85	4.57	42.880	3.690	133.50	391.50	26-50	ngsa037a
TILL-2	5.782	78.70	4.41	44.470	3.756	129.30	379.00	26-50	ngsa037b
TILL-2	5.728	79.21	4.27	45.100	3.819	125.40	382.10	26-50	ngsa037z
TILL-2	5.765	80.76	4.19	46.110	3.799	123.20	384.80	26-50	ngsa037z
TILL-2	5.962	80.51	4.64	42.170	3.773	130.30	385.30	26-50	ngsa038a
TILL-2	5.808	82.54	4.50	43.960	3.819	127.70	396.00	26-50	ngsa038a
TILL-2	5.846	78.85	4.76	43.070	3.686	126.50	379.30	26-50	ngsa038b
TILL-2	5.827	81.23	4.62	42.720	3.751	125.70	385.00	26-50	ngsa038b
TILL-2	6.657	82.30	4.97	43.850	4.090	143.40	395.40	26-50	ngsa039a
TILL-2	6.680	84.21	5.10	43.700	3.984	146.60	395.80	26-50	ngsa039a
TILL-2	6.364	85.35	4.69	46.300	4.059	141.50	413.00	26-50	ngsa039a
TILL-2	6.178	77.50	4.41	40.740	3.730	138.40	360.40	26-50	ngsa039b
TILL-2	5.743	79.90	4.44	42.210	3.665	136.20	378.70	26-50	ngsa039b
TILL-2	5.811	79.37	4.68	41.660	3.611	124.40	375.30	26-50	ngsa040a
TILL-2	5.626	82.14	4.50	43.040	3.753	125.90	388.50	26-50	ngsa040a
TILL-2	5.816	77.73	4.69	42.220	3.705	120.70	376.10	26-50	ngsa040b
TILL-2	5.675	80.24	4.61	42.600	3.664	133.40	376.70	26-50	ngsa040b
TILL-2	5.780	77.46	4.58	43.540	3.679	123.00	373.40	26-50	ngsa041b_ngsa042a
TILL-2	5.772	77.58	4.54	42.130	3.587	124.00	375.10	26-50	ngsa041b_ngsa042a
TILL-2	5.956	77.93	4.55	39.930	3.760	124.30	378.00	26-50	ngsa042b
TILL-2	5.926	79.32	4.57	40.710	3.735	126.20	376.10	26-50	ngsa042b
TILL-2	5.458	79.09	5.25	40.480	3.844	136.60	383.60	26-50	NGSA043A
TILL-2	5.636	80.73	5.02	40.330	3.737	131.20	380.00	26-50	NGSA043A
TILL-2	5.456	80.02	5.38	40.510	3.840	132.70	385.30	26-50	ngsa043b
TILL-2	5.541	80.77	5.29	40.850	3.855	132.80	382.60	26-50	ngsa043b
TILL-2	5.380	79.77	5.11	40.110	3.708	132.90	367.70	26-50	NGSA044A
TILL-2	5.380	79.02	5.07	39.730	3.785	136.50	364.40	26-50	NGSA044A
TILL-2	5.237	78.80	5.33	40.980	3.800	133.80	374.30	26-50	ngsa044b
TILL-2	5.351	82.54	5.14	41.860	3.764	138.10	373.70	26-50	ngsa044b
TILL-2	5.411	78.46	4.97	40.550	3.720	138.10	379.80	26-50	ngsa045a
TILL-2	5.446	78.66	4.70	40.230	3.688	134.70	379.00	26-50	ngsa045a
TILL-2	5.447	78.07	4.85	39.850	3.789	134.50	374.20	26-50	ngsa045a
TILL-2	5.365	80.33	5.04	40.060	3.761	132.20	380.50	26-50	ngsa045b
TILL-2	5.371	79.95	4.74	40.990	3.722	131.30	380.10	26-50	ngsa045b
TILL-2	5.330	78.05	5.03	39.390	3.676	132.10	375.80	26-50	ngsa046a
TILL-2	5.396	78.21	4.94	39.490	3.815	132.50	373.70	26-50	ngsa046a
TILL-2	5.782	79.65	5.40	41.330	3.967	135.60	387.40	26-50	NGSA046B
TILL-2	5.692	82.71	5.47	42.090	4.207	139.90	390.20	26-50	NGSA046B
TILL-2	5.320	77.29	4.79	40.930	3.714	129.40	378.40	26-50	NGSA047A
TILL-2	5.362	81.09	4.33	40.350	3.787	133.80	379.40	26-50	NGSA047A
TILL-2	5.458	80.16	5.46	40.180	3.778	137.40	380.70	26-50	NGSA047B
TILL-2	5.487	82.66	5.13	40.080	3.816	143.30	381.10	26-50	NGSA047B
TILL-2	5.398	78.39	4.82	40.890	3.641	142.20	383.00	26-50	ngsa048a
TILL-2	5.488	80.46	4.43	40.500	3.717	135.70	378.60	26-50	ngsa048a
TILL-2	5.427	79.57	4.64	40.360	3.739	137.60	388.90	26-50	ngsa048b
TILL-2	5.330	82.74	4.73	42.960	3.727	136.20	398.20	26-50	ngsa048b
TILL-2	5.309	78.54	4.67	40.250	3.703	135.90	381.90	26-50	ngsa049a
TILL-2	5.392	78.99	4.67	39.840	3.729	131.90	370.40	26-50	ngsa049a
TILL-2	5.373	80.84	4.71	39.070	3.712	143.30	379.60	26-50	ngsa49b
TILL-2	5.346	81.78	4.72	39.420	3.821	133.50	378.10	26-50	ngsa49b
TILL-2	5.453	77.08	4.05	38.530	3.809	141.30	377.30	26-50	ngsa050a_and rpts
TILL-2	5.498	80.74	4.16	38.680	3.743	137.30	377.40	26-50	ngsa050a_and rpts
TILL-2	5.353	77.61	4.16	39.550	3.757	137.00	379.70	26-50	ngsa050a_and rpts
TILL-2	5.323	80.24	4.05	40.630	3.838	138.50	383.60	26-50	ngsa050a_and rpts
TILL-2	5.546	79.76	4.66	31.940	3.607	137.80	400.50	26-50	ngsa050b
TILL-2	5.529	81.30	4.50	33.080	3.744	141.70	408.80	26-50	ngsa050b
TILL-2	5.529	81.91	4.58	33.020	3.810	143.10	406.40	26-50	ngsa050b
TILL-2	5.339	77.04	4.83	36.380	3.603	138.70	363.80	26-50	ngsa051a
TILL-2	5.356	78.72	4.94	37.660	3.805	134.70	364.50	26-50	ngsa051a
TILL-2	5.219	82.49	4.76	41.470	3.757	127.30	367.70	51-75	ngsa053A
TILL-2	5.019	84.31	4.56	43.580	3.757	127.20	380.20	51-75	ngsa053A
TILL-2	5.437	82.01	5.22	41.750	3.802	130.60	364.90	51-75	ngsa053B
TILL-2	5.441	81.75	5.05	40.930	3.829	132.20	362.50	51-75	ngsa053B

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-2	008SMPL.D#	NGSA054a	9/09/2009	0.213	24.16	538.00	4.23	5.156	0.26
TILL-2	038SMPL.D#	NGSA054b	9/09/2009	0.210	23.46	550.90	3.59	4.945	0.20
TILL-2	008SMPL.D#	NGSA054b	10/09/2009	0.177	25.51	539.10	3.31	5.051	0.32
TILL-2	040SMPL.D#	NGSA054a	10/09/2009	0.161	24.38	537.70	3.10	5.073	0.20
TILL-2	008SMPL.D#	NGSA055A	10/09/2009	0.202	25.06	541.70	4.19	5.572	0.34
TILL-2	038SMPL.D#	ngsa055b	10/09/2009	0.204	25.42	542.20	4.19	5.544	0.24
TILL-2	008SMPL.D#	ngsa055b	11/09/2009	0.159	25.38	541.20	4.32	5.296	0.13
TILL-2	040SMPL.D#	ngsa055a	11/09/2009	0.157	24.33	542.00	4.33	5.156	0.26
TILL-2	008SMPL.D#	ngsa056a	11/09/2009	0.206	25.29	542.80	5.18	5.299	0.20
TILL-2	038SMPL.D#	ngsa055b	11/09/2009	0.157	26.83	537.00	6.03	5.107	0.28
TILL-2	008SMPL.D#	ngsa056b	14/09/2009	0.241	24.99	543.00	4.23	5.155	0.34
TILL-2	040SMPL.D#	ngsa056b	14/09/2009	0.215	24.59	544.10	3.80	5.049	0.38
TILL-2	008SMPL.D#	NGSA057A	15/10/2009	0.328	26.58	537.40	5.30	5.452	0.41
TILL-2	037SMPL.D#	Int Std	15/10/2009	0.403	26.90	548.30	4.87	5.516	0.46
TILL-2	008SMPL.D#	NGSA057B	16/10/2009	0.210	25.06	532.70	3.90	5.393	0.05
TILL-2	040SMPL.D#	NGSA057B	16/10/2009	0.227	25.44	547.40	3.58	5.469	0.05
TILL-2	042SMPL.D#	INT STD	16/10/2009	0.226	26.21	543.40	4.14	5.539	0.11
TILL-2	008SMPL.D#	ngsa058a	19/10/2009	0.106	26.29	534.10	4.49	5.371	0.05
TILL-2	039SMPL.D#	ngsa058B	19/10/2009	0.165	25.70	540.70	3.86	5.381	0.18
TILL-2	047SMPL.D#	ngsa058b	19/10/2009	0.365	24.94	527.80	4.11	5.535	0.71
TILL-2	075SMPL.D#	Int Std	19/10/2009	0.443	25.76	536.10	3.37	5.477	0.74
TILL-2	008SMPL.D#	ngsa059a	20/10/2009	0.442	27.31	561.20	3.55	5.549	0.60
TILL-2	037SMPL.D#	int Std	20/10/2009	0.347	24.74	527.50	3.96	5.455	0.68
TILL-2	039SMPL.D#	NGSA059B	20/10/2009	0.301	25.05	529.50	3.94	5.449	0.59
TILL-2	047SMPL.D#	NGSA059B	20/10/2009	0.363	25.54	538.20	3.51	5.460	0.37
TILL-2	079SMPL.D#	int Std	20/10/2009	0.391	25.07	534.30	3.73	5.489	0.36
TILL-2	081SMPL.D#	ngsa059a	20/10/2009	0.405	25.65	560.70	3.55	5.585	0.41
TILL-2	008SMPL.D#	NGSA060a	26/10/2009	0.220	27.43	558.40	4.24	5.415	0.41
TILL-2	025SMPL.D#	NGSA060b	26/10/2009	0.278	26.05	532.20	3.89	5.442	0.21
TILL-2	040SMPL.D#	NGSA060b	26/10/2009	0.309	26.45	529.70	3.33	5.463	0.34
TILL-2	042SMPL.D#		26/10/2009	0.317	27.20	534.50	3.22	5.498	0.36
TILL-2	008SMPL.D#	NGSA060b	28/10/2009	0.283	25.55	521.70	4.99	5.439	0.29
TILL-2	041SMPL.D#	NGSA061B	28/10/2009	0.311	24.18	540.10	4.26	5.338	0.15
TILL-2	008SMPL.D#	NGSA061A	29/10/2009	0.210	26.56	558.40	3.45	5.392	0.20
TILL-2	010SMPL.D#	NGSA062A	29/10/2009	0.322	24.46	529.40	3.52	5.423	0.37
TILL-2	040SMPL.D#	NGSA062A	29/10/2009	0.290	25.85	523.20	3.83	5.535	0.29
TILL-2	049SMPL.D#	NGSA061B	28/10/2009	0.393	26.73	533.20	3.99	5.462	0.45
TILL-2	081SMPL.D#	NGSA060b	28/10/2009	0.345	26.03	528.70	3.59	5.459	0.38
TILL-2	048SMPL.D#	NGSA062A	29/10/2009	0.313	24.95	525.30	4.51	5.407	0.22
TILL-2	078SMPL.D#	NGSA062A	29/10/2009	0.308	25.07	527.60	3.98	5.442	0.31
TILL-2	008SMPL.D#	NGSA062B	30/10/2009	0.305	23.77	523.70	2.92	5.557	0.41
TILL-2	040SMPL.D#	NGSA063A	30/10/2009	0.308	25.52	528.70	3.66	5.457	0.31
TILL-2	048SMPL.D#	NGSA063A	30/10/2009	0.334	25.49	529.30	4.82	5.443	0.32
TILL-2	078SMPL.D#	NGSA062B	30/10/2009	0.264	25.22	519.80	3.38	5.536	0.29
TILL-2	008SMPL.D#	NGSA063B	4/11/2009	0.407	27.05	546.20	3.99	5.658	0.23
TILL-2	048SMPL.D#	NGSA064A	5/11/2009	0.272	24.99	540.60	3.33	5.363	0.63
TILL-2	076SMPL.D#	NGSA065A	5/11/2009	0.334	25.51	562.30	3.96	5.403	0.58
TILL-2	008SMPL.D#	NGSA064B	6/11/2009	0.283	25.67	555.30	3.74	5.415	0.33
TILL-2	040SMPL.D#	NGSA065B	6/11/2009	0.338	23.05	525.20	3.85	5.434	0.20
TILL-2	008SMPL.D#	NGSA065A	5/11/2009	0.274	24.75	570.60	4.16	5.398	0.45
TILL-2	023SMPL.D#	64a	5/11/2009	0.273	24.06	537.00	3.06	5.346	0.30
TILL-2	029SMPL.D#	64b	5/11/2009	0.318	24.69	561.40	3.33	5.376	0.36
TILL-2	040SMPL.D#	std	5/11/2009	0.423	24.83	540.10	4.00	5.466	0.28
TILL-2	048SMPL.D#	NGSA065B	6/11/2009	0.319	23.77	526.00	3.95	5.539	0.05
TILL-2	080SMPL.D#	NGSA064B	6/11/2009	0.312	22.98	552.20	4.09	5.523	0.26
TILL-2	008SMPL.D#	NGSA066a	17/11/2009	0.344	22.95	513.90	4.11	5.396	0.26
TILL-2	038SMPL.D#	NGSA066a	17/11/2009	0.355	23.67	528.50	4.31	5.354	0.32
TILL-2	040SMPL.D#	NGSA066B	17/11/2009	0.312	23.70	525.30	3.85	5.308	0.31
TILL-2	008SMPL.D#	NGSA066b	18/11/2009	0.300	22.77	521.90	4.43	5.348	0.24
TILL-2	040SMPL.D#	NGSA066a	18/11/2009	0.244	23.13	536.70	3.77	5.428	0.05
TILL-2	048SMPL.D#	NGSA067a	18/11/2009	0.341	24.05	532.30	3.72	5.389	0.23
TILL-2	078SMPL.D#	NGSA066b	18/11/2009	0.340	24.19	535.00	3.34	5.396	0.23
TILL-2	008SMPL.D#	NGSA067b	19/11/2009	0.301	23.65	522.60	3.70	5.490	0.32
TILL-2	033SMPL.D#	NGSA068a	19/11/2009	0.296	24.74	532.90	3.51	5.587	0.23
TILL-2	041SMPL.D#	NGSA068a	19/11/2009	0.331	24.44	530.80	3.65	5.548	0.26
TILL-2	071SMPL.D#	NGSA067b	19/11/2009	0.238	23.93	532.50	4.68	5.434	0.33
TILL-2	008SMPL.D#	NGSA068b	20/11/2009	0.395	24.90	526.10	4.04	5.579	0.41
TILL-2	039SMPL.D#	ngsa069a	20/11/2009	0.273	24.29	538.60	3.31	5.504	0.30
TILL-2	050SMPL.D#	ngsa069a	20/11/2009	0.307	24.64	538.40	3.67	5.490	0.24
TILL-2	039SMPL.D#	NGSA069b	23/11/2009	0.279	24.46	513.50	3.29	5.523	0.05
TILL-2	008SMPL.D#	NGSA069b	23/11/2009	0.216	22.84	534.10	3.36	5.485	0.05
TILL-2	025SMPL.D#	NGSA069b	23/11/2009	0.724	25.34	522.50	3.30	5.539	0.30
TILL-2	055SMPL.D#	NGSA070a	24/11/2009	0.286	22.94	524.80	4.29	5.552	0.24
TILL-2	085SMPL.D#	NGSA070a	24/11/2009	0.303	26.01	528.90	4.29	5.375	0.51
TILL-2	087SMPL.D#	NGSA070b	24/11/2009	0.240	26.58	530.20	3.50	5.458	0.31
TILL-2	089SMPL.D#	Std	24/11/2009	0.409	25.36	524.10	3.21	5.549	0.45
TILL-2	008SMPL.D#	NGSA070b	24/11/2009	0.238	25.54	524.60	4.24	5.555	0.39
TILL-2	015SMPL.D#	NGSA070a	24/11/2009	0.206	22.92	517.60	4.06	5.433	0.36
TILL-2	017SMPL.D#	NGSA070b	24/11/2009	0.262	24.28	521.50	3.05	5.392	0.23
TILL-2	047SMPL.D#	NGSA070a	24/11/2009	0.318	21.82	509.60	3.49	5.396	0.47
TILL-2	008SMPL.D#	NGSA071a	25/11/2009	0.850	25.99	533.90	4.80	5.592	0.56
TILL-2	039SMPL.D#	STD	25/11/2009	0.828	29.01	563.60	5.39	5.466	0.31
TILL-2	008SMPL.D#	NGSA071b	26/11/2009	0.194	25.59	522.30	4.02	5.707	0.05
TILL-2	040SMPL.D#	NGSA072a	26/11/2009	0.110	22.80	527.80	3.06	5.707	0.05
TILL-2	042SMPL.D#	NGSA072a	26/11/2009	0.114	23.22	522.50	3.06	5.694	0.05
TILL-2	050SMPL.D#	NGSA072a	26/11/2009	0.303	23.21	521.60	3.83	5.596	0.73
TILL-2	080SMPL.D#	STd	26/11/2009	0.263	25.16	519.60	4.52	5.558	1.04

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-2	97.880	15.10	74.47	12.21	150.80	6.41	3.810	1.213	19.36	6.973
TILL-2	97.840	15.36	74.32	12.59	148.00	6.34	3.776	1.192	17.66	7.076
TILL-2	99.150	15.09	76.07	12.58	150.00	6.46	3.748	1.206	18.72	6.988
TILL-2	96.820	14.94	76.36	12.30	149.30	6.42	3.744	1.210	20.03	6.921
TILL-2	102.300	14.45	74.63	12.29	150.60	6.31	3.795	1.205	19.16	7.204
TILL-2	101.100	14.89	75.72	12.41	151.10	6.37	3.736	1.193	20.04	7.219
TILL-2	103.200	14.64	73.34	12.52	148.90	6.35	3.670	1.166	19.24	7.154
TILL-2	101.700	14.51	72.83	12.29	148.50	6.44	3.703	1.190	20.50	7.154
TILL-2	104.200	15.11	76.12	12.65	153.60	6.42	3.811	1.191	19.20	7.241
TILL-2	101.300	14.84	74.54	12.42	150.50	6.31	3.706	1.213	20.13	7.098
TILL-2	104.100	14.86	74.84	12.40	150.70	6.32	3.773	1.250	21.16	7.228
TILL-2	102.900	14.68	75.08	12.36	147.20	6.32	3.835	1.308	18.65	7.146
TILL-2	100.900	14.96	75.05	11.97	149.70	6.55	3.712	1.338	18.64	6.843
TILL-2	100.500	15.12	75.59	12.30	150.90	6.76	3.755	1.283	19.09	6.805
TILL-2	102.200	14.93	71.88	12.28	151.20	6.51	3.788	1.346	20.05	6.704
TILL-2	102.000	14.91	73.06	12.51	148.30	6.56	3.666	1.343	18.24	6.709
TILL-2	101.000	14.80	71.54	12.19	148.60	6.71	3.763	1.339	19.16	6.596
TILL-2	101.400	14.81	73.84	12.10	152.00	6.53	3.643	1.216	19.55	6.723
TILL-2	99.500	14.78	73.89	12.32	148.50	6.53	3.562	1.167	18.79	6.557
TILL-2	99.220	14.28	74.31	12.13	149.50	6.48	3.712	1.329	19.80	6.745
TILL-2	100.900	14.67	77.00	12.16	152.70	6.74	3.793	1.325	19.54	6.795
TILL-2	105.700	14.57	73.16	13.14	154.10	6.66	3.823	1.355	20.23	6.907
TILL-2	100.200	14.89	73.54	12.04	148.90	6.49	3.699	1.262	19.58	6.628
TILL-2	98.820	14.75	73.81	12.05	148.90	6.54	3.678	1.246	18.52	6.623
TILL-2	100.600	14.44	75.41	12.23	149.10	6.56	3.724	1.303	19.16	6.738
TILL-2	100.600	14.19	74.49	12.33	147.60	6.60	3.641	1.304	19.20	6.743
TILL-2	105.100	15.00	76.14	13.24	151.60	6.47	3.749	1.307	20.94	6.836
TILL-2	105.100	14.45	72.58	13.06	152.70	6.59	3.685	1.283	19.83	6.810
TILL-2	99.890	14.54	73.11	12.02	150.10	6.66	3.703	1.371	19.88	6.850
TILL-2	99.440	14.57	74.68	12.21	150.30	6.53	3.718	1.325	20.22	6.754
TILL-2	100.000	14.72	74.87	12.36	151.30	6.78	3.721	1.313	20.57	6.735
TILL-2	99.420	14.67	72.50	12.03	152.20	6.53	3.608	1.275	19.94	6.603
TILL-2	100.800	14.70	72.52	11.84	145.50	6.47	3.632	1.309	18.40	6.545
TILL-2	106.600	14.77	75.02	13.35	154.50	6.57	3.737	1.276	18.90	6.904
TILL-2	99.210	14.53	73.24	12.18	150.50	6.48	3.672	1.318	18.39	6.677
TILL-2	98.830	14.88	74.50	12.13	148.90	6.62	3.643	1.301	18.30	6.690
TILL-2	101.600	14.90	74.20	12.56	147.70	6.61	3.647	1.288	18.73	6.732
TILL-2	99.180	14.61	73.25	12.19	152.50	6.63	3.670	1.302	19.50	6.668
TILL-2	99.820	14.92	73.21	12.12	150.20	6.83	3.679	1.323	20.79	6.719
TILL-2	98.340	14.48	74.49	12.05	151.40	6.63	3.632	1.298	20.34	6.565
TILL-2	100.300	14.68	71.01	12.12	150.90	6.43	3.820	1.292	18.55	6.649
TILL-2	100.000	14.72	73.78	12.22	151.70	6.45	3.685	1.429	19.74	6.629
TILL-2	100.100	14.44	74.27	12.18	151.70	6.77	3.627	1.336	19.80	6.748
TILL-2	97.800	14.26	75.42	12.00	150.60	6.69	3.691	1.344	18.52	6.669
TILL-2	101.400	14.74	75.50	12.09	153.50	6.59	3.708	1.312	18.85	6.799
TILL-2	98.360	14.22	73.33	12.28	150.40	6.68	3.793	1.264	19.97	6.625
TILL-2	103.300	14.55	72.69	13.01	148.30	6.65	3.856	1.271	20.62	6.567
TILL-2	101.200	14.63	71.46	12.99	151.00	6.57	3.816	1.273	20.96	6.526
TILL-2	92.690	14.46	71.90	11.85	146.40	6.71	3.851	1.250	17.95	6.589
TILL-2	105.500	14.63	73.37	13.57	150.40	6.73	3.805	1.290	19.75	6.488
TILL-2	98.520	14.97	71.91	12.22	148.30	6.77	3.753	1.271	18.04	6.527
TILL-2	100.900	15.07	71.94	12.86	149.90	6.56	3.696	1.294	19.29	6.559
TILL-2	100.700	15.59	74.21	12.05	150.70	6.58	3.820	1.266	20.16	6.595
TILL-2	94.120	14.64	71.08	11.57	152.00	6.31	3.755	1.272	20.02	6.617
TILL-2	100.600	14.45	73.78	12.70	150.50	6.37	3.840	1.291	19.81	6.441
TILL-2	95.520	14.49	70.62	11.84	151.80	6.60	3.753	1.302	20.95	6.610
TILL-2	96.330	14.50	73.04	12.10	151.70	6.94	3.752	1.274	19.90	6.505
TILL-2	94.450	14.25	72.39	12.14	145.40	6.63	3.773	1.304	19.79	6.494
TILL-2	94.950	13.79	70.59	11.76	146.50	6.29	3.649	1.224	20.73	6.457
TILL-2	94.320	14.55	72.05	12.07	148.40	6.62	3.568	1.311	18.77	6.382
TILL-2	96.390	13.81	70.53	12.14	148.30	6.61	3.954	1.320	18.97	6.567
TILL-2	94.660	14.47	71.20	12.11	150.00	6.61	3.817	1.364	19.22	6.511
TILL-2	95.850	14.69	72.92	12.17	150.90	6.65	3.771	1.297	19.65	6.531
TILL-2	96.400	14.83	73.16	12.06	149.90	6.71	3.856	1.266	17.84	6.629
TILL-2	96.260	14.94	75.85	12.02	152.90	6.63	3.871	1.315	19.86	6.718
TILL-2	93.990	15.16	73.94	11.74	148.70	6.63	3.857	1.307	19.93	6.530
TILL-2	96.760	14.80	75.40	12.04	152.20	6.56	3.753	1.279	18.84	6.579
TILL-2	99.410	14.49	74.65	12.03	146.00	6.52	3.780	1.242	18.64	6.788
TILL-2	99.630	14.71	71.20	12.38	146.80	6.82	3.724	1.329	19.36	6.644
TILL-2	94.110	14.77	78.16	11.63	151.40	6.86	3.769	1.328	21.33	6.370
TILL-2	96.540	14.25	74.06	12.08	151.60	6.78	3.768	1.290	20.54	6.597
TILL-2	95.260	13.77	76.20	11.94	144.00	6.48	3.820	1.342	19.86	6.529
TILL-2	98.880	15.00	74.91	12.51	154.60	6.91	3.834	1.209	20.72	6.543
TILL-2	95.860	15.30	78.90	12.11	155.70	6.67	3.772	1.329	19.44	6.543
TILL-2	96.230	15.19	76.22	12.58	150.90	6.79	3.814	1.255	23.10	6.559
TILL-2	99.000	15.68	75.66	12.57	153.50	6.63	3.667	1.349	19.19	6.775
TILL-2	97.450	14.58	73.29	12.24	156.20	6.83	3.803	1.286	21.16	6.596
TILL-2	94.990	15.16	76.94	11.88	152.30	6.49	3.801	1.249	19.22	6.573
TILL-2	95.060	14.90	75.06	11.68	150.00	6.65	3.709	1.279	17.67	6.399
TILL-2	93.310	14.89	76.80	11.44	146.20	6.65	3.744	1.303	17.99	6.454
TILL-2	98.580	14.20	74.56	12.62	152.20	6.86	3.724	1.275	19.18	6.632
TILL-2	104.400	14.36	75.09	13.69	147.60	6.68	3.719	1.289	20.38	6.940
TILL-2	97.300	15.48	76.51	11.81	152.40	6.64	3.631	1.226	19.78	6.679
TILL-2	93.350	15.02	73.70	11.33	146.80	6.54	3.747	1.213	20.76	6.427
TILL-2	92.910	14.60	71.85	11.50	143.70	6.51	3.710	1.166	17.67	6.181
TILL-2	95.950	15.58	71.64	12.12	149.00	6.73	4.046	1.304	18.93	6.718
TILL-2	97.180	16.14	74.22	12.00	148.90	6.76	3.879	1.350	18.43	6.717

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-2	0.699	9.816	1.317	44.46	0.514	13.78	19.190	38.21	29.61	31.61
TILL-2	0.659	9.883	1.315	45.36	0.539	13.20	19.420	38.11	28.67	31.67
TILL-2	0.672	9.798	1.305	45.09	0.513	13.34	19.190	38.63	29.77	32.97
TILL-2	0.624	9.812	1.314	44.35	0.473	14.24	19.070	38.19	29.25	32.89
TILL-2	0.546	10.240	1.291	46.90	0.476	13.55	19.060	39.88	29.44	32.15
TILL-2	0.559	10.190	1.296	47.05	0.497	13.53	19.050	39.96	30.22	32.05
TILL-2	0.765	10.020	1.254	47.58	0.474	13.99	19.160	39.98	30.56	32.25
TILL-2	0.670	10.170	1.261	46.90	0.480	13.43	19.230	39.62	30.48	31.72
TILL-2	0.608	10.380	1.304	47.51	0.495	14.35	19.310	40.70	30.29	32.43
TILL-2	0.699	10.200	1.269	46.90	0.489	13.95	19.080	40.43	29.68	32.11
TILL-2	0.657	10.290	1.307	47.41	0.536	13.06	19.550	39.44	31.43	31.82
TILL-2	0.665	10.260	1.349	47.47	0.529	13.79	19.200	39.40	30.94	31.78
TILL-2	0.894	10.460	1.331	47.21	0.572	13.59	20.160	40.88	32.36	30.91
TILL-2	0.765	10.310	1.330	47.42	0.569	13.71	20.230	40.27	32.29	31.21
TILL-2	0.836	10.400	1.294	47.16	0.499	13.47	19.920	40.50	32.05	31.55
TILL-2	0.760	10.280	1.291	47.56	0.507	14.19	19.660	40.81	31.76	31.59
TILL-2	0.875	10.110	1.293	47.37	0.491	13.69	19.870	40.91	30.34	31.68
TILL-2	0.933	10.310	1.135	46.61	0.367	14.10	20.370	40.86	30.91	31.32
TILL-2	0.782	10.060	1.144	46.72	0.390	13.43	20.040	40.24	31.96	30.87
TILL-2	0.827	10.080	1.302	46.01	0.534	13.76	20.270	40.77	32.17	31.44
TILL-2	0.860	10.470	1.300	46.77	0.547	14.32	19.940	41.19	31.16	31.53
TILL-2	0.871	11.190	1.394	47.82	0.594	15.16	21.150	41.66	32.45	32.01
TILL-2	0.812	10.420	1.252	45.58	0.479	13.55	19.360	40.34	32.41	31.45
TILL-2	0.793	10.290	1.265	46.01	0.494	14.40	19.350	40.41	31.42	31.28
TILL-2	0.771	10.560	1.305	46.01	0.535	13.76	19.930	40.10	31.90	31.19
TILL-2	0.680	10.440	1.297	46.21	0.537	13.55	19.520	40.48	31.31	31.17
TILL-2	0.742	11.360	1.333	47.89	0.555	14.90	20.770	42.10	32.86	31.79
TILL-2	0.846	11.380	1.288	48.26	0.513	15.09	20.870	41.74	31.63	31.15
TILL-2	0.888	10.300	1.311	46.41	0.530	13.78	19.940	40.79	31.86	31.11
TILL-2	0.784	10.200	1.285	46.02	0.517	13.41	19.560	39.97	33.46	31.49
TILL-2	0.740	10.420	1.331	46.93	0.506	14.05	19.890	40.89	31.30	31.51
TILL-2	0.824	10.250	1.257	45.18	0.486	13.33	19.420	40.20	33.87	30.86
TILL-2	0.764	10.410	1.208	45.87	0.503	12.87	20.000	40.86	31.52	30.86
TILL-2	0.851	11.360	1.299	48.27	0.540	15.25	21.150	41.49	31.37	31.00
TILL-2	0.814	10.160	1.297	46.33	0.576	13.61	19.130	40.06	32.06	31.17
TILL-2	0.728	10.200	1.258	45.56	0.549	13.26	18.860	39.94	31.12	30.97
TILL-2	0.903	10.520	1.240	47.06	0.516	13.83	20.440	40.66	32.55	31.19
TILL-2	0.836	10.360	1.261	46.33	0.479	13.34	19.550	40.26	34.03	31.48
TILL-2	0.735	10.210	1.299	46.17	0.565	13.41	18.660	40.35	31.54	31.10
TILL-2	0.821	10.200	1.320	45.77	0.555	12.87	18.690	40.23	32.24	31.03
TILL-2	0.765	10.300	1.324	46.56	0.576	13.91	18.760	39.47	31.92	31.23
TILL-2	0.760	10.190	1.307	46.48	0.555	14.30	19.430	40.32	33.80	31.56
TILL-2	0.691	10.410	1.279	46.70	0.582	13.78	19.590	41.30	33.71	31.05
TILL-2	0.696	10.270	1.316	45.82	0.565	13.29	18.460	40.17	30.65	31.19
TILL-2	0.904	10.350	1.307	47.23	0.578	13.44	19.900	40.55	33.74	31.79
TILL-2	0.807	10.440	1.308	44.26	0.533	13.55	20.110	38.49	32.87	30.93
TILL-2	0.900	11.470	1.308	44.91	0.595	14.75	20.860	38.66	34.65	31.36
TILL-2	0.859	10.760	1.289	45.84	0.543	14.55	20.710	39.26	32.53	31.20
TILL-2	0.845	10.010	1.325	43.70	0.609	12.78	18.630	38.22	31.14	31.35
TILL-2	0.810	11.530	1.293	45.18	0.559	15.04	21.120	39.41	35.78	30.70
TILL-2	0.736	10.720	1.333	44.61	0.565	14.14	20.060	38.98	31.78	31.09
TILL-2	0.930	10.830	1.317	45.20	0.555	14.18	20.710	39.33	32.08	31.11
TILL-2	0.741	10.300	1.320	46.19	0.547	13.42	19.560	40.46	33.78	31.51
TILL-2	0.987	9.946	1.315	43.96	0.547	13.32	19.080	37.93	30.75	31.04
TILL-2	1.008	10.860	1.299	45.15	0.537	14.71	20.370	39.29	32.32	31.24
TILL-2	0.804	10.380	1.328	44.22	0.591	13.29	19.580	37.63	34.03	30.87
TILL-2	0.731	10.380	1.342	43.93	0.575	12.83	19.540	37.90	32.48	30.64
TILL-2	0.809	10.170	1.344	44.01	0.610	13.24	19.770	37.83	32.88	30.84
TILL-2	0.764	10.100	1.151	43.68	0.587	12.36	19.070	37.64	32.06	30.88
TILL-2	0.808	9.956	1.147	44.41	0.576	13.41	18.890	38.03	32.41	31.11
TILL-2	0.733	10.480	1.353	44.36	0.550	13.04	19.350	38.66	32.07	31.05
TILL-2	0.827	10.280	1.348	43.31	0.571	13.09	19.730	38.21	31.98	30.86
TILL-2	0.759	10.540	1.316	43.73	0.577	13.55	19.860	38.26	35.50	31.24
TILL-2	0.676	10.170	1.350	44.31	0.589	12.61	19.740	38.73	31.67	31.82
TILL-2	0.719	10.220	1.300	44.62	0.604	12.95	19.580	38.62	31.31	31.42
TILL-2	0.754	10.510	1.322	42.59	0.584	12.30	19.210	38.03	36.63	31.22
TILL-2	0.753	10.190	1.373	44.74	0.581	12.89	19.300	39.41	33.57	31.18
TILL-2	0.591	10.210	1.270	46.76	0.512	13.28	19.160	40.16	34.24	31.44
TILL-2	0.714	10.240	1.310	46.81	0.534	13.03	19.480	40.54	33.07	31.12
TILL-2	0.739	10.120	1.302	43.56	0.534	13.10	18.570	38.79	32.28	30.77
TILL-2	0.724	10.030	1.288	44.42	0.539	13.69	19.160	39.30	33.22	30.87
TILL-2	0.571	9.931	1.291	44.24	0.505	13.43	18.330	38.11	30.65	31.13
TILL-2	0.822	10.170	1.315	44.98	0.544	12.56	19.950	39.06	32.71	31.32
TILL-2	0.741	9.988	1.326	43.93	0.539	14.35	19.290	38.12	32.61	31.09
TILL-2	0.767	10.220	1.316	43.83	0.591	13.82	19.410	39.49	33.07	31.78
TILL-2	1.109	10.700	1.289	46.63	0.518	13.53	18.810	40.07	32.34	31.50
TILL-2	0.681	10.310	1.314	44.52	0.538	12.81	19.090	39.00	32.32	31.46
TILL-2	0.574	10.090	1.294	43.55	0.544	13.13	18.850	38.67	31.19	31.20
TILL-2	0.522	10.260	1.283	43.94	0.560	12.78	18.300	37.86	32.15	31.31
TILL-2	0.479	10.440	1.334	42.55	0.543	13.19	17.840	38.56	34.40	31.10
TILL-2	0.828	9.976	1.274	45.25	0.491	13.51	19.640	39.44	32.67	31.32
TILL-2	0.751	10.230	1.279	49.12	0.450	13.81	20.470	40.91	32.29	31.59
TILL-2	0.611	10.130	1.284	44.14	0.465	13.16	19.390	39.43	34.46	32.54
TILL-2	0.686	10.480	1.220	42.91	0.465	13.77	19.040	37.67	33.68	32.39
TILL-2	0.697	10.380	1.191	43.13	0.509	11.90	18.860	37.88	33.57	32.32
TILL-2	0.722	10.330	1.354	44.19	0.624	12.79	19.540	37.86	32.03	30.71
TILL-2	0.697	10.570	1.327	44.99	0.592	13.19	18.540	40.55	31.56	31.45

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-2	10.170	143.40	1.05	11.69	7.955	5.18	151.60	1.751	1.191	18.500
TILL-2	10.180	146.30	0.97	11.30	8.027	5.11	154.30	1.758	1.174	19.170
TILL-2	10.360	143.30	1.07	11.39	8.366	5.27	150.90	1.757	1.168	18.450
TILL-2	10.140	143.00	1.27	11.68	8.004	5.58	153.40	1.759	1.174	18.580
TILL-2	10.740	146.00	1.02	11.70	8.247	5.11	151.70	1.771	1.168	19.160
TILL-2	10.800	147.00	0.84	12.12	8.506	5.59	154.50	1.804	1.185	19.180
TILL-2	10.730	146.00	1.35	11.65	8.431	5.10	158.10	1.704	1.143	19.330
TILL-2	10.580	145.10	0.86	11.98	8.367	5.34	158.10	1.748	1.136	19.250
TILL-2	10.980	148.00	0.94	12.09	8.325	5.44	156.30	1.770	1.195	19.960
TILL-2	10.810	147.60	0.95	12.24	8.088	5.34	155.50	1.748	1.181	19.170
TILL-2	10.570	145.90	1.00	11.93	8.586	5.36	153.10	1.848	1.245	18.900
TILL-2	10.470	145.60	1.30	12.02	8.462	5.52	152.50	1.846	1.207	19.110
TILL-2	10.470	143.20	1.64	11.72	8.396	5.54	155.50	1.799	1.225	18.340
TILL-2	10.570	149.40	1.56	12.23	8.248	5.52	159.70	1.782	1.207	18.360
TILL-2	10.500	144.60	0.75	11.13	8.571	5.72	155.80	1.817	1.165	18.470
TILL-2	10.480	149.30	0.86	11.11	8.567	5.72	156.00	1.818	1.157	18.760
TILL-2	10.360	145.00	0.88	11.33	8.515	5.89	155.80	1.768	1.146	18.630
TILL-2	10.310	146.70	1.37	11.77	8.364	5.65	158.10	2.554	1.048	18.560
TILL-2	10.100	147.60	1.45	12.14	8.251	5.57	157.80	2.530	1.002	18.360
TILL-2	10.310	143.20	1.57	11.66	8.148	5.52	155.50	2.460	1.198	18.470
TILL-2	10.550	146.70	1.48	12.06	8.404	5.43	158.70	2.477	1.231	18.230
TILL-2	10.770	148.90	1.80	11.01	8.663	5.82	164.30	2.719	1.275	15.210
TILL-2	10.340	146.40	1.46	11.69	8.928	5.40	156.70	2.468	1.145	18.570
TILL-2	10.230	144.80	1.69	11.56	8.578	5.03	158.20	2.466	1.100	18.190
TILL-2	10.370	144.60	1.00	11.55	8.257	5.89	153.90	2.593	1.193	17.960
TILL-2	10.450	143.30	1.01	11.17	8.474	6.46	155.70	2.619	1.201	18.300
TILL-2	10.690	149.30	1.57	10.93	8.177	6.96	163.60	2.809	1.204	15.440
TILL-2	10.870	148.60	1.15	10.74	8.583	5.69	162.00	1.870	1.183	12.160
TILL-2	10.390	142.00	0.44	11.42	8.480	5.25	153.90	1.713	1.172	18.430
TILL-2	10.410	141.60	0.41	11.65	8.692	5.33	156.50	1.705	1.157	18.610
TILL-2	10.500	144.80	0.44	11.31	8.477	5.27	156.30	1.757	1.180	18.020
TILL-2	10.300	138.50	0.49	11.44	8.393	4.96	149.00	1.683	1.116	19.210
TILL-2	10.340	140.30	0.78	10.82	8.453	4.97	153.20	1.740	1.114	18.480
TILL-2	10.830	150.50	2.14	10.71	8.577	5.96	163.00	2.373	1.213	13.390
TILL-2	10.320	143.30	1.43	11.03	8.438	5.48	155.50	1.736	1.225	19.080
TILL-2	10.420	143.40	1.21	11.20	8.123	4.96	154.30	1.761	1.200	18.910
TILL-2	10.580	146.10	1.04	11.52	8.256	5.28	157.90	2.615	1.155	17.200
TILL-2	10.330	141.10	0.46	11.36	8.538	5.58	154.50	2.560	1.133	18.740
TILL-2	10.430	146.10	0.53	11.26	8.066	5.18	154.60	1.824	1.234	18.560
TILL-2	10.360	143.40	0.20	11.08	8.370	5.17	157.10	1.832	1.183	18.840
TILL-2	10.500	144.80	0.20	10.92	8.566	5.45	157.80	0.750	1.248	18.700
TILL-2	10.470	150.90	0.20	11.74	8.237	5.71	162.60	1.608	1.235	18.890
TILL-2	10.430	141.40	0.66	11.13	8.464	5.11	154.30	2.220	1.244	18.610
TILL-2	10.400	139.80	0.54	10.97	8.268	5.12	151.00	1.336	1.177	18.770
TILL-2	10.680	146.70	1.27	11.70	8.762	5.13	156.50	1.329	1.238	19.060
TILL-2	10.040	146.60	1.30	11.10	8.050	5.41	156.30	2.192	1.153	16.800
TILL-2	10.260	147.50	1.26	10.68	8.130	5.57	161.60	2.312	1.140	15.290
TILL-2	10.050	149.80	1.50	11.20	7.849	5.26	160.60	2.207	1.153	17.320
TILL-2	9.686	144.10	1.04	11.74	7.308	4.82	153.00	2.067	1.155	20.470
TILL-2	10.250	153.50	0.70	11.10	7.673	5.81	163.80	2.457	1.176	15.310
TILL-2	9.925	148.70	0.20	10.81	8.056	5.47	157.60	2.360	1.171	17.110
TILL-2	10.170	148.30	0.77	11.00	7.767	5.74	160.90	2.394	1.168	17.580
TILL-2	10.340	146.00	0.20	11.94	8.524	5.67	157.80	2.312	1.203	18.230
TILL-2	9.728	140.60	0.20	11.16	8.132	4.69	152.10	2.042	1.167	21.030
TILL-2	10.070	148.30	0.59	10.91	8.102	5.37	161.40	2.195	1.156	17.690
TILL-2	9.918	141.40	0.20	11.71	7.977	4.94	153.40	1.911	1.210	17.980
TILL-2	10.100	145.90	0.20	11.91	8.111	5.23	157.40	1.880	1.176	17.690
TILL-2	9.912	142.70	0.20	11.62	8.329	4.71	158.10	1.879	1.188	17.760
TILL-2	9.709	140.80	0.58	11.19	8.223	4.98	151.30	1.977	0.949	18.000
TILL-2	9.634	144.40	0.51	11.47	7.763	5.17	159.50	1.958	0.974	18.530
TILL-2	9.984	144.70	0.20	11.10	8.025	5.33	156.40	1.552	1.179	16.200
TILL-2	9.834	145.00	0.20	11.35	7.992	4.99	154.80	1.524	1.195	17.730
TILL-2	9.793	142.50	0.94	11.14	7.762	4.96	154.90	1.510	1.181	17.980
TILL-2	9.956	144.00	1.12	10.96	7.999	5.10	158.30	1.520	1.213	18.530
TILL-2	10.050	140.50	1.12	11.38	7.838	5.81	156.50	1.540	1.200	18.420
TILL-2	9.775	145.00	0.99	11.64	7.789	5.15	158.50	1.543	1.199	17.880
TILL-2	10.070	146.10	1.40	11.28	8.224	5.35	156.30	1.513	1.189	18.390
TILL-2	10.360	143.10	1.63	11.33	8.560	5.27	160.90	1.520	1.164	19.350
TILL-2	10.410	145.10	0.20	10.83	8.489	3.96	157.50	1.883	1.203	19.200
TILL-2	9.866	136.90	0.69	10.51	8.020	5.30	154.30	1.519	1.147	18.370
TILL-2	10.110	143.70	0.70	10.75	7.947	5.58	154.40	1.514	1.197	18.620
TILL-2	9.848	139.10	1.09	11.07	8.056	5.11	153.30	1.505	1.186	18.620
TILL-2	10.140	150.90	0.93	10.71	7.776	5.32	157.00	1.483	1.183	18.500
TILL-2	10.010	148.00	0.89	11.10	8.057	5.67	159.30	1.502	1.198	18.340
TILL-2	9.903	143.20	1.06	10.72	8.049	5.27	156.90	1.497	1.224	17.470
TILL-2	10.550	145.00	0.91	11.14	8.410	5.46	159.50	1.502	1.141	18.260
TILL-2	10.050	137.40	0.20	11.59	8.264	5.50	161.60	1.570	1.182	17.790
TILL-2	9.969	141.60	0.20	10.69	7.947	5.80	153.90	1.542	1.140	18.710
TILL-2	9.897	136.30	0.20	10.52	7.993	4.75	148.80	1.568	1.124	17.800
TILL-2	9.998	139.50	0.20	11.73	7.838	5.49	152.10	1.581	1.180	18.890
TILL-2	10.090	146.30	0.83	11.55	7.783	5.10	157.60	1.477	1.137	18.260
TILL-2	10.570	161.30	1.32	12.12	8.081	5.42	169.30	1.488	1.166	18.250
TILL-2	9.988	145.30	1.38	11.44	7.737	5.32	152.70	1.701	1.091	18.630
TILL-2	9.854	138.40	1.05	11.00	7.951	5.14	151.00	1.708	1.066	18.410
TILL-2	9.631	139.60	1.24	11.03	7.861	4.92	151.90	1.712	1.054	18.590
TILL-2	10.030	144.00	0.20	10.84	8.224	4.96	152.00	1.571	1.238	17.790
TILL-2	10.400	142.40	0.20	12.10	8.540	5.22	158.00	1.558	1.228	18.440

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-2	5.488	81.03	5.02	41.330	3.847	127.00	359.10	51-75	ngsa054a
TILL-2	5.584	80.92	4.79	41.720	3.848	127.90	361.20	51-75	ngsa054a
TILL-2	5.317	81.16	5.06	41.110	3.737	131.10	361.30	51-75	ngsa054b
TILL-2	5.333	83.09	4.98	40.750	3.790	132.60	358.90	51-75	ngsa054b
TILL-2	5.390	83.67	5.30	39.630	3.724	127.30	369.00	51-75	ngsa055a
TILL-2	5.417	85.10	5.20	39.990	3.777	131.10	370.70	51-75	ngsa055a
TILL-2	5.355	83.44	5.48	40.480	3.690	132.00	374.10	51-75	ngsa055b
TILL-2	5.401	85.06	5.10	39.490	3.717	133.20	367.10	51-75	ngsa055b
TILL-2	5.532	84.58	5.21	41.200	3.691	130.70	378.40	51-75	ngsa056a
TILL-2	5.339	83.38	5.33	40.260	3.732	128.60	370.10	51-75	ngsa056a
TILL-2	5.565	82.34	5.50	38.940	3.837	129.90	372.30	51-75	ngsa056b
TILL-2	5.599	84.80	5.38	38.610	3.737	126.70	364.90	51-75	ngsa056b
TILL-2	5.690	78.24	5.80	38.760	3.741	134.10	381.80	51-75	ngsa057a
TILL-2	5.719	80.29	5.53	38.790	3.708	131.70	382.90	51-75	ngsa057a
TILL-2	5.922	78.22	6.25	38.190	3.835	132.40	380.30	51-75	NGSA057B
TILL-2	5.983	79.35	5.79	38.040	3.822	126.70	380.10	51-75	NGSA057B
TILL-2	5.917	78.44	5.91	39.500	3.747	130.80	380.30	51-75	NGSA057B
TILL-2	5.584	77.11	6.21	38.690	3.669	133.70	382.20	51-75	NGSA058A
TILL-2	5.587	79.24	5.73	39.850	3.620	130.90	376.90	51-75	NGSA058A
TILL-2	5.654	77.21	6.02	39.550	3.680	130.00	377.00	51-75	NGSA058B
TILL-2	5.657	78.89	5.83	39.430	3.764	136.10	384.60	51-75	NGSA058B
TILL-2	5.694	77.40	6.94	33.810	3.787	132.90	392.70	51-75	NGSA059a
TILL-2	5.736	79.01	6.49	39.360	3.610	135.10	378.20	51-75	NGSA059a
TILL-2	5.529	78.40	6.48	37.600	3.653	133.60	374.20	51-75	NGSA059a
TILL-2	5.599	77.59	6.11	38.060	3.626	130.90	381.90	51-75	ngsa059b
TILL-2	5.738	75.47	6.11	38.270	3.759	133.20	380.00	51-75	ngsa059b
TILL-2	5.811	76.45	6.18	33.370	3.799	133.70	394.50	51-75	ngsa059b
TILL-2	5.597	76.38	6.91	29.850	3.669	136.30	392.60	51-75	ngsa060a
TILL-2	5.572	77.37	5.86	39.730	3.723	132.60	371.50	51-75	ngsa060a
TILL-2	5.665	76.40	6.09	39.500	3.725	135.10	375.20	51-75	ngsa060a
TILL-2	5.730	78.43	6.27	39.550	3.815	134.30	379.80	51-75	ngsa060a
TILL-2	6.040	75.51	5.33	38.280	3.617	125.60	374.90	51-75	NGSA060B
TILL-2	6.130	76.60	5.33	35.450	3.639	124.40	375.20	51-75	NGSA060B
TILL-2	5.686	76.12	5.87	30.680	3.750	140.50	399.40	51-75	ngsa061a
TILL-2	5.566	76.15	4.90	39.300	3.687	131.40	376.70	51-75	ngsa061a
TILL-2	5.684	77.25	5.04	38.900	3.693	134.00	375.80	51-75	ngsa061a
TILL-2	5.589	77.44	6.41	36.640	3.830	128.80	381.50	51-75	ngsa061b
TILL-2	5.662	77.65	6.14	39.870	3.631	133.10	376.20	51-75	ngsa061b
TILL-2	5.572	75.96	5.13	39.740	3.688	126.90	376.40	51-75	ngsa062a
TILL-2	5.624	76.93	5.03	39.020	3.686	132.50	369.90	51-75	ngsa062a
TILL-2	5.687	76.97	4.96	39.890	3.657	130.30	378.80	51-75	ngsa062b
TILL-2	5.673	80.10	4.86	41.410	3.776	135.70	380.90	51-75	ngsa062b
TILL-2	5.607	76.00	5.37	39.170	3.716	128.50	379.50	51-75	ngsa063a
TILL-2	5.662	76.30	4.91	39.320	3.771	136.00	372.30	51-75	ngsa063a
TILL-2	5.666	78.14	5.10	40.610	3.799	135.80	382.40	51-75	NGSA063B
TILL-2	5.456	78.23	5.36	39.380	3.863	135.50	390.50	51-75	NGSA064A
TILL-2	5.598	77.06	5.53	36.320	3.837	140.30	400.80	51-75	NGSA064A
TILL-2	5.485	76.03	5.16	39.150	3.812	132.90	397.10	51-75	ngsa064b
TILL-2	5.528	76.54	4.72	43.410	3.893	133.50	374.40	51-75	ngsa064b
TILL-2	5.458	80.87	5.68	37.410	3.761	129.50	407.00	51-75	NGSA065A
TILL-2	5.625	78.83	5.03	38.030	3.916	129.10	388.40	51-75	NGSA065A
TILL-2	5.560	79.45	5.13	39.420	4.003	131.70	395.90	51-75	NGSA065A
TILL-2	5.700	81.80	5.05	39.000	3.822	132.00	379.20	51-75	NGSA065A
TILL-2	5.528	76.21	4.62	44.350	3.885	135.20	373.60	51-75	ngsa065b
TILL-2	5.547	76.15	5.24	39.250	3.812	134.50	394.50	51-75	ngsa065b
TILL-2	5.507	75.83	4.82	40.610	3.869	134.10	380.80	51-75	ngsa066a
TILL-2	5.486	77.57	4.60	41.620	3.903	137.60	384.90	51-75	ngsa066a
TILL-2	5.386	78.47	4.73	41.280	3.902	133.00	382.50	51-75	ngsa066a
TILL-2	5.760	73.94	4.78	39.420	3.840	130.70	373.60	51-75	ngsa066b
TILL-2	5.810	77.26	4.69	40.210	3.705	131.00	377.90	51-75	ngsa066b
TILL-2	5.545	74.73	4.83	37.800	3.860	130.80	381.90	51-75	ngsa067a
TILL-2	5.444	76.62	4.63	40.640	3.915	131.90	377.70	51-75	ngsa067a
TILL-2	5.557	77.82	4.67	40.940	3.881	128.70	382.10	51-75	ngsa067b
TILL-2	5.722	77.63	4.56	41.070	4.004	135.30	365.70	51-75	ngsa067b
TILL-2	5.703	78.70	4.59	40.980	3.880	133.70	368.40	51-75	ngsa068a
TILL-2	5.564	78.21	4.48	41.410	3.848	137.50	374.50	51-75	ngsa068a
TILL-2	5.615	76.79	4.80	39.600	3.912	133.70	369.90	51-75	ngsa068b
TILL-2	5.689	77.47	4.60	39.550	3.865	131.20	377.60	51-75	ngsa068b
TILL-2	5.594	74.08	4.93	39.460	3.792	132.30	376.30	51-75	ngsa069a
TILL-2	5.694	76.33	4.71	41.010	3.793	139.50	362.20	51-75	ngsa069a
TILL-2	5.619	75.97	4.68	39.710	3.888	133.70	368.40	51-75	ngsa069b
TILL-2	5.650	78.30	4.59	40.980	3.723	128.80	358.80	51-75	ngsa069b
TILL-2	5.659	75.23	4.94	41.370	3.868	133.00	375.60	51-75	NGSA070A
TILL-2	5.670	80.79	4.81	41.820	3.835	143.40	369.10	51-75	NGSA070A
TILL-2	5.608	77.88	4.88	39.390	3.866	140.60	365.20	51-75	NGSA070A
TILL-2	5.787	78.87	5.02	39.470	3.680	137.30	379.10	51-75	NGSA070A
TILL-2	5.628	77.92	4.83	40.060	3.802	139.80	369.90	51-75	ngsa070b
TILL-2	5.799	76.62	4.73	40.220	3.904	132.90	361.30	51-75	ngsa070b
TILL-2	5.703	76.82	4.85	39.580	3.881	141.10	363.10	51-75	ngsa070b
TILL-2	5.776	75.36	4.69	40.550	3.985	137.40	354.80	51-75	ngsa070b
TILL-2	5.590	77.20	4.75	40.670	3.816	134.90	372.00	51-75	NGSA071A
TILL-2	5.464	79.66	4.87	40.770	3.573	130.10	404.60	51-75	NGSA071A
TILL-2	5.655	77.01	4.67	41.480	3.868	137.00	364.60	51-75	ngsa071b
TILL-2	5.518	75.13	4.92	39.330	3.839	128.20	369.70	51-75	ngsa071b
TILL-2	5.627	72.57	4.86	38.490	3.813	129.00	363.10	51-75	ngsa071b
TILL-2	5.529	76.05	4.87	39.910	3.707	128.90	380.10	51-75	ngsa072a
TILL-2	5.739	77.05	5.08	38.060	3.804	133.40	365.80	51-75	ngsa072a

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-2	008SMPL.D#	NGSA073a	27/11/2009	0.268	25.86	549.10	4.24	5.447	0.64
TILL-2	013SMPL.D#	std	27/11/2009	0.300	24.21	538.20	3.89	5.361	0.39
TILL-2	037SMPL.D#	std	27/11/2009	0.227	25.12	541.10	3.21	5.513	0.24
TILL-2	039SMPL.D#	NGSA072a	27/11/2009	0.309	23.46	537.80	4.07	5.359	0.42
TILL-2	047SMPL.D#	NGSA073a	27/11/2009	0.350	24.56	564.90	4.38	5.513	0.05
TILL-2	073SMPL.D#	std	27/11/2009	0.302	24.49	524.00	4.32	5.521	0.16
TILL-2	075SMPL.D#	std	27/11/2009	0.287	24.09	520.80	3.39	5.580	0.05
TILL-2	077SMPL.D#	ngsa073b	27/11/2009	0.386	23.23	517.20	3.35	5.489	0.11
TILL-2	008SMPL.D#	NGSA073b	30/11/2009	0.500	24.18	527.10	4.77	5.445	0.49
TILL-2	040SMPL.D#	NGSA073b	30/11/2009	0.493	23.48	529.50	5.04	5.452	0.38
TILL-2	043SMPL.D#	NGSA072c	30/11/2009	0.537	23.61	532.80	5.01	5.448	0.42
TILL-2	052SMPL.D#	NGSA073b	30/11/2009	0.471	23.43	531.60	5.05	5.572	0.25
TILL-2	008SMPL.D#	NGSA074a	1/12/2009	0.305	24.22	528.10	3.25	5.610	0.38
TILL-2	039SMPL.D#	NGSA074a	1/12/2009	0.220	23.98	536.80	4.40	5.506	0.28
TILL-2	008SMPL.D#	NGSA074b	2/12/2009	0.387	24.41	527.80	4.39	5.489	0.30
TILL-2	041SMPL.D#	std	2/12/2009	0.283	24.90	539.20	4.00	5.424	0.36
TILL-2	047SMPL.D#	NGSA075a	1/12/2009	0.281	23.22	529.90	3.51	5.394	0.28
TILL-2	077SMPL.D#	NGSA075a	1/12/2009	0.341	22.48	517.50	3.83	5.443	0.18
TILL-2	008SMPL.D#	NGSA075b	3/12/2009	0.099	22.39	527.90	3.86	5.480	0.30
TILL-2	040SMPL.D#	ngsa076b	3/12/2009	0.015	24.55	534.40	3.39	5.426	0.43
TILL-2	048SMPL.D#	ngsa076b	3/12/2009	0.077	23.16	535.40	3.01	5.402	0.45
TILL-2	049SMPL.D#	NGSA076a	2/12/2009	0.643	24.11	537.10	4.07	5.450	0.37
TILL-2	079SMPL.D#	std	2/12/2009	0.559	25.65	542.40	4.07	5.548	0.36
TILL-2	048SMPL.D#	ngsa076b	3/12/2009	0.523	23.23	524.30	3.46	5.335	0.33
TILL-2	054SMPL.D#	ngsa076b	3/12/2009	0.502	24.04	524.60	3.71	5.370	0.26
TILL-2	082SMPL.D#	NGSA075b	3/12/2009	0.532	23.99	526.30	4.52	5.343	0.24
TILL-2	008SMPL.D#	NGSA077A	4/12/2009	0.511	24.54	530.30	2.62	5.385	0.26
TILL-2	038SMPL.D#	NGSA077b	4/12/2009	0.498	24.64	536.50	3.96	5.427	0.19
TILL-2	046SMPL.D#	NGSA077b	4/12/2009	0.170	23.50	532.60	3.83	5.501	0.36
TILL-2	078SMPL.D#	NGSA077A	4/12/2009	0.147	23.57	526.10	3.52	5.371	0.38
TILL-2	008SMPL.D#	NGSA078a	7/12/2009	0.534	22.62	523.80	3.58	5.292	0.05
TILL-2	038SMPL.D#	NGSA078b	7/12/2009	0.440	23.16	530.90	3.39	5.379	0.05
TILL-2	046SMPL.D#	NGSA078b	7/12/2009	0.521	24.38	533.60	3.24	5.544	0.29
TILL-2	078SMPL.D#	NGSA078a	7/12/2009	0.490	24.54	528.70	3.58	5.507	0.29
TILL-2	008SMPL.D#	NGSA079a	9/12/2009	0.587	23.82	522.30	3.57	5.397	0.38
TILL-2	034SMPL.D#	NGSA080a	9/12/2009	0.623	23.10	524.40	3.69	5.379	0.56
TILL-2	008SMPL.D#	NGSA079b	8/12/2009	0.339	24.49	527.70	4.01	5.471	0.52
TILL-2	040SMPL.D#	NGSA079b	8/12/2009	0.325	24.10	532.80	4.53	5.527	0.40
TILL-2	042SMPL.D#	NGSA080a	9/12/2009	0.604	24.77	528.10	2.76	5.543	0.83
TILL-2	080SMPL.D#	NGSA079a	9/12/2009	0.610	23.93	523.00	3.55	5.481	0.88
TILL-2	008SMPL.D	ngsa081a	22/02/2010	0.229	24.89	538.81	4.37	5.664	0.29
TILL-2	037SMPL.D	ngsa081a	22/02/2010	0.227	24.16	527.59	4.03	5.614	0.30
TILL-2	008SMPL.D	NGSA081B	18/02/2010	0.266	27.14	550.44	3.96	5.567	0.29
TILL-2	037SMPL.D	NGSA081B	18/02/2010	0.262	25.32	550.91	4.41	5.532	0.27
TILL-2	008SMPL.D	ngsa082a	23/02/2010	0.264	25.51	531.88	5.22	5.745	0.41
TILL-2	038SMPL.D	ngsa082a	23/02/2010	0.266	24.01	516.64	5.21	5.517	0.37
TILL-2	008SMPL.D		23/02/2010	0.252	24.74	543.66	3.90	5.563	0.26
TILL-2	008SMPL.D		2/03/2010	0.213	27.48	576.46	4.18	5.645	0.46
TILL-2	038SMPL.D		2/03/2010	0.187	27.28	544.61	5.32	5.664	0.31
TILL-2	008SMPL.D		1/03/2010	0.160	26.05	542.98	4.07	5.589	0.33
TILL-2	036SMPL.D		1/03/2010	0.223	26.12	567.41	5.40	5.549	0.45
TILL-2	008SMPL.D		3/03/2010	0.255	25.99	550.34	4.19	5.803	0.17
TILL-2	038SMPL.D		3/03/2010	0.241	26.35	581.29	4.83	5.575	0.41
TILL-2	008SMPL.D		4/03/2010	0.282	26.41	545.16	3.73	5.637	0.51
TILL-2	040SMPL.D		4/03/2010	0.281	26.38	557.98	4.49	5.608	0.38
TILL-2	008SMPL.D		5/03/2010	0.238	26.21	541.28	4.62	5.703	0.49
TILL-2	038SMPL.D		5/03/2010	0.256	25.65	552.88	4.65	5.641	0.40
TILL-2	008SMPL.D		10/03/2010	0.232	27.68	555.90	3.42	5.565	0.33
TILL-2	037SMPL.D		10/03/2010	0.177	26.62	549.65	3.89	5.534	0.38
TILL-2	008SMPL.D		9/03/2010	0.235	26.00	540.40	5.18	5.574	0.43
TILL-2	040SMPL.D		9/03/2010	0.245	25.40	560.22	4.44	5.556	0.13
TILL-2	008SMPL.D		11/03/2010	0.246	25.87	542.81	4.65	5.609	0.42
TILL-2	038SMPL.D		11/03/2010	0.206	27.15	564.97	3.98	5.772	0.31
TILL-2	008SMPL.D		11/03/2010	0.223	25.70	555.28	4.05	5.776	0.47
TILL-2	040SMPL.D		11/03/2010	0.231	26.27	542.56	3.60	5.677	0.36
TILL-2	008SMPL.D		12/03/2010	0.260	27.44	549.43	3.56	5.629	0.40
TILL-2	038SMPL.D		12/03/2010	0.217	26.40	553.23	3.57	5.496	0.31
TILL-2	008SMPL.D		12/03/2010	0.235	27.07	550.07	3.37	5.646	0.20
TILL-2	040SMPL.D		12/03/2010	0.221	25.67	547.71	2.92	5.542	0.32
TILL-2	008SMPL.D		15/03/2010	0.253	25.66	557.89	4.32	5.593	0.49
TILL-2	038SMPL.D		15/03/2010	0.241	25.76	568.76	4.19	5.722	0.65
TILL-2	008SMPL.D		17/03/2010	0.077	27.17	542.47	3.56	5.705	0.16
TILL-2	038SMPL.D		17/03/2010	0.015	26.83	557.98	4.58	5.618	0.05
TILL-2	008SMPL.D		16/03/2010	0.189	27.61	552.00	2.59	5.780	0.81
TILL-2	036SMPL.D		16/03/2010	0.152	27.78	549.22	4.34	5.627	0.56
TILL-2	008SMPL.D		18/03/2010	0.122	26.13	555.63	3.72	5.777	0.58
TILL-2	038SMPL.D		18/03/2010	0.150	26.39	555.08	3.99	5.691	0.34
TILL-2	008SMPL.D		19/03/2010	0.295	26.24	539.09	3.75	5.614	0.22
TILL-2	040SMPL.D		19/03/2010	0.240	25.87	543.44	4.18	5.540	0.35
TILL-2	008SMPL.D		19/03/2010	0.252	26.35	539.64	3.85	5.795	0.46
TILL-2	035SMPL.D		19/03/2010	0.259	26.40	547.14	5.06	5.761	0.39
TILL-2	008SMPL.D	NGSA 090908B	13/05/2010	0.243	25.00	536.12	4.14	4.893	0.40
TILL-2	040SMPL.D	NGSA 090908B	13/05/2010	0.260	25.16	543.34	4.48	4.836	0.38
TILL-2	008SMPL.D	NGSA 090908A	14/05/2010	0.209	26.04	548.54	4.69	4.944	0.36
TILL-2	038SMPL.D	NGSA 08082008B	14/05/2010	0.216	25.56	555.71	4.37	4.781	0.50
TILL-2	008SMPL.D	NGSA 08082008B	14/05/2010	0.252	26.87	531.63	4.58	4.901	0.45
TILL-2	043SMPL.D	NGSA 090908A	14/05/2010	0.246	27.66	545.74	3.91	4.972	0.45

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-2	100.300	14.35	71.01	12.63	151.70	6.88	3.863	1.276	18.97	6.817
TILL-2	99.440	14.94	74.54	11.70	151.20	6.55	3.715	1.385	16.78	6.871
TILL-2	100.900	15.43	74.13	11.86	148.10	6.60	3.808	1.297	21.74	6.892
TILL-2	94.790	14.51	72.07	11.97	144.80	6.42	3.941	1.318	18.92	6.520
TILL-2	103.700	14.16	75.05	13.68	152.80	6.87	3.789	1.338	21.56	6.788
TILL-2	99.930	13.94	73.48	11.98	150.30	6.65	3.731	1.365	19.36	6.820
TILL-2	99.310	14.07	75.46	12.05	148.20	6.71	3.786	1.369	17.37	6.612
TILL-2	93.700	14.55	74.84	11.92	152.50	6.56	3.776	1.291	17.68	6.593
TILL-2	96.730	14.64	73.51	12.17	150.10	6.53	3.841	1.353	18.94	6.617
TILL-2	95.020	14.70	73.69	11.92	146.30	6.58	3.804	1.343	18.49	6.603
TILL-2	94.680	14.95	73.24	12.05	148.80	6.65	3.816	1.282	19.44	6.571
TILL-2	95.440	14.92	72.55	12.03	147.90	6.61	3.791	1.304	18.67	6.461
TILL-2	96.280	14.53	72.42	12.06	151.30	6.64	3.820	1.266	18.61	6.488
TILL-2	95.600	14.95	73.92	12.04	149.20	6.68	3.937	1.282	17.94	6.578
TILL-2	95.540	14.23	71.51	11.97	148.00	6.44	3.697	1.264	18.59	6.415
TILL-2	100.400	14.99	75.32	12.44	146.90	6.64	3.591	1.285	19.92	6.762
TILL-2	95.170	14.57	73.24	11.92	150.30	6.48	3.801	1.312	18.57	6.482
TILL-2	94.210	14.39	73.19	11.63	150.90	6.57	3.797	1.301	18.40	6.481
TILL-2	95.970	13.48	69.56	11.86	145.20	6.31	3.721	0.955	19.59	6.291
TILL-2	95.110	14.37	71.64	12.14	147.60	6.18	3.598	0.982	18.69	6.385
TILL-2	94.710	14.09	69.45	12.21	146.00	6.35	3.556	0.991	18.93	6.335
TILL-2	96.610	14.25	72.79	12.39	148.70	6.72	3.846	1.252	19.36	6.769
TILL-2	101.100	14.75	73.77	12.84	149.00	6.72	3.739	1.258	20.27	6.760
TILL-2	94.690	14.26	70.61	12.00	148.20	6.56	3.694	1.173	18.31	6.428
TILL-2	95.180	14.19	71.34	11.81	148.60	6.55	3.738	1.169	20.37	6.424
TILL-2	95.150	14.32	72.02	12.13	146.00	6.60	3.721	1.155	19.40	6.489
TILL-2	97.930	13.73	67.60	12.23	148.70	6.62	3.758	1.197	19.18	6.668
TILL-2	97.870	14.01	69.98	12.16	150.30	6.70	3.728	1.212	19.76	6.583
TILL-2	97.740	14.22	72.82	12.01	150.10	6.67	3.815	1.148	18.79	6.579
TILL-2	95.830	14.37	72.17	11.98	145.70	6.56	3.718	1.166	18.17	6.418
TILL-2	94.960	14.65	68.42	11.60	147.90	6.35	3.737	1.321	18.89	6.279
TILL-2	94.950	14.46	68.73	11.64	144.50	6.41	3.776	1.366	18.65	6.315
TILL-2	96.620	14.66	73.00	12.40	148.50	6.81	3.780	1.202	19.31	6.545
TILL-2	94.720	14.16	71.25	11.95	146.40	6.63	3.615	1.122	17.13	6.490
TILL-2	96.390	14.59	73.31	12.16	147.90	6.58	3.818	1.199	18.81	6.461
TILL-2	95.560	14.80	74.55	11.94	150.90	6.63	3.796	1.233	20.67	6.594
TILL-2	96.720	14.65	74.41	12.10	154.30	6.72	3.836	1.314	18.13	6.653
TILL-2	96.200	14.84	75.85	12.30	151.60	6.61	3.759	1.329	18.60	6.582
TILL-2	97.330	15.64	74.75	12.28	154.10	6.71	3.738	1.319	20.55	6.635
TILL-2	94.490	14.50	72.81	12.01	145.20	6.64	3.806	1.347	19.06	6.389
TILL-2	101.305	14.78	77.44	11.64	147.47	6.94	4.106	1.287	20.42	7.246
TILL-2	101.319	15.00	79.94	11.08	150.28	6.73	4.097	1.285	18.06	7.072
TILL-2	103.398	15.11	83.02	11.46	150.80	6.74	4.120	1.199	20.55	7.338
TILL-2	101.817	15.42	80.14	11.78	146.20	6.99	4.016	1.258	20.14	7.296
TILL-2	101.656	14.86	80.41	11.48	150.91	6.81	4.050	1.231	20.74	7.325
TILL-2	100.052	15.22	83.14	10.83	149.74	6.79	4.073	1.278	18.42	7.105
TILL-2	102.721	15.10	78.93	11.95	152.49	7.01	4.051	1.296	20.67	7.175
TILL-2	107.886	15.27	80.60	12.55	150.52	6.78	3.986	1.255	19.89	7.135
TILL-2	101.962	15.40	82.42	11.19	150.91	6.79	4.102	1.221	17.89	7.237
TILL-2	102.383	15.13	82.34	11.80	150.54	6.90	3.966	1.188	19.17	7.270
TILL-2	105.832	15.76	84.20	12.19	152.20	6.80	3.989	1.241	19.45	7.154
TILL-2	103.844	15.44	83.98	12.07	154.31	6.97	4.174	1.223	20.12	7.374
TILL-2	108.487	15.43	83.37	12.86	147.85	6.76	4.016	1.238	19.55	7.277
TILL-2	102.282	15.03	77.70	11.64	157.77	6.60	4.002	1.238	18.29	7.180
TILL-2	102.541	15.51	78.06	11.97	155.39	6.84	4.000	1.234	18.38	7.192
TILL-2	101.829	14.74	77.21	11.72	152.92	6.75	4.015	1.246	19.71	7.234
TILL-2	103.223	15.26	76.55	11.92	148.35	6.74	3.958	1.218	18.71	7.366
TILL-2	104.911	15.17	74.83	12.38	149.21	6.83	4.016	1.217	18.52	7.222
TILL-2	101.721	15.01	75.94	11.91	145.20	6.60	3.920	1.167	19.39	7.081
TILL-2	103.007	15.11	77.51	11.59	148.38	6.89	3.953	1.221	20.25	7.159
TILL-2	105.170	15.50	76.74	12.32	151.46	6.80	4.002	1.261	20.28	7.221
TILL-2	102.930	15.47	76.43	11.57	149.93	6.83	4.121	1.252	20.22	7.162
TILL-2	105.775	15.64	79.06	11.92	154.82	7.24	4.014	1.300	19.63	7.457
TILL-2	105.589	15.57	84.90	11.79	158.40	7.05	4.102	1.280	19.35	7.353
TILL-2	102.774	14.94	82.93	11.63	153.19	6.85	4.046	1.252	19.60	7.028
TILL-2	102.645	15.55	79.95	11.69	151.31	7.32	3.989	1.241	18.24	7.179
TILL-2	103.662	15.74	78.86	11.86	151.55	7.18	3.992	1.221	17.62	7.142
TILL-2	103.175	15.53	73.80	11.99	152.80	6.92	3.983	1.241	20.63	7.178
TILL-2	102.236	15.34	73.43	12.24	145.22	6.79	4.136	1.239	20.11	7.211
TILL-2	102.994	15.15	78.16	11.51	152.14	6.76	3.973	1.206	18.94	7.321
TILL-2	104.829	15.52	79.03	11.94	154.31	6.93	4.114	1.247	19.66	7.373
TILL-2	103.555	14.91	80.44	11.68	152.68	6.67	3.910	1.231	19.97	7.106
TILL-2	103.063	15.40	78.45	11.89	151.75	6.91	4.069	1.311	19.34	7.384
TILL-2	104.787	14.81	77.60	12.19	153.34	6.84	4.239	1.180	21.67	7.310
TILL-2	102.636	15.20	82.81	12.12	151.97	6.83	4.076	1.147	20.09	7.138
TILL-2	104.086	15.13	76.33	11.88	150.21	6.77	3.970	1.190	19.13	7.130
TILL-2	102.970	14.85	78.18	11.53	149.37	6.71	3.869	1.156	17.93	7.081
TILL-2	103.396	15.55	83.50	11.90	152.18	7.06	4.144	1.290	20.08	7.184
TILL-2	101.054	15.73	84.82	11.57	150.81	6.66	4.042	1.209	17.99	7.264
TILL-2	101.305	14.78	80.85	11.66	150.69	6.75	4.044	1.189	19.55	7.014
TILL-2	102.221	15.45	78.76	11.75	151.49	6.98	4.051	1.203	18.62	7.184
TILL-2	98.025	14.83	72.26	12.24	150.17	6.40	3.773	1.211	19.48	6.504
TILL-2	97.488	14.96	73.64	12.10	149.06	6.43	3.669	1.216	20.69	6.440
TILL-2	100.364	14.74	75.64	12.59	150.02	6.64	3.769	1.247	19.03	6.619
TILL-2	97.009	14.11	74.82	12.95	145.68	6.65	3.734	1.209	22.40	6.433
TILL-2	98.117	14.59	73.77	12.02	148.46	6.49	3.635	1.222	18.70	6.384
TILL-2	100.113	14.70	76.41	12.40	151.54	6.72	3.678	1.277	19.68	6.567

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-2	0.792	11.550	1.401	44.94	0.584	14.16	21.240	38.58	32.52	31.50
TILL-2	0.579	10.410	1.354	45.86	0.568	13.50	19.690	40.69	32.45	31.38
TILL-2	0.670	10.450	1.329	47.10	0.587	13.30	19.560	40.10	32.67	31.28
TILL-2	0.863	10.410	1.363	44.03	0.581	12.58	19.710	38.23	31.95	31.19
TILL-2	0.563	11.370	1.389	46.22	0.563	14.11	20.490	39.41	32.29	31.60
TILL-2	0.506	10.430	1.329	46.25	0.593	12.93	18.900	40.31	32.94	31.23
TILL-2	0.642	10.380	1.336	46.06	0.565	13.71	18.900	40.40	32.06	31.47
TILL-2	0.521	10.650	1.343	42.18	0.605	13.34	18.750	38.63	34.61	31.37
TILL-2	0.938	10.410	1.342	44.22	0.570	13.68	19.460	38.36	33.89	31.11
TILL-2	0.858	10.430	1.349	44.12	0.572	13.21	18.700	38.09	33.48	31.72
TILL-2	0.906	10.290	1.343	44.44	0.568	13.87	18.960	38.27	35.35	31.29
TILL-2	0.904	10.320	1.347	43.96	0.571	13.17	19.400	38.03	35.66	31.15
TILL-2	0.965	10.450	1.331	44.01	0.538	12.97	19.390	38.10	31.93	31.74
TILL-2	0.807	10.350	1.339	44.37	0.556	12.89	19.500	38.06	32.91	31.51
TILL-2	0.857	10.360	1.296	44.16	0.568	13.62	19.400	38.39	30.63	31.80
TILL-2	0.869	10.280	1.290	47.02	0.520	12.61	19.660	40.06	32.61	32.54
TILL-2	1.039	10.480	1.318	43.91	0.571	13.14	19.130	38.18	33.51	31.07
TILL-2	1.028	10.420	1.300	43.16	0.567	13.19	19.090	38.50	33.26	31.19
TILL-2	0.728	10.230	1.020	44.74	0.300	13.27	19.030	38.07	31.69	30.02
TILL-2	0.732	10.240	1.073	44.63	0.279	12.81	19.250	38.37	33.50	30.66
TILL-2	0.794	10.050	1.063	43.95	0.302	13.62	19.150	38.45	32.70	30.33
TILL-2	0.798	10.350	1.310	44.11	0.569	14.08	19.810	38.59	33.69	31.08
TILL-2	0.762	10.340	1.302	47.05	0.583	13.75	19.350	40.59	30.92	31.44
TILL-2	0.816	10.310	1.244	43.46	0.497	13.67	19.230	38.25	32.87	30.28
TILL-2	0.816	10.360	1.223	44.13	0.465	13.06	19.150	37.78	32.26	29.95
TILL-2	0.758	10.380	1.227	44.52	0.468	13.65	19.440	38.12	32.73	30.06
TILL-2	0.737	10.340	1.214	45.15	0.440	13.49	20.100	38.03	32.09	30.31
TILL-2	0.718	10.590	1.237	44.57	0.412	13.77	19.670	38.92	31.30	30.76
TILL-2	0.760	10.690	1.208	44.88	0.468	13.94	19.910	39.11	32.36	30.81
TILL-2	0.766	10.480	1.233	43.33	0.439	13.01	18.730	38.75	29.80	30.57
TILL-2	0.720	10.300	1.232	43.67	0.592	13.73	18.580	38.25	30.89	30.15
TILL-2	0.739	10.390	1.227	44.23	0.552	12.46	18.440	37.53	32.41	30.47
TILL-2	0.677	10.420	1.200	44.43	0.455	13.76	19.740	38.61	33.42	30.63
TILL-2	0.850	10.230	1.190	43.31	0.456	13.41	19.230	38.86	31.08	30.11
TILL-2	0.846	10.150	1.296	44.25	0.522	12.78	19.400	38.42	33.66	30.94
TILL-2	0.914	9.869	1.320	44.34	0.513	13.43	19.100	38.46	31.74	30.99
TILL-2	0.817	10.010	1.326	44.50	0.595	14.01	19.320	38.63	34.95	31.05
TILL-2	0.728	10.070	1.378	44.59	0.578	13.42	19.220	39.00	35.12	31.16
TILL-2	0.747	10.070	1.334	44.96	0.560	13.74	19.600	38.82	32.27	31.04
TILL-2	0.812	10.320	1.339	43.26	0.570	14.13	18.980	38.88	31.42	31.22
TILL-2	0.725	10.668	1.398	47.18	0.593	12.82	19.575	39.23	33.67	31.43
TILL-2	0.703	10.752	1.361	46.61	0.563	13.03	19.315	38.77	30.42	31.63
TILL-2	0.672	10.394	1.415	47.33	0.559	14.51	19.520	37.35	32.42	31.78
TILL-2	0.622	10.463	1.412	47.18	0.583	13.34	19.390	37.40	30.66	31.76
TILL-2	0.679	10.536	1.363	47.69	0.553	13.94	19.323	39.70	31.46	31.63
TILL-2	0.589	10.565	1.370	45.80	0.540	13.11	18.834	39.41	32.63	31.12
TILL-2	0.796	10.845	1.404	46.88	0.587	14.02	20.351	40.30	32.07	31.28
TILL-2	0.661	11.911	1.409	48.59	0.507	14.24	21.012	40.36	34.06	31.56
TILL-2	0.795	11.014	1.438	47.09	0.538	13.51	19.972	40.53	33.66	31.85
TILL-2	0.753	10.557	1.364	47.70	0.493	13.47	19.863	37.97	35.20	31.59
TILL-2	0.796	11.464	1.396	47.66	0.468	14.22	20.905	40.07	33.46	31.34
TILL-2	0.703	10.930	1.413	47.83	0.573	13.86	20.181	40.75	33.02	31.93
TILL-2	0.673	11.992	1.400	49.11	0.509	14.34	21.191	41.34	33.66	30.94
TILL-2	0.593	10.504	1.317	47.79	0.516	13.91	19.345	38.17	33.18	31.45
TILL-2	0.641	10.507	1.324	47.76	0.512	13.35	20.076	37.99	33.15	31.70
TILL-2	0.738	10.805	1.370	47.07	0.491	13.49	19.710	38.46	34.92	31.72
TILL-2	0.792	10.752	1.364	47.67	0.524	13.54	19.940	37.90	32.70	31.30
TILL-2	0.640	11.003	1.318	47.47	0.527	14.36	20.321	38.86	31.24	31.26
TILL-2	0.661	10.774	1.358	47.01	0.515	14.09	19.929	38.27	31.58	31.87
TILL-2	0.702	10.904	1.346	47.29	0.531	13.35	20.464	39.92	32.27	31.39
TILL-2	0.718	11.031	1.392	48.68	0.505	13.51	20.601	40.53	32.21	31.13
TILL-2	0.708	10.403	1.389	47.59	0.579	13.51	19.716	37.89	38.34	31.39
TILL-2	0.708	10.744	1.434	48.49	0.577	13.58	20.270	38.11	37.35	33.30
TILL-2	0.594	10.805	1.471	48.52	0.545	13.13	19.879	39.85	36.96	32.73
TILL-2	0.732	10.625	1.410	46.51	0.521	13.20	19.980	38.70	38.85	31.39
TILL-2	0.685	10.854	1.344	47.93	0.571	13.75	20.125	37.86	33.21	31.44
TILL-2	0.675	11.017	1.406	48.71	0.504	12.95	20.269	38.34	33.23	31.63
TILL-2	0.736	10.932	1.410	47.03	0.521	14.08	20.200	39.87	35.05	31.55
TILL-2	0.694	10.678	1.432	47.52	0.499	13.15	19.609	39.18	32.61	31.48
TILL-2	0.669	10.908	1.385	48.10	0.562	13.33	19.668	39.01	33.59	31.78
TILL-2	0.737	10.475	1.406	48.36	0.532	14.04	19.708	38.25	35.39	32.26
TILL-2	0.717	10.891	1.259	47.62	0.382	12.81	19.670	39.83	33.33	31.54
TILL-2	0.649	10.401	1.298	47.87	0.361	13.34	20.315	39.22	32.93	31.70
TILL-2	0.630	10.787	1.350	48.64	0.502	12.85	20.391	38.34	33.20	32.24
TILL-2	0.675	10.666	1.294	47.89	0.486	15.07	20.041	37.70	34.92	31.17
TILL-2	0.658	10.564	1.243	48.00	0.413	13.43	19.963	38.66	31.50	32.16
TILL-2	0.653	10.616	1.206	47.69	0.394	12.38	20.096	37.29	31.68	31.81
TILL-2	0.655	10.869	1.406	47.90	0.560	14.24	20.382	39.38	35.55	31.53
TILL-2	0.751	10.593	1.383	47.58	0.527	14.32	19.869	37.66	34.23	31.22
TILL-2	0.615	10.617	1.380	47.02	0.543	13.82	20.023	38.63	33.08	31.73
TILL-2	0.637	10.598	1.420	47.41	0.538	13.89	20.309	38.47	34.89	31.80
TILL-2	0.249	10.214	1.345	45.07	0.546	13.89	19.295	37.55	36.26	31.49
TILL-2	0.217	10.061	1.330	45.35	0.586	13.72	19.061	37.47	35.83	31.56
TILL-2	0.743	10.572	1.360	46.18	0.567	13.86	19.515	38.31	35.15	32.02
TILL-2	0.714	10.121	1.295	45.50	0.567	12.92	19.870	37.08	34.02	31.41
TILL-2	0.725	10.132	1.346	45.12	0.553	13.61	19.170	36.84	33.92	31.51
TILL-2	0.696	10.519	1.329	46.29	0.588	14.33	19.429	37.85	34.58	32.34

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-2	10.080	148.40	1.37	10.39	8.285	5.34	161.30	1.709	1.231	12.320
TILL-2	10.440	140.90	1.11	11.80	8.256	5.46	154.80	1.606	1.239	18.770
TILL-2	10.480	145.60	1.18	11.35	8.402	5.61	164.70	1.582	1.224	19.070
TILL-2	9.794	144.80	0.92	11.63	8.113	5.22	160.20	1.594	1.195	18.140
TILL-2	10.210	149.60	1.71	10.19	8.431	5.33	165.20	1.711	1.248	13.930
TILL-2	10.560	149.40	0.84	11.38	8.721	5.24	155.30	1.566	1.232	18.800
TILL-2	10.460	143.50	1.35	11.60	8.694	5.01	156.10	1.590	1.228	18.910
TILL-2	9.794	142.70	1.18	11.93	8.539	5.19	152.80	1.560	1.216	18.080
TILL-2	9.976	141.20	0.20	11.88	7.835	5.38	154.20	1.547	1.198	17.800
TILL-2	9.868	141.50	0.69	11.67	8.277	5.25	154.20	1.549	1.154	18.640
TILL-2	9.883	144.20	0.69	12.22	8.042	5.21	155.50	1.532	1.217	18.350
TILL-2	9.727	143.80	0.45	12.27	7.949	5.25	156.00	1.536	1.168	18.370
TILL-2	10.040	141.70	1.03	11.80	8.343	4.32	149.60	1.520	1.159	18.270
TILL-2	9.854	143.80	0.69	11.93	7.796	4.49	156.90	1.502	1.196	18.560
TILL-2	9.907	138.60	0.20	11.90	8.195	4.22	154.60	1.494	1.139	18.040
TILL-2	10.330	145.40	0.72	11.68	8.468	4.64	160.70	1.506	1.158	19.320
TILL-2	9.933	140.40	0.59	11.46	8.188	4.77	149.70	1.547	1.194	18.040
TILL-2	9.791	137.30	0.42	11.53	8.143	5.08	149.10	1.560	1.138	18.190
TILL-2	9.831	142.10	0.20	11.36	7.822	4.41	151.80	1.263	0.824	17.680
TILL-2	9.727	146.60	0.47	11.77	8.104	4.55	160.90	1.251	0.826	17.660
TILL-2	9.764	144.50	0.20	12.00	7.898	4.39	157.40	1.246	0.812	17.720
TILL-2	9.938	148.60	1.87	11.84	7.843	5.39	160.20	1.504	1.181	17.780
TILL-2	10.620	148.00	1.67	11.59	7.994	5.16	161.40	1.500	1.197	19.140
TILL-2	9.859	139.80	0.20	11.78	7.909	4.18	151.40	1.419	1.056	17.830
TILL-2	9.777	141.20	0.20	11.67	7.990	4.05	152.20	1.430	1.079	17.710
TILL-2	9.816	143.30	0.51	11.61	8.039	4.17	156.40	1.437	1.051	17.670
TILL-2	10.020	138.50	0.49	10.72	8.042	5.04	150.70	1.428	1.047	17.350
TILL-2	10.020	142.20	0.20	11.23	8.107	4.78	155.50	1.454	1.097	18.050
TILL-2	10.070	146.10	1.27	11.71	8.276	5.13	157.60	1.425	1.080	18.040
TILL-2	9.921	141.60	1.35	11.26	8.236	5.10	155.50	1.424	1.067	18.170
TILL-2	9.849	136.30	0.20	10.97	7.655	4.00	146.70	2.145	1.114	18.130
TILL-2	9.765	136.00	0.57	10.50	7.819	4.12	148.20	2.127	1.118	18.600
TILL-2	9.909	144.80	1.31	11.13	8.072	4.89	157.20	1.435	1.052	18.180
TILL-2	9.857	141.10	1.58	11.30	7.867	5.01	155.10	1.419	1.050	18.110
TILL-2	9.801	143.10	1.27	11.00	7.916	4.44	153.90	2.080	1.085	17.630
TILL-2	9.833	141.20	0.89	11.41	8.322	4.78	154.90	2.054	1.108	18.260
TILL-2	10.090	143.80	0.95	11.03	8.445	5.21	151.80	1.421	1.225	18.260
TILL-2	9.982	143.90	0.80	11.09	8.270	5.57	156.50	1.399	1.179	18.550
TILL-2	10.070	145.90	1.62	11.16	8.445	5.60	159.10	1.545	1.199	18.400
TILL-2	9.874	142.40	1.74	11.08	8.004	5.26	153.10	1.570	1.185	17.970
TILL-2	10.162	146.62	1.16	11.10	8.129	5.28	149.03	1.884	1.267	17.657
TILL-2	10.079	142.00	1.12	10.88	8.100	5.41	146.45	1.897	1.268	18.197
TILL-2	10.142	149.05	1.21	11.22	7.637	5.42	148.72	1.863	1.211	17.860
TILL-2	10.238	144.89	1.23	11.14	7.586	5.66	151.85	1.896	1.209	18.089
TILL-2	10.300	141.29	0.20	11.15	8.235	5.23	150.12	1.836	1.267	19.894
TILL-2	10.135	136.93	0.20	10.87	7.987	5.50	146.37	1.883	1.258	18.476
TILL-2	10.189	151.07	0.86	11.72	8.333	5.24	152.61	1.821	1.257	18.206
TILL-2	10.766	157.05	0.90	10.49	8.292	5.94	158.45	2.053	1.249	12.223
TILL-2	10.423	151.64	0.72	11.55	8.171	5.84	155.01	1.897	1.214	18.605
TILL-2	10.297	149.33	1.30	12.30	8.399	5.53	153.48	1.801	1.211	17.676
TILL-2	10.432	154.10	1.45	12.11	8.392	5.44	162.39	1.965	1.212	14.712
TILL-2	10.414	150.07	1.14	11.15	8.118	5.85	152.67	1.787	1.222	18.580
TILL-2	10.411	160.31	1.29	10.60	8.512	5.83	164.84	2.026	1.232	12.598
TILL-2	10.193	145.06	0.60	10.59	7.235	5.20	150.10	1.795	1.190	17.669
TILL-2	10.134	150.59	0.71	10.75	7.235	5.22	157.60	1.789	1.174	17.559
TILL-2	10.238	147.26	1.03	11.95	7.324	5.37	153.11	1.803	1.208	17.881
TILL-2	10.173	150.68	1.10	11.46	7.383	5.43	157.60	1.843	1.151	17.271
TILL-2	10.344	148.24	0.50	11.66	7.814	5.62	154.62	1.803	1.168	15.160
TILL-2	10.236	147.85	0.20	11.95	7.463	5.33	150.87	1.759	1.175	17.409
TILL-2	10.323	143.85	0.98	12.10	7.791	5.15	149.64	1.817	1.167	17.341
TILL-2	10.581	148.80	1.07	11.49	7.912	6.11	156.39	1.909	1.179	15.270
TILL-2	10.224	149.82	1.21	11.10	7.692	5.73	150.52	1.808	1.250	18.093
TILL-2	10.628	151.37	1.04	12.97	7.862	5.63	162.99	1.822	1.308	20.948
TILL-2	10.557	151.56	1.73	13.35	8.030	5.21	160.48	1.764	1.263	20.668
TILL-2	10.278	149.64	1.99	11.07	7.278	5.23	152.09	1.790	1.210	18.183
TILL-2	10.298	147.71	0.73	11.24	7.482	5.13	150.58	1.853	1.216	18.082
TILL-2	10.317	147.21	0.89	8.84	7.482	5.40	147.53	1.858	1.194	15.852
TILL-2	10.267	151.39	0.96	9.17	7.867	5.00	150.52	1.827	1.235	16.020
TILL-2	10.313	152.31	0.93	11.15	7.976	5.84	157.32	1.777	1.188	17.629
TILL-2	10.425	146.03	0.78	11.20	7.839	5.16	145.92	1.857	1.242	17.834
TILL-2	10.409	151.82	1.35	8.67	7.977	5.57	146.65	1.864	1.238	17.925
TILL-2	10.148	140.48	0.72	10.89	7.547	4.74	150.94	1.640	1.001	17.860
TILL-2	10.300	145.73	1.18	10.56	7.980	5.08	153.78	1.654	1.022	18.331
TILL-2	10.293	150.69	0.20	10.79	7.908	5.09	154.78	1.622	1.364	18.583
TILL-2	10.189	156.67	0.20	10.94	7.706	5.30	158.18	1.581	1.384	17.928
TILL-2	10.401	144.92	0.54	10.56	8.365	5.24	153.54	1.685	1.053	17.823
TILL-2	10.243	151.73	0.71	10.62	8.625	5.43	155.08	1.687	1.036	17.997
TILL-2	10.367	148.43	0.80	11.07	8.237	5.88	148.19	1.822	1.226	18.008
TILL-2	10.060	144.54	0.83	10.69	8.108	5.37	148.23	1.848	1.214	17.898
TILL-2	10.035	146.83	1.41	10.35	7.873	5.79	150.65	1.802	1.247	17.740
TILL-2	10.373	147.91	1.17	10.88	8.078	5.07	151.98	1.800	1.281	18.043
TILL-2	10.050	144.70	0.86	12.43	8.056	5.72	153.12	1.845	1.215	18.043
TILL-2	9.863	148.03	0.93	12.79	7.779	5.71	152.58	1.844	1.207	18.152
TILL-2	10.004	150.81	0.94	12.91	7.924	5.88	154.46	1.872	1.234	18.335
TILL-2	9.924	160.25	0.51	13.91	7.894	5.56	165.62	1.796	1.179	17.820
TILL-2	9.886	142.54	0.20	12.20	7.687	5.43	148.97	1.856	1.194	18.111
TILL-2	10.058	148.44	0.56	13.01	7.849	5.94	154.21	1.889	1.223	18.486

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-2	5.658	76.70	5.26	32.200	3.844	136.00	398.30	51-75	ngsa072b
TILL-2	5.805	75.41	4.97	39.810	3.760	127.90	371.40	51-75	ngsa072b
TILL-2	5.677	82.40	4.85	41.710	3.844	130.30	379.30	51-75	ngsa072b
TILL-2	5.488	78.18	4.61	41.170	3.796	132.80	380.30	51-75	ngsa072b
TILL-2	5.567	77.50	5.28	34.280	3.901	134.30	409.50	51-75	ngsa073a
TILL-2	5.737	80.16	4.91	38.980	3.696	132.30	372.00	51-75	ngsa073a
TILL-2	5.709	80.69	4.93	39.340	3.947	134.10	373.40	51-75	ngsa073a
TILL-2	5.636	79.76	5.03	39.730	3.873	136.50	375.40	51-75	ngsa073a
TILL-2	5.546	78.18	4.90	40.360	3.875	131.90	383.30	51-75	ngsa073b
TILL-2	5.806	78.47	4.74	40.770	3.820	131.90	378.60	51-75	ngsa073b
TILL-2	5.760	79.88	4.83	40.240	3.908	133.60	383.20	51-75	ngsa073b
TILL-2	5.706	79.96	4.66	40.720	3.849	130.60	381.50	51-75	ngsa073b
TILL-2	5.686	78.92	4.71	40.490	3.945	131.40	382.20	51-75	NGSA074A
TILL-2	5.717	80.81	4.56	40.720	3.759	131.60	383.30	51-75	NGSA074A
TILL-2	5.792	76.31	5.20	40.480	3.875	132.20	378.00	51-75	ngsa074b
TILL-2	5.939	78.97	5.29	40.290	3.748	132.20	381.20	51-75	ngsa074b
TILL-2	5.679	75.48	4.99	40.200	3.942	135.10	378.00	51-75	NGSA075A
TILL-2	5.753	75.87	4.77	39.610	3.902	134.60	375.20	51-75	NGSA075A
TILL-2	5.379	73.96	4.54	39.300	3.498	129.40	380.70	51-75	ngsa075b
TILL-2	5.301	77.85	4.33	40.980	3.544	131.70	386.80	51-75	ngsa075b
TILL-2	5.312	78.52	4.36	40.990	3.561	125.70	383.70	51-75	ngsa075b
TILL-2	5.474	77.81	4.92	41.360	3.771	126.90	386.40	51-75	NGSA076A
TILL-2	5.699	77.22	4.86	40.020	3.663	129.30	377.70	51-75	NGSA076A
TILL-2	5.501	78.06	4.75	40.600	3.784	126.90	380.10	51-75	NGSA076B
TILL-2	5.470	76.61	4.80	40.460	3.761	129.40	378.00	51-75	NGSA076B
TILL-2	5.482	76.93	4.68	40.820	3.726	130.40	382.40	51-75	NGSA076B
TILL-2	5.379	73.07	4.80	39.960	3.792	131.50	385.60	51-75	NGSA077A
TILL-2	5.576	76.06	4.70	40.730	3.907	133.40	386.30	51-75	NGSA077A
TILL-2	5.556	76.14	4.90	40.740	3.914	137.10	387.20	51-75	ngsa077b
TILL-2	5.580	75.84	4.77	39.460	3.868	131.30	378.10	51-75	ngsa077b
TILL-2	5.868	74.25	5.10	38.660	3.804	129.50	375.50	51-75	NGSA078A
TILL-2	5.935	75.21	5.03	39.680	3.802	133.50	372.50	51-75	NGSA078A
TILL-2	5.440	76.72	4.80	40.360	3.817	132.90	383.70	51-75	ngsa078b
TILL-2	5.404	76.12	4.62	40.280	3.804	132.30	379.00	51-75	ngsa078b
TILL-2	5.558	77.90	4.78	39.980	3.799	132.50	382.20	51-75	ngsa079a
TILL-2	5.627	78.85	4.77	40.130	3.839	126.20	368.50	51-75	ngsa079a
TILL-2	5.739	76.21	4.81	40.250	3.904	134.50	367.30	51-75	ngsa079b
TILL-2	5.803	80.39	4.92	40.590	3.883	131.50	366.30	51-75	ngsa079b
TILL-2	5.710	77.79	4.66	40.770	3.779	132.60	371.00	51-75	ngsa080a
TILL-2	5.572	77.97	4.47	39.470	3.880	134.10	377.30	51-75	ngsa080a
TILL-2	5.608	78.38	5.23	43.339	3.894	133.02	403.62	76-86	ngsa081aa
TILL-2	5.741	77.31	5.30	42.212	3.946	137.60	393.43	76-86	ngsa081aa
TILL-2	5.645	80.40	5.32	43.017	3.885	137.36	401.25	76-86	NGSA081b
TILL-2	5.634	79.07	5.06	44.349	4.134	131.37	394.58	76-86	NGSA081b
TILL-2	5.699	77.60	4.82	46.221	4.086	133.44	396.60	76-86	ngsa082aa
TILL-2	5.755	78.26	5.14	42.954	3.983	136.15	382.85	76-86	ngsa082aa
TILL-2	5.527	77.53	5.02	44.041	4.046	130.16	399.07	76-86	ngsa082bb
TILL-2	5.561	77.66	5.47	33.276	3.872	129.43	420.28	76-86	ngsa083AA
TILL-2	5.653	81.20	5.19	44.160	4.163	130.66	406.12	76-86	ngsa083AA
TILL-2	5.447	79.72	4.92	43.530	4.062	131.06	405.90	76-86	ngsa083bb
TILL-2	5.535	82.82	5.10	37.608	3.875	131.44	421.17	76-86	ngsa083bb
TILL-2	5.675	80.72	5.05	43.577	4.045	133.52	407.69	76-86	NGSA084Aa
TILL-2	5.690	81.47	5.51	33.673	3.952	132.62	421.86	76-86	NGSA084Aa
TILL-2	5.544	79.63	3.69	43.275	3.992	128.20	401.94	76-86	NGSA084B
TILL-2	5.478	81.26	3.81	44.349	3.824	127.57	410.43	76-86	NGSA084B
TILL-2	5.569	82.34	5.09	43.483	3.925	135.12	408.53	76-86	NGSA085Aa
TILL-2	5.549	82.97	4.86	42.057	4.033	133.01	410.91	76-86	NGSA085Aa
TILL-2	5.475	79.77	5.31	39.725	3.818	131.01	416.73	76-86	ngsa086aa
TILL-2	5.563	78.75	5.09	42.801	3.956	126.55	404.35	76-86	ngsa086aa
TILL-2	5.544	77.11	5.40	41.919	3.943	130.45	402.59	76-86	NGSA086Bb
TILL-2	5.584	81.55	5.36	40.013	4.036	129.98	412.43	76-86	NGSA086Bb
TILL-2	5.525	79.09	4.94	44.105	3.984	133.41	401.97	76-86	NGSA087aA
TILL-2	5.660	82.55	5.11	49.625	4.076	137.39	414.86	76-86	NGSA087aA
TILL-2	5.669	81.11	3.34	47.884	4.212	133.95	406.43	76-86	NGSA087bb
TILL-2	5.482	80.24	3.54	44.505	4.066	130.30	400.44	76-86	NGSA087bb
TILL-2	5.539	77.68	3.70	43.047	4.045	137.84	408.74	76-86	ngsa088aa
TILL-2	5.472	77.54	3.66	39.687	4.173	137.48	404.29	76-86	ngsa088aa
TILL-2	5.483	78.02	5.11	40.956	3.790	132.45	408.01	76-86	ngsa088bb
TILL-2	5.444	80.34	5.08	44.954	3.921	132.79	407.19	76-86	ngsa088bb
TILL-2	5.656	79.10	5.05	42.892	4.222	132.46	407.13	76-86	ngsa089aA
TILL-2	5.720	80.50	4.69	43.745	3.998	133.47	415.14	76-86	ngsa089aA
TILL-2	5.631	79.18	4.94	42.193	4.154	134.08	401.53	76-86	ngsa090aA
TILL-2	5.638	80.82	4.93	45.014	4.079	129.97	403.65	76-86	ngsa090aA
TILL-2	5.719	82.35	4.62	43.623	3.960	134.24	413.25	76-86	ngsa090bb
TILL-2	5.486	82.85	4.54	44.029	3.925	131.59	409.52	76-86	ngsa090bb
TILL-2	5.411	78.83	5.05	43.509	3.962	135.85	406.03	76-86	ngsa091aA
TILL-2	5.435	81.05	4.68	43.417	4.032	137.11	407.24	76-86	ngsa091aA
TILL-2	5.538	78.85	5.03	44.346	4.094	134.46	409.31	76-86	NGSA091bb
TILL-2	5.617	81.06	4.97	44.588	4.281	134.89	402.36	76-86	NGSA091bb
TILL-2	5.500	78.63	4.83	42.996	3.973	130.84	402.51	76-86	NGSA092AA
TILL-2	5.655	78.51	4.93	43.279	4.132	136.33	400.96	76-86	NGSA092AA
TILL-2	5.489	78.93	4.98	40.603	3.767	128.29	381.88	1-25 redo	NGSA100 Repeats
TILL-2	5.416	79.83	5.23	41.748	3.659	130.47	380.19	1-25 redo	NGSA100 Repeats
TILL-2	5.439	82.62	5.32	41.393	3.793	128.23	393.06	1-25 redo	NGSA101 Repeats
TILL-2	5.191	83.20	4.83	42.218	3.634	128.18	393.90	1-25 redo	NGSA101 Repeats
TILL-2	5.353	81.12	5.37	39.654	3.647	128.74	380.65	1-25 redo	NGSA102 Repeats
TILL-2	5.549	82.93	5.13	41.314	3.893	129.98	388.76	1-25 redo	NGSA102 Repeats

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-2	008SMPL.D	NGSA-01B	18/05/2010	0.229	26.51	556.59	4.75	5.074	0.25
TILL-2	040SMPL.D	NGSA-02A	18/05/2010	0.208	27.49	564.87	4.34	4.906	0.05
TILL-2	008SMPL.D	NGSA-02A	18/05/2010	0.255	25.84	543.21	3.94	4.880	0.36
TILL-2	039SMPL.D	NGSA-01B	18/05/2010	0.253	27.05	542.44	4.13	5.051	0.38
TILL-2	008SMPL.D	NGSA02B	19/05/2010	0.181	25.52	536.25	3.75	4.902	0.27
TILL-2	039SMPL.D	NGSA02B	19/05/2010	0.203	26.11	546.48	2.83	4.894	0.37
TILL-2	038SMPL.D	NGSA02B	19/05/2010	0.248	25.00	532.75	3.55	4.841	0.34
Till 2	052SMPL.D#	NGSA050b	11/08/2009	0.375	23.40	527.00	4.18	5.536	0.30
Till 2	054SMPL.D#	ngsa051a	11/08/2009	0.294	22.59	534.20	4.07	5.511	0.17
Till 2	074SMPL.D#	ngsa051a	11/08/2009	0.344	24.39	534.50	3.67	5.463	0.41
Till 2	091SMPL.D#	NGSA050b	11/08/2009	0.332	23.11	526.00	3.26	5.480	0.36
Till 2	093SMPL.D#	ngsa051a	11/08/2009	0.324	24.53	525.10	4.09	5.506	0.47
Till 2	008SMPL.D#	ngsa051a	11/08/2009	0.348	25.13	532.90	3.47	5.455	0.28
Till 2	044SMPL.D#	ngsa051a	11/08/2009	0.322	23.64	531.40	3.69	5.416	0.36
Till 2	008SMPL.D	NGSA08082008A	17/05/2010	0.220	26.33	530.02	3.76	4.780	0.38
Till 2	035SMPL.D	NGSA08082008A	17/05/2010	0.215	24.77	538.36	4.57	4.777	0.44
Till-2	008SMPL.D#	NGSA028A	1/06/2009	0.175	25.68	554.80	4.00	4.639	0.42
Till-2	040SMPL.D#	NGSA028A	1/06/2009	0.174	25.07	559.10	4.21	4.616	0.41
TILL-2C	008SMPL.D#	NGSA026B	28/05/2009	0.183	24.33	544.00	3.35	4.529	0.26
TILL-2C	040SMPL.D#	NGSA026B	28/05/2009	0.162	24.07	544.40	3.89	4.507	0.37
TILL-2C	008SMPL.D#	NGSA027B	29/05/2009	0.144	24.56	551.40	4.18	4.565	0.36
TILL-2C	029SMPL.D#	NGSA027B	29/05/2009	0.111	24.45	558.40	4.36	4.549	0.36
TILL-2C	042SMPL.D#	NGSA027B	29/05/2009	0.124	25.35	563.50	4.01	4.596	0.14
TILL-2C	008SMPL.D#	NGSA027A	29/05/2009	0.152	24.55	557.10	4.58	4.551	0.22
Average				0.2807	25.0397	539.4221	3.9721	5.2690	0.3280
RSD				40%	5%	3%	14%	7%	47%
till 3	086SMPL.D#	NGSA050b	11/08/2009	1.218	75.11	471.10	0.55	0.356	0.05
TILL-3	008SMPL.D#	ngsa041a	26/06/2009	1.028	79.07	481.10	1.17	0.311	0.14
TILL-3	037SMPL.D#	ngsa041a	26/06/2009	0.959	86.34	498.00	1.31	0.289	0.05
TILL-3	045SMPL.D#	ngsa041b	26/06/2009	0.896	78.41	477.00	1.42	0.308	0.13
TILL-3	083SMPL.D#	ngsa041b	26/06/2009	1.077	82.31	485.50	1.48	0.294	0.12
TILL-3	009SMPL.D#	NGSA064B	6/11/2009	1.250	80.64	484.80	1.19	0.342	0.13
TILL-3	041SMPL.D	NGSA 03A	19/05/2010	0.985	85.00	506.14	0.55	0.353	0.05
TILL-3	008SMPL.D	NGSA 03A	19/05/2010	0.998	82.16	494.88	1.56	0.328	0.05
TILL-3	008SMPL.D	NGSA 03B	20/05/2010	0.988	80.29	497.32	1.58	0.351	0.05
TILL-3	040SMPL.D	09172008 NGSA 3 A	20/05/2010	0.988	82.95	517.57	1.41	0.367	0.05
TILL-3	008SMPL.D	09172008 NGSA 3 A	20/05/2010	0.948	82.03	500.28	1.80	0.346	0.05
TILL-3	038SMPL.D	NGSA 03B	20/05/2010	1.046	80.43	491.64	1.79	0.347	0.05
TILL-3	008SMPL.D	09172008 NGSA 3 B	21/05/2010	0.950	81.53	486.20	1.67	0.343	0.05
TILL-3	040SMPL.D	NGSA 04A	21/05/2010	0.975	83.20	499.77	1.41	0.309	0.05
TILL-3	008SMPL.D	NGSA 04A	21/05/2010	0.976	83.69	489.80	1.47	0.389	0.05
TILL-3	038SMPL.D	09172008 NGSA 3 B	21/05/2010	0.929	83.84	494.37	1.18	0.401	0.05
TILL-3	008SMPL.D	NGSA 4A	25/05/2010	0.953	82.86	500.17	1.35	0.322	0.05
TILL-3	038SMPL.D	NGSA 04B	25/05/2010	0.940	85.63	516.93	1.44	0.331	0.05
TILL-3	008SMPL.D	NGSA 04B	25/05/2010	1.082	82.03	484.74	1.50	0.322	0.26
TILL-3	040SMPL.D	NGSA 4A	25/05/2010	0.988	80.28	493.26	1.89	0.327	0.05
TILL-3	008SMPL.D	NGSA04 B	26/05/2010	0.993	76.62	487.43	1.75	0.337	0.05
TILL-3	040SMPL.D	NGSA 5 A	26/05/2010	0.977	80.11	512.30	1.56	0.322	0.05
TILL-3	008SMPL.D	NGSA 5 A	26/05/2010	0.991	83.25	491.21	2.51	0.330	0.05
TILL-3	038SMPL.D	NGSA04 B	26/05/2010	0.981	79.43	478.60	2.43	0.321	0.19
TILL-3	008SMPL.D	NGSA 5 B	27/05/2010	1.068	84.10	488.01	1.66	0.344	0.44
TILL-3	040SMPL.D	NGSA 5 B	27/05/2010	1.072	77.02	473.18	2.28	0.328	0.33
TILL-3	008SMPL.D	NGSA05B	1/06/2010	0.959	81.30	477.37	1.62	0.318	0.05
TILL-3	040SMPL.D	NGSA05B	1/06/2010	0.944	83.82	493.01	1.78	0.310	0.05
TILL-3	008SMPL.D	NGSA 05A	28/05/2010	1.042	82.01	479.32	1.60	0.327	0.17
TILL-3	042SMPL.D	NGSA 05A	28/05/2010	0.913	86.44	503.94	1.49	0.307	0.18
TILL-3	008SMPL.D	NGSA 06 A	3/06/2010	0.996	80.60	495.21	1.17	0.326	0.05
TILL-3	038SMPL.D	NGSA 06 A	3/06/2010	0.994	80.62	502.85	0.55	0.315	0.05
TILL-3	008SMPL.D	NGSA 06 B	4/06/2010	0.906	77.76	484.12	1.76	0.300	0.05
TILL-3	040SMPL.D	NGSA 06 B	4/06/2010	0.891	77.70	492.79	1.49	0.323	0.28
TILL-3	008SMPL.D	NGSA 07 A	7/06/2010	0.918	78.62	475.89	1.68	0.326	0.20
TILL-3	038SMPL.D	NGSA 07 A	7/06/2010	0.996	80.00	491.74	1.37	0.323	0.05
TILL-3	008SMPL.D	NGSA07B	8/06/2010	0.881	79.48	481.20	0.55	0.325	0.05
TILL-3	040SMPL.D	NGSA08B	8/06/2010	0.938	81.99	499.79	0.55	0.331	0.11
TILL-3	008SMPL.D	NGSA08B	8/06/2010	1.039	80.77	485.41	1.10	0.326	0.15
TILL-3	008SMPL.D	NGSA08B	9/06/2010	0.949	81.62	490.47	0.55	0.327	0.78
TILL-3	030SMPL.D	NGSA07B	9/06/2010	0.910	78.88	496.23	1.45	0.343	0.78
TILL-3	008SMPL.D	NGSA08A	9/06/2010	0.913	82.42	487.86	1.80	0.342	0.05
TILL-3	038SMPL.D	NGSA08A	9/06/2010	0.949	86.63	492.55	1.19	0.344	0.11
TILL-3	008SMPL.D	NGSA09A	10/06/2010	0.939	83.94	499.54	1.93	0.343	0.05
TILL-3	038SMPL.D	NGSA 09 B	10/06/2010	1.020	86.93	514.93	1.41	0.338	0.05
TILL-3	008SMPL.D	NGSA 09 B	10/06/2010	1.065	79.93	485.79	0.55	0.326	0.05
TILL-3	040SMPL.D	NGSA09A	10/06/2010	0.981	82.73	505.97	0.55	0.331	0.05
TILL-3	008SMPL.D	NGSA10A	11/06/2010	0.885	82.20	483.16	1.45	0.318	0.14
TILL-3	037SMPL.D	NGSA10B	11/06/2010	0.901	82.14	503.60	1.50	0.313	0.05
TILL-3	039SMPL.D	NGSA10B	11/06/2010	0.907	85.10	496.10	1.48	0.313	0.05
TILL-3	008SMPL.D	NGSA10B	11/06/2010	1.003	84.32	475.04	1.68	0.337	0.16
TILL-3	038SMPL.D	NGSA10A	11/06/2010	0.942	82.71	478.77	1.45	0.309	0.13
TILL-3	040SMPL.D	NGSA10B	11/06/2010	0.983	79.80	476.36	1.36	0.333	0.18
TILL-3	008SMPL.D	NGSA011A	15/06/2010	0.985	79.15	485.75	1.54	0.315	0.05
TILL-3	038SMPL.D	NGSA011B	15/06/2010	0.897	80.75	495.20	0.55	0.289	0.05
TILL-3	008SMPL.D	NGSA011B	15/06/2010	0.891	81.21	477.83	1.32	0.312	0.05
TILL-3	039SMPL.D	NGSA011A	15/06/2010	0.910	84.70	485.80	1.55	0.321	0.05
TILL-3	008SMPL.D	NGSA06Z	16/06/2010	0.922	79.78	473.38	1.96	0.294	0.05
TILL-3	038SMPL.D	NGSA012 A	16/06/2010	0.839	75.69	485.86	1.15	0.326	0.05
TILL-3	008SMPL.D	NGSA012 A	17/06/2010	0.975	79.90	485.26	1.29	0.345	0.61

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-2	100.642	14.68	76.99	12.21	152.72	6.84	3.644	1.223	19.26	6.492
TILL-2	99.637	15.14	75.78	12.74	147.74	6.51	3.640	1.237	20.54	6.517
TILL-2	99.438	14.32	72.70	12.38	149.05	6.37	3.617	1.202	19.55	6.388
TILL-2	99.440	14.98	74.98	12.28	154.68	6.72	3.828	1.281	20.11	6.545
TILL-2	97.189	14.18	70.84	11.80	150.74	6.50	3.578	1.190	19.38	6.471
TILL-2	97.179	14.78	70.84	12.30	151.29	6.49	3.584	1.117	19.25	6.382
TILL-2	97.934	14.88	75.51	12.07	157.58	6.40	3.576	1.234	18.68	6.388
Till 2	97.070	14.36	80.65	12.17	151.00	6.15	3.783	1.332	19.16	6.838
Till 2	100.200	14.46	76.28	12.51	150.10	6.17	3.782	1.291	19.88	6.825
Till 2	98.700	14.47	78.24	12.18	150.40	6.15	3.741	1.327	19.10	6.863
Till 2	96.070	14.40	81.28	11.76	149.20	6.13	3.830	1.299	20.06	6.859
Till 2	98.340	14.42	78.39	12.36	150.40	6.14	3.672	1.347	18.46	6.708
Till 2	99.160	14.79	79.48	12.02	152.30	5.96	3.755	1.313	19.12	6.928
Till 2	96.980	15.07	82.80	12.19	150.10	6.10	3.769	1.357	18.53	6.825
Till 2	96.424	13.82	69.54	12.06	141.62	6.33	3.559	1.220	19.39	6.385
Till 2	96.131	14.17	71.10	12.18	141.98	6.28	3.548	1.285	18.00	6.225
Till-2	103.500	15.33	76.80	12.51	148.10	6.54	3.797	1.231	19.07	6.788
Till-2	104.100	15.40	77.66	12.76	145.30	6.58	3.814	1.187	19.36	7.114
TIL-2C	99.740	15.19	72.90	12.25	147.90	6.58	3.932	1.269	19.37	6.894
TIL-2C	99.450	15.45	73.64	12.47	147.30	6.59	3.946	1.271	19.75	6.867
TIL-2C	101.600	15.32	74.02	12.68	150.20	6.43	3.820	1.270	20.01	6.838
TIL-2C	100.900	15.24	73.40	12.90	148.10	6.50	3.932	1.222	20.14	6.806
TIL-2C	102.200	15.50	74.60	13.09	149.10	6.45	3.990	1.233	21.22	6.953
TIL-2C	99.840	15.25	75.89	12.86	147.90	6.55	3.834	1.229	21.07	6.774
Average	100.3293	14.8741	75.3431	12.2549	149.4181	6.5152	3.8016	1.2691	19.5552	6.8493
RSD	3%	3%	4%	4%	2%	4%	3%	5%	5%	4%
till 3	38.200	13.51	126.10	1.97	20.60	2.36	1.452	0.920	13.66	2.979
TILL-3	38.330	13.97	121.50	1.86	21.40	2.37	1.403	0.822	14.88	2.817
TILL-3	38.950	14.40	123.10	2.02	20.87	2.36	1.445	0.776	15.32	2.905
TILL-3	38.100	14.32	121.10	1.93	20.97	2.29	1.434	0.877	14.60	2.924
TILL-3	38.330	14.13	123.80	2.01	21.27	2.35	1.434	0.794	14.38	2.926
TILL-3	38.740	13.80	120.60	1.90	22.98	2.41	1.398	0.851	13.33	2.867
TILL-3	38.564	14.16	130.16	2.01	23.29	2.44	1.384	0.817	14.02	2.862
TILL-3	39.049	14.11	124.57	1.96	22.13	2.48	1.421	0.877	12.11	2.854
TILL-3	38.799	14.54	128.75	1.97	21.54	2.46	1.427	0.792	14.88	2.794
TILL-3	39.283	14.23	132.73	2.08	21.64	2.45	1.297	0.778	15.83	2.815
TILL-3	38.858	13.92	127.02	1.95	25.78	2.45	1.396	0.805	13.38	2.817
TILL-3	38.656	14.18	126.67	1.92	24.78	2.68	1.395	0.834	13.26	2.751
TILL-3	39.341	13.98	125.89	1.88	36.34	2.38	1.316	0.754	13.22	2.669
TILL-3	38.550	14.30	130.28	1.96	18.11	2.46	1.339	0.778	12.48	2.607
TILL-3	38.493	13.60	124.38	1.85	21.63	2.44	1.410	0.791	13.99	2.703
TILL-3	38.367	13.53	125.58	1.84	38.48	2.47	1.387	0.809	14.31	2.722
TILL-3	39.206	14.30	128.20	1.96	21.73	2.48	1.378	0.871	13.88	2.797
TILL-3	38.866	14.48	129.62	2.06	20.25	2.51	1.417	0.864	14.30	2.759
TILL-3	38.514	13.83	125.12	1.86	22.18	2.47	1.410	0.862	12.65	2.760
TILL-3	38.275	14.25	129.35	2.02	22.35	2.52	1.421	0.885	13.14	2.841
TILL-3	38.240	13.79	125.68	1.90	22.44	2.45	1.411	0.868	13.47	2.764
TILL-3	38.409	14.56	126.87	1.90	24.35	2.54	1.367	0.843	13.77	2.782
TILL-3	38.535	13.89	124.17	1.93	24.54	2.56	1.369	0.883	13.66	2.814
TILL-3	37.829	13.66	123.20	1.85	20.95	2.45	1.399	0.868	13.80	2.816
TILL-3	38.986	14.07	127.37	1.81	22.20	2.44	1.440	0.841	12.92	2.791
TILL-3	37.715	14.82	128.96	1.83	21.64	2.41	1.418	0.923	13.21	2.675
TILL-3	38.023	14.20	126.09	1.76	20.20	2.39	1.381	0.707	13.85	2.727
TILL-3	37.909	14.38	127.66	1.95	20.49	2.50	1.452	0.708	12.55	2.732
TILL-3	38.004	14.10	124.42	1.86	21.66	2.45	1.459	0.850	13.51	2.752
TILL-3	38.431	14.85	130.99	1.93	20.83	2.52	1.370	0.856	14.06	2.762
TILL-3	39.027	14.03	123.50	1.99	23.75	2.50	1.362	0.857	12.77	2.791
TILL-3	38.720	14.16	124.67	2.00	23.21	2.50	1.452	0.847	13.90	2.769
TILL-3	38.066	13.90	125.34	1.81	23.13	2.31	1.254	0.752	14.33	2.755
TILL-3	37.445	14.63	132.09	1.84	22.22	2.39	1.318	0.780	14.18	2.813
TILL-3	38.041	13.95	127.82	1.88	20.30	2.52	1.794	0.856	12.12	2.731
TILL-3	37.698	13.87	127.31	1.96	19.35	2.48	1.773	0.834	13.55	2.751
TILL-3	38.253	13.65	123.87	1.91	21.30	2.51	1.428	0.762	11.89	2.931
TILL-3	37.886	14.19	128.07	2.06	21.74	2.55	1.364	0.823	14.67	2.915
TILL-3	38.502	13.96	123.35	1.87	20.79	2.50	1.377	0.809	13.52	2.770
TILL-3	37.990	14.43	130.31	1.93	20.93	2.43	1.431	0.873	13.63	2.778
TILL-3	37.222	14.53	132.26	1.85	20.03	2.46	1.420	0.860	14.48	2.753
TILL-3	39.346	14.00	125.90	1.97	21.78	2.77	1.415	0.814	16.94	2.788
TILL-3	38.793	14.12	126.21	1.87	21.40	2.89	1.378	0.810	15.80	2.764
TILL-3	38.619	14.10	126.51	2.00	21.18	2.47	1.434	0.848	13.84	2.803
TILL-3	38.566	14.28	127.53	2.12	21.14	2.45	1.327	0.830	14.29	2.783
TILL-3	38.750	13.80	123.84	1.83	25.18	2.39	1.361	0.783	13.36	2.752
TILL-3	39.627	14.05	126.88	2.00	24.19	2.54	1.401	0.857	12.95	2.796
TILL-3	38.084	13.89	124.62	1.76	21.39	2.45	1.586	0.834	13.48	2.738
TILL-3	37.324	13.82	129.19	1.86	21.24	2.38	1.552	0.803	13.37	2.669
TILL-3	37.473	14.09	126.85	1.91	21.05	2.27	1.505	0.794	14.74	2.666
TILL-3	37.547	13.91	121.64	1.84	21.33	2.50	1.374	0.786	14.62	2.708
TILL-3	37.682	13.92	124.02	1.99	21.35	2.45	1.314	0.801	13.37	2.676
TILL-3	37.155	14.03	123.44	1.88	21.70	2.40	1.401	0.825	13.08	2.663
TILL-3	38.084	13.95	121.48	1.88	21.01	2.42	1.418	0.806	13.66	2.672
TILL-3	37.601	13.87	127.42	1.98	20.20	2.37	1.391	0.743	14.45	2.696
TILL-3	37.915	13.53	121.88	1.88	20.92	2.59	1.421	0.763	13.60	2.687
TILL-3	37.924	14.01	121.17	1.90	21.11	2.48	1.331	0.770	13.99	2.794
TILL-3	38.301	13.83	125.18	2.04	21.14	2.30	1.385	0.842	13.51	2.682
TILL-3	36.485	14.55	131.90	1.88	19.94	2.43	1.428	0.803	15.71	2.741
TILL-3	38.762	13.93	122.97	1.88	22.16	2.56	1.436	0.858	11.72	2.689

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-2	0.725	10.174	1.372	46.80	0.573	13.61	19.354	37.61	32.45	32.19
TILL-2	0.771	10.159	1.323	47.43	0.532	13.02	20.323	36.90	30.81	31.72
TILL-2	0.658	10.293	1.295	46.35	0.507	13.60	18.869	37.74	33.05	31.40
TILL-2	0.748	10.037	1.368	46.51	0.537	13.69	19.315	38.42	35.88	32.14
TILL-2	0.690	10.218	1.238	43.43	0.479	13.71	18.944	36.96	33.34	31.37
TILL-2	0.686	10.138	1.220	44.26	0.482	13.73	19.294	37.28	31.97	31.72
TILL-2	0.707	10.301	1.302	44.12	0.534	13.05	18.735	37.59	33.27	32.09
Till 2	0.717	9.276	1.325	43.73	0.555	12.95	18.800	38.86	28.69	32.56
Till 2	0.651	9.750	1.371	44.26	0.529	13.51	19.330	39.84	31.32	32.33
Till 2	0.790	9.851	1.342	43.74	0.534	12.84	19.150	39.71	32.46	32.42
Till 2	0.688	9.259	1.318	42.86	0.517	11.96	18.850	38.41	31.05	32.45
Till 2	0.726	9.906	1.313	42.92	0.547	12.52	18.730	39.73	29.58	32.51
Till 2	0.780	9.631	1.325	44.43	0.526	13.22	18.550	38.80	30.97	32.44
Till 2	0.720	9.644	1.328	44.35	0.530	11.80	18.110	38.74	29.69	32.59
Till 2	0.670	9.832	1.269	44.94	0.536	13.52	18.425	36.33	30.08	30.73
Till 2	0.780	9.891	1.287	44.23	0.518	13.16	18.892	36.21	31.89	30.72
Til-2	0.784	10.370	1.347	48.43	0.455	14.20	20.250	39.71	34.40	32.31
Til-2	0.786	10.390	1.321	48.29	0.441	14.17	20.570	39.38	35.37	31.68
TIL-2C	0.716	10.100	1.406	45.84	0.541	14.11	19.500	38.48	31.34	32.06
TIL-2C	0.737	9.969	1.389	46.70	0.513	14.24	19.930	37.95	31.33	32.06
TIL-2C	0.691	10.090	1.358	46.60	0.500	13.90	19.990	38.65	34.06	31.74
TIL-2C	0.744	10.240	1.348	46.97	0.512	13.86	20.450	38.49	32.13	32.01
TIL-2C	0.748	10.200	1.382	47.55	0.509	14.56	20.580	38.62	32.67	32.06
TIL-2C	0.721	10.250	1.348	46.81	0.505	13.40	19.950	37.94	31.00	31.49
Average	0.7346	10.2464	1.3230	46.1223	0.5244	13.6218	19.5997	39.2253	32.6775	31.6623
RSD	14%	4%	5%	3%	9%	4%	3%	3%	8%	2%
till 3	0.507	5.477	0.487	18.51	0.202	0.65	6.787	17.95	37.54	27.14
TILL-3	0.429	5.483	0.510	19.32	0.163	0.64	6.767	16.79	40.03	26.82
TILL-3	0.429	5.371	0.491	19.79	0.180	0.62	7.484	16.98	40.97	26.51
TILL-3	0.405	5.465	0.488	19.27	0.182	0.65	7.170	17.04	37.66	26.87
TILL-3	0.529	5.486	0.490	19.04	0.197	0.75	7.354	17.28	38.74	26.42
TILL-3	0.527	6.023	0.478	19.23	0.191	0.75	6.929	17.77	40.24	24.77
TILL-3	0.538	5.756	0.473	18.72	0.137	0.52	7.161	17.02	49.96	25.16
TILL-3	0.448	5.660	0.510	18.66	0.197	0.69	7.050	16.86	50.22	25.47
TILL-3	0.474	5.768	0.463	18.90	0.150	0.61	7.018	17.00	50.79	25.58
TILL-3	0.444	5.657	0.460	19.29	0.134	0.68	7.390	17.33	52.95	25.49
TILL-3	0.377	5.657	0.475	18.97	0.184	1.54	7.254	16.31	52.37	25.72
TILL-3	0.384	5.704	0.483	18.55	0.179	1.41	7.193	16.43	51.69	25.48
TILL-3	0.503	5.456	0.433	18.18	0.121	0.92	6.912	16.52	50.66	25.22
TILL-3	0.433	5.503	0.418	18.10	0.115	1.13	6.780	16.65	52.02	25.08
TILL-3	0.449	5.597	0.453	18.87	0.149	0.82	7.202	16.93	50.54	25.06
TILL-3	0.422	5.640	0.453	18.26	0.171	0.76	6.725	17.10	48.25	25.25
TILL-3	0.398	5.557	0.492	18.90	0.175	0.81	7.012	16.87	53.23	25.62
TILL-3	0.494	5.592	0.471	19.25	0.181	0.74	7.026	16.86	53.20	25.70
TILL-3	0.474	5.504	0.496	18.56	0.221	0.65	6.905	17.18	50.91	25.09
TILL-3	0.480	5.562	0.510	18.60	0.211	0.90	6.902	17.47	51.43	25.34
TILL-3	0.368	5.536	0.496	18.53	0.198	0.47	6.961	17.05	50.61	25.23
TILL-3	0.426	5.588	0.483	18.95	0.200	0.55	7.012	16.73	52.25	25.23
TILL-3	0.440	5.706	0.494	20.11	0.214	1.05	6.985	17.18	52.83	25.09
TILL-3	0.391	5.699	0.505	19.66	0.215	1.00	6.880	16.75	50.70	24.99
TILL-3	0.388	5.637	0.482	18.86	0.192	0.59	6.873	17.34	53.01	25.51
TILL-3	0.413	5.903	0.501	17.93	0.188	0.84	6.562	17.02	53.70	25.80
TILL-3	0.374	5.598	0.487	19.50	0.179	0.57	6.861	16.72	49.16	24.87
TILL-3	0.619	5.501	0.487	19.59	0.177	0.69	6.681	16.78	48.21	25.28
TILL-3	0.454	5.575	0.488	18.38	0.164	0.69	6.617	16.51	49.08	25.30
TILL-3	0.443	5.489	0.482	18.88	0.193	0.51	6.982	16.58	51.06	25.17
TILL-3	0.429	5.629	0.494	18.59	0.206	0.69	6.899	17.02	50.36	25.55
TILL-3	0.416	5.553	0.491	18.70	0.190	0.50	7.049	16.85	50.90	25.72
TILL-3	0.427	5.490	0.479	19.35	0.245	0.59	6.938	16.38	48.95	24.99
TILL-3	0.413	5.500	0.494	19.63	0.093	0.46	6.679	16.50	47.50	25.16
TILL-3	0.386	5.678	0.476	18.64	0.193	0.71	6.623	16.67	49.51	24.94
TILL-3	0.366	5.464	0.487	18.39	0.209	0.58	7.001	16.43	48.62	24.64
TILL-3	0.524	5.488	0.436	18.15	0.186	1.29	6.652	17.03	50.35	25.43
TILL-3	0.485	5.605	0.454	19.01	0.184	1.28	7.114	17.18	49.86	25.27
TILL-3	0.380	5.745	0.490	19.89	0.201	0.81	6.759	16.44	49.04	25.52
TILL-3	0.352	5.660	0.510	18.35	0.216	0.67	6.791	16.73	51.90	25.14
TILL-3	0.409	5.635	0.494	18.33	0.201	0.94	6.590	16.76	51.36	25.89
TILL-3	0.454	5.489	0.500	19.68	0.197	0.70	6.525	16.39	50.31	25.25
TILL-3	0.416	5.599	0.486	19.68	0.192	0.79	6.764	16.59	50.11	25.22
TILL-3	0.470	5.698	0.477	18.66	0.185	0.85	6.860	17.43	56.59	25.85
TILL-3	0.408	5.660	0.475	18.68	0.162	0.66	6.737	17.07	56.63	25.10
TILL-3	0.432	5.558	0.469	18.95	0.175	0.70	6.933	16.58	58.17	24.78
TILL-3	0.426	5.786	0.477	19.26	0.169	0.56	7.044	17.37	52.52	25.51
TILL-3	0.449	5.567	0.487	18.02	0.241	0.72	6.583	16.35	52.33	25.16
TILL-3	0.459	5.558	0.469	18.21	0.244	0.76	6.681	16.62	52.46	25.19
TILL-3	0.429	5.470	0.468	18.19	0.261	0.78	6.669	16.59	50.42	25.07
TILL-3	0.392	5.546	0.468	18.34	0.175	0.62	6.817	16.40	51.20	24.78
TILL-3	0.427	5.550	0.472	18.08	0.188	0.95	6.673	16.73	53.53	24.96
TILL-3	0.459	5.442	0.448	18.14	0.193	0.81	6.844	16.26	51.41	24.51
TILL-3	0.524	5.624	0.403	17.56	0.164	0.64	6.542	16.85	38.14	26.22
TILL-3	0.432	5.580	0.398	18.26	0.142	0.33	6.848	17.41	39.31	26.42
TILL-3	0.405	5.669	0.425	18.72	0.146	0.79	6.804	17.08	40.17	26.55
TILL-3	0.342	5.581	0.445	18.08	0.156	0.70	6.802	16.86	40.75	26.55
TILL-3	0.339	5.720	0.505	19.38	0.151	0.85	6.777	17.26	37.96	26.72
TILL-3	0.400	5.584	0.485	18.46	0.172	0.72	6.338	16.73	35.35	27.10
TILL-3	0.466	5.547	0.480	18.89	0.200	0.77	6.858	16.86	40.23	27.51

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLO:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-2	9.929	146.05	1.49	12.43	7.443	6.17	156.10	2.801	1.186	20.350
TILL-2	9.883	157.81	1.18	12.92	7.243	5.96	166.11	2.781	1.171	15.902
TILL-2	10.080	143.62	0.74	11.33	7.756	5.68	151.36	1.835	1.175	15.762
TILL-2	10.067	146.30	0.65	12.44	7.610	5.68	155.99	1.853	1.215	20.260
TILL-2	9.786	144.62	0.20	12.03	7.621	5.21	149.10	1.749	1.218	17.997
TILL-2	9.974	151.74	0.20	12.83	7.689	5.67	158.40	1.734	1.205	18.480
TILL-2	9.872	143.87	0.20	12.75	7.866	5.57	154.49	1.780	1.175	18.093
Till 2	9.989	139.30	1.25	11.00	8.210	5.02	148.70	1.331	1.201	21.470
Till 2	10.310	144.30	0.98	10.71	8.058	5.03	151.20	1.423	1.234	16.410
Till 2	10.200	142.10	0.99	10.73	8.174	4.97	149.80	1.393	1.234	16.070
Till 2	9.903	137.30	1.23	10.72	8.469	4.48	142.20	1.361	1.244	21.360
Till 2	10.080	135.30	1.29	10.54	8.591	5.38	147.80	1.442	1.250	16.240
Till 2	10.150	142.30	1.16	10.90	8.395	5.08	145.60	1.411	1.231	18.980
Till 2	10.010	141.60	0.96	11.67	8.275	5.55	150.80	1.404	1.223	18.190
Till 2	9.654	141.52	1.24	11.70	7.798	5.60	151.12	1.823	1.157	16.014
Till 2	9.670	147.26	0.97	12.40	7.425	5.62	157.56	1.816	1.136	15.987
Till-2	10.640	149.60	1.26	13.05	8.709	5.07	155.90	1.871	1.176	15.520
Till-2	10.700	153.60	1.51	12.86	8.459	5.33	159.70	1.894	1.179	14.960
TIL-2C	10.320	145.50	1.17	12.15	8.310	5.06	150.40	1.854	1.241	17.330
TIL-2C	10.270	147.90	1.04	12.36	8.194	5.50	155.60	1.857	1.226	17.360
TIL-2C	10.350	148.80	1.22	12.19	8.208	5.43	154.00	1.857	1.201	17.230
TIL-2C	10.400	153.50	1.31	12.65	8.162	5.45	158.60	1.844	1.189	17.290
TIL-2C	10.500	157.70	0.86	12.92	8.394	5.46	162.10	1.839	1.227	17.280
TIL-2C	10.330	157.30	1.17	10.58	8.134	5.18	150.50	1.809	1.203	16.120
Average	10.2948	146.4174	1.1403	11.4833	8.2227	5.2114	154.4652	1.7622	1.1815	18.1335
RSD	3%	3%	59%	7%	4%	8%	3%	16%	6%	8%
till 3	4.347	52.52	1.16	7.73	3.671	2.37	290.60	0.342	0.425	4.882
TILL-3	4.289	55.81	0.96	8.94	3.305	2.82	311.70	0.446	0.380	4.604
TILL-3	4.487	58.52	1.16	9.69	3.208	2.80	329.50	0.449	0.423	4.566
TILL-3	4.403	53.24	0.90	8.53	3.390	3.02	293.30	0.430	0.444	4.687
TILL-3	4.391	57.30	1.37	9.66	3.205	2.72	314.20	0.420	0.446	4.574
TILL-3	4.457	55.81	1.27	9.03	3.273	3.20	321.10	0.955	0.433	4.439
TILL-3	4.451	57.82	0.20	10.72	3.300	3.97	331.49	0.407	0.505	4.901
TILL-3	4.373	54.04	0.66	9.87	3.510	3.94	310.44	0.439	0.442	4.696
TILL-3	4.346	54.86	1.05	9.84	3.579	3.50	315.47	0.354	0.383	4.741
TILL-3	4.311	60.83	1.10	10.99	3.492	3.83	342.88	0.322	0.391	4.683
TILL-3	4.440	56.77	1.61	9.74	3.454	3.92	313.25	0.419	0.427	4.661
TILL-3	4.419	53.78	1.84	9.94	3.281	3.44	314.20	0.418	0.420	4.695
TILL-3	4.368	57.48	1.33	5.09	3.482	3.95	287.93	0.434	0.370	4.406
TILL-3	4.224	56.31	1.14	9.40	3.438	3.50	322.46	0.428	0.345	4.646
TILL-3	4.270	55.01	0.75	9.18	3.377	4.04	313.92	1.112	0.395	4.674
TILL-3	4.200	54.49	0.78	6.26	3.349	4.03	296.37	1.111	0.393	4.381
TILL-3	4.299	57.05	1.25	9.44	3.494	3.55	313.20	0.421	0.428	4.808
TILL-3	4.270	60.48	1.32	10.76	3.458	3.86	336.22	0.412	0.436	4.694
TILL-3	4.316	54.29	0.68	9.54	3.505	3.82	305.78	0.459	0.458	4.880
TILL-3	4.326	56.83	1.07	9.30	3.472	3.75	312.69	0.466	0.477	4.830
TILL-3	4.222	54.90	0.20	9.31	3.118	3.60	307.93	0.426	0.448	4.722
TILL-3	4.270	58.61	0.52	9.53	3.202	3.93	327.41	0.420	0.431	4.897
TILL-3	4.323	55.65	0.20	9.37	3.037	3.65	310.33	0.463	0.454	4.683
TILL-3	4.331	53.07	0.20	9.01	2.940	3.75	302.29	0.468	0.433	4.779
TILL-3	4.291	53.99	0.77	8.98	3.641	3.73	312.83	0.449	0.466	4.822
TILL-3	4.253	52.68	0.57	9.47	3.466	3.80	306.86	0.439	0.440	5.026
TILL-3	4.273	51.78	1.10	9.44	3.577	3.99	302.37	0.441	0.407	4.690
TILL-3	4.280	55.31	1.23	9.51	3.498	3.52	317.02	0.434	0.414	4.751
TILL-3	4.161	53.68	0.50	9.18	3.270	3.72	303.41	0.448	0.432	4.689
TILL-3	4.222	59.96	0.89	10.22	3.211	3.84	331.42	0.419	0.419	4.766
TILL-3	4.310	55.74	0.81	9.70	3.489	3.46	315.29	0.435	0.432	4.671
TILL-3	4.302	58.28	0.83	10.64	3.591	3.65	325.81	0.421	0.458	4.782
TILL-3	4.113	55.05	1.18	9.34	3.159	3.50	300.86	1.007	0.356	4.697
TILL-3	4.133	55.41	1.08	9.78	3.217	3.27	322.55	1.108	0.362	4.712
TILL-3	4.316	53.93	1.66	9.38	3.466	3.74	307.27	0.389	0.410	4.663
TILL-3	4.321	56.05	1.56	9.79	3.488	3.93	318.70	0.388	0.434	4.701
TILL-3	4.259	58.65	1.24	11.39	3.407	3.51	328.09	0.392	0.488	4.928
TILL-3	4.262	60.14	1.30	10.30	3.222	3.62	332.27	0.379	0.484	4.733
TILL-3	4.352	53.01	1.14	9.37	3.167	3.64	301.18	0.423	0.460	4.793
TILL-3	4.320	53.40	0.90	8.89	3.590	4.07	311.50	0.412	0.440	4.797
TILL-3	4.162	54.58	0.57	12.28	3.427	3.46	345.37	0.393	0.428	5.131
TILL-3	4.531	55.66	0.66	9.02	3.478	3.78	304.63	0.382	0.448	4.680
TILL-3	4.466	55.87	0.70	9.36	3.545	3.58	319.88	0.392	0.447	4.739
TILL-3	4.330	56.37	1.54	9.70	3.217	3.49	310.63	0.387	0.411	4.834
TILL-3	4.292	59.11	1.46	9.96	2.936	3.53	327.13	0.386	0.402	4.769
TILL-3	4.329	54.78	0.98	9.33	3.420	3.63	306.83	0.382	0.419	4.693
TILL-3	4.254	57.84	1.09	9.91	3.655	3.63	320.37	0.385	0.416	4.878
TILL-3	4.223	54.74	0.92	8.88	3.366	3.58	306.91	0.362	0.388	4.644
TILL-3	4.180	56.70	0.77	9.69	3.394	3.91	328.29	0.362	0.393	4.883
TILL-3	4.163	57.67	1.37	9.46	3.255	3.70	321.38	0.347	0.424	4.756
TILL-3	4.134	53.21	0.97	8.84	3.304	4.03	314.95	0.365	0.416	4.864
TILL-3	4.104	55.36	1.48	9.19	3.286	3.74	315.02	0.387	0.437	5.014
TILL-3	4.211	56.81	1.08	9.53	3.389	4.03	310.06	0.388	0.423	4.808
TILL-3	4.156	54.15	1.03	9.17	3.301	3.18	307.40	0.381	0.321	4.600
TILL-3	4.076	56.71	1.36	9.64	3.367	3.08	319.81	0.364	0.344	4.604
TILL-3	4.293	54.14	1.00	8.29	3.047	3.15	310.43	0.386	0.465	4.601
TILL-3	4.297	54.00	0.99	9.03	3.119	3.07	311.42	0.352	0.448	4.629
TILL-3	4.281	52.98	0.72	8.62	3.519	3.36	298.19	0.430	0.448	4.298
TILL-3	4.245	52.17	0.65	9.75	3.565	3.71	311.42	0.407	0.460	4.826
TILL-3	4.257	54.95	0.20	9.55	3.363	2.53	301.80	0.415	0.446	4.420

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-2	5.505	84.41	5.26	44.248	3.707	131.74	389.10	1-25 redo	NGSA104 Repeats
TILL-2	5.337	85.24	5.02	39.740	3.668	126.03	396.35	1-25 redo	NGSA104 Repeats
TILL-2	5.319	80.00	5.22	36.872	3.679	123.95	380.39	1-25 redo	NGSA105 Repeats
TILL-2	5.576	84.14	5.36	43.315	3.780	136.75	388.74	1-25 redo	NGSA105 Repeats
TILL-2	5.350	78.36	5.06	39.444	3.908	123.99	379.94	1-25 redo	NGSA106 Repeats
TILL-2	5.353	81.81	4.74	41.120	3.899	125.86	383.93	1-25 redo	NGSA106 Repeats
TILL-2	5.406	79.50	5.02	39.665	3.706	129.27	381.95	1-25 redo	NGSA107 Repeats
Till 2	5.317	81.03	4.25	43.990	3.785	132.30	359.20	26-50	ngsa050bb
Till 2	5.309	79.01	4.14	37.240	3.809	134.10	365.80	26-50	ngsa050bb
Till 2	5.361	81.56	4.33	36.590	3.755	141.10	363.90	26-50	ngsa050bb
Till 2	5.415	80.82	3.96	43.110	3.712	135.50	351.50	26-50	ngsa050bb
Till 2	5.399	78.64	4.24	36.360	3.782	136.50	360.70	26-50	ngsa050bb
Till 2	5.363	80.80	4.30	41.320	3.802	148.20	365.40	26-50	ngsa051z
Till 2	5.377	83.25	4.24	40.030	3.718	144.70	361.50	26-50	ngsa051z
Till 2	5.307	76.29	5.00	36.569	3.619	123.99	371.23	1-25 redo	NGSA103 Repeats
Till 2	5.221	78.79	4.91	36.953	3.521	122.31	376.45	1-25 redo	NGSA103 Repeats
Til-2	5.855	81.32	5.08	37.500	3.714	132.50	396.90	26-50	NGSA028a
Til-2	5.788	81.25	4.92	36.760	3.726	126.80	401.60	26-50	NGSA028a
TIL-2C	5.773	78.15	5.25	41.210	3.876	126.90	381.30	26-50	NGSA026B
TIL-2C	5.840	79.70	5.04	42.520	3.785	124.50	387.00	26-50	NGSA026B
TIL-2C	5.714	79.72	4.73	42.030	3.815	131.50	387.50	26-50	NGSA027B
TIL-2C	5.792	80.32	4.66	41.320	3.789	128.50	393.70	26-50	NGSA027B
TIL-2C	5.766	80.82	4.73	42.680	3.852	130.40	398.30	26-50	NGSA027B
TIL-2C	5.727	81.80	4.64	39.870	3.692	128.70	392.60	26-50	NGSA027A
Average	5.6049	79.1752	4.9522	40.6631	3.8097	131.8578	384.5112		
RSD	4%	3%	10%	6%	3%	4%	4%		
till 3	1.818	61.80	0.40	15.820	1.391	55.18	210.90	26-50	ngsa050bb
TILL-3	1.833	62.95	0.50	16.630	1.464	55.06	220.30	26-50	ngsa041a
TILL-3	1.798	65.35	0.42	17.720	1.410	61.41	226.80	26-50	ngsa041a
TILL-3	1.928	63.27	0.64	16.270	1.373	56.82	219.20	26-50	ngsa041b ngsa042a
TILL-3	1.887	65.24	0.52	16.960	1.423	54.21	222.20	26-50	ngsa041b ngsa042a
TILL-3	2.122	60.46	0.87	15.350	1.466	58.31	229.30	51-75	ngsa064b
TILL-3	1.877	67.82	0.39	17.386	1.589	58.44	227.98	1-25 redo	NGSA106 Repeats
TILL-3	1.919	64.45	0.74	15.418	1.543	57.01	223.78	1-25 redo	NGSA107 Repeats
TILL-3	1.824	65.77	0.48	16.393	1.375	58.55	228.82	1-25 redo	NGSA108 Repeats
TILL-3	1.795	69.20	0.39	17.610	1.342	58.96	234.08	1-25 redo	NGSA108 Repeats
TILL-3	1.920	65.27	0.59	16.833	1.435	59.70	223.89	1-25 redo	NGSA109 Repeats
TILL-3	1.841	65.82	0.40	16.662	1.540	57.56	223.31	1-25 redo	NGSA109 Repeats
TILL-3	1.775	64.24	0.62	14.153	1.355	61.85	220.51	1-25 redo	ngsa 110
TILL-3	1.845	65.63	0.57	15.517	1.354	58.46	221.64	1-25 redo	ngsa 110
TILL-3	1.822	56.99	0.78	15.543	1.360	55.63	222.91	1-25 redo	NGSA 111
TILL-3	1.848	56.87	0.55	14.816	1.363	57.45	222.24	1-25 redo	NGSA 111
TILL-3	1.918	66.56	0.72	16.152	1.419	57.92	226.66	1-25 redo	NGSA 112
TILL-3	1.890	69.46	0.43	17.058	1.408	58.69	230.60	1-25 redo	NGSA 112
TILL-3	1.876	65.28	0.69	16.090	1.514	57.35	221.62	1-25 redo	NGSA 113
TILL-3	1.912	65.68	0.58	15.820	1.548	59.31	223.79	1-25 redo	NGSA 113
TILL-3	1.896	64.92	0.62	16.143	1.469	58.22	219.04	1-25 redo	NGSA 114
TILL-3	1.902	66.76	0.40	16.302	1.489	56.79	226.50	1-25 redo	NGSA 114
TILL-3	1.877	64.34	0.83	16.440	1.549	60.00	222.16	1-25 redo	NGSA 115
TILL-3	1.922	62.26	0.61	16.235	1.445	57.18	218.25	1-25 redo	NGSA 115
TILL-3	1.942	64.86	0.57	15.878	1.486	58.18	222.39	1-25 redo	NGSA 116
TILL-3	1.983	64.71	0.36	15.748	1.397	58.99	217.00	1-25 redo	NGSA 116
TILL-3	1.904	62.50	0.76	15.394	1.435	63.92	218.18	1-25 redo	NGSA 117
TILL-3	1.898	65.32	0.52	15.971	1.386	59.03	216.75	1-25 redo	NGSA 117
TILL-3	1.899	63.60	0.67	15.826	1.434	56.68	218.19	1-25 redo	NGSA 118
TILL-3	1.886	68.71	0.39	16.676	1.487	55.39	226.27	1-25 redo	NGSA 118
TILL-3	1.887	63.52	0.52	16.328	1.414	57.92	226.28	1-25 redo	NGSA 119
TILL-3	1.915	63.71	0.57	16.651	1.422	60.10	228.41	1-25 redo	NGSA 119
TILL-3	2.048	67.23	0.67	15.957	1.370	58.87	221.93	1-25 redo	NGSA 120
TILL-3	2.012	69.45	0.42	16.941	1.335	57.87	219.00	1-25 redo	NGSA 120
TILL-3	1.868	63.94	0.71	16.032	1.559	57.33	222.11	1-25 redo	NGSA 121
TILL-3	1.849	64.80	0.46	16.038	1.505	53.57	224.05	1-25 redo	NGSA 121
TILL-3	1.906	65.19	0.57	16.567	1.343	60.52	220.54	1-25 redo	NGSA 122
TILL-3	1.930	68.07	0.46	16.989	1.377	56.45	228.50	1-25 redo	NGSA 122
TILL-3	1.957	64.06	0.45	16.309	1.404	54.89	223.20	1-25 redo	NGSA 123
TILL-3	1.945	64.70	0.63	15.668	1.503	51.51	218.39	1-25 redo	NGSA 123
TILL-3	1.988	67.74	0.48	17.083	1.508	50.49	214.95	1-25 redo	NGSA 123
TILL-3	1.917	63.46	0.64	15.980	1.394	61.59	223.57	1-25 redo	NGSA 124
TILL-3	1.878	66.50	0.48	15.764	1.463	61.71	225.02	1-25 redo	NGSA 124
TILL-3	1.917	66.40	0.55	16.056	1.402	56.33	225.88	1-25 redo	NGSA 125
TILL-3	1.848	67.76	0.35	16.234	1.462	56.73	227.03	1-25 redo	NGSA 125
TILL-3	1.858	62.80	0.63	16.266	1.385	52.40	224.94	1-25 redo	NGSA 126
TILL-3	1.918	66.96	0.51	16.828	1.465	54.89	229.79	1-25 redo	NGSA 126
TILL-3	2.032	64.28	0.77	15.810	1.297	57.46	222.89	1-25 redo	NGSA 127
TILL-3	2.052	67.49	0.52	16.599	1.371	64.49	222.19	1-25 redo	NGSA 127
TILL-3	2.035	67.57	0.51	16.224	1.391	57.46	221.69	1-25 redo	NGSA 127
TILL-3	1.827	61.88	0.69	16.226	1.386	55.12	220.66	1-25 redo	NGSA 128
TILL-3	1.853	63.52	0.46	15.841	1.405	59.83	221.64	1-25 redo	NGSA 128
TILL-3	1.818	63.33	0.43	15.509	1.454	57.23	219.92	1-25 redo	NGSA 128
TILL-3	1.830	64.04	0.68	16.029	1.386	57.47	220.02	1-25 redo	NGSA 129
TILL-3	1.786	65.94	0.37	16.102	1.332	56.25	220.94	1-25 redo	NGSA 129
TILL-3	1.807	62.75	0.75	15.541	1.448	54.41	221.70	1-25 redo	NGSA 130
TILL-3	1.765	64.10	0.51	15.424	1.381	56.34	221.95	1-25 redo	NGSA 130
TILL-3	1.845	64.17	0.75	15.697	1.402	61.61	217.75	1-25 redo	NGSA 131
TILL-3	1.884	68.50	0.43	17.402	1.485	63.86	214.67	1-25 redo	NGSA 131
TILL-3	1.841	65.70	0.75	15.775	1.508	55.31	220.38	1-25 redo	NGSA 132

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	SAMPLEID	INFO	DATE_TIME	Ag 107 (ppm)	As 75 (ppm)	Ba 137 (ppm)	Be 9 (ppm)	Bi 209 (ppm)	Cd 111 (ppm)
METHOD:				ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:				0.03	0.4	0.5	1.1	0.02	0.1
TILL-3	039SMPL.D	NGSA06Z	17/06/2010	0.978	81.53	494.41	1.52	0.333	0.82
Average				0.9741	81.4999	490.7178	1.4068	0.3283	0.1380
RSD				7%	3%	2%	32%	6%	132%
TILL-4	010SMPL.D#	NGSA064B	6/11/2009	0.227	103.60	384.60	3.62	47.780	0.05
WRIS	036SMPL.D#	NGSA030B	4/06/2009	0.040	9.68	467.60	2.17	0.336	0.26
WRIS	075SMPL.D#	ngsa041b	26/06/2009	0.097	11.08	483.60	2.00	0.328	0.14
WRIS	087SMPL.D#	NGSA050b	11/08/2009	0.102	8.39	454.90	2.41	0.445	0.34
WRIS	040SMPL.D#		11/08/2009	0.116	8.28	458.70	2.63	0.430	0.18
WRIS	013SMPL.D#	NGSA064B	6/11/2009	0.089	9.60	467.60	1.80	0.404	0.05
WRIS	011SMPL.D	ngsa082a	23/02/2010	0.105	8.82	455.98	3.24	0.413	0.18
WRIS2	041SMPL.D#	ngsa047b	30/07/2009	0.015	8.76	465.30	3.34	0.483	0.05
WRIS2-A	010SMPL.D		3/03/2010	0.098	8.70	450.53	1.77	0.417	0.18
WRIS2-B	012SMPL.D		3/03/2010	0.089	10.33	477.10	2.04	0.418	0.31
WRIS2-C	014SMPL.D		3/03/2010	0.092	9.40	467.97	2.80	0.396	0.13
Average				0.0842	9.3050	464.9281	2.4179	0.4071	0.1816
RSD				37%	10%	2%	23%	11%	53%

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ce 140 (ppm)	Co 59 (ppm)	Cr 52 (ppm)	Cs 133 (ppm)	Cu 63 (ppm)	Dy 163 (ppm)	Er 166 (ppm)	Eu 153 (ppm)	Ga 71 (ppm)	Gd 160 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.03	0.1	0.5	0.1	0.2	0.1	0.03	0.03	0.1	0.03
TILL-3	38.484	13.98	123.17	1.87	21.16	2.46	1.407	0.800	12.65	2.703
Average	38.3102	14.0786	126.0709	1.9206	22.2124	2.4632	1.4142	0.8218	13.7799	2.7707
RSD	2%	2%	2%	4%	14%	4%	6%	6%	7%	3%
TILL-4	76.630	7.93	46.71	12.98	240.40	5.51	3.196	1.116	15.82	5.456
WRIS	77.630	22.12	119.60	6.29	30.80	5.15	2.979	1.361	14.08	5.766
WRIS	75.510	21.74	115.80	6.41	27.00	4.85	2.668	1.355	14.67	5.657
WRIS	75.450	21.60	124.80	6.17	27.67	4.57	2.864	1.475	14.41	5.785
WRIS	74.080	21.84	129.80	6.14	27.25	4.74	2.785	1.438	13.24	5.703
WRIS	75.060	21.29	117.20	6.23	28.04	5.21	2.848	1.415	15.02	5.614
WRIS	77.528	22.08	125.66	5.84	27.72	5.29	2.941	1.367	13.65	6.002
WRIS2	76.120	21.48	127.70	6.46	27.26	5.23	2.950	1.473	14.29	5.923
WRIS2-A	74.387	21.46	121.41	5.81	29.14	4.97	2.899	1.365	12.84	5.722
WRIS2-B	78.624	23.09	131.69	5.96	28.67	5.33	3.063	1.374	15.61	6.112
WRIS2-C	76.585	22.26	127.52	5.79	27.59	5.10	3.049	1.371	14.60	6.017
Average	76.0973	21.8962	124.1178	6.1104	28.1131	5.0443	2.9045	1.3994	14.2407	5.8301
RSD	2%	2%	4%	4%	4%	5%	4%	3%	6%	3%

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Ge 74 (ppm)	Hf 178 (ppm)	Ho 165 (ppm)	La 139 (ppm)	Lu 175 (ppm)	Mo 95 (ppm)	Nb 93 (ppm)	Nd 146 (ppm)	Ni 60 (ppm)	Pb 208 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.04	0.04	0.02	0.1	0.02	0.3	0.03	0.1	0.5	0.1
TILL-3	0.465	5.826	0.499	18.76	0.165	0.67	6.965	16.79	39.40	26.56
Average	0.4367	5.6009	0.4767	18.7934	0.1829	0.7552	6.8786	16.8719	48.5141	25.5656
RSD	12%	2%	5%	3%	17%	29%	3%	2%	12%	3%
TILL-4	0.886	10.750	1.127	41.52	0.456	15.55	15.720	32.11	22.01	49.98
WRIS	0.476	7.832	1.029	40.01	0.378	1.14	25.790	33.25	47.74	19.06
WRIS	0.536	7.549	1.022	39.65	0.351	0.92	25.870	31.73	45.83	18.58
WRIS	0.646	7.947	1.018	37.77	0.402	1.12	25.360	33.83	48.04	19.09
WRIS	0.541	7.858	1.004	37.05	0.386	1.01	23.340	32.73	48.28	19.03
WRIS	0.709	8.630	1.021	37.76	0.429	1.45	25.840	32.86	49.42	18.13
WRIS	0.533	8.198	1.077	40.20	0.379	0.95	25.471	33.58	52.11	18.45
WRIS2	0.615	8.232	1.057	38.23	0.402	1.02	25.180	33.69	47.38	19.21
WRIS2-A	0.548	7.864	0.978	38.06	0.385	1.12	24.826	31.89	49.67	17.87
WRIS2-B	0.525	8.826	1.081	39.90	0.405	1.19	26.316	33.51	49.99	18.93
WRIS2-C	0.583	8.797	1.030	39.34	0.415	1.14	26.476	33.17	49.26	18.54
Average	0.5712	8.1733	1.0317	38.7974	0.3934	1.1065	25.4469	33.0242	48.7708	18.6881
RSD	12%	5%	3%	3%	6%	14%	4%	2%	4%	2%

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	Pr 141 (ppm)	Rb 85 (ppm)	Sb 121 (ppm)	Sc 45 (ppm)	Sm 152 (ppm)	Sn 118 (ppm)	Sr 88 (ppm)	Ta 181 (ppm)	Tb 159 (ppm)	Th 232 (ppm)
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
LLD:	0.02	0.2	0.4	0.3	0.04	0.2	0.2	0.02	0.02	0.02
TILL-3	4.307	55.75	0.64	9.39	3.349	2.24	309.67	0.414	0.409	4.160
Average	4.2884	55.6736	0.9778	9.4234	3.3656	3.5462	314.1587	0.4602	0.4243	4.7144
RSD	2%	4%	39%	11%	5%	12%	4%	40%	8%	4%
TILL-4	8.325	161.80	1.33	9.54	6.713	11.53	116.60	1.791	0.993	17.880
WRIS	8.660	96.73	1.58	10.90	7.019	2.68	186.10	1.800	0.980	11.910
WRIS	8.608	98.76	1.35	11.48	6.880	2.38	187.90	1.544	0.919	10.490
WRIS	8.469	92.48	1.11	9.80	6.827	2.27	181.20	1.329	0.982	11.960
WRIS	8.300	93.59	1.26	10.46	7.114	2.27	183.00	1.346	0.968	12.200
WRIS	8.411	94.49	1.35	11.18	6.651	2.64	193.90	2.056	0.956	11.770
WRIS	8.489	91.09	0.77	10.18	7.233	2.55	178.05	1.777	0.994	11.591
WRIS2	8.489	96.42	2.18	9.87	7.315	2.57	190.80	2.187	0.974	12.140
WRIS2-A	7.956	93.67	0.87	9.52	6.497	3.18	173.91	1.696	0.931	11.221
WRIS2-B	8.445	98.46	1.27	10.10	6.942	2.61	187.74	1.805	0.985	11.780
WRIS2-C	8.204	94.70	1.13	9.83	6.998	2.79	185.68	1.752	0.964	11.355
Average	8.4031	95.0390	1.2855	10.3318	6.9476	2.5929	184.8289	1.7292	0.9652	11.6417
RSD	2%	3%	31%	6%	4%	10%	3%	16%	3%	4%

Appendix 16. QC samples analysis by ICP-MS

SAMPLENO	U 238 (ppm)	V 51 (ppm)	W 182 (ppm)	Y 89 (ppm)	Yb 172 (ppm)	Zn 66 (ppm)	Zr 90 (ppm)	Batch	Notes
METHOD:	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
LLOD:	0.02	0.1	0.1	0.05	0.04	0.9	0.2		
TILL-3	1.826	65.14	0.49	15.385	1.437	54.33	223.66	1-25 redo	NGSA_132
Average	1.8918	64.9308	0.5610	16.1651	1.4302	57.6491	222.6051		
RSD	4%	4%	24%	4%	5%	5%	2%		
TILL-4	4.698	65.00	197.30	32.890	3.333	70.84	401.90	51-75	ngsa064b
WRIS	3.451	101.10	4.36	32.450	2.984	88.78	320.00	26-50	NGSA030b
WRIS	3.303	99.54	3.52	30.870	2.656	82.15	320.50	26-50	ngsa041b_ngsa042a
WRIS	3.192	101.10	3.53	31.090	2.871	94.06	303.60	26-50	ngsa050bb
WRIS	3.163	106.50	3.42	31.200	2.715	94.49	304.20	26-50	ngsa051z
WRIS	3.263	98.17	4.19	32.250	2.888	86.95	327.20	51-75	ngsa064b
WRIS	3.347	100.57	3.90	33.106	2.849	90.80	323.90	76-86	ngsa082aa
WRIS2	3.169	107.70	4.32	31.980	2.873	88.33	319.50	26-50	NGSA047B
WRIS2-A	3.166	97.54	3.86	31.602	2.785	80.59	306.73	76-86	NGSA084Aa
WRIS2-B	3.358	104.02	4.04	34.027	3.036	85.89	335.90	76-86	NGSA084Aa
WRIS2-C	3.330	102.74	4.23	33.468	2.978	86.34	339.04	76-86	NGSA084Aa
Average	3.2743	101.8986	3.9387	32.2042	2.8634	87.8379	320.0574		
RSD	3%	3%	9%	3%	4%	5%	4%		