CAMECO - STANDARD SAMPLING METHODOLOGY AND PROCEDURES

AIRCORE SAMPLING METHODOLOGY

Drill spoils from each metre are interrogated using a handheld scintillometer (SPP2) for total gamma. Representative samples are collected from each metre of drilling, and placed in soil chip trays, which are stored in Darwin by Cameco. An Analytical Spectral Device (ASD) reflectance spectrum is recorded from each sample represented in the soil chip trays.

Geochemical sampling is conducted as composite samples of nominal five metre samples, with smaller sample intervals over zones with increased gamma or alteration. Samples collected from were submitted for geochemical analysis to Northern Territory Environmental Laboratories (NTEL) of Darwin, Northern Territory, for a suite of over 50 elements, and 4 lead isotopes by weak acid leach.

Drill Logging codes are summarised in the following Appendix 1.

Appendix 1: Drill Logging Codes

Analytical Methods

Aircore samples are routinely submitted to Northern Territory Environmental Laboratories Pty Ltd (NTEL) in Darwin for sample preparation and multi-element analysis (G400 and G950 analyses; refer to Appendix 2 and Appendix 3). A split of each pulp was submitted to North Australian Laboratories Pty Ltd in Pine Creek for Au, Pt and Pd analysis using Fire Assay with an ICPMS or ICPOES finish (either method is suitable). In total, four separate methods were used to analyse up to 65 elements and four isotopes as follows. In the initial batches of samples, SiO_2 was also determined from a peroxide fusion digest, in order to get more accurate data than the present method of calculating silica from the other major elements and LOI. However these analyses appeared to be no more accurate than those calculated (i.e. total majors were 100% +/- 5%), so analyses for SiO_2 were abandoned.

Prior to 2005 basement samples and sandstone samples were prepared separately by different methods. However due to problems with repeatability in the sandstone data (Garnett, 2005), a total preparation method for all samples was considered the preferred option. NTEL installed a preparation facility in early 2005 and this is now routinely used for all samples (refer to Appendix 2). Basement and sandstone samples are generally still submitted in separate batches to minimise risk of contamination in sandstone samples from the generally higher background levels of many elements in the basement samples. Sample preparation at NTEL involves initial drying at 110°C. The entire sample is crushed to a nominal 2 mm in a Boyd Crusher, then divided using a Rotary Sample Divider to give a ~300-400 g split. The split is milled in a Whisper ring mill to a nominal 75 μm. The material used on the crushing surfaces was selected to be free of contaminant trace metals (the major contaminant is iron) and this was confirmed in tests conducted by Cameco prior to submitting field samples. The Boyd Crusher is flushed with barren blue metal and the ring mills are flushed with garnet sand before and after each sample. The RSD is vacuum cleaned.

The pulp is digested using a mixed acid digest (G400 nitric, hydrochloric, perchloric and hydrofluoric) with a double dehydration with perchloric acid in a Teflon beaker. The digest is read for a suite of elements listed in Appendix 4 including total U, Th, Pb - isotopes chalcophile and rare-earth elements (REE) using either ICPMS (G400M) or ICPOES (G400I) depending on the element. LOI is measured at 1000°C. Boron is measured following peroxide fusion digest. A portion of each sample is then subject to a weak acid leach (Method G950), which is a dilute nitric acid digest. The sample is read using ICPMS for labile uranium and lead isotopes. It is important to note that with these weak partial leaches the data should not be used in an absolute sense, as the analyses are sensitive to length of time the sample is left in the digest and a small speck of uraninite in the sample will result in a very high result, that might not be repeatable and should only be used relatively as ratios.

Major and Minor Element Geochemical Interpretation Methodology

The Refractory Uranium Index or 'RUI' (nominally U/Zr* 100) is used in this report as a guide to how much uranium is contained in the principal refractory uraniferous silicate phase (zircon) in sandstone, basalt, dolerite and granite (the main rock types in the tenement). This ratio is generally consistent in any given homogeneous rock unit, unless uranium is present as: (i) non-refractory magmatic or hydrothermal uranium-bearing minerals (e.g. uraninite, pitchblende, torbernite); (ii) a lattice component of other silicate phases (e.g. allanite, feldspar, apatite, monazite, baddeleyite) or; (iii) compounds or ligands adsorbed to grain boundaries and clays. These accessory minerals are absent or insignificant

in most samples, and RUI is considered a good proxy for U_G950 (weak acid leach or 'labile' uranium) or can be used effectively in conjunction with this analysis type. If a sample exhibits an RUI above background for its particular rock unit, it is deemed anomalous. Importantly, this ratio is essentially unchanged by the partial dissolution of zircon by hydrothermal fluids.

Loss on Ignition (LOI), SiO2, K2O, CaO, Al2O3, combined Fe2O3 & MgO, and a variety of elemental ratios (e.g RUI, Fe/Mg and Gd/La) are used to ascertain rock types, particularly with RAB or RC chips. In the case of regolith or strongly altered samples, careful interpretation of various geochemical signatures has enabled discrimination of metasedimentary, sandstone, dolerite, amphibolite and granite. To assist this process, Cameco also integrates petrographic studies and PIMA data.

The various elemental concentrations and ratios also act as a gauge of the type and total hydrous aluminosilicate component in the rocks, which enables an accurate assessment of alteration mineralogy and provides quality control for the PIMA data. These geochemical analyses, together with the petrography, RUI and PIMA, permit the assessment of the geochemical behaviour of the rock system during deposition and diagenesis. This, in turn, enables the delineation of alteration systems, which could be associated with uranium mineralisation.

Total carbon is the total calculated weight of carbon present in a rock, in all forms (graphite and organic). Generally, the amount of resistate carbon (i.e graphite or kerogen) present in a metasedimentary rock is proportionately less than the original organic carbon content, as much of the organic material is liberated during metamorphism.

Lead Isotope Interpretation Methodology

^{204}Pb, ^{206}Pb, ^{207}Pb and ^{208}Pb are routinely determined by Cameco as a means of vectoring uranium transport (Holk et al., 2003). Three of the four common isotopes of lead can be produced by the decay of uranium and thorium. ^{204}Pb is the only lead isotope not influenced by these radiogenic processes. ^{206}Pb is the final daughter product of the decay of $_{238}U$ whilst ^{207}Pb is produced during the decay of ^{235}U. The decay of ^{232}Th is responsible for production of ^{208}Pb. For a rock containing uranium and/or thorium, the concentrations of these isotopes are gradually increasing with time while the amount of ^{204}Pb held within the rock remains constant.

The uranium and thorium isotopes responsible for the gradual increase in the concentrations of radiogenic lead with time have variable decay rates. $_{238}^{U}$ has a half-life of 4.47 billion years and $_{235}U$ has a half-life of only 0.70 billion years. For thorium, the half-life of ^{232}Th is 14.01 billion years. These differences in decay rates make it possible to determine fluid history related to radioactive and radiogenic isotopes as follows.

1.   Increasing radiogenic lead concentrations through the decay of uranium -

and thorium-bearing minerals (closed-system scenario).

2.   Post-mineralization precipitation of radiogenic lead during interaction
with basinal fluids and volatiles that have leached lead from uranium or thorium-rich
sources (open-system scenario).

3   The delineation of exploration vectors that may point toward economic
uranium deposits.

The general parameters determined for sandstone analysis are: ^{207}**Pb/^{206}Pb** – a

monitor of the <u>influence of uranium</u> on the system.

- ^{207}Pb/^{206}Pb between 0.95 and 1.15 Indicates <u>no addition</u> of radiogenic lead from
the decay of uranium.

- ^{207}Pb/^{206}Pb between 0.80 and 0.95
<u>Typical range</u> of isotopic ratio for system equilibrated with 'typical' crust.

- ^{207}Pb/^{206}Pb between 0.4 and 0.80
Anomalously low ratio indicates <u>contribution</u> of <u>uranium</u>-source lead to system.

- ^{207}Pb/^{206}Pb < 0.40
Extremely low isotopic ratio indicates <u>major addition</u> of lead formed by the radioactive
decay of <u>uranium</u> to rock.

^{208}**Pb/^{206}Pb** – parameter that determines the <u>relative influence of thorium versus uranium</u> in lead
isotopic system

- ^{208}Pb/^{206}Pb > 2.5
<u>Thorium is dominant</u> element contributing lead to system through radioactive decay.

- ^{208}Pb/^{206}Pb between 1.60 and 2.50
Range of isotopic ratio for system equilibrated with <u>'typical' crust.</u>

- ^{208}Pb/^{206}Pb between 0.5 and 1.60
<u>Greater contribution</u> of <u>uranium</u>-product lead to system.

- ^{208}Pb/^{206}Pb < 0.50
<u>Uranium is dominant</u> (and probably only) radioactive element contributing to
system.

Reflectance Spectroscopy (PIMA)

Reflectance spectroscopy (PIMA) analysis is completed using the PIMA II short-wave infrared
spectrometer on all drill core and outcrop samples collected (Appendix 5). This instrument
measures the reflected energy from a sample in the short wave infrared (SWIR) region of the

energy spectrum. The sampling area on the rock specimen that is measured is permanently marked. Multiple measurements are occasionally taken, particularly if variations in spectral features are noted. The spectra are converted to an ASCII format and processed using "The Spectral Geologist" (TSG) developed by AusSpec International. TSG is routinely used to process all spectral data. The SWIR spectra, once processed, provide a mineral identification utilising internal software pattern matching algorithms called 'The Spectral Assistant' (TSA).

Appendix 5: PIMA and ASD methodology

ASD Reflectance Spectroscopy

Cameco purchased and begun using an Analytical Spectral Device Inc. – Terraspec instrument (ASD) for routine reflectance spectral analysis during 2005. The ASD records similar information to the Integrated Spectronics PIMA instrument, but with a wider wavelength range from the visible through to near infra-red (350nm to 2500nm). The advantage of the ASD is the speed of acquisition of the spectra; a reading every 10 seconds, and the wider spectral range. The spectra are processed using the same methodology as PIMA, with mineral matching processing using The Spectral Geologist software and The Spectral Assistant algorithms.

OUTCROP SAMPLE PROCESSING PROCEDURES

Outcrop samples are routinely divided into two approximately equal halves (appendix 6). One half, (less than 400 g) is used for geochemical analysis (see below). The remainder is used to visually estimate grain size, friability and colour, and measure spectral parameters using the PIMA II spectrometer. This sample is retained within Cameco storage facility in Darwin for reference, but can also be used as a repeat geochemical sample in the event of a lost or erroneous analysis. Small portions of selected samples are sent for thin sectioning, with or without petrographic description (Pontifex & associates). Duplicate samples are submitted for geochemical analysis at a nominal 1 in 20.

Appendix 6: outcrop Sampling Procedures