Annex K: Quality Assurance/Quality Control Procedures for Analyses

1. GENERAL

The consultant shall ensure that sampling data and analytical results are interpretable and representative through a rigorous conformance to analytical Quality Assurance and Quality Control (QA/QC). At a minimum, the consultant shall ensure that the analytical QA/QC procedures outlined in this annex are followed.

1.1 Laboratories must have ISO 17025 certification for all parameters and relevant media.

1.2 The consultant must incorporate a series of external checks to assess the performance of the analytical laboratory. As a minimum, these shall include:

a) Use of an appropriate coding system for submitting blind duplicates to the analytical laboratories. A chain of custody will be established to trace the movement and handling of samples from the field to their final destinations; and,

b) Blind field duplicates for at least 10% of samples are to be submitted to the consultant's second laboratory for an inter-laboratory comparison. The field duplicates shall be collected from a relatively homogeneous substrate such that the expected composition of the sample and its duplicate are similar. When analyte concentrations vary by 30% or more, the consultant will need to provide an explanation.

1.3 The analytical laboratories must incorporate and report the results of internal checks used to assess the accuracy, reliability and reproducibility of the data on the certificates of analysis. As a minimum, the checks shall include:

a) Analyses of samples in batches;

b) Each batch will include the analyses of one sample of standard or certified reference material, or spiked standards where these are not available;

c) Each batch will include at least one analytical (lab) duplicate; and,

d) Each batch will include at least one analytical blank.

1.4 Acceptable QA performance is as follows:

a) For organic analyses, all analytical duplicates are to exhibit less than 20% relative standard deviation on average, and no more than 30% for a specific set;

b) For inorganic elements, all analytical duplicates must exhibit less than 15% relative standard deviation on average, and no more than 20% for a specific set;

c) Analytical results for all reference materials or spiked standards must be within 10% of certified values for inorganic elements or 30% of certified values for organic compounds; and,

d) All analytical blanks should be below the detection limits used for the analyses.

1.5 Review of the analytical data shall take place in concert with external QA checks (inter-laboratory duplicates) and internal checks (analytical duplicates, reference materials, spiked standards, analytical blanks, field blanks, equipment blanks, travel blanks) and shall be reported in the monitoring reports. Internal laboratory QA data must also be included within the monitoring reports. The certificates of analyses shall include a description of how any of these items may impact the interpretation of results obtained:

a) The condition of the samples they received (e.g. temperature of the cooler, moisture content, legibility of labels, chain of custody);

b) Sample containers (i.e., were appropriate containers used?);

c) Holding times;

d) Head space, and confirmation that preservatives were NOT used for inorganic element samples;

e) Confirmation that water samples were NOT filtered;

f) Integrity of sample containers;

g) Laboratory QA/QC, duplicates, blanks and RPD results; and,

h) Any other relevant observations that could impact interpretation of results. Note, all laboratory qualifying data must be reported outlining any limitations or considerations in result interpretation.