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METHOD STATEMENT PREPARATION OF SOIL, SLUDGE AND SEDIMENT

INTRODUCTION

In general, only a small aliquot of the total sample is required for a chemical analysis. Furthermore, more than one aliquot will be required if the analyses dictate that the sample be treated in different ways prior to analysis. Hence, it is imperative that aliquots taken from a sample are truly representative of the whole sample.

Soil extracted from trial pits is inherently heterogeneous and care must be taken to ensure that a representative sample is obtained from the pit. It is good practice to collect at least four sub-samples and combine these to give a relatively large (1 kg) composite sample for each monitoring point. Even so, it is likely that the coefficient of variation (CV) in analytical results for samples of nominally the same material would be in the range 50 – 100 %.

PRINCIPLE

The laboratory assumes that a received sample is heterogeneous and every effort is made to obtain truly representative aliquots where they are required. In addition, the analysts will select methods which are suitable and appropriate to the needs of the investigation and will ensure that adequate quality assurance procedures are applied. In many cases, visual assessment of samples is extremely informative and in some cases will reveal that a particular analysis is not worthwhile. For example, samples which are contaminated with substantial quantities of coal tar are extremely sticky and cohesive which makes analysis more difficult.

The laboratory prepares samples in a manner which reduces the random error and does not introduce a bias in the analytical result. Hence, the uncertainty of the analytical measurement on aliquots taken from a sample received by the laboratory is usually small in comparison to that introduced by sampling and sub-sampling. Therefore, a result pertaining to a particular location is often of less significance than the overall characterisation of a site. To obtain useful results from site sampling and sub-sampling, the analytical method must:

- Be able to measure reliably the parameter of interest.
- Have an appropriate detection limit.
- Have a known response to possible interfering species.
- Be suitable in terms of time and cost.

The procedure described herein regarding the sample preparation of soils, sludges and sediments covers the first important aspect towards providing an accurate and reliable result i.e. the sub-sampling of the original 'as received' material.

SOIL SLUDGE AND SEDIMENT SAMPLES

The sample container, usually a bag or jar, is opened and a suitable amount (at least 100 g) is transferred into a shallow aluminium tray labelled with the unique sample reference.



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Clods and or lumps are broken up by hand. Stones, metal artefacts and fibrous non-crushable materials are excluded. In cases where correction for 'stones and moisture' is required, the weights of material, stones and residue are recorded before drying. The remainder of the original sample is retained until disposal is authorised by the Laboratory Manager.

If the sample requires analysis of volatile determinands, a separate sample in a 40 ml vial should be supplied. In instances where this has not been supplied, a suitable portion of the 'as received' sample will be utilised.

PERFORMANCE CHARACTERISTICS

SUBSTANCES DETERMINED

Not Applicable

RANGE OF APPLICATION

This procedure is suitable for the ICRCCL range of analytes and many organic parameters.

LIMIT OF DETECTION

Not Applicable

REFERENCES

- The Sampling and Initial Preparation of Sewage and Waterworks' Sludges, Soils, Sediments, Plant Materials prior to Analysis, 1977, HMSO
- BS5930: 1999 Code of Practise for Site Investigation
- BS3882: 1994 Specification for Topsoil