

NORPLAN / DACAAR: Proposed method for analysis of soil samples

Samples returned from field should be around 1.5 kg (see document *Soil salinity survey v.1.0*).

1. The samples should be spread out on a clean tray and allowed to dry at ambient room temperature at the laboratory. The location for drying must be clean and dust-free. The dried sample should be weighed.
2. The sample should then be passed through a clean 2 mm nylon mesh or sieve: this process can be assisted by hand, provided the technician is wearing clean **talcum-free** rubber or latex gloves.

Note that David has purchased some 2 mm mesh, which can be stretched over a simple clean wooden frame to make a sieve.

3. The proportion of the sample passing through the mesh and the proportion retained should be measured by weighing.
4. 20 g of the < 2 mm fraction should be added to a clean 500 mL flask with 400 mL of deionised/distilled water and shaken for 1 hr.
5. The flask should then stand for 20 hours in the laboratory to allow the solid fraction to settle.
6. The supernatant liquid should then be extracted using a clean syringe, filtered through a 0.45 µm filter into a clean flask.
7. The liquid should be analysed for the following:

Electrical conductivity, pH, Na, Ca, Mg, K, $\text{SO}_4^{=}$, HCO_3^- $\text{CO}_3^{=}$, Cl^- , F^- , NO_3^-

Duplicate samples

8. For 50% of the samples delivered to the lab (i.e. 16 of 32 samples), the extraction procedure (Steps 1-6 above) should be duplicated for a second 20 g quantum of the < 2mm fraction.
9. From the supernatant liquid resulting from these 16 duplicates, 100 ml of the supernatant liquid should be filtered into a clean new 100 mL polythene flask and shipped to Norway for duplicate analysis.
10. The remaining supernatant liquid should be analysed in Kabul.

Quality control

11. Additionally, for quality control, c four analyses of distilled/deionised water blanks should be subject to the "shaking/settlement" procedure, before being analysed, *without the addition of any sediment.*

Calculation

12. The concentration (C_{liq}) mg/L in the supernatant fluid can be converted back to a soluble salt content in the air-dried solid (C_{sol}) by the formula:

$$C_{sol} \text{ (mg/kg)} = C_{liq} \text{ (mg/L)} \times 0.4 \times 50 = C_{liq} \text{ (mg/L)} \times 20$$