# Mantle Mapper™

## Sample processing and analysis flow sheet

**Representative rock samples**

A key requirement for successful application of this method is that the sample is fully representative of the kimberlite / phase being evaluated. Approximately 10kg of material per sample is usually sufficient, depending on the indicator mineral content of the kimberlite (or phase) being sampled.

**Receipt and weighing**

**Crushing and screening**

Material is crushed and screened in a multistage process including both jaw crush and rotary crushing techniques to liberate KIMs in the 0.3 to 2.36mm size range.

**Heavy mineral separation**

Heavy liquid separation using Tetrabromoethane (TBE, SG~2.9) is the concentration method of choice.

**Multistage splitting and screening of concentrate**

Concentrates are split where necessary and screened in the following size fractions:
+300µm
+425µm
+710µm
+1000µm

**Indicator mineral sorting and extraction**

Meticulous sorting and extraction of garnet, chromite, ilmenite and Cr-diopside indicator minerals by methods that provide a quantitative indication of mineral abundance as well as a representative suite of grains for chemical analysis (see below).

**Major and minor element compositional analysis of indicator minerals**

Analyses are performed by automated high quality SEM-EDS/WDS equipment. The minimum numbers of grains of each indicator mineral recommended for analysis (provided sufficient grains are present in the sample) are as follows:

| | |
|---|---|
| *High-Cr garnet (≥ 2 wt% $Cr_2O_3$)* | *100* |
| *Low-Cr garnet (<2 wt% $Cr_2O_3$)* | *80* |
| *Chromite* | *60* |
| *Ilmenite* | *50* |
| *Cr-diopside* | *40* |

**Trace element analysis of indicator minerals**

Minimum recommended requirements for trace element analysis are to analyse all G10-type high-Cr garnets (up to a maximum of ~ 30), as well as a compositionally representative population of G9-type high-Cr garnets (up to a maximum of ~20). Trace element analyses are performed using well-calibrated laser ablation ICP-MS methods at the University of Cape Town.

**Laboratory reporting of results**