

RESISTIVITY IMAGING

Description

The resistivity imaging method involves injecting a small current into the ground and measuring the resultant variations in electric potential. Resistivity imaging has come a long way in recent years. New multi-electrode programmable field systems drastically increase data acquisition speed and sophisticated interpretation software allows considerably more detail to be extracted from the data. In certain circumstances it is even possible to collect data using electrodes which can be dragged along the ground.

A wide range of survey geometries including borehole surveys are possible and SenseOre Services customises each survey to meet the requirements of the application.



Multi electrode resistivity system



OhmMapper resistivity system

SenseOre Services was asked if we could map the depth of a clay layer at a mine site. Traditionally the depth of this layer has been determined by drilling, however drilling densities have to be very high to map the rapidly undulating nature of this boundary and are consequently very expensive. SenseOre Services conducted resistivity surveys along parallel lines using the capacitive coupled "OhmMapper" system shown to the left. Data acquisition was rapid as the measurements were made while the electrodes were dragged across the pit at walking speed.

The image below shows one of the resistivity images obtained. The cold colours indicate areas of low resistivity, which are interpreted to be clays, and the warm colours represent the more resistive overlying material. The white line shows the depth of the clay interpreted from previous drilling and there is good correlation between this and the resistivity data.

Resistivity imaging techniques provide good depth resolution and can be used in a wide range of geological conditions. Resistivity imaging has been used successfully for general geological mapping, the detection of cavities, mapping contaminated ground, mapping bedrock and groundwater exploration

