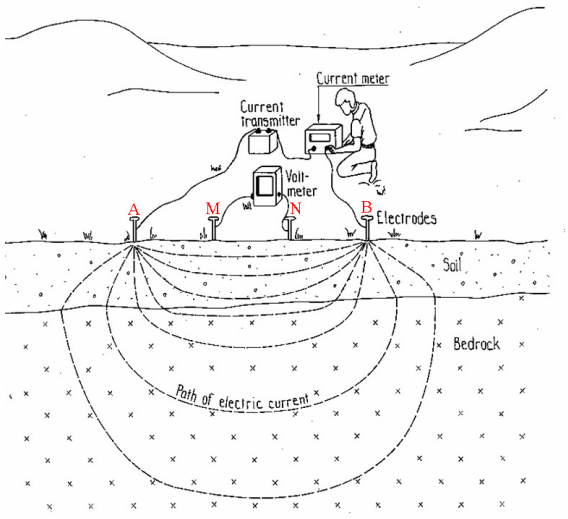
Geoelectrical Imaging

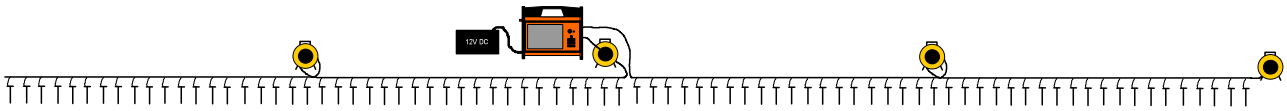
Geoelectrical imaging combining resistivity and induced polarization (IP) surveying has shown great potential for environmental monitoring at landfill sites and other locations that have been polluted, for example old industrial sites. Detection of landfill gas migration has been shown to be possible using resistivity and IP.

Resistivity and IP surveying is based on measurement of the potential distribution arising when electric current is transmitted to the underground via electrodes (see principle sketch below). The electrical resistivity of soil materials generally depends on the moisture content, temperature, porosity, and on the pore water salinity. Multi-electrode data acquisition systems (see below) allow time and cost efficient mapping of the subsurface space in 2D and 3D, and can also be configured for 4D (monitoring).

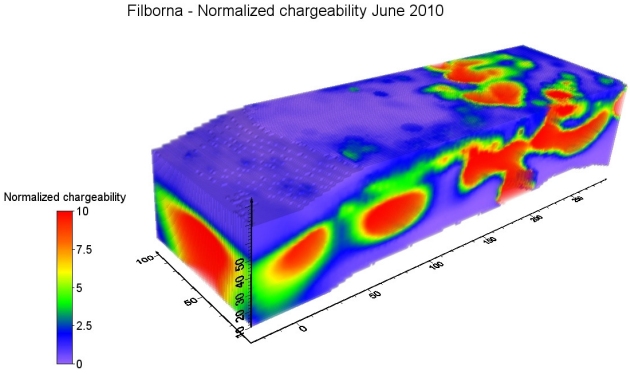
Geoelectrical data acquistion and differential GPS postionining



Principle of geoelectrical surveying (modified from Robison and Coruh 1988)



Sketch of multi-electrode data acquistion system (not to scale)



Example result reflecting internal structure of waste deposit

Multi-electrode data acquisition system

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http://www.geoelectrical.com/coursenotes.zip