Groundwater Applications

International studies indicate that there will be a severe global shortage of water by 2023, particularly in developing nations. This shortage reflects increasing consumption, exhaustion of existing supplies, and contamination of sources.

As organizations seek methods for detecting new sources, one technique of interest is VLF -- an electromagnetic geophysical technique that is effective for detecting lateral changes in subsurface electrical properties. Applications include:

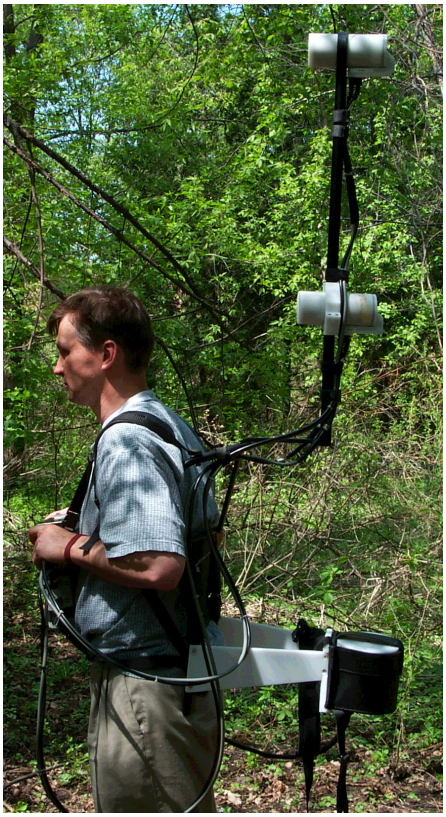
- Locating water bearing fractures in bedrock.
- Locating conductive faults and dykes in mineral exploration.
- Performing groundwater resource studies: mapping and plume delineation.
- Geologic mapping.

For water detection, VLF can be used on its own or combined with EM, resistivity and/or seismic methods for sighting water wells and for delineating contaminant pathways in bedrock.

Some studies indicate that VLF for water detection is limited to 40 to 65 metres; whereas others show successful drilling of wells to a depth of 150 to 200 metres (http://www.scientificexploration.org/jse/articles/betz/11.html). Combination with other methods and satellite photo data may provide additional information on which to make drilling decisions.

VLF Principles

The method is based on the physical phenomenon that conductive structures on the surface or underground, even when covered with thick overburden, change the direction and strength of the field generated by remote communication transmitters located around the world.



GEM's VLF system is a state-of-the-art system that enables you to acquire data simultaneously from up to 3 transmitter frequencies. Data include in-phase, out-of-phase, horizontal component (x), horizontal component (y), and field strength in pT.

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