



MINERAL SANDS DELINEATION AND SEISMIC STATIC CORRECTIONS

Global Experience

Groundradar Inc staff are the world leaders in the application of ground penetrating radar (GPR) technology to mineral sands and seismic static correction applications. To date, projects have been conducted in Canada, the USA, Brazil, South Africa, Madagascar, Libya, the UAE, Oman and Australia.

Radar Applications in Sand Dunes

In sands with resistivities greater than 1000 Ωm , penetration depths of over 80 m are often possible using Groundradar's proprietary UltraGPR technology. In addition to being able to map the base of dunes for seismic static corrections, UltraGPR has a proven track record of providing the highest resolution images of dune morphology possible. This detail may be used to delineate regions of calcrete or organic media which may impact dredge mining operations.

For deeper deposits, a custom long-range GPR system is employed, which has achieved penetrations beyond 120 m in mineral sand deposits. Although fine detail of sand bedding is not commonly visible with this powerful system, surveys often involve a combined approach of UltraGPR for detailed imaging to 80 m and the long-range system for deeper imaging of the base of sands.



Groundradar
Measured resources



UltraGPR requires a narrow cut line or trail, rather than the 3 m wide smooth roads necessitated by commercial GPR systems. Not only does this dramatically reduce the environmental impact of surveying, but site preparation logistics and costs are minimized. In addition, by towing the unit behind the surveyor, large areas may be covered in a single day.

Real-Time Sampling GPR

UltraGPR has been designed specifically to achieve the deepest penetration and highest resolution possible for exploration of alluvial paleochannels. Real-time sampling technology has enabled the imaging of deeper targets than ever before possible, with depths of 80 m possible in suitable conditions. In profiles with high clay ratios which are typically poor radar environments, penetrations of up to 25 m have been achieved.

By eliminating all wires and fiber optic cables, as well as cumbersome control units and batteries, UltraGPR has been reduced to a single 9 m long tube. The traditional laptop computer used on commercial GPR systems has been superseded by the use of a mobile phone or PocketPC to control acquisition parameters and store data. Communication between components employs Bluetooth technology. The unit is waterproof and can be deployed over the most challenging of terrains.

UltraGPR is the fastest, most cost-effective, and highest-resolution geophysical methods available to image the near surface, provided suitable ground conditions are present. GPR is best deployed in conditions where ground resistivity is relatively high. Although sands are generally highly resistive, factors such as saline groundwater or the presence of thick calcrete may inhibit GPR penetration.

