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## Geohazard Assessment – Residential Development, Al Ain, UAE

In October 2009, GES Geotech was retained by ParklandGEO International to carry out an investigation to detect and identify sinkholes in Al Ain, UAE. After carrying out a desk study and based on previous experience, GES concluded that the best results for investigating karstic limestone settings and subsurface cavities would be achieved through a combination of different geophysical methods. Work included applying a suite of geophysical techniques over an area of approximately 13 square kilometers. Geophysical techniques included:

- ERT Survey
- CCR Imaging
- GPR Survey
- Microgravity Survey
- Seismic Refraction Survey
- 3-dimensional Cross Hole Seismic Tomography
- Borehole Investigation

GES conceptualized 4 stages of systematic investigation comprising a combination of the methods mentioned above.



In July 2010, GES Geotech started fieldwork and investigation in Al Ain. Work started with the preliminary field screening stage, which included the CCR survey. Second stage was the preliminary field screening calibration, which utilized the use of ERT survey to provide a basis for calibration between CCR method and historical survey methods. Third stage, advanced field screening, included the microgravity and GPR survey. The use of both methods was recommended by GES to cross-check the results obtained by each method of Investigation. Final stage, Detailed Geophysical Investigation, included the seismic refraction, cross hole seismic tomography and borehole investigation.

Applying a suite of geophysical techniques over the subject site provided a means of calibrating the other geophysical survey techniques and data analysis for accurate results.

GES proved that a combination of geophysical survey techniques was necessary for successfully detecting voids in karstic limestone settings.