

# GEOPHYSICS AS A GROUND INVESTIGATION TOOL

Keele University is delighted to invite RSK's award-winning ground investigation experts to give a seminar on the latest developments in geophysical technologies and techniques, and their use in state-of-the-art ground investigations.

The course will provide a detailed overview of the most commonly used geophysical techniques, and how the data should be acquired and processed effectively in a commercial environment.

Networking sessions will allow delegates to share experiences, and students and potential employers to connect.

All delegates are invited to tour the Keele Sustainability Hub and learn more about Keele's research in this area.

## DATE

19 March 2013

## VENUE

Keele University Sustainability Hub,  
Home Farm, Keele University, Keele, ST5 5AA

## AGENDA

- 10.00–12.00** Commonly used and useful geophysical techniques – How they work and what to do with the data
- 12.30–14.00:** Complimentary lunch with networking
- 14.00–16.00:** Understanding and managing the risks of unforeseen ground conditions

## MORNING SESSION

Acquiring and interpreting geophysical data is normally planned as part of an integrated ground investigation in which intrusive investigations calibrate the interpretations of the geophysical data or target anomalies to determine their cause.

This session introduces the basic physical principles of the commonly used near-surface geophysical techniques. The application of each technique to common site investigations targets will be discussed, and the requirements of the specification and planning of the survey will be set out.

### OBJECTIVES

- Provide basic knowledge about each of the commonly used near-surface geophysical techniques
- For each technique, provide an understanding of the processing and manipulation of the data before it is interpretable, with the emphasis on common difficulties and pitfalls
- For each technique, provide an understanding of the interpretation of the data with the emphasis on the context of the data, what can be interpreted with confidence and what might be speculative
- Provide an understanding of how to use information from historical data and maps, previous site investigations or complementary geophysical data sets to obtain the most information from the geophysical data and to understand its limits

### WHO SHOULD ATTEND

Undergraduate and postgraduate students in geosciences and engineering. Those familiar with the commission and use of geophysical survey data in the following sectors: infrastructure asset management; utilities; airports, road and rail; civil engineering; construction management and contracting; conventional, nuclear and renewable power generation and distribution; environmental management.



## AFTERNOON SESSION

Encountering unforeseen ground conditions mid-project can be an expensive problem.

Buried obstructions, waste and contamination, mineshafts, solution features, soft ground, landfills, storage tanks, unexploded ordnance, archaeological features and difficult geology may variously lie in wait.

Often of early concern are buried services. Managing the health and safety risks means getting the right information at the right time. A well-designed investigation can pick up much more than just services at the same cost.

Each project is different. This session will demonstrate how the latest developments in surveying and geophysics can be tailored to understand and reduce the specific risks encountered at any particular stage in a project.

A graphical approach to visualising information and risk will be used to discuss the value and usefulness of different types of intrusive and geophysical site investigation data. Interactive sessions will illustrate when and when not to use geophysics, and, if it is used, how best to integrate it into a site investigation approach. Detailed case studies will illustrate the lessons and objectives.

### OBJECTIVES

- Provide an understanding of how to use information from historical data, maps and previous site investigations to develop a conceptual model of the risk or the need for information in the ground to be investigated
- Provide an appreciation of the relative value of intrusive and geophysical site investigation techniques in delivering information about ground conditions at a site
- Describe a rationale for deciding whether to use geophysics as part of a site investigation
- Provide an overview of the most commonly used geophysical techniques and best practice in using them as part of an integrated site investigation
- Provide awareness of the importance of integrating all the available information into the interpretation of the geophysical data, which is just one part of the site investigation data for producing the interpretative ground model

### WHO SHOULD ATTEND

Professional, technical and management staff in the following areas: infrastructure asset management; utilities; airports, road and rail; civil engineering; construction management and contracting; conventional, nuclear and renewable power generation and distribution; environmental management. Undergraduate and postgraduate students in geosciences and engineering.



The Applied and Environmental Geophysics Group at Keele has been at the forefront of development of high-resolution geophysical techniques and their application to environmental/engineering/forensic problems in the UK, Europe and Middle East for many years. Led by Professor Peter Styles, the group specialises in microgravity/microseismic and electromagnetic methods and provides advice and consultancy services for the Comprehensive Nuclear-Test-Ban Treaty Organization; Department for Energy & Climate Change; Department for Environment, Food & Rural Affairs; Nuclear Decommissioning Authority; Ministry of Defence; National Grid; wind farm developers; UK local authorities and engineering companies; and overseas governments including, most recently, Western Australia and Qatar.

**Places are strictly limited. For further information and to book, please contact**

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### COURSE LEADERS

Dr George Tuckwell PhD CGeol CSci, Director of RSK  
Prof. Peter Styles CGeol FRES CSci FIMMM

### COURSE RESOURCES

*Environmental Geophysics: Everything you ever wanted (needed!) to know but were afraid to ask!*

*A reference for geophysical techniques and applications.*



Ground Investigation  
Specialist of the Year 2012