

# Quarterly Journal of Engineering Geology and Hydrogeology

The journal is abstracted and/or indexed in Current Contents, ASCA, Science Citation Index, Groundwater On-Line, Geological Abstracts, International Civil Engineering Abstracts, Petroleum Abstracts, Geotechnical Abstracts, GeoArchive, GeoRef and Geobase.

Advertising sales: Please contact Jonathan Knight, Century One Publishing Limited, Alban Row 27–31 Verulam Road, St. Albans, AL3 4DG, UK (tel: 01727 893894; direct line: 01727 739193; e-mail: [jonathan@centurypublishing.ltd.uk](mailto:jonathan@centurypublishing.ltd.uk))

## CONTENTS – Volume 44, Part 2, May 2011

### Research Articles

#### Groundwater and the law

A.N. Charalambous 147

#### A review of hydrogeology and water resources on the Isle of Wight

L. Maurice, M. Packman & P. Shaw 159

#### Stable isotope evidence for the hydrogeological characteristics of clay-rich till in northern East Anglia

K.M. Hiscock, M.A. George & P.F. Dennis 173

#### The application of analytical solutions to the thermal plume from a well doublet ground source heating or cooling scheme

D. Banks 191

#### A neural network approach to predict the performance of recycled concrete used in permeable reactive barriers for the treatment of acidic groundwater

B. Guruprasad, B. Indraratna, L.D. Nghiem & G. Regmi 199

#### Refraction microtremor (ReMi) to determine the shear-wave velocity structure of the near surface and its application to aid detection of a backfilled mineshaft

M.G. Raines, D.A. Gunn, D.J.R. Morgan, G. Williams, J.D.O. Williams & S. Caunt 211

#### Sinking a jacked caisson within the London Basin geological sequence for the Thames Water Ring Main extension

T.G. Newman & H.-Y. Wong 221

#### Reactivation of landsliding following partial cliff stabilization at Barton-on-Sea, Hampshire, UK

M.E. Barton & P.M. Garvey 233

#### Landslide mechanism analysis in the Three Gorges based on cloud model and formal concept analysis

X. Wang, R. Niu & Y. Wang 249

#### The identification, appraisal and assessment of hazards on quarry rock faces in terms of the UK Quarries Regulations

G.D. Matheson & G.M. Reeves 259

### Technical Note

#### Particle size distribution of dune sand from Libya

J.H. Charman & G. West 277

*Quarterly Journal of Engineering Geology and Hydrogeology* (ISSN 1470-9236) is published in February, May, August and November by the Geological Society Publishing House for the Geological Society, London. The Geological Society, Burlington House, Piccadilly, London W1V 0JU.

**Subscription rates 2011 (volume 44, 4 parts).** More information about subscription options can be found at <http://www.geolsoc.org.uk/LyellCollection>. Journal Subscriptions Department, Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath, UK, BA1 3JN (tel 01225 445046; fax 01225 442836; e-mail: [sales@geolsoc.org.uk](mailto:sales@geolsoc.org.uk)). The subscription prices for 2011 to institutions and non-Fellows is: UK, £380+VAT (online only), £494.08+VAT (online + print); EU, £425+VAT (online only), £468+VAT (online + print); Rest of World, £425 (online only), £468 (online + print).

Outside Europe, the Journal is dispatched by various forms of airspeeded delivery; Periodicals Postage paid at Rahway, NJ. POSTMASTER: send address corrections to the Quarterly Journal of Engineering Geology and Hydrogeology, c/o Mercury International, 365 Blair Road, Avenel, NJ 07001. Back numbers are normally dispatched by surface mail.

© 2011 The Geological Society of London. Except as otherwise permitted under the Copyright, Designs and Patents Acts, 1988, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency Ltd, Saffron House, 6–10 Kirby Street, London EC1N 8TS, UK. Enquiries concerning reproduction outside these terms should be sent to the Publishers at the Bath address. Users registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA: the item-fee code for this journal is 1470-9236/11/\$15.00. The Geological Society makes no representation, express or implied, with regard to the accuracy of the information contained in this publication and cannot accept any legal responsibility for any errors or omissions that may be made. No responsibility is assumed by the publisher for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein. Inclusion of advertising in this publication does not constitute a guarantee or endorsement of the quality or value of such product or of the claims made of it by its manufacturer.

**Cover Photograph.** The surface rupture of the previously unmapped Greendale Fault extended west–east for 28 km across gravel-dominated alluvial plains west of Christchurch, New Zealand, during the shallow-focus (c. 10 km depth),  $M_w$  7.1 Darfield Earthquake which struck at 4.35 am on 4 September 2010 (New Zealand Standard Time). Along the central 14 km of surface rupture, 2 to 5 m of right-lateral displacement is distributed across a 30 to 150 m wide deformation zone, via Riedel shears, conjugate Riedel shears, horizontal flexure and decimetre-amplitude anticlinal bulging. In this aerial view looking NW, the deformation zone is up to 40 m wide, and the right-lateral displacement is 3 to 4 m. The photograph was taken 12 hours after the earthquake by Richard Jongens (GNS Science, member of the University of Canterbury & GNS Science Fault Rupture Response Team).