

GEOLOGICAL SOCIETY SPECIAL PUBLICATION NO. 458

# Geomechanics and Geology

EDITED BY

J. P. TURNER

Radioactive Waste Management Ltd, UK

D. HEALY

University of Aberdeen, UK

R. R. HILLIS

Deep Exploration Technologies Co-operative Research Centre, Australia

and

M. J. WELCH

Technical University of Denmark, Denmark

2017

Published by  
The Geological Society  
London

# Contents

Acknowledgements	vii
TURNER, J. P., HEALY, D., HILLIS, R. R. & WELCH, M. J. Geomechanics and geology: introduction	1
ADDIS, M. A. The geology of geomechanics: petroleum geomechanical engineering in field development planning	7
TAVENER, E., FLOTTMANN, T. & BROOKE-BARNETT, S. <i>In situ</i> stress distribution and mechanical stratigraphy in the Bowen and Surat basins, Queensland, Australia	31
TASSONE, D. R., HOLFORD, S. P., KING, R., TINGAY, M. R. P. & HILLIS, R. R. Contemporary stress and neotectonics in the Otway Basin, southeastern Australia	49
ENGLISH, J. M., FINKBEINER, T., ENGLISH, K. L. & YAHIA CHERIF, R. State of stress in exhumed basins and implications for fluid flow: insights from the Illizi Basin, Algeria	89
WYNN, T. J., KUMAR, R., JONES, R., HOWELL, K., MAXWELL, D. & BAILEY, P. Chalk reservoir of the Ockley accumulation, North Sea: <i>in situ</i> stresses, geology and implications for stimulation	113
SIBSON, R. H. The edge of failure: critical stress overpressure states in different tectonic regimes	131
FETTER, M., MORAES, A. & MULLER, A. Active low-angle normal faults in the deep water Santos Basin, offshore Brazil: a geomechanical analogy between salt tectonics and crustal deformation	143
RICHARDSON, C. A. & SEEDORFF, E. Estimating friction in normal fault systems of the Basin and Range province and examining its geological context	155
ROBERTS, J. J., WILKINSON, M., NAYLOR, M., SHIPTON, Z. K., WOOD, R. A. & HASZELDINE, R. S. Natural CO <sub>2</sub> sites in Italy show the importance of overburden geopressure, fractures and faults for CO <sub>2</sub> storage performance and risk management	181
LAHANN, R. W. & SWARBRICK, R. E. An improved procedure for pre-drill calculation of fracture pressure	213
DESCAMPS, F., FAY-GOMORD, O., VANDYCKE, S., SCHROEDER, C., SWENNEN, R. & TSHIBANGU, J.-P. Relationships between geomechanical properties and lithotypes in NW European chalks	227
GILLESPIE, P. & KAMPFER, G. Mechanical constraints on kink band and thrust development in the Appalachian Plateau, USA	245
ENGLISH, J. M. & LAUBACH, S. E. Opening-mode fracture systems: insights from recent fluid inclusion microthermometry studies of crack-seal fracture cements	257
GULMAMMADOV, R., COVEY-CRUMP, S. & HUUSE, M. Geomechanical characterization of mud volcanoes using P-wave velocity datasets	273
Index	293