Editorial

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It is a great privilege and an honour to write the first in a series of regular editorials for *Environmental Geotechnics*, especially during these exciting times for the journal. We are publishing our second volume and have, impressively, had submissions from authors based in more than 140 institutions from more than 30 countries around the world. These facts speak of the global appeal of the problems and topics we set out to promote when we published the first issue last year. So far, we have attracted attention from authors and readers who focus not only on the traditional concerns of soil and geology, water and groundwater, financial aspects of the design and construction, but also share this focus with societal impacts, ecology, aesthetics, air quality, noise and vibration, energy and radiation, traffic and transportation, as well as preserving historical and archaeological treasures.

Continuing with our aim to disseminate knowledge, *Environmental Geotechnics* provides a fresh perspective regarding the basic concepts, theory, techniques and field applicability of innovative testing, and analysis methodologies and engineering practices in geoenvironmental engineering. In this issue you will read about the progress made in the mitigation of environmental impacts, using the state-of-the-art microbiology and polymer engineering as well as the challenges in this field for the future (Rowe, 2015).

Part of these challenges were investigated by Malusis *et al.* (2015) who looked at the influence of semipermeable membrane behaviour on salt diffusion through a geosynthetic clay liner (GCL) by conducting multi-stage membrane tests. They also investigate the correlation between membrane efficiency coefficients and the effective salt-diffusion coefficients. They open the problem field by outlining the challenges in assessing the applicability of their findings for different materials that behave like a membrane.

Thyagaraj and Rao (2015) investigate the behaviour of clay subjected to all potential osmotic flow conditions, such as those for a GCL. Their experimental results highlight the dependency of swelling strains on applied stress, stress paths and osmotic suction gradient, and postulate the irreversibility of the swelling strain.

The stress levels and their effect on crack patterns in argillaceous rocks are investigated by Pellet (2015) who, through observations, shows how crack patterns influence rock properties such as permeability. The paper calls for the proper investigation and characterisation of crack propagation networks in order to assess the reliability and safety of the long-term underground storage of hazardous materials. A solution for this problem could perhaps be using the non-destructive method described in Kato *et al.* (2015),

with which we visualise the internal features of non-transparent objects in terms of geometry and spatial distribution of an object's constituent materials (see Figure 14 in Kato *et al.*, 2015).

This method can also be used to support the findings of Mohamed *et al.* (2015), who verify and validate the superiority of sulfur concrete over the ordinary Portland cement concrete and sulfate-resistant concrete in severely aggressive environments.

To round up this volume, Qian and Koerner (2015) propose a two-part wedge method for the translational failure analysis of landfills with multilayer geosynthetics, where the depth of the shift points varies with changes in the geometry of the waste mass including depth, top width, front slope and back slope.

This method could potentially be used to also assess the stability of slopes under vegetation – another environmental geotechnics topic with global significance – where, over the last 50 years, alterations in land-use coupled with the consequences of climate change have led to severe erosion and landslides. The degradation of mountainous and hilly regions around the world is significant and the prevention of slope instability, the restoration of degraded slopes and the correct management of steep farmed slopes is of utmost importance. The forthcoming 4th International Conference on Soil Bio- and Eco-engineering – ‘The Use of Vegetation to Improve Slope Stability’ (<http://sydney.edu.au/science/geosciences/soil/index.shtml>) may appeal to the readership of *Environmental Geotechnics* because it promises to focus on inter- and multi-disciplinary topics such as the effects of vegetation on slope stability over time and space, the use of vegetation for reversing soil degradation and soil bioengineering case studies. The conference will bring together scientific researchers, practitioners, geotechnical, environmental, and civil engineers, biologists, ecologists, geomorphologists and foresters to discuss various environmental geotechnics topics.

I hope you will enjoy the papers in this issue and, on behalf of the Editorial Panel, would like to encourage you to keep contributing and supporting our journal in the future.

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