PRESS RELEASE

For immediate release

ESG Solutions Drives Innovative Work in Seismic Stress Inversion as a Member of the Ultra-Deep Mining Network

Kingston, Ontario (December 12, 2016) – ESG Solutions, an industry leader in microseismic solutions for the mining, oil and gas and geotechnical industries is pleased to be working with the Ultra-Deep Mining Network (UDMN) to improve safety and productivity in mines through the development of innovative methods focusing on rock stress risk reduction. The Ultra-Deep Mining Network (UDMN) is a national business-led NCE network, managed through the Centre for Excellence in Mining Innovation (CEMI), and supported by members of the mining, oil and gas industries, and with the active participation of mining companies, SMEs, consultants, industry agencies, research facilities and academia. UDMN aims to become the leading organization in Ultra-Deep (below 2.5km) research and innovation and to solve resource extraction difficulties.

"As mining in Canada occurs at greater depths, geotechnical risks are increasing significantly, particularly as they relate to stress within the rock mass," says Damien Duff, UDMN Rock Stress Risk Reduction theme leader and Vice President, Geoscience and Geotechnical R&D at the CEMI. "Failing to address the challenges associated with increasing rock stress introduces unacceptable projects risks." ESG Solutions is examining an innovative approach to estimate rock stress using microseismic data collected during mine operations. Specifically, stress tensor determination from microseismic source mechanisms provides a relatively inexpensive way to assist in the evaluation of induced stress and mine hazard and acquire numerous stress measurements throughout wider volumes of a mine.

Seismic monitoring system installed in an underground mine

"Using microseismic data, mines will also have better opportunities for numerical model calibration and enhanced model forecasting by being able to obtain more accurate stress information from seismic data at remote locations in the mine," says Dr. Dave Collins, Manager of ESG's Mining and Geotechnical Consulting Services Group at ESG Solutions. "Using seismic stress inversion analysis may also help mines increase understanding of failure processes. This can result in improved mine design and safety procedures, contributing to greater operational efficiencies and productivity," says Collins.

ESG Solutions is confident this project will contribute beneficial tools to assist in the safe and effective operation of ultra-deep mines. "We're pleased to contribute to such a ground-breaking initiative as the Rock Stress Risk Reduction theme, and join efforts with a diverse group of solution-providers within the UDMN to create the tools and technologies this industry needs," says Zara Anderson, General Manager of ESG's Mining and Geotechnical Services Group.

About ESG Solutions:

Founded in 1993, ESG Solutions (Engineering Seismology Group or ESG) is a pioneer and leading provider of innovative downhole and surface-based microseismic solutions for the mining, oil and gas and geotechnical industries. ESG helps operators improve safety, optimize production, reduce costs, and mitigate risk associated with underground and open-pit mining, coal seam gasification, hydraulic fracturing, thermal enhanced oil recovery, waste-water injections, natural gas storage, carbon sequestration and geotechnical applications. ESG Solutions is an Operating Company of Spectris plc. ESG is headquartered in Kingston (Canada), with operations in Houston, Denver and Calgary and offices in Dallas, Pittsburgh, Beijing, Brisbane, and Dubai. www.esgsolutions.com

About Spectris plc:

Spectris plc is a leading supplier of productivity-enhancing instrumentation and controls. Headquartered in Egham, Surrey, United Kingdom, the Company employs over 8,000 people with offices in more than 30 countries. www.spectris.com

About UDMN:

The Ultra-Deep Mining Network (UDMN) is a national business-led NCE network, managed through the Centre for Excellence in Mining Innovation (CEMI), and supported by members of the mining, oil and gas industries, and with the active participation of small-to-medium sized enterprises, industry agencies, research facilities and academia. UDMN aims to become the leading organization in Ultra-Deep (below 2.5km) research and innovation and to solve resource extraction difficulties. www.miningdeep.ca

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