Patrick P. Andrieux

ITASCA

Mining Engineering, Geomechanics, Ground Control, Drilling & Blasting

Expertise

Mine Design and Sequencing, Mine Monitoring, Geomechanics, Ground Control, Ground Support, Drilling and Blasting, Blast Monitoring

Education

Ph.D. (Mining Engineering), 2005, Université Laval, Canada

M.Eng. (Mining Engineering), 1996, McGill University, Canada

B.Eng. (Mining Engineering), 1985, École Polytechnique de Montréal, Canada

Registrations

Registered Professional Engineer in the Province of Ontario, Canada

Designated Consulting Engineer in the Province of Ontario, Canada

Registered Professional Engineer in the Province of Quebec, Canada

Professional Affiliations

Member: Canadian Institute of Mining, Metallurgy and Petroleum (CIM), Canadian National Rock Mechanics and Strata Control Committee (RMSCC), International Society of Rock Mechanics (ISRM), International Society of Explosives Engineers (ISEE), Société de l'énergie explosive du Québec (SEEQ)

Patents Granted

Borehole Deviation Monitor, December 1992. Magnetometer-based differential system for surveying the location of deep non-breakthrough drill holes after they have been drilled.

Real-Time Location of Deep Boreholes, April 1998. Passive acoustical system for surveying the location of deep non-breakthrough drill holes while they are being drilled (in real time).

Professional Experience

2000 – Present	*Itasca Consulting Canada Inc., Sudbury, Canada* *Senior Mining, Geomechanics and Drilling & Blasting Engineer, Principal*
1995 – 2000	*Noranda Inc., Brunswick Mine, Bathurst, Canada* *Chief Ground Control Engineer*
1988 –1995	*Noranda Inc., Noranda Technology Centre, Montreal, Canada* *Senior Research Engineer and Program Leader (Drilling & Blasting)*
1985 – 1988	*Miron Limited Open Pit, Montreal, Canada* *Mining and Drilling & Blasting Engineer*

Project Experience

Mining Engineering. Mining strategies, pillar destressing, mining under and through backfill. Pillar extraction (remnant pillars, sill pillars and regional pillars). Experience with various underground mining methods, such as primary-secondary, avoca, pyramidal pillarless, and cut-and-fill, for example. Experience in open-pit mining.

Geotechnical Engineering. Rock mass characterization, three-dimensional numerical modeling, stope design, dimensioning and sequencing. Experience in ground-support systems design, quality control and behavior monitoring, as well as in ground reconditioning. Quantitative seismology. Open-stope wall stability.

Ground Monitoring and Instrumentation. Microseismic monitoring for the assessment of the rock mass response to mining. Non-seismic geotechnical monitoring (GMMs, extensometers, stress cells, borehole camera surveys, laser-based cavity surveys, geophysical surveys, Time Domain Reflectometry).

Blasting Engineering. Drilling and blasting design for surface and underground applications. Large-scale choked destress blasting of mine pillars.

Blast Monitoring and Instrumentation. Full waveform monitoring of blast-induced vibrations on surface (for environmental impact assessment and compliance purposes), as well as underground at various distances (for blast diagnostics, field behavior evaluation and rock-mass damage assessment). Monitoring of the VOD of explosives. Empirical elaboration of site-specific near-field blast vibration level prediction curves. Other project experience includes the measurement of blast-induced damage in the rock mass and the development of instrumentation (both analog and digital seismographs, a remote blast-vibration monitoring system operating through microseismic cable networks, a blasthole deviation survey probe, and a real-time passive location system for deep non-breakthrough blastholes).