

**Consulting Engineer & Director**

<b><i>Expertise</i></b>	Methane and Flammable Gases in Coal, Gold and Platinum Mines, Related Environmental Concerns
<b><i>Education</i></b>	MSc. Engineering (Mining), 1999 University of Witwatersrand, Johannesburg, South Africa  BSc. Mining Engineering (Honours), 1983 University of Strathclyde - Glasgow, Scotland
<b><i>Professional Affiliations</i></b>	Fellow, the Mine Ventilation Society of South Africa
<b><i>Honors</i></b>	Advisor: South African Country Study on Climate Change (SACSCC), Coal Mining Activities  Member: Safety in Mines Research Advisory Committee (SIMRAC), 1992-Present  Project Leader: COALTECH 2020, 2002 - Present  Colliery Environmental Engineering Advisory Group (COLLEEAG), Safety Research Requirements for the Mining Industry, SASOL Representative, 1995-1997.  Referee: Methane-related papers for the 25 <sup>th</sup> International Conference of Safety in Mines Research Institute, Pretoria, 1993.
<b><i>Professional Experience</i></b>	
<i>1997 - Present</i>	<i>Itasca Africa (Pty) Ltd., Johannesburg, South Africa Consulting Engineer and Director</i>
<i>1995 - 1997</i>	<i>SASOL Mining (Pty) Ltd. Coal Division, Johannesburg, South Africa Senior Project Engineer</i>
<i>1985 - 1995</i>	<i>CSIR Division of Mining Technology, (previously COMRO, Chamber of Mines Research Organization), Johannesburg, South Africa Engineer (Gold Mine Backfill Placement), Senior Engineer (Coal Mining Environment), and Project Manager (Coal Mining, Environment)</i>
<i>1983 - 1985</i>	<i>GENCOR, West Rand Consolidated Mines Ltd., Krugersdorp, South Africa, Graduate Mining Engineer</i>

***Project Experience***

*Methane in Mines:* Experience in all factors affecting methane in mine workings: strata characteristics, drainage, atmospheric pressure, detection and monitoring, goafed and old workings, mechanized and conventional mining methods, and ventilation flow and effectiveness. Development of the Methane Rating System for methane emission rates and gas content of coal seams. Approved by the DME in 1998, it is implemented across the industry and has become the SA industry standard method, with a national database in excess of 600 samples. Greenhouse gas emissions, as a member of the SACSP for international agreements, and development of improved greenhouse methane-emission models for the SA coal mining industry.

*Flammable Gas Research:* Flammable gas emission rates into hard rock mines: identifying areas of increased emission and the effect this has on time available to reach flammable limits. Flammable gas mixtures, especially for hard rock mines, and the effect of mixtures on flammable limits and on the accuracy of flammable gas measuring instruments. Flammable gas explosion investigations for both coal and gold mines. Expert witness for explosion enquiries.

*Atmospheric Environmental Conditions:* Consulting for greenhouse gases and other emissions, contamination and respirable dust from open-cast mines, spontaneous combustion in mine discard dumps.

*Continuous Miners, Roadheaders and Bolter Miners:* Consulting and research experience for on-board methane and dust monitoring, risk analyses for methane dust and ventilation conditions, triggered systems to extinguish a methane flame after ignition by coal cutting picks, development of the directional water spray system for South African applications, frictional ignitions, on board dust control and scrubbers.

*Alternative Energy:* Consulting, research and experience in alternative energy systems, including coalbed methane in South Africa and Zimbabwe, and in-situ gasification of coal.