

RICHARD M. GOWANS, P. Eng.
President and Principal Metallurgist

BACKGROUND

Richard Gowans is President and Principal Metallurgist with Micon International Limited, mineral industry consultants. Mr. Gowans gained his operations experience in the platinum mines of South Africa from 1981 and has been engaged in consulting since 1987, with LTA Process Engineering Limited, Kilborn (SNC-Lavalin) and Micon, which he joined in 1998.

Mr Gowans' experience, which spans over 27 years, includes the operation and design of mineral processing and hydrometallurgical plants for a wide variety of minerals and metals. He has been involved in operations, management, detailed engineering and commissioning of a broad range of processing facilities. He has also worked on a wide assortment of feasibility studies, technical audits, project management and due diligence assignments on international industrial mineral, precious and base metal projects.

PROFESSIONAL ASSIGNMENTS

Agrium Inc., Ontario (1996): Flow sheet development, metallurgical design and associated capital and operating cost estimates for a feasibility study on a green fields phosphate project in Kapuskasing.

Aquiline Resources, Calcatreu Project, Argentina (2004/2005): Conceptual metallurgical design and plant capital and operating cost estimation for the 2,000 t/d gold mine as part of a NI 43-101 preliminary economic assessment report.

Apollo Mining, Montana Tunnels, Montana, USA (2003): An assessment of the 17,000 t/d capacity processing facilities at the Montana Tunnels Pb/Zn/Ag/Au mine, as part of a due diligence review of the operations of Apollo Gold Corp.

Aurelian Resources, Fruta Del Norte Project, Ecuador (2007): Management of a preliminary metallurgical testwork program and interpretation of results for the semi-refractory gold/silver deposit.

Asean Potash Mining, Thailand (2001): Third party feasibility review of the process and infrastructure aspects of a carnallite mining project.

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Avalon Ventures, Separation Rapids Rare Metals Project, Ontario (1999): Conceptual process engineering and plant operating and capital cost estimates for the pre-feasibility study. The products of mining and processing include concentrates of petalite, spodumene, rubidium-rich potassium feldspar, sodium feldspar and tantalum.

BacTech Mining Corporation, Tonkin Springs Gold Project, Nevada (2003/04): Management and assembly of a NI43-101 Technical Report in support of an updated mineral resource estimate. Management of a feasibility study based on the bio-oxidation of sulphide mineralization and subsequent cyanide heap leaching of the oxidized ore.

Barrick Gold Corporation:

- **Pierina Project, Peru (1996/97):** Coordination of development test work and process engineering for the 21,000 t/d gold and silver heap leach operation.
- **Bulyanhulu Project, Tanzania (1999/2003):** Assistance with compiling the bankable Feasibility Study on behalf of the owner. Also, detailed study into the variances between the pre-production project plan and actual operating results.
- **Veladero Project, Argentina (2002/03):** Assistance with compiling an internal mine development plan.
- **Tulawaka Prospect, Tanzania (2003):** Assistance with compiling an internal development report.
- **Buzwagi Project, Tanzania (2006):** Assistance with compiling a Technical Report on a prefeasibility study and associated mineral reserve estimate for the Buzwagi gold project.

Cambior, Gross Rosebel Project, Surinam (1995): Metallurgical aspects, including flow sheet, process modelling (Metsim), mass balance and preliminary operating cost estimates of a pre-feasibility study on a saprolitic gold prospect.

Canadian Arrow Mines, Kenbridge Project, Ontario, Canada (2007/2008): Metallurgical design, and process cost estimates for a preliminary economic assessment of the Kenbridge Nickel and Copper project.

Centerra Gold Inc., Gatsuurt Project, Mongolia (2006): Assistance to Centerra in assembling a feasibility study on the Gatsuurt gold project.

Confidential Clients:

Review of number of underground tungsten mines and silicon smelter and iron ore mine in China for a Chinese mining company (2007).

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Detailed due diligence of the Rey de Plata Pb/Ag/Zn operation for a potential investor, Mexico. (2006)

Due diligence of the metallurgical processing facilities associated with two copper/molybdenum mining operations in Armenia. (2004)

High level due diligence of the metallurgical operations of a large copper/gold operation in Serbia. (2004)

Detailed metallurgical due diligence of a PGM/Ni/Cu mining operation on behalf of a potential investor. The study included a detailed review of the mineral processing facilities, smelter and base metal refinery. (2002)

Development study for a 3.3 million t/y bacterial heap leach to recover nickel from disseminated ore in Canada. The process included two-stage heap leaching, comprising a primary acid leach to recover deleterious magnesium followed by a secondary bacterial leach to extract nickel and cobalt. (2002)

Conceptual design, capital cost and operating cost estimates for a potential sand and gravel plant in British Columbia, Canada. (2001)

A prefeasibility study into the bacterial heap leaching of disseminated sulphide ore to recover nickel and cobalt in southern Africa. (2000)

Third party technical review of a rare earth separation plant in China, including the supervision of a production trial designed to assess productivity and quality of the operation. (1999)

Risk assessment review of the processing aspects of the Cawse nickel/copper laterite project in Western Australia. (1999)

Review of the technical concepts of a process to produce a product suitable for use as a filler in the plastics industry from an industrial waste product in the United States. (1998)

Due diligence assessment of a cobalt hydrometallurgical recovery plant in Ontario, Canada. (1998)

Technical due diligence of a 900 tonne per day gold, silver and copper metallurgical facility situated approximately 200 kilometres north of Santiago, Chile. (1997)

Project manager for the design, engineering and construction of a barge mounted, modular DMS plant to be used for the recovery of precious stones from a river bed in Sri Lanka. (1994)

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Development of process aspects of a feasibility study to develop the Haib low-grade copper prospect in Southern Namibia. (1993)

In-depth investigation into synthetic rutile production technology. (1992)

Assisted with technical aspects of a feasibility study into a heavy mineral sands wet and dry mineral separation plant in the Western Cape. (1990)

Crowflight Minerals, Canada (2005/06): Management of the metallurgical design aspects and the overall independent feasibility study and associated NI 43-101 report for the Bucko Lake nickel project, Manitoba.

Crystallex International Corporation, Venezuela (2003/04): Development of EPCM tender documentation and RFP coordination for the Las Cristinas gold project. Following award of EPCM contract, acted as client process representative reviewing specifications and other early project documentation.

Department of Indian Affairs and Northern Development, Canada (2001): Metallurgical aspects of an economic evaluation of the Faro lead/zinc property in the Yukon Territory.

European Nickel, Albania (2001): Prefeasibility study into the recovery of nickel and cobalt from a lateritic ore using heap leach technology. The proposed 2.5 million t/y operation included two-stage acid heap leaching, two-stage iron removal circuit comprising primary pressure leaching to remove iron as haematite and to recover sulphuric acid, followed by nickel/cobalt precipitation.

ECU Silver, Mexico (2003, 2006): Technical review of the Velardeña 350 t/d gold and silver cyanide leach/Merrill-Crowe metallurgical operations (2003). A due diligence of the Velardeña operation was also completed in 2006.

ECU Silver, Mexico (2003): Technical review of the La Parrilla 145 t/d gold and silver cyanide leach/Merrill-Crowe metallurgical operations and the Minera Labri 200 t/d sulphide flotation plant.

First Dynasty/Global Gold Corp, Armenia (1996): Study of gold mining industry in Armenia: Review of process and mechanical integrity of the metallurgical resin-in-pulp plant. Flow sheet development, preliminary equipment selection, preliminary engineering, order-of-magnitude capital and operating cost estimates for a scoping study of a carbon-in-leach tailings retreatment facility at Ararat.

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Foskor, South Africa:

- Technical aspects of an in-depth study into the milling and classification circuits at Foskor's phosphate operation in Phalaborwa. (1993)
- Process assistance on a development project at Phalaborwa to recover alumina, magnesia and potassium sulphate from phlogopite and kaolin using liquid ion exchange and packed column technology. (1995)

Gold Fields, Ghana (2000): Inspection and assessment of plant, equipment and facilities, by Tarkwa Gold Mines, at the adjacent Teberebie property, on behalf of Standard Bank of London, Limited.

Gold Hawk Resources, Coricancha Mine, Peru (2008): A technical review of the Coricancha metallurgical facility and associated operating costs on behalf of an investor. The Coricancha process includes base metal flotation to produce lead and zinc concentrates and bacterial leaching to recover gold.

Golder and Associates, Fortaleza De Minas, Brasil (2004): A comprehensive review of the nickel production at MSF's processing facilities and an assessment of the component metallurgical efficiencies in order to reconcile nickel production between the mine, concentrator and smelter.

HMZ Metals, China (2002): Due diligence of the metallurgical process facilities as part of an independent technical report produced by Micon on the material assets (zinc/tin/lead/antimony mines and copper smelter) included in HMZ's Chinese joint venture.

Inmet Mining, Finland (2001): Metallurgical portion of a technical audit performed on the Pyhäsalmi copper/zinc operation.

Inmet Mining, Spain (2006): Conceptual process design for a scoping study performed on the gossan mineralization to recover lead and gold at the Cobre Las Cruces operation.

International Minerals Corporation (IMC):

- Management of the Rio Blanco gold/silver project (Ecuador) feasibility study and the compilation of the associated NI43-101 report.
- Assembly of a pre-feasibility and associated NI43-101 Technical Report for the Gaby open pit gold project in Ecuador (2008).

Iscor, Grootegeeluk, South Africa (1987): Process engineering for a new coal preparation plant.

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Jiangxi Copper Company, China (2001): Technical assistance to a review and optimization program of the Dexing and Yongping copper processing operations, under a technical co-operation agreement with Jiangxi Copper. Phase II of the assignment included a review of the low grade dump leach and associated SX/EW facilities.

Knights Gold Mine, South Africa (1990): Process Engineering and commissioning of Knights Gold Mine's 150,000 t/m slimes and 100,000 t/m sands dump re-treatment plant, Germiston.

Lihir Management Company, Papua New Guinea (1998): Acting as the Independent Engineer responsible for monitoring of the physical facilities and production completion test criteria of the 90,000 t/d pressure oxidation gold recovery operation.

Mauricio Hochschild, Brazil (2000): Preliminary review of the processing aspect of a feldspar mining project, São Paulo State.

Milpo, Peru (1995): Review of a lead/zinc milling and flotation circuit at the Milpo mine, Cerro de Pasco.

Nigel Gold Mine, South Africa (1989): Commissioning of Nigel Gold Mine's 150,000 t/m slimes dam re-treatment plant.

Olympus Pacific Minerals Inc., Bong Mieu Gold Project, Vietnam (2004): Compilation of a NI 43-101 technical report in support of a pre-feasibility study for the 500-800 t/d open pit gold project.

Olympus Pacific Minerals Inc., Dak Sa Project, Phuoc Son Property, Vietnam (2005): Compilation of a NI 43-101 technical report in support of a preliminary assessment report on the 300 t/d underground gold mine project.

Polyus Gold, Russia (2006): Review of the metallurgical aspects of the Natalka project, Kuranakh operation, and Nezhdaniskoe project, as part of Micon's audit review and competent persons report on Polyus' mining assets and mineral reserves.

Porcupine Joint Venture, Canada (2002): Metallurgical testwork management, process design and cost estimates for the Pamour gold mine phase 1 feasibility study.

Purity Andalusite Mine, Groot Marico, South Africa (1987): Metallurgical investigation into improving the mineral recovery at Purity Andalusite Mine, Groot Marico.

Richards Bay Minerals, South Africa (1987 – 1991):

- Audit of the operational and maintenance aspects of the new zircon acid treatment plant and feed preparation module (uprate) at Richards Bay Minerals.

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- Process engineering of a new rutile and zircon dry beneficiation plant, including flowsheet development, PFD's, PID's, process equipment specifications, process design criteria, sequence logic development and commissioning.
- Process engineering and commissioning of wet monazite plant uprate.
- Commissioning engineer at beach sands mineral separation plant expansion.

Robinson Mine, Nevada, USA (2004): A review of the 38,000 t/d capacity processing facilities at the Robinson Copper mine, as part of a property due diligence.

Saudi Company for Precious Metals, Bulghah Project, Saudi Arabia (2000): Process engineering and detailed capital and operating cost estimates for the bankable feasibility study on a 4 million t/y gold heap leach project.

Triton Minera S.A., Nicaragua (1999): Review of the 1,000 t/d El Limon gold processing facility as part of a mill efficiency improvement project.

Ursa Major Minerals Inc., Shakspeare Project, Sudbury, Canada (2005): Metallurgical aspects, including the management of the testwork program, and assistance with the management and coordination of a feasibility study for a 4,000 t/d Ni/Cu/PGM project.

U.S. Gold Corp., Tonkin Springs Project, Nevada, USA (2006): Compilation of a NI43-101 Technical Report in support of the Tonkin Springs gold project

Western Goldfields Inc., Mesquite Gold Mine, California, USA (2006): Review of metallurgy and compilation of a feasibility study and associated NI43-101 report for the 14 million tons per year run-of-mine heap leach project.

World Wide Minerals Inc., Kazakhstan (1996): Due diligence study of phosphoric acid plant, ammonium phosphate fertilizer plant and gold recovery plant at a uranium production facility.

Yamana Gold Inc, Chapada Copper Project, Brazil (2004): Review of the metallurgical and cost aspects of the Chapada feasibility study as part of an appraisal of the Brazilian mineral properties of Yamana.

PRE MICON INTERNATIONAL

Kilborn SNC-Lavalin Inc. (1995 to 1998): Senior Metallurgist at Kilborn's Toronto office, responsible for the process engineering of various gold, base metal and industrial minerals feasibility and engineering projects.

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LTA Process Engineering Limited 1987 to 1995: Senior Lead Process Engineer responsible for Process Engineering Group, comprising over 8 metallurgical engineers with specialties in coal, gold, diamonds, industrial minerals and base metals. Responsibilities included resource allocation and quality of design work as well as “hands on” project involvement.

Impala Platinum Limited, Mineral Processes (1981 to 1987): Commencing as Plant Metallurgist and advancing to the position of Senior Metallurgical Engineer. Experience included a variety of production positions and a member of the head office project evaluation team.

EDUCATION

B.Sc. (Hons.) Minerals Engineering (1980) - University of Birmingham, England

PUBLICATIONS AND PRESENTATIONS

“The Various Demands of the Process Engineer When Applied to Different Contract Types”, presented at the Executive Communications conference ‘Process Design Optimisation and Control’ held in Johannesburg, South Africa, July 26 and 27, 1994.

“Description of the Gaofeng Mining Corporation Zinc, Tin, Lead and Antimony Mineral Processing Facility, Dachang Town, Guangxi Zhuang Autonomous Region, People’s Republic of China”, presented at the Toronto branch of the Canadian Mineral Processors (CMP) Toronto branch regional meeting, September 12, 2002.

“Metallurgical Testing for the Exploration Geologist”. Part of the Project Development Toolkit for Qualified Persons session at the CIM Mining Industry Conference and Exhibition, held in Toronto Canada, April 24-27, 2005.

PROFESSIONAL AFFILIATIONS

- Association of Professional Engineers of Ontario
- Canadian Institute of Mining, Metallurgy, and Petroleum