



Industry Driven Mineral Processing Research

Project Sponsors 2000-2003

MAJOR

Alcoa
Anglo Platinum
Anglogold
BHP Billiton
Lonmin Platinum
Mount Isa Mines/Xstrata
Noranda/Falconbridge
North Limited (Rio Tinto)
PT Freeport
Rio Tinto
Teck Cominco
WMC Resources

MINOR

Anglo American
Cliffs Mining Services
De Beers
Impala Platinum
INCO
Kalgoorlie Consolidated Gold Mine
Kanowna Belle Gold Mine/Placer
Kumba Resources
Newcrest
Newmont
Northam Platinum
Pasminco
Phelps Dodge
Western Metals

SUPPLIER

AfroX/BOC
Bradken
EIMCO Dorr-Oliver
Hatch
JR/Roche Mining
Magotteaux
ME Global
Metso Minerals
Minproc
Outokumpu
Samancor
Senmin

Research Providers



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McGill University



University of Cape Town

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Industry Driven

Mineral Processing Research

- ◉ Outstanding leverage of research investments
- ◉ Delivering benefits through new technologies and tools for process design and optimisation
- ◉ Collaboration and networking between researchers, major mining companies, and suppliers
- ◉ World's leading mineral processing research teams



About P9 Mineral Processing

P9 is the world's leading, collaborative, mineral processing research project and is strongly industry driven.

Its achievements over more than 40 year of on-going research have helped re-shape industry understanding, design and operational practices in mineral processing.

Typically, P9 runs on a four year program, enabling regular review of outcomes and re-setting of objectives for research and technology transfer.

The keys to P9's success have been:

- ⦿ active collaboration, open communication and sharing of project costs and outcomes between sponsors
- ⦿ participation by mineral processing operators, and equipment, engineering, chemical, media and consultant suppliers to the industry
- ⦿ practical application of research outcomes to sponsors' sites – often during the course of the project
- ⦿ very high leveraging (up to 60:1) of sponsors' investments through indirect access to third party research funds
- ⦿ assembly and nurturing of a highly effective, integrated, multi-disciplined, research team
- ⦿ project management based on a four year cycle of review and re-definition of industry's situation and technology needs vs. project outcomes and deliveries
- ⦿ delivery of mathematical models, computer simulations and tools that enable plant optimization, along with a range of new technology products
- ⦿ state-of-the-art project management and coordination services.

From 2000 to 2003, P9M – the thirteenth extension of the original P9 – was sponsored by 39 companies operating in five continents, representing all sectors of the global minerals industry. The total budget for the research was around US\$1.8m per year delivering research outcomes conservatively valued at US\$100 – \$200m.

Proposal for P9N: 2004-2007

The major aim of P9 is to help its sponsors achieve "best practice" in the design and operation of their mineral processing plants. This is done, principally though not exclusively, through the development of modelling and simulation techniques and measurement tools that will enable mining companies that sponsor the project to design better plants and operate their plants better. The P9N extension will undertake a range of integrated research projects addressing a number of key themes which have been defined by industry.

General Aim of P9N Comminution Research

The overall objective of the comminution and classification research is to minimize the energy used in grinding rocks to the required size distribution and liberation.

The research topics in comminution and classification have been divided into three themes:

- ⦿ Improvement of current technologies
- ⦿ Reduction of energy for comminution and
- ⦿ Innovation and enabling technologies.

Within these themes, five major areas have been identified – AG and SAG modelling, Classification including cyclones, Fundamental modelling of comminution, HPGR and Fine comminution machines.

General Aim of P9N Flotation Research

The major objective of P9N flotation research is to achieve the optimum separation of particles, on the basis of recovery and/or selectivity, received from the comminution and classification circuit. This will allow better resource utilisation through improved value recovery, reduced metal losses to tailings and reduced energy consumption in downstream processes.

Flotation projects in P9N have been divided into four major headings:

- ⦿ Floatability component modelling
- ⦿ Property based modelling
- ⦿ Cell characterisation and
- ⦿ Integration and optimisation.

Project Research Team

The multi-discipline research team will consist of a collaboration of key staff and students from the following universities:

- ⦿ JKMR, University of Qld
- ⦿ University of Cape Town
- ⦿ McGill University.

The project manager will be Dr Emmy Manlapig from JKMR who has vast experience in the mineral processing field including many years as Technology Manager at Mt Isa Mines.

Project Sponsors

It is expected that around 30–40 of the worlds leading mining companies and suppliers to the industry will participate in the project representing all of the major mining sectors of the world.

Project Coordination

AMIRA International will be the overall project coordinator. Various levels of sponsorship cost and benefits are available. Contact AMIRA for further details.