



# MINERALS INDUSTRY CAREERS. RICH IN DISCOVERY.

## Metallurgy and Mineral Processing

### WHAT DOES A METALLURGIST DO?

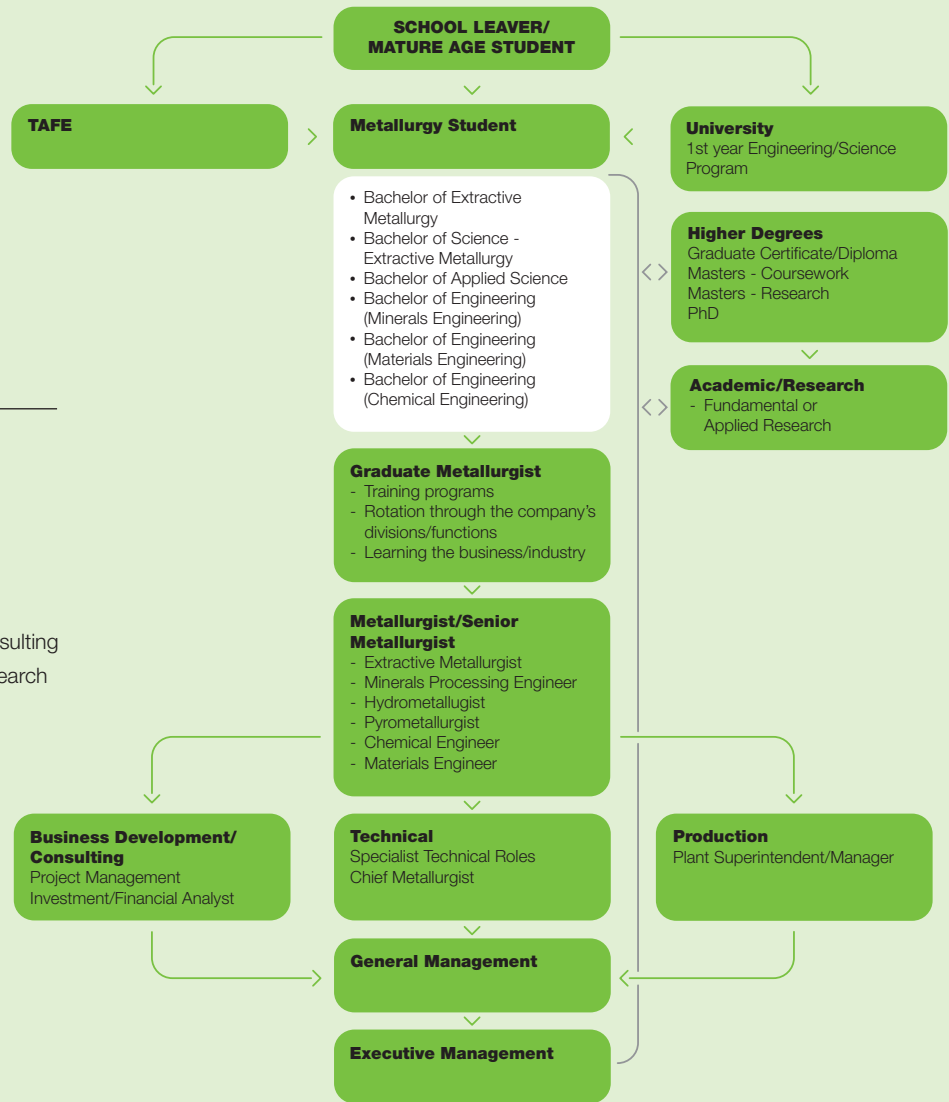
Within the minerals industry, metallurgists work at mine sites in concentrators and metal recovery operations, in smelters, metal refineries, foundries, and research and development laboratories. They use their knowledge of chemistry and physics, mineralogy, underlying process fundamentals and process engineering to control and improve the processes that separate, concentrate and recover minerals and their valuable metals from the natural ores.

Some of the many roles that a metallurgist can take are:

- application of physical and chemical methods to concentrate valuable minerals from their ores; processes can involve methods such as magnetic, electrostatic, gravity, and flotation processes
- application of a combination of processes involving hydrometallurgy, electrometallurgy and pyrometallurgy to produce crude or refined product metal for market
- management of the technical aspects of metallurgical operations using tools such as on-line process monitoring, sampling, chemical analysis, data analysis and process modelling
- management and supervision of production staff in metallurgical operations
- design and improvement of mineral processing and extractive metallurgical plant
- study and application of the fundamentals of metallurgical processes to both aid control and improve their physical and economic operation
- undertake or manage research and development studies to improve existing processes, or to apply existing or possible processes to new ores or concentrates
- improve environmental performance of metallurgical operations and ensure all environmental standards are met
- prepare reports on metallurgical operations and projects
- liaise with a wide variety of people on the job such as operators, maintenance and engineering staff, geologists, mining engineers, and supporting specialists in process control, computing, technology provision and research.

### WHAT DOES A MINERAL PROCESS ENGINEER DO?

Minerals process engineers transform the ores found in nature to value-added products. These ores can be high-grade materials taken directly into metal extraction, such as iron ore into production of iron and steel. For most other metals (and for some iron ores) it is necessary to upgrade or concentrate the ore into an intermediate product that is then subject to extractive processes for metal recovery. →



## METALLURGY AND MINERAL PROCESSING CAREERS

- Metallurgist- Extractive/General
- Mineral Processing Engineer
- Hydrometallurgist
- Pyrometallurgist
- Metallurgy/Mineral Processing- Consulting
- Metallurgy/Mineral Processing- Research
- Chemical Engineer
- Materials Engineer

→ A mineral process engineer may perform the following tasks:

- process design and development
- process control and management
- application of chemical, metallurgical and process engineering fundamentals to production processes
- management of process data collection and analysis
- metallurgical problem solving with application of modified or additional unit processes
- application of economic analysis of production processes to effect optimal performance
- planning of production, budgets, operational and management reporting
- human resource management of both professional and operational staff.

## WHAT ARE THE CAREER OPPORTUNITIES?

Metallurgists and Minerals Process Engineers can become technical specialists in their field, working in senior roles for a company or setting themselves up as a consultant to several companies. Alternatively, metallurgy/minerals processing can lead to management or strategic planning careers. There are also opportunities to move into marketing or consulting to investment and finance companies.

### ADAM LONERGAN

BE (Metallurgical Engineering) (Hons)  
BBus (Business Administration), MAusIMM  
Metallurgical Engineer, Rio Tinto Technical Services

### Why did you choose your particular career?

Whilst completing high school I was interested in Chemistry and Physics and wanted a career that would combine these disciplines and be "hands on".

## What have you done so far in your career?

Day one of my full time employment saw me in the Pilbara working at an iron ore mine, where I stayed for 5 months; followed by a 2 month stint in Perth before spending my first day at my desk back in Melbourne (7 months after starting). Since then I've worked at ERA (Ranger, Uranium), a number of Coal operations in Queensland and NSW and nearly a year overseas in Richards Bay, South Africa, but that's another story...I don't know of any other graduates in any industry that have had these kind of opportunities!

## What have you enjoyed most about your profession?

I really enjoy the diversity of the work I do as a Metallurgical Engineer. In the past year I've been involved in pilot plant construction, equipment decommissioning, mine site energy reviews, high temperature molten metal test work, numerous plant and laboratory trials, advanced computer modelling and technical desktop studies. I've travelled extensively interstate and worked overseas in a number of different commodities and roles.

PROFILE