

# Your coal processing solutions







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**Whether investing in a new project or optimising an existing plant, the overcome including investment, licensing, infrastructure, coal recovery product. When major investors see that we are working on a project the level of confidence that it is well underway.”**



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# The first step – understanding your project vision

From pit to port, the world’s leading coal producers rely on us for  
coal processing solutions.

Success is achieved through skilled,  
passionate people working together in  
pursuit of a shared vision and goals.  
That’s why the very first step we take  
in working with our customers is to  
**listen and understand what success  
for the project looks like.**

We then go out of our way to work  
collaboratively with our customer  
teams, based on our shared  
understanding of the project goals  
and timeframes.

## Pit to port solutions

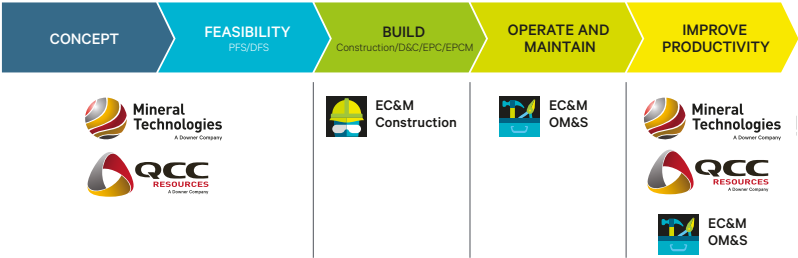
Customers call us when they need  
cost effective pit to port solutions  
across the project lifecycle.

In addition to the design and  
construction of new plants and  
plant upgrades, we also deliver  
coal quality assessments, plant  
auditing/debottlenecking studies  
and equipment for the processing  
of fine coal.

## Experience delivers results

Combining the process engineering  
and project delivery expertise of  
QCC Resources with industry-leading  
process equipment from Mineral  
Technologies and proven construction  
expertise from Downer, we cost  
effectively deliver quality coal projects  
for customers worldwide.

From our beginnings in the coal  
mining region of the Hunter Valley in  
Australia over 30 years ago, we have  
expanded our services and today we  
are recognised as **the ‘go to’ partner  
for coal processing solutions across  
the project lifecycle.**







## Reliable, expert delivery

**With experience in delivering a large number of coal projects ranging from 3,000 t/h coal handling preparation plants to smaller scale 250 t/h plants and upgrades, we have the proven expertise to deliver quality projects on-time and on-budget.**

### Concept and Feasibility

Customers regularly engage our strategic consulting services for the optimisation and development of coal mining and processing operations.

Our coal experts use leading edge software to augment bore core data and develop early testwork for optimised mine plans, processing routes and product specification.

Key services include:

- concept, prefeasibility and feasibility studies;
- coal quality assessment;
- management of bore core testing;
- process simulation;
- due diligence and IPO work;
- operational review;
- mine product algorithms;
- pit to port financial model optimisation; and
- research and development.

### Project Delivery

We deliver fully integrated Engineering, Procurement and Construction Management (EPCM) services solutions from concept through to operations and ongoing asset management.

Our EPCM capability is delivered via an industry standard operating model that links

project practitioners to functional specialists ensuring access to industry leading technology and support services.

**Customers value our distinct capability to execute entire project delivery by utilising our in-house skills and resources.**

QCC Resources provides the EPCM services; while Downer's Engineering, Construction and Maintenance division delivers construction services.

As one of Australia's largest providers of engineering services for critical infrastructure projects we deliver civil, structural, mechanical, electrical, instrumentation and technical capabilities.

### Operate and Maintain

We deliver services for maintenance shutdown and sustaining capital projects. Our teams are experienced in the maintenance of industrial assets with specialists located close to major coal mining regions across Australia.

### Improve productivity

Post operational handover we maintain a focus on project and plant support with the objective of continually improving plant operating efficiencies.

Through our ongoing research we develop new processes and plant optimisation solutions.

Coupled with our close engagement with expert process engineers and external consultants, we bring the latest technology and solutions to coal processing operations to improve productivity for existing plants.

### Recent Projects

- Ravensworth North, Australia 3,000 t/h;
- Curragh, Australia 1,200 t/h;
- Mangoola, Australia 1,800 t/h;
- Stockton, New Zealand, 275 t/h;
- Mt Arthur Coal, Australia 3,000 t/h;
- Liddell, Australia 1,000 t/h;
- Mount Owen, Australia 650 t/h;
- Camberwell Coal, Australia 1,200 t/h;
- Isaac Plains, Australia 500 t/h;
- Carborough Downs, Australia 500 t/h; and
- Goedgevonden Colliery, South Africa 2,000 t/h.



### **Mangoola – Dry Disposal of Tailings – 1,800 t/h CHPP**

Completed in 2011, our project scope ranged from run of mine receipt, raw coal crushing and sizing, two-stage washing using dense medium cyclones and spirals, coarse rejects and fine tailings handling, product coal storage and handling, overland conveying and train loading.

Services delivered:

- early stage studies;
- definitive feasibility (FEL3);
- full detailed design and engineering, procurement and construction management;
- diversion and routing of major high voltage power supply lines;
- plant and process testing; and
- commissioning through to handover.



## Industry leading technology

**Customers value our ongoing commitment to researching and developing new, innovative equipment designs that maximise fine coal recovery.**

### Research and Development

Our investment in research and development, led by Mineral Technologies, has resulted in the launch of new, industry-leading gravity separation equipment for fine coal recovery.

**Today, most Australian coal washeries employ one or more banks of our signature LD7 and LD7RC spirals. In the USA, 1,000 coal spiral starts are installed across the region treating in excess of 18,000,000 tonnes of coal annually.**

### Benefits of Mineral Technologies Equipment

- high coal recoveries over a wide particle size range;
- highly selective process improving product grade;
- compact and low weight construction reduces installation costs;
- operator friendly, no need for skilled supervision;
- low equipment maintenance requirements for greater plant availability;

- no reagents are used in the circuits; this delivers environmentally friendly processes reducing operating costs and lowering potential for environmental incidents; and
- robust and proven designs incorporating innovation when applicable.

### LC3 Spirals

The LC3 is a revolutionary new spiral that has the following proven benefits at industry accepted feed rates:

- producing a low cut-point of 1.4 to 1.5RD;
- producing a superior product yield at conventional 1.7 to 1.8RD cut points;
- less build-up than conventional spirals; and
- improved beneficiation of ultrafine material.

The LC3 is available in four and eight turn models, and has the same footprint as the LD7 and LD7RC spirals.

### LD7 and LD7RC Spirals

Available in three and four-turn configurations, the LD7 features improved tramp oversize handling capability.

The LD7RC offers seven-turns consisting of three rougher turns and four cleaner turns, effective on feeds with high levels of near-gravity material and other difficult coal separations.







## Relationships creating success



**Our experience in safely delivering coal processing solutions for customers worldwide ensures that we understand what's important to their success.**

### Ravensworth North

In delivering the expansion of Glencore's Ravensworth North operations, we focused on creating and sustaining valued working relationships throughout the project so that our teams could use their expertise to predict and deliver solutions to successfully achieve the project vision and objectives.

Located in Australia's Hunter Valley coal mining region, the project required an expansion of the Coal Handling and Preparation Plant (CHPP).

**We delivered the design, procurement, construction, commissioning and handover of the CHPP with our teams notching up 2,000,000 site hours over a two and a half year period with no lost time injury.**

Two new 900 t/h CPP modules were built and integrated with the existing module involving single stage washing using dense medium cyclones and spirals circuits.

The project scope required all disciplines including civil, structural, mechanical, pipework, services, high voltage works, electrical, instrumentation and control.

As part of the project delivery, the project team relocated a 330 kV Transgrid transmission line requiring 48 new towers, constructed a new 66/11 kV substation, relocated a 66 kV Ausgrid transmission line, completed various overhead and underground HV works, delivered all 11 kV site wide reticulation and all electrical, instrumentation and control.

The new raw coal facility married each end into the existing dump station and plant feed silos by incorporating a series of overland and plant conveyors, secondary and tertiary sizing stations, stacker, raw coal stockpile and reclaim tunnel.

The rejects conveyor system was extended to transport reject material to a new mine truck load-out bin near the Run of Mine (ROM) dump station.

The product coal facility incorporated an extension to the existing tunnel and a new product and reclaim tunnel system, with associated plant conveyors and a stacker.

Extensive brownfields work was required to upgrade the capacity of all the existing plant conveyors and services. Eighteen conveyors were upgraded totaling 4.8 km. Fourteen new conveyors totaling 9.1 km were installed with the longest being 2.4 km.







### **Key Project details**

- 2,000,000 site hours over two and a half years with no lost time injury;
- design and engineering of two additional 900 t/h coal preparation plant modules;
- design and engineering of new raw coal and product coal facilities;
- brownfields capacity upgrade of existing infrastructure;
- all site-wide electrical works; and
- completed in 2013 to the project Target Cost Estimate (TCE) and four months ahead of schedule.

## Health and safety



**Zero Harm is embedded in our culture and is fundamental to our future success. We are committed to achieving our goal of Zero Harm.**

Zero Harm means sustaining a work environment that supports the health and safety of our people and minimises the impact our business has on the environment.

We work to eliminate all injuries by identifying and controlling hazards, protecting our people from exposure to health and safety risks, and supporting their general health and wellbeing.

**We recognise that working on critical infrastructure is like no other project. This is why our passionate safety culture, refined project management processes and collaborative approach help us deliver services while maintaining the primary focus of Zero Harm.**

We are continuously improving our management systems, and remain focused on managing risks with the potential to cause serious harm. We learn from our experiences, and develop our frontline employees with the commitment and capability to manage Zero Harm.

- **Leadership:** We listen, set clear expectations, develop and involve our people, and act with integrity;
- **Culture:** We have an aligned set of values throughout our organisation;

- **Systems:** Our approach is simple, robust and consistent across our businesses;
- **Hazards:** Our hazards are identified, assessed, controlled and monitored; and
- **Actions:** We learn from our experiences, and do what we say we will do, translating Zero Harm theory into good work practices.

We have placed a strong governance charter on Zero Harm to ensure the strategy and performance is developed, monitored and refined.

Our Executive Management Team ensures that we have the mandate, systems and processes in place to assist our people to deliver a Zero Harm environment.



## Our Promise

To work closely with  
using world leading







h customers to help them succeed,  
insights and solutions.

### **Diversity and inclusion**

**We are committed to ensuring that we have a diverse and inclusive workforce which fulfils our employees', customers' and shareholders' expectations, while also building a sustainable future for our business.**

### **2017 – 2020 Action Plan**

To advance our diversity and inclusion efforts, the Engineering, Construction and Maintenance (EC&M) division has an established Diversity Taskforce which is responsible for implementation of the division's Diversity and Inclusion Plan 2017-2020.

The objectives for our Plan are focused on the following three key areas:

- Youth;
- Aboriginal and Torres Strait Islander (ATSI) workforce development; and
- Gender Equity.





**Mineral  
Technologies**  
A Downer Company

**Downer**  
Relationships creating success

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