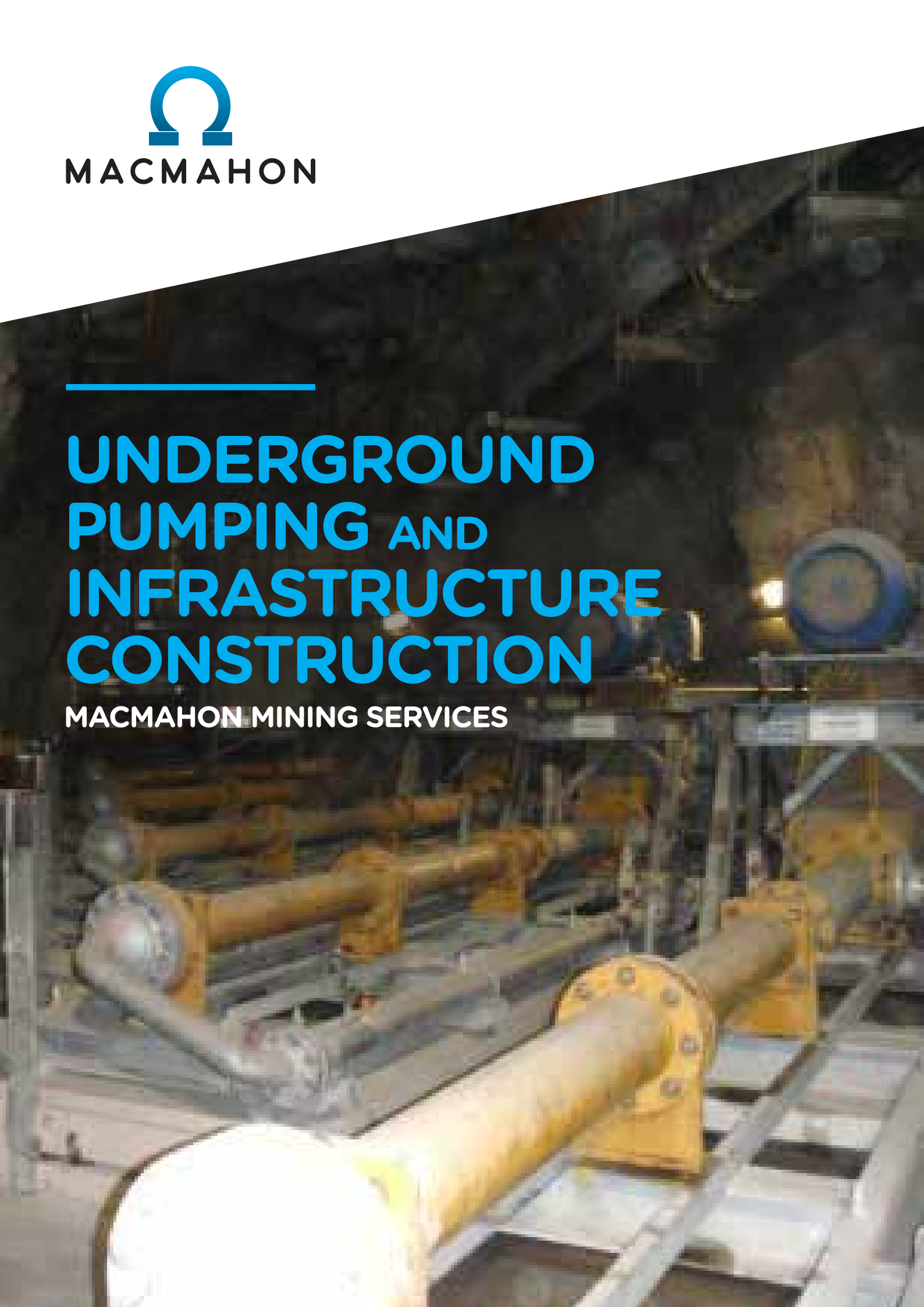




MACMAHON

UNDERGROUND PUMPING AND INFRASTRUCTURE CONSTRUCTION

MACMAHON MINING SERVICES



MACMAHON'S EXTENSIVE ENGINEERING CAPABILITIES PROVIDE CLIENTS TAILORED MINING SOLUTIONS FOR PROJECTS BOTH ABOVE AND BELOW GROUND.



Backed by years of experience in the resources sector, Macmahon Engineering has the capability to deliver underground pumping and general infrastructure design, supply and install projects.

Macmahon prides itself with the ability to "think outside the box" and offer innovative and cost effective solutions for our clients. The Company's services range from the specialised Annular Pressure Exchange pumping system (APEXS) and ventilation controls, through to underground piping reticulation, ore-pass linings and general underground services.

Macmahon employs experienced, practical engineers and draftspersons to design customised solutions with a 'made to order' approach for each project. With complete 3D modelling capability, Macmahon uses the latest versions of Inventor, Solid Edge, AutoCad and Microstation drafting software for all drawing requirements. The Company's design engineers use SpaceGass for structural analysis and ANSYS for Finite Element Analysis (FEA). Macmahon's design office operates with a quality management system that complies with the requirements of AS/NZS ISO 9001:2008.

Macmahon can provide complete support from safety administration, training and inductions, through to hands on guidance assessing the risk and safety of all tasks undertaken throughout the project execution phase.

Macmahon's Engineering capabilities complement the Company's range of underground mining services. From raise drilling and shaft sinking, through to specialised ground support and mine development, Macmahon has the ability to deliver large-scale projects, while also offering its specialised capabilities separately.

Past and present projects include: **ARGYLE MINE (WA) Argyle Diamonds Pty Ltd (subsidiary of Rio Tinto)**

- Design, supply and installation of automated ventilation door and air-locks for the block cave mine
- Installation and construction of pump stations, rising mains and ancillary infrastructure to support the block cave development
- Special excavations such as the vertical dams, ROM and fine ore bins

LEINSTER NICKEL OPERATIONS (WA) BHP

- Supply and installation of emergency egress ladderways
- Special excavations and installation of wear lining to the ROM and fine ore bins

APEXS PUMPS

- Design and development of Annular Pressure Exchange System (APEXS) pumps. This patented APEXS pump intellectual property was later sold to Weir Minerals.
- Each pump had the capacity to pump 48 l/sec dirty mine water with a total head of 1450m

WESTCLIFF COAL MINE (NSW)

- Manufacture and installation of 1000 tonne underground coal storage bin discharge hopper

TAHMOOR (NSW)

- Design of a 900 tonne underground coal storage bin bottom structure

DEWATERING STUDIES

- Beaconsfield Mine
- McArthur River
- Jundee Mine
- Reef Mining NL