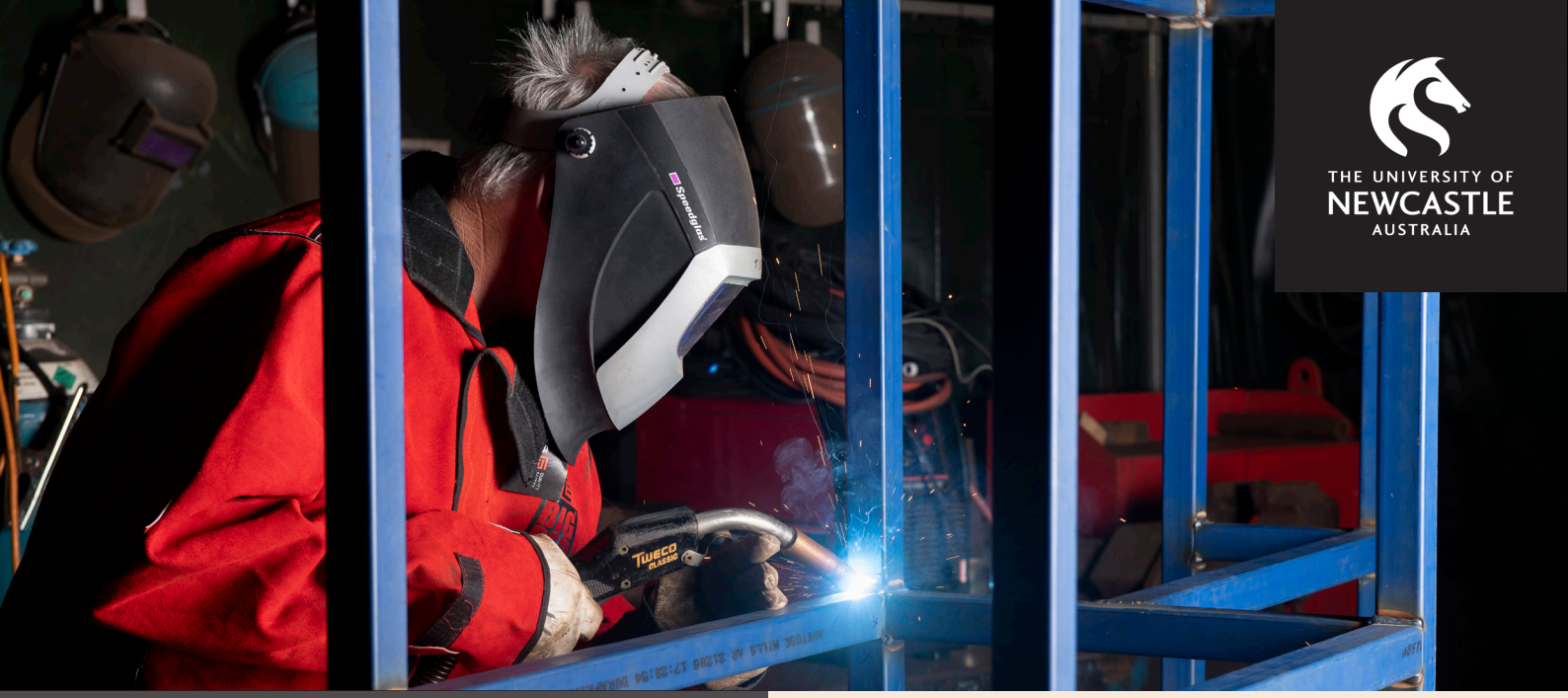

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

TUNRA BULK SOLIDS

NovaCell™ Flotation Rig

Project Scope:

Introduction:

Froth flotation is a process utilised to recover valubale minerals that would otherwise be discarded in the mining process. To achieve this, JORD's NovaCell™, a pilot size integrated rig, is employed to process slurries containing recoverable minerals in batches.

The NovaCell™ has a novel configuration, which produces ideal hydrodynamic conditions for both fine and coarse particle recovery in one device. The slurry is pressurised and pumped to the top of the down-feeder tube, where particles and tiny bubbles collide in the high-shear zone ideal for fine and ultrafine particle recovery. The slurry then travels down the tube and exits near the bottom of an acrylic tube stack, where a fluidised bed is formed. In the fluidised bed, partially loaded bubbles surround particles in a low-shear environment ideal for coarse particle recovery. Bubble / particle clusters rise in the NovaCell™ and are collected in the foamy froth at the top of the cell. The device also includes a secondary collection zone, an internal cone, halfway up the cell. Coarse valuable particles that aren't recovered in the froth, are collected here, and feed onto a vibrating screen. After passing the screen, the slurry returns to the mixing tank and is pumped back into the system. The two collection points enables efficient recovery of valuable minerals across a wide particle size range and produces high valuable mineral recoveries.

TUNRA's highly specialised workshop team was engaged by JORD International to construct a duplicate NovaCell™ Flotation Rig. This rig is to be used locally for testing in the mining industry.

Challenges:

- No detailed drawings of the first prototype were available.
- The prototype had been relocated to South Africa.
- Sketches of the frame and components had to be made based on an assembly video and one wire frame CAD drawing with no dimensions.
- The control system was to be upgraded with a PLC, integrated pump drive and touch screen.

TUNRA Bulk Solids Solution:

TUNRA's workshop team provided the following:

- Full documentation of all components required for the build.
- Integration of a new peristaltic pump for the system.
- A new control system and sensor package including a mass flow meter and pressure sensors.
- A stainless steel frame constructed to suit predicted dimensions and capability.
- An acrylic cell tower designed and constructed by TUNRA workshop staff.
- Pipe-work, frame and tank components designed and constructed by TUNRA workshop staff.
- Integration of a new peristaltic pump for the system.
- New pulsation dampener and slurry level air cylinder systems.
- Full mechanical, electrical and electronic commissioning of the rig.
- Test run of the rig with a sample slurry.

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TUNRA Bulk Solids can build custom systems to suit the individual needs of our clients

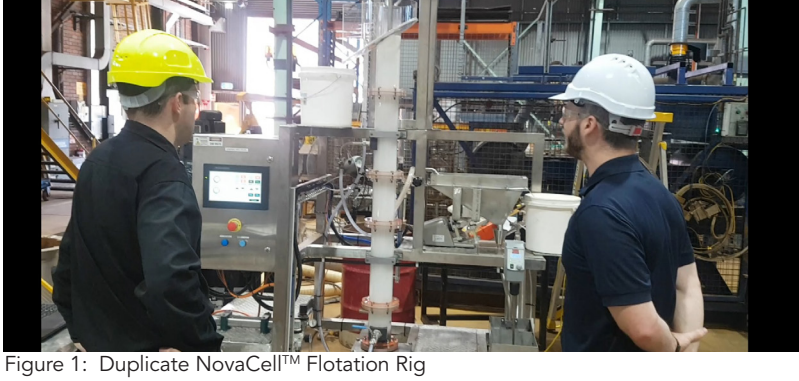

Figure 1: Duplicate NovaCell™ Flotation Rig

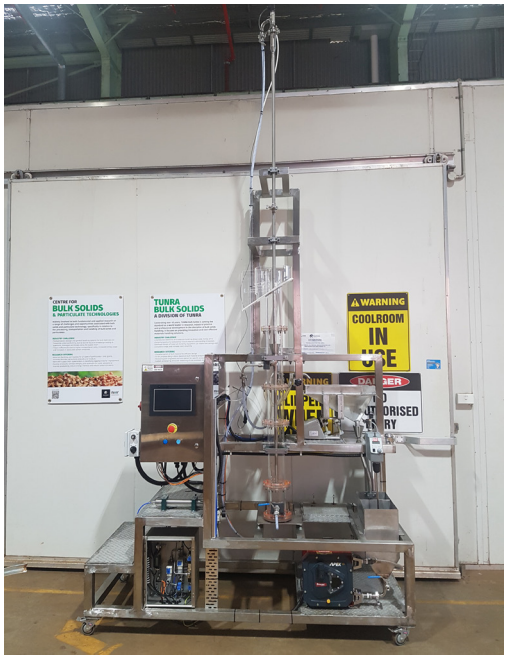

Figure 2: Duplicate NovaCell™ Flotation Rig

TUNRA Bulk Solids Workshop:

The laboratory and workshop facilities at TUNRA Bulk Solids are ISO 9001, ISO 14001 and ISO 45001 accredited. These facilities reside on the Newcastle Institute for Energy and Resources (NIER) site at The University of Newcastle. TUNRA is regularly involved in the design, fabrication and commissioning of custom test rigs for both industry and the University.

Through the project work completed directly to industry, TUNRA has built significant capabilities in terms of both mechanical and electrical/electronic skills.

Mechanical and Electrical Services:

- General and high-precision machining.
- Fabrication of ferrous and non-ferrous materials, excluding pressure welding.
- High level technical advice and installation of specialised equipment.
- Manufacture and assembly of items as per specifications.
- Monitoring, maintenance and repair of test and laboratory equipment.
- Licensed electrical work and installations.
- Fault finding and electrical testing capabilities
- Data logging
- PLC coding and HMI screen development.

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Why TUNRA Bulk Solids?

Experience and Expertise

We have provided expert solutions to industry for over 45 years and are the leading organisation for materials handling research and consulting in Australia and internationally

Research and Development

We have a proven track record in research and development through the close association with The University of Newcastle

Quality Service

We have highly qualified, well-trained and specialist staff that are committed to delivering excellence

First Class Facilities

Our laboratory is a state of the art facility located within the Newcastle Institute of Energy and Resources (NIER) at The University of Newcastle

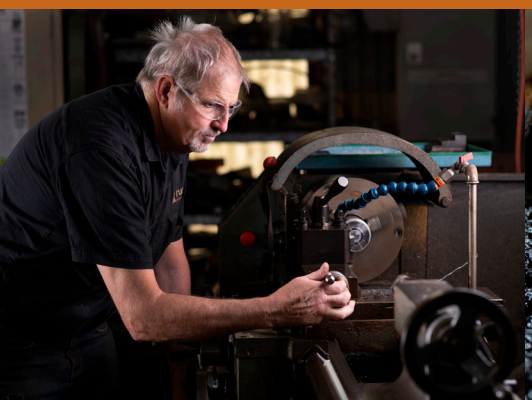
Industry Standards

We are accredited to ISO 9001, ISO 14001 and ISO 45001

Independent

We are independent and not for profit

Advancing the Bulk Materials Handling Discipline Globally



Further information

- To access our Case Studies **visit www.bulksolids.com.au**
- To discuss your industry and business needs **phone 02 4033 9055**