



TUNRA Clean Coal

Specialist technology and services to the Australian and international coal and mineral industries

A Division of Newcastle Innovation, The University of Newcastle, Australia
A.B.N. 97000710074

Frother Gauge

Frother Gauge

Froth Depth Gauge

RT Cell

Slurry Sampling

Online Slurry Ash
Analyser

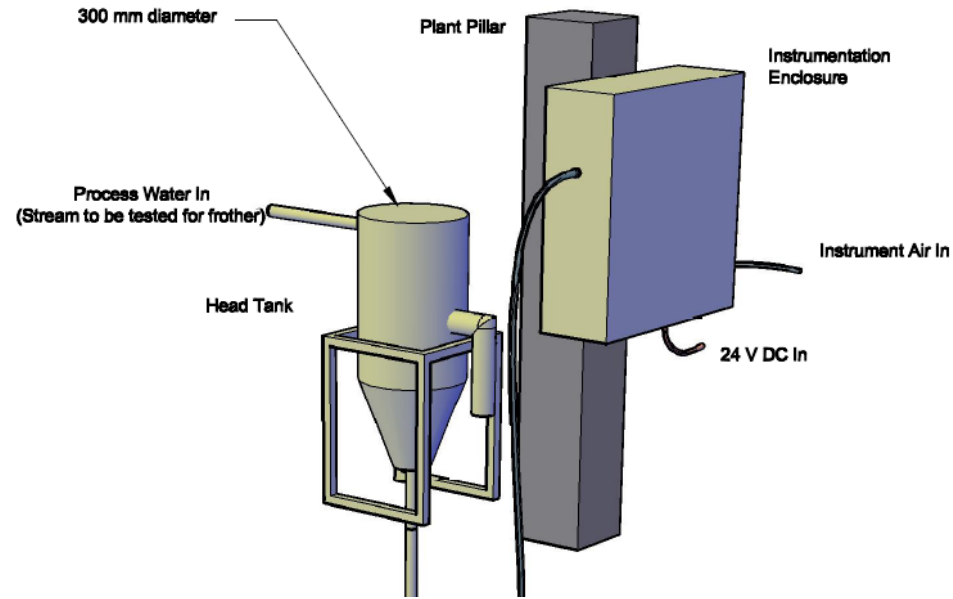
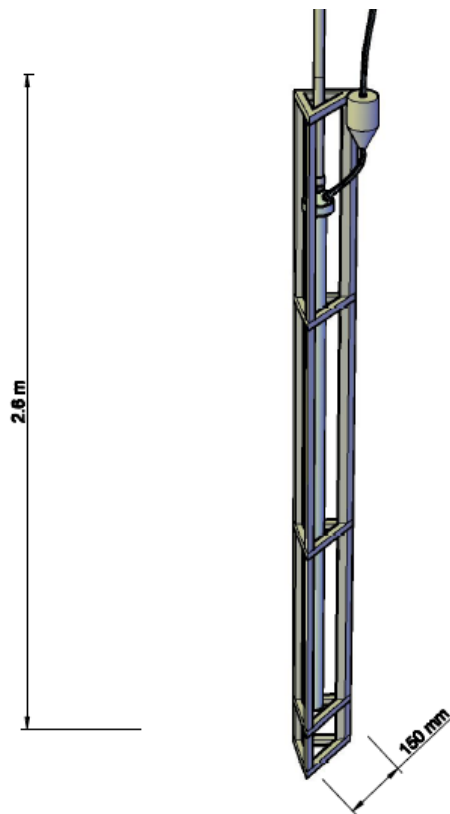
Emulsifier

Remote DMC
Inspection

Laboratory
Services

Consulting Services

- Measures the propensity of the frother in the process water to form bubbles



- Gives real-time digital output of frother levels
- Increases the yield and efficiency of flotation circuits by ensuring correct frother levels
- Decreases incidence of plant “froth out”

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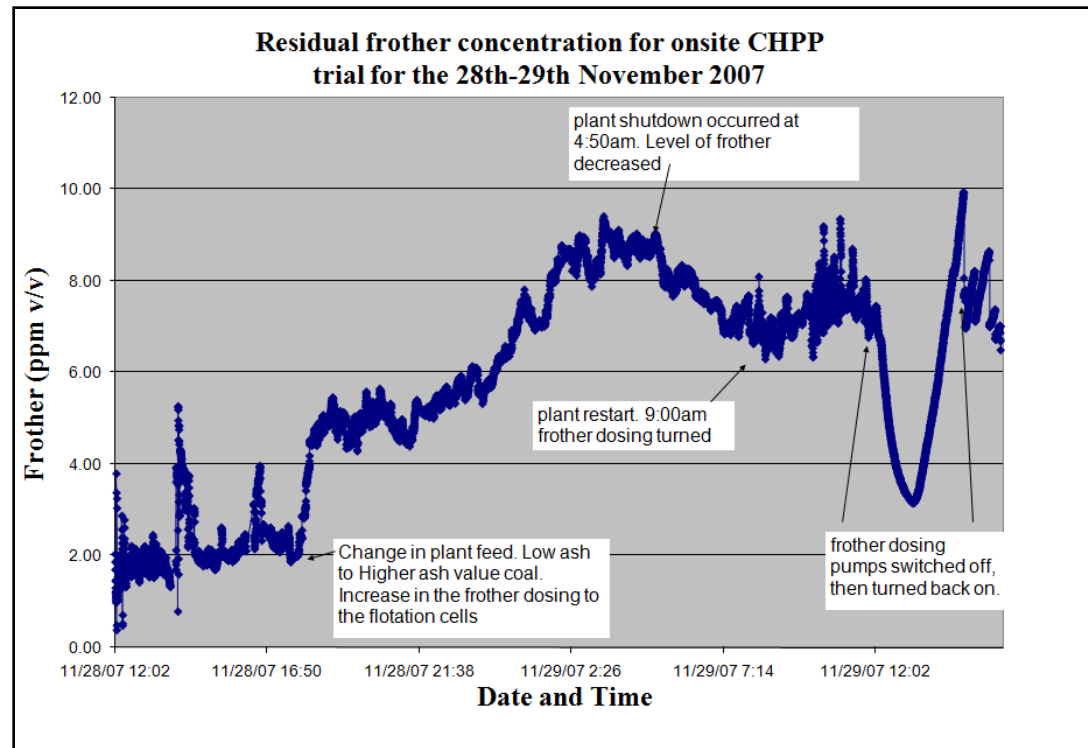
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- Small plant footprint, minimal calibration and upkeep
- Customised to existing plant communication network (i.e. 4-20 mA)



- 24 V DC low voltage operation
- Full customer support and backup supplied

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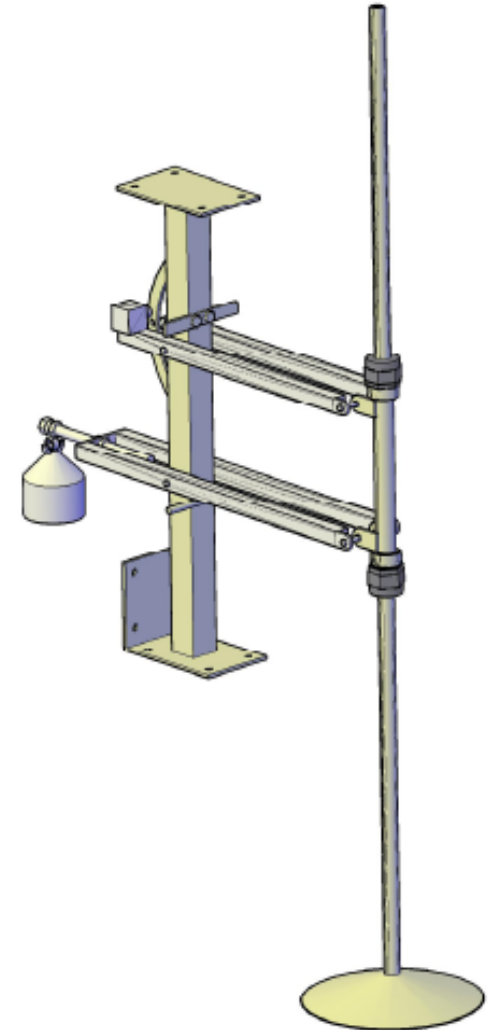
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- Provides an accurate, online reading of froth depth in a flotation cell
- Utilises a unique, patented float design
- Simple to install and customisable for different plant installations
- Uses low voltage 24 V DC power and 4-20 mA output
- Easily integrated into existing plant instrumentation systems



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- The Rio-TUNRA cell has been developed as a demonstration scale unit and trialled at Rio Tinto Warkworth CHPP
- The initial site testwork showed significant issues with sampling practices – the data attained through sampling and flowrate monitoring could not be matched. As using data regression to correct errors within samples would be an invalid and fraudulent method, new sampling systems were designed (See ‘Slurry Sampling’)
- A new, improved demonstration scale version is currently being built incorporating accurate samplers and a variation on the original cell design.

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- The cell is naturally aspirated and uses a low, 20 kPa feed pressure
- It has significantly higher throughput than conventional mechanically agitated or jet flotation cells and has significant advantages in terms of energy expenditure and plant footprint



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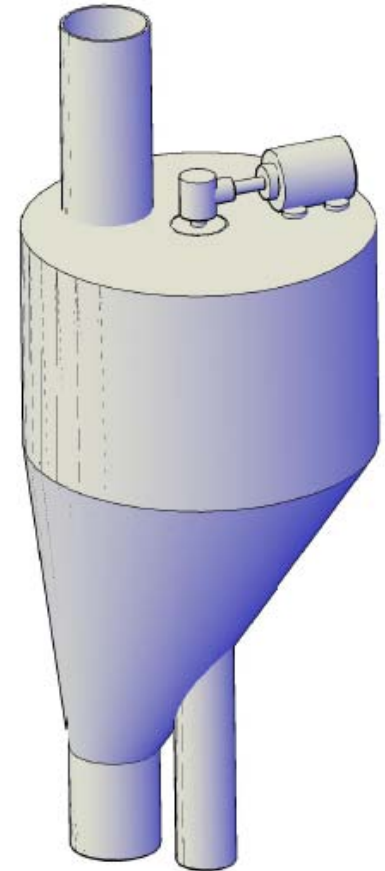
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- TUNRA Clean Coal’s “perfect slurry sampler” utilises a unique cutter shape, constantly monitored cutter speed and randomised sampling frequency to achieve a highly accurate slurry sample in a manner consistent with best sampling practice
- It is highly valuable in accurately depicting plant performance and the specifications of any slurry stream
- Uses low voltage, 24 V DC power supply
- Used as an in-steam sampler; further development is underway to adapt the unit to pressure applications



Online Slurry Ash Analyser

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- Uses slurry density and solids concentration to determine the particle density and hence ash content of the coal particles within the slurry
- This device can be used to constantly monitor the ash content of a slurry stream of a CHPP, helping to give a continuous indication of plant performance
- When applied to a tailings stream, this device can monitor clean coal losses to rejects and hence allow steps to be taken to either improve or maintain yield and specification



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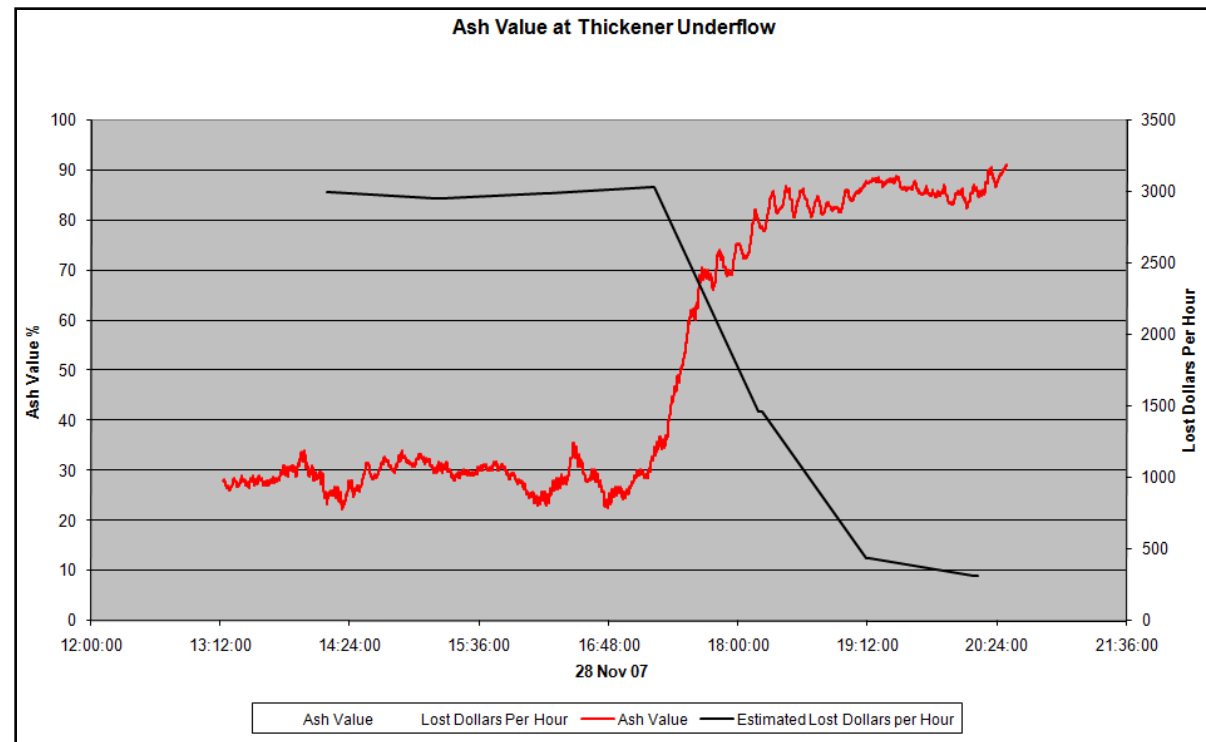
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- The device is compact and can be easily installed on any stream in a plant
- It can be integrated into existing plant communications and made to report to monitoring and control software



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- Emulsifying reagents such as frother and collector has been shown to dramatically increase the dispersion rate and hence efficiency of surface interaction of the reagent in operation
- The TUNRA emulsifier achieves this without the use of mechanical agitation
- With the addition of one of these compact and easily maintained units to the dosing mechanism significant reductions in reagent use can be achieved



Remote DMC Inspection

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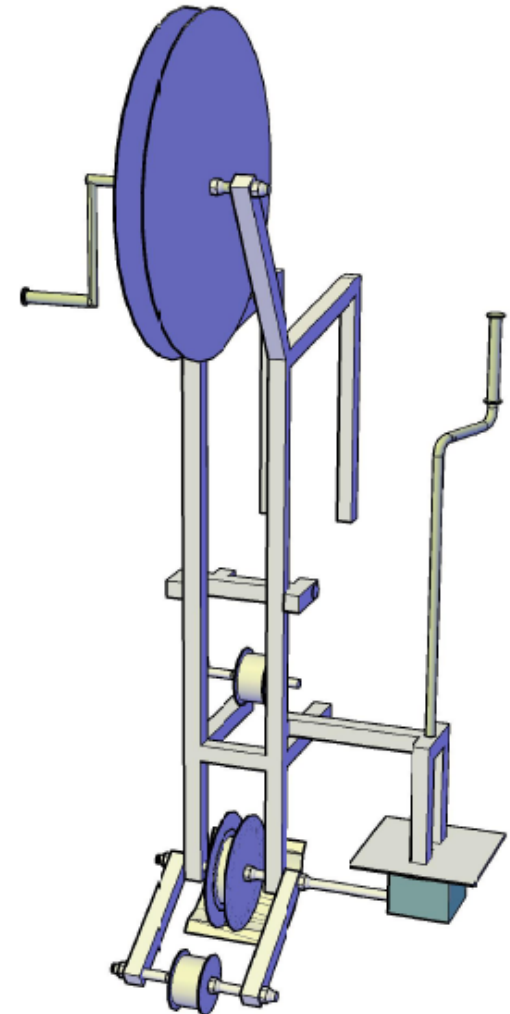
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- Inspects the interior of Dense Medium Cyclones during CHPP downtime
- Uses unique one way chain and support system to deliver a camera and laser to the interior of the cyclone
- Computer controlled mobile interface uses 24 V DC power and outputs to data collection device
- Data taken and used to generate a cyclone condition report for plant process personnel



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- Performs inspection without shroud or cap removal and eliminates confined space entry from the operation
- Yields superior inspection results due to image orientation
- Results in improved DMC circuit yields and eliminates a significant OHS concern from plant maintenance procedure



Laboratory Services

- TCC has a variety of specialised laboratory services available including:
 - Ultimate Flotation Testwork (UFT); sample sizes 100 g to 250 kg
 - 150, 300 & 450 mm Jameson Cell testwork
 - TUNRA flotation cells
 - Denver mechanically agitated cells
 - Filtration tests
 - Pilot scale TBS
 - Inclined cone thickener testwork
 - Hydrocyclone testwork
 - Pilot scale spirals testwork
 - All samples can be dewatered, dried and ashed at TCC or sent to a laboratory of the clients' choice

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- TCC also offers a variety of consultancy services including:
 - Process Design
 - Structural design and drafting coordination
 - Plant and system audits
 - Examination of plant sampling systems
 - Running of pilot and laboratory testing programs
 - Plant labour and management