

# AMC Underground SRU™ reduced water consumption by 86% at remote site

## CASE STUDY

Water is a scarce commodity at remote sites in the Goldfields Western Australia, making underground mining operations challenging and costly. By implementing the AMC Underground Solids Removal Unit™ (AMC UG SRU™), our customer Barminco achieved a significant reduction in water (86%), mud consumption (64%) and associated costs.

### Background

Water is a scarce commodity at remote sites in the Goldfields WA. When coupled with underground mining operations, water management can become challenging and costly. AMC's customer Barminco took the initiative to seek ways to reduce the amount of water and mud used. A trial was conducted comparing two holes – one was using the AMC Underground SRU™ and the other traditional methods.

### Improved Mud Properties and Fluid Capacity

Mixing mud underground can be challenging, particularly when using powders such as AMC CR 650™, due to inadequate power supply or mixing equipment. Often the only option is to use high pressure air driven agitators. The AMC UG SRU™ is supplied with a mixing tank and hopper – sufficient hydrated mud can be mixed for the day before drilling commences. Optimal mud improves drilling productivity and reduces wear-and-tear on drill bits.



### Results

- AU\$7,134\* net savings per rig per month
- 86% reduction in water costs
- 64% reduction in mud use
- 75% reduction in slurry volume
- Drilling continues despite water supply interruptions.

\* Rental is not included as rates may vary depending on the terms of the contract.

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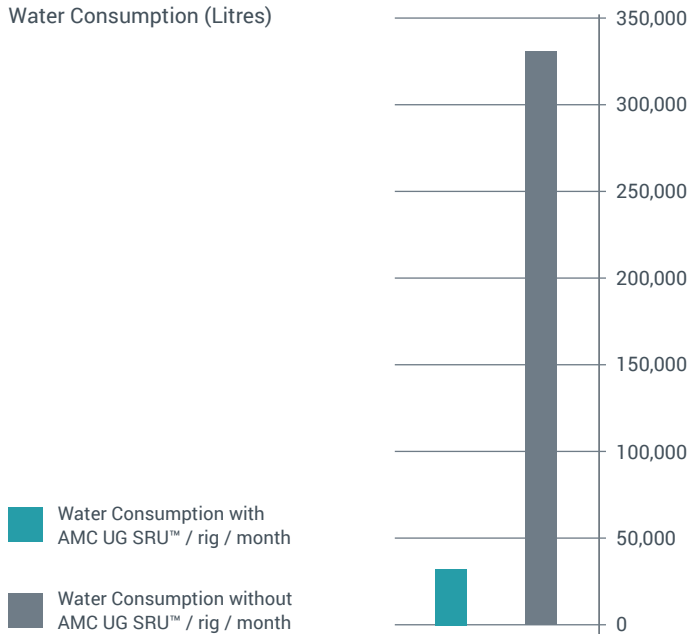
Reduced water consumption by 86% at remote site.



## Water Usage Reduced By 86%

Traditionally water is supplied by the mine, via poly-pipe, and channelled into a mixing tank. Mud and water are then disposed of into sumps at the end of tunnels where they are returned to the surface via trash pumps. Mud and water are often not recycled in underground operations due to drilling in small alcoves. Up to 500,000 Litres of water may be used per rig per month adding additional costs to the operation. The AMC UG SRU™ trial demonstrated an immediate reduction from 14,000L to 2,000L per day - including water losses. Water usage reduced by 90%, a saving of at least \$600 per rig per month.

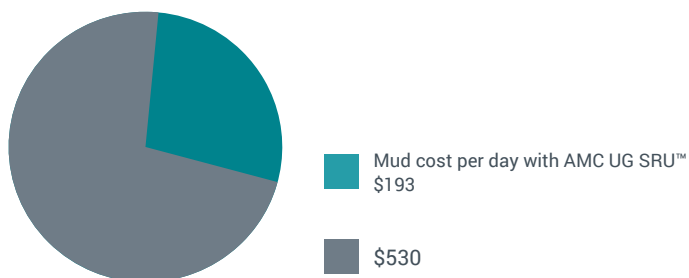
Water Consumption (Litres)



## Mud Consumption Reduced By 64%

A significant cost of any drilling operation is drilling mud – the larger the amount of water used, the larger the quantity of mud required to maintain adequate properties. By utilising the AMC UG SRU™ drilling fluids were able to be recycled and water and mud consumption reduced by 64% (mud costs reduced by at least \$10,000 per rig per month).

Savings in Mud Consumption Per Day Per Rig



## Cuttings Concentrated For Easy Disposal

Underground drill pads often have a shallow sump to catch water from wash downs, dust management and mud from the drill rig. Any dirt or cuttings, sludge is washed into the sump. Water from the sump is then pumped to the surface by a trash pump for treatment – cuttings dry out over time and are removed by the mine. The high speed centrifuge of the AMC UG SRU™ removes cuttings and provides a thick semi-dry slurry. The volume of this slurry reduces by approximately 75% and can be easily and economically transported to the surface.



Cuttings have a semi-dry consistency once processed by the centrifuge.

## Drilling Continues Even With Water Supply Interruptions

Occasionally underground water supply and drilling operations are interrupted due to burst pipes, breakdowns or water being needed elsewhere.

When this occurs, drilling meters and KPIs are interrupted and place the operation on standby, adding additional costs. When using the AMC UG SRU™, water and mud are still available and drilling can continue. During the trial the AMC UG SRU™ enabled a saving of \$12,000.



AMC UG SRU™ easily fits into typical underground pads.

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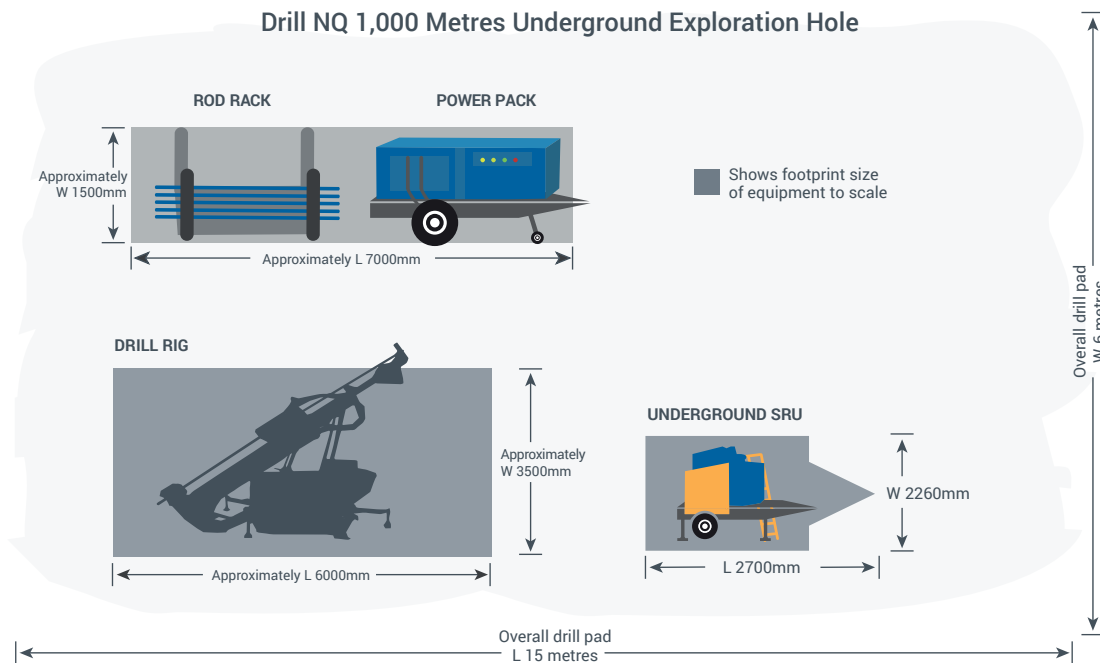


## A Drier, Safer Environment

Underground conditions are particularly challenging – conditions are hot, humid and slips can occur by crew and vehicles due to mud on roads and runways. The AMC UG SRU™ closed loop system recycles the fluid and reduces these risks.

## Small Footprint and Compact Design

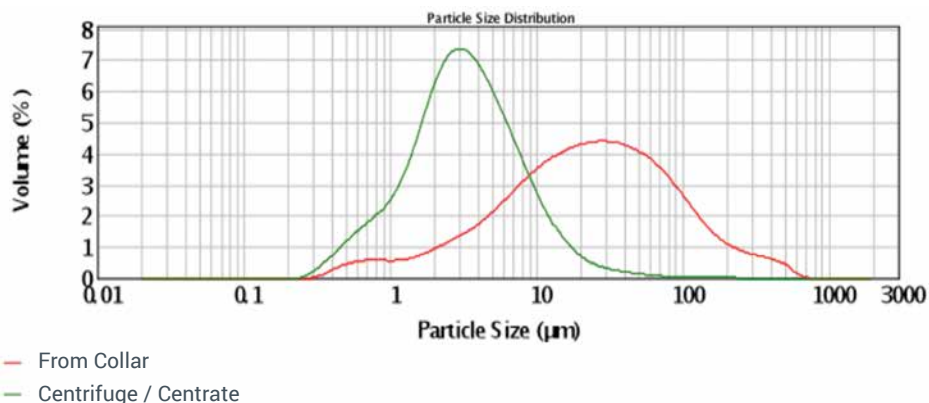
The small footprint of the AMC UG SRU™ allows easy transportation down the mine to the drill pad. The compact and mobile unit fits easily into a typical 15 x 6 metre underground pad and can be positioned to not interfere with operations.



## Efficiency

The centrifuge speed of the AMC UG SRU™ has been set to efficiently remove cuttings from the drill mud. The typical particle size of cuttings within drilling fluid pouring from the collar during diamond drilling is approximately 0 – 1000 microns, which creates wear and tear on drilling equipment as it circulates through the fluid system. When utilising the AMC UG SRU™, the particle size reduces to less than 10 micron (this includes the particle size of the drill fluid itself – see green line). The significantly smaller particle size minimises wear and tear on equipment and ensures fluids systems remain in optimal condition for longer.

Particle Size Distribution Indicating Reduction of Particle Size Between Collar and Centrate



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## Project Outcome

The unique AMC UG SRU™ provides significant economic benefits for drilling operators and resource companies. The unit's closed-loop fluid system significantly reduces the health and safety risks in underground mine sites and greatly improves the efficiency of drilling operations.

The trial demonstrated the unit's principal economic benefits were reduced water and mud usage, together with associated costs, and improved drilling productivity (drilling KPIs). These benefits were estimated to be AU\$7,134 (net savings) per rig per month.

The significant reduction in water usage also improved water management and reduced water treatment and pumping costs.

The trial reinforced the success of the unit's small footprint. It was easily positioned underground and did not interfere with drilling operations on the small drill pad.

### Key Benefits for the Drilling Company

- Reduced downtime caused by water supply interruptions – the AMC UG SRU™ continues to run (saving of approximately \$12,000 per rig per month)
- Reduced mud usage (saving of approximately \$10,000 per rig per month)
- Better use of muds – optimal mud properties and improved yield, filtrate loss, consistency and lubricity
- Limited flow lines resulting in less trip and slip hazards
- No need for air driven agitators on bulkers
- Better fluid capacity (2000L vs 1000L)
- Reduced chance of burning bits as the unit is continuously recycling fluid.

### Key Benefits for the Resource Company

- Reduced water wastage (up to 500,000 L), together with reduced power, pump, piping and surface storage space required to vacate water (saving of at least \$600 per rig per month)
- Less manual handling with minimal flow lines
- Lower cost of mud, together with better production rates and hole completion
- No downtime charges caused by water supply interruptions (saving of approximately \$12,000 per rig per month)
- A drier safer operating environment with reduced risk of slips and hazards – less water running along access ways, which can be slippery with Polymer
- Reduced fluid contamination within the mine – cuttings and fluid product.

## Award-winning Technology



AMEC ENVIRONMENT AWARD



WA INNOVATOR OF THE YEAR AWARD

## Further Information

For more information about this case study, please contact [amc@imdexlimited.com](mailto:amc@imdexlimited.com) or your local AMC representative.



Check out our website or YouTube to watch a video on this product. [youtube.com/amcdrillingfluid](https://www.youtube.com/amcdrillingfluid)

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