



# Operational Innovation in Hydraulic Mining

## *Remote System Implementation*

### Objective

XR3 upgraded its proprietary hydraulic mining cannons to fully remotely controlled for a Queensland operation.

The objective was to leverage existing technology in an innovative manner to maximise operational uptime and improve tailings reprocessing efficiency while reducing personnel exposure and enabling supervisors to focus on broader operational priorities, delivering safer and more reliable operations.

### Challenges

XR3 faced operational constraints that limited tailings processing efficiency and risked interruptions to uptime.

- **Safety Risks** – Personnel exposed to hazardous conditions during adverse weather or unstable ground.
- **Weather & Site Interruptions** – Conditions forcing shutdowns, reducing throughput.
- **Limited Oversight Capacity** – Supervisors were tied to monitoring operations, limiting their ability to be proactive.



### Key Outcomes

- ✓ **Up to ~140 t/h sustained mining rate**, producing ~2,800 tonnes per day per cannon
- ✓ **14% increase in average production**, equivalent to over 6,000 extra tonnes per month
- ✓ **~40% recovery of saleable material** from tailings
- ✓ **Operators and supervisors fully enabled:** remote control improves decision-making and frees supervisors for high-value tasks
- ✓ **Improved safety and reduced fatigue:** personnel removed from hazardous zones and harsh environmental conditions

# Approach

XR3 developed and implemented a structured operational model to ensure its proprietary remote hydraulic mining cannons delivered measurable improvements in tailings processing efficiency, uptime, and safety. The approach leveraged a custom combination of technology modules to achieve remote operational control and optimise performance and support supervisors to achieve superior operational oversight.

Key elements of the approach included:



## Technology Development & Deployment

Development and deployment of remote hydraulic mining cannons designed to operate safely from a climate-controlled control room up to 1.5 km from the tailings facility.



## Remote Operational Control

Integration of SCADA, high-quality camera systems, instrumentation, and monitoring interfaces to allow operators to manage flows, processing rates, and pumping systems simultaneously.



## Safety & Risk Mitigation

Implementation of enhanced safety controls and exclusion zones to reduce personnel access to hazardous areas while maintaining operational continuity.



## Operational Planning

In-house engineering supported operational planning and sequencing to meet geotechnical requirements, maintain slurry solids, optimise sump placement, and maximise throughput.



## Performance Monitoring & Optimisation

Continuous monitoring and performance optimisation through weekly data review, operator feedback, and adjustments to short-term planning to sustain consistent throughput.



## Supervisory Enablement

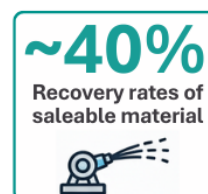
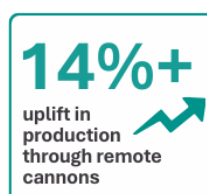
Empowering supervisors to focus on inspections, troubleshooting, and other site priorities by reducing their direct monitoring of cannon operations.

# Our Results

The introduction of XR3's remote hydraulic mining cannon delivered measurable improvements at the operation:

- **14% increase in average daily production**, equivalent to **over 6,000 extra tonnes per month**
- **~40% recovery of saleable material** from tailings, demonstrating the effectiveness of XR3's hydraulic mining methodology
- Sustained mining rate of up to **~140 tonnes per hour per cannon**
- Operators manage plant performance remotely, improving decision-making and control
- Reduced operator fatigue and exposure to harsh environmental conditions

The remote cannon has proven to be a **key driver of productivity, safety, and operational efficiency.**







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