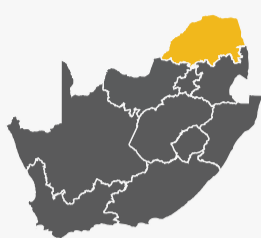




“ The North Seeking Gyro has significantly improved breakthrough accuracy, reduced re-drilling costs, and enhanced operational safety at Two Rivers Platinum Mine. ”

- Donald Malejane

BONICO TWO RIVERS PLATINUM



MINE/PROJECT LOCATION:

Limpopo, South Africa

MINE:

Bathopele Mine

CLIENT:

Bonico Drilling (Two Rivers Platinum)

ORE TYPE:

Platinum

COMMODITY:

Platinum Group Metals (PGMs)



HYBRID MEMS/FOG TECHNOLOGY GIVES THE BEST OF BOTH WORLDS!

The NorthFinder downhole survey tool is now in its second generation. It combines high-accuracy northfinding with continuous processing for precise surveys in deep vertical sections or daily use, ensuring quick results and reliable performance under challenging conditions with real-time DTH processing. Hybrid MEMS/FOG technology gives the best of both worlds.

COVER DRILLING SURVEYING

Our exploration services are designed to locate and assess the viability of mineral deposits. We specialize in both underground and surface drilling techniques to gather precise geological data, enabling our clients to make informed decisions about resource extraction.

PROJECT SUMMARY

Project Focus

Enhancing Underground Survey Accuracy for Cover Drilling Holes.

Operational Background

- Type of Mining Operation: Underground and surface operations.
- Mining Depth (approx.): approximately 2000m in depth.
- Typical Cover Drill Hole Length: 150 – 300 meters.
- Previous Hole Orientation Method Used: Push rods and winch.

Challenges experienced before implementing the North Seeking Gyro:

- Magnetic interference from roof bolts.
- Steel mesh.
- Mechanised equipment.



TECHNICAL PERFORMANCE & ACCURACY

Required Azimuth Tolerance:

±270°

Achieved Azimuth Accuracy with Gyro:

99% accurate

Repeatability Between Multiple Surveys:

Multiple Surveys: 0,2%

Performance in Magnetically Disturbed Areas:

Excellent – unaffected by magnetic interference.

Verification:

Breakthrough deviation reduced to less than 0.3 meters over 300-meter holes.

OPERATIONAL EFFICIENCY

- **Average Time to Survey One Hole:** 2-4 Hours.
- **Number of Holes Surveyed per Shift:** 2 holes.
- **Reduction in Re-drilling:** Approximately 75-85% reduction.
- **Ease of Use:** Operators trained within 1-2 days; reporting integrates with mine survey systems.

Safety Impact

- **Reduction in Risk:** Improved breakthrough control reduces the intersection into unsupported areas.

Financial & Productivity Impact

- **Estimated Cost Savings:** R1 million – R1.8 million annually.
- **Reduction in Drilling Delays:** Approximately 60% reduction.
- **Estimated ROI:** Achieved within the first 6 months of implementation.

KEY TAKEAWAYS

Underground Environment Conditions

- High magnetic interference from steel support and machinery.
- Vibrations from drilling rigs and LHDs.
- Temperatures between 30-38°C.
- Humid and occasionally wet conditions.
- The North Seeking Gyro maintained reliable performance under all conditions.

Decision Factors

- Reason for Selection: True north reference independent of magnetic fields.
- Key Criteria: Accuracy, reliability, technical support, ease of deployment and cost savings.

Cover Drilling Performance

- Improvement in Breakthrough Accuracy: Reduced deviation from 1.2-1.5 meters to less than 0.3 meters.
- Reduction in Dilution or Deviation: Improved panel stability and grade control.

CONCLUSION

The North Finder Gyro has significantly improved survey efficiency, accuracy, and safety. With up to 85% reduction in re-drilling, 60% fewer drilling delays, and ROI achieved within six months, the system delivers strong operational and financial value. Its ease of use and rapid implementation make it a highly effective solution for improving underground drilling performance.

