

# How **Anglo American** is Advancing Mining Safety and Efficiency using **Autonomous Drones** in Peru

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Anglo American has successfully deployed drone-in-a-box technology at their Quellaveco copper mine in Peru through a strategic partnership with UAV LATAM, transforming their topographical mapping operations. By replacing manual drone flights with autonomous operations powered by FlytBase's AI-driven platform, the mining giant has eliminated time-consuming truck transport between survey locations while enhancing personnel safety in challenging mountainous terrain. The implementation includes strategic dock placement on elevated positions to maintain communication across the mine's complex geography.







**Anglo American** stands as one of the world's leading mining companies, operating across multiple continents with a focus on sustainable mining practices and technological innovation. The company's Quellaveco copper mine in Peru represents a significant investment in modern mining infrastructure, positioned to serve global copper demand for decades to come. The mine has a geographically widespread area, spanning roughly 150 kilometers from the mountains to the coast.

This case study examines insights gathered from Anglo American's deployment in collaboration with UAV LATAM, their technology implementation partner. The global mining industry increasingly recognizes autonomous drone technology as essential for operational efficiency and safety. Mining operations worldwide have seen a 67% increase in drone adoption over the past three years, with autonomous systems representing the fastest-growing segment. This trend reflects the industry's commitment to reducing human exposure to hazardous environments while maintaining precise operational oversight.

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## The Challenge



The challenge was enabling efficient monitoring of extensive and inaccessible mining areas where the Anglo American's topography team spends considerable time traveling between locations in trucks and facing security risks during field operations.

**-Kimberly Rojas Ruiz, UAV LATAM**

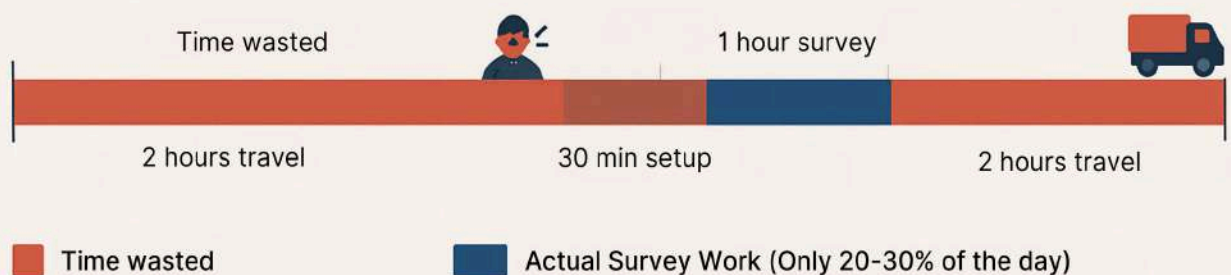
Anglo American's topography team at Quellaveco faced several operational challenges that hindered efficient mine surveying:

- **Time-intensive manual operations:** The topography team required daily panoramic flights using Mavic Air drones, necessitating physical travel between survey locations via truck transport across the mine site
- **Geographic accessibility constraints:** The mine's mountainous terrain created significant logistical challenges for reaching optimal survey positions, particularly in elevated areas where communication and safety concerns were paramount
- **Personnel safety considerations:** Manual drone operations exposed surveying teams to security risks and hazardous conditions inherent in active mining environments
- **Resource allocation inefficiencies:** Valuable technical personnel spent considerable time on transportation and positioning rather than focusing on core surveying and analysis activities





### Manual Operations Day



Traditional manual drone operations challenges

The combination of Peru's challenging geographic conditions and the scale of mining operations at Quellaveco demanded a solution that could maintain survey precision while eliminating manual intervention requirements.

## The Solution

Anglo American implemented a comprehensive drone-in-a-box solution powered by FlytBase's AI-powered drone autonomy platform. The deployment strategically addresses the mine's unique operational requirements while leveraging advanced autonomous capabilities.

The technical architecture centers on autonomous docking stations positioned at elevated locations throughout the mine site. These strategic placements ensure reliable communication links across Quellaveco's mountainous terrain, where signal loss represents a critical operational concern.

## Drone-in-a-box solution at Quellaveco



Each dock maintains constant connectivity with the central monitoring system, enabling seamless flight operations without manual intervention.

FlytBase's platform provides the autonomous flight management capabilities essential for reliable Beyond Visual Line of Sight operations. The system handles complex flight planning, real-time obstacle avoidance, and automated mission execution while maintaining regulatory compliance standards specific to Peru's aviation framework.

DJI Dock 2 + FlytBase solution

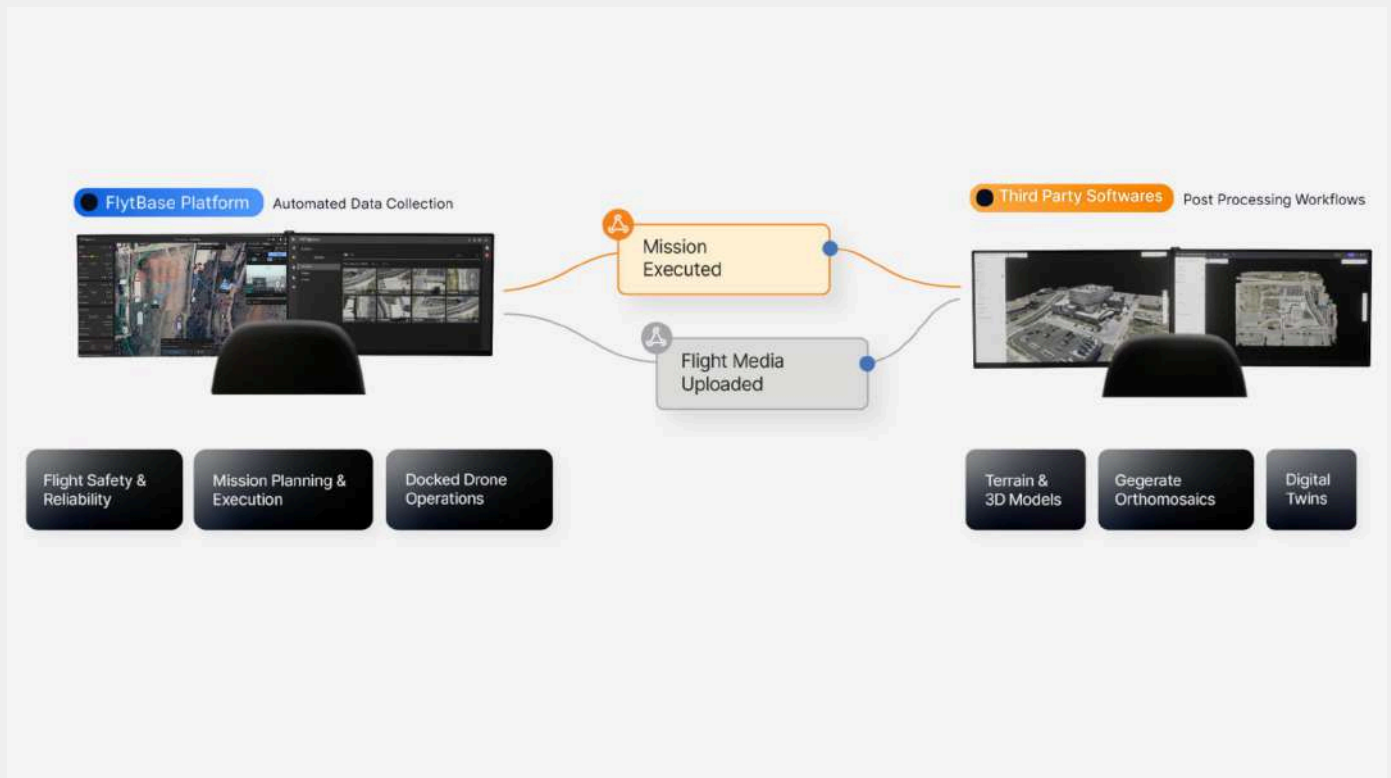
## How it Works

The operational workflow begins with automated mission planning through FlytBase's interface, where survey areas and flight parameters are defined based on daily operational requirements. Upon mission initiation, drones automatically deploy from their docking stations, execute predetermined flight paths while capturing high-resolution imagery, and return autonomously for battery replacement and data upload.

Real-time monitoring occurs through a centralized command center where Anglo American's team oversees multiple simultaneous operations across different mine sectors. The AI-powered system provides continuous flight status updates, weather condition monitoring, and automated alerts for any operational anomalies, with UAV LATAM providing technical support and maintenance services.

Powered by **FlytBase**

Data processing occurs immediately upon flight completion, with captured imagery automatically transferred to Anglo American's analysis systems for integration with existing mine planning workflows.



Drone Data Capture and Data Processing Workflow

## Implementation

The deployment followed a phased approach, prioritizing critical survey areas where manual operations presented the highest safety risks and operational inefficiencies. UAV LATAM led the implementation process, conducting detailed site assessments and coordinating with Anglo American's technical teams to ensure seamless integration with existing mining workflows.

Initial installations focused on elevated positions that provided optimal communication coverage while serving the most strategically important survey requirements.

UAV LATAM's expertise in mountainous terrain deployment proved crucial for determining optimal dock placement strategies that account for Peru's challenging geographic conditions.

Since Quellaveco operates as a private mining property, Beyond Visual Line of Sight operations can proceed through a streamlined regulatory process. Monthly reports are provided to DGAC under an agreement made with the Peruvian CAA, where they highlight the total flight time per drone dock. This approach significantly accelerates deployment timelines compared to public airspace operations.

UAV LATAM managed all regulatory aspects and continues to monitor compliance requirements. Testing protocols validated communication reliability across various weather conditions and geographic positions before full operational deployment. The elevated dock positioning strategy underwent extensive validation to ensure consistent connectivity even in challenging mountainous terrain where traditional communication methods often fail.



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# Impact

## Enhanced Operational Efficiency

The autonomous drone implementation has transformed Anglo American's daily surveying operations by eliminating time-consuming truck transport between survey locations. Personnel previously spent significant portions of their workday traveling across the mine site, time now redirected toward higher-value analytical activities.



This technology was implemented to optimize operational outcomes, and we're seeing consistent improvements.

**- Representative, Anglo American**

## Improved Safety Standards

Autonomous operations have removed personnel from potentially hazardous survey locations while maintaining comprehensive site monitoring capabilities. The centralized monitoring approach allows teams to conduct thorough surveys from secure office environments rather than exposed field positions.

## Advanced Technical Capabilities

FlytBase's AI-powered low-altitude flight capabilities proved particularly valuable for Quellaveco's mountainous geography. The system enables flights below traditional altitude restrictions, crucial for detailed surveying in elevated terrain where docks must be positioned on mountaintops to maintain communication links. UAV LATAM's operational expertise ensures optimal utilization of these advanced capabilities in challenging mining environments.



## The Way Ahead

Anglo American continues to evaluate expansion opportunities for autonomous drone capabilities across additional survey applications at Quellaveco. UAV LATAM remains the strategic implementation partner, providing ongoing maintenance services and technical support while exploring advanced surveying applications.

The success at Quellaveco positions Anglo American to evaluate similar deployments across their global mining portfolio, with UAV LATAM's proven implementation methodology serving as a model for future autonomous drone integrations in challenging geographic environments.

## Conclusion

Anglo American's implementation at Quellaveco demonstrates how autonomous drone technology can transform traditional mining surveying operations. Through their strategic partnership with UAV LATAM and FlytBase's AI-powered platform, the company has achieved significant operational improvements while enhancing safety standards.

The collaboration showcases the value of combining global technology innovation with local implementation expertise to address complex mining challenges.

For the official announcement by Anglo American, visit: [\[here\]](#).

