Technical Article-5

Drone for Mining industry

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Mining processes are highly labour-intensive which require huge investment to check the safety of laborers. Mining industries are searching for new technologies to reduce costs and enhance productivity and worker safety. Drones are one of such technologies that can be applied across mine sites, making on-site activities a lot safer and more productive. Drones in mining boost the overall productivity of large mine sites and quarry management by giving exact and comprehensive details of data in a very short time. This data can be safely produced by on-site laborers who have little surveying experience at a fraction of the cost of traditional survey methods. Across the mining industry, drones are exhibiting surprising results by allowing much greater data collection, improving safety, and intensifying productivity. The popularity of drone technology across the mining industry has increased significantly in recent years. In mining, drones have various applications like mine surveying, inventory management, stockpile evaluation, and hot spot identification, etc.

The top companies in the world have already started to integrate drones for mining. In fact drones have proven to be vital tools across every part and phase of a mine site from exploration, to drilling and blasting, to reclamation.

How are drones used in mining to boost operations?

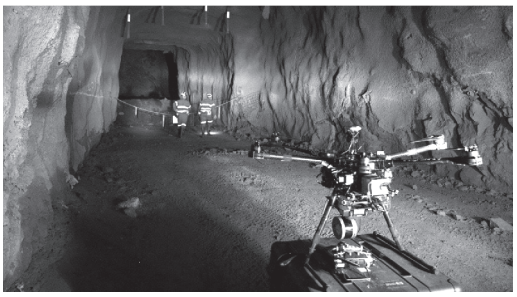
Every mine presents its own unique challenges. Chances are good that they are based on one of the following key jobs that drone mapping makes easier across the life cycle of a mine site:

1. Hazard identification

Correcting potentially- dangerous site features and avoiding safety hazards is easier when you have more frequent and more accurate surveys of all the active areas of your mine. This has been well known and researched since earlier days of the technology.

2. Haul roads

Measure, monitor and update haul roads with accurate data from mining drones.



3. Underground

Specially-designed mining drones are collision tolerant and equipped with lights and real-time controls for quick inspections of underground environments that cut costs and boost safety.

4. Water and sediment flow monitoring

It's easier to manage your site and prevent setbacks and hazards related to uncontrolled water movement with more frequent aerial surveys based on a more accurate comparison of terrain and water levels. Mine sites also need tight water treatment and management plans to begin aligning to the technological age of industry.

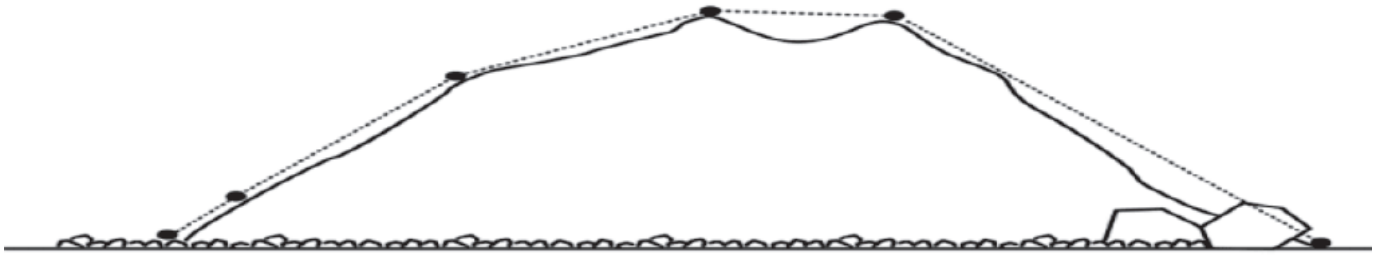
5. Drilling and blasting

Get precise and detailed aerial views of drill patterns and blasting results.

6. Stockpile management

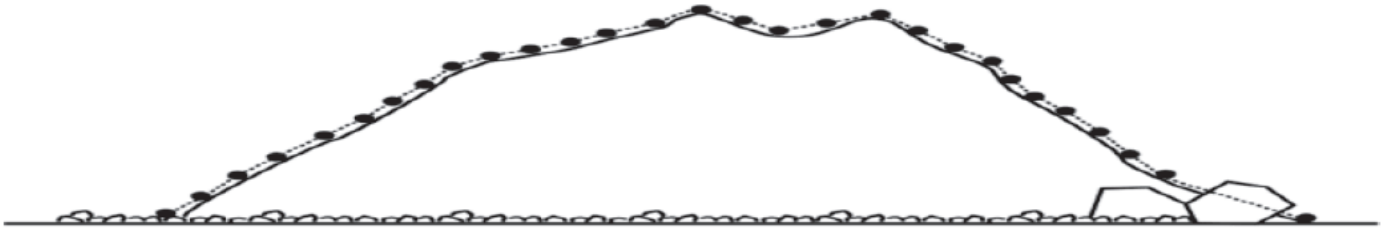
With drones, measuring volumes is based on hundreds of times more data points and is 100 percent safe since data can be captured from a distance vs. climbing on slopes.

Traditional GNSS survey



Only a few data points can be collected, craters and steep slopes are often overlooked.

Drone survey



Hundreds of data points are collected, including steep slopes or craters sometimes invisible from the ground.

7. Maintaining tailings dams and ponds

Prevent unexpected activity and leaks with clearer, more frequent drone survey data. Additionally, more sophisticated analytics are available to prevent breaks when using data-rich drone imagery.

8. Reclamation

Returning land to its original state is much more feasible if you have data that allows you to see how the land has changed and what needs to be done to return it to the original state.

9. Reporting and auditing

Tracking and recording what happens onsite is much easier with a history of accurate aerial or underground imagery providing exact figures to present or compare with contractors.

10. Drones for mineral exploration

Aerial data from drones helps produce base geology maps for planning and excavation of assets.

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