USE CASES

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STOPE MAPPING
WITH HOVERMAP

MAP STOPES IN MINUTES

Hovermap enables data capture of critical underground mine excavations, delivering new insights for mine planning and operations

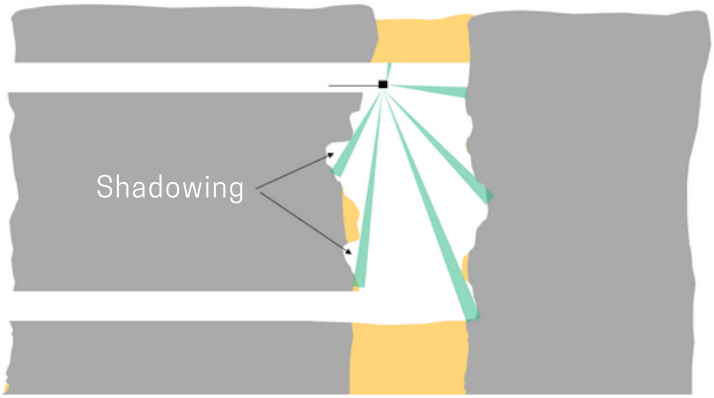
With Hovermap, mine and geotechnical engineers can easily map underground excavations—quickly, safely, and with minimal disruption to production.

TRADITIONAL CMS MAPPING - TIME-CONSUMING AND HAZARDOUS

Inspections of inaccessible areas such as stopes require specialized cavity monitoring systems (CMS). But CMS scanning is time-consuming, often requiring multiple scans that take hours—halting production.

The boom-mounted scanner is extended out into the stope, requiring surveyors to work in close proximity to drawpoints or past a stope bund.

At drawpoints the surveyor is exposed to the risk of sudden rock fall and riling hazards, while access to upper levels of an open stope can expose them to unknown undercutting.



CMS imaging contains shadowing, occluded areas of a stope, and variable point density, reducing the value of the data for geotechnical, volumetrics or reconciliation analyses.

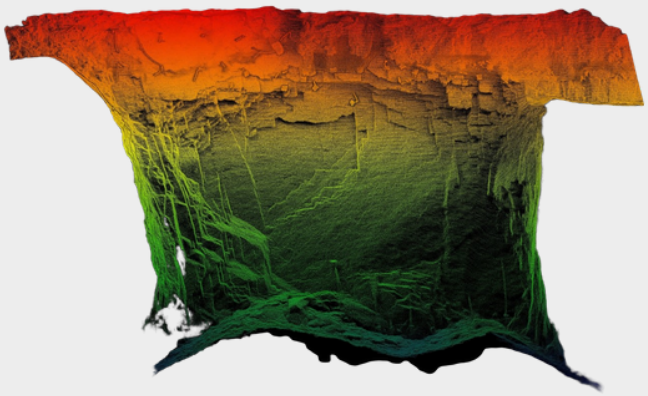
Substituting a CMS with a drone-mounted LiDAR scanner eliminates the requirement for surveyors to work near the stope edge, and improves data quality and coverage.

MAP HAZARDOUS AREAS SAFELY & QUICKLY

STOPE MAPPING WITH HOVERMAP

Hovermap is a drone-mounted mapping solution able to operate in GPS-denied and hazardous environments. Hovermap can fly a mission and within minutes capture high resolution LiDAR point clouds and imagery.

These data sets provide mining and geotechnical engineers with rock mass, structural and volumetric data of unparalleled quality — improving decision-making in mine safety and design — with minimal impact to production schedules.



Geotechnical engineers can identify structural planes and discontinuities from detailed point clouds.

ENHANCED STOPE ANALYTICS

The reconciliation and analysis of a stope relies on the quality of the data produced by the stope scan.

With CMS, the quality of a scan is limited by the location of the static scanner and the size and shape of the cavity—resulting in poor point density and shadowing that can occlude over-break.

In comparison, Hovermap flies beyond the brow, into the stope, to capture data consistently in the range of ten to twenty thousand points per square meter and without shadowing.

High resolution point clouds deliver several benefits. Analytics conducted on a rich point cloud data gives engineers greater confidence in the final stope volume for reconciliation of production tonnes or for backfill.

Over- and under-break can be calculated with greater certainty, plus there is better interpretation of the mechanism by which it occurred. Discontinuity traces and structural planes within a stope can be identified by geotechnical engineers, which previously was not possible given CMS coverage and quality limitations.

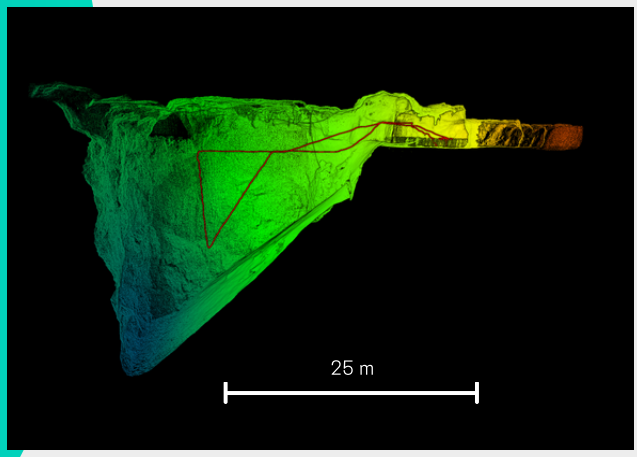
A SAFER METHOD

WITH MORE ACCURATE RESULTS

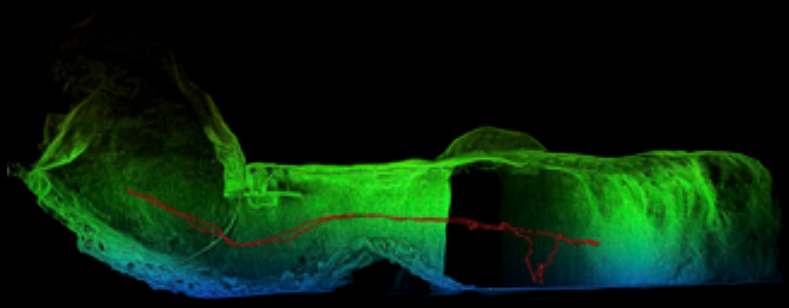
ACCURATE BACKFILL MONITORING

Mining operations backfill stopes to meet a variety of requirements, but most commonly to control dilution and stability within a mining area.

Monitoring of backfill material used for engineering purposes requires a high degree of detail to confirm the correct placement of the material within the stope, to ensure the design is correctly followed and to calculate the correct batch volume.



With Hovermap's rapid acquisition of data, engineers have access to accurate information on backfill placement, heights and remaining stope volumes.



SAFER HANG-UP INSPECTIONS

Drawpoint hang-ups in both stoping and caving mines pose a serious safety hazard to the personnel attempting to clear them, and cause unplanned delays to production.

Common clearing methods are blasting and hosing with water to dislodge the material blocking the drawpoint.

Scanning the drawpoint with Hovermap gives miners a clear view of the blockage and facilitates a targeted management approach.

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CASE STUDY SNAPSHOT:
RAPID CAPTURE
UNDERGROUND

In an African underground long-hole stoping gold mine, Hovermap flew two six-minute, beyond-line-of-sight, flights to fully map an enormous (150 x 40 x 20 m) stope. Previously, this had been mapped with a CMS, from three entrances and the bottom drawpoint.

While personnel remained a safe distance from bund edge, Hovermap captured high resolution, accurate point clouds.

CMS	HOVERMAP
• Boom-mounted CMS, three scans (top, middle, bottom) • Total time: 3+ hours including post processing and coordinate registration • Incomplete, low density point cloud	• Stope mapped from top and middle entrances • Total time: 30 mins including post-processing and coordinate registration • High resolution point cloud

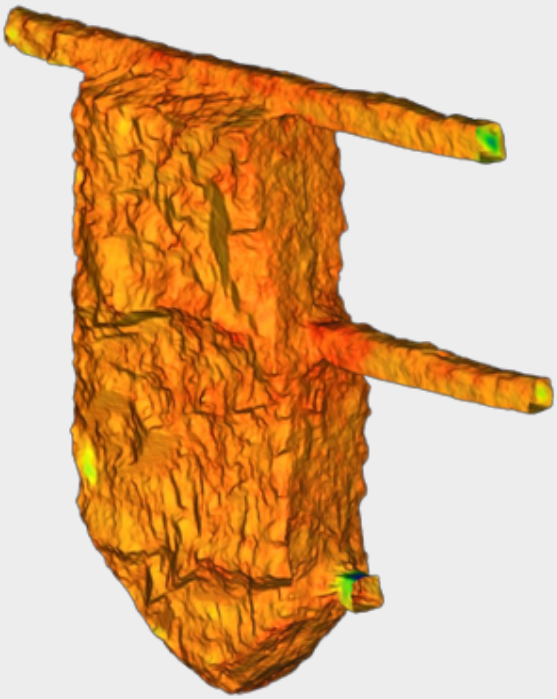

Image credit:
Unmanned Aerial Services

A stope point cloud, colour coded by density, shows high resolution and consistent coverage of the entire stope.

"It took us only 2 x 6 minutes to cover the entire stope with over 96% coverage. It would take them over 3 hours to survey this exact same stope using traditional survey methods."

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Matt McKinnon, Operations Manager
Unmanned Aerial Services Inc.