

# PETRA DIAMONDS FINSCH MINE DATA CAPTURE



## How Emesent Hovermap technology helped Petra Diamonds save millions on ore pass remediation at their Finsch mine.

### BACKGROUND

Headquartered in Jersey in the Channel Islands, Petra Diamonds has an interest in eight mines in South Africa and Tanzania, with a combined production output of around 3,700,000 carats a year. The company's Finsch underground mine, in South Africa's Northern Cape province, is often used as a testbed for new technology, prior to its deployment across other Petra sites.

### THE CHALLENGE: GAINING DATA ON INACCESSIBLE UNDERGROUND SHAFTS AND PASSES

Finsch uses orepasses and underground silos to transfer ore between levels or to redirect ore for load and haul to the surface. Blockages, hang-ups, overbreak or scaling can impact the structural integrity and result in extended downtime and significant remediation costs.

Accurate imagery enables mine engineers to gauge the integrity of ore passes and plan timely and cost-effective rehabilitation programs. Historically, however, scanning and mapping inaccessible shafts and voids has been a challenge for Petra.

The company's management sought a means of obtaining accurate visualizations of underground voids, quickly and cost effectively, without endangering the safety of Petra personnel or contractors.

### THE SOLUTION: SEND IN HOVERMAP

In October 2019, Petra management trialed the Hovermap multiple data capture methods. Emesent partner Dwyka Mining Services was contracted by Petra to carry out multiple scans of an indoor stockpile, orepasses and vertical shafts, and a series of access tunnels and ramps. For one of the orepasses, management needed to decide between scheduling remediation to repair long term scaling, or abandonment.

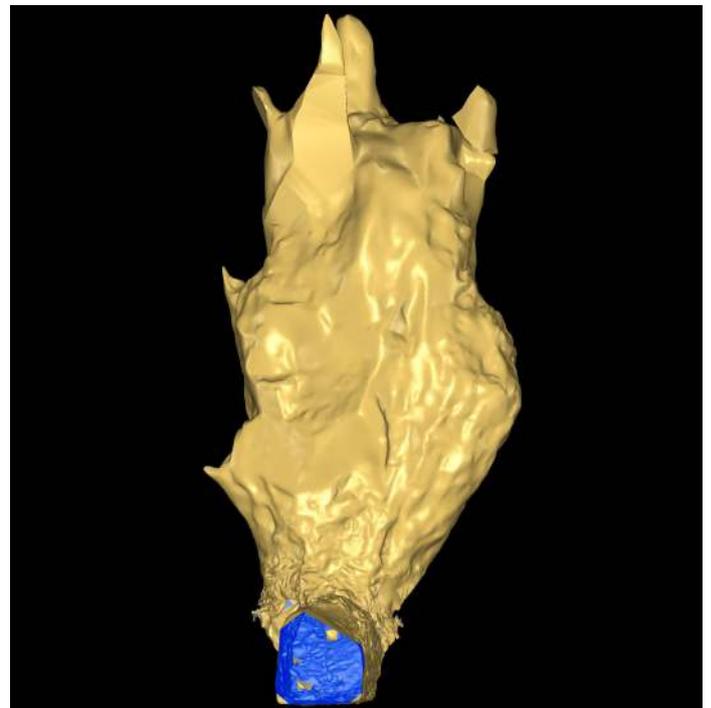
Dwyka Mining Services spent a day onsite conducting a series of scans using Hovermap mounted to vehicles, a DJI drone, or lowered in a protective cage.

### KEY ACHIEVEMENTS

-  Savings of US\$ 350,000 on remediation activities
-  Immediate payback of Hovermap system
-  Reduced safety risk for Petra survey team
-  Accurate data of inaccessible infrastructure delivered within hours

"We lowered Hovermap down ore passes, flew the drone into drawpoints and even scanned our shaft and ramps by fixing the scanner to one of our vehicles. The visualization delivered exceeded all our expectations. The data captured in one ore pass saved us significant time and effort by confirming it was irreparable. That saved us millions."

Alex Holder, Group planning and projects lead, Petra Diamonds



Survey of stope and drawpoint point cloud meshed to form a solid.

## DELIVERABLES

Dwyka Mining Services delivered highly accurate point cloud data sets for Petra's survey team to geo-reference and analyze, within 24 hours. Dwyka also delivered visualizations of the orepasses, enabling the mine engineers to 'see' the condition of orepasses for the first time.

## BENEFITS: MAXIMIZING PRODUCTIVITY AND PROFIT THROUGH DATA-DRIVEN DECISION MAKING

Using Hovermap led to an immediate decision to abandon plans to expend resources remediating a compromised ore shaft. This decision saved Petra an estimated five months and five million rand (US\$ 350,000).

The data collected by Hovermap has become the basis of a data library for the site. It is augmented regularly and used to inform operational decision-making by Petra's mine planning and survey teams.

Petra intends to deploy Hovermap scanning technology to map inaccessible locations at its other sites across the African continent.

“The ability to power and switch the Hovermap payload between the various applications meant that we were able to scan a considerable amount of the mine in one shift. Generally, this was either impossible and, if it were possible, it would take weeks to collect those datasets and months to see the final visuals.”

**Heinrich Westermann, Mining Engineer, Petra Diamonds**



Scan of 350m ore pass, colored by intensity, showing moisture seepage.