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Precision High-grading and Production Optimization at Pumpkin Hollow Mine Using Muon Tomography

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Muon tomography is a passive method for mapping the subsurface using naturally occurring energy from supernova explosions in space. Muons are charged particles that arise from cosmic energy interacting with the Earth's upper atmosphere. Naturally occurring cosmic-ray muons penetrate deep into the Earth's crust and their attenuation in matter is proportional to the density of material they pass through. By measuring muon flux through detectors positioned beneath the surface, precise 3D models of density across a wide field of view can be determined.

Muon tomography is a foundational technology in the Ideon REVEAL™ for Resources solution, the world's first high-resolution subsurface intelligence platform™ that provides continuous, high-resolution imaging of mineralization — even at great depths, at spatial resolutions down to 20 m or less, and in noisy, active mining environments. This novel technology enables mining companies to reduce in-fill delineation drilling while improving ore recovery, reducing planning risk, and accelerating time to market.

In August 2025, Ideon activated this solution at the Pumpkin Hollow underground copper mine in Nevada, owned by Kinterra Capital and considered one of the top 20 copper assets in the USA. Pumpkin Hollow is a fully built and permitted underground copper mine, discovered by U.S. Steel in 1960 and closed in 2024 following a bankruptcy filing by then-owner Nevada Copper. Kinterra has been leveraging Ideon technology as a cornerstone of its efforts to restart and optimize production at the mine.

Ideon generated high-resolution 3D models of the subsurface at Pumpkin Hollow — mapping geology, increasing certainty in the ore density, informing mine planning, and enhancing grade reconciliation. The results are helping Kinterra target the richest zones first and optimize production outcomes, bringing high-grade tonnes to the mill sooner. This presentation covers how decision-grade subsurface intelligence helps mine planners accelerate cash flow and copper supply.