

SEG 2024 Conference: Sustainable Mineral Exploration and Development

Predicting Giants: The Role of Geoscientists and Mineral Systems in our World of Emerging AI

Nicole Januszczak

BHP, Toronto, ON, Canada

Mineral exploration suffers from a prediction problem: we are good at predicting mineralization, but not very good at predicting world-class mineral systems. Prospectivity models take months to build, geoscientists are under considerable cognitive load, and few techniques are used to stress test our understanding of how critical processes need to line up for world-class mineral systems to form.

AI will drastically improve our ability to predict world-class mineral systems. AI can assimilate large volumes of data, make complex decisions, and communicate how predictions are made. Exploration needs AI, but AI also needs us. Humans take empirically driven predictions from AI derived from patterns in data, and we attribute conceptual understanding of processes that govern how mineral systems form.

At BHP we are curating one of the largest cloud-hosted data lakes in the world as a key enabler for the advanced application of AI. We are investing in new spatio-temporal data sets that are revealing how world-class mineral systems form. We have built AI toolboxes, and we are pioneering the use of large language models in BHP to extract mineral systems insights stranded in unstructured legacy data.

BHP is committed to the advanced application of emerging technology, and we are preparing to use AI at scale and at pace to accelerate the delivery of high-value options to the business. New technologies take time to take hold, but early adopters will be rewarded with first-mover advantage in our competitive mineral exploration industry.