

# Complex Orebodies Conference 2018

Paper Number: 24

## A comparison of opportunity and risk in deep-sea and terrestrial mining projects

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### ABSTRACT

The existence of metalliferous mineral deposits on the deep-sea floor has been known since manganese nodules were discovered in the Arctic Kara Sea in 1868. Modern exploration with the aim of defining commercially viable base and precious metal deposits began in the 1970s and gained further momentum in the last decade. High grade deposits have been delineated but investors remain cautious, perhaps considering deep sea mining projects to be riskier than terrestrial projects.

This paper compares opportunities and risks presented by terrestrial base metal mines and those presented by three deep sea mineral deposits; the Solwara 1 volcanic-hosted massive Cu-Au-Ag sulphide deposit, the Atlantis II Deeps sedimentary base metal sulphide deposit and the Mn-Ni-Cu-Co nodule deposits of the north-eastern Pacific Ocean. These are advanced deep-sea projects with published mineral resource estimates, on the cusp of development. They provide a basis for comparing exploration and geological uncertainty, the technical risks of proposed mining systems and the potential environmental and social impacts.

In many respects the risks of development of seafloor resources are lower than for terrestrial resources and the post-closure management of deep-sea mining projects may be much less problematic than for competing land-based projects. The limited precedents for seafloor mining may currently challenge investors and regulators but with several groups on the verge of committing to trial mining or full-scale mine development this impediment may soon disappear.