

A new five-fold classification for Large Igneous Province-related resources

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Large Igneous Province (LIPs) events transport a significant amount of energy and metals from the Earth's mantle to the crust and are directly involved, drive or otherwise causatively influence a variety of differing metallogenic systems [1]. LIP events can also directly affect the hydrocarbon source rock maturation and hydrocarbon generation and are genetically related to the development of important aquifer and hydrocarbon reservoir systems [2]. Here, we present a new five-fold classification for LIP-related resource generation:

(1) LIP magmas as primary sources of commodities within ore deposits.

(2) LIP magmas as source of energy, fluids, and/or metals and as heat sources that drive hydrocarbon source rocks to maturation or over-maturation.

(3) LIP rocks as barriers to fluid flow and/or reaction zones that control mineralising events, act as structural traps within hydrocarbon systems, or form impermeable barriers that control water flow and aquifer formation.

(4) Weathering of LIP rocks to form residual deposits and the surficial interactions that genetically link oceanic-plateau LIP formation with anoxic events and the formation of important organic-rich black shale hydrocarbon source rocks.

(5) Indirect connections between LIPs and ore deposits, such as tectonic changes that generated ore deposits linked to distal LIP events and associated rifting. LIP events also enable the reconstruction of Precambrian supercontinents and the tracing of areas of metallogenic and hydrocarbon endowment between presently separated but formerly contiguous crustal blocks. This new classification that outlines the genetic relationships and links between LIP events and the formation of these resources across the geological record can be used to enhance exploration strategies for the wide variety of LIP-related resources outlined above.

[1] Ernst. & Jowitt (2013) *SEG Special Publication* **17**, 17-51. [2] Ernst (2014) *Large Igneous Provinces*. Cambridge U. Press.