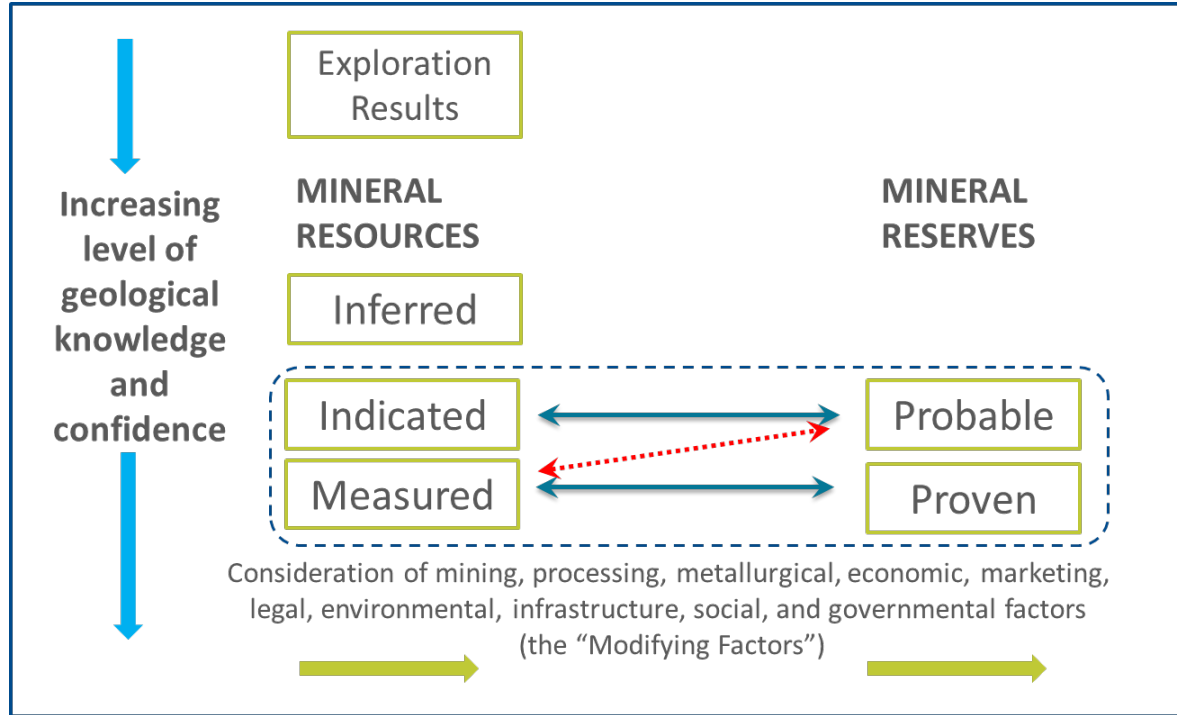




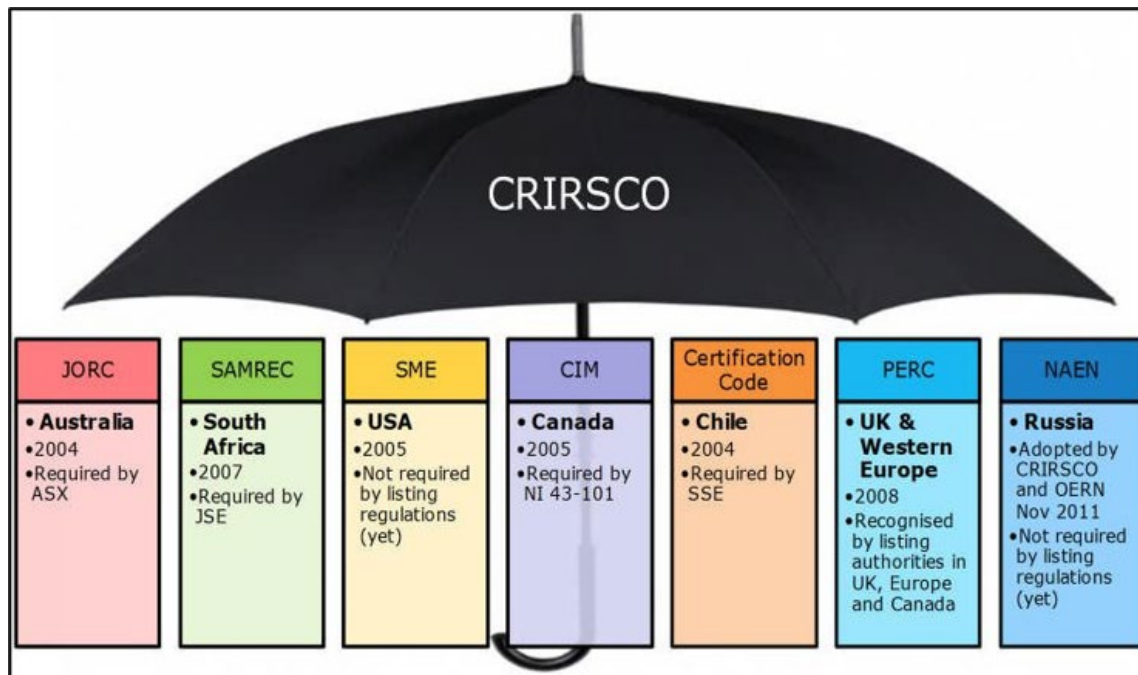


Mineral Resource and Reserve Classification





CRIRSCO Umbrella For International Reporting Codes





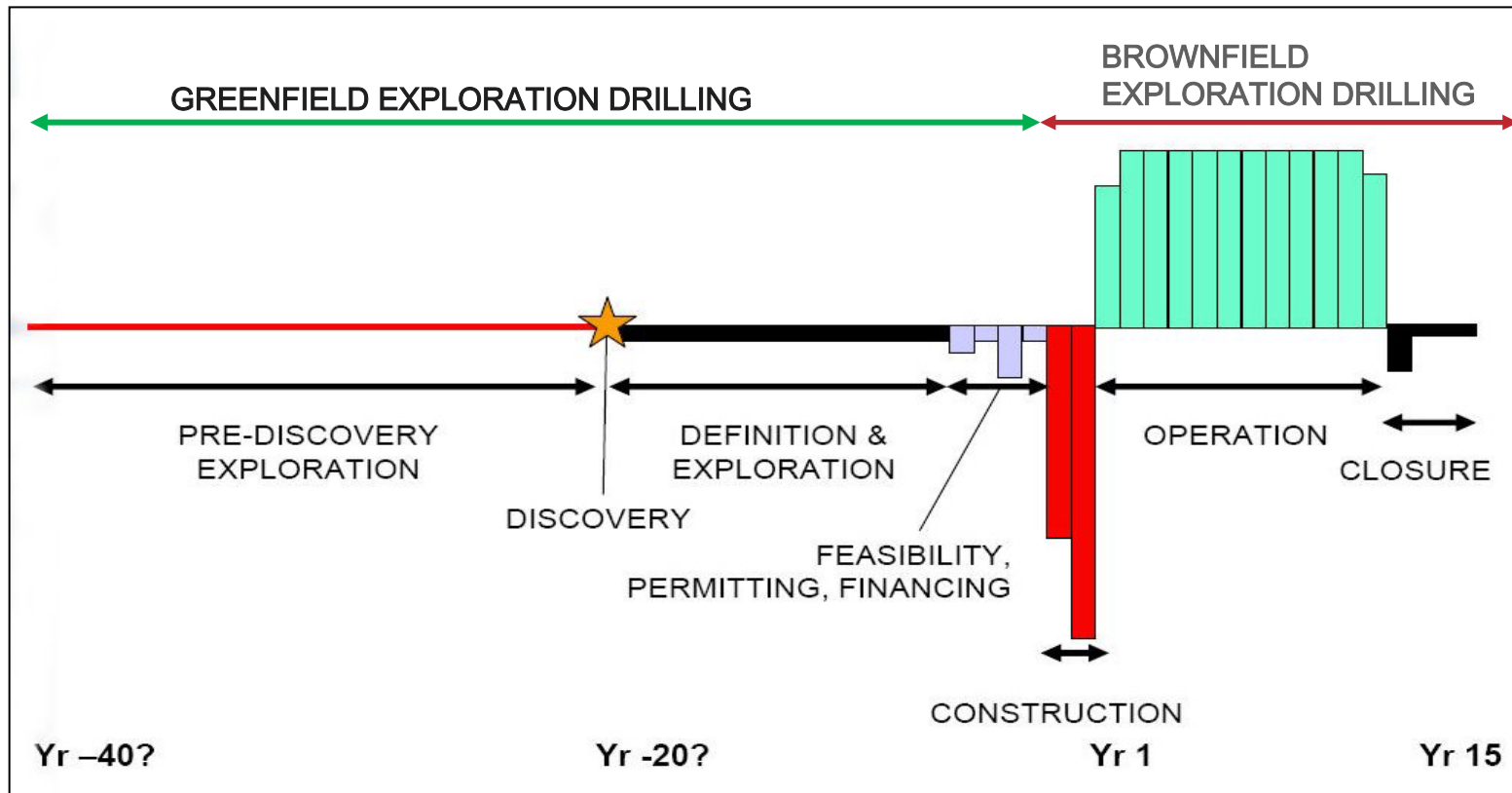
CIMVAL 2019

TABLE 1. Valuation Approaches for Different Types of Mineral Properties

Valuation Approach	Exploration Properties	Mineral Resource Properties	Development Properties	Production Properties
Income	No	In some cases	Yes	Yes
Market	Yes	Yes	Yes	Yes
Cost	Yes	In some cases	No	No



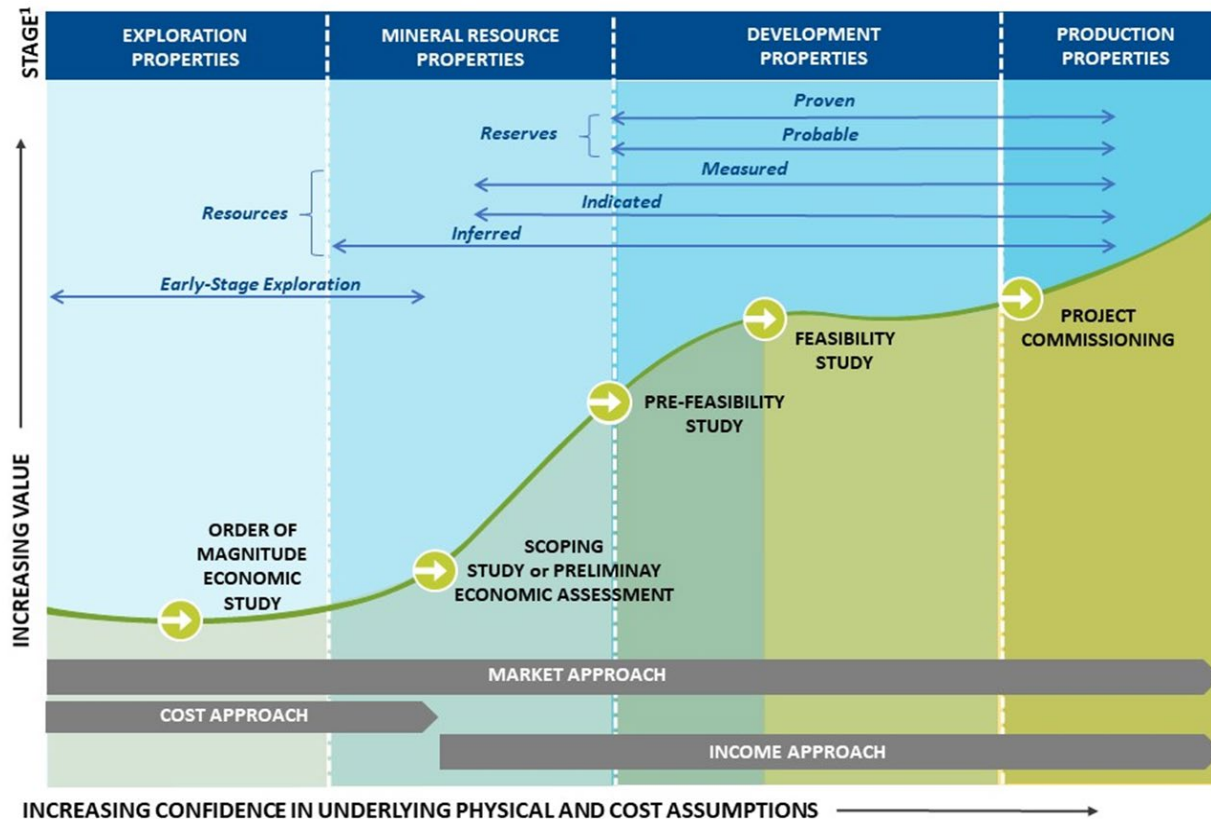
Mining Life Cycle is Many Years to Production



Courtesy Larry Smith



Project Stage- Development & Pre-Development Projects





Risks for Mining Projects

- **Security of Tenure:** type of license – exploration or exploitation, Validity – long enough for the project, coordinates, terms of license – minerals, committed spend, relinquishment, etc.
- **Geological:** correct interpretation, ore types, mineralogy, rock/ore competency, oxide-sulphide boundaries, grade & thickness variation, specific gravity, moisture content and ARD.
- **Geotechnical:** slope angles (o/p), mining method (u/g), rock stability, support requirements, etc.
- **Hydrological:** water issues – too much or too little, overall water balance (zero discharge?).
- **Resources:** CRIRSCO classified geostatistical estimates based on appropriate and audited sampling and analytical methods.
- **Reserves:** correct application of “modifying factors” including dilution & recovery.
- **Mine Planning:** mining method, production rate, grade control & reconciliation.
- **Metallurgy:** plant design vs performance, overall recoveries.
- **Infrastructure:** power, water, roads, rail, comms and workforce.
- **Construction and Startup:** timeline and project overruns.
- **CAPEX:** will often dictate the funding options (debt, equity, offtake, royalty, streaming, etc).
- **OPEX:** managing inflationary pressures and rising input costs.
- **E&S:** compliance with local and international guidelines (IFC), ESG buy-in to include community relations & social license to operate, stakeholder engagement, government approval, etc. TMF??
- **Health & Safety:** get this right or.....
- **Markets:** metal price movements, cost inflation, market performance – ability to raise money!