

Figure 2: Geological grade risk integration into planning framework.

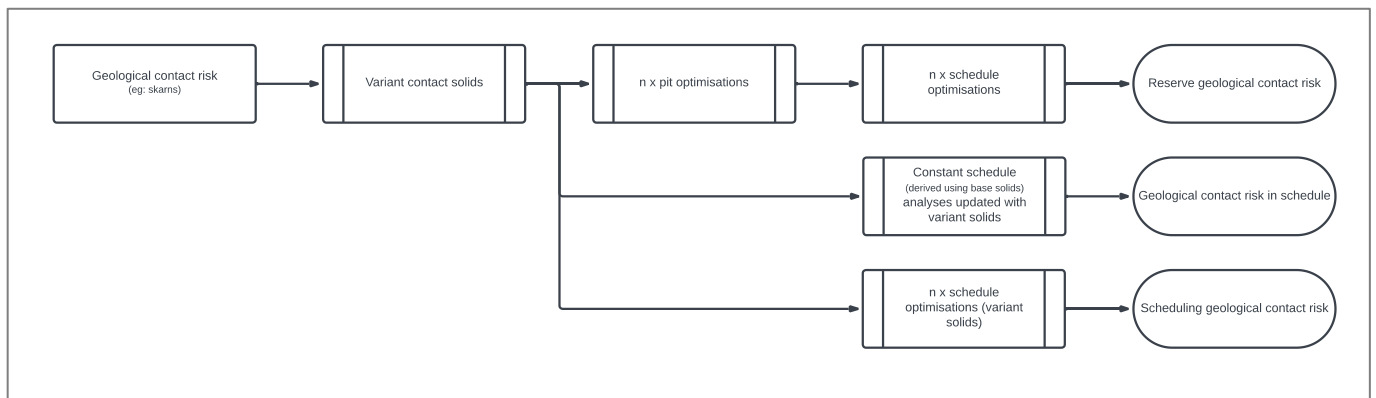


Figure 3: Geological contact risk integration into planning framework.

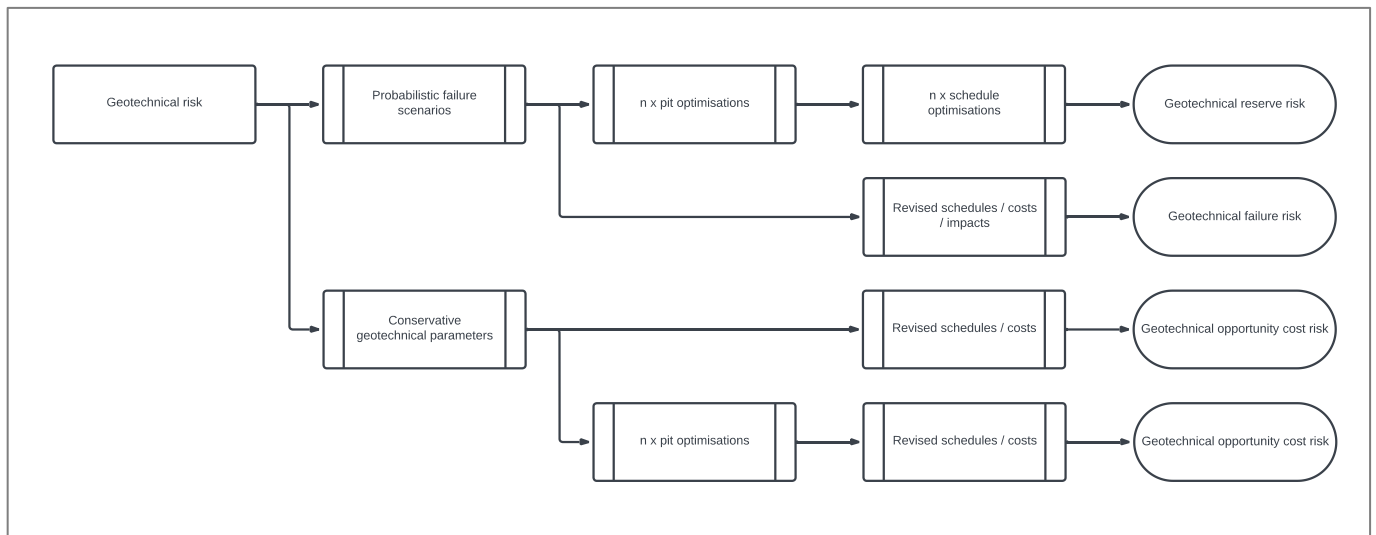


Figure 4: Geotechnical risk integration into planning framework.

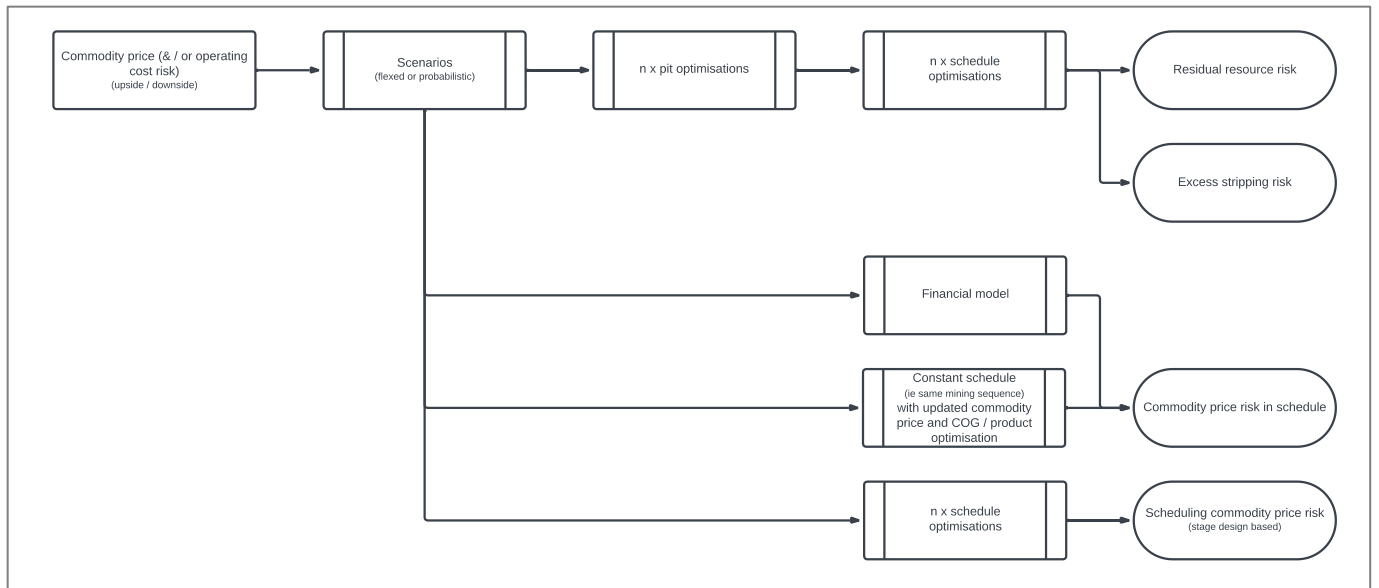


Figure 5: Commodity price (operating cost) risk integration into planning framework.

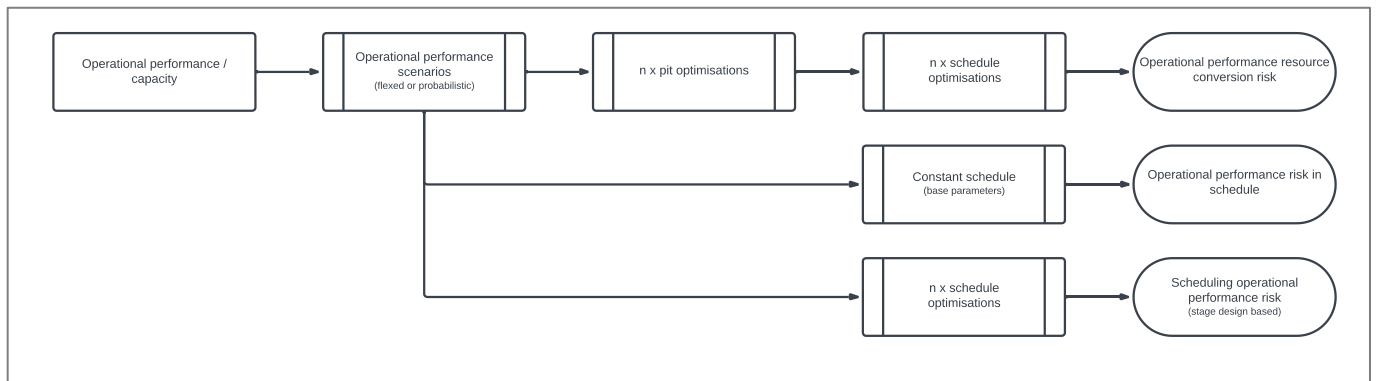


Figure 6: Operational performance/capacity risk integration into planning framework.

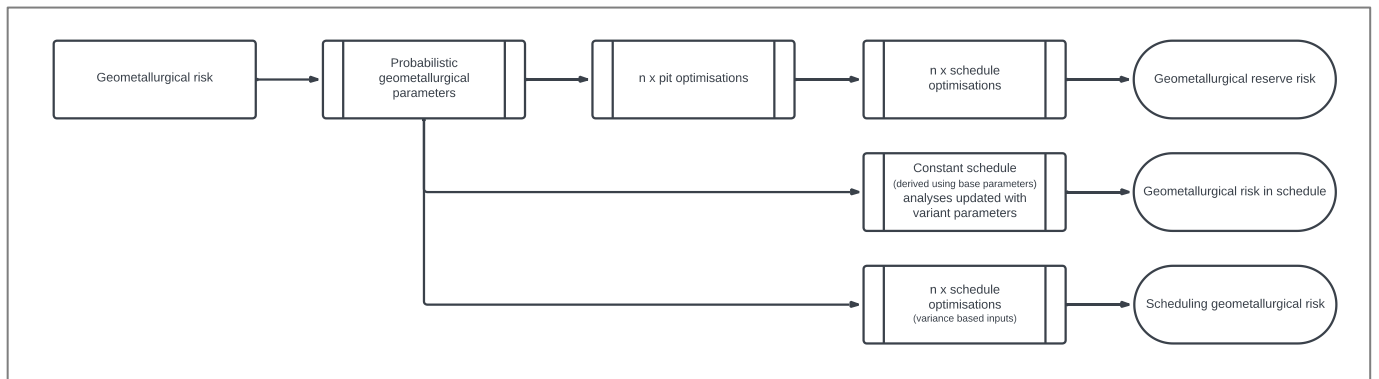


Figure 7: Geometallurgical grade risk integration into planning framework.

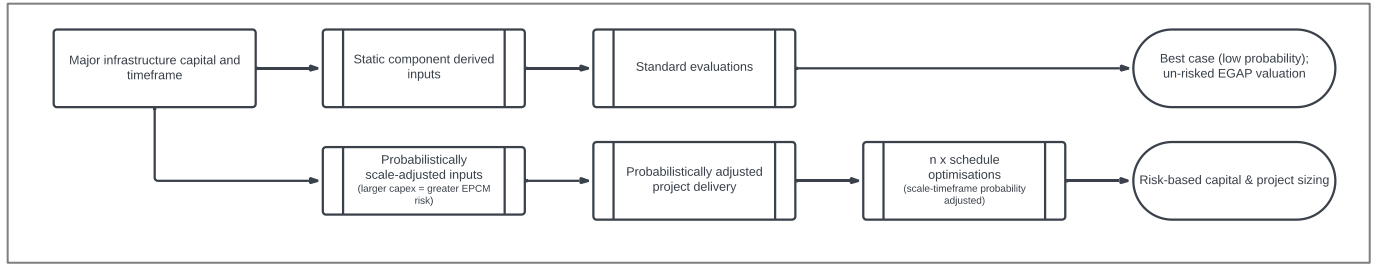


Figure 8: Major infrastructure capital and timeframe risk integration into planning framework.

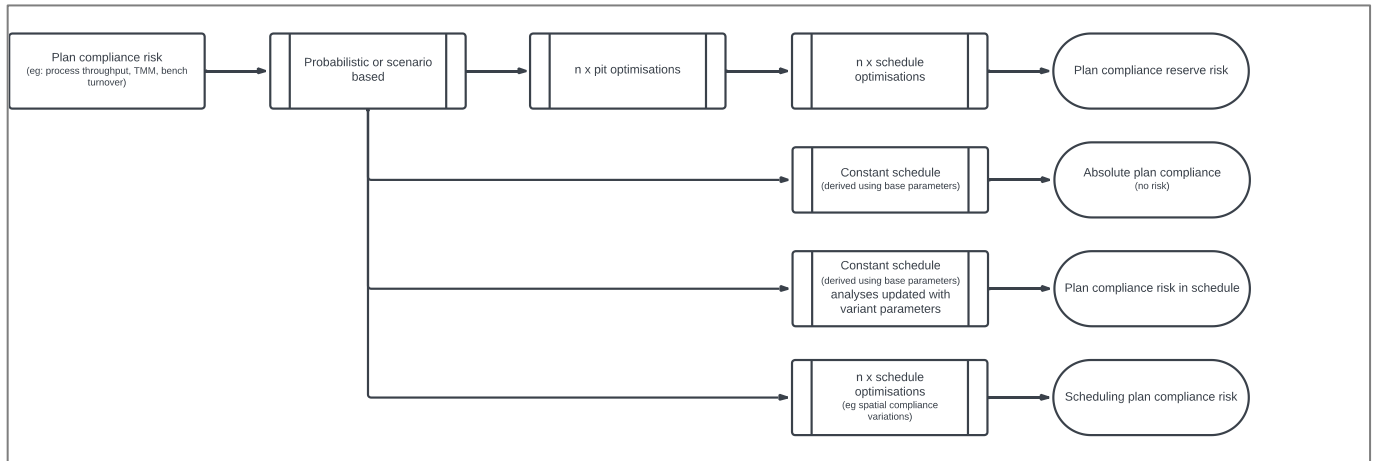


Figure 9: Plan compliance risk integration into planning framework.

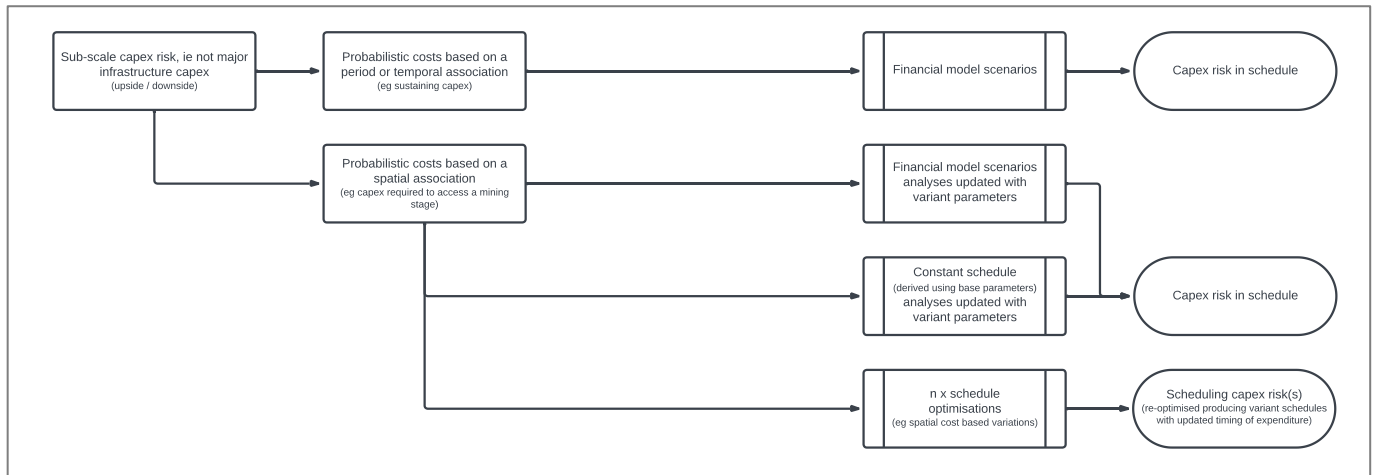


Figure 10: Sub-scale capex risk integration into planning framework.

Table 1 summarises the different range of risks outlined in Figure 2 - Figure 10 and includes in the columns ‘Pit Optimisation’, ‘Schedule Optimisation’ and ‘Financial Model’ the placement and order that different risks should be included in a planning framework. The final column then outlines the risks that can potentially be quantified.

Table 1: Risk categories, planning framework integration sequence and risks quantified.

	Pit Optimisation	Schedule Optimisation	Financial Model	Risks
Geological grade risk	1	2	3	Reserve grade risk
				Grade risk in schedule
				Scheduling grade risk
Geological contact risk (eg: skarns)	1	2	3	Reserve geological contact risk
				Geological contact risk in schedule
				Scheduling geological contact risk
Geotechnical risk	1	2	3	Geotechnical reserve risk
				Geotechnical failure risk
				Geotechnical opportunity cost risk
Commodity price (& / or operating cost) risk (upside / downside)	1	2	3	Residual resource risk
				Excess stripping risk
				Commodity price risk in schedule
				Scheduling commodity price risk (stage design based)
				Planning to not plan risk
Operational performance / capacity	1	2	3	Operational performance resource conversion risk
				Operational performance risk in schedule
				Scheduling operational performance risk (stage design based)
Geometallurgical risk	1	2	3	Geometallurgical reserve risk
				Geometallurgical risk in schedule
				Scheduling geometallurgical risk
Major infrastructure capital and timeframe	-	1	2	Best case (low probability); un-risked EGAP valuation
				Risk-based capital & project sizing
Plan compliance risk (eg: process throughput, TMM, bench turnover)	1	2	3	Absolute plan compliance (no risk)
				Plan compliance reserve risk
				Plan compliance risk in schedule
				Scheduling plan compliance risk
Sub-scale capex risk, ie not major infrastructure capex (upside / downside)	-	1	2	Capex risk in schedule
				Scheduling capex risk(s) (re-optimised producing variant schedules with updated timing of expenditure)

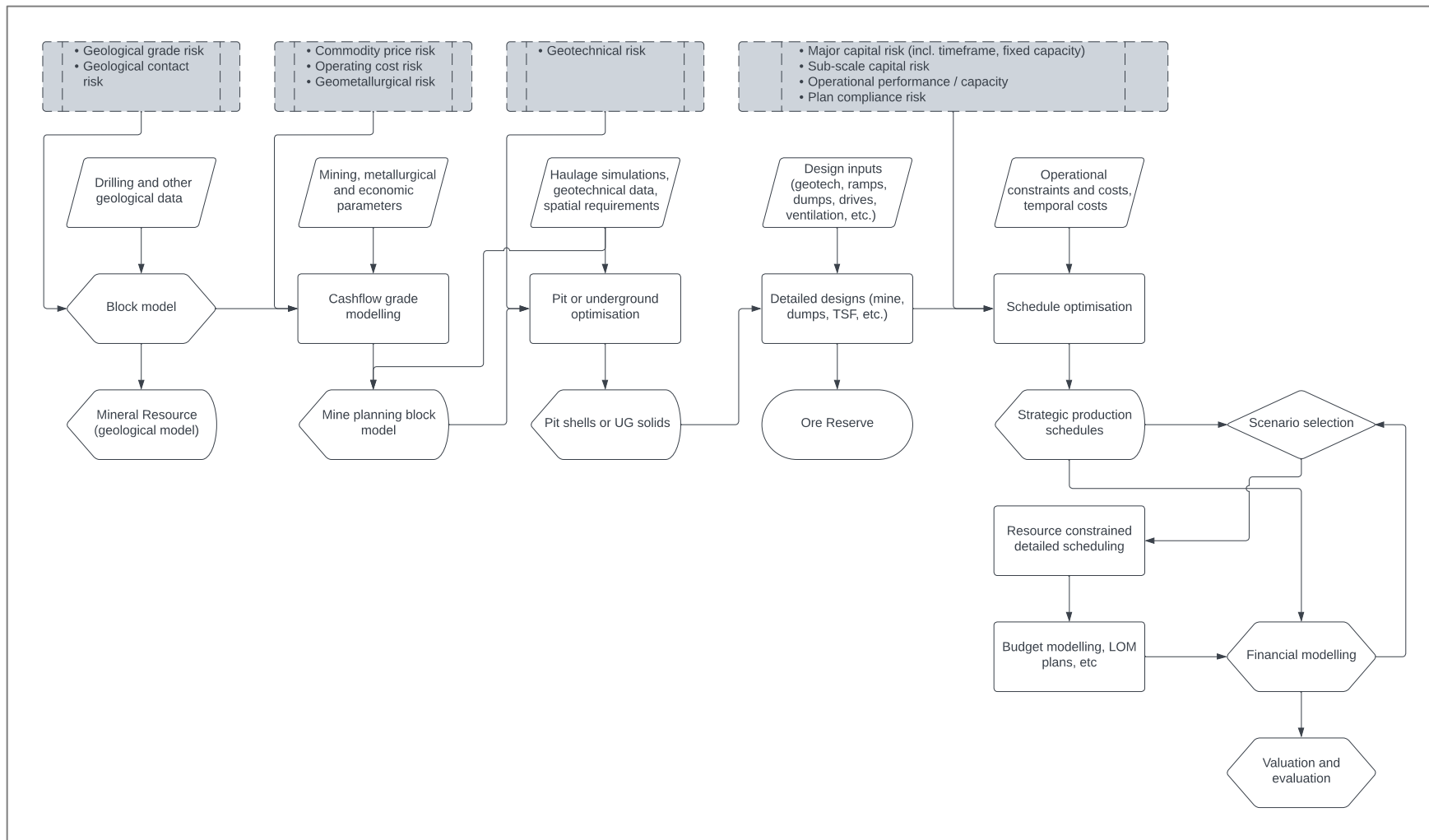


Figure 11: Risk mapping into planning framework.