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SPECIALIST MINERALS & ENERGY CONSULTANTS

Technical Due Diligence & Value Waves

What Investors Should Look for in Potential Mining Investment

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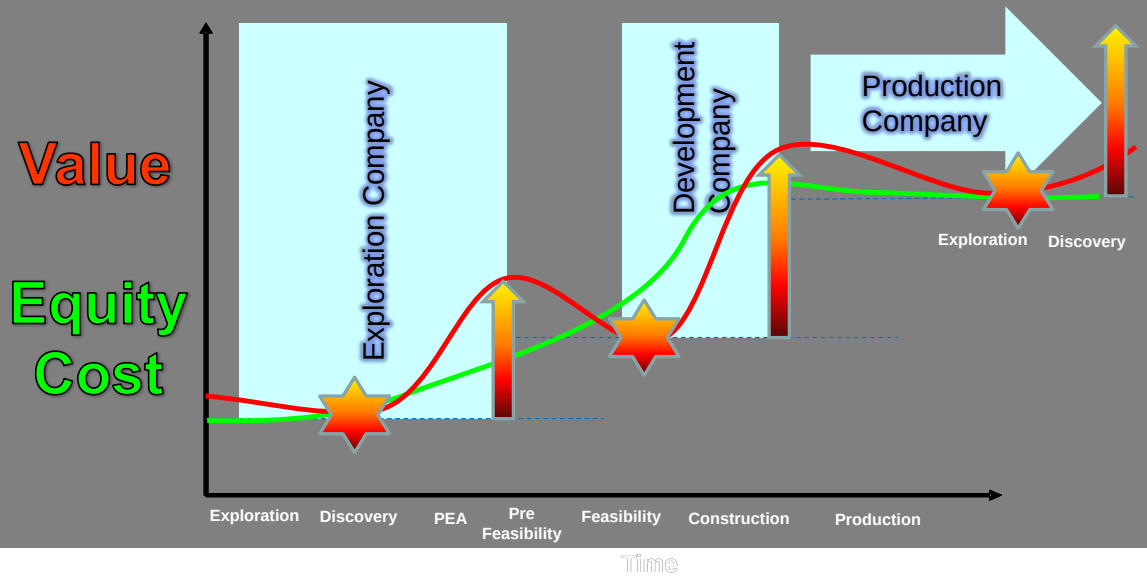
Outline

- Mining Technical Due Diligence
- Technical Reports and Standards
- Board, Management and Advisers
- Lifecycle of Mining Project – Value Waves
- Examples



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Mining Technical Due Diligence

- Review previous audit material.
- Site based audit:
  - Collect and review site data
  - Selected audit of key data
  - Answers to prepared questions
  - Interviews with Operations Staff
- Evaluate and compare data.
- Complete report draft for company to review for factual content.

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Agreed Scope

- Purpose of the Due Diligence.
- Extent of responsibility of the Specialist.
- Clearly understood and agreed by both parties in writing – Deliverables and Timing.
- Scope and budget reflect the purpose.
- Team of suitable standard and approved.
- Variations agreed at the time in writing.

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Technical Due Diligence Topics

- Staffing & Technical Support
- Geological Setting and Mineralisation Styles
- Resource Estimates
- Mine Design, Production Schedule & Reserves
- Plant performance, Metallurgical Testwork
- Capital and Operating Costs
- Cash Flow Projections, NPV and IRR
- Tenure, Social, Environmental, Right to Operate
- Risks and Opportunities

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Attitude

- Determine the purpose for which the site studies have been made.
  - Estimates made for short-term planning in a long established mine are often conservative.
  - Estimates in a feasibility study for a green-fields operation are often optimistic.
- A touch of cynicism is recommended as a survival instinct during the Due Diligence process.
- Smell test.
- Fraud is rare, but it does happen.

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Use a Check List

- Checklist of technical issues to be addressed.
- Agreed between the Financier and Specialist as part of the initial project brief.
- Forwarded to the Miner well in advance of the site visit.
- Miner has time to prepare the technical supporting information for examination.
- Give examples of the required data and format.

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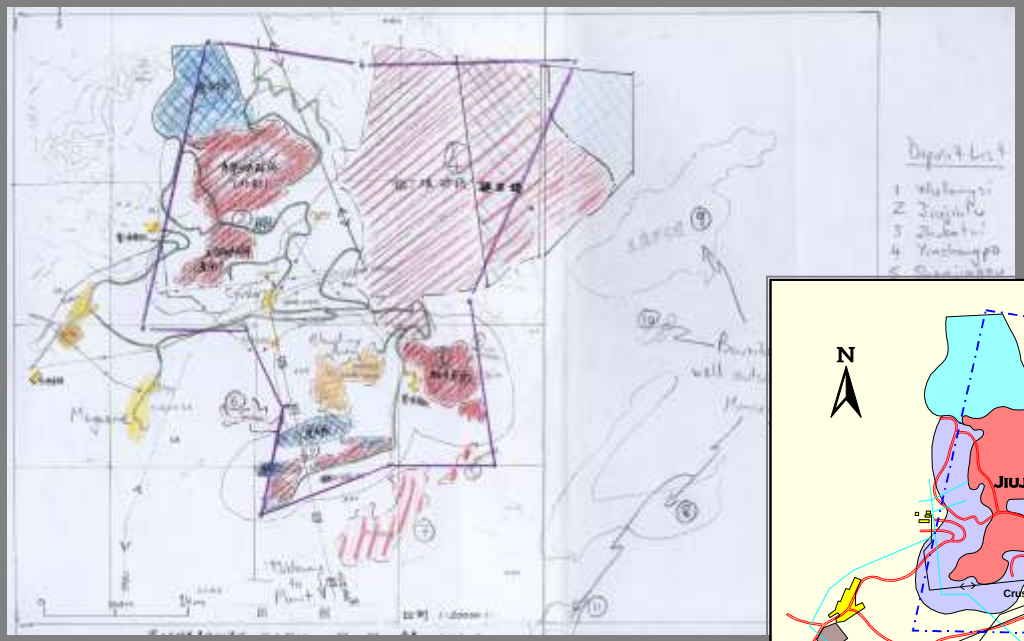
From this



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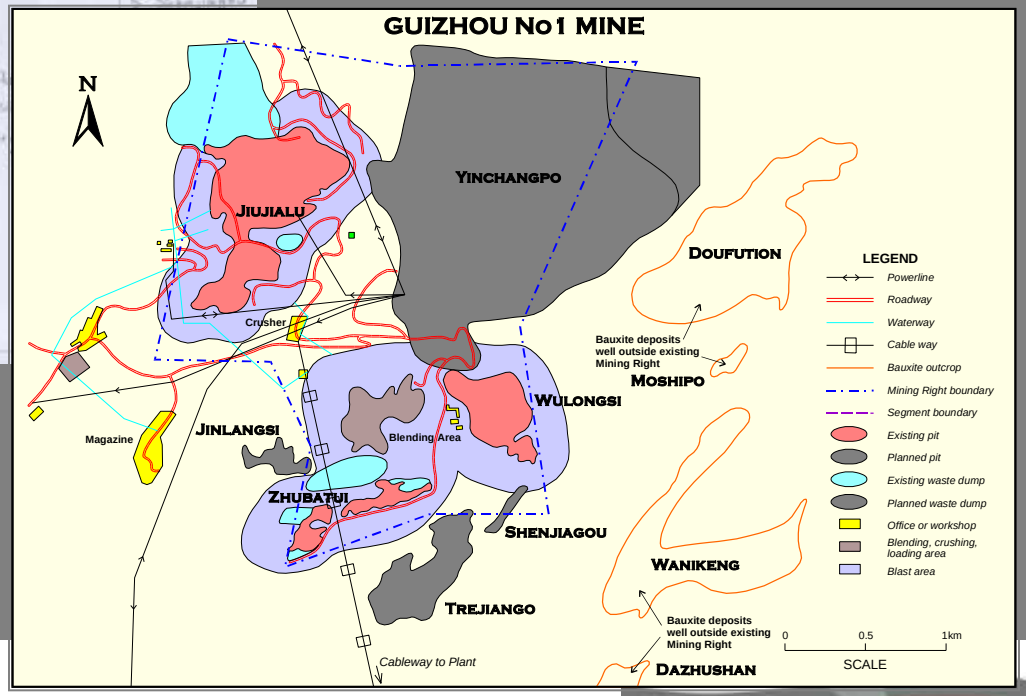

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Resource estimate is the key

- The Resource base is often stated at a lower cut-off than the reserve.
- The resource is largely fixed by the Feasibility Study stage, yet this has the largest impact.
- There is considerable scope with the advanced computer techniques currently available to seriously distort the grade/tonnage profile of a deposit, just are there powerful techniques available to get it right.

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International Systems

- Australian JORC and Valmin Code
- Canadian NI43-101 and CimVal
- SAMREC
- CRIRSCO
- UN UNFC
- General agreement on Resources, Reserves and Competent Person
- US SEC Guide7 – Reserves only

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Codes Require

- Minimum for reporting Resources & Reserves
- Transparency
- Data and Assumptions
- Missing or inadequate data
- Resource must have "reasonable prospects for eventual economic extraction"
- Conversion of Resource to Reserves
- Personal responsibility – Competent/Quailified Person

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Study level Definitions (CIM)

- **Preliminary Economic Assessment (Scoping Study)**
  - Scoping level assessment of options for forecast mine development, including capital and operating costs.
- **Preliminary Feasibility Study**
  - Minimum for Reserves.
  - Preferred mining method and mineral processing established.
  - Includes a financial analysis based on reasonable assumptions.
- **Feasibility Study**
  - Comprehensive technical and economic study of the selected development option for a mineral project that includes all factors.
  - Extraction is reasonably justified (economically mineable).
  - The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed.

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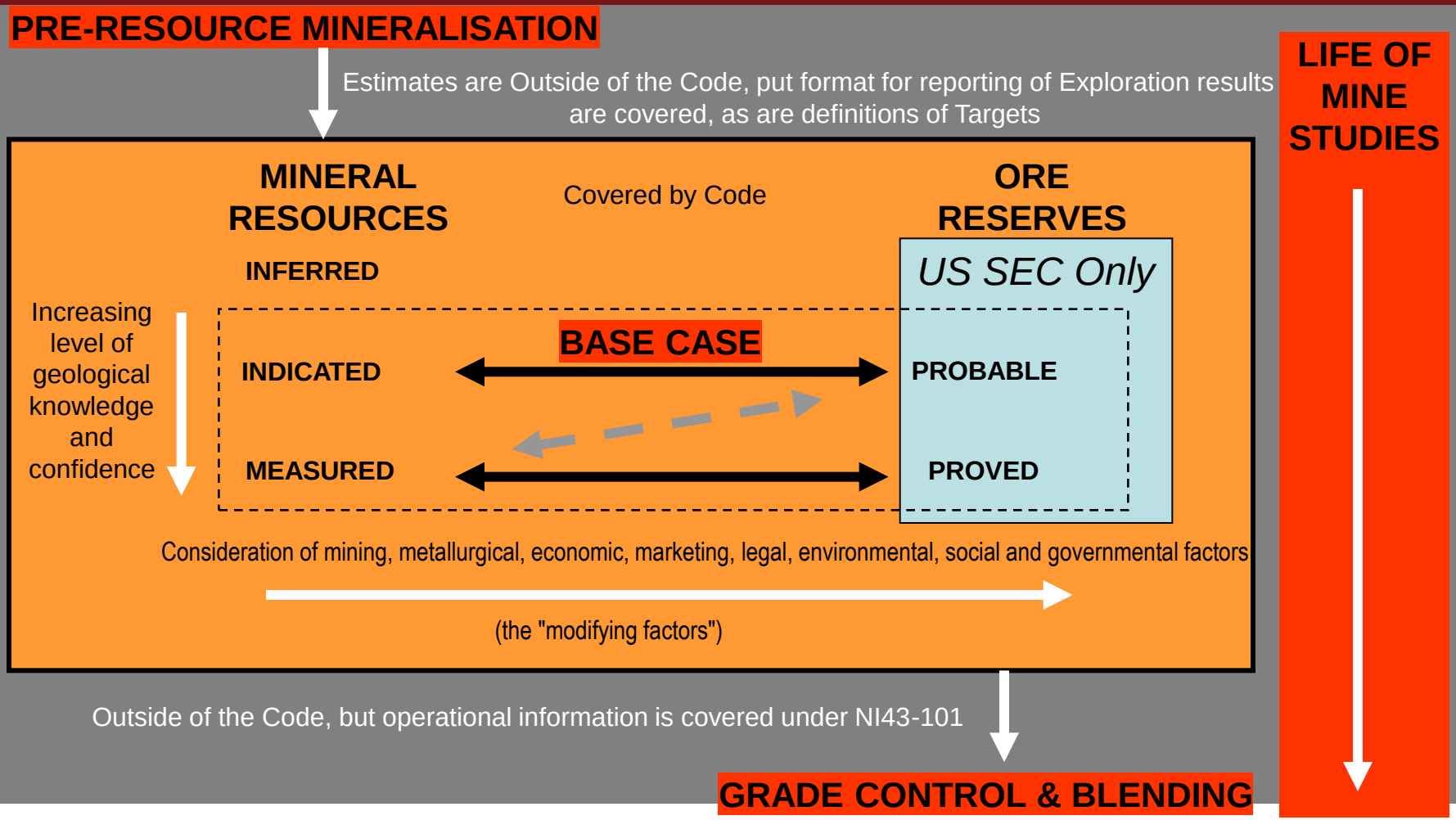
JORC/NI43-101 Codes & Beyond



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Estimation Issues

- A poor understanding of the geological controls will always lead to a poor resource estimate.
- Simple techniques such a polygonal estimation may highlight the strength of underlying geology knowledge.
- The over-estimation of grade is worse for the project than under-estimation but both are bad in that neither truly reflect the actual cash-flows.
- Have multiple methods been used and compared?

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Cut-off Grade

- Should be realistic and achievable
- The sensitivity of the estimates to changes
  - grade/tonnage curves
  - plans and sections of changes
- The Specialist will be required to comment whether the chosen mining method, processing option and capital and operating costs reflect the deposit geology, location and infrastructure.

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Reserves with time

- Variation of the resources and reserves with time
- Major milestones of the project
- Use a time-line chart
  - major changes in all areas the project milieu
  - not just the hard technical issues of the mine production team.

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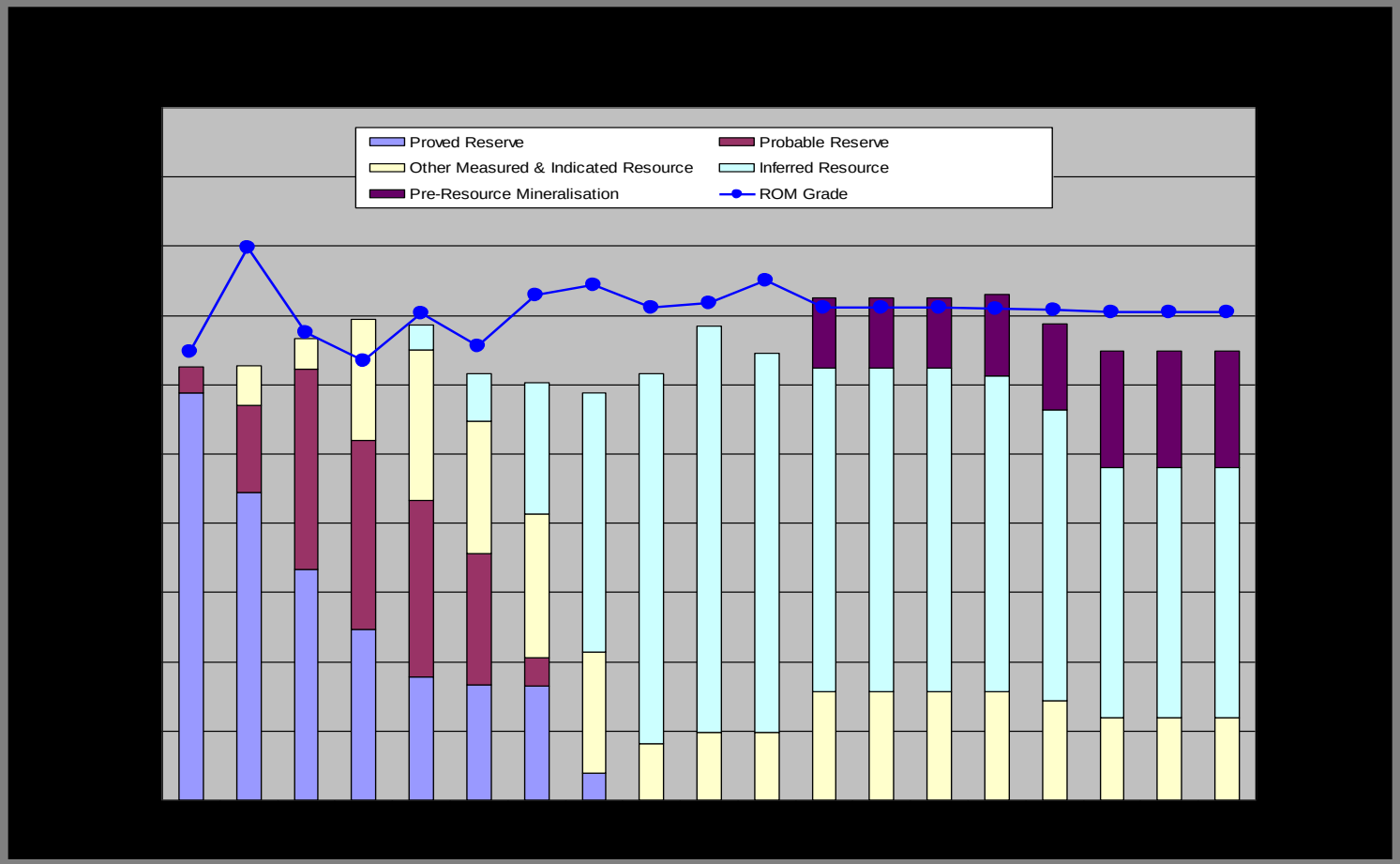
Ore Feed vs time



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Environmental

- Impact, closure & rehabilitation

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Sensitivity and Risk

- Look at the likely range of outcomes rather than just state a single figure.
- The impact of variations to be tested, eg
  - impact of high values are dealt with (eg top-cutting)
  - grade tonnage curves
  - using different geological domains
  - changing the estimation methods
  - optimization of production plans

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Start-up risk

- A quick cash injection at the start from higher grade or lower cost ore.
- Small changes in the start-up period cash-flow can have a dramatic impact.
- Negative impacts from which it will never be able to recover.
- There are several recent major projects which have stumbled at this first hurdle and thus completely removed their ability to ever repay the original capital.

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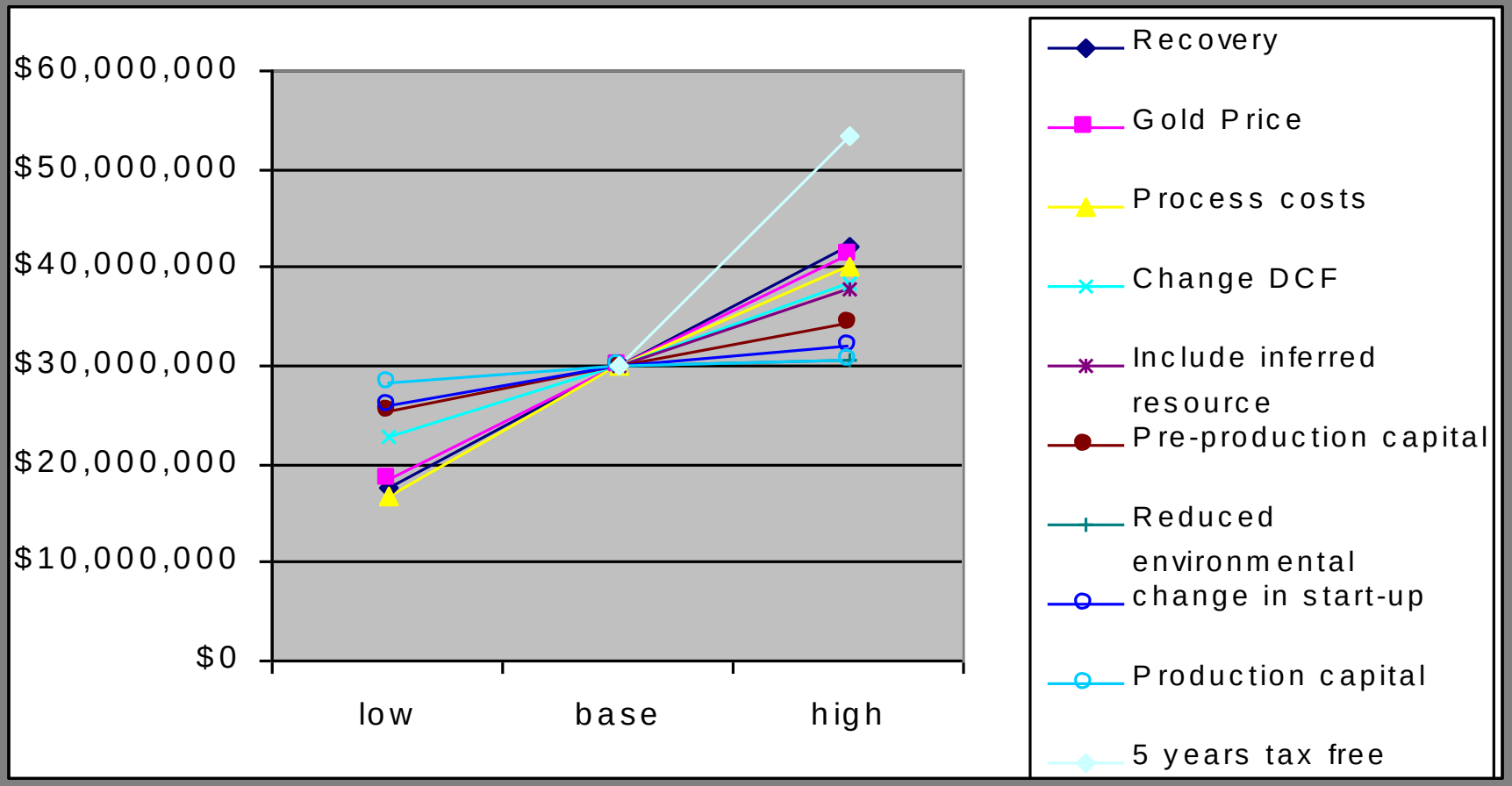
Sensitivity plot



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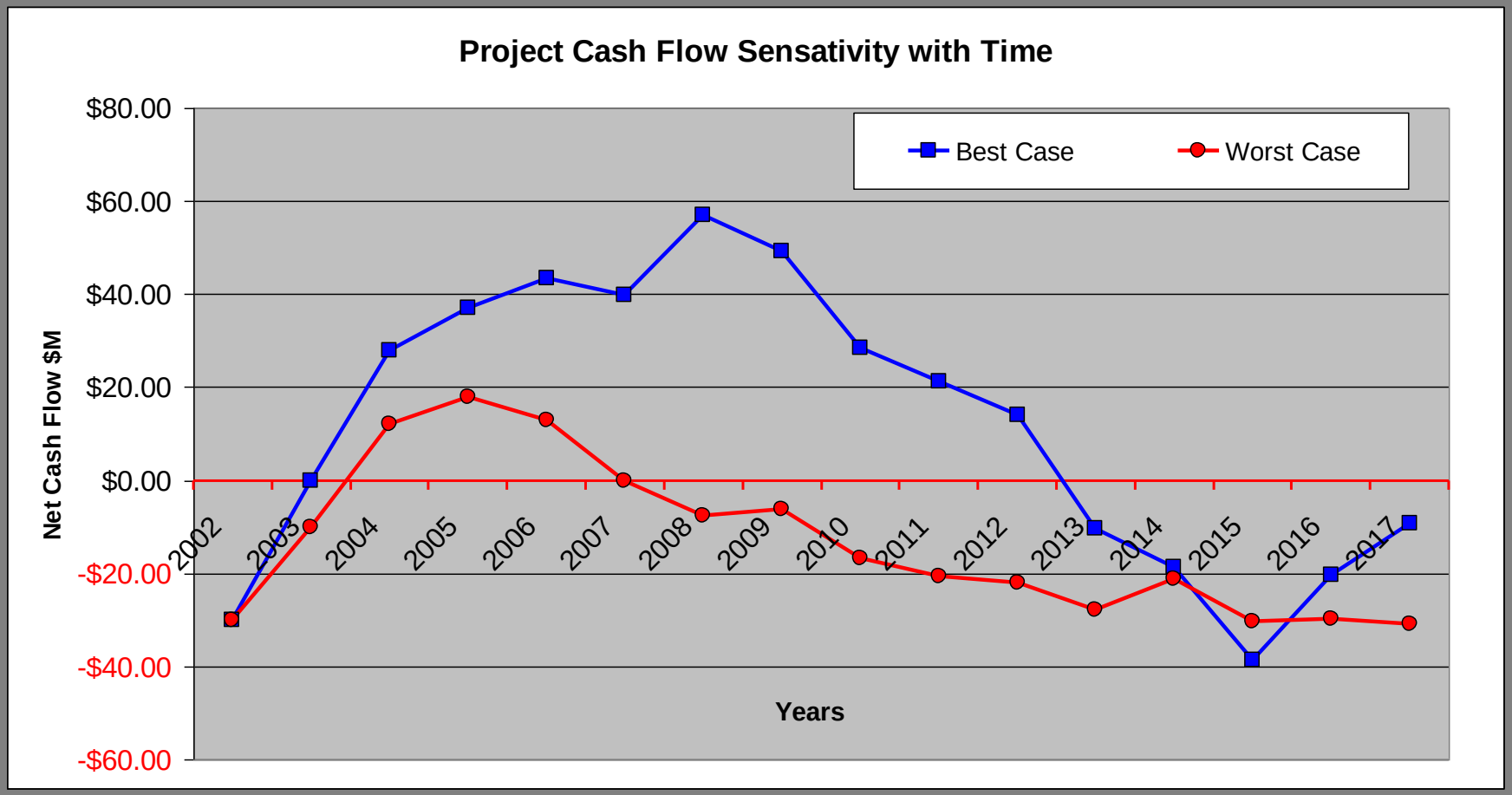
Cash Flow Sensitivity with Time



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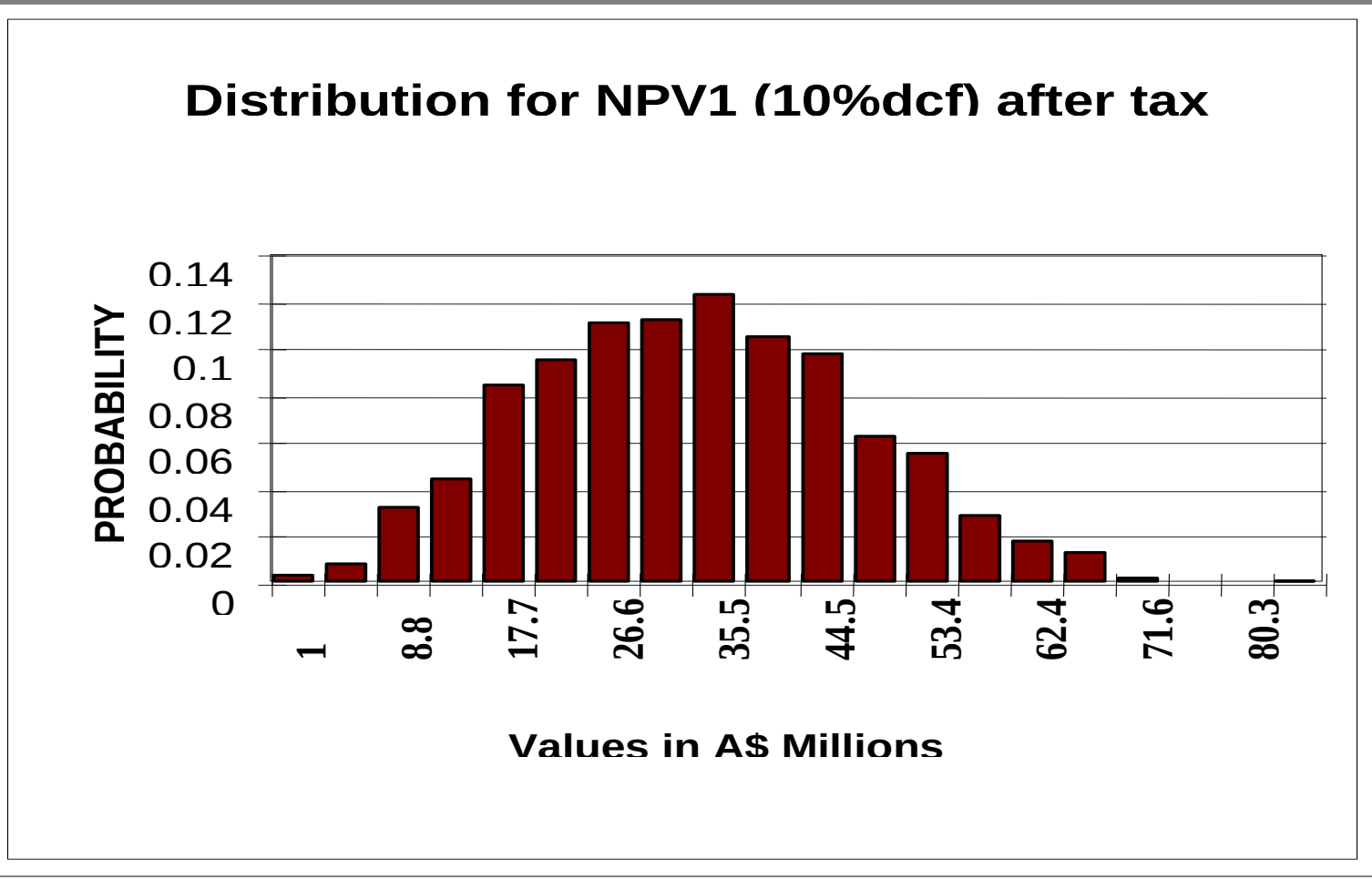
A range of likely outcomes



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Risk is OK

- The Financier is in the business of dealing with risk.
- The expression of a reserve in terms of an expected outcome with upper and lower limits is quite acceptable.
- The old practice of giving just one number will hide the risk factors.
- Risk is not bad, it just needs to be known.
- Limit the downside.

AS/NZS 4360:1999 Risk Matrix

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Clear Management Strategies

- Investors need to understand the company strategy and risk/reward drivers
- Exploration success
- Development value add
- Production efficiency
- Trading, Investment and Royalties
- Key people 100% dedicated to venture
- Evaluate as a whole

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Value Waves

Burleigh Heads, March 16, 2010. Photo: Shield. www.seahopedaily.com

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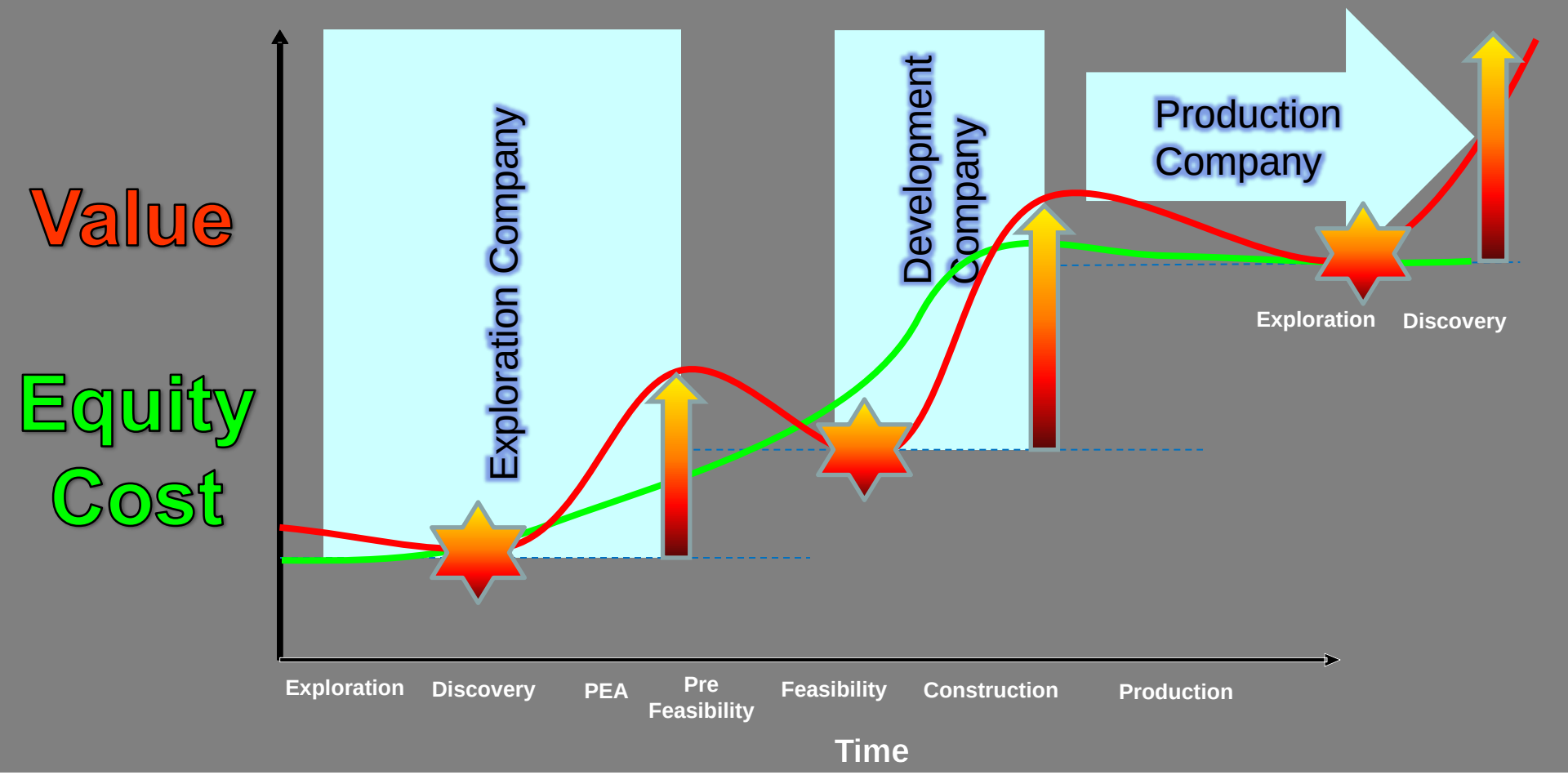
Value Waves



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Case Study: TSXV Kazax Minerals

- Development Company
- Vancouver based and listed (TSXV:KZX).
- Lomonosovskoye Iron Project; NW of Rudny in Kazakhstan.
- Major magnetite iron deposit.
- Validation drilling underway, FS 2012 and production 2013.
- Strong Board and technical team with proven ability to deliver projects of this size in country

KAZAX MINERALS INC

Mining Associates is a Technical Adviser to Kazax Minerals

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Case Study: ASX – Alligator Energy

- Exploration Company
- Listed on ASX (ASX: AGE).
- Uranium and REE assets in Northern Territory, Aus.
- Region hosts nearly 1 billion pounds high grade uranium resources.
- Near past production, including the Ranger Mine and Jabiluka.
- Strong Board and technical team with proven exploration success in this style of deposit and region

Mining Associates is a Technical Adviser to Alligator Energy and Mr Andrew J Vigar is a Director

Case Study: AIM – Metals Exploration

- Development Company
- Listed on AIM currently (AIM:MTL.L).
- Focus on the Pacific Rim; Particularly Philippines.
- Runruno project – 200 miles north of Manila; Nueva Viscaya.
- Large open pit gold molybdenum operation.
- Feasibility Study completed.
- Pre-construction site works underway.
- Strong Board and technical team with proven ability to deliver projects of this size in country

metals exploration
TOWARDS PRODUCTION

Mining Associates is a Technical Adviser and CPR to Metals Exploration

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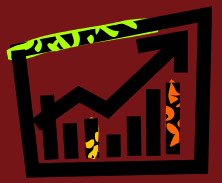
In Summary



- Company clearly focused on stage of the value wave.
- Board and senior management with technical understanding of the company's assets 100% committed.
- Quality advisers provide another view.
- Strategic planning for high potential projects; to reach long-term company objectives.
- Detailed analyses – key to successful project outcome; provides support and reassurance to investors.
- Transparency and materiality to investors.

AusIMM THE MINERALS INSTITUTE

Australian Institute of Geoscientists Supporting Geoscientists

IOM3 The Institute of Materials, Minerals and Mining

CIM ICM

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