Reconciling AISC to Mineral Property Valuations

Society of Mining, Metallurgy & Exploration (SME) Presentation
4th Annual Current Trends in Mining Finance Conference
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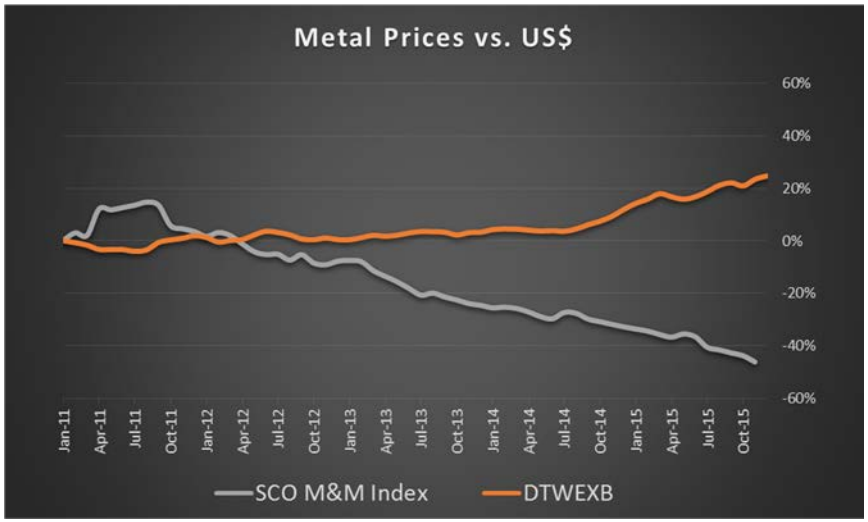
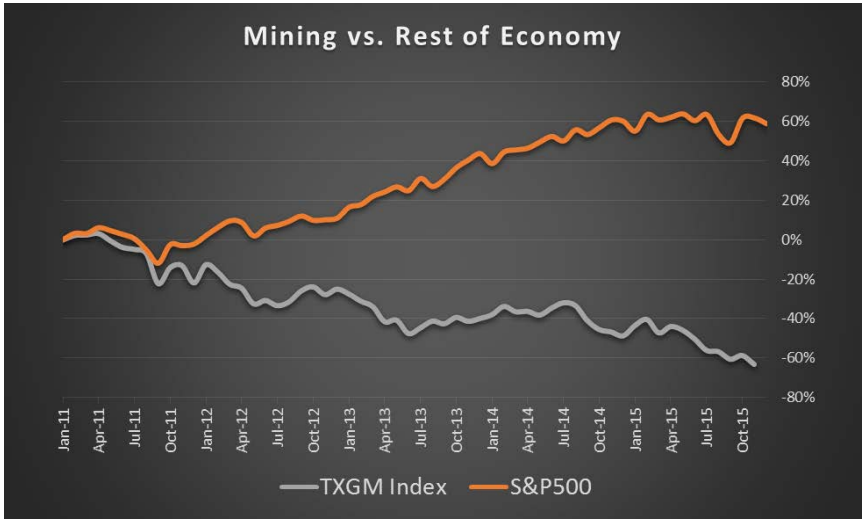
srk consulting

Why This Presentation?

Macroeconomic Trends Have Not Been Kind to the Mining Industry

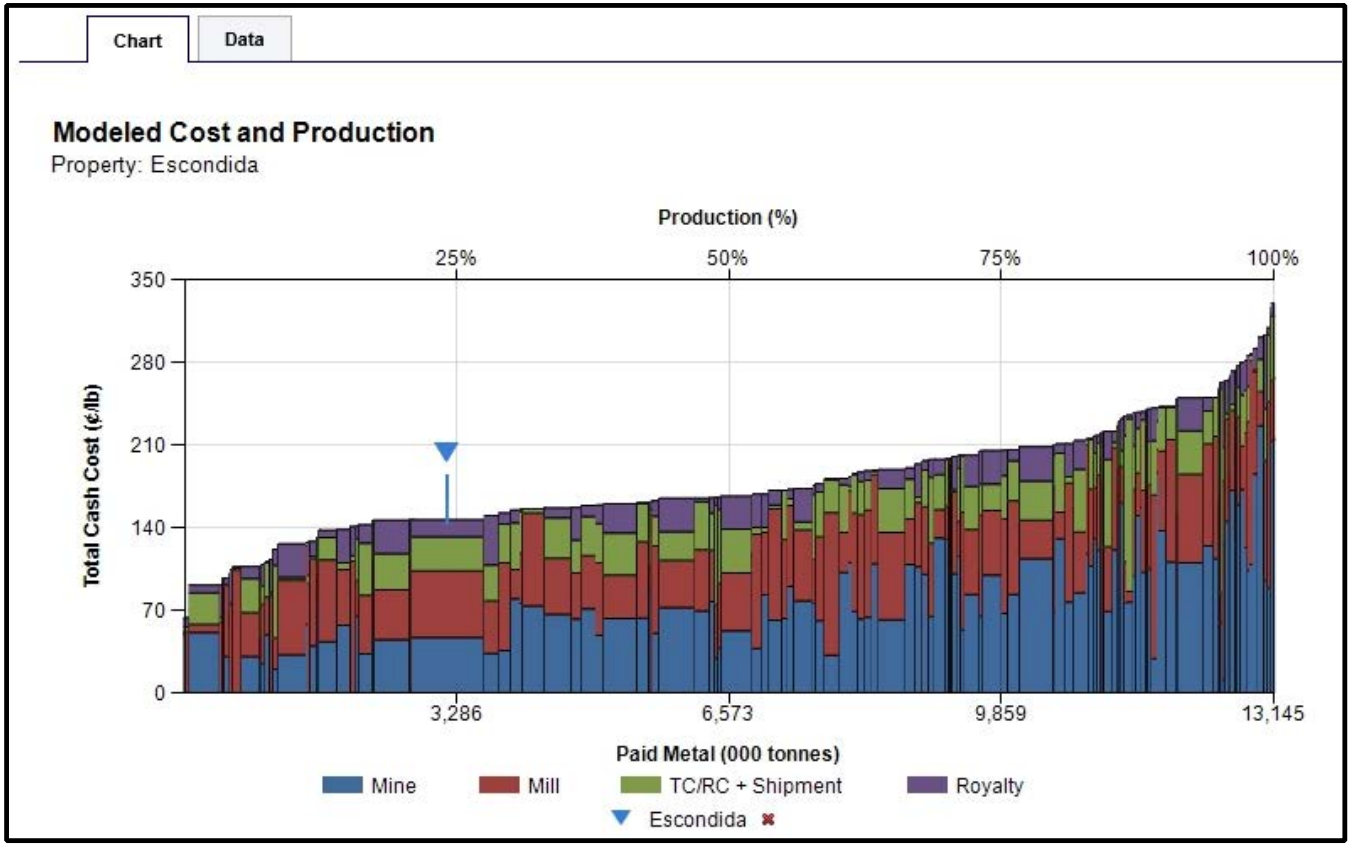
- As of December 2015, five straight years of YoY metal price declines and accompanying market cap losses





Why This Presentation?

Cost curve position is currently main differentiator of value in this period of low metal prices!



SNL Mine Economics Copper Cost Curve (2016)

Why This Presentation?

But confusion is rampant in the industry about how such costs are complied and defined in a consistent manner

- Adjusted Operating Costs
- All-in Sustaining Costs
- All-in Costs
- C1, C2, and C3 Costs
- FOB, CIF, and CFR Basis
- By-product vs. Co-product Basis
- Cash vs. Non-Cash
- Recovered vs. Payable Units

Agenda

The goals of this presentation are three-fold:

1) Review AISC format and discuss overall cost reporting issues and how SRK deals with them;*

2) Discuss Total Cash Cost (TCC) methodology for cost reporting of greenfield and brownfield mineral projects that are reported in NI 43-101 technical reports (PEA, PFS, FS); and

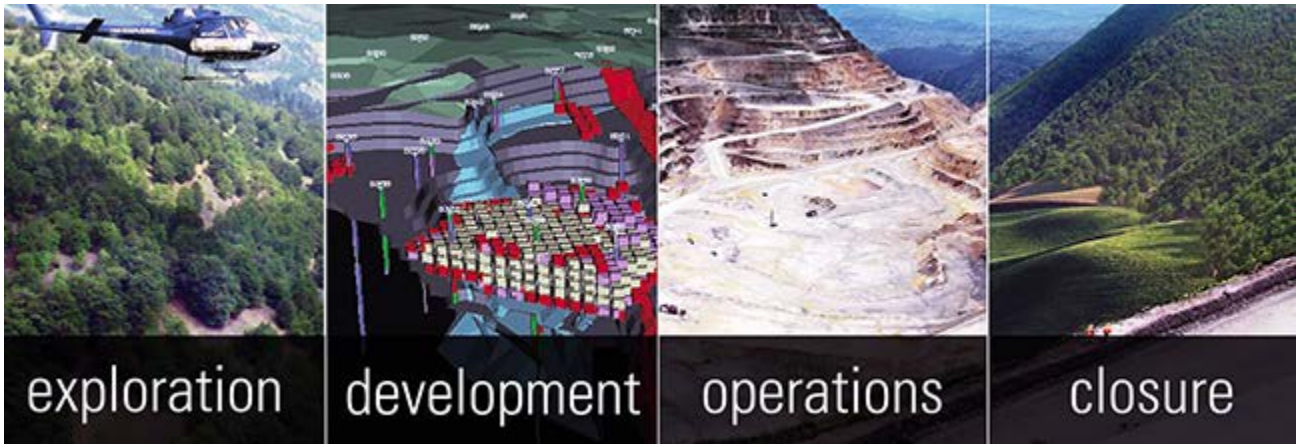
3) Reconcile the differences between AISC and TCC methods.

*in the context of technical-economic valuations using Discounted Cash Flow analysis (aka Income Approach) for greenfield and brownfield mineral projects assuming 100% equity basis for Life of Mine (LoM) period between start of commercial production through final year of production and any subsequent post closure costs.

Key Facts about SRK

Highlights

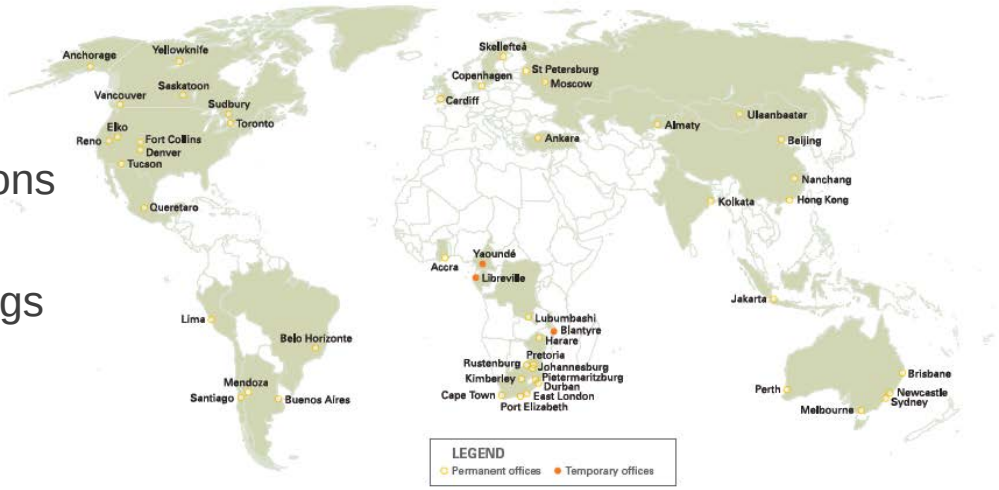
- Established in 1974
- Over 1,400 staff and 150 associates
- 45 offices worldwide
- Primarily in mining industry
- Provide specialist services from exploration through closure
- Owned by employee shareholders



Valuation Portfolio

Project Valuations Supporting

- Feasibility studies
- Audits/Due Diligences/IE Investigations
- Benchmarking
- Financing and Stock Exchange listings
- M&A transactions
- Litigation and arbitration (i.e. ICSID, ICC, UNCITRAL)



By Geography

- Offices in 26 countries
- Located on 6 continents

By Commodity

- Base and precious metals
- Ferrous and speciality metals
- REE
- Coal, uranium, oil sands
- Industrial minerals

Relevant Experience:

- SRK Denver valuation work is generally split 50/50 between technical studies and investment transactional support.
- Thus we both calculate our own valuations and audit outside valuations.

NI 43-101 Guidelines

No formal mention of cost reporting in NI 43-101 technical reports

Item 22: Economic Analysis – Provide an economic analysis for the project that includes:

(a) a clear statement of and justification for the principal assumptions;

(b) cash flow forecasts on an annual basis using mineral reserves or mineral resources and an annual production schedule for the life of project;

(c) a discussion of net present value (NPV), internal rate of return (IRR), and payback period of capital with imputed or actual interest;

(d) a summary of the taxes, royalties, and other government levies or interests applicable to the mineral project or to production, and to revenue or income from the mineral project; and

(e) sensitivity or other analysis using variants in commodity price, grade, capital and operating costs, or other significant parameters, as appropriate, and discuss the impact of the results.

Current Cost Reporting Methodologies

Two current (Non-GAAP) reporting systems in use today

1) World Gold Council guidelines for precious metal cost reporting*

- Adjusted Operating Costs
- All-in Sustaining Costs
- All-in Costs

*Includes minor non-cash adjustments

2) Wood-McKenzie guidelines for base metal cost reporting**

- C1 Cash Costs
- C2 Cash Costs
- C3 Cash Costs

**Includes significant non-cash items like depreciation and amortization

WGC - Adjusted Operating Costs

Basically operating costs as follows:

- On-site mining costs
- On-site G&A costs
- Royalties/production taxes
- Hedging impacts on operating costs
- Community relations costs
- Permitting costs
- 3rd party smelting, refining, and transport costs
- Non-cash remuneration (site-based)
- Stockpiles/product inventory write-downs
- Operational stripping costs
- By-Product credits

= Subtotal Adjusted Operating Costs

WGC All-In Sustaining Costs (AISC)

Add corporate expenses plus "sustaining" and reclamation capital related to operations

Adjusted Operating Costs; plus

- Corporate G&A
- Reclamation and remediation costs
- Exploration and study costs (sustaining)
- Capital exploration (sustaining)
- Capitalized OP stripping and UG development (sustaining)
- Capital expenditures (sustaining)

= All-in Sustaining Costs

WGC All-In Costs (AIC)

- **Everything else not related to a company's current operations**

All-In Sustaining Costs; plus

- Permitting & Social Responsibility costs
- Exploration and study costs
- Capital Exploration
- Capitalized OP stripping and UG development
- Capital Expenditures

= All-in Costs

For mineral project valuations, these costs are not considered since they do not contribute to the value of the business case in question.

AISC – Main Issues

- Omissions and errors in cost estimates
  - i.e., excluding concentrate TC/RC and freight costs since they are part of a NSR calculation, also not adding smelter penalties

- More stringent definitions needed for:
  - by-product vs. co-product treatment;
  - sustaining capital;
  - G&A; and
  - exploration spending.

- AISC also does not account for:
  - working capital;
  - income taxes;
  - acquisition costs and development capital; and
  - financing charges.

By-Product vs. Co-Product Rule of Thumbs

By-Product

- ROT – one or more commodities each contribute less than 20% of total LoM revenue stream
- Becomes a credit against operating costs
- Costs reported on a $/payable unit of primary metal
- i.e., Au (87%) / Ag (13%) = US$/oz Au with Ag revenue counted as by-product credit against costs

Co-Product

- ROT – two or more commodities each contributes greater than 20% of total LoM revenue stream
- Is not credited against direct operating costs
- Costs reported on a $/equivalent payable unit of the primary metal
- i.e., Au (57%) / Ag (43%) = US$/oz Au equivalent with no credit against costs

By-Product vs. Co-Product Rule of Thumbs

By-Product

- Metal prices: US$1,000 Au, US$15 Ag
- Production: 1,000 oz Au, 10,000 oz Ag
- Revenue: US$1,000,000 Au, US$150,000 Ag (~13%)
- Cash Cost: US$700,000
- Cash Cost after by-product credit: US$700k - US$150k = US$550k
- Cash Cost: US$550k / 1,000 oz Au = US$550 / oz Au

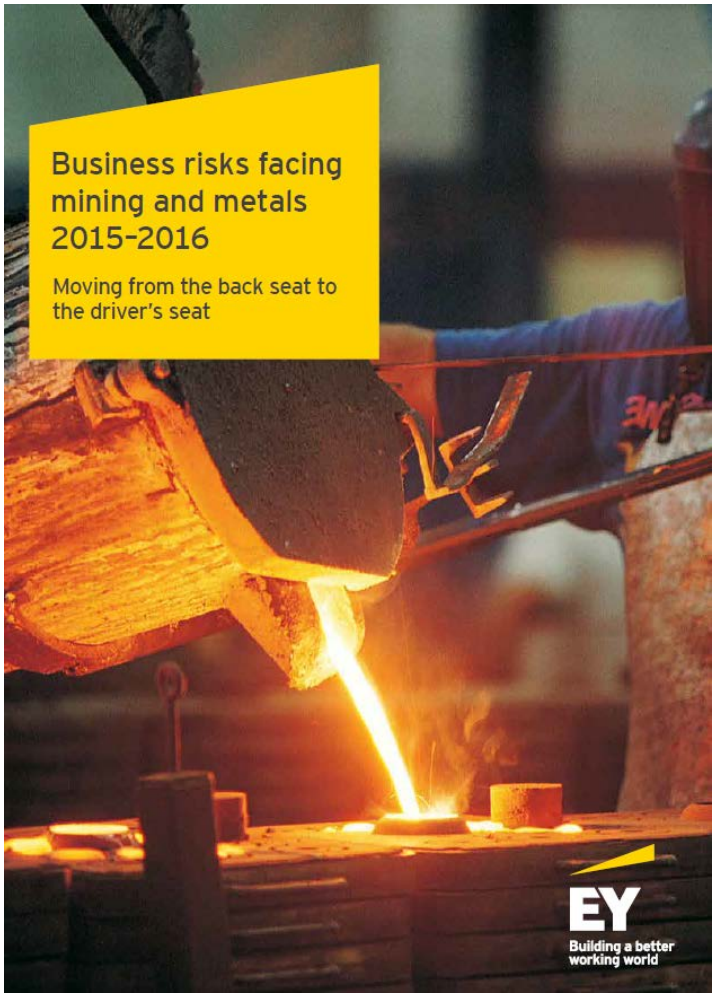
Co-Product

- Metal prices: US$1000 Au, US$15 Ag
- Production: 1,000 oz Au, 50,000 oz Ag
- Revenue: US$1,000,000 Au, US$750,000 Ag (~43%)
- Cash Cost: US$700,000
- Gold Eq Oz: (1,000 oz Au + (US$15/US$1000*50,000 oz Ag)
- = 1,750 oz AuEq
- Cash Cost: $700k / 1,750 oz AuEq = $400 / oz AuEq

Sustaining Capital, G&A, & Exploration

1. Sus Capex – If capex expenditure during LoM results in increase of annual nameplate capacity of >5% going forward, then it is defined as expansion / development capital and not included per current cost reporting methods;
2. G&A – Mineral project valuations rarely, if ever, include corporate G&A costs. However, site and regional office support costs (if present) are included; and
3. Exploration – never include exploration and study costs (aka off-mine cost) that don't add additional production in the mine schedule in the valuation

Taxation - E&Y 2015-16 Mining Risks



1. Switch to Growth
2. Productivity improvement*
3. Access to capital
4. Resource nationalism*
5. Social license to operate*
6. Price and currency volatility
7. Capital projects
8. Access to energy*
9. Cybersecurity
10. Innovation*

Resource Nationalism

1. Mandated beneficiation/export taxes (Indonesia Cu and Ni)
2. Retaining or mandating state/in-country ownership of natural resource (Venezuela)
3. Increased or newly imposed taxation regimes (many places)

Taxation Regimes

IMF definitions (Sunley and Baunsgaard, 2000)

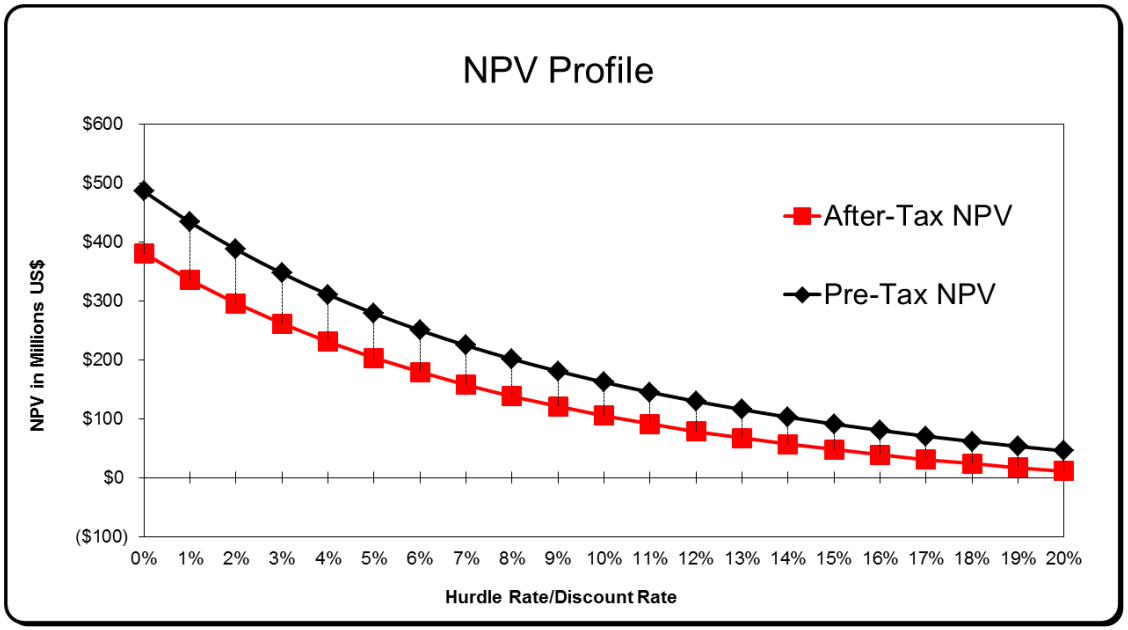
1. Royalty/Severance tax – already in cost reporting
   a) Production (based on volume of minerals extracted)
      - $/t ore mined
   b) Ad valorum (based on value of minerals extracted)
      - Gross revenue
      - NSR (gross revenue less TC\RC & freight costs)
      - Profit (NSR less OpEx)

2. Corporate Income tax – imposed on normal return and rent - not included in cost reporting

3. Resource rent tax – to capture a larger share of higher return and rent projects - not included in cost reporting

Income Taxes – Impact on Valuation

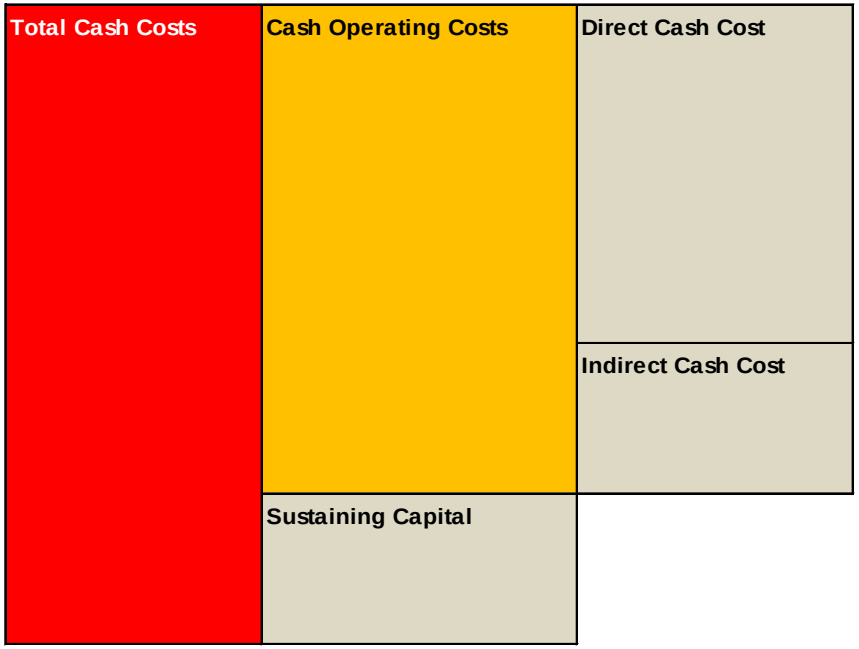
Major effect - must be accounted for but not currently included in any cost methodology!



Income taxes can add 300-400 basis points to a discount rate in a mineral project valuation

There's one for you, nineteen for me.
– Taxman, The Beatles, 1966

Total Cash Cost Methodology for Mineral Project Valuations for NI 43-101 TR

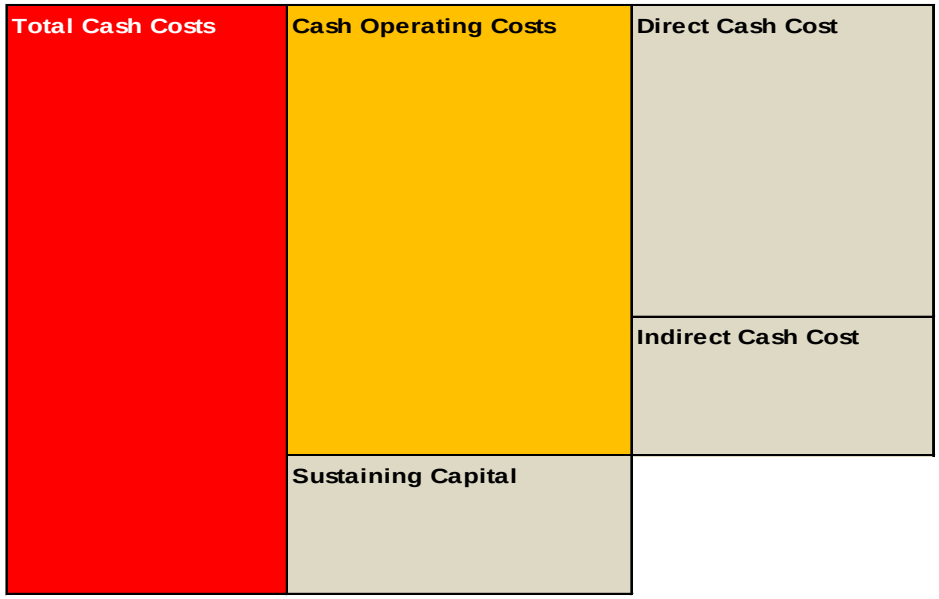


- Direct Cash Costs: costs incurred to produce & sell payable product
- Indirect Cash Costs: costs incurred to keep LLO & SLO in compliance
- Sustaining Capital: investment in assets with >1 year useful life required to "keep the lights and/or pumps on" at designed nameplate capacity

Total Cash Cost Methodology for Mineral Project Valuations for NI 43-101 TR

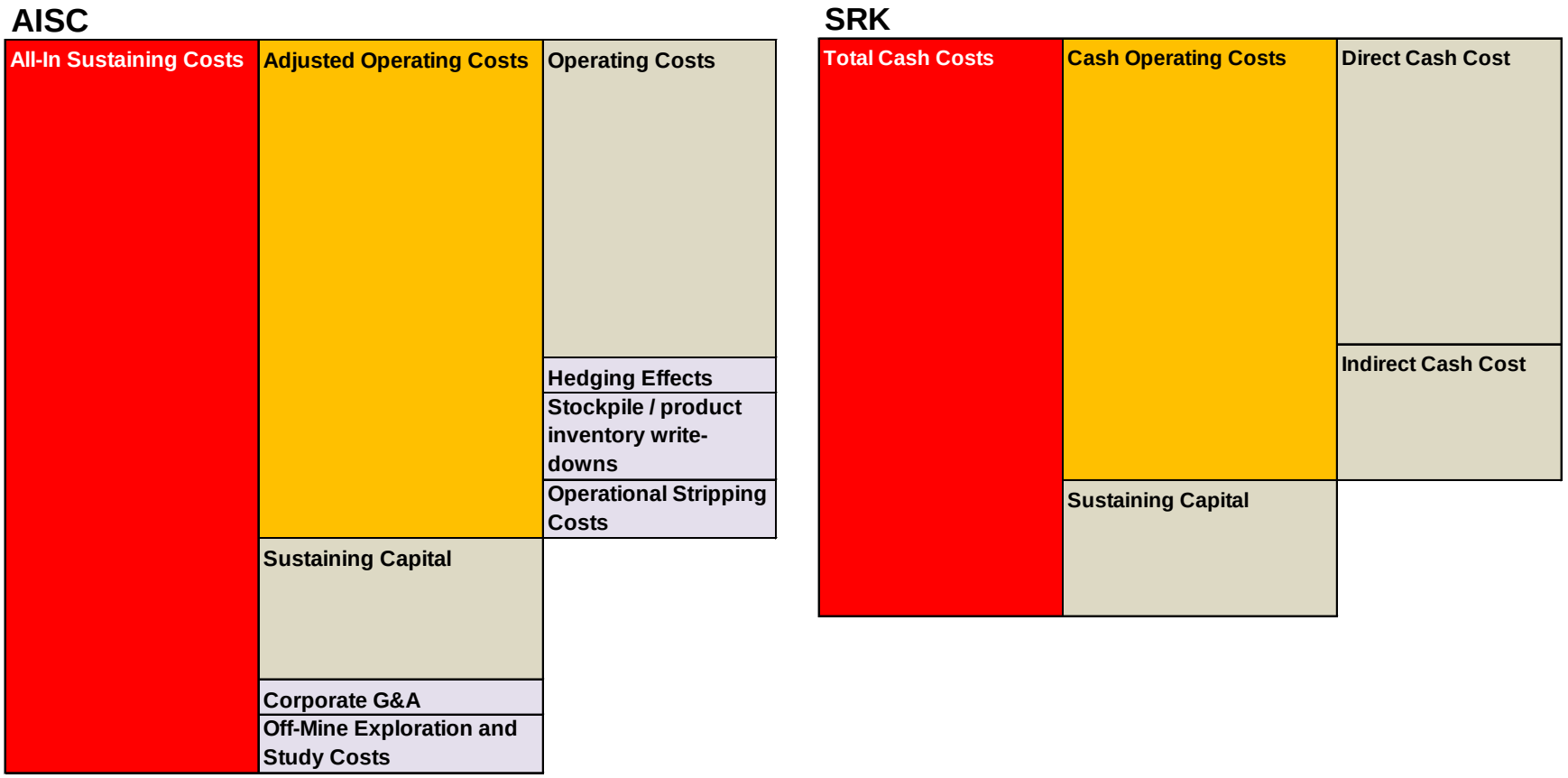
Direct Cash Cost	mining processing leaching, solution pumping, solvent extraction and electrowinning on-site general and administrative expenses any associated services essential to the operation (tailings, water mgmt, power plant, etc.) smelting/refining charges (i.e. TC/RC) freight/insurance costs (truck, rail, port, ship, aircraft to point of custody transfer) selling/marketing costs by-product credits
Indirect Cash Cost	royalties/production taxes (both private and government) permitting/environmental costs (monitoring, testing, filings, etc.) social responsibility costs (i.e. community infrastructure, sponsorships, etc.) expensed concurrent cash reclamation/closure costs other (i.e. JV mgmt fees, WGC fees, etc.)
Sustaining Capital	mining (i.e. fleet replacement, major rebuilds, OP stripping and UG development) processing (i.e. mill motor replacement) infrastructure (tailings dam embankment lifts, replacing gensets at site power plant, etc.) reclamation/closure (capitalized costs during LoM and/or at EoM)
Total Cash Costs	This format can be used for precious, base, ferrous and industrial minerals.

Total Cash Cost Methodology For Mineral Project Valuations in NI 43-101 TR



- Does NOT include:
  - corporate income taxes
  - working capital
  - financing costs
  - corporate G&A costs
  - non cash adjustments for stockpiles / product inventories

Reconciling AISC to Total Cash Cost

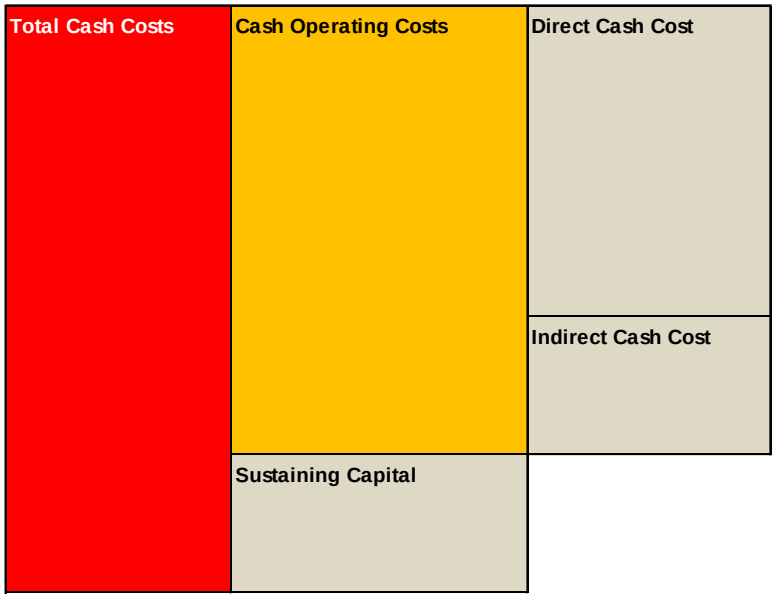


Both methods currently exclude:

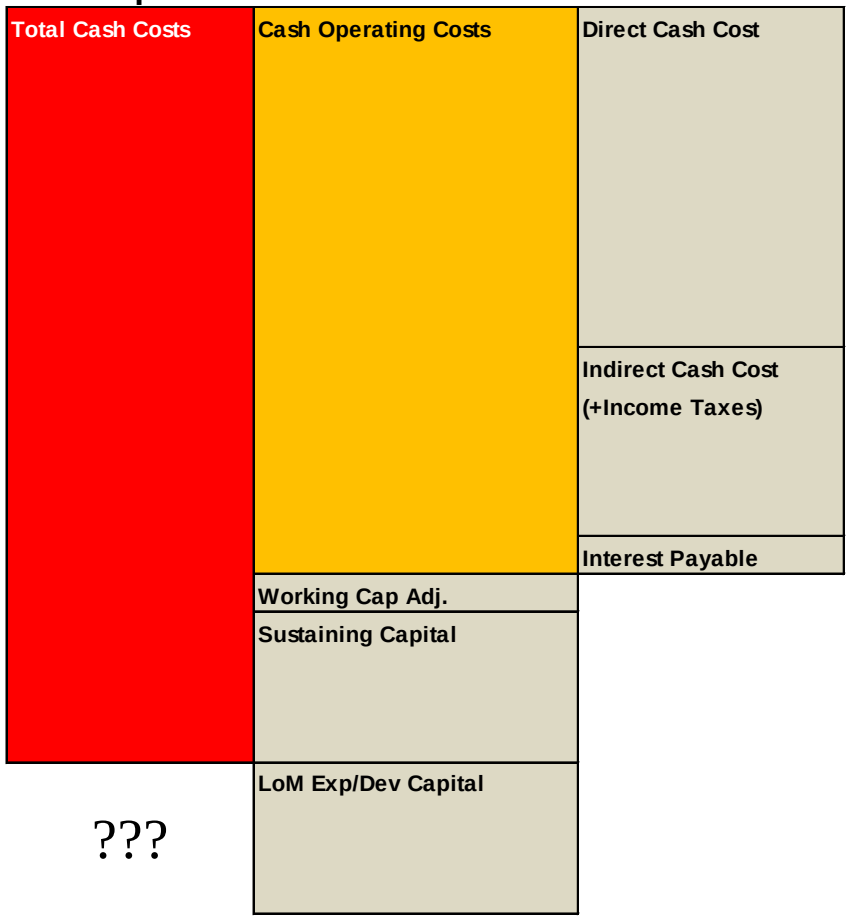
working capital, income taxes, acquisition costs, development capital, and financing

Stay Tuned

SRK Current View



SRK Expanded View



Thanks for the opportunity to share my views about these issues.

Questions?

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