What Does it Mean to Create Value in the Mining Industry?

CIM MES Discussion Group, Toronto

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Presentation Overview

• RPA has been giving advice to the mining industry for over 30 years
• All stages, and all geographies:
  • exploration and resource evaluation
  • scoping, prefeasibility and feasibility studies
  • financing, permitting, construction, operation, closure and rehabilitation.
• Clients are financial institutions, governments, major mining companies, exploration and development firms, law firms, individual investors, and private equity ventures
• We are 100% employee owned, completely independent
• This has given RPA the opportunity to objectively assess the key fundamentals that are necessary for long-term value creation in the mining industry
• The purpose of this presentation is to summarize some of RPA’s observations, and inspire some lively debate and dialogue surrounding the question:

  What does it mean to create value in the mining industry?
What is Mining?

- Mining is simple: pull money out of the ground, and hopefully it is worth more than the money you had to spend to enable you to do this.

- The mining industry is unparalleled in its ability to create **FIRST GENERATION** value for all stakeholders, including owners, suppliers, lenders, community groups, employees, governments.

- From grass roots exploration to Mineral Resource definition, studies, construction, operations, and closure, there will be many ups and downs.
“Making choices to create value for all stakeholders in a responsible manner”

- Richard Ross, Director of Global Mining Management Program, Schulich School of Business;
  Former CEO of Inmet Mining
Value Creation in Mining – Key Questions

• How is value creation measured?

• More importantly, through whose lens is value creation being measured?

• Traditional thinking is that stakeholders and shareholders have opposing or conflicted views

• Who is more important?

• How do you value and prioritize one over the other?

• Everyone has different wants, needs, expectations, and timelines

Owners
• Institutional
• Private Equity
• Retail
• Larger Company

Shareholder Eagles

Stakeholders
• Employees
• Suppliers
• Communities
• Customers
• Lenders

Stakeholder Patriots
Are Shareholders Stakeholders?

- Evolved thinking is that shareholders are one of many equally important stakeholders, however this is not a universally accepted view.

- There is still the question of how all the various priorities are aligned.

- Michael C. Jensen, HBS Professor proposes *Enlightened Stakeholder Theory*, where “The objective function of the firm is to maximize total long-term firm market value.”

- In simplified language, *do what you need to do to keep everyone happy*. 

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Annual Reports - Major Au Producer

- Stakeholder (LHS)
- Shareholder (LHS)
- Number of Pages (RHS)

Annual Reports - International Diversified Producer

- Stakeholder (LHS)
- Shareholder (LHS)
- Number of Pages (RHS)
How is this Applied to the Mining Industry?

- It seems reasonable that the traditional measure of value is still applicable for the broader group of stakeholders.

- The majority of concerns that are front-of-mind for other stakeholders would be included in a company’s NAV Multiple.

- Investors are less likely to purchase shares of a company that is frequently in the news for the wrong reasons, thus lowering the NAV Multiple.

- The concept of market value using a NAV Multiple is fairly unique to the mining industry.

<table>
<thead>
<tr>
<th>Enterprise Value</th>
<th>Market Capitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>NAV Multiple</td>
</tr>
<tr>
<td>Debt</td>
<td>NAV per Share</td>
</tr>
<tr>
<td>Number of Shares Outstanding</td>
<td></td>
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</tbody>
</table>

NAV: Net Asset Value
Calculating Net Asset Value

Mkt Cap = (NAV Multiple) * (NAV)

= \sum \text{NPV of Assets + Cash - Debt}

What does a company need to do to create value?
1) Grow NAV, and 2) Increase NAV Multiple

Simple, right?
The NAV Multiple – Wide Ranges

- Clear distinction between different tiers of mining company, from exploration to majors

- Within the tiers of companies, there is a wide range of NAV Multiples

- How does a company position itself toward the right hand side?

1. Adapted from CIBC Global Mining Group Weekly Comps Update, January 15, 2018
2. Share price as of January 15, 2018
3. NAV is calculated based on analyst consensus estimates
4. Total Enterprise Value equals market capitalization + net debt + preferred shares
Key Success Drivers

✅ Technical Factors
- Metal production
- Cost position
- Defining in-ground asset base
- Operational efficiency

✅ Capital Allocation
- Mergers and acquisitions
- New project construction
- Managing pipeline

✅ Reputation
- Delivery on commitments
- Social license
- Building trust and confidence
The Investment Stages of a Mining Project

Develop
- Project Acquisition
- Exploration
- Pre-Scoping
- Advanced Exploration

Study & Definition
- Scoping
- Prefeasibility
- Feasibility

Financing

Construction
- Startup

Operation
- Closure

Relative Cost
- Low
- Medium
- High
- Uncertain
Exploration and Acquisitions

- Successfully acquiring (through exploration or purchase) Mineral Resources is one of the prime areas where value can be created for investors.
Exploration Example

- A recent PEA completed by RPA is an example of how a mining project can potentially create significant value for all stakeholders

- It all started when a geologist had an idea

- The idea led to seed-financing and exploration, which led to a discovery, Mineral Resource estimate, and PEA

- Important to remember that the Project is at an early stage, with a lot of work ahead to capture the value that has been identified in the PEA

Value Creation for all Stakeholders (C$ billions)

- Owners, 7.1
- Government, 5.6
- Suppliers, 2.4
- Labour, 1.6
Acquiring Mineral Resources and Reserves

- Two broad methods – exploration or acquisition, with a host of other sub-methods: farm in/out option agreements, in-house exploration, minority equity positions.

- Either way, a key metric for any mining company is the cost incurred per unit of Mineral Resource – i.e. US$/oz or lb.

- Some companies regularly publish this, however it is not the norm.

Source: Agnico Eagle 2018 TD Mining Securities Conference January 17, 2018
Acquisition Frameworks

- Every company will have a unique set of parameters that they use to weigh acquisition opportunities.

- Factors that are considered include jurisdiction, commodity, stage of asset, point of commodity cycle, financing constraints, execution planning.

- Capacity for M&A must be built within the company.

Source: Deans, G., 2014
Mining M&A Outcomes

- Recent presentation from Paulson & Co. at the 2017 Denver Gold Forum shows that among large transactions, there is a poor track record of M&A that results in value creation.

- Major write-downs were common in the past three years, as a result of acquisitions from last seven years.

- Despite write-downs, M&A can be used as a key value creation engine for a mining company.

- Counter-cyclical approach is required, however the investor community may have other ideas.

Source: Paulson & Co., BMO Capital Markets, September 2017
Questions for the Group on Discount Rates:

- You are evaluating two separate gold mines for a potential acquisition, both producing approximately the same annual revenue. One is located in Ontario, and one is located in Guatemala. What is an appropriate discount rate for each of the two mines?

- You are evaluating a copper mine and a gold mine for a potential acquisition, both producing the same annual revenue, with the same mine life, and both located in Ontario. What is an appropriate discount rate for each of the two mines?
Commodity Diversification – Is it Worth It?

- At an asset level, having by-products is a significant advantage (provided that they haven’t been sold into a stream)

- At a corporate level, the jury is out whether multi-commodity companies are superior than single commodity players

- Generally from an operational level, it makes little difference, except in certain situations

- Some companies evolve to excel at certain mining or processing methods

Sherritt’s Moa (L) and Ambatovy (R) nickel assets
Studies, Financing, Construction, Commissioning

- A time when the initial momentum from the PEA can start to wane, a lot of heavy lifting needed to bring it from a deposit into an operation.

  - Project financing is arranged
  - Local community organizes road blockade
  - Bond Work Index underestimated, throughput cannot be achieved
  - PFS shows robust results
  - Analyst coverage initiated
  - Drilling hits high grade mineralization
  - Metallurgy test work shows high arsenic
  - Construction budget overrun, company needs to refinance
  - Project is optioned to a Major
  - Maiden Mineral Resource estimate is promising
Transition from Explorer to Developer

- Paradox between exploration companies and mine developers and operators

- Very few companies have made the transition successfully (i.e. created value)

- Successful transition requires the right people in place, the right project, and a well-considered financing plan
Key Principles of the Evolution of Studies

- Capital Projects are considered and developed in a phased approach

Scoping Study / PEA  
Prefeasibility Study  
Feasibility Study  
Project Commitment  
Project Execution

- WHAT COULD IT BE?
- WHAT SHOULD IT BE?
- WHAT WILL IT BE?
- PREPARE AND INVESTMENT DECISION
- DELIVER THE PROJECT
- EXTRACT THE VALUE

Operations

• Case A
• Case B
• Case C
• Case D
• Case E

SELECT THE BEST CASE

Best case

Project Execution

Start-up

Production

Funding approval and project readiness

Rock Solid Resources. Proven Advice.

www.rpacan.com
“In-Situ Value” put into Context

• The concept of “In-Situ Value” is misleading, but also helpful when evaluating projects

• There can be a massive mineral deposit with enormous “In-Situ Value” that has little chance of ever being developed

• Understanding where value is being lost and captured over the operating cycle is critical

• Prohibited disclosure on the TSX

Connecting "In-Situ Value" to Free Cash Flow
Where Do Things Go Wrong?

- Head Grade – Resource/Reserve models
  - Basic errors or incorrect assumptions in resource estimation
- Mining extraction overestimated and mining dilution underestimated
- Productivity and misapplication of mining method
- Processing, including metallurgy, equipment selection, and ramp up
- Capital costs – Project Execution Plan and Project Controls
- Operating costs
- People and Technology
  - Management team
  - Lack of experience
  - Substituting software for judgment
- External Pressures
  - Time and cost constraints
Question for the Group

- You are a mining executive and your capital project team presents you with two scenarios to develop a deposit.

- Which of the two options is superior?

- What other questions or information is needed to make an informed decision?

- From the lens of different stakeholders, is one more favourable?

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Option 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Capital Cost</td>
<td>US$ millions</td>
<td>250</td>
<td>450</td>
</tr>
<tr>
<td>Construction Period</td>
<td>yrs</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Mine Life</td>
<td>yrs</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Throughput</td>
<td>tpd</td>
<td>5,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Head Grade</td>
<td>g/t Au</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Metallurgical Recovery</td>
<td>%</td>
<td>95%</td>
<td>93%</td>
</tr>
<tr>
<td>Annual Production</td>
<td>koz / yr</td>
<td>69</td>
<td>126</td>
</tr>
<tr>
<td>Revenue @ US$1,250/oz Au</td>
<td>US$ millions</td>
<td>87</td>
<td>157</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>US$/t</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>AISC</td>
<td>US$/oz</td>
<td>881</td>
<td>557</td>
</tr>
<tr>
<td>Cost Curve Position</td>
<td>%</td>
<td>55</td>
<td>40</td>
</tr>
<tr>
<td>Pre-Tax IRR</td>
<td>%</td>
<td>19%</td>
<td>20%</td>
</tr>
<tr>
<td>Pre-Tax NPV @ 10%</td>
<td>US$ millions</td>
<td>150</td>
<td>167</td>
</tr>
<tr>
<td>Payback Period</td>
<td>yrs</td>
<td>4.8</td>
<td>4.0</td>
</tr>
</tbody>
</table>
Capital Cost Intensity

- Management’s ability to bring production online is a key value driver in mining

- A “Rule of Thumb”, and nothing more, to look at what a project might cost
  - i.e. Company plans to build a 100 koz/yr gold mine, what are they reporting as capital costs, and is it in line with industry average

- Capital Cost Intensity calculated by:
  (Total Initial Capital Spend) / (Nominal Production Capacity)

- RPA studied gold projects, across regions, mine types, and timelines

- Attempt to compare “apples to apples”, however it skews data when co-products or long-life assets are involved, and also depends heavily on project location

- Capital Intensity has clearly risen from mid 2000’s, across mine types
Choice of Financing

- Raising money for further exploration or mine construction in an accretive manner, without destroying value for existing shareholders, is complex and challenging.

- Continuum of choices from Equity to Debt, each with advantages and disadvantages, and it can be a combination of several options.

Source: Financing Fundamentals in Mining, November 2014, CIBC Capital Markets
Mine Operations

- Poor Resource model reconciliation
- Labour union initiates strike action
- Metal prices crash
- Government announces new royalty regime
- Commercial production is declared
- Construction budget overrun, company needs to refinance
- Project is optioned to a Major
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Mine Operations Management

- One of the few areas that a mining executive can exert any influence or control

- A typical head grade of a large scale open pit could be in the range of 1 g/t Au, with a 3:1 strip ratio (waste:ore)

- Can anyone spot the gold?
Using the previous example, can anyone spot the gold yet?
Mine Operations Management

• Since commercial production in 2013, all of the gold produced from one of Canada’s largest open pit gold mines could fit into a small bin.

• Small improvements to fleet optimization, recovery, grinding, consumables, can be the difference between being cash flow negative and positive.
Operations Management

- Mines generally take millions to hundreds of millions of dollars per year to operate.

- Operating costs are one of the few areas that a manager exerts any control over.

- Most mines have no control over the price they sell their commodities, although there is some control over the form (e.g. doré v. concentrate).

Source: SNL Metals and Mining
Adapted from BCG Stars and Dogs Matrix
With input from Outliers Mining Solutions
Operating Cost Curve

- Generally, an operation wants to be as far to the left as possible.

- Large scale, simple operations with predictable head grades and recovery, in stable jurisdictions, also make great “star” assets even if they are in the bottom half of the cost curve.

2017 Copper Production Ranked on Total Cash Cost

Source: S&P Global Market Intelligence
Closure and Reclamation

- Mine closure and reclamation is inevitable, as the Mineral Resource is depleted, or commodity prices fall to uneconomic levels
  - The mine has no value, or negative value (remediation cost), right?

Recreation Complex

Data Storage

Events Complex and Tourism

Marijuana Facility

Research Laboratory

Museum
Closure and Reclamation

• If all else fails, start mining Bitcoin!

**Chinese bitcoin miners eye sites in Quebec, Manitoba**

Cryptocurrency miners attracted by low energy costs, worries that Beijing may crack down

Thomson Reuters · January 12
Recap – Key Success Drivers

- **Technical Factors**
  - Metal production
  - Cost position
  - Defining in-ground asset base
  - Operational efficiency

- **Capital Allocation**
  - Mergers and acquisitions
  - New project construction
  - Managing pipeline

- **Reputation**
  - Delivery on commitments
  - Social license
  - Building trust and confidence
Conclusions and Wrap-Up

- Over the course of a mining project, enormous *FIRST GENERATION* value can be created for all stakeholders

- There will be several peaks and valleys along the way

- **Managers and Executives:** know your strengths as a company, and play to them

- **Investors:** know what the company is good at, understand what you are investing in, and keep an eye open when a company starts to deviate from its stated strategy
Presenter Contact Information

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About RPA

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- Offices in Canada, United States and United Kingdom
- Head office in Toronto
- 100% employee owned
About RPA

• Our mission
  • to apply our broad and deep experience to provide objective, independent advice.

• Our vision
  • to enable mining industry operators and investors to make the right decisions for business success.

• Our proof
  • accurate, credible technical reports that are accepted and relied on time and again, among financial institutions and major regulatory bodies worldwide.

• At RPA, we:
  • Deliver what we promise
  • Provide unsurpassed quality
  • Communicate effectively with clients and other stakeholders

• All of these characteristics are embodied in our motto:

  Rock solid resources. Proven advice.
RPA Capabilities

- Mineral resource/reserve estimates and audits, compliant with worldwide reporting codes
- Mine design and optimization
- Metallurgical assessment and process review
- Estimation of project capital and operating costs, financial modeling and analysis
- Preliminary economic assessments, scoping, prefeasibility, and feasibility studies
- Valuation of mineral properties
- M&A due diligence reviews of mining and exploration projects
- Lender advisory services
- Expert witness services
- Design and management of exploration programs
- Reporting for public disclosure, including NI43-101 Technical Reports, Competent Persons Reports, and Mineral Expert Reports
- QA/QC audits and reporting
- Operations benchmarking, optimization programs and troubleshooting
- Strategic planning and advice for boards and senior management