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<u>Mines in Development:</u>
<u>Options in Times of "Fog"</u>

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Presentation Outline

- Some New Terminology- Reflective of new trends
- Towards a New Industry- Structural shifts mean “fog”
- Re-Costing- Private-costs must be re-scrambled
- Re-think the Public Sector Side- seldom done
- Lessons Learned- Blunderous examples; what not to do
- Questions and Discussion

New Terminology, New Markets

- “Thinner grades and/or too remote”: or “TGTR”, a Canadian refrain

- “Double-queue”: Queues for public permits and public co-funding

- “Cost dormancy”: When costs are predictable (i.e.: now!!)
  - McKinsey showed four out of five mines at 46%+, when times are good
  - Capital cost curve is the tough one, so dodge it

- Private-sector costs (slide 7 for details)
  - All costs on balance sheet and in the feasibility studies
  - All costs could be scaled, phased, shed, shared or pooled

- Public-sector frameworks and needed “symmetry” (slide 8 for details)
  - Growing deficits; so public sector needs an “upside” (symmetry)
  - Infrastructure, environment, social and fiscal, to name a few
    - Now, if Canada can put $350m into Bombardier then..why…?

The Current Industry: The "Fog"

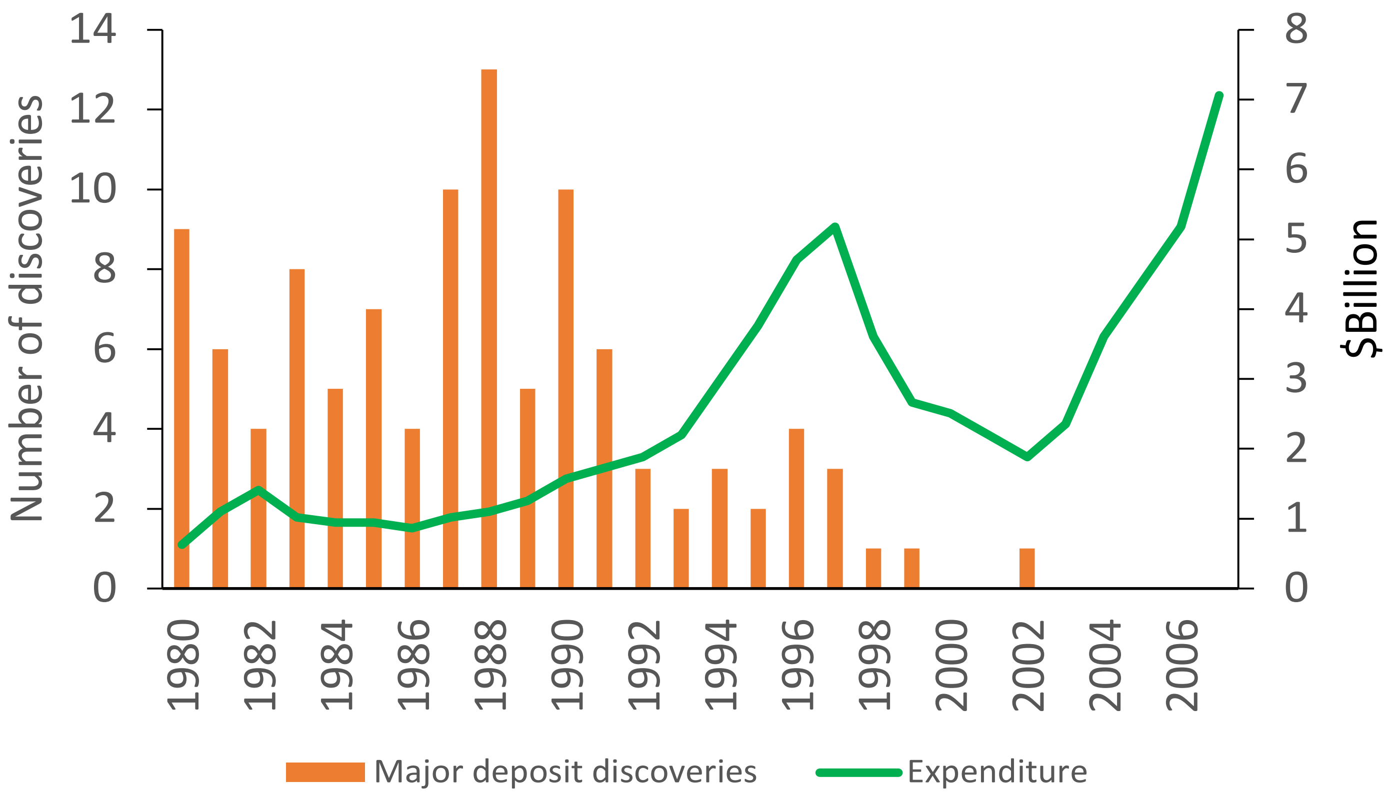
- Demand: USA rebounding; EU in Brexit; Japan in Quantitative Easing
  - Bad for base metals; good for gold, cobalt, lithium, copper, cadmium
- Demand: Emerging markets now largest, slowing; BRICS have issues
- Displacement: High tech, UBER, new lifestyles replacing metal demand
- Displacement: Re-cycling increases supply and reduces demand
- Supply: Old assets being depleted, with growing costs
- Supply: New projects are fewer, further afield (TGTR) (next slide)
- Supply: Capital difficult; if found, it wants performance AND dividends

Bottom Line: Unknown cycles; prices to rise but when? <u>low cost</u> essential

New Project Pipeline: Depletion of Major Finds

<u>Graph: Major Finds vs. Exploration Expenditures </u>(Source: UBC - Keevil School)

- M & A rush of 2009-2012, and overbidding and $160bn in write-offs
- Need for better productivity & new technology for weaker projects (ie: TGTR)



For New Projects: Forget the Past

- The Past
  - Majority of Vancouver companies formed in 1995-2007
    - “globalization”, no Iron Curtain, BRICS offered up-side
  - Non-producing assets re-stated with rising metal prices
  - Public sector had surpluses; was very supportive
    - Permits and infra were mostly “grandfathered”
  - Private and institutional investors wanted, and got, growth

- The Future
  - New assets further afield and need full cost-recovery (ie: TGTR)
  - Public sector not supportive with subsidies
  - Metal prices unknown; must <u>focus on cost, and risk-sharing</u>
  - Permits, access, politics, internet add complexity and delays
  - Investors now want precise performance and dividends

<u>**Bottom Line**: If not a private sector investor, then public sector is key for feasibility</u>

Re-Cost: Private-Sector for "New" Cost Options

- <u>Costs and Revenues</u>: "Cost dormancy" and devaluation revisited!!
  - Costs within the perimeter fence, often overlooked…
    - Phasing/scaling using less capital (ie: Sabina; LithiumAmericas)
  - All mine development, infrastructure costs, permits now shared
    - Low infra-utilisation supports "pooling" (ie: Goldcorp/Teck in Chile)
    - Cerro Casale, once a dog now a joint-venture (Goldcorp/Barrick in Chile)
    - Sharing at all levels of risk (Barrick/PRC in Argentina)
    - LithiumAmericas sold 50% to SQM; then a sale-interest in Phase 1 to Ganfeng
  - Co-generation revenues, FCF essential, cost transfers
    - Solar energy offers options in Burkina Faso; Mali; others
    - Detour Gold could not afford to pay for its road
  - "Risk-sharing" with symmetry on upside is the new "essential"

<u>**Bottom Line**</u>: TGTR requires assessment not found in F/S; hire someone

Re-Cost: Public-Sector Costing Options

Public "frameworks" must be laid out, assessed and kept current

- Infrastructure Frameworks: Any operating subsidies, including capital
  - Up to now, all cost-sharing but no upside risk-sharing ("symmetry")
  - Optimally, present a 2x2 matrix of capex vs. opex
- Social Frameworks: Hidden cost, often at the multi-government level
  - Aboriginal
  - Training
  - Immigration
- Environmental Frameworks: Too numerous; need clarity
  - Can easily be ¼ of the total cost or more, and increasing
- Fiscal Frameworks: Often overlook price-taking role of extraction

Bottom Line: Any one can kill a TGTR; and private-sector will not wait

Public Sector Must Improve, However

- Public sector has growing rural/urban issues and must do something yet..
  - Provincial rules are antiquated, or non-existent
    - Sask., Man., Que., Yukon best; Ontario and BC, among worst
  - Consolidation means fewer and/or weaker buyers, fewer deals
    - fewer deals means weaker tax bases
    - Increasing rural/urban splits; rural very costly when empty
  - Frameworks now compared world-wide, instantly; its the internet
    - And inter-governmental squabbles do not sell
  - Deficit-driven tax-reforms clash with extraction economics
    - Commodities are price-takers, not price-givers (Amazon, Starbucks)

Bottom Line: Must stay current and drop obsolete; time to call in the Feds?

Blunderous Examples; or Why Caution Warranted...

- Requires completeness before engagement and follow-through
  - BC went out on LNG with none of the four variables
    - Touted billion$ of benefits and ludicrous hiring (which scared !!)
    - Got a client in Petronas, but late; others walked
  - Potash Corp. sale quashed by a right-wing government of Saskatchewan
    - Why? Sask. was 22% dependent on potash revenues

- Requires relevance
  - Ring of Fire has no deal with Ontario’s ancient legislation
  - False positives do not help (Prosperity 1;then Prosperity 2 in BC)
    - Both shot down by a Conservative government in Ottawa
  - False negatives do not help either (Morrison in BC)
    - Developer spent capital on lawyers, now ailing

- Requires cooperation
  - KSM is currently in limbo because of EPA /Alaska “misunderstanding”
  - Cut the bullshit: the market now has the internet

“A Bird in Hand Beats Two in the……..”

- Softer Economics: Absorbs the downside, share the upside
  - Build in a period of soft-markets, therefore upside is stronger
  - Offers an option to the public-sector

- Costing: Project costed in times of cost-dormancy; priceless!
  - Often the steepest of all price-sensitivity curves

- Educate Public Sectors: They are often not equipped

- Expediency is priceless: reduces “double-queues”
  - Invaluable, especially in times of cost-dormancy

- Public sector with capital: has a robust return on co-investment
  - Jobs maintained in weak times, dividends in good times

Bottom Line? One year of avoided inflation/delays = $200m ($1bn @ 20%)

- Especially when capital is hard to find and margins are thin

Re-costing with the Public Sector: a Summary

- **U**ncertainty will prevail; grades are getting thinner, more remote (TGTR)
  - Learn to live with this, not avoid; <u>re-cost everything with options</u>
- Private sector is challenged, MUST be more responsive with re-costing
  - Cost-dormancy cannot be underestimated as advantage
  - Avoid the 46%+ cost overrun…next “lift” may not equal 46%.....
- Public sector realising it cannot afford the cost of “empty rural”
  - Must focus on projects that are price-only; needs help
  - But must modernise, and keep constant
- Private sector has a bird in hand….
  - needs more work done on costing; cost-dormancy a MASSIVE advantage
  - needs to map the low-price point; least capex point……..
  - ask for subsidy and offer partner an “up-side”: public-sector… or otherwise
- Or we all lose……

Full-Costing Your Project: The End

- **A special “thanks, merci, grazie” to all!**
- **Questions, and (*hopefully*) some answers…**
- **Yes, rumors are true, I do like espressos:**

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