



## KOPERNIK PERSPECTIVE MINING

*The secret to investing is to figure out the value of something – and then to pay a lot less. (Joel Greenblatt)*

Mining is an unpopular industry and is unpopular for very valid reasons. Management teams are prone to allocate capital pro-cyclically, destroying vast amounts of capital. Governments take advantage of the fact that companies cannot move a mine out of the country. And, operationally, mining is a difficult business. Many investors have been burned in the past, and vow *never* to get burned again, no matter the discount.

People are prone to hyperbole and exaggeration, frequently repeating phrases like “never” and “absolutely not.” Our philosophy discourages this binary thinking. The question is not “should we own this?” but “at what price is owning this worthwhile?” Emerging markets, unpopular industries, places with unfamiliar or challenging geopolitical situations—all these present specific challenges as well as the potential for deep discounts and substantial bargains.

This white paper explains how we value mining companies and why we currently prefer to own the mining companies, risks attached, instead of the physical commodities. We believe that a position that says “never” and “absolutely not” to investing in a security is not well thought out. Pertaining to mining companies today, we see this binary thought process in the extreme—an extreme that we are taking advantage of.

### **Not If, but How Much**

For true investors, the question isn’t “are mining companies good investments?” but “at what price does a mining company’s stock become a good investment?” There is a price for everything. Kopernik believes that investments should not be made until a reasonable estimate of a stock’s intrinsic value has been calculated. This process always begins with an analysis of the industry. We analyze supply, demand, Porter’s Five Forces, material risks, primary valuation metrics, and key factors that will allow a business in the industry to succeed. Some of these things differ from industry to industry; for example, some valuation metrics may be suitable for one industry but entirely inappropriate for another. In the case of mining, the single most important driver is ownership of the material being mined. Usually, this means the more of the material, the better. Large deposits have the advantage of being able to produce over a full cycle (or, hopefully, more). Because mining is a scale business, size matters.

The most common way to value resource companies is net asset value (NAV) which usually means estimating five things: the size of the resource, the speed at which the resource will be mined, the cost to mine the resource, the price of the commodity when it is mined, and the appropriate cost of capital over that time period. We believe estimating the future is a fool’s errand. Mining comes with a host of unknowns. We have written extensively about the problems of discounting cash flows in a world of interest rate suppression, but it is worth a quick review.

*Time is what we want most, but what we use worst. (William Penn)*

Many are familiar with the theory of the time value of money, which says that the money you hold now is worth more than the money you’ll hold in the future because of its potential earning capacity. If you have \$5 today, it is worth more than the exact same \$5 a year from now, because you could invest it and earn interest over the 12 months between now and next year. Therefore, of course you would prefer the \$5 now, as opposed to a year from now, so that you would not miss out on all that extra potential earning power.



Discounted cash flow (DCF) models employ this theory to derive the value of a business, and many value managers have been very successful using this technique. We argue, however, that DCF models have lost much of their effectiveness due to central bank manipulation. The central banks have subverted the market interest rate used to determine the discount rate. This has caused significant mal investment, which is impacting the cash flows that are being discounted. DCF models do a particularly poor job of valuing companies that are producing a finite good in an environment that underprices that good.

A hypothetical example is helpful: an investor is given the choice between Company A, a gold mining company that is in production and has 10 years' worth of resources to mine or Company B, a gold mining company that is estimated to start production 5 years from now but has 20 years' worth of resources once the deposit becomes a mine. At the same time, the price of gold is reflecting a lack of demand in the market, and it may take time for prices to recover, but analysis suggests that it will recover to a price that is double current prices. Which company should the investor prefer? Using a DCF model, and a typical discount rate of 10%, investors would prefer Company A since a DCF model of distant cash flows would yield a very low value.

We believe this is flawed logic. First, the DCF model doesn't differentiate much between a mine that has enough resources for 10 years, 20 years, or 50 years, because it gives a low value placed on production beyond year 10 (if it uses a typical 5 to 10% discount rate). Second, investors typically erroneously extrapolate current low prices into the future, falling victim to the psychology of cyclical markets. A DCF model can value production of years 1-5 much higher than of years 5-10, even if the model assumes that the price of gold was to be significantly higher in years 5-10.

We often tell investors that the last thing we would want Company A to do is mine all their material during the bad times and be left with a hole in the ground where the gold once was when the good times come. When dealing with underpriced goods, time is the investor's friend. The longer the timeframe, the more likely prices are to revert to their intrinsic value. For this reason, we prefer optionality-based models. Additionally, it is easy to put less import on time when central banks around the world have repressed interest rates to artificially low levels. When a 10-year bond yields less than 1%, it is easier to wait for our capital to be returned to us.

As mentioned, we look at many valuation metrics when performing analysis. But given the flaws of using DCF models in an era of interest rate suppression combined with the specific peculiarities of the resource extraction businesses, it should be clear why we put little emphasis on it. When our approach is the most different from the mainstream is when we get most excited, because it is then when we have the largest opportunity for outsized gains.

## Opportunities Today

Today, we find most commodities attractively priced. Many are trading well below their incentive prices, or the price that *incentivizes* a sufficient number of new mines to be built to meet demand. Commodities are still free markets – when there is too much supply, prices fall, and when there is too little supply, prices rise. As Howard Marks says, markets are either in a cycle of optimism or in a cycle of pessimism; they are rarely balanced. As the market is selling the commodities too cheaply, why bother owning the mining companies? Why not simply invest in the physical commodity?

To answer this question, we find asset arbitrage models and optionality models to be instructive. Again, let us take a hypothetical example. Suppose copper is selling at \$2.50 per pound (lb.) but you can buy it on the stock market (valued by enterprise value divided by reserves) for \$0.25 per pound? Sound too good to be true? It is. The catch is that it is



still underground. To get to it, you must build a mine. This could cost billions of dollars, which let's say amounts to \$0.75/lb. on our hypothetical billions of pounds of copper reserves. Now we've spent \$1.00 (a seeming bargain compared to \$2.50 per pound!). As you might expect, it is still too good to be true. It still needs to be extracted from the earth, processed to be separated from other elements and impurities, concentrated, smelted, and refined. That can be another \$1.00/lb. and suddenly our \$0.25/lb. cost has become \$2.00/lb. It gets worse – taxes, royalties, cost overruns, management errors, and other unforeseen items can tack on more, let's say \$0.25. So instead of buying copper at \$0.25 and selling it for ten times that amount, we are buying for \$2.25 and selling it for \$2.50. Not as exciting. But, possibly more exciting than it appears. In an environment where cash yields zero, bonds yield just above zero and less than zero when inflation is factored in, and most common stocks and real estate prices are at levels that in the past have portended low or negative returns, we are relieved to have the opportunity to arb out an 11% gain—a gain that could be more if the unforeseen problems don't materialize.

While 11% arbitrage returns in our opinion are attractive, we hope that the readers are still with us, because we haven't gotten to the exciting part yet – optionality. Copper, like all commodities, has wild price swings. It gets way too high and way too low, but always remains around its incentive price – the price below which miners will not put forth the efforts and capital required to keep supply in line with demand. Shortages will ensue. We believe that copper's incentive price is around \$3.25. When copper reaches its incentive price, the return on our hypothetical investment balloons from 11% to 44%. That 44% is likely inflation protected since scarce resources usually maintain their purchasing power during times of monetary debasement. We view this investment as providing us with a free option on the likely appreciation up to the incentive price since we still make 11% even if our assumptions prove incorrect. The table below illustrates this hypothetical example.

Copper Company A	Current Price	Upside at Current Price	Incentive Price	Upside at Incentive Price
\$2.25	\$2.50	11%	\$3.25	44%

While we find a 44% prospective return to be exciting, you may have noticed that we don't own much copper in mid-2020. That is because while 44% is attractive, the possibilities in certain other commodities are even more compelling, particularly uranium and precious metals mining companies, as we will discuss below.

## Why Miners?

### Uranium

Optionality in the uranium mining industry is cheap relative to historical levels. As mentioned, Kopernik's process begins with analyzing supply and demand, Porter's Five Forces, and key risks, which helps us to determine our estimate of the incentive price and how much a company in this industry should make. The intrinsic value of these companies is determined by multiplying the recoverable pounds of uranium by the difference between the incentive price and the total costs required to extract, process, and sell it. The result is a preference for companies that own lots of uranium. For more on the subject please reference our [uranium white paper](#).

Companies that trade significantly below their incentive price are analyzed further, and a company specific margin of safety is applied. We determine our margin of safety by analyzing the company's management and financial strength, the quality of the assets, the industry dynamics, and the regulatory/geopolitical concerns. The table below illustrates some of the questions that we ask ourselves as we analyze these factors.



Factor	Questions
Management and Financial Strength	<ul style="list-style-type: none"> <li>• What has the company's management done in the past?</li> <li>• Are the managers good capital allocators?</li> <li>• Does the company have a strong balance sheet?</li> <li>• Is the company able to control costs?</li> <li>• Is there a history of finding deposits and successfully developing mines?</li> </ul>
Industry Dynamics	<ul style="list-style-type: none"> <li>• Does the commodity meet basic needs?</li> <li>• How elastic is supply?</li> <li>• Are there viable substitutes for the material?</li> </ul>
Asset Quality	<ul style="list-style-type: none"> <li>• How long is the reserve and resource life?</li> <li>• What is the extraction cost over the life of the mine?</li> <li>• Is the ore difficult to process?</li> <li>• Is the asset close to infrastructure?</li> <li>• Is there a high-quality labor force nearby?</li> </ul>
Regulatory and Geopolitical Concerns	<ul style="list-style-type: none"> <li>• What is the level of government ownership of the resource?</li> <li>• Is there a strong rule of law in the country?</li> <li>• How has the country treated mining companies historically?</li> </ul>

As one can gather, there are many risks to consider, which is why we wait for optionality to be free or close to free. We believe that uranium, having swung from a price below \$20 per pound to \$137 and back below \$20, will ultimately settle in near its incentive price of between \$60-90 per pound in the future. The range is large because the cost curve is steep. Low levels of demand can be met with low cost mines, but as demand increases, the cost of bringing on new mines increases rapidly. The price currently hovers around \$32 per pound, so the uranium price can be expected to double (or more) from here. What this means for investors is captured in the following table:

	Current Price (As of 9/15/2020)	Upside at \$75 Incentive Price
Uranium	\$32	134%
Cameco Corp ("Cameco") <sup>1</sup>	\$11.18	271%
Fission Uranium ("Fission") <sup>1</sup>	\$0.31	819%

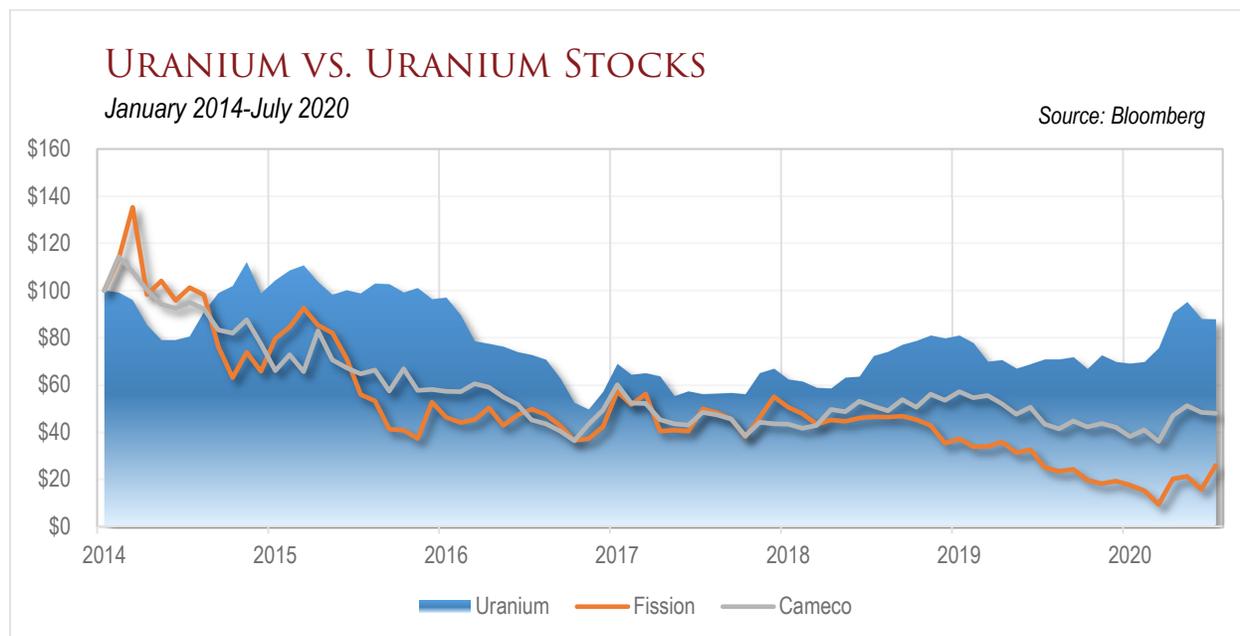
For illustrative purposes. Actual results may differ.

It is important to point out that the upside figures are not risk-adjusted; thus, they do not represent our expected return. Our expected return would be lower. Our margin of safety is usually 50-70% for junior mining companies such as Fission, which is higher than the 30-50% margin of safety we require for producing companies such as Cameco. Even

<sup>1</sup> Kopernik has positions in both Cameco and Fission.



risk-adjusted, there is significant optionality on an in-production mining company (Cameco) and the extreme optionality on reserves that aren't yet being mined (Fission). How did we get here? The crowd is overly repelled by volatility, shuns small size, has little patience for future cash flow, and in our opinion, mismodels resource companies. The following chart shows how miners have underperformed the spot price since 2014.



Of course, there are advantages to buying commodities on Wall Street/Bay Street that are worth mentioning. Because of uranium's radioactive properties, its trade is highly regulated, a fact that makes uranium holding companies more convenient. These companies often trade at a discount to what they are worth, and Kopernik has a position in two of them, Uranium Participation Corporation ("UPC") and Yellowcake PLC ("Yellowcake"). However, on the continuum of uranium trading, the miners are the most convenient and offer the best value.

## Gold

Gold mining is a difficult business. The key factor to success is ownership of gold, ideally lots of it. Finding a gold mine is incredibly difficult: only 1 out of 3,000 mineralized anomalies become mines.<sup>2</sup>

As is the case with uranium, over the past 9 years, the gold price has fared much better than that of the large miners (represented in the first chart below by the VanEck Vectors Gold Miners ETF), which in turn have fared much better than smaller miners (represented by the VanEck Vectors Junior Gold Miners ETF). In the same vein, the second chart shows how a large **producing** company (Newcrest Mining, Ltd. ["Newcrest"]) has fared in the market relative to a small **resource owner** (Northern Dynasty Minerals Ltd ["Northern Dynasty"]) whose cash flow will come well into the future.

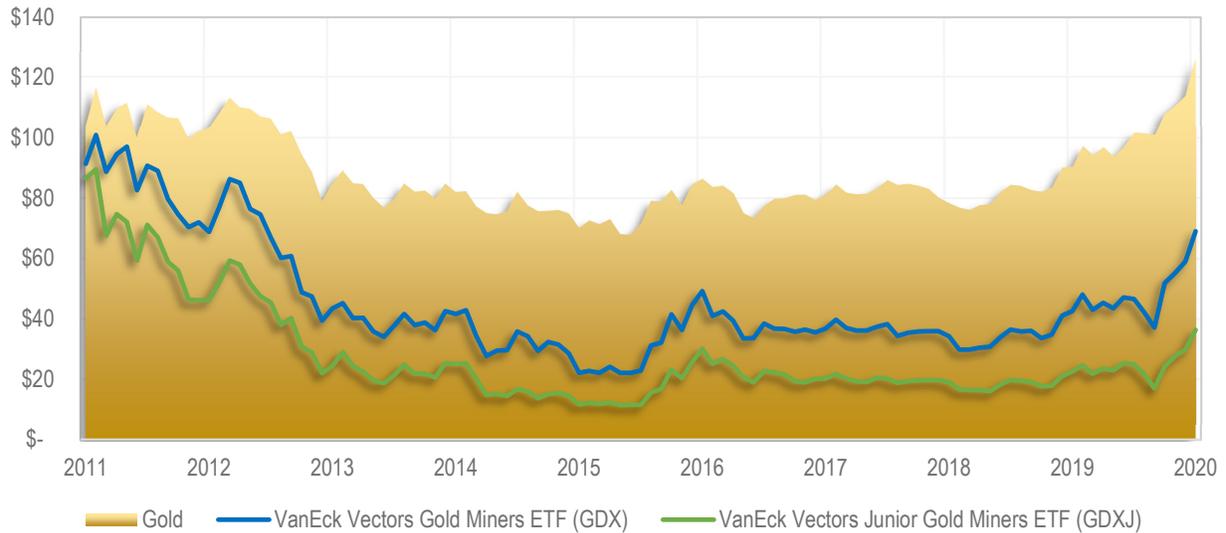
<sup>2</sup>[Prospect generation – making mining into a numbers game, Palisade Research, May 19, 2016](#)



## GOLD VS GOLD MINERS VS JUNIOR GOLD MINERS

July 2011 - July 2020

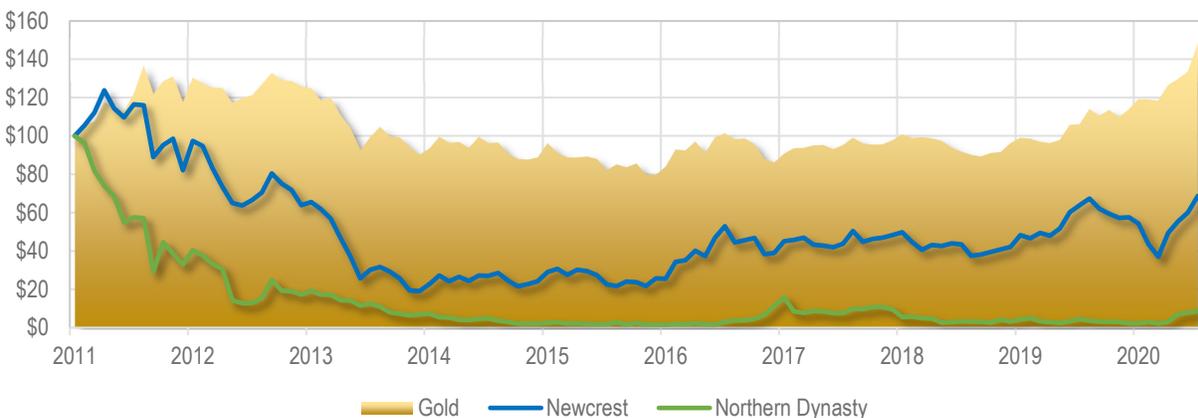
Source: Bloomberg



## GOLD VS GOLD STOCKS

January 2011-July 2020

Source: Bloomberg



The following table highlights our ability to arbitrage the difference between gold above ground versus in-situ and the concurrent optionality. In addition, we've added some more variables. This is in response to the common complaint that gold is an unproductive asset – that “we eat corn, put gas in the fuel tank, add copper to the industrial process, but gold is worthless.” We view that as further support for the argument that **gold is money**. We don't eat U.S. dollars, nor put them in the fuel tank. They don't have any industrial uses. They don't yield anything unless loaned out. Ditto for



other fiat currencies: euros, yen, pounds, rubles – none of them are productive assets. As we discuss further in our [gold white paper](#), gold’s incomparable use as money makes gold miners even more attractive.

Therefore, the table below shows the upside of four of our gold holdings at the commodity incentive price and at 25% gold monetization (the arrangement under the Bretton Woods system). As of late August 2020, the current price is near Kopernik’s incentive price of \$2000. As the table shows, even at current prices, there is still upside, particularly in producers and miners (less so in streamers and royalty companies). To reiterate, the figures shown are not risk-adjusted. Our expected returns are lower, and our margins of safety are larger for junior miners.

	Current Price (As of 9/15/2020)	Upside at Incentive Price	Upside at 25%- backed
Gold	\$2000	0%	143%
Newcrest Mining Ltd. (“Newcrest”) <sup>3</sup>	\$24.10	162%	588%
Northern Dynasty Minerals Ltd. (“Northern Dynasty”) <sup>3</sup>	\$1.00	3,321%	8,882%
Wheaton Precious Metals Corp. (“Wheaton”) <sup>3</sup>	\$54.04	8%	210%
Seabridge Gold Inc. (“Seabridge”) <sup>3</sup>	\$19.84	808%	3,053%

For illustrative purposes. Actual results may differ.

### Some Thoughts on Risk

While the upside potential for the miners is tremendous, it is imperative to consider the substantial risk inherent to mining. Kopernik views investment risk as the possibility of a permanent loss of purchasing power. Some risks are systemic; with miners, the biggest challenge comes from business risks. Unlike systemic risks, business risks can be diversified away. It is extremely important to diversify across many different management teams, governments, currencies, geologies, geographies, chemistries, and companies. The market currently gives ample opportunity to do so, without sacrificing quality or standards. This is what we have done and encourage others to do.

No analysis of mining companies can be complete without addressing the formidable obstacles that they face. Management teams have collectively earned their reputation as destroyers of capital. They have a history of buying high, selling low, committing capital at inopportune times, diluting shareholders through serial stock issuance, options and warrants, and placing “growth” over economics. Geopolitical risk is rising, as it is for most industries in recent years, and is higher for miners as most countries have reevaluated the idea of letting foreigners extract their valuable resources without demanding a meaningful share of the economics. Also, due in part to a poor ESG (Environmental, Social, Governance) track record, many countries have arguably swung from one extreme to the other in terms of their demands for mining companies. On top of this, costs are rising as the easy-to-mine resources have been mined.

<sup>3</sup> Kopernik has positions in Newcrest, Northern Dynasty, Wheaton, and Seabridge.



Remaining reserves often now reside on mountains, under glaciers, in remote deserts, deep in the earth, and/or in politically unfriendly locals. The chemistry, engineering, and geology have become increasingly complex. Stocks tend to be volatile and many are in emerging and frontier markets. There are reasons that most people won't touch them.

However, volatility is not risk, and neither are stereotypes; simply because gold miners are stereotypically considered poorly run companies does not mean that *all* gold mining companies are. As Howard Marks so effectively points out, risk to some is different than risk to another. When those who can't handle volatility dump those stocks to attractive levels, not only is the upside potential enhanced, but the risk becomes lower for those who view risk as the prospect of *permanent* loss of capital.

Management error is often a cyclical phenomenon. Management tends to get overly confident and throw caution to the wind at the top of the cycle. At the cyclical trough, they get overly cautious, sowing the seeds for the next upswing. With many commodities more than a dozen years into a bear market, managements are generally being ultra-conservative. They are not tossing around capital. Few are investing at all. When the cycles eventually return to the other extreme, prudent investors will be long gone.

To repeat, we utilize our fundamental, bottom-up research process and industry-tailored valuation metrics to find the best risk-adjusted investments, **heavily discounting for the risks**. While a producing company may require a 30-50% margin of safety, a development stage company may require a 50-70% margin of safety. One company in the portfolio had a 90% margin of safety. In other words, in this instance, to compensate for potential risks, we would only invest at a price where the upside to our appraised value is ten times! When many stocks are going up, some substantially, we believe the portfolio can handle a few adversities and still provide nice returns. **We only invest in miners when the upside potential is significant, even after discounting the risks.** The risk-adjusted upside potential currently is substantial. (See the chart below.) Many of the business specific risks are diversified away.

Year	Upside Potential			Internal Rate of Return
	2X	3X	5X	
1	100%	200%	400%	
2	41%	73%	124%	
3	26%	44%	71%	
4	19%	32%	50%	
5	15%	25%	38%	
6	12%	20%	31%	
7	10%	17%	26%	
8	9%	15%	22%	
9	8%	13%	20%	
10	7%	12%	17%	

For illustrative purposes. Actual results may differ.



## Conclusion

From a bottom-up standpoint, many commodities are vastly undervalued relative to history and to the price required to sustain production into the future. They arguably deserve a place in all portfolios. For those incorporating top-down factors such as unlimited sovereign borrowing and central bank currency issuance, the case becomes exponentially more persuasive. Physical holdings and/or holdings via ETFs or similar structures make a lot of sense. However, ownership of publicly traded owners/producers of resources currently offer much potential, even when heavily adjusted for risk.

Miners are fortunate to have control of certain resources and the tremendous optionality that comes with that. Those resources, while they might be finite, can be enriched or weakened by miners adding (or subtracting) value. A miner can add or subtract value through management decisions, exploration, acquisitions, ESG considerations, or any number of other variables. This often can enhance value over time, but even when it's adverse, to reiterate, there is a price for everything. We strongly believe that many stocks are significantly underpriced because investors have grossly overreacted to legitimate concerns regarding the difficulty of mining, and because they shun volatility and headline "risk." The risks that do exist can be managed through adjusting valuations and by diversifying them away across different management teams, governments, currencies, geologies, geographies, chemistries, and companies.

The attractiveness of resource stocks tends to increase meaningfully with exposure to tough geographies, unpopular commodities, and especially with the duration of the expected production profile. As should be the case with all investments, ask not **if** they are good investments. Ask **at what price** do they become good investments? Fundamentals and history suggest that many mining stocks currently provide extraordinary investment opportunities.

Investment Research Team  
Kopernik Global Investors, LLC  
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