The Ore in the Ground Is Not Money in the Bank

written by Jack Lifton | September 15, 2026

> *"A mineral deposit is geology. A mine is engineering. A qualified product is manufacturing. A positive cash flow is a business. Do not value the first as though it were already the last." — Jack Lifton, Critical Minerals Institute (CMI)*

An old habit in the junior mining business has probably kept investors from more money than bad geology ever has. A company discovers a mineral deposit. It estimates how many tons of material are present. It determines, or assumes, a grade. It multiplies those numbers by the current prices of the refined form of the contained metals and announces, directly or indirectly, that it has discovered an enormous amount of "value."

It may have discovered an enormous amount of mineralization. That is not the same thing. I have spent more than six decades in and around the businesses of metals, mining, refining, processing and manufacturing. One lesson should be obvious but apparently is not:

The value of the elements contained in a rock is not the value of the rock, and neither is necessarily the value of the business that proposes to produce those elements.

This distinction matters today because governments have rediscovered mining. Words such as *critical minerals*, *strategic materials*, *supply chain security* and *national security* have entered the vocabulary of politicians and financial promoters. The result has been an extraordinary amount of money chasing

projects that would have struggled to attract capital under ordinary commercial standards. Investors therefore need to understand what the numbers in a junior mining presentation actually mean.

Start With the Simplest Number—and the Most Misleading One

Suppose a company says that its deposit contains one million tons of material averaging 1% of some metal. That sounds like 10,000 tons of contained metal. If that metal is selling for $100,000 per ton, elementary arithmetic produces a theoretical contained value of $1 billion. The arithmetic may be perfectly correct. The conclusion may be completely meaningless. The company does not have $1 billion. It does not even have 10,000 tons of metal. It has one million tons of rock, and geological sampling and modeling indicate that approximately 10,000 tons of the metal may be distributed. Between that rock and a customer’s purchase order lies the entire mining industry.

The rock must be mined. It may have to be crushed and ground. The valuable minerals must be liberated from the waste minerals. They must be concentrated. The desired element must then be chemically extracted, separated, and purified. If the customer requires a metal, alloy, chemical compound, or engineered material, additional processing will be necessary.

Every one of those steps has a recovery factor. Every one costs money. Every one creates waste. Every one requires equipment, energy, labor, reagents, and technical knowledge. And every one can fail.

Grade Is Only the Beginning

Investors understandably pay attention to grade. Higher grade is generally preferable to lower grade, all else equal. But other things are almost never equal.

Mineralogy can be more important than grade. A relatively low grade deposit containing minerals that can be economically concentrated and processed may be worth considerably more than a higher grade deposit whose valuable elements are locked in difficult mineral structures. This matters especially in rare earths. A press release may report an impressive total rare earth grade. But which rare earths? Cerium is not dysprosium. Lanthanum is not terbium. Neodymium is not yttrium.

Even knowing the elemental distribution is insufficient. The investor needs to know the mineralogy and whether those minerals can be economically beneficiated and chemically processed. I have seen far too many discussions of rare earth deposits begin with assays and end with multiplication by published oxide prices. That is not economic analysis. It is arithmetic.

Recovery Is Where Geology Meets Reality

If a deposit theoretically contains 100 units of a valuable material, the operator will never sell 100 units. Some material is lost in mining. More may be lost during beneficiation. More may be lost during chemical extraction. Additional losses occur during separation and purification. If the final product must be converted to metal, alloy or another useful material, there are further yield losses.

Thus, the investor should never ask merely, “How much metal is

in the ground?” The useful question is: **“How much saleable product can reproducibly be produced from each ton mined, at what total cost, and who will buy it?” Those last four words — *who will buy it?* — are among the most neglected questions in mining finance.** A product does not acquire commercial value merely because somebody publishes a price for something with the same chemical symbol.

Resources Are Not Reserves

Investors should also pay careful attention to terminology. An exploration target is not a resource. An inferred resource is not an indicated resource. An indicated resource is not a measured resource. And a mineral resource is not automatically an economically mineable reserve. These distinctions exist for a reason.

Yet promotional language around junior mining companies often blurs these categories for investors. The farther a project is from demonstrated economic production, the greater the uncertainty attached to any valuation. A drill hole is evidence. A resource estimate is a model. A reserve incorporates economic considerations under specified assumptions. A producing operation generating positive cash flow is a business. Investors should not value all four as though they were the same thing.

Beware of the Spreadsheet Mine

Eventually the junior miner produces an economic study. Now the numbers become more sophisticated. There is capital cost, operating cost, production rate, mine life, internal rate of return and, inevitably, net present value. The project that began as holes drilled in the ground has become a mine inside a spreadsheet. There is nothing wrong with this. Every industrial

project must be modeled first. The mistake is confusing the model with the factory. A net present value is not an appraisal in the sense that your house might be appraised. It is the mathematical result of a collection of assumptions. Change the assumptions, and you change the value. Commodity price goes up: NPV goes up. Recovery goes up: NPV goes up. Capital cost goes down: NPV goes up. Operating cost goes down: NPV goes up. Discount rate goes down: NPV goes up. Construction begins sooner: NPV goes up. Mine life increases: NPV goes up. There is nothing mysterious about this.

The investor’s job therefore is not merely to read the NPV. It is to examine the assumptions that produced it. When someone tells me that a mining project has an NPV of $2 billion, my first question is not whether $2 billion is a large number. My first question is: **What assumptions did you have to make to get it?**

Revenue Is Not Profit

Another elementary distinction becomes surprisingly obscure in mining promotion. **Revenue is not profit.** Suppose a proposed operation expects to produce $500 million annually of saleable material. That tells me almost nothing about its value. What will it cost to mine? What will it cost to beneficiate? What will reagents cost? What will energy cost? What are the labor requirements? What are transportation costs? What royalties are payable? What are sustaining capital requirements? What does environmental compliance cost? What will financing cost? What happens when equipment operates at 75% of planned throughput rather than 100%? What happens when recovery is 62% instead of the laboratory’s 78%? And perhaps most importantly, what happens when the commodity price falls? Profit is what remains after economic reality has finished with revenue.

Laboratory Success Is Not Commercial Production

This is another distinction I urge investors to make. Producing grams or kilograms of a high purity material in a laboratory is important. It demonstrates chemistry. It does not demonstrate a commercial business. Pilot operation is another step. Demonstration scale production is another. Continuous operation is another. Reproducible product quality is another. Customer qualification is another. Commercial throughput at projected cost is yet another. The mining industry, and especially the critical minerals sector, contains many projects that have demonstrated one or more of these steps. Far fewer have demonstrated all of them. The difference is enormous.

A customer does not care that a metallurgist once produced a beautiful sample. The customer wants to know whether you can deliver the same specification next month, next year, and five years from now, in the required quantity and at an acceptable price. That is the difference between chemistry and manufacturing.

Then There Is Capital

Assume that the geology is good. Assume that the metallurgy works. Assume that customers exist. Assume that the projected operating economics are attractive. One inconvenient question remains: **Who will pay to build it?**

If a junior mining company has a market capitalization of $100 million and proposes to build a $1.5 billion mine and processing complex, the investor should not simply admire the project’s projected NPV. The investor should ask where the $1.5 billion will come from and what securing it will do to today’s

shareholders’ ownership. Debt must be serviced. Equity dilutes. Government money comes with conditions. Offtake financing may transfer some of the project’s economics to the customer. Royalties and streams may provide capital today by selling part of tomorrow’s revenue. There is no free money. The capital structure of the eventual operating company may look very different from the capitalization table of the junior company whose shares you are buying today.

The Discount Rate Should Reflect Reality

The concept of discounted cash flow is simple. A dollar expected ten years from now is worth less than a dollar in your hand today. But there is another issue. That future dollar may never arrive. Mining projects face geological, metallurgical, construction, permitting, political, commodity price, financing, operating, and market risk. Critical minerals projects add another problem: markets for relatively small volume specialty materials may not behave like markets for copper, gold or oil. Published prices may not represent prices actually available to a new producer. Markets may be opaque. Customers may require lengthy qualification.

And an apparently enormous new mine may itself alter the supply/demand balance and therefore destroy the price assumption on which its valuation was based. A spreadsheet that assumes today’s high price for 20 years may be mathematically impeccable and economically absurd.

My Test for a Junior Mining Valuation

When I examine a junior mining company, I work backward from the customer rather than forward from the ore body. The questions I

want answered are straightforward:

1. What exactly is the saleable product?
2. Who will buy it?
3. Has that customer qualified it?
4. How much can actually be recovered from the ore—not theoretically, but reproducibly?
5. Has the complete process been demonstrated continuously at meaningful scale?
6. What will the operation really cost to build?
7. Where will that money come from?
8. What will the financing do to existing shareholders?
9. What commodity prices are being assumed?
10. What happens to the economics if those prices fall 20%, costs rise 20%, construction is delayed two years or recovery disappoints?

If a project remains attractive after answering those questions conservatively, then I become interested. If its attractiveness disappears when optimistic assumptions are replaced by ordinary ones, I have learned something equally useful.

The Market Does Not Owe the Miner a Profit

There is a tendency, particularly in today’s government supported critical minerals industry, to reverse the normal logic of business. A company discovers something designated “critical.”

Therefore, the reasoning seems to go, somebody must finance it. Somebody must buy its output. The government must ensure it earns an adequate return. No.

A mineral can be critical to a nation and still be uneconomic to produce from a particular deposit. A mine can be geologically excellent and commercially unsuccessful. A processing technology can work and still cost too much. And a strategically desirable supply chain can still require permanent subsidy. Governments can redistribute economic costs. They cannot abolish them. Governments and financial markets cannot suspend economic reality.

Follow Where Value Is Added

The purpose of all this is not to discourage investment in junior miners. Quite the opposite. New mines have to come from somewhere, and exploration companies perform the indispensable job of finding the deposits from which tomorrow’s raw materials may be produced. But discovery is the beginning of value creation, not its completion. The sophisticated investor should therefore resist the largest number in the presentation and look instead for the sequence of smaller numbers that determines whether money will ever be made: Ore grade, mineralogy, recovery, throughput, yield, operating cost, capital cost, financing, qualification, sale price, margin, and finally, cash flow.

That is how a mineral discovery becomes an industrial asset. Everything before that is a projection. There is nothing wrong with projections. Civilization could not build anything without them. But investors should remember what they are.

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