


The logo for Aston Bay, featuring the word "ASTON" in white capital letters, a white diamond symbol, and the word "BAY" in white capital letters, all set against a background of copper-colored rocks with some green patina.

ASTON  BAY

Change in Copper Supply:

What do we face in 10 years?

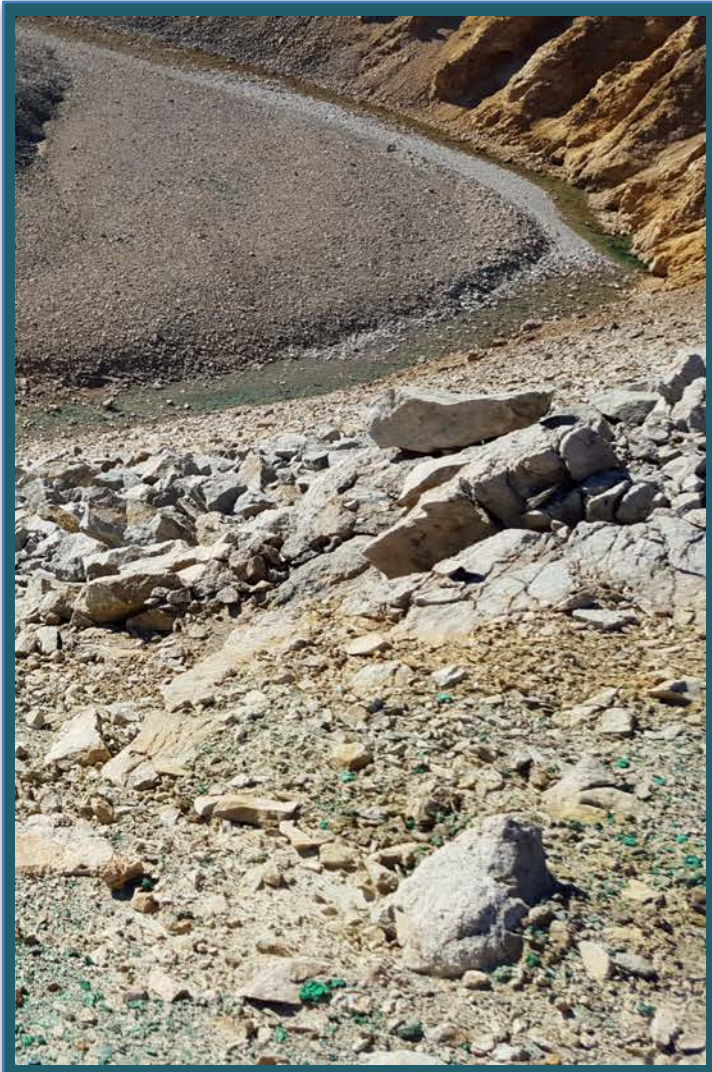
A close-up photograph of copper ore rocks, showing various shades of brown, tan, and green, with some areas appearing more crystalline or mineralized.

Hint: Limited supply growth

There are only five core drivers of supply in the copper industry:

1. Scarcity or oversupply of water
2. Political and nationalization risk
3. Dwindling mine grade
4. Limited feasible discoveries
5. Inconsistent capital flow





- ❖ Copper mines are often found in a:
 - ❖ Desert: Desalination of saltwater to get water to process ore.
 - ❖ Rain forest: Tailings management becomes a real cost center, as seen with multiple recent dam failures.
- ❖ Either way, the license to operate is changing. The existing rules of operating mines are being rewritten.
- ❖ Capital and operating costs of water management are not going to go down for new operations.

- ❖ **What are the marginal political risks of nationalization or changing tax rates for a localized government for a mature operation?**

- ❖ Today the “themes” are:
 1. Export permit
 2. “Tax optimization”
 3. National ownership stakes

- ❖ What does that do to attract new capital to our sector? At some point does established capital get smart?

- ❖ Average mine head grade is decreasing.
 - ◆ Short term: high grading for cash flow.
 - ◆ Longer term: Assets are getting mature and trend is secure in grade decreasing.

- ❖ Good for someone, right?
 - ◆ Extending the mine life of older projects is still very competitive with most new projects due to low grades of projects earlier in development cycle.
 - ◆ Weighted average grade of TSX-V-listed copper resources is 0.35%, still 10-20 basis points lower than the operating mines today.

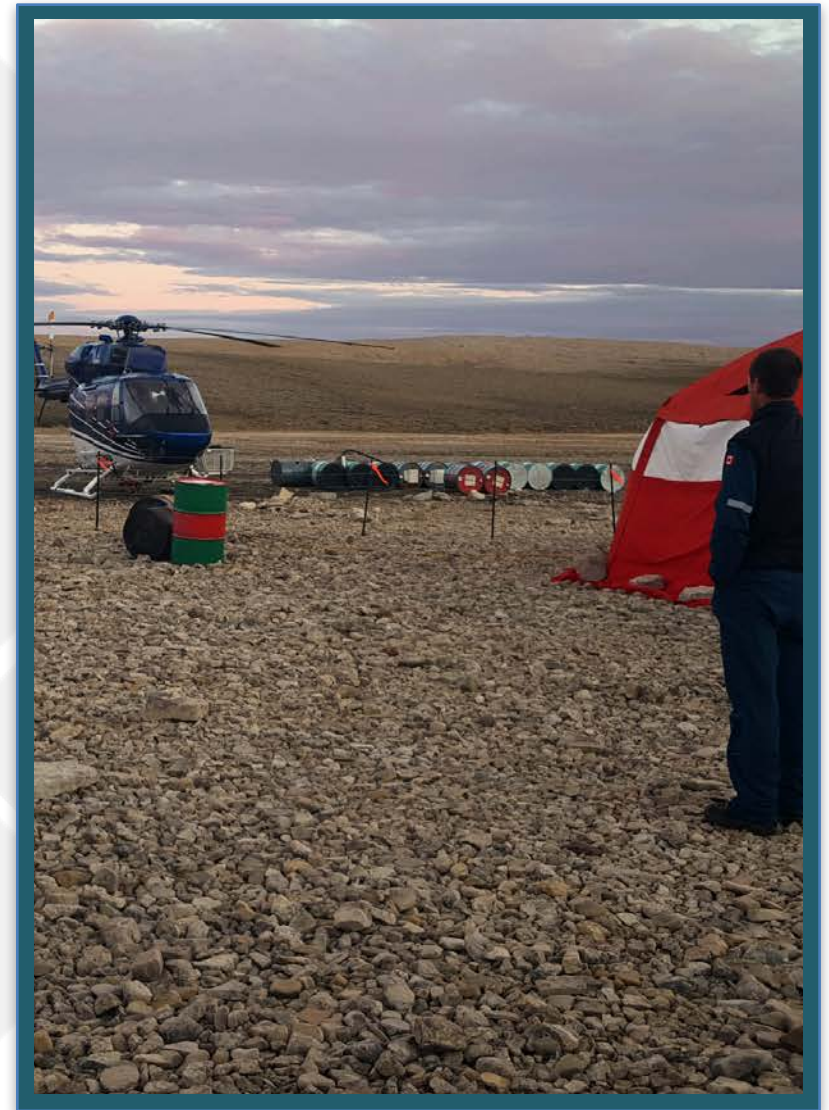
- ❖ Core take away: Far less expensive to extend the life of an older operation than to build a new mine.

Does Exploration Work at \$10b per Discovery



TSX-V: BAY

- ❖ How many world-class assets have been found in the last 10 years? (It's maybe two or three...)
- ❖ How much money has our industry spent looking?
- ❖ Of those world-class assets, how many of them have grade, water, location or political risk issues?



GROWTH TONNES NEEDED (IN BASE OYU TOLGOI)

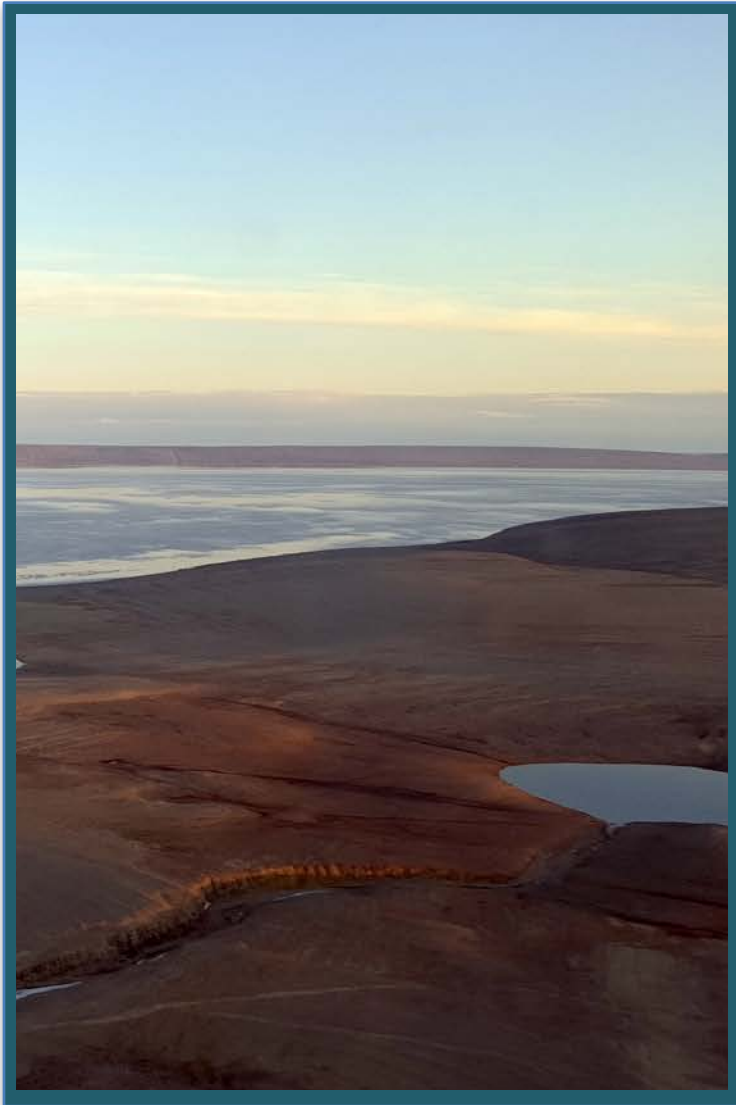
2% global demand growth = 396,000 tonnes = 0.88 Oyu Tolgois

3% global demand growth = 594,000 tonnes = 1.3 Oyu Tolgois

4% global demand growth = 792,000 tonnes = 1.75 Oyu Tolgois

5% global demand growth = 990,000 tonnes = 2.2 Oyu Tolgois

**How many massive discoveries like
Oyu Tolgoi are there, really?**



New projects take 15+ years to develop, post-discovery.

- ◆ That is three or more financial cycles.
- ◆ Companies require strong balance sheets to advance assets.
- ◆ Lots of assets are stranded by a cycle.

Bottom Line?

If you need 15 years to finance a project into production, but capital is available for only a random seven, how do you, explore, permit and build a mine without taking 15-20 years?



- ❖ Large low-grade porphyries are not going to work in the next 10 years, and outside of that there are very few things to look at.
- ❖ Supply will be more constrained as companies don't reinvest into mature operations beyond the minimum needed to maintain current production.
- ❖ Political risk, water risk and declining grades all require significant investment, but balance sheets of operators are often stretched.
- ❖ Demand is not price constrained; when was the last time someone decided not to buy a refrigerator or car because of the price of copper?
- ❖ In the long-term, copper will be supply versus demand constrained.

There are only five core drivers of supply in the copper industry:

1. Scarcity or oversupply of water.
2. Political and nationalization risk.
3. Dwindling mine grade.
4. Limited feasible discoveries.
5. Inconsistent capital flow.