Low-cost lithium on the menu at Rhyolite Ridge

As the release of the DFS on the Rhyolite Ridge lithium-boron project in Nevada, US inched closer, ioneer Ltd managing director Bernard Rowe started pondering the traditional scepticism which is often directed at companies when such results are published.

In particular, Rowe was bracing for his company's proposed low cost of production to be heavily scrutinised.

Based on Roskill's assessment of all lithium operations across the globe last year, ioneer's estimated AISC of $US2,510/t LCE would comfortably sit at the far left of the all-important cost curve.

Speaking to **Paydirt** last month following the official release of the DFS, Rowe was confident his company had the data to back up its estimates.

"There's always going to be a lot of scepticism when companies come out and say 'oh, we're going to be the lowest cost producer', particularly when they're not producing anything, but backing up our claim to that statement is a 5,000-page DFS that's been completed in conjunction with Fluor and a whole host of other top-tier engineering and process-type firms," Rowe said.

"There's a huge amount of data and test work supporting that estimate. There's 30% engineering completion estimates by Fluor, there's a lot of firm bids on a lot of equipment and reagents, so we're very confident those numbers are a very accurate estimate, not just an arm wave 'we can do this'."

Other key estimates in the DFS were a pre-production capex of $US785 million to develop a 2.5 mtpa mining and processing operation at Rhyolite Ridge, producing 20,600 tpa lithium carbonate and 22,000 tpa battery-grade lithium hydroxide from the fourth year onwards.

An additional $US99 million – to be funded out of operational capital – is needed for the construction of a hydroxide circuit and heat recovery system.

One of the main contributors towards ioneer's expected low AISC is the co-production of 174,000 tpa of boric acid.

"A lot of lithium deposits have by-products – tungsten, tin and potentially some other things – but typically those by-products are very small contributors to the revenue," Rowe said.

"The difference at Rhyolite Ridge is, in round numbers, there's $US100 million a year that comes from the production and sale of boric acid. So, it's truly a co-product, not a by-product.

"To explain the impact of it, if you take that boric acid as a credit and you apply it against your lithium, it pays for about 75-80% of your total operating costs, and that's how we arrive at $US2,510/t. If it wasn't for that boron stream, that cost would be $US8,000-8,500/t."

An important addition to the DFS from the PFS is the upfront inclusion of a steam turbine for power generation, which is set to provide the entire operation with enough energy for it to be fully self-sufficient.

In completing and publishing the DFS on Rhyolite Ridge, ioneer now has the most advanced lithium project in the US.

From Rowe's perspective, it is a good position to be in given there is essentially no local production of the key battery mineral in one of the world's fastest emerging markets for electric vehicles.

"The US is a large emerging market for lithium ion batteries because they have the second largest car fleet in the world, but importantly the US essentially produces no lithium of its own today," Rowe said.

"There's one small mine, but that production actually doesn't go into batteries, it's more for research purposes, so really there's a huge market that's going to emerge in the US as they electrify their motor vehicle fleet and there's zero domestic production currently for that.

"We think we're really well positioned to come into production in 2023. We think that's an ideal time when we're going to start to see a big uptick in a shortage of supply from 2025 onwards."

With a two-year timeline in place for that first production target, ioneer has moved into the final stages of permitting with state and federal regulators, having completed all environmental baseline studies, in a bid to gain development approval for the project within the next 12 months.

Offtake discussions will also ramp up over that period. While the company has signed a five-year supply contract with Dalian Jinma Boron Technology Group Co Ltd for 105,000 tpa of boric acid, no agreements have yet been struck on the lithium side.

Rowe said the company was hopeful of bringing in a strategic partner at the project level ahead of the scheduled final investment decision mid-next year.

"We think the economics, the longevity and the location in the US are all going to make it incredibly attractive for potential partners," he said. "It's an important and main piece in the funding solution for the project."

Late last month the company also signed separate distribution and sales agreements with Kintamani Resources Pte Ltd and Boron Bazar Ltd to supply boric acid into multiple Asian countries, including Malaysia, Indonesia and Singapore, for at least the first three years of production from Rhyolite Ridge.

– Michael Washbourne

Rhyolite Ridge DFS

After-tax NPV @ 8%: $US1.265 billion
Unlevered after-tax IRR: 20.8%
Annual EBITDA: $US288 million
Annual cashflow: $US193 million
Annual revenue: $US422 million
Capex: $US785 million
AISC: $US2,510/t LCE
Payback: 5.2 years
Carbonate production: 20,600 tpa
Hydroxide option: 22,000 tpa (yrs 4-26)
Boric acid production: 174,400 tpa
Resource: 146.5mt
Reserve: 60mt
Life-of-mine: 26 years

Rhyolite Ridge will be one of the lowest-cost lithium production centres in the world when in operation, according to ioneer's recently released DFS