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Tricky Digs

With Easy Nickel Fading Fast, Miners Go After the Tough Stuff

Inco Tries Again at 'Goro' Site Using Acid and Heat; Protests in New Caledonia Company's Trucks Go Missing

By PATRICK BARTA
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NOUMEA, New Caledonia -- Deep in a scrubby valley on this former French island colony in the South Pacific, Canadian mining giant **Inco** Ltd. is carving out a giant patch of red earth. Its goal: Build one of the biggest and most complex nickel mines the world has ever seen.

The last time Inco was at work here, four years ago, its so-called Goro project turned into a disaster. The budget ballooned by about $500 million. Indigenous leaders threatened to block the mine. Industry analysts questioned the premise of the project, which relied on a tricky refining process using acid and 500-degree temperatures to unlock the nickel -- a vital commodity used in everything from cookery to coins to clock pendulums.

Now, amid the biggest commodities boom in a generation, Inco is back on the island -- known to Americans as a locale on the hit 1960s television show, "McHale's Navy." While much has changed in the market, a lot on the ground has not.

Some still question the economics of the project. Costs are soaring again. And a group of indigenous leaders and their followers -- worried about the environmental impact and eager to get a bigger financial stake -- recently stormed the site. They torched trucks and made off with equipment valued at millions of dollars.

Inco's South Pacific adventure underscores a new reality in the world's mining sector. Like oil, most of the easy-to-reach deposits of basic materials like copper, nickel and gold have already been found and exploited. That has left lower-grade deposits in remote, politically volatile countries that will cost more to develop than the mother lodes of yesteryear.

Nickel and other commodity prices tumbled earlier this year due to concerns about the sustainability of global growth. Yet nickel has rebounded to new records in recent weeks and prices for most commodities are still dramatically higher than they were a few years ago, thanks to strong demand in China -- and problems expanding supply.

Mining companies "are going to be very hard-pressed to find slam-dunk projects in the future," says **Alex Gorbansky**, managing director of **Frontier Strategy Group**, a Cambridge, Mass.-based firm that analyzes political risks for miners. "You're going to be dealing with projects like Goro that have massive potential but significant challenges."

Various mining outfits are also struggling to develop projects in Mongolia, Indonesia and a host of other places beset by political turbulence.

All this is happening at a time of massive consolidation in the mining world -- and especially in the nickel market. Inco got the ball rolling last year by offering to buy rival producer Falconbridge Ltd. of Canada, while other bidders swooped in hoping to also gain control of those companies. Just yesterday, **Xstrata** PLC of Switzerland upped its bid for Falconbridge (see related story, Page A2).

But the biggest deal on the table is from **Phelps Dodge** Corp. which recently entered a $40 billion bid to buy both and Inco and Falconbridge.

Although none of the deals have been completed, the combined Phelps Dodge Inco would be among the world's biggest miners. Phelps Dodge is staking part of its future on plans to develop an enormous copper vein in the Democratic Republic of Congo, one of the world's least stable countries.

On a recent day, indigenous leader Raphael Mapou stood below a massive totem pole on a windswept mountain peak overlooking the region. Mr. Mapou vows that as long as that totem stands, Goro, which bears the name of a nearby village, will never be completed as designed. "There will be a mobilization and there will be violence," he said. "No doubt about it."

Yet Inco is forging ahead. It's completing work on a new deepwater port and nickel extraction tanks that will tower nine stories high. In a few weeks, Inco will start assembling the centerpiece of the project: a high-tech nickel processing plant composed of more than 400 premade sections now being built in the Philippines. The biggest will weigh 750 tons and will require one of the world's largest cranes to heave it into place when it arrives by a massive barge.

Discovered in 1751, nickel quickly became one of the world's most sought-after commodities. Two-thirds of the world's supply is used to make stainless steel, which goes into everything from pots and pans to oil refineries. Nickel is also found in batteries and electronic components.

Most of the world's recent production came from deposits that are relatively easy to exploit, especially in Canada and Russia. But those deposits, known as sulfides, make up about 40% or less of the world's remaining known reserves, according to mining companies and industry analysts.

The rest of the deposits are called laterites, an often lower-grade variety that mining companies sometimes ignored in the past because they are difficult to process.

Separating nickel from laterite rock can require enormous amounts of energy, making it prohibitively expensive in some cases. One potentially cheaper method that consumes less energy is called "high pressure acid leaching." This complex process involves running the ore through high-pressure tanks where it's subjected to intense heat, pressure and acid.

Mining companies spent vast sums attempting the acid-leaching method in the 1990s, primarily in Australia. They boasted their technology would crack open large new deposits of nickel at low costs, ensuring that world demand would be met for decades to come. Nickel prices tumbled amid expectations of all the new supply.

The experiments were largely a bust, though, partly because the equipment failed to stand up to the punishing forces of extreme heat and pressure. Maintenance issues forced frequent plant shut-downs. Costs spiraled.

Inco says it learned from the industry's previous mistakes. Its new plant design has undergone more testing than previous efforts and uses sturdier materials such as special titanium valves that control the flow of acid. It says Goro will be able to produce about 60,000 metric tons a year -- about 5% of global consumption. More importantly, it says, proving the technology is sound could open up similar deposits elsewhere, including other sites on New Caledonia.

An island roughly the size of New Jersey, New Caledonia has an estimated 225,000 residents, and as much as 20% of the world's nickel reserves.

It was colonized by France in the mid-1800s and remains an overseas territory of the French state, which continues to exert authority over courts and police.

The largest segment of the population is Melanesian, an indigenous group of peoples from the South Pacific Islands. Representing roughly 40% of the island's residents, they have been agitating for full independence from France. French émigrés make up about another third of the population, mostly in the capital of Noumeau, a hilly seaside town that maintains an air of the French Riviera, with outdoor brasseries and sailboats in its blue bays.

In the early 1900s, New Caledonia's ore was so rich -- in some cases 15% nickel -- that miners could dig it out with pickaxes and haul it to market on the backs of donkeys. Today, that ore is mostly gone.

At Goro, most of the ore is less than 2% nickel. Geologists stepped up exploration of the deposit, near a whale breeding ground, in the 1960s. Still, it remained unexploited for decades because no one was able to process such ore profitably.

Inco, which had already been active in the area, bought additional mining rights in the 1990s from a French state-owned company. It set up a pilot plant to test its own acid-leaching technology and, satisfied with the results, authorized full-scale construction in 2001.

By late 2002, though, Inco's prospects here were beginning to look less certain. Among other problems, it discovered underground areas that weren't structurally sound, and suspended operations.

"You have to wonder what the guys who were doing the engineering were doing" the first time around, says Ron Renton, a former Alcoa Inc. manager tapped to be Goro's new general manager in late 2004.

Inco brought in a team of engineers to reassess the project. They reduced the site to 64 acres, about half the size of the original footprint. They redesigned elements of the acid plant and made other changes to cut the amount of steel used in the project to about 9,000 tons from nearly 24,000 before.

Instead of building a costly new reservoir to supply water to the plant, the engineers found a way to pipe in water from an existing reservoir about 20 miles away. The engineers also opted to build the acid-treatment plant in pieces in the Philippines, rather than importing the labor and supplies to New Caledonia.

By 2005, construction was under way again. Most analysts believe Goro will now work, but at a higher price than expected. Inco officials say they're revising the project's $1.9 billion price tag and will release updated figures later this year.

One recent afternoon, several hundred trucks and other vehicles crisscrossed the massive clearing in a wide, green valley, moving dirt and laying concrete. Contractors were putting the final touches on the workers' camp, complete with a soccer pitch, four dining halls and a pub serving French beer. A new power plant towered above the reddish brown dirt, framed by the distant green mountains.

Inco officials acknowledge that the mine will produce waste that may exceed some international standards. But they say a system to eject waste into the sea will disperse the material in such a way that it won't harm the environment.

Members of Rheebu Nuu, a local indigenous advocacy group, say they're worried the acid-treatment process will introduce new environmental problems that aren't yet fully understood. They want the project to be stopped until all the environmental consequences are mapped out.

They also want a bigger financial stake in the project. Currently, local residents own 10% of the project. But indigenous leader Mr. Mapou, a former New Caledonian government mining official, says that if the mine does go forward, locals deserve "at least 35%" of the proceeds. Other indigenous leaders say 40%.

Protesters have already caused delays. Members of Rheebu Nuu sneaked into the mine one night in April and commandeered millions of dollars in trucks and equipment. Later, trucks and excavators were found abandoned across the island. Protestors also blockaded one of the key

road junctions to the site, leading to a standoff that wasn't defused until police arrived and unleashed tear gas on the crowd.

Leaders say that if their demands aren't met, they could resume protests as early as mid-July. Inco says it is meeting more regularly with locals and believes relations are improving. The company has also improved security at the mine site.

Violent protests aren't new at mines. But indigenous groups have become more sophisticated since the last commodity boom and are more aware of similar movements to preserve natural assets for locals' benefit. Leaders in New Caledonia cite recent events in Bolivia, where the president nationalized much of the country's energy industry rather than allow foreign conglomerates to control it.

"They should close all the mines," proclaims Walter Maperi, a 34-year-old man who sells kava, an herbal drink, from a shack in a mangrove swamp on the outskirts of Noumeau. On a recent day, he sported a "Rheebu Nuu" baseball cap as his friends passed around a hand-rolled cigarette and lounged on ripped-out car seats.

Mr. Maperi says he makes as much as $300 a day selling kava. "Nickel's not the only thing that allows you to live -- before nickel, people managed," he says.

Inco officials say they believe the acid-treatment system is actually less environmentally destructive than other mining techniques. They also say the protesters represent a small segment of the population -- an assessment shared by many locals who support Goro. This includes many Melanesians as well as local government officials who believe the project is critical to New Caledonia's economic future.

"There's a lot of confidence in this project," says Jeffery Zweig, vice president of finance and administration at Goro. "The important thing is to get it right."

Write to Patrick Barta at patrick.barta@wsj.com