

# In search of behemoth porphyries in British Columbia's Golden Triangle

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Right about the time I was busy being born back in July 1970, a mining company called Great Plains Development Company of Canada was in the process of drilling two exploratory holes into its "Chris" claims, in northern British Columbia. These two holes would lead to a series of events that would culminate in the development of the Red Chris Mine, scheduled to begin production by May of next year.

The mine will process an astounding 30,000 tonnes of copper-gold-silver-infused rock every day for the duration of its mine life. That's the equivalent of extracting six Statues of Liberty every hour, 24 hours a day, and crushing them into gravel—pretty much every day for 28 years.

Red Chris has reserves of over 300 million tonnes grading 0.359% copper and 0.274 g/t gold, plus additional low grade silver, however, the known resources outside the open pit model are ten times that amount.

The mine is expected to generate \$17.79 for every tonne of ore produced, for a total life of mine revenue stream of more than \$5 billion dollars. At conservative metal prices, and after costs and other discounts, the net present value (NPV) of the project is approximately \$423 million. **At 2010 metal prices (<http://www.imperialmetals.com/i/pdf/RCDC2011ExecutiveSummary.pdf>), the NPV jumps to \$1.5 billion.**

The circumstances of Red Chris' acquisition were also extraordinary. After a bidding war with Taseko Mines, Imperial Mines purchased the project from bcMetals for \$1.70 per share—almost triple bcMetals' share price. The deal valued bcMetals at \$74 million, and represents one of the largest premiums in Canadian merger and acquisition history.

The region in which Red Chris lies is known as the Golden Triangle.





(<http://www.mining.com/wp-content/uploads/2013/10/2.jpg>)

The region is home to numerous alkalic porphyry copper-gold mines and advanced exploration projects collectively worth hundreds of billions of dollars. These include Eskay Creek, which prior to its closure in 2008, was the fifth largest silver producer in the world, Galore Creek, with 6.2 billion pounds of copper, 4 million ounces of gold and 65.8 million ounces of silver, and Schaft Creek, with 7.1 bn lbs Cu, 455 Mlbs Mo, 7.3 Moz Au, and 67 Moz Ag, plus inferred resources.

Deposits like Red Chris and Galore Creek are often difficult to find because at surface they have a smaller “footprint” and different geochemical characteristics than other porphyries. As such, scientists have had to employ

different methods to identify these deposits and, to date, only a few have become fully developed, although these are truly remarkable, economy shaping mines.

For three primary reasons—concerns about the lack of First Nations treaty resolution, lack of infrastructure and more attractive mining policy elsewhere in the world—remarkably little exploration has been completed in the Golden Triangle.

Exploration work began here in the 1950s, with the provincial government doing some shallow drilling on some of the known mineral showings. The progress often follows a familiar pattern: The province's Ministry of Mines conducts grassroots exploration—sampling, mapping and shallow drilling, creating an inventory of the local geology. Over the next decades, the most promising results are revisited by exploration companies in search of economic deposits.

**Prosper Gold's (TSXV:PGX) Sheslay Project (<https://www.google.ca/finance?q=CVE%3APGX&ei=kBJoUpC2CIW2qgGNGA>) and neighbours Garibaldi Resources' (TSXV:GGI) Grizzly Project (<https://www.google.ca/finance?q=CVE%3AGGI&ei=iBJoUtj0FYW2qgGNGA>), as well as Colorado Resources' North Rok Project (<https://www.google.ca/finance?q=CVE%3ACX0&ei=ITVoUtDcEMWYrAGdjwE>), for example, appear to share numerous characteristics with the larger alkalic porphyries in the region. Each company is actively exploring with results that point to potentially massive, porphyry style copper-gold mineralization.**

The former two projects are contiguous, with Grizzly surrounding Sheslay to the south and west (see the map below). They are located about 150 km north of Galore Creek, Copper Canyon and Schaft Creek, and about the same distance north-east of the Red Chris Mine.

Fifteen kilometres northwest of Red Chris is also Colorado Resources' North Rok, which in April this year yielded impressive drill results: 333 metres at 0.51 percent copper and 0.67 g/t gold, starting very close to surface, with as much as 180 metres at 0.76 percent copper and 1 g/t Au starting 63 metres

downhole. The company has followed up with similar holes since then, including 402 m grading 0.28% Cu and 0.27 g/t Au in a step-out hole 400 m southeast of the discovery hole.

The discovery at North Rok has awakened investor interest in the region, and has also led a number of companies to re-examine historic data on their own projects in the region.

According to Prosper Gold's co-founder, veteran geologist and British Columbia Geological Survey alumnus Dirk Tempelman-Kluit, although there is historical data available on the Sheslay project, no exploration companies have hit the area particularly hard with exploration dollars.

The BC Ministry of Mines drilled four shallow holes at Sheslay in the 1950s, however no data remains. Newmont continued the search in the 60s, Skyline in the 70s, United Cambridge and Golden Ring in the 90s. According to the data, results continually showed promise, but no gloryhole was hit, no smoking gun was discovered.

It wasn't until Sheslay project was acquired by Firesteel Resources that the potential of Sheslay would finally become understood.

Over the course of the eighties, Firesteel invested \$1.7 million into exploration on the Sheslay project, including sampling, trenching, geophysics, mapping, IP surveys and drilling.

Of the early drilling, Tempelman-Kluit says, "There were 26 holes and every hole had good numbers. Many holes had good numbers top to bottom."

Unfortunately for Firesteel, the company was unable to come up with the cash to continue exploration on the project. Nor did they have a Tempelman-Kluit, who is an expert at identifying alteration targets.

When he first arrived on the project, Tempelman-Kluit knew instantly that the rocks were classic alkalic porphyry-style rocks.

“This was the kind of alteration and mineralization that you would expect to see—and want to see,” said the geologist. “A very strong looking, very powerful system. It wasn’t clear from the drilling that had been done that they had tested it all, but where they had drilled they were certainly in the right kind of rocks.”

Of Firesteel’s 26 holes in the Star zone, 25 fall within an area measuring about 300 metres by 300 metres.

Here are 10 holes given as highlights in Prosper’s May 2013 technical report for the project:

1. CC2004-01: 236.90 m @ 0.32% Cu, 0.18 g/t Au
2. CC2004-02: 173.10 m @ 0.41% Cu, 0.17 g/t Au
3. CC2004-05: 242.30 m @ 0.44% Cu, 0.32 g/t Au
4. CC2004-06: 190.20 m @ 0.41% Cu, 0.22 g/t Au
5. CC2004-07: 329.40 m @ 0.32% Cu, 0.11 g/t Au
6. CC2005-08: 141.30 m @ 0.36% Cu, 0.27 g/t Au
7. CC2005-09: 142.08 m @ 0.44% Cu, 0.25 g/t Au
8. CC2007-01: 334.67 m @ 0.35% Cu, 0.17 g/t Au
9. CC2007-02: 220.36 m @ 0.42% Cu, 0.21 g/t Au
10. CC2007-04: 290.17 m @ 0.41% Cu, 0.19 g/t Au

The weighted average across all ten holes was 0.38% copper and 0.2 g/t gold. This compares favourably with other major alkalic porphyry deposits. For example, Schaft Creek had total resources of 1.3 billion tonnes grading 0.25% Cu and 0.18 g/t Au. Red Chris has reserves of 300 million tonnes grading 0.359% copper and 0.274 g/t.

Even if the entire 26 holes are included in the measurement, the weighted average grades are still respectable at this early stage of the game: 0.34% copper and 0.17 g/t gold.

“These things are all individual just like people,” Tempelton-Kluit said. “This is *like* Red Chris, which is to say in the same family as Red Chris but it’s probably not identical. And nor is it identical to Galore creek or Schaft creek, even though it’s in that family. The key thing for investors to understand is it’s a good-

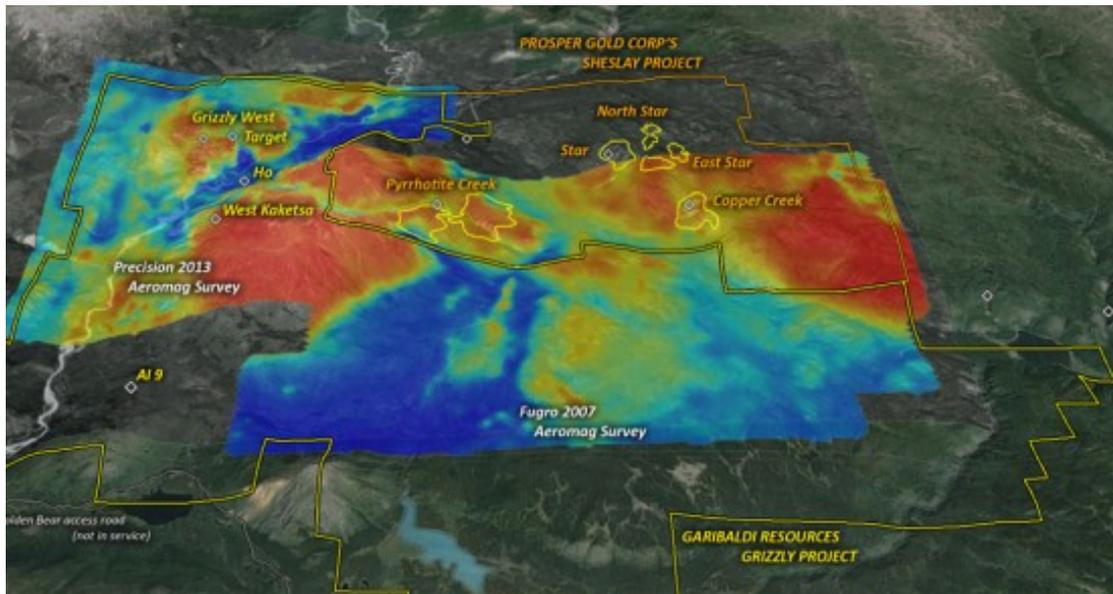
looking target and has a lot of room to grow. We've got 26 holes. Most of the time it takes hundreds of holes to define these deposits. To have these kinds of numbers at this stage of the game is pretty amazing."

For its part, management at Garibaldi Resources has no intention of riding the coat tails of the fast moving Prosper Gold. CEO Steve Regoci told me that although the company has been focussed on its Mexican operations, including a small cash-flow positive coal project in Sonora, events at Sheslay and North Rok make it clear that the time is right to get boots on the ground at the Grizzly project.

"The story at in the Stikine Arch region has really happened very quickly over the last couple of months, with Colorado's big hole and Prosper coming on the scene," Regoci said. "Of course, there was already the Red Chris project going to production and that brought a lot of eyes to this area. But the fact that the guys at Prosper have gone ahead and taken on the Sheslay project after their success at Blackwater project is really the best of both worlds for us—we get to have our cake and eat it too."

Regoci is referring to the fact that all this is unfolding during bearish market conditions. Although raising capital for a drill program is difficult, success at Prosper and Colorado may translate into higher share prices, making transactions like fundraising less arduous for all.

Garibaldi has about \$3 million in cash and cash equivalents, so it has had no trouble starting up an exploration program on its Grizzly project: This summer the company completed sampling, mapping and an extensive airborne survey, which as a result has identified its first drill targets for the 2014 drilling season.



(<http://www.mining.com/wp-content/uploads/2013/10/3.jpg>)

Although none of these projects has completed enough drilling for a 43-101 compliant resource estimate, Prosper Gold is more advanced than either Colorado or Garibaldi. A “back-of-the-envelope” calculation reveals that the company is about 1/10 of the way to a Schaft Creek-sized deposit.

The area of the Star target drilled off is to date approximately 300 metres by 300 metres and, although the average depth of the holes is 154 metres, it appears it is mineralized to a depth of 600 metres. At a specific gravity of 2.8, that would make the tonnage of this zone somewhere in the region 150 million tonnes. Not bad for 26 drill holes (4,063 metres).

I asked CEO Peter Bernier what sort of deposit he’d like to see Sheslay become, once Prosper has drilled it off for a year or two, and he told me that they’re looking for a resource of 500 million to 1 billion tonnes at economic grades, which would make it one of the largest deposits of its kind.

With mineralization starting at or very close to surface, and with mineralization open in all directions, there is a great possibility that this project will expand rapidly once drilling begins in earnest, next summer. As with all low grade projects of this kind, the key will be low operating and capital costs and high tonnage.

So the questions Bernier and Tempelton-Kluit are asking themselves now is, How deep does it go? How far sideways does it go? Which directions? Are there other deposits?

“Probably it wasn’t the only [deposit],” Tempelton-Kluit tells me. “These things rarely occur by themselves. They often occur in clusters, not necessarily the same size and grade. At Red Chris, for example, there’s more than one central area. These tend to be good size systems with rich pods that have less rich pods connecting them to other rich pods.”

This is evidently why the company changed the name “Dick” targets to Star, Star North and Star East. It’s very apropos of the way an alkalic porphyry system works: discrete pods emanate from one another forming a multiple pronged shape, much like the shape of a star. Plus, I don’t know many miners who like talking about Dick all day.

Dirk tells me there may yet be undiscovered pods to the northwest and south of the main Star zone.

“Trenching to the south of Star zone two or three hundred metres discovered some nice looking mineralization for long distances with good grades. So, we need to see whether the star gets bigger to the south. There’s a chargeability anomaly to the northwest that hasn’t been tested that could tie back to the star.”

Dirk says this could indicate a “star” system with three or four enriched pipes connected within a cloud of lower grade material.

“So, basically this thing could get a lot bigger, given that the rocks that are there are very pregnant looking, there’s no reason to believe that what we have so far is “all she wrote”.

For its part, Garibaldi's Grizzly project appears to host the same type of alteration as Sheslay. An airborne geophysical study along with new IP data on both the Grizzly project and the southern part of the Sheslay project suggests that the chargeability signature found on the Sheslay project continues in an east-west fashion onto the Grizzly project.

This confirms previous soil sampling and geochemical data on the project, and along with new soil sampling carried out in October 2013, has identified numerous drill targets for completion next summer.

Now that the winter season is upon both projects, most exploration work will cease until next year.

For their \$500 million success with the Blackwater gold project, Bernier and Tempelman-Kluit were awarded the 2011 AME BC Award for Excellence in Prospecting and Mineral Exploration. They formed that company, Richfield Ventures, in 2005 and by 2011 had announced an initial resource estimate (indicated and inferred) containing 4.2 million ounces of gold.

Richfield was purchased by Newgold in 2011 for \$550 million (\$10.38 per share), making the duo and their shareholders all significantly wealthier—all in just over five years.

With Richfield behind them, the team of Bernier and Tempelman-Kluit had hatched a new plan, not unlike the previous plan, because, after all, it had been wildly successful.

It took the team of Bernier and Tempelman-Kluit two years to find the Sheslay project. Tempelman-Kluit, with decades of experience in putting projects through the paces, emphasises the importance of finding the right project.

"We find it hard to raise money on a project that we don't believe is going to go," Tempelman-Kluit said. "You need to wait until there's one you really love, then it's time to go. I've seen a lot of projects, and I've liked some things about a lot of them, but I needed to really love something before jumping in. If this hadn't come along we'd probably still be looking."

Since taking over Sheslay from Firesteel, Prosper Gold's first 3 drill holes at the Star delivered excellent numbers, improving on the historical results with longer intercepts and slightly better grades than average. S024 hit 312 m grading 0.37% Cu and 0.24 g/t Au; 269 m grading 0.42% Cu and 0.20 g/t Au (S025); and 263 m grading 0.35% Cu and 0.15 g/t Au (S026).

According to Bernier, the drill teams encountered some difficulties around 300 metres, where they intercepted some clay formations, which may in part explain why previous teams like Firesteel have so little to show at depth.

Their 4th, 5th and 6th holes (assays pending) pushed deeper, and mineralization was intersected from top to bottom (598 metres) in the 4th hole (S028). This particular hole could be a game-changer (same with the other 2 holes) and should provide valuable insight into the depth potential of the property. Previous drilling at Sheslay was relatively shallow—almost entirely to depths not exceeding 250 metres.

Bernier says that the three pending drill holes, still undergoing analysis at the lab, have already visually confirmed copper bearing porphyry style mineralization to a depth of 598 metres, which is the deepest confirmed mineralization to date.

Other untapped potential on the project remains at two other zones. The Copper Creek and Pyrrhotite Creek zones, respectively 2.5 km southeast and 4.5 km southwest of the Star target, host copper-gold mineralization in a similar geological setting to Star.

Finding the Sheslay project took the team of Bernier and Tempelman-Kluit two years.

“One really good piece of advice I got from one of our investors is you don't have to take the first one that comes along. Just wait till you see one you really love and then go after it. And I think that's the attitude we've taken with this

one. We looked at properties for two years since Blackwater, for two years we've been combing the field and kicking tires and trying things out, and this is the first one we settled on."

Says Tempelman-Kluit, "Surprisingly, it seems like nobody ever went after Sheslay very hard—probably because of money."

Now that he and Bernier have the project, they intend to hit it with everything they have.

"It's a big system in the right kind of rocks with a lot of room to grow sideways and down, and the right numbers in the first five or six holes. What more could you want? That's amazing. It's unheard of. It doesn't happen. It's kind of amazing to see a project like Sheslay still available. There's not that many left out there."

One of the reasons these projects have remained underexplored has been the poor availability of infrastructure in the region. Sure, you can fly in a few drill rigs and drill off a billion tonnes of ore, but every kilometre of power costs between \$300,000 and \$600,000. Mining roads cost about the same to build.

In recent years, the federal government and the province of British Columbia have invested heavily in infrastructure in this region. In 2011 the federal government announced that the Northwest Transmission Line, a proposed \$404 million, 344 kilometre transmission line extension from Terrace to a new substation near Bob Quinn Lake, was approved.

Once completed in 2014, the Northwest Transmission Line will be a huge benefit to development throughout the region. For many mines, energy is the single biggest cost item; soon they will benefit from access to some of the cheapest power in the world.

Like Red Chris and other behemoths discovered before it, it may take some years before Sheslay, Grizzly or North Rok become mines, if they ever do at all.

In the case of both Prosper Gold or Garibaldi, both management teams

stressed the importance of moving quickly on their projects.

Both Bernier and Tempelman-Kluit told me in separate interviews that they would find something or “kill” the project.

For both companies, one would think the end goal is to identify a sizeable resource and sell it to one of the nearby majors that has experience in developing porphyry deposits into mines: Teck, which borders Grizzly to the south, Imperial Metals, Taseko, Thompson Creek or even AuRico, all have interests in the region. There are bound to be European and Asian suitors too, hungry for more copper and gold reserves.

For most juniors, once you’re a few hundred million tonnes into exploring one of these billion-tonne-potential-deposits, a takeover is the only way to go. And as Bernier and Tempelman-Kluit learned with Richfield, and bcMetals learned with Red Chris, early success can be extremely rewarding.

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