

803869

An independent evaluation of the bulk-tonnage Cu-Au potential of the Sulphurets area, British Columbia- expensive exploration with high risks but potentially high economic rewards

R. V. Kirkham

A private report for Novicourt Inc.

February 28, 2006

Introduction

On February 8, 2006, Mr. David Sandison, Vice President of Novicourt, requested on behalf of independent directors, for me to provide an independent evaluation of the potential for bulk-tonnage porphyry Cu-Au deposits in the Sulphurets area of northwestern British Columbia. This brief report is directed to that purpose, but it is not an in depth review of all materials available for the area. This evaluation is based on the author's past experience in the area (1960 to 1993) and a CD provided of a collection of documents compiled by M. Savell and A. Huard, November, 2005.

The area is in the Coast Mountains of British Columbia about 70 km north of the town of Stewart. It comprises very large alteration zones with defined areas of important Cu and Au mineralization, such as the Kerr and Sulphurets Gold deposits and Mitchell and Iron Cap occurrences and many other areas anomalous in Cu and Au. The main challenges, however, are rugged terrain, inclement weather, extensive snow accumulations, poor access with surrounding glaciers and icefields on three sides and a very deep canyon on the fourth side, extremely complex geology, and shear magnitude of any exploration and engineering program necessary to bring the property into production. Standard engineering practices and geological models do not apply to this area.

In this evaluation I will attempt to touch on some of the main aspects of the area, its basic geological characteristics, some of the main problems involved, and offer a few recommendations and conclusions. I will assume that all independent directors of Novicourt have access to the same CD and are familiar with most aspects of the geology, exploration history, and engineering challenges.

Geological Aspects

Very large alteration zones occur at Sulphurets and to the north in the Treaty Glacier area on the other side of the Johnston Icefield. Much of the porphyry Cu-Au mineralization and associated alteration is early Jurassic about 194 Ma related to a wide variety of intrusive rocks. Intense, widespread alteration also occurs in the Brucejack Lake area possibly extending north of the Snowfield Zone (?) that cuts rocks dated at 186 and 185 Ma in the Brucejack Lake area clearly indicating extensive alteration younger than that related to the main known porphyry deposits. In the Treaty Glacier area the widespread alteration cuts the Mount Dilworth Formation dated at about 174 Ma. This alteration and mineralization is probably the same age as that at Eskay Creek, 15 km to the west. Whether or not it is the same hydrothermal event as that at Brucejack Lake is unknown but it is also clearly younger than the alteration related to the main porphyry Cu-Au deposits.

The Sulphurets porphyry system(s?) has been severely deformed with folded alteration zones and cut by numerous low- to moderate-angle thrust faults and high-angle normal faults possibly with dextral slip components. Sericitic and chloritic, phyllosilicate-dominated alteration zones are now schists, while more-competent silicified and K-feldspar alteration zones are not foliated. In places zones of Cu(-Au-Mo) mineralization have been thrust over Au(-Cu) mineralization, such as the

south contact of the Mitchell Zone. Also, in places, are late- or post-mineral, magnetite-bearing monzonitic intrusions, which truncate or dilute known mineral zones. Such relationships make reconstruction of the original mineral deposits extremely difficult. However, they also offer exploration opportunities as the heart of the Mitchell Zone porphyry Au-Cu deposit, an intense sheeted-quartz vein zone with greater than 80 to 90 per cent quartz veins still has not been drilled and it extends under the above-mentioned thrust fault (the author and the Geological Survey of Canada (GSC) probably have sufficient surface lithochemical information on this sheeted quartz vein zone to indicate what grades might be expected but it should be drilled).

Despite what has been published on the Kerr deposit, the author suspects that both the upper and lower contacts of the deposit are post-mineral faults indicating that the deposit probably came from a much larger deposit possibly at great depth to the west. With such structural complications reconstruction of the original deposit geometries are not possible without much more information.

The area also faces serious geological hazard challenges. With rapid downwasting and retreat of glaciers many hillsides are over steepened and unstable. A bedrock landside scarp a couple of kilometres long exists on the hillside south of the Mitchell Glacier. It was propagating along the steeply north dipping foliation in siliceous, pyritic, sericitic schist. This scarp didn't exist in 1960-61 when the author was first in the area but was very active propagating to west in 1993, the last year that the author was in the area. Further to the west in both the Mitchell and Sulphurets valleys several older scarps had apparently stabilized but one large ancient landslide had crossed the Mitchell valley from south to north. Probably in the late 1950s a very large rock slide, moving across the valley from east to west and extending far up the west slope, covered the Tim Williams Glacier to a great depth. The 23.5 km-long tunnel in Alternate H proposal passes under this unstable area.

Avalanches occur everywhere on steep slopes. In 1966, in late August, the author also witnessed a massive flood that changed the courses of major braided streams, and in vertical rock wall canyons near the US border the water was more than 60 m high. Such enormous floods probably occur in the steep canyon in the lower reaches of Sulphurets Creek where a summer road might be planned for heavy equipment.

The amec engineers don't mention the rock stability problems so perhaps they don't view them as a major concern but the author is concerned for pit wall stability and on slopes planned for waste dumps.

Engineering Aspects

Amec engineers and Falconbridge geologists have done an excellent job in identifying potential engineering problems; possible fatal flaws in prohibited closure costs for pits, waste rock piles, and tailings or in permitting submerged tailings disposal in Bowser Lake with sockeye in the area; and possible solutions to the various engineering challenges.

Rock waste disposal is a serious problem with limited stable slopes near proposed pit sites and, probably excavation of much very acid-generating material. Also a need for perpetual water collection from ex-pit dumps. This subject needs considerable more attention but, as will be suggested below, if more and larger pit sites can be identified, their such parameters might be changed significantly. Moreover, with very rapid deglaciation the area already is a major acid generator. The author has observed a major increase in acid generation from 1960 to 1993, as more and more high-pyrite rock is exposed to the atmosphere. The pits and dumps will need attention but the area already is a major generator of acid and toxic elements such as As and will

continue to do so, with or without, industrial activity. One possibility that doesn't seem to have been explored fully would be to use Brucejack Lake as a catchment basin and redirect its drainage to under the Knipple Glacier into the Bowser River system. The lake is at the top of a high pass and not much would be required to change the drainage flow from west to east, at the same time treating, in a modest way, the effluent, which would have a long travel route under the Knipple Glacier.

Tunnel ventilation could be a problem as all of the proposed tunnel routes pass under extensive areas of ice. With the extensive ice cover one can also expect considerable water flow. Also many parts of the area under consideration are underlain by other extensive pyritic alteration zones and the Salmon River Formation with abundant bedded pyrite. The author, over the last few years, has been amazed how many major new gossans have appeared as more pyritic rock is being exposed with the rapid melting of the ice. This natural acid generation is probably already affecting some drainage systems, without any industrial component.

Some components of the tailings will definitely be acid generating as pyrite is very abundant in potential ores of the Sulphurets region. Amec's possible proposed impoundment of tailing in a high divide valley about 3 km north of Treaty Creek, with two 90 m-high containment dams, and separated sulphides being placed in the drowned centre of the containment area is probably the type of solution necessary to avoid the possible fatal permitting flaw of placing the tailings in the bottom of Bowser Lake.

Economic Aspects

The Sulphurets area is high cost in every respect. Probably, since 1960, well over \$100 million dollars has been spent on exploration with lots of encouragement but no clearly defined ore bodies. Helicopters are required for everything. Exploration costs can be expected to be high with frustratingly short field seasons, probably only from April through October even for a winterized camp. If major new mineral zones are located exploration costs will have to be increased dramatically.

Development and operating costs for the Sulphurets area can be expected to be very high with the numerous, non-standard engineering challenges. Heavy snow falls, much blowing snow in pits and on roads, and avalanches will add greatly to winter operating costs.

A long period of exploration and definition drilling at high cost should be expected before any operation is brought into production. This is money tied up that would not be making anything for the company for a long period of time.

Discussion

The Sulphurets area for development has engineering challenges that have not been faced in any other part of the world, including Grasberg. Corporate risks are very high, especially cumulative risks when all of the potential problems are added together. A high risk of the unexpected should also be added for this area, such as the massive late August 1966 flood that the author mentioned above.

Despite these and geological problems, the area still offers significant exploration potential. Several areas of potential that the author knows about still have no drill holes. If larger areas of ore can be defined, the pit designs that have been considered to this point might be altered significantly and the threshold of 400 Mt of 1% Cu equivalent might be reached. Consider most

holes drilled to date and the very uniform grades, even on the low side for economic ore bodies. Such uniform grades support the idea that this is a huge, world-class system that is still poorly understood and that the higher grade, deeper parts of the system have still not been identified. The area, so far, has only been tested partially for open pits and not at all for potential large block caves. Between the Mitchell and Sulphurets glaciers the author believes that a reasonable possibility exists that, at depth, much of the area is underlain by gold- and copper-bearing rock. However, he has no idea what the grades might be and one can expect several relatively barren late magnetite-bearing monzonitic intrusions. Also, the author knows of significant porphyry Cu-Au mineralization extending to east onto Silver Standard's Brucejack property. The author collected lithochemical samples from these areas and reported results to the owners at the time, but these areas have never been drilled.

Conclusions and Recommendations

The Sulphurets area might be a world-class porphyry Cu-Au system but the deposits have been deformed and faulted, the geology is extremely complex, exploration and development costs will be very high, several major engineering problems remain to be resolved and refined, and corporate risk is high.

Novicourt's (and Falconbridge's) directors should ask themselves should your companies operate in such an environment? Such challenges are what make the exploration business so interesting.

If Novicourt decides to proceed then I would recommend significant spring compilation of both Falconbridge's and Geological Survey of Canada data (4 1:5000-scale geological maps that in 1993 were submitted for Open File release have never been released; a huge, high-quality lithochemical database that identified many untested targets; an extensive unpublished mineralogical database; and aeromag-gamma-ray spectrometry corporate database that was being reprocessed by the GSC- the author was deeply involved with most of this work, except the airborne geophysical survey). Such a compilation would help identify and refine several drill targets for the 2006 field season.

Both larger tonnages and higher grades should be sought. On the longer term, with sufficient encouragement, deeper block-cave targets should also be considered. Similar to Savell and Huard, the author also thinks that more consideration should be given to gold-dominant and gold-only targets, although other copper-dominant deposits such as the Kerr are not unreasonable.

Declaration

The author was born in 1938 and has B.Sc., M.Sc., and Ph. D. degrees in economic geology. For over 28 years, with the Geological Survey of Canada, he studied copper and molybdenum deposits in Canada and other parts of the world and has published several papers on them.

In the summers of 1960 and 1961 he worked in this part of British Columbia for Newmont Mines Limited (Granduc). In 1961 he spent the entire summer in the Mitchell-Sulphurets area and produced a master's thesis on the area. In the summer of 1966 he mapped in this part of British Columbia for the provincial department of mines. He also visited exploration projects in the area later in the 1960s and 1970s and carried out a project focused on the Mitchell-Sulphurets region for the GSC from 1986 to 1993. This was done in cooperation of all companies exploring in the area and, included detailed property-scale geological mapping, lithochemistry- >2000 samples? for more than 40 elements, mineralogy, and broader 1:50,000-scale geological mapping with 4

structural geologists in attempt to put the highly altered and complex Sulphurets area are into a regional context.

I am not an employee of either Falconbridge or Novicourt, nor do I own any stock of either company. I view myself as an entirely independent person knowledgeable about the Sulphurets area.

In case any directors want further information or want to discuss any of the subjects raised in this report, my e-mail address is: rkirkham@telus.net and my phone number is: 604-943-7550.