

# Crystal Graphite Producing Graphite & Pumice

by Kristina Walcott

**L**ying in a complex geological environment in the Valhalla Range of the southern Selkirk Mountains of British Columbia is North America's only producer of high purity flake graphite – the Black Crystal graphite mine of Crystal Graphite Corp. (CGC) [CYTG-CNQ; CYTGF-OTCBB].

Graphite is one of two natural forms of carbon, the other being its flashy sister, diamond. Graphite is a soft non-metallic mineral which occurs in three principal forms – flake, crystalline and amorphous. Strongly resistant to corrosion, it is an excellent conductor of heat with a melting point of 3,550°C. It is increasingly used in the automotive and chemical industries with other high-tech applications emerging. The flake form such as that found at CGC's Black Crystal deposit is found only in a few locations in the world. Flake graphite occurs when the carbon atoms link together to form flat sheets. The larger the flake the purer the graphite and the higher the price it commands on the world market.

Over the past five years demand for this limited form of graphite has soared by some 40%. Increased technological uses are largely responsible and CGC has been quick to position itself as a leading producer of high quality graphite. With its self lubricating, flame retardant, and highly corrosion resistant qualities, it is not surprising that new applications for flake graphite are rapidly evolving.

As part of its development strategy, CGC is focussed on increasing the graphitic purity in order to more aggressively pursue the burgeoning fuel cell industry, a major consumer of high purity graphite. Approximately 85% of the graphite produced by CGC from the Black Crystal deposit will be fuel cell grade. CGC has completed sales to major players within the fuel cell industry and several other potential manufacturers of bi-polar plates within the fuel cell industry are testing the suitability of CGC's product.

At present the plant has the capacity to produce about 400 tonnes/year of high quality graphite and CGC has received market prices of US \$2,500/tonne for its high purity flake graphite. Average graphite prices in the US are about \$1,000/tonne for non high-tech applications. Production is based on product demand and can be increased at minimal capital cost and by the addition of further shifts. With one industrial mineral operation well in hand, this past April Crystal Graphite solidified its position as an industrial mineral producer in BC with the acquisition of Canada Pumice Corp. (CPC) and its Nazko volcanic material deposit. The acquisition combines two industrial mineral resources in BC with similar operations. Both operations are quarries and are environmentally benign.

The Nazko volcanic material aggregate deposit contains approximately

29,265,000 tonnes of proven material and, at its current production license of 100,000 tonnes/year, has an estimated life of 290 years. Unlike many volcanic aggregate deposits, Nazko possesses several different types of aggregate. This diversity is ideally suited to Crystal Graphite's development strategy, as it not only manufactures the product but also develops the market.

The largest and most well-known market continues to be landscaping and barbecue rocks; however, over the years uses for volcanic material aggregate have continued to expand. Its lightweight and low density make it ideal for concrete and other applications such as backfill where sand and gravel have been traditionally used. Its superior insulating and drainage properties have allowed CPC to successfully market "Tephralite™" for use in poor soil conditions and colder climates where traditional material may expand and contract causing roads and sidewalks to crack.

Another example of CGC's innovative development activities surrounding its industrial mineral portfolio is its application to the horticultural and agricultural industries in the form of Tephragro™ as replacement for traditional soil amendment. This product has been extensively tested in Holland, where similar aggregates have been used for years with excellent results. Other uses include winter road cover as an alternative to sand and salt, called Anti Slip™. It has also been used as a filtration medium in a recirculating irrigation system (Tephrafilter™). There are a number of other uses for the Nazko aggregate which are currently under development.

The key to successful development of an industrial mineral is, of course, reliable delivery; however, management unlike other exploration sectors must not only focus on exploring and developing the product, but must devote equal care and attention to the development of the end user market and/or securing markets to sell its product. Management at CGC/CPC appears to have not only sound technical projects, but has also been able to effectively identify select uses for its products in order to generate maximum value for its products. 🏠

Crystal Graphite's Black Crystal Graphite mine in the Selkirk Mountains of BC.  
 Photo courtesy Crystal Graphite Corp.

