

Base Metals in New Brunswick



Copper, Lead and Zinc

Society as we know it would grind to a halt without the so-called base metals: copper, lead, and zinc. Cars are laden with base metals. So are telephones and televisions. The information highway would be a footpath without base metals to build and power our computers, satellites and communication lines.

How were they formed?

New Brunswick's richest known concentration of base metals is located around Bathurst. The metals appear in an extremely fine-grained mixture of chalcopyrite (copper sulphide), galena (lead sulphide), sphalerite (zinc sulphide) and pyrite (iron sulphide) together with gold, silver and other metals. Such complex ores are called massive sulphides.

The volcanic and sedimentary rocks containing the massive sulphides were formed on an ocean floor about 465-480 million years ago. Over time, the rocks became buried within the earth's crust, squeezed into folds and uplifted as part of extensive mountain building. Erosion later exposed the rocks and their ore deposits.

Brunswick No. 12 Mine

The Austin Brook iron mine near Bathurst was worked sporadically from the early to mid-1900s. Yet the famous massive sulphide deposits just north of Austin Brook were not discovered until 1952. The Brunswick No. 12 Mine opened in 1964 and continues to be one of the world's largest zinc producers. Mine production in recent years has averaged about 9,500 tonnes of ore per day.

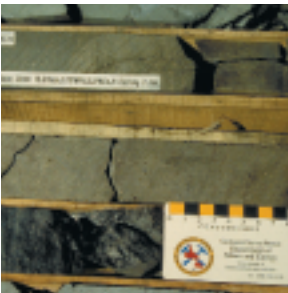
Brunswick No. 12 is mined using an open stoping method. The voids created by mining are filled using a system called paste backfill, where a liquid mixture of tailings and cement is pumped into the opening and allowed to cure like cement.

The Brunswick mine is characterized by some of the most advanced equipment in the business. One recent innovation is the Weasel, a unit that can be operated by remote control in open stope areas to drill blast holes and load charges. Remotely controlled front end loaders (scoops) and trucks are used to remove rock from blasted areas.

The mined ore is crushed underground, then raised to surface for transport to the adjacent concentrator. The concentrator helps to remove waste material or gangue from the commercial components: these are lead, zinc, copper, silver, gold, bismuth, antimony and cadmium.

Ore in the mill is ground to a powder, mixed with frothing agents and placed in flotation tanks. As gangue (waste materials) sinks to the bottom, sulphide minerals stick to froth on the surface. Different chemical reagents are used to selectively float the sulphide minerals up as foam. The foam is skimmed off and dried to produce lead and bulk concentrates, copper concentrates and zinc concentrates.

Copper, zinc, and bulk concentrates are shipped to market while the lead concentrate undergoes further refining in the company smelter at Belledune. The smelter separates out copper matte, antimony-lead alloys, silver-gold doré and bismuth alloys in successive steps. Brunswick concentrates and smelter products are shipped throughout North America, Europe, Asia, South America, North Africa and the Far East.



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