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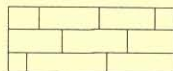
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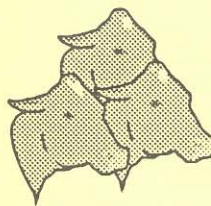
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Geological Survey Branch



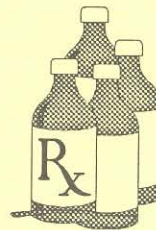
MAGNESITE



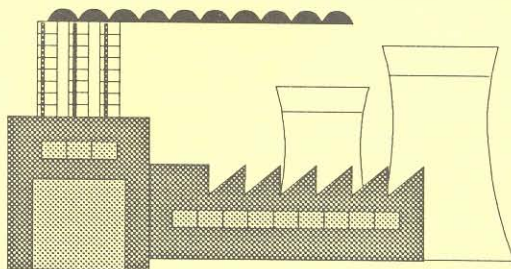
REFRACTORY



ANIMAL FEED



PHARMACEUTICAL PRODUCTS



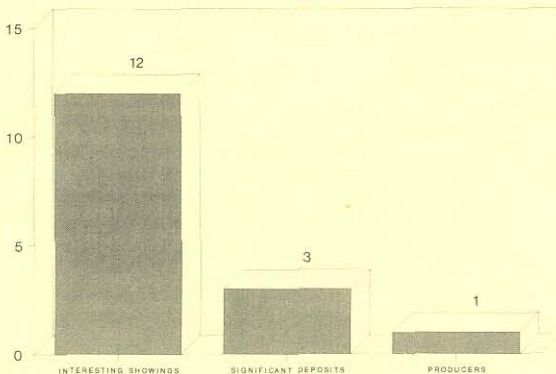
TREATMENT OF INDUSTRIAL EFFLUENT

Information Circular 1992-11

INVENTORY/RESOURCES

- The purest, and one of the largest, crystalline magnesite ($MgCO_3$) deposits in the world is located in southeastern British Columbia, at Mount Brussilof.
- Most significant magnesite deposits are hosted by either ultramafic or shallow-marine sedimentary rocks.
- Promising sparry-magnesite deposits in British Columbia are hosted primarily by Precambrian to Cambrian sedimentary rocks.
- Magnesium oxide (MgO) and impurities (commonly quartz, clay, chert and dolomite) may vary substantially within individual magnesite horizons.
- There are 65 documented magnesite occurrences in British Columbia. Mount Brussilof is the most significant.

Distribution of Magnesite Occurrences in British Columbia



PRODUCTION

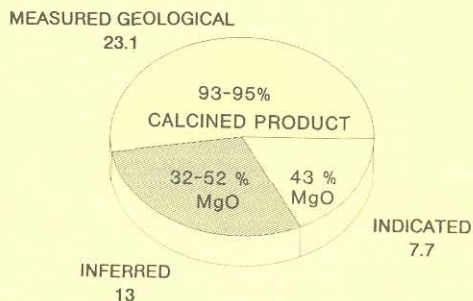
- The large, high-grade Mount Brussilof deposit, in dolomites of the Cambrian Cathedral Formation, is the largest Canadian magnesite producer.
- Baymag Mines Co. Ltd. began mining at Mount Brussilof in 1982 at a rate of about 35 000 tonnes a year.
- Increasing demand has resulted in production of about 200 000 tonnes per year, making Baymag one of North America's largest producers of high-grade, calcined magnesium oxide and the world's largest supplier of refractory grade, fused MgO .
- Baymag processed some magnesite into magnesium metal during 1989-1990.
- The Mount Brussilof deposit typically contains 46 to 47% MgO , 0.5% silica and 1.8% calcium oxide.
- Crushed and sized magnesite is shipped from the mine site to Baymag's plant in Exshaw, Alberta for processing.

RESERVES

- British Columbia magnesite reserves total 43.8 million tonnes, including 23.1 million tonnes proven and probable reserves of calcined product at Mount Brussilof.
- Magnesite deposits in the Brisco-Driftwood Creek area represent the highest potential for economic development, these include:
 - **Topaz Lake:** several magnesite showings, largest over 38 800 square metres. Thickness up to 30 metres.
 - **Driftwood Creek:** magnesite lenses over 4 km.
 - **Red Mountain:** over 400 metres in length, variable thickness, >20 metres.
 - **Cleland Lake:** >20 metres thick.
 - **Dunbar:** irregular shape, variable grade.
 - **Jab:** knoll about 130 metres long, 55 metres wide and up to 20 metres high.
 - **Botts Lake:** magnesite over 118 metres long >10 metres thick.

MAGNESITE RESERVES

(Million tonnes)



All the Brisco-Driftwood Creek deposits are in Helikian Mount Nelson Formation dolomites. The MgO content varies between 35.97 and 44.85%. There is generally lower MgO, higher Si₂O₃ and higher CaO than at Mount Brussilof. However, they have a low iron oxide content and are similar in sparry textures and mineralogy.

Cominco's Marysville deposit, hosted by the Lower Cambrian Cranbrook Formation, is a magnesite horizon traced over 8 kilometres. The central part of the deposit has the highest grade.

The Chuyazega Creek showing, in Lower Cambrian dolomites north of Prince George, is being investigated by Norsk Hydro. Magnesite-bearing rocks are similar to those at Mount Brussilof.

Talc deposits, in the Kwoiek Creek area, contain significant, inferred magnesite reserves in ultra-mafic rocks.

MARKET OPPORTUNITIES

- Opportunities exist to purchase high-grade product for established or new applications.
- Annually, North America imports magnesium oxide, >94% MgO, valued at over \$40 million, plus \$12.5 million of other magnesium oxides, and \$5 million of magnesite.
- Magnesite is used in the production of calcined, dead-burned and fused magnesia, and magnesium metal.
- Dead-burned and fused magnesia are used in basic refractories with direct applications in the cement, glass, steel and copper industries.
- Calcined magnesia is used in the pulp and paper industry, in rayon, rubber, plastics, and adhesives, as an additive to animal feed and fertilizers, in the production of transformer steel, in the pharmaceutical industry and as nuclear-grade fused magnesia.
- Large quantities of caustic magnesia are used in construction, mainly in oxychloride and oxysulfate cements and in insulating boards.
- Environmental rehabilitation (acidic effluent and mine tailings neutralization, desulphurizing stack gases etc.) represents an important potential growth area for magnesite.

EXPLORATION POTENTIAL

- British Columbia has several undeveloped magnesite deposits in the southeast.
- There is excellent potential for additional high-grade, Mount Brussilof-type deposits.
- Geological mapping indicates the magnesite belt containing Mount Brussilof, is extensive.
- Brisco-Driftwood Creek magnesite deposits are equivalent or of higher grade than European deposits.
- Some B.C. deposits could supply raw material for magnesium metal production, tailings treatment, and agricultural and cement applications.
- Well-established magnesite upgrading techniques used in Europe (heavy media separation, cyclones, optical sorting and flotation) could be used in British Columbia.

MAJOR OCCURRENCES

(FROM MINFILE, 1992)

- SEDIMENTARY-HOSTED
- ▲ ULTRAMAFIC-HOSTED
- ◆ LATERITIC

REFERENCE

- ⊠ MAJOR ROADS
- ⊡ RAILWAYS
- MAJOR CITIES
- ⚓ MAJOR PORTS

