

### Location/Identification

<b>MINFILE Number:</b>	082JNW001	<b>National Mineral Inventory Number:</b>	082J13 Mgl
<b>Name(s):</b>	<b><u>MOUNT BRUSSILOF</u></b> BAYMAG, BAYMAG MINE, ROK, MOUNT EON, CROSS RIVER, MT. BRUSSILOF		
<b>Status:</b>	Producer	<b>Mining Division:</b>	Golden
<b>Mining Method</b>	Open Pit	<b>Electoral District:</b>	Columbia River-Revelstoke
<b>Regions:</b>	British Columbia	<b>Resource District:</b>	Rocky Mountain Natural Resource District
<b>BCGS Map:</b>	082J072		
<b>NTS Map:</b>	082J13E	<b>UTM Zone:</b>	11 (NAD 83)
<b>Latitude:</b>	50 47 20 N	<b>Northing:</b>	5627181
<b>Longitude:</b>	115 40 44 W	<b>Easting:</b>	593120
<b>Elevation:</b>	1440 metres		
<b>Location Accuracy:</b>	Within 500M		
<b>Comments:</b>	Open pit, 1 kilometre north-northeast of the confluence of Assiniboine Creek with Mitchell River, approximately 35 kilometres northeast of Radium Hot Springs (Fieldwork 1990).		

### Mineral Occurrence

<b>Commodities:</b>	Magnesite		
<b>Minerals</b>	<b>Significant:</b>	Magnesite, Dolomite	
	<b>Associated:</b>	Dolomite, Calcite, Pyrite, Ankerite, Chlorite, Quartz, Chalcocite, Fersmite	
	<b>Associated Comments:</b>	Also phlogopite, talc, palygorskite, boulangerite, huntite and brucite.	
	<b>Alteration Type:</b>	Carbonate	
	<b>Mineralization Age:</b>	Middle Cambrian	
<b>Deposit</b>	<b>Character:</b>	Podiform, Stratabound, Massive	
	<b>Classification:</b>	Replacement, Sedimentary, Industrial Min.	
	<b>Type:</b>	E09: Sparry magnesite	
	<b>Shape:</b>	Irregular	<b>Modifier:</b> Folded
	<b>Dimension:</b>	790x500x120 metres	<b>Strike/Dip:</b> 330/30W
	<b>Comments:</b>	Magnesite deposit.	

### Host Rock

<b>Dominant Host Rock:</b>	Sedimentary		
<b>Stratigraphic Age</b>	<b>Group</b>	<b>Formation</b>	<b>Igneous/Metamorphic/Other</b>
Middle Cambrian	Undefined Group	Cathedral	-----
<b>Isotopic Age</b>	<b>Dating Method</b>	<b>Material Dated</b>	
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<b>Lithology:</b>	Magnesite, Dolomite, Limestone		

### Geological Setting

<b>Tectonic Belt:</b>	Foreland	<b>Physiographic Area:</b>	Continental Ranges
<b>Terrane:</b>	Ancestral North America		

### Inventory

**Ore Zone:** BAYMAG  
**Category:** Possible  
**Quantity:** 17,600,000 tonnes

**Year:** 1986  
**Report On:** Y  
**NI 43-101:** N

Commodity	Grade
Magnesite	92.4400 per cent

**Comments:** Grade averages 92.44 per cent magnesia in the calcined product.  
**Reference:** Fieldwork 1990.

**Ore Zone:** BAYMAG  
**Category:** Combined  
**Quantity:** 9,500,000 tonnes

**Year:** 1980  
**Report On:** Y  
**NI 43-101:** N

Commodity	Grade
Magnesite	95.0000 per cent

**Comments:** Proven/probable reserves grading over 95 per cent magnesia in the calcined product.  
**Reference:** Fieldwork 1990.

### *Summary Production*

	Metric	Imperial
<b>Mined:</b>	5,277,032 tonnes	5,816,932 tons
<b>Milled:</b>	5,277,032 tonnes	5,816,932 tons
<b>Recovery</b>	Magnesite 5,277,032,000 kilograms	11,633,864,123 pounds

### *Capsule Geology*

The Baymag deposit is situated east of a Cambrian bathymetric feature commonly referred to as the "Cathedral escarpment". The carbonate rocks east of this feature, which host the magnesite mineralization, were deposited in a shallower marine environment than their stratigraphic equivalents to the west (Fieldwork, 1990).

Stratigraphy east of the escarpment is described from oldest to youngest. The Lower Cambrian Gog Group is a rusty, grey or buff, medium to coarse-grained, massive to thick bedded sandstone more than 250 metres thick. Middle Cambrian rocks overlying the Gog Group include the Naiset, Cathedral, Stephen, Eldon, Pika and Arctomys formations. The Naiset Formation comprises thinly bedded, brown and green shale 65 to 170 metres thick. The Cathedral Formation, which hosts the magnesite deposits, is about 340 metres thick and consists of buff, white and grey limestones and dolomites. Laminations, ripple marks, intraformational breccias, algal mats, oolites, pisolites, fenestrae and burrows are well preserved. Pyrite is common either as disseminations or pods and veins. The Stephen Formation consists of tan to grey, thinly bedded to laminated shale about 16 metres thick and contains abundant fossil fragments. The Eldon and Pika formations cannot be subdivided in this area. The lowermost beds of the Eldon Formation, overlying the Stephen Formation, are black limestones approximately 50 metres thick. The Arctomys Formation is characterized by green and purple shales and siltstones interbedded with beige, fine-grained dolomites.

The rocks outcropping immediately east of the escarpment strike 170 degrees and dip 20 degrees west and are affected by diagenetic dolomitization.

Sparry carbonate rocks occur within the Cathedral, Eldon and Pika formations. They consist mainly of coarse dolomite and magnesite crystals in varying proportions. Magnesite-rich sparry carbonates are restricted to the Cathedral Formation, where they form lenses, pods and irregular masses. Barren Cathedral Formation consists mainly of fine-grained, massive or laminated dolomites interbedded with limestones. Parts of the Cathedral Formation are entirely altered to sparry magnesite, forming deposits of economic interest.

In the Baymag mine area, sparry carbonates are separated from limestone by light grey massive dolomite, which may contain needle-shaped quartz crystals. The contacts between sparry carbonate masses and the fine-grained dolomite are sharp and may be concordant or discordant. Magnesitic sparry carbonate is usually white or light grey in colour and buff when weathered. It consists of regularly spaced, alternating white and grey magnesite layers, randomly oriented centimetre-scale white magnesite crystals or a mixture of light grey and white magnesite crystals. Common impurities of the magnesite ore are isolated rhombohedral dolomite crystals, calcite veins, pyrite veins, subvertical fractures filled by a mixture of beige ankerite, calcite and chlorite, coarse radiating or single quartz crystals and coarse pyrite pyritohedrons and octahedrons disseminated within sparry magnesite.

Chalcocite, fersmite, phlogopite, talc and coarse, white acicular palygorskite were also observed in the mine. Boulangerite, huntite and brucite were reported from laboratory analysis (Fieldwork, 1990).

Where fine-grained dolomite is not entirely converted to magnesite, replacement features such as coarse, white carbonate crystals growing perpendicular to fracture planes or partings and lenses of fine-grained dolomite enclosed by sparry carbonates are common. Sparry dolomite rock consists mainly of dolomite rhombs. It forms lenses, veins or irregular masses in fine-grained dolomite and is believed to occur at the same stratigraphic horizons and to contain the same impurities as coarse sparry dolomite. Dolomite veins cutting magnesite ore occur at the mine, however magnesite veins were never observed to cut sparry dolomite.

It is suggested that the magnesite postdates early diagenesis of the Cathedral Formation and probably of the Stephen, Eldon and Pika formations as well (Fieldwork, 1990).

The Baymag deposit is defined as an area about 790 by 500 metres on a northwest axis with a maximum thickness of at least 120 metres within the main magnesite zone. The deposit is open in three directions with potential for substantial new reserves.

In 1980, proven and probable reserves were 9.5 million tonnes grading over 95 per cent magnesia in the calcined product and 13.6 million tonnes of 93 to 95 per cent magnesia in calcined product. Possible reserves were estimated at 17.6 million tonnes averaging 92.44 per cent magnesia in the calcined product (Fieldwork, 1990).

Since 1980, caustic magnesia and electrofused magnesia has been produced from two plants in Exshaw, Alberta and magnesium metal is produced at the Mag-Can plant in High River, Alberta (Z.D. Hora, personal communication, 1991).

The magnesite occurrence was first discovered by G.B. Leech of the Geological Survey of Canada who was conducting a mapping program in the area. As a result of the Leech report, New Jersey Zinc Exploration Canada Ltd. staked the area and conducted a mapping and diamond drill program. Imperial Oil Enterprises also investigated the area but no additional work was performed. Imperial Oil Enterprises also investigated the area but no additional work was performed. Baykal Minerals Ltd. conducted a mapping program in 1969 which resulted in acquisition of additional claims. Baykal Minerals arranged with New Jersey Zinc: Exploration Canada Ltd. to conduct mining on their claims.

Following the completion of field work in 1969 to 1970 which included diamond drilling for Baykal Minerals Ltd programs, a production feasibility report was completed by Acres Western Limited of Vancouver. During 1971, Brussilof Resources Limited and Baykal Minerals Ltd. amalgamated to form Baymag Mines Co. Limited.

The property was optioned to Canadian Exploration Limited (CANEX) in 1972. CANEX conducted a field orientation program which included 2819.4 meters of diamond drilling to bring the total length then drilled on the property to 5,255 meters. Geological mapping of specific areas was also completed.

In 1975 a 250 mt bulk sample was shipped to Refratechnik, a major German producer of refractory products. In 1979 Baymag Mines Co. Limited, a subsidiary of Refratechnik contracted Techman Ltd. and Kilborn Engineering to re-evaluate the feasibility of bringing the magnesite deposit into production. The evaluation involved surveys, 130 meters of percussion drilling, 75 meters of shallow diamond drilling and bulk sample extraction. A 100 ton sample of magnesite was extracted from a site on Rok 17 (now mine lease M31) and shipped for testing.

In 1981 Baymag entered into a contractual agreement with John Wolfe Construction Co. Ltd. to operate the mine and also to be responsible for ore supply to the production plant at Exshaw, Alberta, a facility leased from Canada Cement Lafarge. Commercial scale mining started in the second quarter of 1982.

During 1984, eight exploration holes totaling 731.5 meters of diamond drilling was completed on the Rok 17 claim. A major exploration program was conducted in 1987, the purpose of which was to investigate the extension of the known magnesite deposit up-slope from the current pit development and further delineate and evaluate the quality and quantity of the ore in the immediate vicinity of the active mining operations. Thirty-four diamond drill holes totaling 2707 meters were drilled, logged, sampled and assayed. In 1989, fifteen shallow diamond drill holes totaling 273 meters were drilled. The other area of interest was near the confluence of the Cross and Mitchell Rivers on the southern Vano claims (now Bay 19 & 21 claims). Ten shallow diamond drill holes totaling 110 meters were there. A small percussion drill hole program was conducted in 1990 with the goal of delineating zones of contamination near the little explored upper pit area. A total of 370 meters was drilled, sampled and assayed. Eight shallow percussion holes were drilled in the summer of 1991 to further delineate the zones of contamination in the north section of the upper pit. A total of 166 metres were drilled, logged and assayed. A diamond drilling program consisting 950 metres in 16 holes was drilled in the summer of 1992. A small exploration program was conducted in 1993 on the Bay-21 claim. Three diamond drill holes totaling 182 meters were drilled, logged, sampled and assayed. At the end of the 1993 exploration program a total of 27 percussion holes and 145 diamond drill holes had been drilled on the property bringing the total length of diamond drilling to 10,280 meters and percussion drilling to 500 meters.

Baymag Mines Company Limited continued to mine magnesite at an annual rate of approximately 175,000 tonnes. Construction of a new shaft kiln is in preparation at Exshaw, Alberta and is expected to be in production in 1997, increasing Baymag's output by approximately 70 per cent. The

company plans to process and upgrade the lower grade magnesite (approximately 85 per cent) presently wasted (Information Circular 1996-1, page 9).

Estimated production has been at or close to 200,000 tonnes per years since the mid to late 1990s to 2005. Please refer to the production section for details of estimated yearly production.

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<b>Date Coded:</b>	1985/07/24	<b>Coded By:</b>	BC Geological Survey (BCGS)	<b>Field Check:</b>	Y
<b>Date Revised:</b>	2024/03/04	<b>Revised By:</b>	Jessica Norris (JRN)	<b>Field Check:</b>	Y