

Location/Identification

MINFILE Number:	082ESE091	National Mineral Inventory Number:	082E1 Ni1
Name(s):	<u>CASTLE MOUNTAIN NICKEL</u> MASTADON (L.2384S), MAMMOTH (L.2385S), DOMINION (L.2386S), PAN (L.2387S), CANYON (L.2390S), MASTODON, CHROMEX NICKEL		
Status:	Past Producer	Mining Division:	Greenwood
Mining Method	Underground	Electoral District:	West Kootenay-Boundary
Regions:	British Columbia	Resource District:	Arrow Boundary Forest District
BCGS Map:	082E010		
NTS Map:	082E01E	UTM Zone:	11 (NAD 83)
Latitude:	49 00 33 N	Northing:	5429140
Longitude:	118 10 29 W	Easting:	414094
Elevation:	960 metres		
Location Accuracy:	Within 500M		
Comments:	Adit and open cuts, 4.75 kilometres south-southeast from the south tip of Christina Lake on the southwest slope of Castle Mountain, 22.4 kilometres east of Grand Forks (Property File - Maps and plans).		

Mineral Occurrence

Commodities:	Nickel, Chromium, Iron, Magnetite, Copper, Platinum		
Minerals	Significant:	Magnetite, Heazlewoodite, Chromite, Pentlandite, Pyrrhotite, Pyrite, Millerite, Brucite, Chalcopyrite, Serpentine	
	Associated:	Magnetite, Pyrite, Serpentine, Pyrrhotite	
	Alteration:	Serpentine, Talc, Carbonate, Chlorite, Quartz	
	Alteration Type:	Serpentin'zn, Quartz-Carb., Chloritic	
	Mineralization Age:	Unknown	
Deposit	Character:	Disseminated, Podiform, Massive	
	Classification:	Magmatic, Hydrothermal, Industrial Min.	
	Type:	M03: Podiform chromite	
	Shape:	Irregular	Modifier: Sheared, Fractured
	Dimension:	2440x1220x0 metres	
	Comments:	Ultramafic body; dips 38 degrees east.	

Host Rock

Dominant Host Rock: Metaplutonic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Carboniferous	Anarchist	Undefined Formation	-----
Jurassic	Rossland	Unnamed/Unknown Formation	-----
Jurassic	-----	-----	Ultramafic Intrusions
Jurassic	-----	-----	Nelson Intrusions

Isotopic Age	Dating Method	Material Dated
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Lithology: Serpentinite, Dunite, Gabbro, Quartz Porphyry Dike, Quartz Feldspar Porphyry Sill, Greenstone Breccia, Greenstone Tuff, Greenstone Flow, Meta Sediment/Sedimentary Rock, Monzonite

Comments: Ultramafic body (ophiolite?) is emplaced in Rossland Group rocks.

Geological Setting

Tectonic Belt:	Omineca	Physiographic Area:	Okanagan Highland
Terrane:	Plutonic Rocks, Quesnel		
Metamorphic Type:		Relationship:	Post-mineralization
Grade:	Greenschist		

Inventory

Ore Zone:	CASTLE MOUNTAIN NICKEL	Year:	1970
Category:	Indicated	Report On:	Y
Quantity:	354,676,100 tonnes	NI 43-101:	N

Commodity	Grade
Nickel	0.2000 per cent

Comments: Mineable by open pit. An appreciable part of the Ni present in the form of Ni-bearing serpentine, is not recoverable by conven. methods.

Reference: Statement of Material Facts 07/74, Chromex Nickel Mining Ltd.

Summary Production

	Metric	Imperial
Mined:	725 tonnes	799 tons
Milled:	0 tonnes	0 tons
Recovery	Chromium 279,000 kilograms	615,090 pounds

Capsule Geology

The area is predominantly underlain by Lower to Middle Jurassic Rossland Group massive greenstone, andesite, latite, agglomerate and volcanic breccia. Minor greywacke and interbedded limestone with lenses of silicified equivalents, also occur.

At the Castle Mountain Nickel deposit, a wedge-shaped ultramafic complex comprised of serpentinized dunite of the Carboniferous or older Anarchist Group has been tectonically emplaced against chlorite and carbonate altered Rossland Group greenstone breccias, tuffs, flows and metasedimentary rocks. The Rossland Group rocks surround the ultramafic body to the west, north and northeast while foliated monzonites of the Middle to Late Jurassic Nelson Intrusions, outcrop to the east and southeast. The contacts with these surrounding rocks are fault-bounded and commonly quartz-talc- carbonate altered. The serpentinite body has been mapped as an upthrust section of an ophiolite (J. Fyles, personal communication, 1989).

The faulted and sheared ultramafic body is 2440 metres long, 1220 metres wide and dips 38 degrees east. The rock is largely serpentinite and is composed of variably oxidized alternating layers of serpentinized dunite and gabbro or their equivalents. Locally unaltered dunite is present. Mesh textures in serpentine are absent, as are bastites, and there are no relict orthopyroxene grains which suggests the that protolith was massive dunite. The dunite and gabbro layers are intercalated with porphyritic dykes or sill-like bodies which constitute up to 30 per cent of the ultramafic rock mass. Predominant quartz-feldspar porphyry sills occur regularly throughout the body; crosscutting quartz porphyry dykes, diorite porphyry dykes and lamprophyre dykes are also common. Shearing and fracturing are pervasive throughout the ultramafic body with the zones commonly quartz-talc-carbonate altered.

Nickeliferous magnetite and nickel sulphide minerals consisting of pentlandite, millerite and heazlewoodite are more or less uniformly distributed and disseminated throughout the ultramafic body. Heazlewoodite is the most common of the nickel sulphide minerals. Nickel-bearing serpentine and nickeliferous pyrite are also common; pentlandite is intergrown with pyrrhotite. Some chalcocopyrite and brucite have also been identified. Approximately 42 per cent of the total nickel content is held in solid solution with magnetite and sulphides hold the balance (Property File - R. Steiner, 1972). Dykes carry up to 0.19 per cent nickel as millerite, nickeliferous magnetite or heazlewoodite. Chromite occurs as disseminated grains, stringers and massive lenses. Disseminated chromite is ubiquitous; stringers of chromitite consisting of elongate trains of coarse crystals give the rock a "pebbly" texture with chromite forming 15 to 40 per cent of the rock. Pods of massive chromitite have been exposed in scattered workings across the serpentinite. The randomly located pods vary in size from 3 to 7 metres in length and 2 to 3 metres in width. Surface and underground development have shown that the chromite mineralization is structurally disrupted by a multitude of fractures and shears. Individual shears vary from 1 to 15 centimetres in width and can be grouped into zones up to 30 metres wide. Occasionally chromite is found to be concentrated along some of

the shear planes. There is no specific orientation to the chromite mineralization but there has been some suggestion that it trends roughly northwest and dips subvertically. An adit and underground workings explored chromite lenses occurring in the hangingwall of a strong fault which strikes northeast and dips 50 degrees southeast. In 1918, about 725 tonnes of chromite ore, grading 38.5 per cent Cr₂O₃ was shipped from these workings.

The ultramafic body becomes gabbroic at depth with dykes becoming thinner and less frequent and dunite/gabbro layering thicker. Chromite and magnetite content decreases but nickel sulphides (millerite, pentlandite) increase.

Underground diamond drilling has suggested indicated reserves of 354,676,100 tonnes of ore with an average grade of 0.2 per cent total nickel (Statement of Material Facts 07/74, Chromex Nickel Mining Ltd.). However, serious concerns about the validity of the nickel resource potential has been raised by others and further work and testing has been recommended (Property File - Grove, E.W. and Johnson, W.M., 1975). The drilling has shown that nickel mineralization is uniform to depth and the chromite mineralization is erratic.

Platinum is said to occur with chromitite in the serpentinite, but the only record is the Munition Resources Commission report (W. Thomlinson, 1920). Rock samples assayed up to 0.68 gram per tonne platinum.

The property is located at approximately 914 metres elevation on the southwesterly slope of Castle Mountain 5 kilometres southeast of Christina Lake and 19 kilometres east of Grand Forks. Details of early staking and prospecting on this ground are lacking. The Brandon (Lot 2382), Little Burne (Lot 2383) and Little Burne Fr. (Lot 2387) claims were Crown granted in 1901 to J. McNulty and associates. The Marshall, Little Annie, Little Brown (Lots 2388-2390), and Marshall Fr. (Lot 2404) were Crown granted to the above in 1904. The Sylvester K. (Lot 2385) claim was Crown granted to Adolph Sercu in 1900. The Sylvester K Fr. (Lot 2386) was Crown granted to Mr. Sercu in 1915. The Mastodon group, comprising the Mastodon, Mammoth, Black Tail Fr., Pan, Dominion and Canyon claims, was leased in 1917 for a period of 1 1/2 years from Angus Cameron and associates of Laurier, by the Stewart Calvert Company, of Oroville, Washington.

Chromite was reportedly discovered on the property in 1917 and shipments were made from opencuts and two adits, the upper about 61 metres long, on the Mastodon claim, and from a 9 metre deep inclined shaft on the Mammoth claim. The Mastodon, Mammoth, Dominion, Pan, Mastodon Fr., and Canyon (Lots 23845-23885, 23905, respectively) were Crown granted to W.H. Stewart in 1919. Opencutting was done on several claims to the northeast, including the Midnight and Black Tail. The Midnight claim was owned by W.H. Phillips of Cascade in the 1930s. In 1939, Northern Syndicate Limited, of Calgary acquired a lease on the Crown grants from W.H. Stewart of Bellevue, Washington, and Wm. Calvert, Jr., of Seattle. An additional 14 claims were acquired, 7 by purchase on a royalty basis from R.E. Wolveston of Greenwood and D.P. Simpson of Osoyoos, and 7 by staking. These claims are the Black Tail, Power, Midnight, Big Cave, Chromite, Serpentinite, Serpentinite No. 1, Power 1-5, 10, 12. Of these the first four claims (Lots 35675, 35695-35715) were subsequently Crown granted. No activity other than prospecting and sampling was reported at that time. Canadian Exploration, Limited staked 13 claims in this vicinity in 1941.

Chromex Nickel Mines Ltd., incorporated January 1966, acquired the Mastodon group of Crown grants. Hunter Point Explorations Ltd., a wholly owned subsidiary also incorporated in January 1966, staked over 100 adjacent claims in the Ann and other groups. Geophysical surveys carried out during the year included a combined airborne magnetometer, electromagnetic and scintillometer survey, and a ground magnetometer survey. Drilling during 1967-68 totalled 2530 metres in 18 holes, mainly on the Mastodon claim. In 1969, an additional 305 metres of diamond drilling was carried out, again mainly on the Mastodon claim. Additional claims were staked, 74 to the east and 16 to the west. Drilling in 1970 totalled 1554 metres in 12 holes. In 1971 most of the work was concentrated on the Basic property although some drilling was done on the Ann and Haz-al groups and the Canyon claim. Diamond drilling in 1972-73 totalled about 488 metres in 5 holes, in part on the Ann and H groups. Work by Chromex Nickel in 1977-78 included trenching and 411.5 metres of diamond drilling in two AQ holes. In 1997, Applied Mine Technologies Inc. conducted a remote sensing study and GIS compilation on the Bowser and Bif claims which cover the Mastodon prospect.

Bibliography

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EMPR ASS RPT 860, *6457, 6665, 7067, 15627, 25332

EMPR EXPL 1977-E12; 1978-E13; 1979-13; 1987-C14

EMPR GEM 1969-311,312; 1970-433; 1971-373; 1972-34; 1973-35

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GSC EC GEOL 13, p. 106

GSC MAP 828; 6-1957; 10-1967; 1736A

GSC MEM 38, Part III, Map 82A

GSC OF 481; 1969

CANMET IR 69-75; 70-38

GCNL #115 (June 15) 1971

EMPR PFD 1040, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1357, 823026, 823631, 520133, 520134, 520135, 520136, 520137

Date Coded: 1985/07/24

Coded By: BC Geological Survey (BCGS)

Field Check: N

Date Revised: 2008/02/20

Revised By: Karl A. Flower (KAF)

Field Check: N