Location/Identification

MINFILE Number: 103C 003
National Mineral Inventory Number: 103C16 Fe1
Name(s): **TASU**

TASSOO (L.604), WARWICK (L.615), DELA-BLUJAY, DELLA-BLUJAY, BLUJAY, JONES, ELLA (L.609), CHINA BOY FR. (L.616), CHICAMUNSTONE FR. (L.614), COPPER CHEAF (L.617), WEST JACK, PAULINE, ROSE, BERTA FR., ELIZABETH FR.

Status: Past Producer
Mining Division: Skeena
Mining Method Underground, Open Pit
Electoral District: North Coast
Regions: British Columbia, Queen Charlotte Islands
Resource District: Queen Charlotte Islands Forest District
BCGS Map: 103C080
NTS Map: 103C16E
UTM Zone: 08 (NAD 83)
Latitude: 52 45 24 N
Northing: 5849302
Longitude: 132 02 36 W
Easting: 699513
Elevation: 300 metres
Location Accuracy: Within 500M
Comments: Centre of Lot 604, Centre of ore zone - Figure 37 (Bulletin 54). Located on the slopes south of Tasu Sound near its junction with Fairfox Inlet.

Mineral Occurrence

Commodities: Iron, Magnetite, Copper, Silver, Gold

Minerals
Significant: Magnetite, Chalcopyrite, Pyrite, Pyrrhotite, Sphalerite
Significant Comments: Sphalerite is rare.
Alteration: Chlorite, Sericite, Epidote, Garnet, Actinolite, Tremolite, Anthophyllite
Alteration Type: Skarn
Mineralization Age: Unknown

Deposit
Character: Stratiform, Concordant, Massive
Classification: Skarn, Replacement, Industrial Min.
Type: K03: Fe skarn, K01: Cu skarn
Shape: Tabular
Modifier: Faulted
Dimension: 1200x1000x100 metres
Strike/Dip: 175/20W
Comments: Northwest plunging syncline bordered by anticlines; ore zone on axial zone of west limb of eastern anticline.

Host Rock

Dominant Host Rock: Volcanic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Upper Triassic	Kunga	Sadler	------
Upper Triassic	Vancouver	Karmutsen	------
Middle Jurassic	------	------	San Christoval Plutonic Suite

Isotopic Age	Dating Method	Material Dated
------	------	------
------	------	------
170-175 +/- 5 Ma	Uranium/Lead	Zircon

Lithology: Amygdaloidal Greenstone, Limestone, Andesitic Dike, Basalt Dike, Dioritic Porphyry, Hornblende Diorite, Quartz Diorite, Skarn
Comments: The San Christoval Pluton of the San Christoval Plutonic Suite was dated by Anderson(Geological Survey of Canada Current Research, 1989).

Geological Setting

Tectonic Belt: Insular
Physiographic Area: Queen Charlotte Ranges
Terrane: Wrangell

Metamorphic Type: Contact, Regional
Relationship: Pre-mineralization, Syn-mineralization
Grade: Greenschist, Hornfels

Inventory

Ore Zone: TASU
Year: 1980
Category: Indicated
Report On: Y
Quantity: 2,721,560 tonnes
NI 43-101: N

Commodity	Grade
Copper	0.2750 per cent

Comments: 3,628,740 tonnes were depleted from a reserve of 6,350,300 tonnes before the mine closure in 1983.

Reference: Energy, Mines and Resources Mineral Bulletin 189, page 20.

Summary Production

		Metric		Imperial	
Mined:		23,297,228	tonnes	25,680,797	tons
Milled:		22,701,946	tonnes	25,024,611	tons
Recovery	Silver	52,822,505	grams	1,698,283	ounces
	Gold	1,430,140	grams	45,980	ounces
	Iron	12,349,672,416	kilograms	27,226,367,181	pounds
	Copper	57,090,466	kilograms	125,862,933	pounds

Capsule Geology

The property is located on the south side of Tasu Sound, west coast of Moresby Island, Queen Charlotte Islands. The Nos. 1, 2, 3, and 4 ore zones, respectively, extend up the north slope of the mountain between elevations of 91 and 457 metres. The concentrator is located at the shoreline just west of Gowing Island.

The magnetite occurrence was discovered by the Haida Indians in the latter part of the eighteenth century. In 1908 prospector named Gowing, of Grand Forks, was sent by lumberman J.E. Corlett, of Seattle, to investigate the rumour of the occurrence of an unknown mineral. He was guided to Tasu Sound by Henry Moody and his father, both prominent Haida's of Skidgate Mission on Graham Island, who not only knew of the original discovery but had prospected the hillside and found magnetite-copper outcrops. Gowing was made to wait on the island, which now bears his name, while his guides sampled the showings and staked 4 claims, one of which was later Crown-granted as the Tassoo claim. Gowing agreed to purchase the 4 claims for $2,000.00. Mr. Moody, Senior, sent word to Albert Jones, son of a close friend, to come and stake adjacent claims in order to share in the discovery. Albert Jones' arrival was delayed and Henry Moody returned to stake additional claims surrounding the original four.

On Gowing's return a partnership was formed, including himself, J.E. Corlett and F.C. Elliott of Revelstoke, to acquire and develop the 20 claim property, now known as the Warwick group. Trenching during 1908, and 61 metres of adit driven in 1909, was carried out under the names Elliott Mining Company and Tassoo Mining and Smelting Company, respectively; there is no record of these as Canadian incorporations. The property was subsequently optioned to R.R. Hedley and associates, of Vancouver, who incorporated the Tassoo Syndicate, Limited, in December 1913. A tramline was built to the shore and ore shipments began in 1914. Exploration and development work included driving a 91-metre long adit at 360 metres on the Tassoo claim and sinking a 12-metre deep winze. Production was from two stopes in the adit. A lower adit at elevation 323 metres was driven 61 metres, but not far enough to encounter the ore. J.E. Corlett obtained Crown-grants on 24 claims (Lots 600-623) including the Tassoo (Lot 604) and Warwick (Lot 615) claims, in 1915. The mine operated intermittently until 1917.

All that remained of the property in later years was two key claims, the Tassoo and Warwick Crown-grants. In 1952 Albert Jones returned with son Cliff, and George Brown, to stake 6 claims adjoining the two Crown-grants. In 1953 Dr. Alex Smith acquired the two Crown-grants at a tax sale and in 1955 optioned the 6 claims from Albert Jones.

Frobisher Limited, which was controlled by Ventures Limited, incorporated Wesfrob Mines Limited in February 1956 to acquire, explore and develop the property, then comprising 21 Crown-granted and 11 recorded claims. During 1956-1957 some 6706 metres of diamond drilling was done on No. 3 zone. No further work was done until 1961 when geological and magnetometer surveys were carried out and 4971 metres of diamond drilling in 70 holes. Falconbridge Nickel Mines Limited, through a merger with Ventures Limited in 1962 acquired Wesfrob Mines as a wholly owned subsidiary. Diamond drilling continued and to the end of 1964 totalled some 40,234 metres. Proven ore reserves at that time were 22,679,625 tonnes averaging 41.33 per cent iron; of this the No. 3 zone contained about 6,168,858 tonnes averaging 47.65 per cent iron and 0.66 per cent copper.

The 7,257 ton per day mill was put into production in June 1967 with ore from the No. 3 zone open pit. Open pits were subsequently established on the No. 2 and No. 1 zones. Ore passes were driven from No. 2 and No. 3 (upper) zones to a haulage adit driven at the 198-metre level. In 1973 this level was extended 66 metres and a crosscut driven to No. 3 zone.

The Della-Blujay group, comprising Crown-grant Nos. 2995, 2996, 2999, 3004, and 3007, and several recorded claims, lies west of the No. 2 and 3 zones and apparently covers No. 5 zone, which is in part a down faulted extension of No. 2 and 3 zones. During 1970-1971 the Della-Bluejay adit was driven from a point on the shoreline some 1067 metres southwest of the concentrator for a distance of 791 metres. Exploratory diamond drilling included 4291 metres underground and 3559 metres on surface. No further underground development was done on the Dela-Bluejay until 1974 when a decline was sunk from the 67-metre elevation in No. 1 zone open pit. Underground development was completed in 1977 and with the exhaustion of ore in the open pits the switch to underground mining was made during the year. Reserves (proven) as of January 1, 1980 were 2,384,731 tonnes at 0.275 per cent copper (Canadian Reserves as of January 1, 1980, MR 189, page 20, Energy, Mines and Resources, Ottawa).

Wesfrob Mines Limited was dissolved in January 1980 and the mine became the Wesfrob Mining Division of Falconbridge Nickel Mines Limited. Ore reserves of 6,350,296 tonnes at the end of 1980 were sufficient to continue the operation through 1987. Due to lower copper prices and other economic factors some 3,628,740 tonnes of low-grade material were deleted from reserves in 1981-82. Economic reserves were depleted and the mine closed permanently on October 5th, 1983. Lumberton Mills Ltd. subsequently acquired the property and equipment from Falconbridge Limited; Lumberton was placed in receivership in 1987.

The area is underlain by the Jurassic-Triassic Kunga Group and the Upper Triassic Karmutsen Formation of the Vancouver Group. These rocks have undergone regional greenschist facies metamorphism.

The Tasu orebodies occur at the contact between grey limestone of the Upper Triassic Sadler Formation (Kunga Group) and massive amygdaloidal greenstones of the Upper Triassic Karmutsen Formation. These rocks, were intruded by various stages of igneous rocks. First, the volcanics were cut by minor related sills. Next, a complex diorite porphyry laccolith was emplaced between the Karmutsen and Sadler formations. The foliated hornblende diorite and quartz diorite of the Middle Jurassic San Christoval Pluton intruded the stratified rocks, followed by skarn development and mineralization. Finally, earlier andesitic and later basaltic dike swarms cut all rocks.

The panel of Karmutsen and Kunga rocks that form the locus of the ore deposits has been moderately compressed into a synclinorium bordered on each limb by anticlines, all with axes trending 330 and plunging 25 degrees. The ore zones occur along the crest of the eastern anticline and extend down the west limb toward the synclinal axis. The most significant faults strike north-northwest and dip steeply. The faults pre-date the mineralization, but some have been subjected to later movement. The ore zones are crosscut by a large number of post ore dikes and in some areas they have diluted the grade.

The orebodies and their skarn envelope form a tabular panel, 30 to 120 metres thick, which conforms to the bedding attitude (roughly 175 degree strike, 20 degree west dip) of the Karmutsen greenstones. However, the ore replaces diorite porphyry sills and Sadler limestone. This panel extends over a horizontal area at least 1000 by 1200 metres, which contain linear ore "build-ups" along pre-ore fault lines.

Ore zones 1 to 4 represent "build-up" and fringe areas. Zone 5 includes all known mineralized areas to the west. The orebodies of No. 1 zone, the furthest north zone, replace diorite porphyry, are skarn rich and generally copper poor. No. 3 zone orebodies, about 650 metres to the south-southeast, replace limestone, are relatively skarn free, copper-rich and are concentrated just above the contact of the Karmutsen Formation. No. 2 zone lies between No's. 1 and 3 and has intermediate characteristics to both zones. No. 4 zone lies 200 metres south of No. 3 and has similar characteristics.

The oxide and sulphide minerals have distribution and textures characteristic of a later metasomatic sequence. Magnetite replaces all earlier minerals and is found principally in the core of the skarn areas and as central bands in skarn replacement veinlets. Still younger are the sulphide minerals, pyrite, pyrrhotite, chalcopyrite, and rare sphalerite. Sulphur content of the orebodies is fairly uniform at 2 to 3 per cent, regardless whether chalcopyrite is the main sulphide, as in No. 3 zone, or pyrite and pyrrhotite, as in No. 1 and No. 2 zones. The sulphide minerals generally occur as blebs and small masses in magnetite but are also common as veinlets. Grades are roughly 40 per cent iron, 0.3 per cent copper and 3.4 grams per tonne silver.

Production from 1914 to the mine closure in October 1983 totalled 23,297,228 tonnes of ore mined. From this 1,430,141 grams gold, 52,822,505 grams silver and 57,090,466 kilograms of copper were recovered. Iron concentrates produced were 12.35 million tonnes, averaging 65 per cent iron.

Underground development was completed in 1977 and with exhaustion of ore in the open pits, underground mining was initiated during that year. Indicated reserves as of were 2,721,560 tonnes grading 0.275 per cent copper (Energy, Mines and Resources Mineral Bulletin 189, page 20). Total ore reserves outlined by the end of 1980 were reported as a 6,350,300 tonnes. Due to lower copper prices and other economic factors some 3,628,740 tonnes of low-grade material were deleted from the reserves in 1981-1982. Economic reserves were depleted and the mine closed permanently on October 5, 1983.

Bibliography

EMPR AR 1908-62; 1909-72-78; 1910-85; 1912-110; 1913-96,97; 1914-162; 1915-449; 1916-81,515; 1917-447; 1918-104; *1956-125-127; 1961- 11-13; 1962-11; 1963-13-16; 1964-45; 1965-68; 1966-52; 1967-54-56; 1968-70

EMPR BC METAL MM00019

EMPR BULL *54, pp. 183-189

EMPR GEM 1969-73; 1970-101,102; 1971-110,111; 1972-494-497; 1973- 482-484; 1974-320,321

EMPR IR 1984-2, pp. 99, 102; 1984-3, pp. 105, 108; 1984-4, p. 121; 1984-5, pp. 113, 115; 1986-1, p. 111

EMPR MINING 1975-1980, pp. 31-32

EMPR OF *1988-28, pp. 77-79; 1998-10

EMPR PF (*Various maps, plans and sections; Campbell, C.M. (1958): Report on Economic Analysis of the Tasu Project, Feb.24, 1958; Polk, G.K. (1962): Westfrob Mines Ltd., Report on 1961 Field Season at Tasu, Queen Charlotte Island, Jan.30, 1962; McDougall, J.J. (1963): Report on Wesfrob Mines Ltd., Air Mag Survey, Tasu Area, 1963, Jun.25, 1963; Polk, G.K. (1964): Report on Westfrob Mines Ltd., Geology to March 1964, Apr.10, 1964; Photographs of Tasu Mine; Starr, C.C. (1953): Letter on Jones Group of claims to Waddington Mining Corporation Ltd.; Starr, C.C. (1953): Letter on Jones Group to R. Crowe-Swords; Starr, C.C. (1953): Notes on Various Trails to Tassoo Harbour; *Starr, C.C. (1953): Report of Preliminary Examination of the Jones Group of Mineral Claims, 4 pp., map scale 1" = 300', detail of workings scale 1" = 40')

EMR MIN BULL MR 31, p. 144; 166; *189, p. 20; 223 B.C.280

EMR MP RESFILE (Tasu Mine)

EMR MP CORPFILE (Wesfrob Mines Limited; Falconbridge Nickel Mines Limited)

CIM Reporter Vol.2, No.4; Bulletin, March 1968

CMJ Jul., 1964, p. 53; Vol. 88, #3, 1967, pp. 45-51

GSC BULL 172, pp. 81,82

GSC EC GEOL No. 3, pp. 31,32

GSC MAP 278A; 1385A

GSC P 86-20; 88-1E, pp. 213-216,221-227; 89-1H, pp. 95-112; 90-10, pp. 59-87, 163-172

MIN REV March/April 1988, pp. 19-24

W MINER, Oct., 1965, pp. 87-96; Jun., 1967, pp. 40-66; May, 1983

WESTERN MINER & OIL Review Vol. 32, Oct., 1959, pp. 38-44

Falconbridge File

EMPR PFD 650273, 650274, 650272, 650275, 650266, 650267, 650268, 650269, 650276, 650270, 650258, 650271, 17379, 17380, 17381, 17382, 17383, 17384, 17385, 17386, 17387, 17388, 17389, 17390, 17391, 17392, 17393, 17394, 17395, 17396, 17397, 17398, 17399, 17400, 17401, 17402, 17403, 17404, 17405, 17406, 17407, 17408, 17409, 17410, 17411, 17412, 17413, 17414, 17415, 17416, 17417, 17418, 17419, 17420, 17421, 17422, 17423, 17424, 17425, 17426, 17427, 17428, 17429, 17430, 17431, 17432, 17433, 17434, 17435, 17436, 17437, 17438, 17439, 17440, 17441, 17442, 17443, 17444, 17445, 17446, 17447, 17448, 17449, 17450, 17451, 17452, 17453, 17454, 17455, 17456, 17457, 17458, 17459, 17460, 17461, 17462, 17463, 17464, 17465, 17466, 17467, 17468, 17469, 17470, 17471, 17472, 17473, 17474, 17475, 17476, 17477, 17478, 17479, 17480, 17482, 17483, 17484, 17485, 17486, 17487, 17488, 17489, 17490, 17491, 17492, 17493, 17494, 17495, 17496, 17497, 17498, 17499, 17500, 17501, 17502, 17503, 17504, 17505, 17506, 17507, 17508, 17509, 17510, 17511, 17512, 17513, 17514, 17515, 17516, 17517, 17518, 17519, 17520, 17521, 17522, 17523, 17524, 17525, 17526, 17527, 17528, 17529, 17530, 17531, 17532, 17533, 17534, 17535, 17536, 17537, 17538, 17539, 17540, 17541, 17542, 17543, 17544, 17545, 17546, 17548, 17549, 17550, 17551, 17552, 17553, 17554, 17555, 17556, 17557, 17558, 17559, 17560, 17561, 17562, 17563, 17564, 17565, 17566, 17567, 17568, 17569, 17570, 17571, 17572, 17573, 17574, 17575, 17576, 17577, 17578, 17579, 17580, 17581, 17582, 17583, 17584, 17585, 17586, 17587, 17588, 17589, 17590, 17591, 17592, 17593, 17594, 17595, 17596, 17597, 17598, 17599, 17600, 17601, 17602, 17603, 17604, 17605, 17606, 17607, 17608, 17609, 17610, 17611, 17612, 17613, 17614, 17615, 17616, 17617, 17618, 17619, 17620, 17621, 17622, 17623, 17624, 17625, 17626, 17627, 17628, 17629, 17630, 17631, 17632, 17633, 17634, 17635, 17636, 17637, 17638, 17639, 17640, 17641, 17642, 17643, 17644, 17645, 17646, 17647, 17648, 17649, 17650, 17651, 17652, 17653, 17654, 17655, 17656, 17657, 17658, 17659, 17660, 17661, 17662, 17663, 17664, 17665, 17666, 17667, 17668, 17669, 17670, 17671, 17672, 17673, 17674, 17675, 17676, 17677, 17678, 17679, 17680, 17681, 17682, 17683, 17684, 17685, 17686, 17687, 17688, 17689, 17690, 17691, 17692, 17693, 17694, 17695, 17696, 17697, 17698, 17699, 17700, 17701, 17702, 17703, 17704, 17705, 17706, 17707, 17708, 17709, 17710, 17711, 17712, 17713, 17714, 17715, 17716, 17717, 17718, 17719, 17720, 17721, 17722, 17723, 17724, 17725, 17726, 17727, 17728, 17729, 17730, 17731, 17732, 17733, 17734, 17735, 17736, 17737, 17738, 17739, 17740, 17741, 17742, 17743, 17744, 17745, 17746, 17747, 17748, 17749, 17750, 17751, 17752, 17753, 17754, 17755, 17756, 17757, 17758, 17759, 17760, 17761, 17762, 17763, 17764, 17765, 17766, 17767, 17768, 17769, 17770, 17771, 17772, 17773, 17774, 17775, 17776, 17777, 17778, 17779, 17780, 17781, 17782, 17783, 750495, 750496, 750497, 750878, 750879, 750880, 750881, 750882, 750883, 750884, 820002, 888506, 888507, 888508, 20681, 20682, 20929, 20684, 20931, 20687, 802192, 802193, 802194, 802904, 802905, 670989, 508439, 508440, 508441, 508442, 508443, 508444, 508445, 508446, 508447, 508450, 508451, 508452, 508453, 508454, 508455, 508521, 508526, 508527, 508528, 508529, 508530, 508531, 508693,

508694, 508695, 508696, 508796, 509079, 509080, 509081, 509082, 509366, 509367, 509368, 675864

Date Coded:	1986/07/15	**Coded By:**	Larry Jones (LDJ)	**Field Check:**	N
Date Revised:	1989/02/23	**Revised By:**	Laura L. Duffett (LLD)	**Field Check:**	N