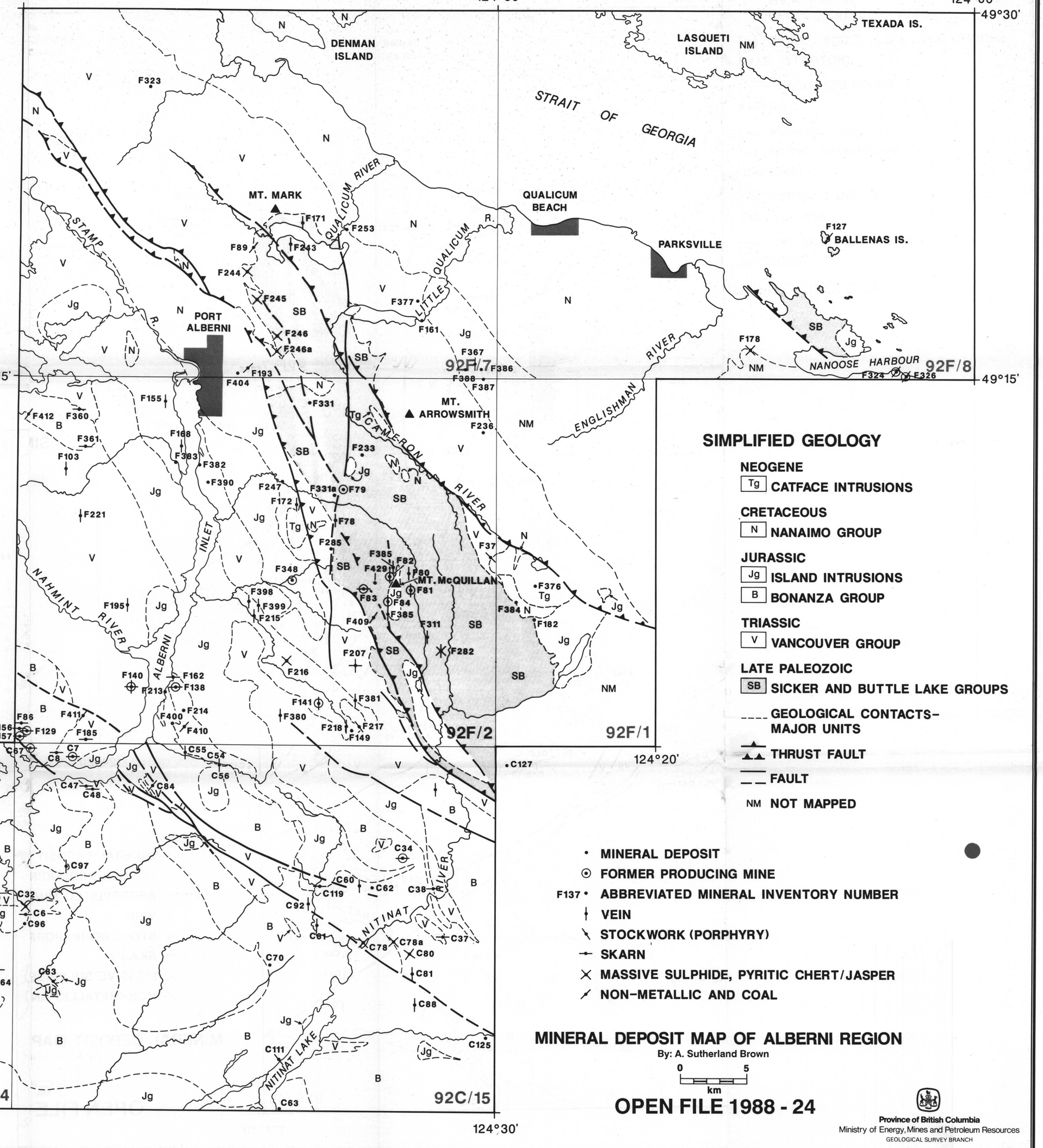
MINERAL DEPOSIT INVENTORY

SHEETS 92C/14 AND 15

MIN. INVENT. #	NAME(S)	METALS
92C/14/33	Mountain	Fe
92C/14/50	Marble Cove	Cu
92C/14/52	Sudbury Pacific	Ni
92C/14/64	Dan	Cu Au
92C/14/66	Santa Maria	Fe
92C/14/82	DA	Mo Cu
92C/14/118	Barkley Sound	non-metallic
92C/15/6	Doer	Fe
92C/15/7	Monitor	Cu Au
92C/15/8	Happy John	Cu Au
92C/15/32	Sarita	Cu Fe
92C/15/34	Nadira	Cu
92C/15/37	Avallin	Cu
92C/15/38	Tanitin	Cu Fe
92C/15/47	Gladys, San Mateo	Cu Au Ag
92C/15/48	Edith	Cu Ag
92C/15/54	Copper King	Cu
92C/15/55	Copper Prince	Cu
92C/15/56	WW	Cu
92C/15/60	Dickson	Ag Pb
92C/15/61	Flora, Jumbo	Ag Cu
92C/15/62	Panther	Cu
92C/15/63	Mal	Cu
92C/15/67	Southern Cross	Cu Ag
92C/15/70	Klanawa, Canyon	Cu
92C/15/78	MJ	Cu
92C/15/78a	?	Cu
92C/15/80	Tam 24, Jasper	Cu Zn Au
92C/15/29	Tam 16, Jasper	Zn Pb Au
92C/15/83	SR, WET	Mo
92C/15/84	Spencer Creek	non-metallic
92C/15/88	Pan	Cu
92C/15/92	Ni	Cu Zn Pb Ag
92C/15/96	Gambler, Omar	Cu Ag
92C/15/97	Bus	Cu Ag
92C/15/111	Fit #2, Marge	Mo
92C/15/119	ABC Summit	Pb Zn Cu Ag
92C/15/125	CR	Cu
92C/15/?	Silvercross	Cu Ag

SHEETS 92F/1,2,7 AND 8

92F/1/182	Skarn	Cu
92F/1/376	Karlsson	Cu
92F/1/384	Villalta	Au
92F/2/37	Specogna Copper, Waterfall	Cu
92F/2/78	Regina	Au
92F/2/79	Victoria, Alberni, Debbie	Au (Ag Cu)
92F/2/80	Golden Eagle	Au
92F/2/81	B & K	Au Ag
92F/2/82	Haviiah	Au Ag Cu Pb
92F/2/83	Thistle	Cu Au Ag
92F/2/84	Black Panther	Au Ag Pb Cu
92F/2/85	Black Lion	Au
92F/2/86	Black Prince	Fe
92F/2/103	Kola	Cu
92F/2/129	Sunshine	Cu Ag Au
92F/2/138	Kitchener	Cu (Au Ag)
92F/2/140	Three Jays	Au Ag Cu
92F/2/141	WWW	Au Ag Pb Cu
92F/2/149	Golden Slipper	Au Ag Cu
92F/2/155	Raven, Stamp, Hoik	Cu Au
92F/2/156	Saucy Lass	Fe Cu
92F/2/157	Cascade	Cu Ag
92F/2/162	Darby and Joan	Fe
92F/2/167	Bank	
92F/2/168	Dauntless	Au Ag Cu
92F/2/172	Grizzly	Au Ag As
92F/2/185	Defiance	Fe Cu Ag
92F/2/195	Contented	Cu
92F/2/207	Mary	Cu Ag Mo Zn
92F/2/213	Union Jack	Cu
92F/2/214	Canadian	Cu
92F/2/215	Star of the West	Au Cu Zn
92F/2/216	Starlight	Au Pb
92F/2/217	Andy	Cu Mo Zn
92F/2/218	Golden Rule	Au Ag Cu Pb
92F/2/221	Rex	Cu (Mo)
92F/2/233	Cop	Cu
92F/2/236	Independent	Cu
92F/2/247	Duke of York	Au
92F/2/282	Kit Kat	Cu Au Ag (Ni Pt)
92F/2/285	Ken	Cu
92F/2/311	Raft	Cu (Au Ag Zn)
92F/2/331	Debbie	Au Cu
92F/2/331a	Debbie, 900 zone	Au
92F/2/348	B D Q	Au Ag Cu
92F/2/360	A North	Cu Fe
92F/2/361	A South	Cu Fe
92F/2/380	Lofstrom	Cu
92F/2/381	Mt. Olsen	Cu Zn
92F/2/382	Campbell	Cu
92F/2/383	BK 136G	Cu
92F/2/385	Sol	Cu Mo
92F/2/390	Mt. Hankin	Cu
92F/2/392	Cor. 14	Au Cu
92F/2/399	Cor. 6	Au Cu
92F/2/400	MOR	Cu
92F/2/409	Mt. Spencer	non-metallic
92F/2/410	Parsons Creek	non-metallic
92F/2/411	Hecate Mtn.	non-metallic
92F/2/412	Sproat	non-metallic
92F/2/429	McQuillan Creek	
92F/7/89	Horne Lake	
92F/7/161	Arrowsmith	Cu Au Ag
92F/7/171	P D	Zn Au Ag
92F/7/193	Port Alberni	non-metallic
92F/7/243	Silver Bell	Sb
92F/7/244	Lacy Lake (iron)	Fe
92F/7/245	Lacy Lake	Mn
92F/7/246	Cameron Lake	Fe Mn
92F/7/246a	Cameron Lake, railway showing	Au
92F/7/253	Qualicum	Cu
92F/7/323	CIH	Au
92F/7/367	Coombs Copper	Cu
92F/7/377	Little Qualicum Falls	Cu
92F/7/386	Skarn	Fe Cu
92F/7/387	Louishman-Maureenah	Fe Cu
92F/7/388	Cup, Ra	Cu
92F/7/404	Rogers Creek	non-metallic
92F/8/127	Ballenas Island	
92F/8/178	Georgina	Au Cu
92F/8/324	Lantzville, slope	
92F/8/326	Lantzville, shaft	



SIMPLIFIED GEOLOGY

NEOGENE

Tg CATFACE INTRUSIONS

CRETACEOUS

N NANAIMO GROUP

JURASSIC

Jg ISLAND INTRUSIONS

B BONANZA GROUP

TRIASSIC

V VANCOUVER GROUP

LATE PALEOZOIC

SB SICKER AND BUTTLE LAKE GROUPS

---- GEOLOGICAL CONTACTS– MAJOR UNITS

THRUST FAULT

FAULT

NM NOT MAPPED

- MINERAL DEPOSIT
- ⊙ FORMER PRODUCING MINE
- F137 • ABBREVIATED MINERAL INVENTORY NUMBER
- VEIN
- STOCKWORK (PORPHYRY)
- SKARN
- MASSIVE SULPHIDE, PYRITIC CHERT/JASPER
- NON–METALLIC AND COAL

MINERAL DEPOSIT MAP OF ALBERNI REGION

By: A. Sutherland Brown

0 5 km

OPEN FILE 1988 - 24

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources
GEOLOGICAL SURVEY BRANCH

MINERAL RESOURCES DIVISION
Geological Survey Branch

MINERAL INVENTORY OF THE ALBERNI REGION VANCOUVER ISLAND, BRITISH COLUMBIA (092C, 092F)

By A. Sutherland Brown

OPEN FILE 1988-24

MINERAL RESOURCES DIVISION
Geological Survey Branch

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INTRODUCTION

"Mineral Inventory of the Alberni Region, Vancouver Island, British Columbia", is the product of an office study undertaken to augment the field mapping program that was part of the LITHOPROBE study of southern Vancouver Island. The study relied mainly on assessment reports, MINFILE and minor incidental field visits. The British Columbia Geoscience Research Grant Program provided funds to support the study.

The LITHOPROBE study of Vancouver Island was initiated to investigate the third dimension in an area with an active subduction zone (Clowes *et al.*, 1984). LITHOPROBE, funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) and Energy, Mines and Resources, Canada, is a coordinated series of geophysical, geological and geochemical investigations undertaken by government, university and industry geoscientists. The Vancouver Island study was conducted in the first years of the project. It was spearheaded by four vibroseismic profiles on southern Vancouver Island with the principal one a transect across the island from near Parksville to Bamfield and one of the others along the Nitinat valley (Yorath *et al.*, 1985). Greater resolution of surface geology and stratigraphy than that provided by existing 1:250 000 scale mapping was needed to interpret these profiles. Hence two years of field mapping was initiated at 1:50 000-scale to provide these data (Sutherland Brown *et al.*, 1986). Although the project expected spin off benefits to accrue to mineral exploration from the improved resolution, no provision was made for studies of the economic geology. This office study evaluates some of the economic potential of the area.

The LITHOPROBE project involved 1:50 000 mapping of the following areas: Little Nitinat River (92C/15), Alberni Inlet (92F/2), Horne Lake (92F/7), the Vancouver Island part of Parksville (92F/8), and parts of Barkley Sound (92C/14) and Nanaimo Lakes (92F/1). This study deals only with areas that were mapped as shown on Figure 1, called the Alberni region for convenience.

HISTORY OF EXPLORATION AND MINING

Exploration and mining in the Alberni region have been highly episodic and mineral developments have varied from episode to episode, partly because of local conditions and partly because of industry-wide trends. Because of ready access by sea, and the existence of harbours and near shoreline exposures, exploration for lode gold, copper and iron was intensive along the Alberni Inlet and China Creek early in British Columbia's lode mining history. Also, the discovery of placer gold during this period on lower China Creek lead to the early exploration in its headwaters. Much exploration took place in the early 1890s leading to typical small scale production of copper and gold between 1898 and 1906 from the Monitor, Southern Cross, Cascade, JJJ, WWW and Victoria claims (*see* Table 1). The copper properties received renewed attention and were placed into production again during the time of high metal prices of World War I (Monitor and Sunshine). Gold exploration in the 1930s resulted in development and production of vein and precious metal-rich skarn deposits at the Victoria, Havilah, Thistle and WWW properties, with some carry over after World War II at the Black Panther.

Widespread exploration for iron and copper skarns along the British Columbia coast in the early 1960s lead to the re-evaluation of the properties along Alberni Inlet and inland at Avallin and eventually to the mining of the Nadira deposit. This exploration cycle evolved into the province-wide search for porphyry copper deposits which, in the Alberni region, was manifest in extensive work between 1965 and 1972 at the Andy, Fit #2, DA and SR (WET) properties. Activity subsided until the 1980s when, kindled by the discovery of the HW volcanogenic massive sulphide deposit at Buttle Lake and fanned by the discovery of the Lara deposit at Mount Brenton, exploration in the upper Sicker Group rocks became intensive. Exploration was beginning to wane until the recently announced discovery of a new type of deposit in the Sicker, the Debbie 900 zone.

Coal prospecting and exploration extended throughout the Nanaimo coal measures in the late 19th Century but significant coal seams were found only along the south shore of Nanoose Bay. The Wellington seam, at the base of the Extension Protection Formation, was developed by a shaft in 1916 and a slope mine in 1921. Production started in 1924 with major output to 1926 and minor output continuing until 1942.

TABLE 1
MINERAL PRODUCTION OF ALBERNI REGION

PRODUCER	MINFILE NUMBER	PRODUCTION YEARS	TONNAGE (t)	AU (g)	AG (g)	CU (Kg)	PB (Kg)
Monitor	092C 009	1900-1901, 1918	1 289	0	0	233 960	
Nadira	092C 034	1960	4 665	0	0	61 929	
Southern Cross	092C 067	1905-1906	290	0	5 132	6 104	
Victoria	092F 079	1898, 1934 1936	365	9 425	1 679	88	
Havilah	092F 082	1936, 1939	949	8 056	43 669	1 925	5 750
Thistle	092F 083	1938-1942	6 283	85 874	65 969	309 088	
Black Panther	092F 084	1947-1948, 1950	1 715	15 832	29 642	226	5 588
Sunshine	092F 129	1916	5		218	869	
Kitchener	092F 138	1929	168	124	653	5 366	
Three Jays	092F 140	1898-1899, 1902	1 981	1 929	75 207	148 889	
W W W	092F 141	1899, 1935, 1940-1941	106	14 650	15 552	244	1 100
Cascade	092F 157	1904-1905	113		3 235	14 629	
B D Q	092F 348	1940	1	62	156	11	
Total			17 930	135 952	241 112	738 328	12 438

COAL PRODUCTION

Lantzville	092F 324	1924-1942	259 528

GEOLOGICAL SUMMARY OF THE ALBERNI REGION

Vancouver Island is a characteristic part of Wrangellian terrane and was most likely fully developed before its accretion to the North American Cordillera. Pre-accretionary Wrangellia is dominated by three thick, discrete volcanic piles separated by thinner platformal sequences and penetrated by a major group of plutons that are consanguineous and substantially coeval with the youngest pile (*see* Figure 1). The tectonic settings of the three superposed volcanic sequences evolved from a primitive marine arc to a marine rift, or back-arc rift, and then to a mature emergent arc (Sutherland Brown and Yorath, 1987). Neither the base nor the top of these superposed piles has been recognized but the measured accumulation is over 12 twelve kilometres.

Rocks of the early marine arc form the Sicker Group of Late Devonian age. These are separable into two thick formations: the Nitinat which is dominated by augite-phyric basaltic andesite agglomerates, and the McLaughlin Ridge which is characterized by volcaniclastic sandstones but also which contains aphiric andesitic pillow lavas or felsic volcanics (*see* Figure 2). The Sicker Group is overlain by Carboniferous and Permian sedimentary strata, the Buttle Lake Group, that resulted from the development of a shallow marine platform. The basal formation is a thinly bedded one, the Cameron River (now called the Fourth Lake Formation), comprised of chert, argillite, sandstone and bioclastic limestone. Overlying it is a massive bioclastic crinoidal limestone, the Mount Mark Formation and above this is a thin unit of sandstone and shale, the St. Mary's Lake Formation.

Minor folding, uplift, erosion and deposition of shales occurred through the Middle-Triassic before the eruption in the Karnian of the Karmutsen Formation, a thick pile composed of uniform ferro-tholeiite. Though of consistent chemistry the Karmutsen is composed of three stratigraphically superposed effusive facies of differing texture, a lower pillow lava member, an intermediate pillow breccia and an upper massive amygdaloidal flow member. In addition there is a hypabyssal suite of sheeted-dykes and sills. This marine rift assemblage is overlain by a late Karnian sedimentary sequence characterized by a mainly shallow water carbonate, the Quatsino Formation. This limestone is in turn overlain by two thin units of Norian age, a flaggy argillite and limestone, the Parson Bay Formation, and a reefoid limestone, the Sutton Formation.

The third pile forms a mature and emerging arc, the Bonanza Group of Early Jurassic age. This consists of a lower, partly marine, fine-grained red felsic tuff, the Redbed Creek facies, and a thick upper facies comprising early pyroclastic andesites grading upwards to subaerially deposited rhyolitic tuffs. The Island intrusions were comagmatic with the Jurassic volcanism but their emplacement and cooling continued beyond the time of eruption.

Post-accretionary sequences in the Alberni region are represented by the sandstone, shale, and conglomerate of the Nanaimo Group of Late Cretaceous age, and mainly by units of the first cycle. These consist of a local conglomerate, the Benson facies, and a more widely distributed sandstone facies of the Comox Formation, overlain by a shale and turbidite unit, the Haslam Formation. The basal part of the second cycle, the Extension Protection Formation, also occurs locally in the region. Plutonism was renewed in the middle to late Paleogene and early Neogene resulting in the emplacement of the Catface intrusions of quartz diorite porphyry.

MINERAL DEPOSIT CLASSIFICATION AND METALLOGENY

The diverse, voluminous and long lasting volcanism, related plutonism, intercalated reactive carbonates, and repeated tectonic activity provided a uniquely fertile environment for metallic mineralization in Wrangellia as a result of the provision of a wealth of sources, conduits and hosts. This fertile environment is attested to by the high density of mineral occurrences in the Insular Belt. In an exposed area of about 50 000 square kilometres (southern Insular Belt), 765 deposits were inventoried in MINFILE (Sinclair *et al.*, 1978). This amounts to 15.4 occurrences per 1000 square kilometres, the highest density of any belt and twice the average for Cordilleran British Columbia. Most of the deposits of this study are of minor importance but they confirm and reinforce the pattern evident for the major deposits.

FIGURE 2

COMPOSITE WRANGELLIAN STRATIGRAPHIC COLUMN, ALBERNI AREA AND PROPOSED NOMENCLATURE

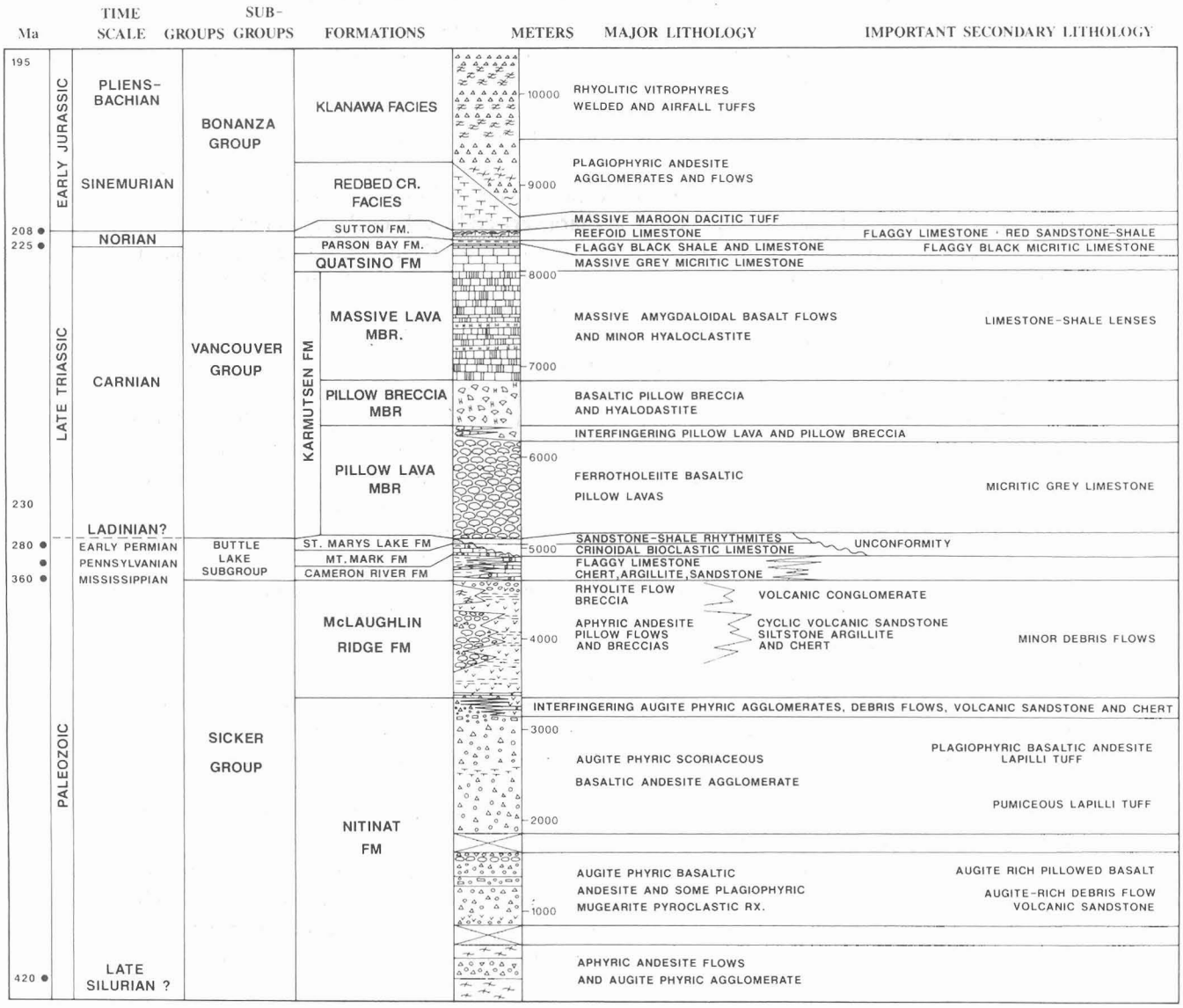

TABLE 2
TABLE OF FORMATIONS

	Symbol	Formation and Facies
Catface Intrusions	Tg	Catface plutons
	KEP	Extension Protection
	KH	Haslam
Nanaimo Group	KC	Comox, sandstone facies
	KCb	Comox, Benson facies
	Jga	felsic plutons
Island Intrusions	Jg	intermediate plutons
	Jgm	mafic and hybrid plutons
	JBi	hypabyssal intrusions
Bonanza Group	JBk	Klanawa facies
	JBr	Redbed Creek facies
	TrS	Sutton
	TrPB	Parson Bay
	TrQ	Quatsino
Vancouver Group	TrKi	hypabyssal intrusions
	TrKc	massive lava members
	TrKb	pillow breccia members
	TrKa	pillow lava members
	PSt.ML	St. Mary's Lake
Buttle Lake Group	PMM	Mount Mark
	PCR	Cameron River (Fourth Lake Formation)
Sicker Group	PMR	McLaughlin Ridge
	PN	Nitinat

The density of mineral occurrences in the Alberni region is nearly twice that of the Insular Belt as a whole (30 per 1000 square kilometres) and the metallogeny is substantially similar to that of the rest of Vancouver Island. Table 3 shows the classification of deposits in the Alberni region, the contained metals, host units, and provides Vancouver Island and local examples in a framework related to pre-accretionary (Wrangellian) or post-accretionary age and syngenetic or epigenetic origin in the broad sense. The following brief descriptions are keyed by numbers (in brackets) to the classification of deposit types in Table 3.

The population of pre-accretionary occurrences and the major deposits consist of iron, copper and zinc sulphides, precious metals, molybdenite and magnetite that occur in volcanic massive sulphide, skarn, porphyry and vein deposits. The common setting of Kuroko-type volcanic massive sulphide deposits (1A) on Vancouver Island is in the upper part of the Sicker Group, in or adjacent to rhyolites of the McLaughlin Ridge or Myra formations. Significant discoveries have not yet been made in the Alberni region. Massive sulphide mineralization occurs within dykes (1B) related to the Karmutsen Formation in several localities. The nature of these occurrences is not greatly different from the sulphide-rich veins or shears (4) present in Karmutsen and Bonanza volcanics. Bedded cherts, that may be ferruginous, pyritic, or manganiferous (2), are common in the McLaughlin Ridge and lower Cameron River formations. Some of these are significantly auriferous and may have an exhalative origin. Deposits of chalcocite, native copper and vanadium minerals in inter-lava calcareous shales, such as occur near Menzies Bay (3), occur in very minor amounts in the upper Karmutsen Formation near Sproat Lake. There are many sulphide ocurrences in vein and shear zones cutting Wrangellian rocks (4). These appear related to the development of the volcanic piles and are weak analogs to volcanic massive sulphide deposits.

The principal settings of skarn deposits (5A) are at or near the triple junction of Karmutsen Formation, Quatsino Formation and Island intrusions, or less commonly the upper Quatsino and Bonanza formations, or the Buttle Lake Group, with plutons. Dyke-like bodies of skarn (5B), slightly removed from the main settings, occur in the Karmutsen and Bonanza formations and the Island intrusions. Small plutons of the Island intrusions are the most common site for porphyry deposits of copper and molybdenum (6A) or molybdenum (6B). Quartz veins occur in Wrangellian rocks without significant distinguishing features (7); some may be related to Jurassic plutonism and others to any of the volcanic episodes.

Post-accretionary syngenetic deposits, apart from non-metallic bedded ones such as coal (8) or limestone (9), are not known in the Alberni region. Post-accretionary epigenetic deposits are mostly quartz veins. Many of these are epigenetic precious metal deposits in Wrangellian rocks, associated with young fault zones and characterized by ferroan-dolomite vein filling and wallrock alteration (10). A few contain arsenic or antimony minerals (11), a characteristic mineralogy in other parts of Vancouver Island. Some of these in the Alberni region occur within the Nanaimo Group, establishing their post-accretionary origin. Also important on Vancouver Island are porphyry copper-molybdenum, copper-gold-silver (molybdenum) or gold-silver deposits in Catface plutons although these are but weakly developed in the Alberni region (12).

A few deposits are difficult to assign to a category in the table and may involve two cycles of mineralization. One such occurrence is a skarn deposit enriched and altered by supergene processes at the Nanaimo unconformity (Villalta), another appears to combine gold-bearing ferruginous bedded chert in schistose Sicker rocks with an auriferous quartz ferroan dolomite stockwork (Debbie 900 zone).

DEPOSIT DISTRIBUTION

Mineral occurrences in the Alberni region do not have a random distribution but, with few exceptions, are clustered into groups of generally similar or related showings. These groups of deposits are evident (*see* Figure 1) and fall fairly naturally into 10 clusters of varying density. The clusters, named informally for reference, from southwest to northeast are as follows:

Pachena Cone cluster, centred about this peak, includes a variety of pre-accretionary deposit types including two of the main porphyry prospects of the region (DA, (C/82); SR, (C/83), as well as an iron skarn at the contact of the Quatsino and Karmutsen formations and an Island intrusion (Doer,

TABLE 3
MINERAL DEPOSIT CLASSIFICATION

Deposit Code	Type Name	Common Metals	Host Units	Vancouver Island Examples	Alberni Region Examples
			PRE-ACCRETIONARY "SYNGENETIC"		
1A	Volcanogenic massive sulphide Kuroko type	Cu,Zn,Ag,Au	PMR	Lynx-Myra-Price HW Lara	?
1B	Dyke type	Cu,Zn,Ag,Au	TrKi		F/246a, Cameron Lake F/83, Thistle, in part
2	Bedded cherts	Au,Fe,Mn	PMR, PCR		F/245, Lacy Lake F/246, Cameron Lake F/331a, Debbie 900 zone, in part
3	Inter-lava copper	Cu,Ag,V	TrKc	Menzies Bay	?
4	Sulphide veins	Cu,Au,Ag	TrK, JB		F/103, Kola C/80, Tam 24, Jasper
			PRE-ACCRETIONARY "EPIGENETIC"		
5A	Skarn, massive replacement	Fe,Cu,Au,Ag	TrQ, TrKc, PMM, PCR, Jg, JB	Kennedy Lake Zeballos Coast Copper	C/08, Happy John C/06, Doer C/34, Nadira
5B	Skarn, veins	Cu,Au,Ag,Fe	TrK, JB	Kingfisher	C/07, Monitor C/67, Southern Cross
6A	Porphyry	Cu,Mo,Au,Ag	Jg, TrK, JB	Island Copper	F/217, Andy C/82, DA
6B	Porphyry	Mo	Jb, JB	?	C/83, SR, WET
7	Quartz-sulphide veins	Cu,Au,Ag	PN to JB		
			POST-ACCRETIONARY "SYNGENETIC"		
8	Coal		KEP, KC	No. 1 mine	F/324, Lantzville mine
9	Limestone		TrQ, PMM	Cobble Hill quarry	F/409, Mt. Spencer
			POST-ACCRETIONARY "EPIGENETIC"		
10	Quartz-ferroan dolomite veins	Au,Ag (Cu,Zn,Pb)	All		F/79, Victoria F/82, Havilah F/331a, Debbie 900 zone, in part
11	Quartz-arsenic veins	As,Sb,Au,Ag	KH, PN	Domineer	F/172, Grizzly F/243, Silverbell
12	Porphyry	Cu,Mo	Tg	Catface	?

C/6), and a vein-like massive sulphide body in a shear in Karmutsen volcanic rocks (Sarita, C/32). The DA porphyry prospect occurs near the northeastern contact of the Westcoast complex in a zone of intensive dyking of hornfelsic Bonanza rocks near Island intrusions. The SR porphyry molybdenum prospect is a circular stockwork zone of quartz-molybdenite veinlets and dry, molybdenite-coated fractures, in felsic Bonanza rocks between two small zoned Island intrusions.

Little Nitinat River cluster, centred on the confluence of the Little Nitinat and Nitinat rivers, includes a variety of pre-accretionary deposits in a loose group, many close to the Harrison Creek fault zone. A small producing mine (Nadira, C/34) and the Avallin prospect (C/37) are representative skarn deposits; the MJ showing (C/78) and occurrence C/78a are massive to disseminated sulphide deposits at the contact of a small Island intrusion with Bonanza rocks; Tam 24 (C/80) is a massive sulphide vein or shear deposit in Bonanza Group rocks, and NI (C/92) is a somewhat similar deposit of massive sulphide lenses in a strand of the Harrison Creek fault. In addition there are numerous simple veins.

Hecate Mountain cluster, at the west entrance to Alberni Inlet, includes closely grouped and related skarn and skarn-vein deposits centred on the characteristic stratigraphy, Island intrusions and cut by major and minor faults. Included are four small mines that produced at the turn of the century, Monitor (C/9), Southern Cross (C/67), Sunshine (F/129) and Cascade (F/157), as well as six similar prospects of the same vintage.

Coleman Creek cluster, opposite the mouth of the Nahmint River, has a similar setting to the Hecate Mountain cluster. Some of the deposits are skarn, such as the former producing mine, Kitchener (F/138), however most are veins, some of which, such as the Three Jays (F/140), contain skarn minerals. The Three Jays was a producing mine with extensive development but modest output.

Corrigan Creek cluster extends along the mafic phase of the pluton centred on Corrigan Creek. Most of the deposits are quartz veins within the pluton, including the former producing mine WWW (F/141), and the Mount Olsen prospect (F/381). A copper-molybdenum porphyry prospect (Andy, F/217) is situated at the southeast end of the pluton within a more felsic phase. The Mary prospect (F/207) is a linear zone of quartz veins and disseminated and massive sulphides in a shear zone cutting the Karmutsen Formation. All these deposits appear to be pre-accretionary, however, at the northwest end of the cluster some veins contain ferroan dolomite, such as is observed at the Star of the West (F/215), Cor 14 (F/398) and Cor 6 (F/399), and so these veins may be younger.

Mount McQuillan cluster occurs in the faulted southern limb of the Cowichan anticlinorium, straddling China Creek. It is a complex cluster including occurrences of both pre and post-accretionary age and of differing characeristics. The area is underlain by felsic volcanics of the McLaughlin Ridge Formation as well as ferruginous cherts, an environment favourable for volcanogenic massive sulphide deposits. However, this group of deposits is dominated by quartz ferroan-dolomite veins along two northerly trending faults, Yellows Creek and McQuillan. These include the former producing mines, Victoria (F/79), Havilah (F/82) and Black Panther (F/84) as well as the prospects Golden Eagle (F/80), B&K (F/81), Black Lion (F/85), Sol (F/385) and part of the Regina (F/78). In addition the cluster includes the unique formerly producing Thistle (F/83) mine, where precious-metal rich copper-skarn ore replaced Buttle Lake Group limestone. Contemporary exploration is concentrated on adjacent sheeted diabase dykes of the Karmutsen Formation that contain lenses of massive sulphide. The Debbie 900 zone (F/331a), which is adjacent to the Yellows Creek fault and the Victoria vein system, also lies within this cluster. The nature of the Debbie 900 zone is not fully understood but it seems to include both auriferous bedded cherts and a ramifying quartz ferroan-dolomite stockwork. High gold assays have been recorded and it is possible that there are two phases of mineralization. The environment at the Regina is similar but no significant occurrence has yet been found. A definite post-accretionary vein of arsenopyrite with precious metals (Grizzly, F/172) occurs at the base of the Patlicant Catface pluton in the Haslam shales along a strand of the Cowichan Lake fault zone.

Labour Day Lake cluster, a small one, centred on the lake and the Catface pluton of the same name, includes some diverse and enigmatic deposits. These include the Skarn (F/182) at the contact of the Cameron River Formation with the Skarn pluton of the Island intrusions, Villalta (F/384) and Specogna Copper (F/37). The latter is a vein shear at the base of the thick sill-like Catface pluton but within the Karmutsen Formation. Villalta is a complex deposit that has elements of a skarn replacing Cameron River limestone but the main showing is a lens of auriferous hematite at the Nanaimo unconformity and may represent supergene enrichment of the original skarn.

Stamp Point cluster, on both sides of the inlet near Alberni was explored mostly at the turn of the century. It consists of a small group of copper-bearing quartz veins with some gold, in the Karmutsen Formation. Included are the Raven (F/155), Dauntless (F/168), Campbell (F/382), BK 136G (F/383) and Mount Hankin (F/390) occurrences.

French Creek cluster, northeast of Mount Arrowsmith, is a tight group of copper-bearing veins and vein-like skarn deposits in the Nanaimo Lakes pluton and adjacent Karmutsen Formation. Included are the Coombs Copper (F/367), Skarn (F/386), Louishman-Maureenah (F/387) and Cup (F/388) prospects.

Lacy Lake cluster occurs on the upland between Alberni and Horne Lake, on the west flank of the plunging nose of the Cowichan anticlinorium, within the McLaughlin Ridge and Cameron River formations. The occurrences are mostly ferruginous or manganiferous bedded cherts, some of which contain some gold. Included are the Lacy Lake iron (F/244), Lacy Lake manganese (F/245) and Cameron Lake (F/246) occurrences. The Cameron Lake railway showing (F/246a) in the same cluster is a massive sulphide lens within the Karmutsen diabase sheeted-dyke system. Nearer Horne Lake is a probable post-accretionary deposit, Silver Bell (F/243), which is a quartz-stibnite vein in the Nitinat Formation.

Relatively few deposits that have seemed important enough to receive extensive exploration occur outside the ten clusters. One is the Fit #2 (C/111) which is a molybdenum porphyry at the northwest end of Nitinat Lake. It is fracture and veinlet stockwork centred on a small pluton and dykes of the Island intrusions in Bonanza rhyolite. Another is the Georgina (F/324) near Nanoose Creek, which consists of a number of small massive sulphide showings and quartz veins in the upper Sicker Group. A third is A North (F/360) near Sproat Lake on Arbutus Summit, a copper-iron skarn deposit in Quatsino limestone and Karmutsen basalt. A fourth is Kola (F/103) which is a massive sulphide lens in a shear in the Karmutsen Formation.

The highly clustered distribution of known deposits in the Alberni region is only partly explicable. Such non-random distribution is fairly typical of terrains of varied stratigraphy and structure and can be attributed in part to the non-random distribution of favourable hosts, heat sources and structures. Other factors affecting the uneven distribution of known deposits include accessibility, and the depth and nature of unconsolidated cover. Beyond this there is still a fundamental problem of clustered distribution that would probably seem more explicable with greater knowledge of the third dimension, the main objective of LITHOPROBE.

The influence of favourable geology is best illustrated by the cluster of copper and iron skarn deposits on Hecate Mountain where the factors necessary for their development exist, namely a reactive carbonate host, nearby plutons in digestive contact with iron and copper-rich volcanic sources as well as many pre-ore faults. Similarly the Mount McQuillan cluster has some characteristics that help explain its existence. These include the presence of McLaughlin Ridge Formation with integral felsic volcanic and exhalative cherts, small Island intrusions that may have had a role in the reconcentration of metals, and two important northerly trending faults that may have acted as late conduits and depositional sites. However, many of these conditions also exist on the northern part of the Cowichan anticlinorium without the same density of deposits.

The influence of deep transported soils, gentle relief, sparse outcrop and poor road access in accenting the apparent clustered distribution is evident in the southern part of the Little River area between Frederick and Nitinat lakes where there is a paucity of recorded occurrences.

ANALYSIS

The majority of metallic deposits in the Alberni region are veins, some 55 per cent compared to 26 per cent skarns, 9 per cent massive sulphide related lenses or shears, 4 per cent porphyries and 6 per cent unknown or complex (*see* Table 4). Subjective judgement was used to assign a classification deposit type as well as to divide the types between multiple hosts. Nevertheless Table 4 shows the Karmutsen Formation is the commonest host unit (29 per cent) although the deposits discovered in it so far have been relatively unimportant. The Bonanza Group and Island intrusions both host 19 per cent of occurrences, the Sicker Group 17.5 per cent, the Quatsino Group 12 per cent, the Buttle Lake Group 3 per cent and the Nanaimo Group 1 per cent.

The veins in the Alberni region are not a single related family but form at least three groups of different character, age and origin. Most common (39 per cent of all occurrences) are crosscutting and fissure-filling quartz veins with weak wallrock alteration and few distinctive features. Mineralogy is variable but sulphides are a minor constituent; pyrite and chalcopyrite are most common and may be auriferous. These are found in all Wrangellian units, particularly Karmutsen and Bonanza volcanics and many are within or adjacent to Island intrusions. Just as many are remote from these plutons and they could occur in any cooling volcanic pile.

A second group of sulphide-rich veins (some 8 per cent of all deposits) are dominated by pyrite and pyrrhotite with lesser quartz, commonly as stringers. Chalcopyrite and lesser sphalerite and galena are normally present. These veins are closely associated with volcanic rocks and form in any of the piles, quite commonly within minor shear zones. Their general nature and physical association with the volcanic rocks is probably indicative of their origin. In some respects they could be considered weakly developed volcanic massive sulphide deposits.

The third group (8 per cent) are quartz ferroan-dolomite veins. These commonly have extensive orange-red weathering wallrock alteration as well as ferroan-dolomite vein fillings. Quartz filling frequently forms shoots and these may display a ribbon texture believed to be indicative of incremental secular movement during vein formation. Sulphides form a few to 10 per cent of the veins and may be auriferous. These veins are closely associated with the Late Cretaceous and Early Tertiary fault systems, both the northwesterly striking thrusts and the later vertical northerly trending wrenches. They are believed to represent dewatering of the subducting Juan de Fuca plate (Fyfe *et al.*, 1987).

Skarns are the second most common deposit type in the region and the most common type of formerly producing metal mines (7 of 13). The common model of coastal skarn deposits (15), described previously, is generally applicable in the area, modified only in the more common occurrence of skarn veins, especially in Bonanza hosts, and the occurrence of a moderately important deposit, Thistle, in the Buttle Lake Group.

The volcanogenic massive sulphide deposits (in the broad sense) occur in all volcanic suites but most commonly in the Sicker Group. The deposits included are all somewhat aberrant and Kuroko-type massive sulphides have yet to be discovered in the Alberni region. The commonest occurrences are auriferous cherts, which may have an exhalative origin, occur principally in the McLaughlin Ridge Formation and possibly at the base of the Cameron River Formation. Also included are the occurrences of massive sulphides in diabase dykes of the Karmutsen Formation. If the sulphide-rich veins are included, the distribution between the three volcanic piles becomes fairly even (Sicker and Cameron River, 8.5; Karmutsen, 4.5; Bonanza, 7.5).

Porphyry deposits are relatively uncommon (4) and uneconomic at present, but because of their large size potentially they are important. Three of them occur in Bonanza felsic volcanics intruded by cogenetic Island intrusions, the Island Copper model, whereas the other occurs in a more felsic phase of a mafic Island intrusion that cuts Karmutsen rocks. Catface porphyries have not been discovered.

The complex deposits are enigmatic and seemingly each involves multiphase mineralization. The potentially very important Debbie 900 zone appears to be a high-grade gold deposit that combines original auriferous McLaughlin Ridge cherts cut, and possibly upgraded, by a quartz ferroan-dolomite stockwork close to the Yellows Creek fault and the Victoria veins. The Villalta deposit appears to combine a skarn, developed in the Cameron River Formation, with supergene enrichment during the tropical weathering which preceded the deposition of the Comox Formation.

TABLE 4
MATRIX OF DEPOSIT TYPE AND HOST UNIT

Deposit Type	Sicker	Buttle Lake	Karmutsen	Quatsino	Bonanza	Island Intrusions	Nanaimo	Total	Per Cent
Vein-Q	2	1	18.5	0	9	13	0	43.5	39.2
Vein-S	1.5	0	3	0	4	0.5	0	9.0	8.1
Vein-A	7	0	0	0	0	1	1	9.0	8.1
Skarn	0	1.5	9	13	3.5	2	0	29.0	26.1
VMS	2	0	0	0	2	0	0	4.0	3.6
Dyke MS	0	0	1.5	0	0	0	0	1.5	1.4
Chert	4	1	0	0	0	0	0	5.0	4.5
Porphyry	0	0	0	0	1.5	2.5	0	4.0	3.6
Complex	2	0	0	0	0	0	0	2.0	1.8
Unknown	1	0	0	0	1	2	0	4.0	3.6
TOTAL	20	3.5	32.0	13.0	21.0	21.0	1.0	111.0	
PER CENT	17.6	3.2	28.8	11.7	18.9	18.9	0.9		

CONCLUSIONS

The mineral deposit types described as occurring in the Alberni region have varied importance and probability of discovery or development. Of first importance are volcanic massive sulphide, auriferous cherts and auriferous quartz ferroan-dolomite veins and stockworks. Of secondary importance are skarn and porphyry deposits, important because they offer the possibility of significant size and (if they are auriferous), grade. The commonest deposits, quartz veins, are interesting chiefly as pathfinders but also as sources of precious metals. Sulphide veins and massive sulphides in dykes are unlikely in themselves to be large enough to excite interest but again might be useful as guides. An outside possibility exists of finding paleo-epithermal deposits in the Bonanza rhyolites.

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APPENDIX 1

INVENTORY OF MINERAL DEPOSITS IN THE ALBERNI REGION

The inventory covers the areas mapped for the LITHOPROBE project during 1984-1985. Mineral resource studies were only an incidental part of this project and deposits were not specifically visited in the field. This inventory depends mainly on the following information sources: geological mapping by the author, the British Columbia Geological Survey Branch mineral inventory, MINFILE, assessment reports, Annual Reports of the Minister of Mines, GEM, and the Northern Miner and other journals. Citing references would greatly add to the text and most are internal to the Survey so that only pertinent Assessment Reports are included.

The LITHOPROBE project involved the following areas mapped at 1:50 000 scale: Little Nitinat River (92C/15), Alberni Inlet (92F/2), Horne Lake (92F/7), the Vancouver Island part of Parksville (92F/8), and parts of Barkley Sound (92C/14) and Nanaimo Lakes (92F/1). The inventory deals only with the areas mapped (*see* Figure 1) and is in two lists, one for each NTS sheet. The listing is in alpha-numerical order by map sheet from 92C/14 (Barkley Sound) to 92F/8 (Parksville) and within each area by MINFILEnumber. Hence 92C/82 in Barkley Sound precedes 92C/34 in Little Nitinat River. The normal MINFILE number is augmented by the 1:50 000 sheet number.

Abbreviations are used for metals, minerals and exploration methods. Abbreviations for geological units are those used in Table 2 of Formations, in the text minerals from the the following two-letter code:

as	-	arsenopyrite	mo	-	molybdenite
Au	-	gold	mt	-	magnetite
bn	-	bornite	po	-	pyrrhotite
cp	-	chalcopyrite	py	-	pyrite
gl	-	galena	sb	-	stibnite
hm	-	hematite	sl	-	sphalerite
iv	-	ilvaite	tg	-	thurginite

MINERAL INVENTORY

NTS SHEET 92C

MINFILE NO.:	092C 033	**NTS MAP:** 092/C14
NAME(S):	Mountain	
RECORD NO.:	01	
DEPOSIT TYPE:	skarn	
HOST UNIT:	TrQ and Jg	
GEOL. FEATURES:	Irregular lenses of magnetite in inclusions and breccia of calcsilicate and marble of Quatsino Fm. in Island intrusions and near significant Quatsino outcrop.	
METALS:	Fe	
MINERALS:	mt	
WORKINGS:	30 m adit	
PRODUCTION:	0	

MINFILE NO.:	092C 050	**NTS MAP:** 092C/14
NAME(S):	Marble Cove	
RECORD NO.:	02	
DEPOSIT TYPE:	skarn	
HOST UNIT::	TrQ inlier in Jg	
GEOL. FEATURES:	Irregular lenses of calcsilicate with chalcopyrite and sulphide-bearing dyke in Island intrusions near Quatsino marble.	
METALS:	Cu	
MINERALS:	cp, mt, po	
PRODUCTION:	0	

MINFILE NO.:	092C 052	**NTS MAP:** 092C/14
NAME(S):	Sudbury Pacific	
RECORD NO.:	03	
DEPOSIT TYPE:	sulphide-bearing shear	
HOST UNIT::	Jgm	
GEOL. FEATURES:	Shear with some small sulphide lenses.	
METALS:	Ni	
MINERALS:	po, as	
PRODUCTION:	0	

MINFILE NO.:	092C 064	**NTS MAP:** 092C/14
NAME(S):	Dan	
RECORD NO.:	04	
ASST. REPT. NO.:	9509	
DEPOSIT TYPE:	skarn and vein?	
HOST UNIT:	TrQ and JB	
GEOL. FEATURES:	Shattered pyritic shears in Bonanza Gr. with minor limestone at the base, possibly Quatsino; near Westcoast complex.	
METALS:	Cu, Au	
MINERALS:	py, po, mt, cp	
EXPLORATION:	mapping, soil geochem	
PRODUCTION:	0	

MINFILE NO.:	092C 066	**NTS MAP:** 092C/14
NAME(S):	Santa Maria	
RECORD NO.:	05	
DEPOSIT TYPE:	magmatic vein?	
HOST UNIT:	WCC	

GEOL. FEATURES: A vein in mafic phase of the Westcoast complex.
METALS: Fe
MINERALS: mt, po, py
WORKINGS: small shaft
PRODUCTION: 0

MINFILE NO.: 092C 082 **NTS MAP:** 092C/14
NAME(S): DA
RECORD NO.: 06
ASST. REPT. NO.: 3794
DEPOSIT TYPE: porphyry, stockwork
HOST UNIT: Jg and JB
GEOL. FEATURES: Island intrusion dyke complex at the edge of the Westcoast complex intruding Bonanza pyroclastic rocks.
METALS: Mo, Cu
MINERALS: py, mo, cp
EXPLORATION: mapping, soil geochem, IP
PRODUCTION: 0

MINFILE NO.: 092C 118 **NTS MAP:** 092C/14
NAME(S): Barkley Sound
RECORD NO.: 07
DEPOSIT TYPE: metamorphosed bedded
HOST UNIT: TrQ
GEOL. FEATURES: Marbleized inlier of Quatsino limestone in Westcoast complex?
METALS: non-metallic
MINERALS: calcitic marble
PRODUCTION: 0

MINFILE NO.: 092C 006 **NTS MAP:** 092C/15
NAME(S): Doer
RECORD NO.: 08
ASST. REPT. NO.: 5472, 9505
DEPOSIT TYPE: skarn
HOST UNIT: TrQ, TrK and Jg
GEOL. FEATURES: A lens of magnetite some 40 by 20m occurs at contact of Quatsino limestone and Karmutsen greenstone near Island intrusions. Only 100m from Sarita showing (92C/15/032).
METALS: Fe (Cu, Zn)
MINERALS: mt, po, py, cp, sl
EXPLORATION: mapping, mag, EM, soil geochem, perc. dh 646 m, ddh 289 m
WORKINGS: adit and crosscuts, ca. 85 m development
PRODUCTION: 0

MINFILE NO.: 092C 007 **NTS MAP:** 092C/15
NAME(S): Monitor
RECORD NO.: 09
ASST. REPT. NO.: 15199
DEPOSIT TYPE: skarn
HOST UNIT: TrQ and TrK near Jg

GEOL. FEATURES:	Three separate vein-like skarn bodies, at least one of which is a vein in Karmutsen. Others may be associated with Quatsino or Karmutsen limestone.
METALS:	Cu, Au
MINERALS:	cp, mt, py, po
EXPLORATION:	mapping, mag
WORKINGS:	3 adits and at least 300 m of underground development
PRODUCTION:	1900-1901, 1918; 1289 tonnes, Cu 233 960 kg

MINFILE NO.:	092C 008	**NTS MAP:** 092C/15
NAME(S):	Happy John	
RECORD NO.:	10	
ASST. REPT. NO.:	15199	
DEPOSIT TYPE:	skarn	
HOST UNIT:	TrQ and TrK	
GEOL. FEATURES:	Mineralization developed mainly at Quatsino-Karmutsen contact.	
METALS:	Cu, Au	
MINERALS:	cp, py, mt	
EXPLORATION:	mapping, mag	
WORKINGS:	3 adits	
PRODUCTION:	0	

MINFILE NO.:	092C 032	**NTS MAP:** 092C/15
NAME(S):	Sarita	
RECORD NO.:	11	
ASST. REPT. NO.:	5472, 7943, 9509	
DEPOSIT TYPE:	massive sulphide	
HOST UNIT:	TrK	
GEOL. FEATURES:	Lens of massive sulphide along a shear in Karmutsen greenstone normal to an important easterly fault. The shear trends toward the Doer (92C/15/006) magnetite skarn deposit about 100m away.	
METALS:	Cu, Fe, Zn	
MINERALS:	cp, py, po, as, sl	
EXPLORATION:	mapping, mag, EM, soil geochem, perc. and ddh	
WORKINGS:	70 m adit and crosscuts	
PRODUCTION:	0	

MINFILE NO.:	092C 034	**NTS MAP:** 092C/15
NAME(S):	Nadira	
RECORD NO.:	12	
ASST. REPT. NO.:	291, 4105	
DEPOSIT TYPE:	skarn	
HOST UNIT:	JB	
GEOL. FEATURES:	Skarn developed near the base of the Bonanza Gr. with some thin limestone, possibly Quatsino, near Island intrusions and cut by peripheral dykes. Iron is present as the unusual mineral ilvaite with actinolite and garnet.	
METALS:	Cu	
MINERALS:	cp, py, iv	
EXPLORATION:	ca. 4000 m ddh in 1942, 1956	
WORKINGS:	small open pit	
PRODUCTION:	1960; 4665 tonnes, Cu 61 929 kg	

MINFILE NO.:	092C 037	**NTS MAP:** 092C/15
NAME(S):	Avallin	
RECORD NO.:	13	
ASST. REPT. NO.:	12434, 48526	
DEPOSIT. TYPE:	Skarn	
HOST UNIT:	TrK, TrPB/TrQ	
GEOL. FEATURES:	Skarn developed at the faulted crest of a small anticline cored by Karmutsen Fm. with the mineralization in Quatsino and Parson Bay limestone and Bonanza tuff.	
METALS:	Cu	
MINERALS:	py, cp, iv, gt	
EXPLORATION:	mapping, mag, soil geochem, 300 m ddh in 1956	
PRODUCTION:	0	

MINFILE NO.:	092C 038	**NTS MAP:** 092C/15
NAME(S):	Tanitin	
RECORD NO.:	14	
ASST. REPT. NO.:	11950	
DEPOSIT TYPE:	skarn	
HOST UNIT:	TrK and Jg	
GEOL. FEATURES:	Skarn developed at the contact of the Karmutsen Gr. and Island intrusions.	
METALS:	Cu, Fe	
MINERALS:	cp, mt	
EXPLORATION:	ca. 300 m ddh	
PRODUCTION:	0	

MINFILE NO.:	092C 047	**NTS MAP:** 092C/15
NAME(S):	Gladys, San Mateo	
RECORD NO.:	15	
ASST. REPT. NO.:	9761	
DEPOSIT TYPE:	skarn	
HOST UNIT:	TrQ inclusions in Jg	
GEOL. FEATURES:	Large blocks of Quatsino limestone in the northern contact of the Sarita pluton contain areas of skarn. Similar to the Edith (92C/15/048).	
METALS:	Cu, Au, Ag	
MINERALS:	cp, mt	
EXPLORATION:	mapping	
PRODUCTION:	0	

MINFILE NO.:	092C 048	**NTS MAP:** 092C/15
NAME(S):	Edith	
RECORD NO.:	16	
ASST. REPT. NO.:	9761	
DEPOSIT TYPE:	skarn	
HOST UNIT:	TrQ inclusions in Jg	
GEOL. FEATURES:	Skarn developed at contact of large blocks of limestone with the north end of the Sarita pluton.	
METALS:	Cu, Ag	
MINERALS:	cp	
PRODUCTION:	0	

MINFILE NO.: 092C 054 **NTS MAP:** 092C/15
NAME(S): Copper King
RECORD NO.: 17
DEPOSIT TYPE: vein
HOST UNIT: JB
GEOL. FEATURES: Showing at the base of the Bonanza Gr. consists of a 2+m wide vein of pyrrhotite and skarn minerals with chalcopyrite lenses.
METALS: Cu
MINERALS: cp, po
PRODUCTION: 0

MINFILE NO.: 092C 055 **NTS MAP:** 092C/15
NAME(S): Copper Prince
RECORD NO.: 18
DEPOSIT TYPE: vein
HOST UNIT: JB and Jg
GEOL. FEATURES: A narrow vein is contained in a dyke(?) of granodiorite in Bonanza Fm.
METALS: Cu
MINERALS: cp, py, po
PRODUCTION: 0

MINFILE NO.: 092C 056 **NTS MAP:** 092C/15
NAME(S): WW
RECORD NO.: 19
DEPOSIT TYPE: vein
HOST UNIT: JB and TrPB
GEOL. FEATURES: A thin vein occurs in an easterly trending shear between Bonanza andesite and limy shales of the Parson Bay Fm.
METALS: Cu
MINERALS: cp, py, po
PRODUCTION: 0

MINFILE NO.: 092C 060 **NTS MAP:** 092C/15
NAME(S): Dickson
RECORD NO.: 20
DEPOSIT TYPE: vein
HOST UNIT: JB
GEOL. FEATURES: Small quartz vein with pyrite and galena occur in Bonanza Fm.
METALS: Ag, Pb
MINERALS: py, gl
WORKINGS: small adit
PRODUCTION: 0

MINFILE NO.: 092C 061 **NTS MAP:** 092C/15
NAME(S): Flora, Jumbo
RECORD NO.: 21
ASST. REPT. NO.: 11143
DEPOSIT TYPE: vein
HOST UNIT: JB
GEOL. FEATURES: Several northeasterly striking quartz pyrrhotite veins and mineralized shears occur in metamorphosed Bonanza Fm.

METALS: Ag, Cu
MINERALS: po, py, cp
PRODUCTION: 0

MINFILE NO.: 092C 062 **NTS MAP:** 092C/15
NAME(S): Panther
RECORD NO.: 22
DEPOSIT TYPE: ?
HOST UNIT: JB
METALS: Cu
MINERALS:
PRODUCTION: 0

MINFILE NO.: 092C 063 **NTS MAP:** 092C/15
NAME(S): Mal
RECORD NO.: 23
DEPOSIT TYPE: vein
HOST UNIT: Jg
GEOL. FEATURES: A northwesterly 7 m wide fault zone contains lenses of sulphides up to 0.6m wide.
METALS: Cu
MINERALS: cp, py, sl, tg
EXPLORATION: soil geochem
PRODUCTION: 0

MINFILE NO.: 092C 067 **NTS MAP:** 092C/15
NAME(S): Southern Cross
RECORD NO.: 24
ASST. REPT. NO.: 15199
DEPOSIT TYPE: skarn
HOST UNIT: TrQ, JB and Jg dykes
GEOL. FEATURES: Skarn mineralization seems restricted to vein-like bodies in Bonanza Fm. with granitic and diabase dykes.
METALS: Cu, Ag
MINERALS: cp, py
WORKINGS: several adits
PRODUCTION: 1905-1906; 290 tonnes, Cu 6104 kg, Ag 5132 g

MINFILE NO.: 092C 070 **NTS MAP:** 092C/15
NAME(S): Klanawa, Canyon
RECORD NO.: 25
DEPOSIT TYPE: veins and disseminations
HOST UNIT: JB and Jg
GEOL. FEATURES: Deposit in a broad pyritic and argillically altered contact zone of Sarita pluton with Bonanza Gr.
METALS: Cu
MINERALS: cp
PRODUCTION: 0

MINFILE NO.: 092C 078 **NTS MAP:** 092C/15
NAME(S): MJ
RECORD NO.: 26
DEPOSIT TYPE: massive sulphide
HOST UNIT: JB and Jg

GEOL. FEATURES: A body of silicified and pyritized rock at the contact of Bonanza and a small hybrid and mafic pluton and on the probable extension of the Harrison Creek fault.

METALS: Cu
MINERALS: py, po, cp
PRODUCTION: 0

MINFILE NO.: 092C 078a **NTS MAP:** 092C/15
NAME(S): ?
RECORD NO.: 27
DEPT. TYPE: massive sulphide
HOST UNIT: JB and Jgm
GEOL. FEATURES: A small body of massive and disseminated sulphides at the contact of a small mafic pluton but chiefly in Bonanza rocks. Showing covered by claims but not named or inventoried.

METALS: Cu
MINERALS: py, po, cp
PRODUCTION: 0

MINFILE NO.: 092C 080 **NTS MAP:** 092C/15
NAME(S): Tam 24, Jasper
RECORD NO.: 28
ASST. REPT. NO.: 13916
DEPOSIT TYPE: massive sulphide
HOST UNIT: JB
GEOL. FEATURES: The main showing on the Jasper claims consists of massive to disseminated sulphides with some quartz stringers across 28m in felsic tuffs and breccias of the Bonanza Gr.

METALS: Cu, Zn, Au
MINERALS: py, cp, sl
EXPLORATION: mapping, soil geochem, EM, 4 ddh
PRODUCTION: 0

MINFILE NO.: 092C 081 **NTS MAP:** 092C/15
NAME(S): Tam 16, Jasper
RECORD NO.: 29
ASST. REPT. NO.: 13916
DEPOSIT TYPE: vein shear
HOST UNIT: JB
GEOL. FEATURES: Disseminated sulphides and quartz filled breccia zones occur in sheared felsic Bonanza tuffs and breccias.

METALS: Zn, Pb, Zu
MINERALS: py, sl, gl
EXPLORATION: mapping, soil geochem, EM, ddh
PRODUCTION: 0

MINFILE NO.: 092C 083 **NTS MAP:** 092C/15
NAME(S): SR, WET
RECORD NO.: 30
ASST. REPT. NO.: 5772, 7927
DEPOSIT TYPE: porphyry
HOST UNIT: Jg and JB
GEOL. FEATURES: A small differentiated Island intrusion, quartz diorite with hybrid borders and quartz monzonite cores, intrudes felsic

pyroclastic rocks of the Bonanza Gr. and is cut by northeasterly trending Bonanza-type dykes and later northwesterly faults. An irregular zone of silicification, qtz-py and qtz-mo veinlets with a higher grade core (400m diameter) is centred between the pluton and smaller boss.

METALS: Mo
MINERALS: py, mo
EXPLORATION: mapping, mag, IP, silt and soil geochem, ddh 775 m
PRODUCTION: 0

MINFILE NO.: 092C 084 **NTS MAP:** 092C/15
NAME(S): Spencer Creek
RECORD NO.: 31
DEPOSIT TYPE: bedded
HOST UNIT: TrQ
GEOL. FEATURES: A bluff of Quatsino limestone occurs adjacent to an Island intrusion.
METALS: non-metallic
MINERALS: calcite
PRODUCTION: 0

MINFILE NO.: 092C 088 **NTS MAP:** 092C/15
NAME(S): Pan
RECORD NO.: 32
DEPOSIT TYPE: vein
HOST UNIT: JB
METALS: Cu
MINERALS: py, cp
PRODUCTION: 0

MINFILE NO.: 092C 092 **NTS MAP:** 092C/15
NAME(S): NI
RECORD NO.: 33
ASST. REPT. NO.: 13706
DEPOSIT TYPE: vein shear
HOST UNIT: JB and Jgm sill
GEOL. FEATURES: A gossanous shear zone, part of the Harrison Creek fault zone, and nearby areas, contain disseminated sulphides and small lenses of massive sulphides. The fault cuts andesitic and felsic Bonanza pyroclastic rocks that have been argillically altered and intruded by dykes.
METALS: Cu, Zn, Pb, Ag
MINERALS: py, cp, sl, gl
EXPLORATION: mapping, soil geochem
PRODUCTION: 0

MINFILE NO.: 092C 096 **NTS MAP:** 092C/15
NAME(S): Gambler, Omar
RECORD NO.: 34
ASST. REPT. NO.: 5470
DEPOSIT TYPE: skarn?
HOST UNIT: TrQ?
GEOL. FEATURES: Near the Doer, no information.
METALS: Cu, Ag

MINERALS: cp
PRODUCTION: 0

MINFILE NO.: 092C 097 **NTS MAP:** 092C/15
NAME(S): Bus
RECORD NO.: 35
ASST. REPT. NO.: 4357, 8719
DEPOSIT TYPE: vein shear, skarn
HOST UNIT: JB
GEOL. FEATURES: Many small showings of sulphide veins, commonly in shear zones, and some vein-like skarn mineralization occur within andesitic and felsic Bonanza rocks.
METALS: Cu, Ag
MINERALS: cp, py, po, mt
EXPLORATION: mapping, soil geochem, EM
PRODUCTION: 0

MINFILE NO.: 092C 111 **NTS MAP:** 092C/15
NAME(S): Fit NO.2, Marge
RECORD NO.: 36
ASST. REPT. NO.: 9182, 13849
DEPOSIT TYPE: porphyry, stockwork
HOST UNIT: JB and Jg dykes
GEOL. FEATURES: Bonanza rhyolitic tuffs and breccias are cut by small Island intrusions, mainly dykes, and show hydrothermal alteration and silicification adjacent to quartz pyrite vein stockwork with minor molybdenite over an area of 300 by 400m in the intrusive rocks.
METALS: Mo
MINERALS: py, mo
EXPLORATION: mapping, soil geochem, mag, EM, IP, ddh
PRODUCTION: 0

MINFILE NO.: 092C 119 **NTS MAP:** 092C/15
NAME(S): ABC Summit
RECORD NO.: 37
DEPOSIT TYPE: skarn
HOST UNIT: JB and Jg
GEOL. FEATURES: A pyritic skarn at the contact of Bonanza Gr. and the south end of the Corrigan Creek pluton.
METALS: Pb, Zn, Cu, Ag
MINERALS: sl, gl, cp, py
PRODUCTION: 0

MINFILE NO.: 092C 125 **NTS MAP:** 092C/15
NAME(S): CR
RECORD NO.: 38
DEPOSIT TYPE: skarn
HOST UNIT: TrK, TrQ and Jg
GEOL. FEATURES: The showing is in the Quatsino and top of the Karmutsen intruded by Island intrusion and on the projection of the Harrison Creek fault.
METALS: Cu, Ag, Au
MINERALS: cp, mt, py

EXPLORATION: mapping, mag, EM, soil geochem
PRODUCTION: 0

MINFILE NO.: 092C ? **NTS MAP:** 092C/15
NAME(S): Silvercross
RECORD NO.: 39
ASST. REPT. NO.: 15958
DEPOSIT TYPE: vein
HOST UNIT: JB
GEOL. FEATURES: A quartz-epidote-calcite vein occurs in Bonanza Gr.
METALS: Cu, Ag
MINERALS: cp, bn, mal
EXPLORATION: mapping
PRODUCTION: 0

MINERAL INVENTORY

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MINFILE NO.:	092F 182	**NTS MAP:** 092F/1
NAME(S):	Skarn	
RECD NO.:	01	
ASST. REPT. NO.:	6585, 8487	
DEPOSIT. TYPE:	skarn	
HOST UNIT:	PCR at contact Skarn pluton	
GEOL. FEATURES:	A skarn developed at the contact of the Cameron River limestone and the Skarn pluton adjacent to the Nanaimo unconformity.	
METALS:	Cu	
MINERALS:	cp, py, po, sl	
EXPLORATION:	mapping, soil geochem, 14 ddh totaling 3187 m	
PRODUCTION:	0	

MINFILE NO.:	092F 376	**NTS MAP:** 092F/1
NAME(S):	Karlsson	
RECORD NO.:	02	
ASST. REPT. NO.:	8571	
DEPOSIT TYPE:	vein	
HOST UNIT:	TrK by Labour Day L. pluton	
GEOL. FEATURES:	Mineral Inventory inaccurate.	
METALS:	Cu, Au, Zn	
MINERALS:	cp, sl	
EXPLORATION:	mag, EM, soil geochem	
PRODUCTION:	0	

MINFILE NO.:	092F 384	**NTS MAP:** 092F/1
NAME(S):	Villalta	
RECORD NO.:	03	
ASST. REPT. NO.:	7792, 10789, 13236	
DEPOSIT TYPE:	complex	
HOST UNIT:	Cameron River Fm.+	
GEOL. FEATURES:	Lens of auriferous hematite in thinly bedded limestone, chert and argillite with evidence of skarn mineralization at or near the Nanaimo unconformity, and also the contact of both Island and Catface plutons.	
METALS:	Au, Fe	
MINERALS:	py, po, Au, hm, cp, bn, sl	
EXPLORATION:	numerous short dd holes (400 m), soil geochem, VLF	
WORKINGS:	0	
PRODUCTION:	0	

MINFILE NO.:	092F 037	**NTS MAP:** 092F/2
NAME(S):	Specogna Copper, Waterfall	
RECORD NO.:	04	
ASST. REPT. NO.:	13236	
DEPOSIT TYPE:	vein shear, skarn	
HOST UNIT:	TrK near Tg	
GEOL. FEATURES:	Pods of sulphides occur in a shear in Karmutsen basalts near the Catface Labour Lake pluton.	
METALS:	Cu, Zn, Ag	
MINERALS:	cp, sl	
EXPLORATION:	mapping, soil geochem, EM, several short dd holes	
PRODUCTION:	0	

MINFILE NO.:	092F 078	**NTS MAP:** 092F/2
NAME(S):	Regina	
RECORD NO.:	05	
ASST. REPT. NO.:	1401, 12664	
DEPOSIT TYPE:	veins, bedded cherts	
HOST UNIT:	PMR cut by TrKi	
GEOL. FEATURES:	Narrow veins and "exhalative" pyritic cherts occur near the intersection of Cowichan Lake and Yellows Creek faults and also a felsic unit of the PMR Fm.	
METALS:	Au, Ag, Cu	
MINERALS:	py, cp	
EXPLORATION:	mapping, soil geochem, EM	
WORKINGS:	adit	
PRODUCTION:	0	

MINFILE NO.:	092F 079	**NTS MAP:** 092F/2
NAME(S):	Victoria, Alberni, Debbie	
RECORD NO.:	06	
ASST. REPT. NO.:	4915, 14483	
DEPOSIT TYPE:	vein shear, stockwork	
HOST UNIT:	PN and PMR	
GEOL. FEATURES:	Several discrete deposits in and close to the Yellows Creek fault: the Victoria mine, a series of three quartz-ferroan dolomite veins in and adjacent to the fault; Linda similar in the east wall; and the Debbie southwest of the Victoria and combining pyritic cherts with an extensive stockwork of quartz ferroan-dolomite veins.	
METALS:	Au (Ag, Cu)	
MINERALS:	py (cp)	
EXPLORATION:	soil geochem, VLF?, extensive diamond drilling	
WORKINGS:	8 adits	
PRODUCTION:	1898, 1934-1936, 365 tonnes, Au 9425 g, Ag 1679g, Cu 88 kg	

MINFILE NO.:	092F 080	**NTS MAP:** 092F/2
NAME(S):	Golden Eagle	
RECORD NO.:	07	
ASST. REPT. NO.:	10194	
DEPOSIT TYPE:	vein	
HOST UNIT:	PMR andesite	
GEOL. FEATURES:	Veins in and adjacent to a strong northerly trending fault.	
METALS:	Au	
MINERALS:	py, cp	
EXPLORATION:	silt and soil geochem, EM, VLF, 453 m ddh	
WORKINGS:	8 adits, one 700 m long	
PRODUCTION:	0	

MINFILE NO.:	092F 081	**NTS MAP:** 092F/2
NAME(S):	B & K	
RECORD NO.:	08	
ASST. REPT. NO.:	10194, 13670	
DEPOSIT TYPE:	vein	
HOST UNIT:	PMR andesite, volc. ss., chert	

GEOL. FEATURES:	Small quartz veins are contained in ankeritic alteration zones along a northerly shear zone.
METALS:	Au, Ag
MINERALS:	py, gl, sl
PRODUCTION:	0

MINFILE NO.:	092F 082	**NTS MAP:** 092F/2
NAME(S):	Havilah	
RECORD NO.:	09	
ASST. REPT. NO.:	6643, 10194, 13904	
DEPOSIT TYPE:	vein	
HOST UNIT:	PMR andesite	
GEOL. FEATURES:	Three veins, all northerly striking, steeply dipping ribbon veins with some silicification and shearing. Hybrid diorite, Jg and Catface dykes occur nearby.	
METALS:	Au, Ag, Cu, Pb	
MINERALS:	py, po (cp, as, sl, gl, mo)	
EXPLORATION:	IP, soil geochm, 446 m ddh	
WORKINGS:	4 adits, 3 on the Gillespie vein and 1 on the McQuillan	
PRODUCTION:	1936, 1939, 949 tonnes, Au 8056 g, Ag 43 669 g, Cu 1925 kg, Pb 5750 kg	

MINFILE NO.:	092F 083	**NTS MAP:** 092F/2
NAME(S):	Thistle	
RECORD NO.:	10	
ASST. REPT. NO.:	11064	
DEPOSIT TYPE:	skarn and VMS in dykes	
HOST UNIT:	Buttle Lake Gr. and Trki	
GEOL. FEATURES:	Mined ore came from skarn developed in Mt. Mark limestone adjacent to the Cowichan Lake fault. Recent exploration has concentrated on massive sulphides contained in steeply dipping sheeted diabase, dykes which are feeders to the overlying Karmutsen tholeiites.	
METALS:	Cu, Au, Ag	
MINERALS:	cp, py, mt	
EXPLORATION:	mapping, mag, IP, soil geochem, ddh	
WORKINGS:	4 adits	
PRODUCTION:	1938-1942, 6238 tonnes, Au 85 874 g, Ag 65 969 g, Cu 309 088 kg	

MINFILE NO.:	092F 084	**NTS MAP:** 092F/2
NAME(S):	Black Panther	
RECORD NO.:	11	
ASST. REPT. NO.:	7857, 9639	
DEPOSIT TYPE:	vein	
HOST UNIT:	PMR and Jgm diorite	
GEOL. FEATURES:	Vein contained in northerly trending vertical fault separating PMR andesite on the west from diorite pluton (Jgm) on the east. Extensive ferroan dolomite alteration of the walls and quartz/ferroan dolomite vein filling.	
METALS:	Au, Ag, Pb, Cu	
MINERALS:	py, gl, sl, cp	
EXPLORATION:	soil geochem, 5 ddh, 1154 m	
WORKINGS:	4 adits	

PRODUCTION: 1947-1948, 1950; 1715 tonnes, Au 15832 g, Ag 29642 g, Pb +5588 kg, Cu226 kg

MINFILE NO.: 092F 085 **NTS MAP:** 092F/2
NAME(S): Black Lion
RECORD NO.: 12
DEPOSIT TYPE: vein
HOST UNIT: PMR and Jgm
GEOL. FEATURES: PMR andesites are in fault contact with diorite of Island intrusions. The northerly trending shear is the locus of ribbon quartz veining and ferroan dolomite alteration and a continuation of the Black Panther structure.
METALS: Au
MINERALS: py, gl
PRODUCTION: 0

MINFILE NO.: 092F 086 **NTS MAP:** 092F/2
NAME(S): Black Prince
RECORD NO.: 13
DEPOSIT TYPE: skarn
HOST UNIT: Quatsino Fm. and Bonanza Gr.
METALS: Fe
MINERALS: mt
PRODUCTION: 0

MINFILE NO.: 092F 103 **NTS MAP:** 092F/2
NAME(S): Kola
RECORD NO.: 14
ASST. REPT. NO.: 10288, 12052
DEPOSIT TYPE: massive sulphide vein
HOST UNIT: Trkc
GEOL. FEATURES: Massive sulphides occur in a shear zone cutting massive amygdaloidal basalts of the upper member of the Karmutsen Formation.
METALS: Cu
MINERALS: py, cp, bn
EXPLORATION: stripping, airborne EM and mag, ground EM
PRODUCTION: 0

MINFILE NO.: 092F 129 **NTS MAP:** 092F/2
NAME(S): Sunshine
RECORD NO.: 15
DEPOSIT TYPE: skarn
HOST UNIT: TrQ and Jg dykes
GEOL. FEATURES: Mainly narrow skarn-type veinlets rich in sulphides near the contact of Quatsino limestone, Bonanza Gr. and Jg dykes.
METALS: Cu, Ag, Au
MINERALS: cp, po, mt, py
WORKINGS: 3 adits
PRODUCTION: 1916, 5 tonnes, Cu 869 kg, Ag 218 g, Au 5 g

MINFILE NO.: 092F 138 **NTS MAP:** 092F/2
NAME(S): Kitchener
RECORD NO.: 16
DEPOSIT TYPE: skarn

HOST UNIT: Karmutsen limestone?
GEOL. FEATURES: Vein-like sulphide-rich bodies in a thin limestone in the Karmutsen.
METALS: Cu (Au, Ag)
MINERALS: cp, po, py, mt
EXPLORATION: 230 m ddh in 1957
WORKINGS: 1 adit
PRODUCTION: 1929, 168 tonnes, Cu 5336 kg, Au 124 g, Ag 653 g

MINFILE NO.: 092F 140 **NTS MAP:** 092F/2
NAME(S): Three Jays
RECORD NO.: 17
DEPOSIT TYPE: vein
HOST UNIT: Karmutsen Fm.
GEOL. FEATURES: Narrow quartz veins occur in shears in Karmutsen basalt.
METALS: Au, Ag, Cu
MINERALS: cp, py, mt
WORKINGS: ca. 2000 m of workings mainly in 3 adits and 2 shafts
PRODUCTION: 1898-1899, 1902, 1981 tonnes, Cu 148 889 kg, Au 1929 g, Ag 75 207 g

MINFILE NO.: 092F 141 **NTS MAP:** 092F/2
NAME(S): WWW
RECORD NO.: 18
ASST. REPT. NO.: 13857
DEPT. TYPE: vein
HOST UNIT: Jg and Jgm
GEOL. FEATURES: Two westerly striking quartz fissure veins and a mineralized shear cut hybrid diorite and granodiorite near the western margin of the Corrigan Creek pluton of the Island intrusions.
METALS: Au, Ag, Pb, Cu
MINERALS: py, gl, sl, cp
EXPLORATION: mapping, VLF
WORKINGS: 4 adits
PRODUCTION: 1899, 1935, 1940-1941; 106 tonnes, Au 14 650 g, Ag 15 552 g, Pb 1100 kg, Cu 244 kg

MINFILE NO.: 092F 149 **NTS MAP:** 092F/2
NAME(S): Golden Slipper
RECORD NO.: 19
ASST. REPT. NO.: 13857
DEPOSIT TYPE: vein
HOST UNIT: Jg diorite
METALS: Au, Ag, Cu
MINERALS: py, cp
WORKINGS: shallow shaft and short adit
PRODUCTION: 0

MINFILE NO.: 092F 155 **NTS MAP:** 092F/2
NAME(S): Raven, Stamp, Hoik
RECORD NO.: 20
ASST. REPT. NO.: 11337
DEPOSIT TYPE: vein

HOST UNIT: Karmutsen, Trkb top
GEOL. FEATURES: Quartz veins up to 1 m wide with 0.2 m of sulphides in Karmutsen pillow breccia.
METALS: Cu, Au
MINERALS: cp
EXPLORATION: EM
WORKINGS: 1 adit
PRODUCTION: 0

MINFILE NO.: 092F 156 **NTS MAP:** 092F/2
NAME(S): Saucy Lass
RECORD NO.: 21
DEPOSIT TYPE: skarn
HOST UNIT: TrQ?
METALS: Fe, Cu
MINERALS: mt, cp
PRODUCTION: 0

MINFILE NO.: 092F 157 **NTS MAP:** 092F/2
NAME(S): Cascade
RECORD NO.: 22
DEPOSIT TYPE: skarn
HOST UNIT: TrQ
METALS: Cu, Ag
MINERALS: cp
WORKINGS: 2 adits
PRODUCTION: 1904-1905; 113 tonnes, Ag 3235 g, Cu 14 629 kg

MINFILE NO.: 092F 162 **NTS MAP:** 092F/2
NAME(S): Darby and Joan
RECORD NO.: 23
DEPOSIT TYPE: skarn
HOST UNIT: TrK near TrQ contact
METALS: Fe
MINERALS: mt
PRODUCTION: 0

MINFILE NO.: 092F 167 **NTS MAP:** 092F/2
NAME(S): Bank
RECORD NO.: 24
ASST. REPT. NO.: 14389
DEPOSIT TYPE: vein
HOST UNIT: PMR
GEOL. FEATURES: Disseminated pyrite and quartz/ferroan dolomite veins occur in andesitic pillow lavas and dacite of the PMR Fm.
METALS: Au
MINERALS: py
EXPLORATION: mapping
PRODUCTION: 0

MINFILE NO.: 092F 168 **NTS MAP:** 092F/2
NAME(S): Dauntless
RECORD NO.: 25
DEPOSIT TYPE: vein

HOST UNIT:	TrK
METALS:	Au, Ag, Cu
MINERALS:	cp, py
PRODUCTION:	0

MINFILE NO.:	092F 172	**NTS MAP:** 092F/2
NAME(S):	Grizzly	
RECORD NO.:	26	
ASST. REPT. NO.:	15368	
DEPOSIT TYPE:	vein	
HOST UNIT:	Haslam Fm. and Catface	
GEOL. FEATURES:	On a main strand of the Cowichan Lake fault at the base of the Patlicant Catface pluton.	
METALS:	Au, Ag, As	
MINERALS:	as, py	
EXPLORATION:	mapping	
WORKINGS:	1 adit	
PRODUCTION:	0	

MINFILE NO.:	092F 185	**NTS MAP:** 092F/2
NAME(S):	Defiance	
RECORD NO.:	27	
DEPOSIT TYPE:	skarn	
HOST UNIT:	TrK	
GEOL. FEATURES:	Skarn mineralization in limestone at the top of the Karmutsen Fm. and near Island intrusions.	
METALS:	Fe, Cu, Ag	
MINERALS:	mt, cp	
WORKINGS:	2 short adits	
PRODUCTION:	0	

MINFILE NO.:	092F 195	**NTS MAP:** 092F/2
NAME(S):	Contented	
RECORD NO.:	28	
ASST. REPT. NO.:	12044	
DEPOSIT TYPE:	vein	
HOST UNIT:	TrKa near Jga	
GEOL. FEATURES:	Veins and shears in Karmutsen contain sulphide mineralization.	
METALS:	Cu	
MINERALS:	py, po, cp	
PRODUCTION:	0	

MINFILE NO.:	092F 207	**NTS MAP:** 092F/2
NAME(S):	Mary	
RECORD NO.:	29	
ASST. REPT. NO.:	13564	
DEPOSIT TYPE:	vein and skarn	
HOST UNIT:	TrK	
GEOL. FEATURES:	A zone 400 m long and up to 100 m wide of massive and disseminated mineralization contained mostly within east-striking faults and quartz veins in Karmutsen Fm. pillow breccias and minor skarny limestone, possibly Quatsino Fm.	
METALS:	Cu, Ag, Mo, Zn	

MINERALS: cp, py, po, mo, sl, bn
EXPLORATION: mapping, soil geochem, EM, SP, IP, mag, 20 ddh totaling 1850 m
PRODUCTION: 0

MINFILE NO.: 092F 213 **NTS MAP:** 092F/2
NAME(S): Union Jack
RECORD NO.: 30
DEPOSIT TYPE: vein
HOST UNIT: top of Bonanza Fm.?
METALS: Cu
MINERALS: cp
PRODUCTION: 0

MINFILE NO.: 092F 214 **NTS MAP:** 092F/2
NAME(S): Canadian
RECORD NO.: 31
DEPOSIT TYPE: skarn?
HOST UNIT: TrK
METALS: Cu
MINERALS: cp
PRODUCTION: 0

MINFILE NO.: 092F 215 **NTS MAP:** 092F/2
NAME(S): Star of the West
RECORD NO.: 32
ASST. REPT. NO.: 5400, 6675
DEPOSIT TYPE: vein
HOST UNIT: TrK near Jg contact
GEOL. FEATURES: A quartz carbonate vein up to 1.5 m wide is contained in the Corrigan Creek pluton near its contact with the Karmutsen Fm.
METALS: Au, Cu, Zn
MINERALS: py, cp, sl
EXPLORATION: mapping, trenching, geochem
PRODUCTION: 1 ton reported shipped in 1895

MINFILE NO.: 092F 216 **NTS MAP:** 092F/2
NAME(S): Starlight
RECORD NO.: 33
DEPOSIT TYPE: disseminated sulphides
HOST UNIT: Jgm
GEOL. FEATURES: Disseminated mineralization in altered band of diabase, in hybrid part of the Corrigan Creek pluton.
METALS: Au, Pb
MINERALS: gl, py
PRODUCTION: 0

MINFILE NO.: 092F 217 **NTS MAP:** 092F/2
NAME(S): Andy
RECORD NO.: 34
ASST. REPT. NO.: 13857
DEPOSIT TYPE: stockwork, porphyry
HOST UNIT: Jgm

GEOL. FEATURES: A stockwork of fractures and small quartz-hornblende veinlets occur in a granodiorite plug within a more mafic phase of the Corrigan Creek pluton.
METALS: Cu, Mo, Zn
MINERALS: py, cp, mo, po, sl
EXPLORATION: silt and soil geochem, EM, IP, mag, 19 ddh 2400 m
PRODUCTION: 0

MINFILE NO.: 092F 218 **NTS MAP:** 092F/2
NAME(S): Golden Rule
RECORD NO.: 35
DEPOSIT TYPE: vein
HOST UNIT: Jg
GEOL. FEATURES: A vein up to 0.8 m wide in the Corrigan Creek pluton, probably explored as part of the Andy.
METALS: Au, Ag, Cu, Pb
MINERALS: py, gl, as
PRODUCTION: 0

MINFILE NO.: 092F 221 **NTS MAP:** 092F/2
NAME(S): Rex
RECORD NO.: 36
DEPOSIT TYPE: vein
HOST UNIT: TrKa
GEOL. FEATURES: A quartz vein in Karmutsen Fm.
METALS: Cu, Mo
MINERALS: cp, mo
EXPLORATION: mapping, silt and soil geochem
PRODUCTION: 0

MINFILE NO.: 092F 233 **NTS MAP:** 092F/2
NAME(S): Cop
RECORD NO.: 37
ASST. REPT. NO.: 13934
DEPOSIT TYPE: minor VMS
HOST UNIT: Nitinat Fm.
GEOL. FEATURES: Minor sulphide lenses occur in the top of the Nitinat Fm.
METALS: Cu
MINERALS:
EXPLORATION: mapping
PRODUCTION: 0

MINFILE NO.: 092F 236 **NTS MAP:** 092F/2
NAME(S): Independent
RECORD NO.: 38
ASST. REPT. NO.: 15171
DEPOSIT TYPE: vein
HOST UNIT: TrK
GEOL. FEATURES: Quartz veins occur in fault zones within the Karmutsen Fm.
METALS: Cu
MINERALS: py, cp, po
EXPLORATION: mapping
PRODUCTION: 0

MINFILE NO.:	092F 247	**NTS MAP:** 092F/2
NAME(S):	Duke of York	
RECORD NO.:	39	
DEPOSIT TYPE:	placer Au deposit	
HOST UNIT:		
GEOL. FEATURES:	Now covered by dam and pondage of Port Alberni's water supply.	
METALS:	Au	
MINERALS:	gold	
PRODUCTION:	?	

MINFILE NO.:	092F 282	**NTS MAP:** 092F/2
NAME(S):	Kit Kat	
RECORD NO.:	40	
ASST. REPT. NO.:	13945	
DEPOSIT TYPE:	massive sulphide and vein	
HOST UNIT:	top of Nitinat Fm.	
GEOL. FEATURES:	Disseminated and lenses of massive sulphide in Nitinat and Jg hybrid gabbro as well as later quartz/ferroan dolomite veins, anomalous Cu, Au, Ni, Pt	
METALS:	Cu, Au, Ag	
MINERALS:	cp, py, po	
EXPLORATION:	mapping, soil geochem, EM, mag, ddh	
PRODUCTION:	0	

MINFILE NO.:	092F 285	**NTS MAP:** 092F/2
NAME(S):	Ken	
RECORD NO.:	41	
DEPOSIT TYPE:	vein?	
HOST UNIT:	TrK	
GEOL. FEATURES:	On the Yellows Creek fault south of Lizard Lake.	
METALS:	Cu	
MINERALS:	cp	
PRODUCTION:	0	

MINFILE NO.:	092F 311	**NTS MAP:** 092F/2
NAME(S):	Raft	
RECORD NO.:	42	
ASST. REPT. NO.:	12444, 13954	
DEPOSIT TYPE:	disseminated and vein	
HOST UNIT:	PMR and Jgm diorite	
GEOL. FEATURES:	McLaughlin Ridge pillowed andesites cut by dacite and quartz diorite dykes and mineralized by disseminated sulphides with stringers and veins of massive sulphides and quartz.	
METALS:	Cu (Au, Ag)	
MINERALS:	py, cp, sl	
EXPLORATION:	mapping, soil geochem	
PRODUCTION:	0	

MINFILE NO.:	092F 331	**NTS MAP:** 092F/2
NAME(S):	Debbie	
RECORD NO.:	43	
ASST. REPT. NO.:	4875, 15287	

DEPOSIT TYPE: vein stockwork and bedded
HOST UNIT: PMR and PN
GEOL. FEATURES: Large property covers many showings of diverse types, some bedded pyritic chert or jasper and vein sulphide showings in the north near the Cameron Main, as well the 900 zone, Linda and Victoria on Mineral Creek in the south.
METALS: Au, Cu
MINERALS: py, cp
EXPLORATION: mapping, soil geochem, mag
PRODUCTION: 0

MINFILE NO.: 092F 331a **NTS MAP:** 092F/2
NAME(S): Debbie, 900 Zone
RECORD NO.: 44
ASST. REPT. NO.: 15285
DEPOSIT TYPE: stockwork and bedded
HOST UNIT: PMR and PN
GEOL. FEATURES: A complex deposit not fully explored or understood, combining pyritic cherts or jaspers with an extensive vein stockwork of quartz and ferroan dolomite rich in gold.
METALS: Au
MINERALS: py, Au
EXPLORATION: mapping, soil geochem, extensive diamond drilling
PRODUCTION: 0

MINFILE NO.: 092F 348 **NTS MAP:** 092F/2
NAME(S): B D Q
RECORD NO.: 45
DEPOSIT TYPE: vein?
HOST UNIT: Jg
GEOL. FEATURES: Vein in Alberni pluton.
METALS: Au, Ag, Cu
MINERALS: cp, py
PRODUCTION: 1940, 1 tonne; Au 62 g, Ag 156 g, Cu 11 kg

MINFILE NO.: 092F 360 **NTS MAP:** 092F/2
NAME(S): A North
RECORD NO.: 46
ASST. REPT. NO.: 5981
DEPOSIT TYPE: skarn
HOST UNIT: TrQ and TrK
GEOL. FEATURES: On the eastern limb of the Arbutus syncline, magnetite with chalcopyrite replace limestone and diabase dyke in the limestone and form a series of small showings dispersed in the upper Karmutsen Fm. The Corrigan Creek pluton outcrops to the east and probably underlies the showings.
METALS: Cu, Fe
MINERALS: cp, mt
EXPLORATION: mapping, mag, EM, soil geochem, 213 m perc.dh
PRODUCTION: 0

MINFILE NO.: 092F 361 **NTS MAP:** 092F/2
NAME(S): A South
RECORD NO.: 47

ASST. REPT. NO.: 5981
DEPOSIT TYPE: skarn
HOST UNIT: TrQ and TrK
GEOL. FEATURES: Magnetite with chalcopyrite showings occur near the southeastern keel of the Arbutus Summit syncline. The area is near the Alberni pluton.
METALS: Cu, Fe
MINERALS: cp, mt
EXPLORATION: mapping, mag, soil geochem
PRODUCTION: 0

MINFILE NO.: 092F 380 **NTS MAP:** 092F/2
NAME(S): Lofstrom
RECORD NO.: 48
ASST. REPT. NO.: 12735
DEPOSIT TYPE: vein
HOST UNIT: TrK
GEOL. FEATURES: Quartz vein in shear in Karmutsen Fm.
METALS: Cu
MINERALS: cp, py
EXPLORATION: silt and soil geochem
PRODUCTION: 0

MINFILE NO.: 092F 381 **NTS MAP:** 092F/2
NAME(S): Mt. Olsen
RECORD NO.: 49
ASST. REPT. NO.: 13857
DEPOSIT TYPE: vein
HOST UNIT: Jg and TrK
GEOL. FEATURES: Quartz veins on either side of a contact of diorite with Karmutsen Fm.
METALS: Cu, Zn
MINERALS: py, po, cp, sl
EXPLORATION: mapping
PRODUCTION: 0

MINFILE NO.: 092F 382 **NTS MAP:** 092F/2
NAME(S): Campbell
RECORD NO.: 50
DEPOSIT TYPE: vein
HOST UNIT: TrK
METALS: Cu
MINERALS: cp
PRODUCTION: 0

MINFILE NO.: 092F 383 **NTS MAP:** 092F/2
NAME(S): BK 136G
RECORD NO.: 51
DEPOSIT TYPE: vein?
HOST UNIT: TrK
GEOL. FEATURES: Probably a vein in Karmutsen near the Alberni pluton.
METALS: Cu
MINERALS: cp
PRODUCTION: 0

MINFILE NO.:	092F 385	**NTS MAP:** 092F/2
NAME(S):	Sol	
RECORD NO.:	52	
ASST. REPT. NO.:	13904	
DEPOSIT TYPE:	vein	
HOST UNIT:	PMR	
GEOL. FEATURES:	On or adjacent to the Havilah fault.	
METALS:	Cu, Mo	
MINERALS:	cp, mo	
EXPLORATION:	mapping	
PRODUCTION:	0	

MINFILE NO.:	092F 390	**NTS MAP:** 092F/2
NAME(S):	Mt. Hankin	
RECORD NO.:	53	
DEPOSIT TYPE:	vein	
HOST UNIT:	TrK	
METALS:	Cu	
MINERALS:	cp	
PRODUCTION:	0	

MINFILE NO.:	092F 398	**NTS MAP: 092F/2**
NAME(S):	Cor 14	
RECORD NO.:	54	
ASST. REPT. NO.:	5400, 6675	
DEPOSIT. TYPE:	vein	
HOST UNIT:	Jgm	
GEOL. FEATURES:	Quartz-ankerite veins near the contact of Karmutsen Fm. and diorite of the Corrigan Creek pluton.	
METALS:	Au, Cu	
MINERALS:	py, cp	
EXPLORATION:	mapping, soil geochem	
PRODUCTION:	0	

MINFILE NO.:	092F 399	**NTS MAP:** 092F/2
NAME(S):	Cor 6	
RECORD NO.:	55	
ASST. REPT. NO.:	5400	
DEPOSIT TYPE:	vein	
HOST UNIT:	TrK and Jgm	
GEOL. FEATURES:	Quartz/ferroan dolomite veins at the contact of Karmutsen Fm. and diorite of the Corrigan Creek pluton.	
METALS:	Au, Cu	
MINERALS:	py, cp	
EXPLORATION:	mapping, geochem	
WORKINGS:	2 small adits driven in 1890s	
PRODUCTION:	0	

MINFILE NO.:	092F 400	**NTS MAP:** 092F/2
NAME(S):	MOR	
RECORD NO.:	56	
ASST. REPT. NO.:	6655	
DEPOSIT TYPE:	vein	

HOST UNIT: JB and Jg
GEOL. FEATURES: Narrow quartz veins occur in a shear zone in Bonanza Gr. and granitic dykes.
METALS: Cu
MINERALS: cp, bn
PRODUCTION: 0

MINFILE NO.: 092F 409 **NTS MAP:** 092F/2
NAME(S): Mt. Spencer
RECORD NO.: 57
DEPOSIT TYPE: bedded
HOST UNIT: Mt. Mark Fm.
GEOL. FEATURES: Thick limestone unit.
METALS: non-metallic
MINERALS: calcite/limestone
PRODUCTION: 0

MINFILE NO.: 092F 410 **NTS MAP:** 092F/2
NAME(S): Parsons Creek
RECORD NO.: 58
DEPOSIT TYPE: bedded
HOST UNIT: Quatsino Fm.
GEOL. FEATURES: Folded relatively thin locality of Quatsino limestone.
METALS: non-metallic
MINERALS: calcite/limestone
PRODUCTION: 0

MINFILE NO.: 092F 411 **NTS MAP:** 092F/2
NAME(S): Hecate Mtn.
RECORD NO.: 59
DEPOSIT TYPE: bedded
HOST UNIT: TrQ
METALS: non-metallic
MINERALS: calcite/limestone
PRODUCTION: 0

MINFILE NO.: 092F 412 **NTS MAP:** 092F/2
NAME(S): Sproat
RECORD NO.: 60
DEPOSIT TYPE: bedded
HOST UNIT: TrQ
METALS: non-metallic
MINERALS: calcite/limestone
PRODUCTION: 0

MINFILE NO.: 092F 429 **NTS MAP:** 092F/2
NAME(S): McQuillan Cr.
RECORD NO.: 61
DEPOSIT TYPE:
HOST UNIT: PMR
GEOL. FEATURES: Gemstone deposit.
METALS: non-metallic
MINERALS:
PRODUCTION: 0

MINFILE NO.:	092F 89	**NTS MAP:** 092F/7
NAME(S):	Horne Lake	
RECORD NO.:	62	
DEPOSIT TYPE:	non-metallic	
HOST UNIT:	Mt. Mark Fm.	
GEOL. FEATURES:	350 m of massive bioclastic limestone.	
METALS:	non-metallic	
MINERALS:	calcite	
PRODUCTION:	0	

MINFILE NO.:	092F 161	**NTS MAP:** 092F/7
NAME(S):	Arrowsmith	
RECORD NO.:	63	
DEPOSIT TYPE:	skarn?	
HOST UNIT:	Karmutsen Fm. at contact of Island intrusion, Nanaimo River pluton	
METALS:	Cu, Au, Ag	
MINERALS:	cp	
PRODUCTION:	0	

MINFILE NO.:	092F 171	**NTS MAP:** 092F/7
NAME(S):	P D	
RECORD NO.:	64	
DEPOSIT TYPE:	vein	
HOST UNIT:	PMM	
GEOL. FEATURES:	A vein and replacement along a fault zone in Mt. Mark limestone.	
METALS:	Zn, Au, Ag	
MINERALS:	sl, as	
EXPLORATION:	mag, EM	
PRODUCTION:	0	

MINFILE NO.:	092F 193	**NTS MAP:** 092F/7
NAME(S):	Port Alberni	
RECORD NO.:	65	
DEPOSIT TYPE:		
HOST UNIT:	Haslam Fm.	
METALS:	non-metallic	
MINERALS:	shale	
PRODUCTION:	0	

MINFILE NO.:	092F 243	**NTS MAP:** 092F/7
NAME(S):	Silver Bell	
RECORD NO.:	66	
ASST. REPT. NO.:	11024, 16197	
DEPOSIT TYPE:	vein	
HOST UNIT:	PN/PMR	
GEOL. FEATURES:	A quartz-stibnite vein occurs in the Nitinat Fm.	
METALS:	Sb, Cu, Au, Ag, As	
MINERALS:	py, sb, cp, as	
EXPLORATION:	mapping, silt geochem	
WORKINGS:	1 adit	
PRODUCTION:	0	

MINFILE NO.: 092F 244 **NTS MAP:** 092F/7
NAME(S): Lacy Lake (iron)
RECORD NO.: 67
ASST. REPT. NO.: 16138
DEPOSIT TYPE: bedded ferruginous chert
HOST UNIT: PMR/PCR
GEOL. FEATURES: Bedded ferruginous chert occurs at the base of the Cameron River Fm.
METALS: Fe (Au)
MINERALS: py
EXPLORATION: mapping, soil geochem, VLF, mag
PRODUCTION: 0

MINFILE NO.: 092F 245 **NTS MAP:** 092F/7
NAME(S): Lacy Lake
RECORD NO.: 68
ASST. REPT. NO.: 16138
DEPOSIT TYPE: bedded chert
HOST UNIT: PCR
GEOL. FEATURES: Bedded manganiferous and ferruginous chert occurs without sulphides in the Cameron RiverFm.
METALS: Mn, Fe
MINERALS: pyrolusite
EXPLORATION: mapping, soil geochem, VLF, mag
PRODUCTION: 0

MINFILE NO.: 092F 246 **NTS MAP:** 092F/7
NAME(S): Cameron Lake
RECORD NO.: 69
ASST. REPT. NO.: 16138
DEPOSIT TYPE: bedded ferruginous chert
HOST UNIT: PCR/PCR
METALS: Fe, Au
MINERALS: mt, py, cp
EXPLORATION: mapping, soil geochem, VLF, mag
PRODUCTION: 0

MINFILE NO.: 092F 246a **NTS MAP:** 092F/7
NAME(S): Cameron Lake, railway showing
RECORD NO.: 70
ASST. REPT. NO.: 16138
DEPOSIT TYPE: VMS
HOST UNIT: TrK sheeted dykes
GEOL. FEATURES: Diabase dykes showing chill and differing grain size carry small bodies of pyrite and chalcopyrite.
METALS: Au, Cu
MINERALS: py, po, mt, cp
EXPLORATION: mapping, soil geochem, VLF, mag
PRODUCTION: 0

MINFILE NO.: 092F 253 **NTS MAP:** 092F/7
NAME(S): Qualicum
RECORD NO.: 71

DEPOSIT TYPE: vein or shear
HOST UNIT: TrK?
METALS: Cu
MINERALS:
PRODUCTION: 0

MINFILE NO.: 092F 323 **NTS MAP:** 092F/7
NAME(S): CIH
RECORD NO.: 72
DEPOSIT TYPE: vein
HOST UNIT: TrK
METALS: Au
MINERALS:
PRODUCTION: 0

MINFILE NO.: 092F 367 **NTS MAP:** 092F/7
NAME(S): Coombs Copper
RECORD NO.: 73
ASST. REPT. NO.: 6042
DEPOSIT TYPE: vein
HOST UNIT: TrK and Jg
GEOL. FEATURES: A vein and skarn deposit at the contact of the Nanaimo Lakes pluton.
METALS: Cu
MINERALS: py, cp
PRODUCTION: 0

MINFILE NO.: 092F 377 **NTS MAP:** 092F/7
NAME(S): Little Qualicum Falls
RECORD NO.: 74
DEPOSIT TYPE: skarn?
HOST UNIT: TrK at Nanaimo Lakes pluton(Jg) contact
METALS: Cu
MINERALS:
PRODUCTION: 0

MINFILE NO.: 092F 386 **NTS MAP:** 092F/7
NAME(S): Skarn
RECORD NO.: 75
ASST. REPT. NO.: 6305
DEPOSIT TYPE: skarn vein
HOST UNIT: Nanaimo Lakes pluton (Jg)
GEOL. FEATURES: Vein occurs in a fault zone with skarn minerals.
METALS: Fe, Cu
MINERALS: mt, cp
PRODUCTION: 0

MINFILE NO.: 092F 387 **NTS MAP:** 092F/7
NAME(S): Louishman-Maureenah
RECORD NO.: 76
DEPOSIT TYPE: ?
HOST UNIT: Nanaimo Lakes pluton (Jg)
METALS: Fe, Cu
MINERALS:

PRODUCTION: 0

MINFILE NO.: 092F 388 **NTS MAP:** 092F/7
NAME(S): Cup, Ra
RECORD NO.: 77
DEPOSIT TYPE: ?
HOST UNIT: Nanaimo Lakes pluton (Jg)
METALS: Cu
MINERALS:
PRODUCTION: 0

MINFILE NO.: 092F 404 **NTS MAP:** 092F/7
NAME(S): Rogers Creek
RECORD NO.: 78
DEPOSIT TYPE: ?
HOST UNIT: Haslam Fm.
METALS: non-metallic
MINERALS: clay
PRODUCTION: 0

MINFILE NO.: 092F 127 **NTS MAP:** 092F/7
NAME(S): Ballenas Island
RECORD NO.: 79
ASST. REPT. NO.:
DEPOSIT TYPE: bedded
HOST UNIT: Buttle Lake Gr.
GEOL. FEATURES: Massive crinoidal limestone of the Nanoose facies of the Buttle Lake Gr. occurs on tidewater.
METALS: non-metallic
MINERALS: calcite
PRODUCTION: 0

MINFILE NO.: 092F 178 **NTS MAP:** 092F/8
NAME(S): Georgina
RECORD NO.: 80
ASST. REPT. NO.: 14762
DEPOSIT TYPE: qtz. vein, mass. sulph.
HOST UNIT: Sicker Gr., PMR?
GEOL. FEATURES: Quartz vein with sulphides on Georgina 4 claim, strikes 320 degrees steep. Several showings of massive pyrite, arsenopyrite with gold on Bonell Cr. and Nanoose Cr.
METALS: Au, Cu
MINERALS: py, ap, Au
EXPLORATION: prospecting and trenching
WORKINGS: 18 m shaft near Nanoose Cr. and power line on Georgina4 claim
PRODUCTION: 0

MINFILE NO.: 092F 324 **NTS MAP:** 092F/8
NAME(S): Lantzville No. 1
RECORD NO.: 81
DEPOSIT TYPE: coal
HOST UNIT: Extension Protection Fm.

GEOL. FEATURES:	The Wellington coal seam in the base of the Extension Protection Fm. outcrops on the shore of Nanoose Bay and was mined seaward.
METALS:	non-metallic
MINERALS:	coal
WORKINGS:	slope mine
PRODUCTION:	1924-1942; 259 528 tonnes

MINFILE NO.:	092F 326 **NTS MAP:** 092F/8
NAME(S):	Lantzville shaft mine
RECORD NO.:	82
DEPOSIT TYPE:	coal
HOST UNIT:	Extension Protection Fm.
GEOL. FEATURES:	Wellington seam.
METALS:	non-metallic
MINERALS:	coal
WORKINGS:	shaft connected with the slope mine when they were amalgamated
PRODUCTION:	shown for No. 1 mine