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THE ELIZABETH-YALAKOM GOLD PROSPECT,

BRIDGE RIVER MINING CAMP

(S20/2)

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Keywords: Economic geology, Bridge River, Elizabeth-Yalakom, gold, porphyritic quartz veins

Question: Any suggested additions or deletions?

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INTRODUCTION

BCDM REPORTS

The Elizabeth-Yalakom property (MINFILE No. 0920-012) is centred approximately at latitude 51°02' north, longitude 122°35' west, 6.7 kilometres west of the junction of Blue Creek and the Yalakom River in the Shulaps Range (Figure 2/00-1). A gravel road links the property to the Yalakom River Road at a point approximately 23 kilometres north of the Carpenter Lake (Bridge River) all-weather highway; the ^{of the} Yalakom River ~~and~~ ~~at~~ Carpenter Lake ^{road} junction is approximately 18.5 kilometres west of Lillooet. All workings are at or above treeline (6500 feet or 1982 metres elevation).

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EXPLORATION

ELEVATION AND DEVELOPMENT HISTORY

Auriferous quartz veins were first discovered in 1934 (Hedley, 1941) and subsequently rediscovered and staked as the Crown-granted Elizabeth mineral claims in 1940 and 1941. Surrounding claims staked at this time include the Yalakom, Churn and Plateau claims. Bralorne Mines Limited optioned the Elizabeth and adjoining claims and staked additional claims in the

British Columbia Ministry of Energy, Mines and Petroleum
Resources, Geological Fieldwork, 1987, Paper 1988-1.

vicinity. A total of 760 feet (232 metres) of diamond drilling at five holes and 1750 feet (534 metres) of surface stripping to explore four quartz veins (the Nos. 1, 2, 3 and 4 veins) exposed on the Elizabeth Nos. 1 and 2 claims was completed (Anonymous, 1941).

Wartime conditions delayed further work until 1947, at which time a portal was collared on the Churn No. 1 claim (6640 feet, 2025 metres elevation) ~~and~~ ^{A crosscut was} driven nearly due west toward the Elizabeth No. 1 claim ^{to test the downward extension of the} No. 1 vein (also later known as the High-grade or West vein) 750 ^{ac H, 2} feet (229 metres) below its surface exposure (Peck, 1947). By 1948, this main crosscut was extended a total length of 2204 feet (672 metres). Two quartz veins, the B and C veins, were intersected 1611 feet (490 metres) and 2103 feet (641 metres) respectively from the portal. In addition to 371 feet (266 metres) of diamond drilling, drifts were put in to follow ~~the~~ ^{2,} ~~local extension of~~ these veins (Figure 2-00-1; Merrett, 1948). The B and C veins are not exposed on surface and their relationship to the intended No. 1 vein ^{target} is not known.

The following year a raise was driven ^{up} ~~down~~ a 4-foot-wide (1.2 metre) section of the B vein to a point 271 feet (82.5 metres) above the level. In addition, a raise was driven ~~down~~ ^{up} 78 feet (23 metres) ~~down~~ the C vein. No significant gold concentrations were encountered during this work. At this time, surface work on the Yalakom No. 2 claim uncovered a quartz

vein 2 to 3 feet (0.6 to 0.9 metre) thick and continuous for more than 200 feet (61 metres). Known as the No. 9 vein (Merrett and Stephenson, 1949).

During 1951 and 1952 a drift was excavated from a portal collared on the Yalakom No. 2 claim at an elevation of 7537 feet (2299 metres) southward along the No. 9 vein for a distance of 307 feet (246 metres). Gold content of the vein is variable; assays as ~~low~~^{high} as 0.51 ounce per tonne (17.5 grams per tonne) gold over a length of 28 feet (8.5 metres) and a thickness of 2 feet (0.6 metre), and 0.45 ounce per ton (15.4 grams per tonne) gold over a length of 65 feet (19.8 metres) and thickness of 2.5 feet (0.8 metre) were reported (National Mineral Inventory No. 920/2-AUZ). Surface trenches exposed the No. 9 vein in two cuts ^{north of} and below the portal. Overall, the thickness of the ^{ore} auriferous quartz vein was considered to be too narrow and the gold distribution too erratic to constitute ore (Merrett 1951, 1952). Bralorne Mines Limited subsequently abandoned the option and its adjacent claims in 1953 (Merrett 1953).

Work was resumed by the owners (T.W. Illidge and W. White) in 1956 and a crosscut ~~portal~~ collared on the Elizabeth ^{of portal} No. 1 claim at an elevation of 7200 feet (2205 metres) was ^{driven} ~~excavated~~ at ^{azimuth} 110 degrees for 466 feet (142 metres) to ^{further} explore ~~at~~ ~~depth~~ quartz veins exposed on surface. The main vein and West ^{NE H, W} vein (No. 1 vein) were intersected ~~by the crosscut~~ at 110 feet (33.5 metres) and 455 feet (138.8 metres) from the portal

11c W
respectively (Patterson 1956; Figure ² 0-00-1). The following year the West vein was followed an additional 320 feet (97.6 metres) (King 1957). During this time a geological study of surface and underground workings was carried out by R. Thompson (Thompson 1957a, b). Nine tons (8.2 tonnes) of rock excavated from the west vein drift was custom processed at Trail, British Columbia and yielded 5 ounces (155.5 grams) gold, 5 ounces (155.5 grams) silver, 53 pounds (24 kilograms) lead and 18 pounds (8.2 kilograms) zinc (King 1958). No further work has been done on the Elizabeth claims and the portals have subsequently caved in.

indent] The claims remained dormant until 1978 when Southern Lights Resources Ltd. acquired the Yalakom claims and did additional staking in the area. In 1983 an option to earn a 40 per cent interest was given to Cal-Denver Resources Ltd. and the same year the No. 9 vein drift was rehabilitated, sampled and subsequently drilled. Both drift sampling and drilling yielded encouraging results (George Cross News Letter, ^{August 26,} 1984); Culbert and Leighton, 1986). During the summer of 1987 a total of 1968 feet (600 metres) of diamond-drill core was recovered from four holes drilled from surface ^{and} designed to test the ^{down-dip extension of the} ~~depth to which~~ ~~gold-bearing veins continue along dip~~ (Vancouver Stockwatch, 1987a). During a visit by the authors, the No. 9 vein portal (Plate ² 0-00-1) was being de-iced as a prerequisite for further underground exploration planned for the fall of 1987 in conjunction with Vanguard Mining Exploration Ltd. (Vancouver Stockwatch, 1987b).

Plate
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GEOLOGICAL SETTING

The Shulaps Range in the area of the Elizabeth-Yalakom gold prospect is composed of ultramafic rocks, specifically serpentinite and serpentinized hornblende gabbro, with porphyritic quartz diorite intrusions (Figure ^{2/}~~1/~~00-1). The geology of the area has previously been described by McCammon (1946) and Leech (1953).

The two largest outcrop areas of porphyritic quartz diorite (referred to as the Blue Creek porphyry by Leech (1953)) are on the Elizabeth Nos. 1, 2 and 3 claims and on the Yalakom No. 2 claim on the southeast and north slopes of the ridge that forms the main topographic feature in the area (Figure ^{2/}~~1/~~00-1). The porphyritic quartz diorite is typically grey, with plagioclase and hornblende phenocrysts in a finer grained groundmass of plagioclase, hornblende, quartz and some biotite; altered porphyritic quartz diorite also contains epidote as well as hornblende partly occupied by biotite to completely pseudomorphed by chlorite.

Call his
The outline of the porphyritic quartz diorite bodies ^{is} ~~are~~ more complex than as shown in Figure ^{2/}~~1/~~00-1. Peripheral areas contain irregular offshoots and satellitic bodies of intrusive rocks similar in appearance to the main masses but variable (in texture and composition) from porphyritic to equigranular diorite

to quartz-rich diorite. Abundant white aplite veinlets occupy irregular fractures in porphyritic quartz diorite on the northwest part of the Elizabeth No. 1 claim.

h/s
x=
h/s
Serpentinized ultramafic rocks ^{typical} of the Shulaps ultramafic body ^{surrounds} the porphyritic quartz diorite. Glacial debris consists predominantly of ^{unlayered} ~~non~~ to slightly layered ^{weakly} ~~serpentinized~~ ^{cluddy}, yellow-rusty ^{s.} ~~surfaced~~ harzburgite and dark green serpentinite and obscure ^{much} of the ultramafic bedrock exposure. Ultramafic rocks adjacent to porphyritic quartz diorite are well-foliated serpentinite.

The ~~ultramafic~~ porphyritic quartz diorite contact along the west side of the Yalakom No. 2 claim is occupied by rusty coloured carbonate-talc-quartz green ^{mica} rocks or **listwanite** (Boyle 1979, page 210). These rocks resemble harzburgite on weathered surface but are more physically ^s resistant and form a '30 to 70' ^{foot-thick} (9 to 21-metre) ^r rib along the northwest ^{slope} ~~side~~ of the main ridge (previously referred to as the Bralorne dyke by Leech (1953). These rocks are most likely the hydrothermally altered equivalent of surrounding serpenitined harzburgite.

(2) AURIFEROUS QUARTZ VEINS ——— *Promote heading & (2)*

important
The ~~distribution~~ ^{important} of gold-bearing quartz veins at the Elizabeth-Yalakom prospect are ~~confined~~ confined to porphyritic

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quartz diorite (McCammon, 1946a)

^{to} ^{although} ^{along or adjacent}
~~Some veins are near or partly~~
at contacts with ultramafic rocks ~~but important auriferous veins~~
~~are generally within the main bodies of porphyritic quartz~~
diorite (Leech, 1953; Thompson, 1957b).

Alteration of porphyritic quartz diorite along vein margins is slight; plagioclase phenocrysts, originally andesine, contain albite-oligoclase, sericite, epidote, clinzoisite and clay-like material. A greater pyrite and quartz content is also noted (Leech, 1953).

Auriferous quartz veins on the Elizabeth-Yalakom prospect include: the Nos. 1, 2, 3 and 4 veins and the B and C veins on the Elizabeth Nos. 1 and 2 claims and the No. 9 vein on the Yalakom No. 2 claim (Table ²/~~6~~-00-1). Surface and underground ~~exploration of veins~~ on the Elizabeth claims has resulted in the delineation of gold concentrations considered too erratic and vein widths too narrow to constitute ore. At present, the No. 9 vein is the only vein ^{with} ~~these~~ underground workings ^{that} are accessible and being actively explored.

The No. 9 Vein

The No. 9 vein is within the porphyritic quartz diorite body northwest of the main body that contains the Elizabeth veins; it is not known whether the ~~porphyritic quartz~~ diorite is continuous between the two areas beneath the surface. The No. 9

vein is exposed at depth along much of ~~the~~ ^{the} length ~~of~~ ^{of} the No. 3 drift, ~~accessed by the 7507 foot 2255 meter air shaft~~
(Figure ²/~~1~~-00-1). It is generally less than 2 feet (0.6 metres) ~~thick~~ ^{wide} although continuous for more than 807 feet (246 metres) and is actually a system of parallel veins rather than a single vein.

² Much of the vein ^{7 Hutton} quartz is massive and milky white and contains a variable amount of calcite and ankerite with disseminated sulphide minerals (as observed in vein material on the dump ~~site~~). However, ² much of the vein quartz is ribboned with laminations and strolitic partings of chlorite and carbonaceous material. Metallic mineral concentrations tend to coincide along the ribbons (Plate ²/~~1~~-00-2). Small fragments of what appears to be ^{7 Hutton} altered porphyritic quartz diorite are common within ribboned domains. Ribbons are generally parallel to vein walls and separate massive to fractured, partly rusty, milky white quartz that contains only sparsely disseminated metallic minerals and a variable calcite and ankerite content.

Metallic minerals ~~in the veins~~ are mostly arsenopyrite, pyrite and chalcopyrite (accompanied by malachite and azurite), with lesser galena, sphalerite, pyrrhotite, magnetite and molybdenite. Native gold occurs as visible blebs within and as thin surface coatings along chloritic/carbonaceous ribbons (Plate ²/~~1~~-00-2) and only rarely as isolated visible blebs within inter-ribbon ~~domain~~ quartz. Total metallic mineral content of the veins rarely exceeds a few per cent.

An underground sampling program started out in 1983 by Southern Lights Resources Ltd. (Balsam Resources Inc. as of March 1987) along the length of the No. 9 drift delineated three auriferous zones (Figure ²/~~1~~-00-1; Table ²/~~1~~-00-2). Three diamond-drill holes ~~designed~~ to test the continuity of the auriferous zones were subsequently drilled (Figure ²/~~1~~-00-1) and intersected numerous auriferous quartz veins adjacent to the No. 9 vein (Table ²/~~1~~-00-3). Combined drift sampling and diamond drilling results indicate reserves to be approximately ~~4248 tons~~ ⁰/~~3857~~ tonnes/ with a mean gold content of ~~1.199 ounces per ton~~ /41.1 grams per tonne/ (George Cross News Letter, 1984).

Q(1)
3850
Q(1)

Four additional diamond-drill holes ^{completed} ~~drilled~~ in 1987 and totalling ~~300 metres~~ /600 metres/ yielded gold concentrations of ~~4.54, 4.18 and 3.57~~ ^{4.54, 4.18 and 3.57} ~~0.144 (4.54), 0.122 (4.18) and 0.104 ounces per ton~~ (3.57 grams per tonne/ over unknown thicknesses. Grab samples taken from the rock dump outside the No. 9 portal contain up to ~~0.715 ounces per ton~~ /24.5 grams per tonne/ (Vancouver Stockwatch, 1987a).

Q(1)
Q(1)

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DISCUSSION

Auriferous quartz veins at the Elizabeth-Yalakom prospect are essentially confined to porphyritic quartz diorite and generally strike north or slightly east of north with a steep dip. The location of auriferous quartz veins indicate ^S/_L that under stress the porphyritic quartz diorite acted as a competent medium

and was brittlely deformed^h in contrast to surrounding incompetent ultramafic rocks which behaved in a ductile manner. As a consequence, ~~the ultramafic rocks~~^{ultramafic} contacts are mostly well foliated and yield little information on relative age relations. ^{lips} ~~The results of the contrast in rock competency are the fracturing of porphyritic quartz diorite and subsequent fluid invasion.~~

Repetitive

The ribboned texture of the quartz veins suggests repeated fracturing during emplacement and vein growth. The concentration of metallic minerals (including native gold) along chloritic/carbonaceous ribbons may have resulted from fluid penetration and metal precipitation during vein fracturing episodes. Inclusions of altered wallrock within ribboned quartz suggest stoping and partial consumption of adjacent wallrock during fracturing and vein growth.

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Surrounding serpentinite may have acted as an important impervious barrier restricting fluid movement and circulation to within the porphyritic quartz diorite.

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Vancouver Stockwatch (1987b): Balsam Resources Inc., news release, September 10, 1987.

Captions

Figures

Figure ²/~~0~~-00-1. Location and geology of the Elizabeth-Yalakom prospect [includes information from Bralorne Mines Ltd. (1953), Leech (1948), McCammon (1946b), and Thompson (1957a, b)].

Plates

Plate ²/~~0~~-00-1: The No. 9 portal (~~7537~~^{, 2297 metre} elevation), Yalakom No. 2 claim.

Plate ²/~~0~~-00-2: Ribboned quartz from the No. 9 vein. Note concentration of metallic minerals and native gold along ribbons.

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TABLE 0-00-1

AURIFEROUS QUARTZ VEINS OF THE ELIZABETH-MERRETT DISTRICT

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Vein Name	Claim	Dimensions (approx.)		Attitude	Exposure and/or Access	References
		Length (max) (m) <i>(ft/in)</i>	<i>width</i> Thickness (cm) <i>in/ea</i>			
#1 vein (also No. 1, 2 <i>High-grade</i> <i>vein, West</i> <i>vein)</i>	Elizabeth	500/183 180	45/117 120	030°/15 vertical	Exposed on surface in trenches; access at depth in West vein drift via 2200m 2200'-elevation portal.	McCannan (1946a) Thompson (1957a)
#2 vein	Elizabeth No. 1	400/130 50 (240/73) ?	24/61 60	038°/7 70° NW	Exposed on surface in trenches; access at depth in 2200m- drift via 7000' elevation portal	McCannan (1946a)
#3 vein	Elizabeth No. 1	(90/27.5) 27.5	37/421 100	070°/7 79° S	Exposed on surface in trenches	McCannan (1946a)
#4 vein	Elizabeth No. 2	(240/73) 75	3-25' 7.5-65	120°/7 65° NE	Exposed on surface in trenches	McCannan (1946a)
B vein	Elizabeth	75 ?	up to 48' 120	000°	Access at depth in	Merrett (1948)

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No. 1		122	015 ⁰⁰ /1?	B/ ⁼ vein drift, via Merrett and 2200m -elevation Stephenson portal (1949)
C vein	Elizabeth	(900/275)	?	Access at depth Merrett (1948)
No. 1. 2		275	000 ⁰⁰ - 025 ⁰⁰ /1?	in C/ ⁼ vein drift : Merrett and 2020m via 2200m -elevation Stephenson portal (1949)
#9 vein	Yalakom	60 200/61	60-90 24-26T	Exposed on surface Merrett and in trenches; Stephenson accessed by #9 (1949) 2300m- drift via 75271 Merrett (1952) elevation portal
No. 2		(800/244) ?	51-91 70 ⁰⁰ W	

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TABLE 0-00-2

AURIFEROUS ZONES ALONG #9 DRIFT

(1983 SAMPLING PROGRAM)

Zone	Distance from Portal (m)	Length (m)	Average Width Thickness (cm)	Uncut g/t Au (g/t Au)	Diluted: g/t g/t Au/width	Best Assays g/t (g/t Au)
1	32-81	49	27.2	69.2	44.4/42.5 cm	27.70, 4.752, 3.144,
	105-155	160	0.272	2.219	1.204/1.335	2,122, 2,055
	(32-81)	(49)	(0.272)	(69.22 g/tonne)	(44.37 g/tonne)	(1635.44, 162.93,
					0.425)	107.79, 72.75,
						70.45 g/tonne
2	111-127	16	46.7	33.7	25.4/61.9 cm	15.48, 4.5, 24
	655-715	50	1530	0.233	0.741/2000	(530.75, 158.54
	(111-127)	(16)	(0.467)	(33.70 g/tonne)	(25.40 g/tonne)	g/tonne)
					0.512)	
3	183-194	11	28.4	31.7	206/43.5	
	600-695	35	0.930	0.926	0.601/1.125	
	(183-194)	(11)	(0.284)	(31.75 g/tonne)	(20.61 g/tonne)	
					0.425)	

If these grades can be detected. If you indicate how they are diluted. Car factor seems an average of 42.5 cm. narrow means as possible, dry is in 47cm No. 2 zone diluted to 62 cm?

Suggest omit best assays. Average grades are for more meaningful. If best assays are quoted, they not include lowest assays. One block D provide a mixture of how much the grade is.

See Figure 0-00-1 for zone locations.

Information from Culbert and Leighton (1986); Vancouver Stockwatch (1987a).

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 TABLE 0-00-3 ^{ASSAYS}
 DIAMOND DRILL CORE GOLD CONTENT
 (1984 DRILLING PROGRAM)

Hole #	Vein Intersection (m)	Vein Width (cm)	(g/t)/width Au (oz/t)/width
84-1	313 95.5 155.47m	0.1 21 (0.21m)	1.020/0.7 37.4/21 cm (37.37 g/tonne/0.21m)
84-2	88.5 - 89.1 220 - 222 (88.45a-89.06a)	61 2.0 (0.51m)	0.208/2.0 7.1/61 cm (7.13 g/tonne/0.51m)
84-3	250-257 (76.25a-78.39a)	61 2.0 (0.51m)	0.2/61 cm 0.206/2.0 (0.21 g/tonne/0.51a)

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250-252
255-257

See Figure 0-00-1 for hole locations.

Information from Culbert and Leighton (1986).

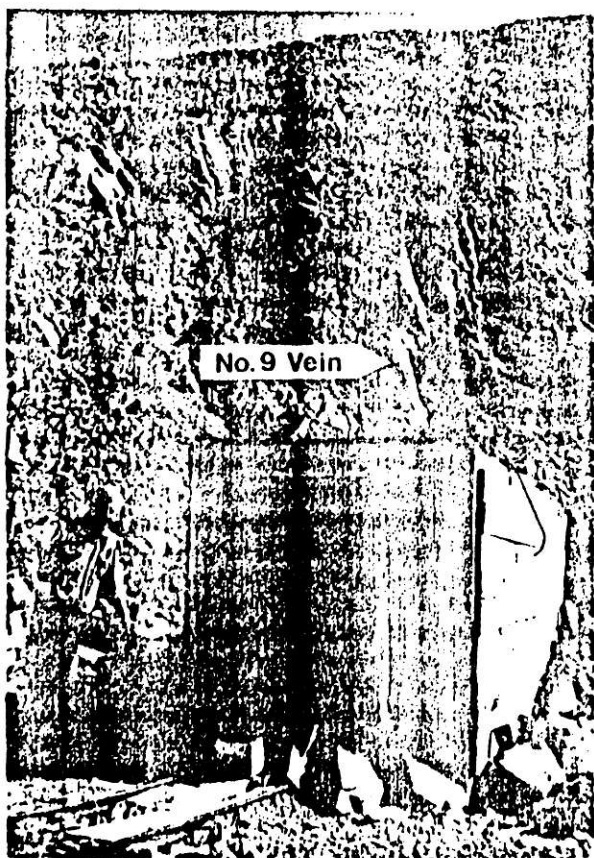


Plate 00-1 The No. 9 portal
(7537' elev), Yalakom No. 2 claim.

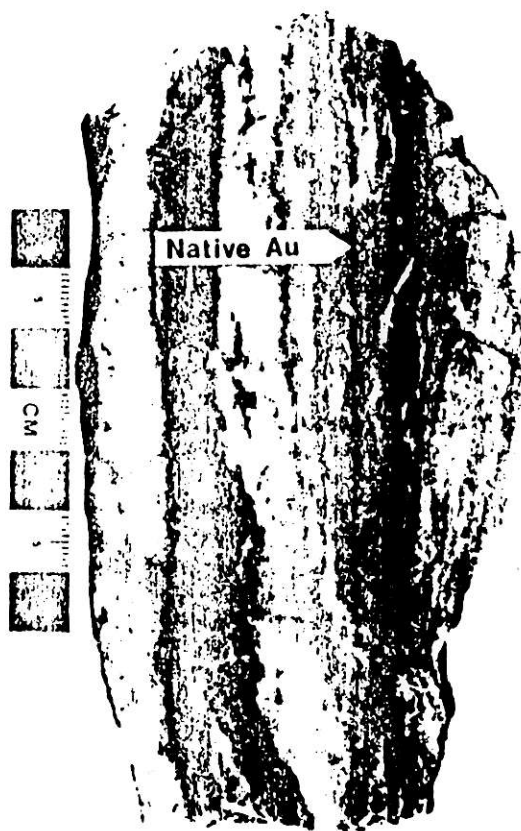


Plate 00-2 Ribbed quartz from the
No. 9 vein. Note concentration of
metallic minerals and native gold
along ribbons.