BRITISH COLUMBIA

PROSPECTORS ASSISTANCE PROGRAM

MINISTRY OF ENERGY AND MINES

GEOLOGICAL SURVEY BRANCH

PROGRAM YEAR:	1995/1996
REPORT #:	PAP 95-2
NAME:	BARBARA WELSH

TECHNICAL REPORT

- FOR THE -

PROSPECTORS ASSISTANCE PROGRAM

- FOR -

QUARTZ CREEK AREA

GOLDEN MINING DIVISION

COVERING: Mineral Claim "Prairie Dog" (340057)
Mineral Claim "Griz 2" (328607)

LOCATION: (1) 51°-23'-25"N, 117°-19'-55"W
(2) NTS Map 82N/6W
(3) 30 km WNW of Golden, B.C.

PREPARED BY

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October 14, 1995

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(1) INTRODUCTION

The presence of igneous intrusions within this predominantly sedimentary sequence has importance for two reasons: 1) If the ultrabasic intrusions originated from the upper mantle under conditions of high pressure and temperature, and ascended relatively rapidly, there may be potential for diamonds, and 2) If the igneous activity produced sufficient hydrothermal fluids and a large enough source of metals was present, the geological environment is conducive to the formation of a "Manto-type" polymetallic replacement deposit (Cu-Au+/-Ag-Pb-Zn), similar to the Midway deposit in the Cassiar Mountains (MINFILE 1040 038).

The area of the claims is located in the valley of Quartz Creek in the Northern Purcell Mountains approximately 30 km WNW of Golden, B.C. NTS 82N/6W, Lat. 51°-23'-25" N., Long. 117°-19'-55" W. The "Griz 2" claim is located on the north flank of Dauntless Mountain, and the "Prairie Dog" claim is located immediately to the northwest, in the Prairie Hills.

Access is via the Trans-Canada Highway to a point 40 km northwest of the town of Golden, where the Quartz Creek Forest Access Road follows Quartz Creek south from the highway. It is a gravel road in good condition, accessible by car. The campsite is located 10 km south of the highway, near the 50 km road sign.

(2) GEOLOGY AND ORE POTENTIAL

(a) Geology

The Dogtooth Range is the topographical expression of the northern termination of the Purcell Mountains where they pinch out between the Selkirk Mountains to the west and the Rocky Mountains to the east. The rocks range in age from Proterozoic (Windemere) to Late Cambrian, and consist of slate, grit, quartzite, and carbonate rocks, all having undergone low-grade metamorphism of the greenschist facies.

The Horsethief Creek Group represents an overall shallowing-upward cycle of deposition. The coarse clastics of the Lower Grit Division, and the turbidites and calcareous shales of the Baird Brook Division represent a deeper water environment as a result of intracratonic rifting. Pelites, calcareous sandstones, and minor limestone that overlie the grits were deposited during a transgressive phase. Finally, decreasing subsidence led to shoaling and the formation of a stable carbonate platform.

During early Cambrian time, the Dogtooth High was an area of high relief and possible subaerial exposure. The Dogtooth Range itself consists of a series of southwest-dipping thrust sheets forming an imbricate thrust system.

In the Quartz Creek thrust sheet, outcrops are dominated by Lower Cambrian strata of the Hamill Group (quartzites, interbedded with minor argillaceous sandstones, argillites, slates, and phyllites) and the Donald Formation (sandstones, calcareous sandstones, quartzites, shales, and bioclastic, oolitic and pisolitic carbonates). Minor volcanic flows and tuffs unconformably overlie the Hamill Group, representing renewed tectonic activity

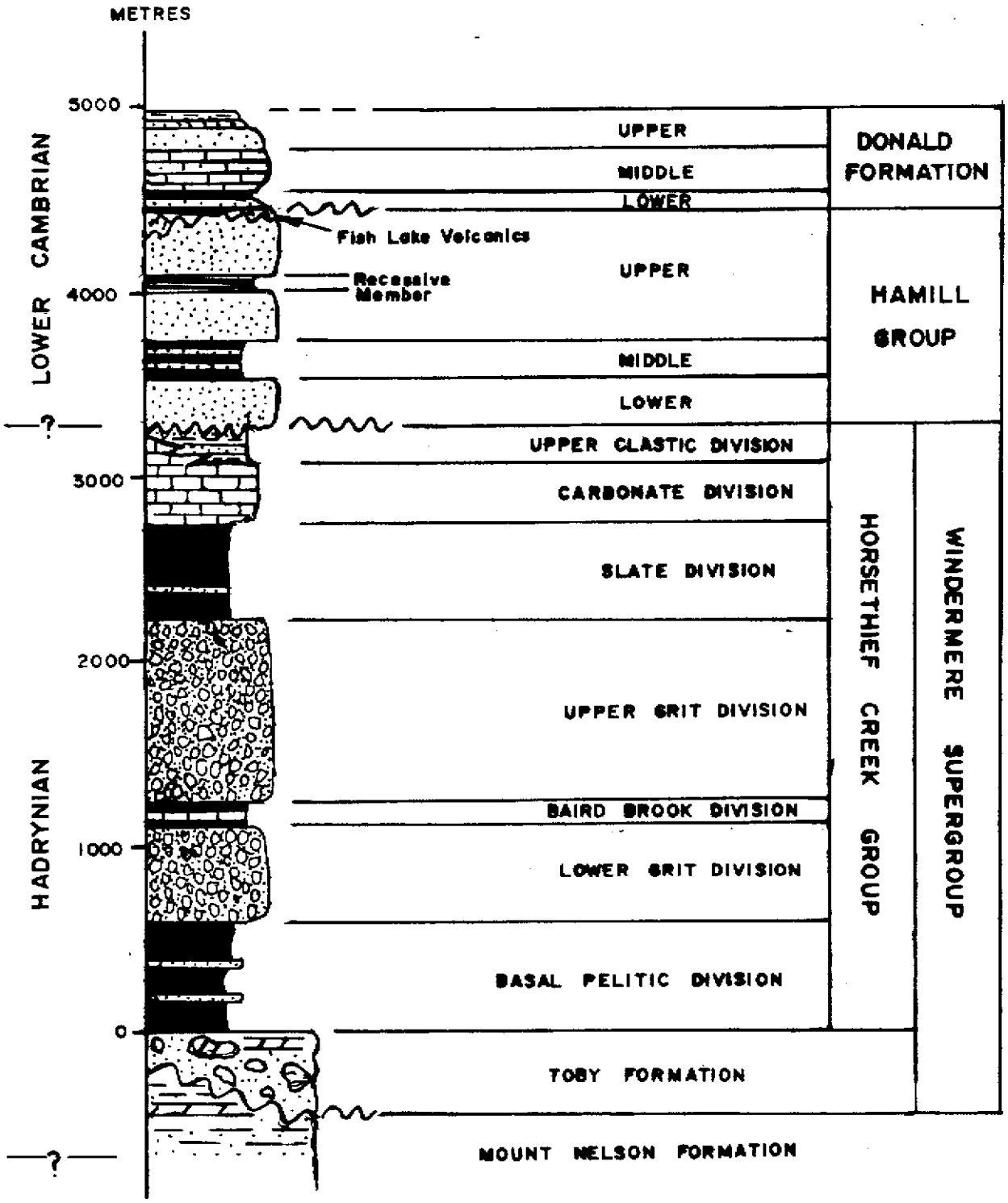

FIGURE I. COMPOSITE STRATIGRAPHIC SECTION OF UPPER PROTEROZOIC AND LOWER CAMBRIAN STRATA OF THE NORTHERN PURCELL MOUNTAINS

after deposition of the Hamill Group. The Donald Formation in turn overlies these volcanics.

The diatreme, located on the north flank of Dauntless Mountain, and which cross-cuts the Hamill Group contains large clasts of the Hamill quartzite suspended in a fine-grained, partly porphyritic groundmass which is largely recrystallized and altered to chlorite and calcite.

(b) History

As far back as the 1880's, the Quartz Creek area has been recognized as being an area of high mineral potential, due to its numerous mineralized quartz veins and gossanous zones.

The following are excerpts from B.C. Dept. of Mines Annual Reports:

1900: "... On the *Klondike*, *Lexington*, and *Bostor* claims there is a ledge nearly 25 feet in width, occurring at a contact between porphyry (sic. dolomite) and slate, and showing at the surface 2 feet of high grade copper ore.
"... On the *Zuh* a 50-foot tunnel has been driven on the ore body, which carries good values in gold and copper. Had the trail mentioned been completed, a car-load of ore would have been shipped this autumn."

1929: "... This property, owned by N.T. Edwards, Sam Indebrigsten, T. Edwards, *et a*, of Revelstoke, consists of the *Fata Morgana*, *Dominion*, *Manitoba*, and *Amanda* claims. they are located at the head of Porcupine creek, the left tributary of Quartz creek, and are served by a 16-1/2 mile trail from Beavermouth, a small station on the mainline of the Canadian Pacific Railway...

> The *Fata Morgana* group is located on an outcrop of quartz which contains disseminated through it small quantities of malachite, chalcopyrite, and pyrite. The work to date consists of a few open-cuts at elevation of 7,050 feet, and exposes a large ledge of quartz occurring in quartzites. In the uppermost open-cut, the mineralized quartz would appear to strike N. 70° W., with a dip 55° to the north, and has about 10 to 12 feet of its width exposed. A sample of selected ore from this open-cut assayed 1.41 per cent copper. In a second open-cut, about 50 feet to the east and at 40 feet lower altitude, a channel sample across a width of 100 inches of copper-stained quartz assayed: Gold, 0.02 oz. to the ton; silver, 0.4 oz. to the ton; copper, 0.57 per cent. "

It is assumed that these mineralized exposures are of small extent, and that is why there was little subsequent activity on these claims. However, given the attitudes of the day, it is likely that the focus of attention was the quartz veins, and potential orebodies hosted within the carbonates were not investigated. The *Fata Morgana* group, and the *Klondike, Lexington, and Boston* claims are located at the headwaters of Porcupine creek, at the slate-carbonate boundary, but the *Zulu* adit is approximately 300 m south of the campsite, or some 6 km away.

(c) Orebody Model

The Midway deposit, located in the Cassiar Mountains (NTS 1040/16), is cited as an excellent example of manto-type orebodies in B.C. Necessary elements of this deposit type include:

-- a suitable carbonate host (such as the Carbonate Division of the Proterozoic Horsethief Creek Group), where karsting and open-space filling is possible. Solution-collapse breccias were observed on the Prairie Hills ridge, in the vicinity of the "Prairie Dog" claim (T.Kubli, Pers. Comm., 1995), which would provide the requisite ground preparation.

-- a buried intrusion, occurring at a level below that of the manto occurrence, and therefore poorly exposed, if at all, but represented by the presence of dykes and alteration. Mafic dykes occur over the area of the claims, and are associated with quartz-sericite alteration. The east ridge, opposite the claims, is comprised of a large area (approximately 5 km long) of Mg-enriched, sparry dolomite-to-magnesite (MgO content as high as 36%), which clearly reveals hydrothermal activity, most evident at the slate-carbonate contact.

-- high-angle faults, which controlled the explacement of the stock (the diatreme is located within the steeply-dipping Dogtooth thrust fault, as is one of the larger mafic dykes on the "Prairie Dog" claim. Immediately adjacent to the diatreme is a vertical normal fault, which resulted in a down-dropped block.

-- high temperature (300° C), generally represented in manto deposits by complex mineralogy and high silver content. In the case of the Quartz Creek area, the high temperature is manifested by chrome-mica (fuchsite), scheelite, and arsenic, and is reflected by the high fineness of the placer gold (reported to be .960 fine)

-- cross-cutting veins, or chimneys, mentioned in the historical accounts in the preceding section, and seen in the malachite showing on the "Griz II" claim. In the accounts of the Midway deposit, it was suggested that a hole collared on one of these veins would intersect the core of the manto deposit.

(3) PROSPECTING ACTIVITY AND RESULTS

(a) Diatreme

Two phases of the volcanic breccia were sampled, a rusty-weathering phase, and a green-weathering phase. They were analysed by Dia Met Minerals Ltd., and although a few indicator minerals are present, it was felt that the claims are not worth pursuing based on their potential for hosting a diamond deposit.

(b) Headwaters of Porcupine Creek

Considerable time was spent searching for the *Fata Morgana* group of claims, described under the historical accounts on p. 3-4. Porcupine Creek splits into three tributaries at its headwaters, the middle and east fork occupy two large, open bowl-shaped drainage. The third fork occupies a small cirque in very steep topography. Mineralized quartz veins were found at the middle fork, one a flat-dipping quartz vein within quartzite (see Photo 1, next page), the other two were cross-cutting rusty quartz veins found amidst rubble at the base of a steep slope (elevation 7050 feet), the top of which defines the Glacier National Park boundary. It would seem that these occurrences, consisting of quartz with finely-disseminated sulphides, are those described in the historical account (analyses are in Appendix B, sample Nos 4, 5, and 6), but the analytical results do not compare to those mentioned in the descriptions, and are quite disappointing. Sample #5, from the middle outcrop, is somewhat anomalous in Ni, Co, As, and W. Sample #6, taken from a rusty quartz vein near the slate-carbonate contact, is also slightly anomalous in Ni and As.

Photo 1a: Headwaters of Porcupine Creek -- Mineralized vein

Photo 1b: Headwaters of Porcupine Creek -- quartz ledge

(c) Oldman Creek

A new logging road, east of Quartz creek, accesses the area around Oldman Creek, and the east side of Quartz Lake. the geology is similar to that of Quartz Creek, and is dominated by disintegrated phyllite with numerous rusty quartz veins. The quartz veins were sampled, and were analysed as Samples No. 1 and 2 (no significant anomalous values).

(d) Prairie Hills (Cu showing)

A small, high-grade copper showing, consisting of malachite, chalcopyrite, pyrite, pyrrhotite, and other fine-grained sulphides within a narrow rusty quartz vein occurs on the Prairie Hills slope, just southeast of the diatreme at the slate-carbonate contact at an elevation of 6800 feet.(see Photo 2, next page). The vein cross-cuts the sediments, is steeply dipping, and plunges to the northwest. A small cave occurs in the limestone bluffs immediately above this occurrence.

(e) Rock of Gibraltar

A prominent, flat-topped hill adjacent to the campsite, has been dubbed the "Rock of Gibraltar". It has steep slopes on three sides, and is bounded to the west by a broad bowl. The east-facing slope contains a small cave in limestone. The Rock of Gibraltar is cut by a series of northwest-trending mafic dykes, which lie adjacent to the Dogtooth Thrust Fault, and are on strike with the diatremes. A chain of five lakes occurs in a creek valley on the north flank of the Rock of Gibraltar. Photo 3, on page 11, shows sampling locations from the traverse which passes through slate, then

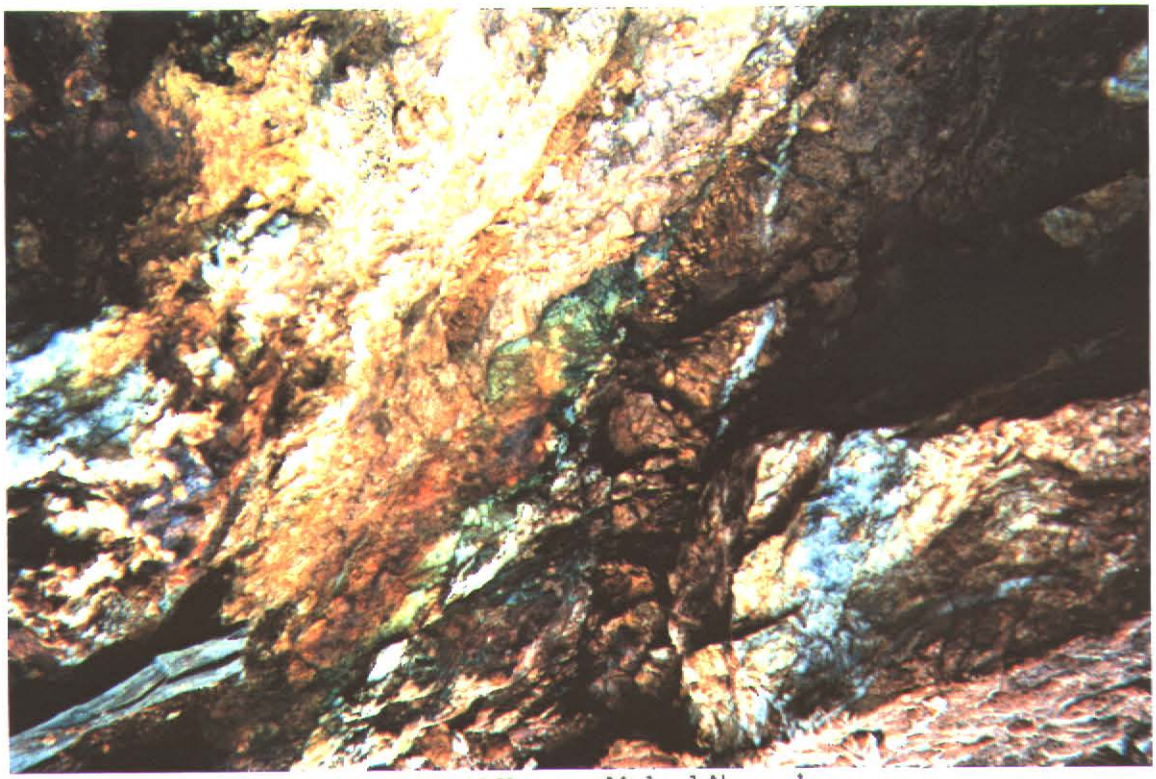

Photo 2a: Prairie Hills -- Malachite vein

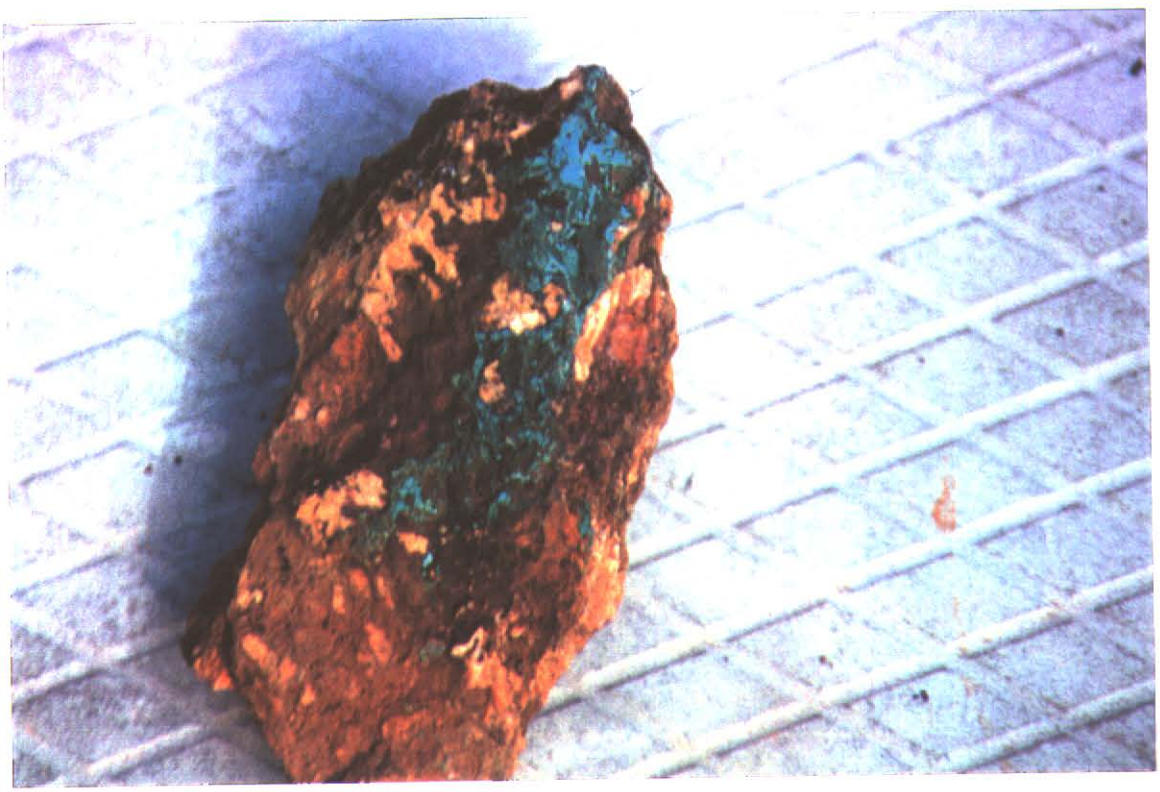

Photo 2b: Rock sample from vein (above)

Photo 3a: "Rock of Gibraltar" -- viewed from campsite

Photo 3b: View from Rock of Gibraltar looking towards Dogtooth Range -- mafic dyke outcrop right foreground (sample #5)

carbonate, and then a mafic dyke near the Dogtooth Thrust fault. Samples #1 and #2 are from the Carbonate Division, just above the slate contact. Minor disseminated sulphides were observed in these rocks, and Sample #3 represents the Dogtooth thrust fault (rusty micrite with finely disseminated pyrite). Sample #2 is a good example of the solution-collapse breccia. Photo 4, next page, shows Sample #2 and Sample #5 (mineralized breccia, containing fuchsite, fine-grained sulphides, and quartz-sericite alteration).

Photo 4a: Sample #2 -- solution collapse breccia (Rock of Gibraltar)

Photo 4b: Sample #5 -- fuchsite in carbonate breccia

(4) CONCLUSIONS

In and of themselves, the diatremes have no economic significance. However, related hyfrothermal activity which is reflected in abundant quartz veins, a large associated deposit of Ca-Mg-Fe carbonate, and high pyrite, arsenopyrite, magnetite, scheelite and gold within the soils is significant. A significant horizon near the Dogtooth Thrust Fault, mostly within the Proterozoic Carbonate Division of the Horsethief Creek Group, contains within it (from southeast to northwest):

1) The historically significant Fata Morgana Group of claims, giving rise to assays of 1.41 % and 0.57 % Cu, 0.4 opt Ag, and 0.02 opt Au.

2) A small copper showing, with an assay of 2.2 % Cu, located some 2.8 km. northwest of the Fata Morgana Group.

3) The diatremes, and related Fish Lake volcanics, located 1/2 km northwest of the copper showing above.

4) Mineralized mafic dykes, sampled on the Rock of Gibraltar (a further 3 km to the northwest), which were associated with carbonatized breccia containing fuchsite, fine-grained sulphides, and arsenopyrite (although the gold content was not significant).

The overall strike length represented by these showings is over 7 km. Geochemical surveys done by Aurun Resources in 1984 (A.R. 12,761) reveal high Ag : Au ratios, which are typical of manto-type replacement deposits. A suitable carbonate host, which has undergone solution brecciation is present.

Widespread hydrothermal activity is revealed by the formation of low-grade sparry magnesite over a strike length of 5 km. on the east ridge opposite, and parallel to, the favourable horizon described above. The presence of placert gold of unusually high fineness reflects a high-temperature of formation for the lode deposit. Finally, the cross-cutting quartz veins containing copper may be the best indirect evidence of a manto deposit, and represent the most attractive site for diamond drilling, which is ultimately the most practical way to detect such a deposit.

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APPENDICES

BRITISH COLUMBIA
PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM (continued)

B. TECHNICAL REPORT

- One technical report to be completed for each project area.
- **Refer to Program Requirements/Regulations, section 15, 16 and 17.**
- If work was performed on claims a copy of the applicable assessment report may be submitted in lieu of the supporting data (*see* section 16) required with this TECHNICAL REPORT.

Name BARBARA WELSH Reference Number 95-96-P005

LOCATION/COMMODITIES

Project Area (as listed in Part A) QUARTZ CREEK MINFILE No. if applicable N/A

Location of Project Area NTS 82N/6W Lat 51°-23'-25" Long 117°-19'-55"

Description of Location and Access CLAIM IS LOCATED 30 km WNW OF GOLDEN, B.C. ACCESS IS VIA T-C Hwy. 40 km WEST OF GOLDEN, THEN 10 km SOUTH ON QUARTZ CREEK F.A. ROAD. CLAIM LIES WEST OF QUARTZ CREEK.

Main Commodities Searched For LODE Au-Cu-Ag-Pb-Zn

Known Mineral Occurrences in Project Area PLACER Au, LODE Cu-Ag-Au

WORK PERFORMED

1. Conventional Prospecting (area) 925 ha.
2. Geological Mapping (hectares/scale)
3. Geochemical (type and no. of samples)
4. Geophysical (type and line km)
5. Physical Work (type and amount)
6,. Drilling (no,. holes, size, depth in m, total m)
7. Other (specify)

SIGNIFICANT RESULTS

Commodities Cu Claim Name GRIZ 2 / PRAIRIE DOG

Location (show on map) Lat 51°-22'-30" Long 117°-18'-10" Elevation 2073 m.

Best assay/sample type 2.2% Cu

Description of mineralization, host rocks, anomalies BASE METAL SULPHIDE MINERALIZATION ASSOCIATED WITH SLATE-CARBONATE CONTACT AND MAFIC INTRUSIONS. HIGHER-TEMPERATURE MINERALS (FUCHSITE) FOUND IN CARBONATE BRECCIA CLOSE TO INTRUSIONS.

Supporting data must be submitted with this TECHNICAL REPORT

Eco-Tech LABORATORIES LTD.

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ENVIRONMENTAL TESTING

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Fax (604) 573-4557

CERTIFICATE OF ANALYSIS AS 95-664

KETTLE RIVER VENTURES
619 N. FORK ROAD, R.R.#1
LUMBY, B.C.
V0E 2G0

30-Aug-95

ATTENTION: BARBARA WELSH

6 Rock samples received August 15, 1995
Project #: Not Given
SHIPMENT #: Not Given

	ET #.	Tag #		Ag (ppm)	As (ppm)	Cd (ppm)	Co (ppm)	Cu (ppm)	Fe (%)	Ni (ppm)	Pb (ppm)	Sb (ppm)	Sn (ppm)	W (ppm)	Zn (ppm)
OLMAN	1	#1	OL-1	0.4	<5	<1	4	7	3.66	9	<2	<5	<20	<10	18
OLMAN	2	#2	OL-2	0.8	<5	1	7	7	11.90	16	<2	<5	<20	<10	54
CIRQUE	3	#3	CG-1	0.4	<5	<1	4	7	3.75	6	<2	40	<20	<10	7
PORC	4	#4	PH-1	<.2	15	<1	5	12	1.72	15	12	<5	<20	<10	1
PORC	5	#5	PH-2	<.2	140	<1	41	30	6.66	129	<2	15	<20	50	30
PORC	6	#6	PH-3	0.6	70	<1	30	20	6.41	116	14	10	<20	10	26

QC/DATA:

Resplit:

RS/1	#1	0.2	<5	<1	3	6	3.64	10	<2	<5	<20	<10	17

Repeat:

1	#1	0.4	<5	<1	4	6	3.64	10	<2	<5	<20	<10	17

Standard:

GEO'95		1.2	65	<1	18	62	3.94	26	20	<5	<20	<10	77

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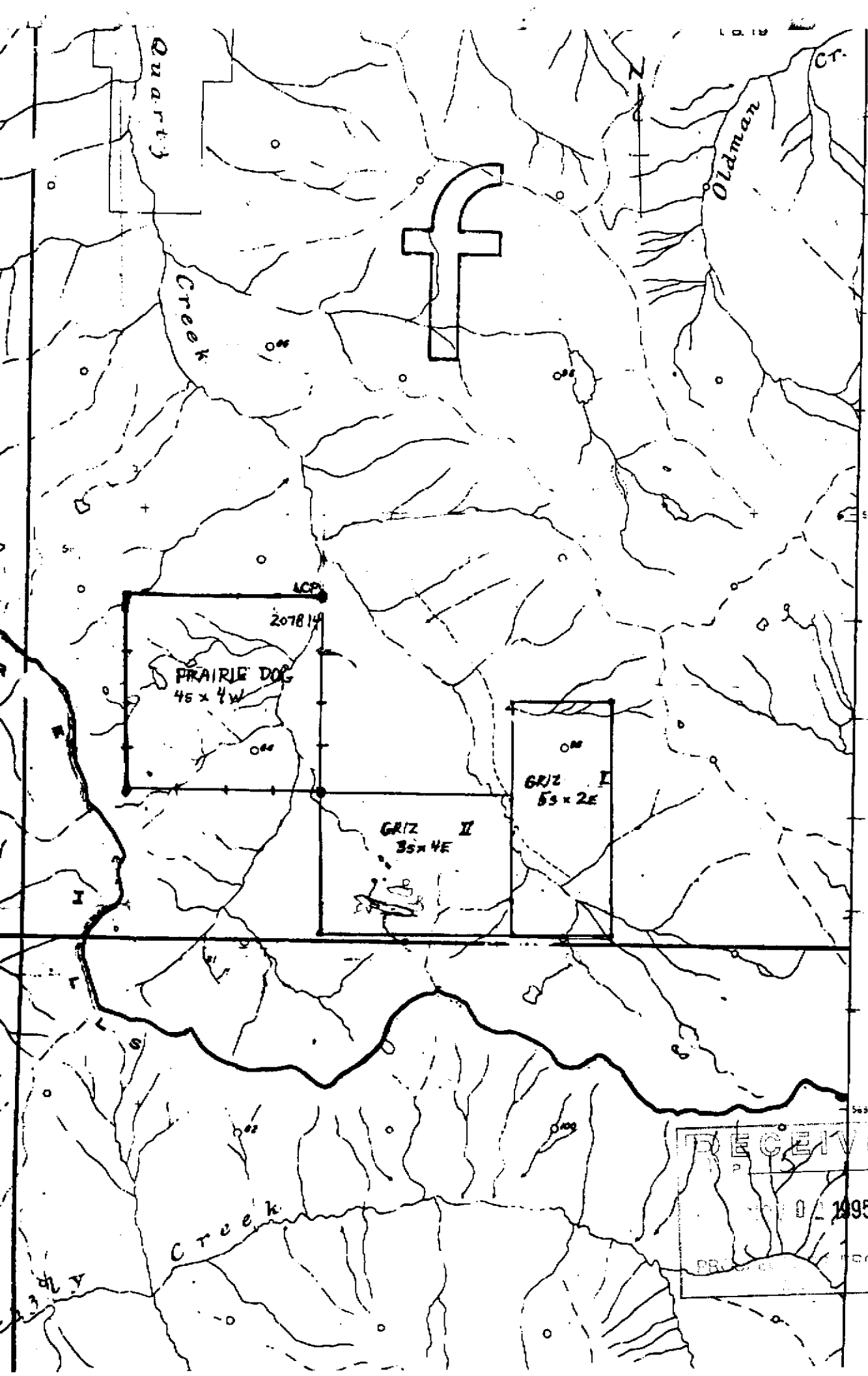
ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

TITLE 19-10-95 13:25:45 V95-01376.0 B. WELSH 11/10/95
CLIENT DISCOVERY CONSULTANTS
PROJECT 275 #SAMPLES: 4

Sample #	ppb Au30	ppm Ag	ppm Cu	% CuOL	ppm Pb	ppm Zn	ppm Mo	ppm Ni	ppm Co	ppm Cd	ppm Bi	ppm As
CS-2	13	1.5	20000	2.2	28	17	9	75	44	-0.2	-5	1181
RG-2	-5	-0.2	54	-9	6	13	2	16	7	-0.2	-5	13
RG-3	-5	-0.2	31	-9	4	15	3	28	19	-0.2	-5	-5
RG-4	-5	-0.2	3	-9	-2	13	2	16	6	-0.2	-5	-5

Sample #	ppm Sb	ppm Ga	% Fe	ppm Mn	ppm Ba	ppm Te	ppm Cr	ppm V	ppm Sn	ppm W	ppm La	ppm Li
CS-2	-5	-2	3.42	131	3	-10	154	-1	-20	-20	10	-1
RG-2	-5	-2	1.87	354	13	-10	25	3	-20	-20	10	1
RG-3	-5	-2	4.63	2204	11	-10	13	4	-20	-20	22	1
RG-4	-5	-2	3.21	1900	3	-10	52	8	-20	-20	16	1

Sample #	% Al	% Mg	% Ca	% Ti	% Na	% K	ppm Ta	ppm Sc	ppm Nb	ppm Sr	ppm Y	ppm Zr
CS-2	0.03	1.41	2.14	-0.01	-0.01	0.02	-10	-5	1	11	4	-1
RG-2	0.38	2.54	8.3	-0.01	0.01	0.20	-10	-5	-1	54	1	4
RG-3	0.24	3.3	9.77	-0.01	0.01	0.17	-10	-5	-1	33	7	4
RG-4	0.07	3.0	10	-0.01	0.01	0.06	-10	-5	-1	49	5	1



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1995

PROGRAM

QUARTZ CREEK MAP AREA

B. WELSH 1995

(Geology by T. Kubli 1990)

LEGEND

Lower Cambrian

- Cd — Donald Formation
- Cv — Fish Lake Volcanics
- Ch — Hamill Group

Precambrian Horsethief Cr. Gp.

- Puc — Upper Clastic Div.
- Pca — Carbonate Division
- Psl — Slate Division

- Dt — Diatreme
- D — Mafic Dyke
- br — Breccia (tectonic?)
- Thrust Fault
- Normal Fault
- ▲ RG-3 — Sample Location
- Traverse

N

To Hwy 1

OLDMAN CREEK

▲OL-1

▲OL-2

QUARTZ CREEK F.S. ROAD

QUARTZ LAKE

Camp

PRAIRIE HILLS

PRAIRIE DOG (340057)

GRIZ 2 (328607)

GRIZ (327120)

DOGTOOTH RANGE

THE WALL THRUST

QUARTZ CREEK THRUST FAULT

DOGTOOTH THRUST FAULT

PORCUPINE CREEK

▲RG-1 ▲RG-2 ▲RG-3 ▲RG-4 ▲RG-5

▲CS-1 ▲CS-2

▲PH-1 ▲PH-2 ▲PH-3

0 0.5 1 kilometer

SCALE: 1: 20,000