860692



V,

ON THE WILLIAMS CREEK GOLD QUARTZ PROPERTY

BARKERVILLE, B. C.

K. J. BUCHANAN, GEOLOGIST

OCTOBER 19, 1973

the fi

(

18 M 4		n na standing and an and an
	H DEX O	Page No.
	LOCATION MAP	
	CLAIM MAP	
	INTRODUCTION	1
	PROPERTY AND LOCATION	1
	ACCESS	2
	HISTORY	3
	REGIONAL GEOLOGY	4
	EXPLANATION OF ROCK UNITS	6
	ECONOMIC GEOLOGY	6
	MINERALOGY	8
	VEIN DISTRIBUTION AND CONSIS	9
	PROPERTY GEOLOGY	9
	DEVELOPMENT WORK	10
	CONCLUSIONS	12
	RECOMMENDATIONS	13
	Program for 1973	•
	Costs	
	Program for 1974	

Costs

2 0 18

(

APPENDIX

BIBLIOGRAPHY	
APPENDIX I	3
MAP IN POCKET -	GEODOICAL PLAN





INTRODUCTION

The contents of this report represent a compilation of all existing data available at the present time and aside from a cursory inspection of the property by the writer and S. Dannhauer of Wells, B. C., no work has been recorded since December, 1947.

PROPERTY AND LOCATION

The property consists of twenty-eight contiguous Crown-Granted claims, some of which have placer rights.

Crown- Granted		Date Crown		Taxes		
Mineral Lease	Lot No.	Granted	Acres	<u>@ 25¢/Acre</u>		
Black Jack and Burns	1 B	Apr. 3, 1875	12.00	\$ 3.00		
Homestake (Placer)	4B	Mar. 5, 1877	10.00	2.50		
Cornish (Placer)	1 F	Feb. 2, 1874	38.00	9.50		
Wintrip (Placer)	32F	Dec. 30, 1875	82.23	20.75		
Snowden	10467	Oct. 18, 1939	20.22	5.25		
Westport	10468	July 28, 1939	25.95	6.50		
Black Jack Extension	10469	July 28, 1939	35.46	9.00		
Blackbird	10470	Oct. 18, 1939	47.13	12.00		
Royal Oak	10471	Oct. 18, 1939	31.40	8.00		
Mammoth	10472	July 28, 1939	29.08	7.50		
Pilot	10473	July 28, 1939	47.80	12.00		
Canadian	10475	Oct. 18, 1939	33.15	7.50		
Armistice	10476	Oct. 18, 1939	37.23	9.50		
Hoover	10477	Oct. 18, 1939	21.68	5.50		
Tyee Fraction	10478	Oct. 17, 1939	2.16	.75		
Nan Fraction	10479	Oct. 8, 1943	. 05	. 25		

Meter Fraction	10480	Oct. 8, 1943	4.93	1.25
Leeds Fraction	10481	Oct. 8, 1943	. 23	. 25
Babs Fraction	10482	Oct. 8, 1943	. 17	. 25
Pat Fraction	10483	Oct. 8, 1943	. 30	. 25
Tabu Fraction	10484	Oct. 8, 1943	. 56	. 25
Diller	10503	Jan. 12, 1939	29.82	7.50
Morning Star	10504	Jan. 12, 1939	49.07	12.50
Evening Star	10505	Jan. 12, 1939	35.77	9.00
Sirios	10506	Jan. 12, 1939	31.54	8.00
Orion	10510	Jan. 12, 1939	39.27	10.00
Venus Fraction	10516	Jan. 12. 1939	4.62	1.25
Roosevelt	9442	Oct. 17, 1939	42. 51	10.75
	28		712.33	\$ 181.75
	(Claims)		(Acres)	(Taxes)

Claim status and ownership were verified to be in good standing.

The property is located in the Cariboo Mining Division of British Columbia at Latitude $53^{\circ}-04$ 'N and Longitude $121^{\circ}-31$ 'W.

ACCESS

-

The claims are located 56 miles east of the Town of Quesnel, B. C., which has rail, air and highway connections. Highway 26, a paved secondary road, connects the ghost town of Barkerville, which is a class "A" provincial park, to Quesnel. Some of the Williams Creek claims border on this park boundary but as yet a satisfactory access road to the property is not available, since the only access is through the park.

- 2 -

HISTORY

and the second sec

The Williams Creek Gold Quartz Mining Company Limited holds twenty-eight Crown-granted claims on ground that was one of the richest placer deposits in the Barkerville area, these deposits being the Williams Creek placer deposits. Lode deposits were examined after the placer deposits began to play out and development on the Black Jack claims, consisting of a 120 foot shaft and three drifts, was completed between 1887 and 1892. Some 300 tons of ore were recovered but primitive milling practice prohibited further work. In 1933 Britannia Mining and Smelting Company Limited took an option on some of the claims and drove three adits, one each on the Westport, Black Jack and Wintrip claims. The option was dropped in 1934.

The claims were then acquired by Cariboo Gold Quartz Mining Company Limited in 1938, and in 1946 were transferred to Williams Creek Gold Quartz Mining Company, a company owned jointly by Cariboo Gold Quartz Mining Company Limited, Noranda Mines Limited and Consolidated Quebec Gold Mining and Metals Corporation, respectively. This company initiated a work program in September, 1946 and by August, 1947 had completed 14, 213 feet of diamond drilling, 10,000 feet of bulldozer stripping and a geological survey. No work on the ground has been done since then and the company has come under new ownership.

REGIONAL GEOLOGY

The geology of the Cariboo District has been described in numerous reports beginning with those of Dr. G. M. Dawson of The Geological Survey in 1875 and continued by Amos Bowman in 1887. In 1926 the Geological Survey of Canada published Memoir 149 by Johnson and Uglow. The authors set up a nomenclature of the rock types in the area and included a description of the auriferous veins. Hansen, in Memoir 181, gave a detailed account of the geology of

- 3 -

the Barkerville Gold Belt in 1935 and this was extended by Davis in 1937 to include the Island Mountain property. The Island Mountain property also provided the site for P. C. Benedict's paper "Structure at Island Mountain Mines, Wells, B. C.", published in 1945. This was the first real study of the ore deposits of the area and presented a more detailed account of the complexity of folding in the Cariboo Series of rocks. A. C. Skerl published a report on the Williams Creek Gold-Quartz property in the Western Miner (1948) which summarized the work done on that property. The latest major report on the area is "Geology on the Antler Creek Area", a B. C. Department of Mines Bulletin published in 1955, and written by A. Sutherland Brown. The following represents a compilation of the above data, with emphasis on Brown's work.

The rock types of the Barkerville Gold Belt are part of the Cariboo Series of Cambrian rocks and include the upper two formations of the series, the Midas and the Snowshoe (Holland, 1954). Both formations are greater than 1,000 feet thick and have a more or less conformable contact. The Snowshoe formation consists of grey brown, micaceous quartzite, brown, grey or green phyllite and metasiltstone, black and white limestone and granule conglomerate. The Midas formation consists of black to dark grey quartzose phyllite and metasiltstone and black to grey limestone.

Both these formations have been intensely deformed by metamorphism to form tight asymmetric folds trending northwest, which plunge at $20^{\circ} - 25^{\circ}$ northwest. These folds also are overturned to the southwest in the Wells-Barkerville area.

The major structure in the Barkerville-Wells area is the Snowshoe synclinorium, which is flanked by the Cunningham anticlinorium on the east and the Island Mountain anticlinorium on the west.

- 4 -

The Cunningham anticlinorium is east of the area of interest and it will suffice to say that it is a complex mixture of digitating minor folds on a major fold structure.

The Island Mountain anticlinorium trends northwest through the Williams Creek Gold property and through to the former Island Mountain Mine. Its core is emphasized by outcrop of the Midas formation. This fold is asymmetrical with a relatively gentle northeastern limb, a fairly flat crested zone and a steep overturned southwestern limb. Much of the fold is intensely dragfolded. On the northeastern flank of the Island Mountain anticlinorium there is an attenuated isoclinal syncline called the Saunder syncline, which is highly asymmetrical.

The intense degree of drag folding sometimes masks the structure of the major folds, even with the benefit of seeing the structure exposed underground. Surface interpretation is very difficult.

Faults are common in the Snowshoe and Midas formations. The major faults strike north-northeast and are normal right-hand faults. The displacement along these faults is sometimes greater than 1,000 feet. Numerous small faults are oriented sub-parallel to the foliation, usually dip at fairly shallow angle and are called bedded faults. Most faults cut the folding of the Cariboo Series and appear to be considerably younger.

The Barkerville fault is the largest in the area and dips steeply to the east. Other important faults are the Aurum and Jack of Clubs faults which run through the former Cariboo Gold Quartz Mine.

The Barkerville fault is slightly curved or may be composed of several strands. Where it is exposed at Barkerville it shows two feet of gouge material.

-The Align Anders and the State of the Stat The Jack of Clubs fault is the only fault in the area known to dip northwestward at $50^{\circ} - 60^{\circ}$. The lithology along this fault may signify a reverse movement. The Aurum fault has had both normal and strike-slip movement and dips 40° to the east. Its movement has been determined as being 475' in strike-slip and 240' in dip-slip.

EXPLANATION OF ROCK UNITS

The nomenclature of the rock units in the Barkerville Gold Belt is somewhat confusing because the B. C. Department of Mines in 1954 carried formation names that were located south of the present map sheet, into the Wells camp which had, and continued to use, the nomenclature of the Geological Survey of Canada established in 1935. The Geological Survey mapped five formations in the Barkerville Gold Belt and these formations made up the Cariboo Group of rocks. These formations, in order of ascending age, are the Basal, B. C., Lowhee, Baker and Rainbow units. The Rainbow unit is composed of dark grey quartzites, dark grey to black argillites and occasionally bleached argillites and tuff. The Baker unit is composed of light grey quartzites, light grey argillites, white and grey limestone and occasional light green tuff of possible volcanic origin. The visual difference between these two units is colour and usually the contacts are quite marked. The B. C. and Lowhee members are equivalent to the Rainbow and Baker but lower in the succession. The Basal unit is a distinct dark grey quartzite with interbedded argillite.

The 1954 survey includes the Baker, Rainbow and upper Lowhee in the Snowshoe formation and the lower Lowhee, B. C. and Basal members in the Midas formation. These formations form the upper part of the Cariboo Series of rocks and both are 1000+ feet thick.

ECONOMIC GEOLOGY

There are two types of lode deposits that are economically

- 6 -

important in the Wells-Barkerville area. These are the gold-bearing quartz veins and the replacement bodies.

Quartz veins are common in the area and although some are large, most are small and occasionally closely spaced.

Most of the smaller veins contain greater than 5% pyrite mineralization and some contain free gold.

There are four types of quartz veins recognized: transverse, diagonal, northerly and strike.

Transverse veins strike N. 30E. to N. 55E. and dip 70° to 90° southeast. Although they are the smallest of the quartz veins and are usually less than 100 feet long and one foot wide, they are mineable because they occur in clusters. They cut sharply across the country rocks and are not folded. They commonly fill tensional openings aligned to A. C. jointing and are most numerous adjacent to northerly faults. These veins generally contain the highest grade of ore.

Diagonal veins strike north 70° to 90° east and dip steeply southward. These veins are less numerous but usually a little larger than transverse quartz veins, are up to 250 feet long and are five feet wide. Occasionally these veins occupy minor faults that have small left-hand displacements. Although lower in grade, the diagonal veins may be enriched where they intersect transverse veins.

Northerly veins strike north to N. 20E. and dip 50° - 70° eastward. They occur in conjunction with the northerly striking faults of the area and are commonly crushed. They are very difficult to mine because of this and are also fairly rare.

Strike veins are sub-parallel to the regional foliation, i.e. $N.40^{\circ} - 60^{\circ}W$. and dip steeply southwestward. They are cut by northerly and easterly striking faults. They are the largest veins in the area and are few in number. The B. C. vein is 2400' long and 42' wide. These veins are usually sparsely mineralized but may contain

- 7 -

A.

large isolated masses of pyrite; however, these masses usually contain little gold and the veins are not usually of economic importance.

In general the sulphide mineralization is usually on the outer fringes of the quartz veins and probably indicates that the sulphide mineralization is younger than the quartz mineralization.

Replacement bodies are found in the Baker limestone beds of the Snowshoe Formation. These deposits consist of fine-grained pyrite which has selectively replaced the limestone and are usually associated with coarse grey andesite. These bodies may be pencilshaped or tubular and be along the crests of folds, plunging with them. at 20 degrees towards N. 55W. The length of these orebodies may be over 1,000 feet but they are seldom greater than 100' wide and usually they are smaller. All replacement bodies are usually within "ore-making range" of northerly faults and usually in proximity to quartz veins. Some of the stronger transverse veins do, however, penetrate into some of the replacement bodies.

The gold content of the replacement bodies is commonly more than double that of the quartz veins. In the Island Mountain Mine, replacement ore averaged 0.83 oz./ton, compared to 0.34 oz./ton for the quartz veins.

MINERALOGY

Gold is the mineral of value in both the replacement type deposit and the quartz veins. Silver is present in most of the ore but its ratio to gold is 1 to 10 and it is relatively unimportant, except as an accessory mineral. Pyrite is the dominant sulphide but there are traces of galena, sphalerite, scheelite, cosalite, bismuthinite, pyrrhotite and chalcopyrite.

Veins containing commercial gold, usually contain 15 - 25% pyrite and the higher assays are associated with fine-grained pyrite, rather than coarse-grained pyrite. High grade gold ore is usually

- 8 -

associated with needle-like cosalite and galenobismuthinite, both of which may contain very finely divided interstitial gold.

Replacement ore normally consists of massive fine-grained pyrite with few accessory minerals. The finest-grained pyrite may assay as much as 5 ounces per ton gold. Bands of ore are commonly separated by bands of grey akerite or phyllite. Towards the fringes ² of the orebodies, akerite becomes dominant and pyrite becomes more sporadic and coarser grained.

VEIN DISTRIBUTION AND GENESIS

Sec. 100

Most of the strike veins in the area have the characteristics of locally derived secretions and occur in quartzites or micaceous quartzites. These veins are usually barren and devoid of minerals other than quartz. Rarely, some are mineralized and others may occasionally occur in schistose argillaceous rocks.

Most other quartz veins in the area may be of hydrothermal origin but they share many of the characteristics of the secretional veins. They are largely restricted to quartzites and micaceous quartzites and may be barren of hydrothermal minerals in some places but not in others. Although in most cases the adjacent limestones are not silicified, the close spatial relation of the veins to northerly faults would indicate that these veins are of hydrothermal origin.

The gold-pyrite mineralization is presumed younger than the quartz veins and only indirectly related to them. The mineralized fluid followed the same conduit system occupied by the quartz veins, occurring in streaks that suggest the filling of voids in the veins. The transverse veins may be feeders of the replacement deposits, since these are usually in close proximity to such deposits.

PROPERTY GEOLOGY

The Williams Creek Gold property (Westport Group) is

- 9 -

underlain almost entirely by Snowshoe formation, except for part of the Pilot claim and the Morning Star claim which are underlain by Midas formation. The rock types include grey micaceous quartzites and interbedded argillites (phyllites) grading into brown and green argillites and limestone on the northeastern section of the property.

A moderate-sized anticline crosses Williams Creek 1200 feet southeast of the Stouts Gulch, Williams Creek junction. A syncline occurs between this anticline and the northeastern flank of the Island Mountain anticlinorium where the Midas formation outcrops. Fold structures are complex accompanied by much drag-folding.

Two major northerly faults cross the Westport Group. The Sirius Fault is a normal right-hand strike-slip fault with 800 foot separation. It is the westernmost of the two faults and a branch of it appears in the Wintrip adit. The Barkerville fault runs parallel to Williams Creek east of Barkerville and appears to have more than one branch. It is a normal strike-slip, right hand fault with more than 1000 feet separation. Several bedded faults also exist in the area, but the Westport bedded fault is the only one large enough to be worthy of mention. It strikes 65° west and dips 40° east and is interesting because of the numerous auriferous veins in its hanging wall. Its intersection with the Barkerville fault may provide a favourable area for exploration.

DEVELOPMENT WORK

Three adits were drifted in 1933 by the Britannia Mining and Smelting Company and although the original maps are not available, geologists for Williams Creek Gold re-mapped and sampled these adits.

The Wintrip adit on CG 32 is located immediately west of the Sirius Fault and is 2,000 feet south of the Rainbow-Baker contact. The Rainbow rocks here are considered to be near the top of a hidden overturned anticline. Sampling of a vein in this adit gave values of .25 oz. of gold over 3 feet for a length of 60 feet. Two diamond drill

- 10 -

intersections below the Westport adit assayed:

0. 16 oz. go'd over 4. 5 feet 2. 85 oz. gold over 2. 0 feet 0. 72 oz. gold over 3. 0 feet

There are 320 feet of workings in the Wintrip adit but it is presently inaccessible due to a blocked portal.

The Black Jack adit has 160 feet of workings and has a strong quartz vein at its portal. Drill holes cutting this vein gave values of 0.36 oz. over 6 feet at 320' below surface and 0.58 oz. gold over 9 feet in another hole 100 feet to the south and 250' below surface.

The Westport adit has 260' of workings and is located about halfway between the Black Jack and Wintrip adits. One vein in the adit assayed 0. 37 oz. gold over 1 foot for 36 feet. Diamond drilling below the adit gave the following values:

> 0.10 oz. over .2 feet 0.73 oz. over .4 feet 0.42 oz. over 1.0 feet 1.79 oz. over .8 feet

The above-mentioned diamond drill work was done by Williams Creek Gold in 1946-47 and was part of the program of 39 drill holes carried out in the central area of the claims. 11, 687. 6' of drilling was accomplished within the central part and is plotted on the accompanying map. D. D. H. 48 had the following intersections:

vein - 0.54 oz. gold over 2.5' - 257.0' to 259.5'
vein - 1.91 oz. gold over 0.5' - 274.1' to 274.6'
vein - 0.12 oz. gold over 2.5' - 293.5' to 296'
sludge-0.24 oz. gold over 5.0' - 290.0' to 295.0'
sludge-0.72 oz. gold over 5.0' - 295.0' to 300.0'

The vein cut at 295' in D. D. H. 48 corresponds to a vein in D. D. H. 43 which assayed 0.70 oz. gold over 3 feet.

D. D. H. #27 encountered 11 feet of quartz vein which assayed 0. 58 oz. gold over a true width of 9 feet. D. D. H. #24 encountered the same vein over 6 feet true width which assayed 0. 36 oz. gold.

Other holes intersected gold values which are plotted on the accompanying assay plan but the values given above are the most interesting.

10,000 feet of bulldozer trenching and 2525' of diamond drilling was done on the Morning Star claim along the Rainbow-Baker contact. Veins on surface between two bedded faults assayed as follows:

25	feet	averaging	0.41	oz.	over	4.	0	feet
17	11	11	0.50	н	.11	4.	7	11
18	11	11	0.66	11	11	2.	9	11
5		11	0.39	н	11	1.	9	11
15	11		0.15	11	11	1.	6	11

A shear zone north of the veins averaged 0.45 oz. gold over 5.3 feet for 35 feet. 30 feet beyond the end of this shear a transverse vein averaged 0.56 oz. gold over 1.6 feet for 17 feet. In line with this vein and 30 feet to the north is another section which averaged 0.11 oz. gold over 2.4 feet for 45 feet. Another vein 60 feet west of the above averaged 0.24 oz. gold over 1.6 feet for 32 feet. Nine diamond drill holes were put down to test this area but nothing of note was found and it is assumed that the ore shoots were short and that deviation of the drill holes increased the difficulty of intersection.

CONCLUSIONS

The results of diamond drilling and trenching indicate a sizeable area of potential gold mineralization and although no ore reserves can be estimated due to the irregular pattern of diamond drill holes, several intersections of ore grade material were encountered. Core recovery was not good, especially in the mineralized quartz veins, and some of the assays may be low. With the improvement of drilling techniques in the past 25 years, it is felt that better recovery is probable.

The eastern portion of the claim group encompasses unexplored areas of favourable geology along the Rainbow-Baker contact which runs east for 4,000 feet from the northerly trending Barkerville fault. The junction of these two geologic features should provide favourable ground for exploration, especially since the richer replacement bodies have occurred along this contact in the former producing Island Mountain Mine and the Mosquito Creek property.

One mineralized quartz vein has been discovered on the IF claim but outcrop in the area is rare because of the glacial overburden.

These claims represent an excellent exploration target in view of the present gold price and the favourable geology of the area.

RECOMMENDATIONS

Program for 1973

Additional claims should be staked along the southeastern boundary of the property and options or direct purchases should be made on several surrounding Crown-granted claims. The three existing adits on the property should be remapped and sampled.

Costs	Staking 23 claims @ \$50/claim	\$ 1,	150.00
	Geology and sampling	2,	000.00
	Assays - 40 samples @ \$3.00		120.00
	Cat work to open Wintrip adit: 10 hrs.	@ \$32.50/	
		hr.	325.00
	General administration		500.00
	Contingencies - 10%		400.00
		\$4,	495.00

Program for 1974

An access road to the property should be constructed from Wells utilizing existing roads and possibly the Lowhee hydraulic ditch. A geological survey should be carried out on the entire property.

- 14 -

The remainder of the recommended work program should be concentrated on the eastern portion of the claims. A test line of soil samples should be run over known mineralized areas to define the reliability of geochemistry and if results are favourable, a grid system should be established along the Rainbow Baker contact for sampling purposes. 10,000 feet of trenching should be carried out along the Rainbow-Baker contact to expose surface veins and geology.

A series of percussion holes drilled to a 300' depth at 100' intervals on a 400' grid is recommended to establish the Rainbow-Baker contact.

The area covered by these holes would be east from the Barkerville fault along the Rainbow-Baker contact.

Costs

	١c	C	e s	S	R	oa	d
-		~	~ ~		~~	~~	-

Cat time - 100 hrs. @ \$40/hr.	\$ 4,000.00
Geological survey - 3 mos. @ \$2500/mo.	7,500.00
Geochemical survey - linecutting	5,000.00
Trenching - cat time 200 hrs. @ \$40/hr.	8,000.00
Percussion drilling - 6000' @ \$2.75/ft.	16,500.00
Supervision	1,500.00
General Administration	5,000.00
Contingencies - 10%	4,700.00
	\$ 52,200,00

BIBLIOGRAPHY

and the second of the second second and the second s

Benedict, P. C. (1945):-

Contraction and

1.1

Structure at Island Mountain Mine, Wells, B. C. - Can. 1st. Min. Trans. Vol. 48 pp. 755-770.

and the an

A SD STA

Hanson, G. (1935):-

Barkerville Gold Belt, Cariboo District, British Columbia - Geo. Surv. Canada, Mem. 181

Holland, S. S. (1954):-

Yanks Peak - Roundtop Mountain area, British Columbia, B. C. Dept. of Mines, Bull. No. 34

Johnston, W. A. and Uglow, W. L. (1926):- Placer and Vein Gold Deposits of Barkerville Cariboo District, British Columbia, Geol. Surv., Canada, Mem. 149

Skerl, A. C. (1948a):-

Report on the Property of Williams Creek Gold Quartz Mining Company Western Miner pp. 38-43

Sutherland Brown, A. (1957):- Geology of the Antler Creek Area, Cariboo District, British Columbia -B. C. Dept. of Mines, Bull. 38

Appendix I

Crown-Granted Claims Favourably Located

to the Westport Group

Name & Owners	Lot #	Date	Acres	Rent
Bonita owned by Vera M. Vaux c/o W. F. McGowan 3262 Marine Dr. W. Van. B. C	42F	May 22, 1876	10.00	\$ 2. 50
Mint	10474	Feb. 28,1946	23.82	6.00
O.I. Fraction owned by Newmont Mining Corp., Marine Bldg. Van. 1, B. C.	11240	June 30, 1943	13.43	3. 50
Forward	21F	Sept. 22, 1875	6.94	1.75
Deadwood owned by M.A. Nason, L.B. Nason, W.A. Meecham C/o E.L. McConnan 11 Jedburgh Rd., Victoria, B	3F . C.	Dec. 8,1874	27.25	7.00
Liberty	7809	Nov. 13, 1934	48.19	12.25
Free Gold owned by Cariboo Amalga- mated Gold Mines C/c J. C. Oswald & Co. 635 - 789 W. Pender St. Vancouver, B. C.	7810	Nov. 13, 1934	42.21	10.75

e.e.