

MEMORANDUM

TO: H. Mogensen

FROM: E.A. Schiller

SUBJECT: Geological Review of Goosely Lake Area, B.C.

DATE:

March 9, 1970

I met with Neal Church, geologist with the British Columbia Department of Mines, in Victoria on March 4th. Purpose of the trip was to acquaint myself with the geology of the Goosely Lake area, north central B.C., in order that certain comparisons could be made with the geology of the Kitselas submittal of New Gold Star Mines Ltd. to CIGOL.

Church has been mapping in the Goosely Lake area for the past two summers and will be publishing his results in the forthcoming B.C. Mines Report for 1969. Church's work in this area was prompted by discoveries of copper and silver by Kennco as a result of stream sediment geochemical surveys in 1967. Of interest is the fact that some of the silver values from geochemical surveys were so high that Dr. John Sullivan, President of Kennco, came to the field and re-sampled selected areas himself. Follow-up studies led to the discovery of copper and silver in Hazelton type (Mesozoic) volcanic rocks within a window surrounded by Tertiary volcanic rocks.

General Geology

The geology of the Goosely Lake area is dominated by Miocene and Eocene rocks. The Eocene rocks are both fragmental and non-fragmental of intermediate composition, and the Miocene rocks are trachy-andesite flows. Where erosion has cut through the Tertiary volcanic rocks, Mesozoic rocks are exposed and for the most part belong to what is thought to be Hazelton type. At the Kennco deposit the Hazelton rocks are primarily dacitic fragmentals and flows, intensely folded and well mineralized, and showing evidence of varying amounts of argillic alteration.

The copper and silver occur as chalcopyrite, bornite and chalcocite (secondary minerals) and tetrahedrite in fine to medium grained fragmental rock.

Significance of Kennco Deposit

It would appear that the Goosely Lake property of Kennco has all the earmarks of an economic deposit. Fairly reliable sources of information claim that Kennco have delineated 45 million tons of open pitatable ore with a grade of 6 oz. of silver and 0.7% copper. From an exploration standpoint additional Goosely Lakes are

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to be expected because the Hazelton group has a wide distribution throughout central B.C. and it known to be mineralized in several widely spaced localities. Exploration programs directed to deposits of this type are warranted, and therefore efforts to define similar geological environments could lead to success.

E.A. SCHILLER

EAS:cl

MEMORANDUM

TO: H. Mogensen

DATE:

FROM: E.A. Schiller

March 9, 1970

SUBJECT: Meeting with Geologist G. White,
Consultant to New Gold Star Mines Ltd.

I met Gordon White on March 4th in his Vancouver office, and reviewed with him the Kitselas submittal of New Gold Star Mines Ltd. The property was offered to CIGOL via Art Cassidy who is a close friend of White's and of New Gold Star's President, Bill Blackstock of Calgary.

Purpose of this memo is to evaluate the merits of the property and make recommendations as to possible participation by CIGOL. The conclusions drawn are based on a review of all available data, my assessment of Gordon White as a geologist and what I can predict to be the potential of the Kitselas geological environment. It must be pointed out that I have not seen the property and in a similar fashion Kennco, who have made a firm offer for the property, have not seen the property either. In the accompanying memo I have briefly reviewed the geological environment of Kennco's Goosely Lake copper-silver deposit and having done so will make certain comparisons to the Kitselas property.

Potential of Kitselas Property

The Kitselas property definitely deserves a thorough exploration program. Sufficient evidence has been uncovered to indicate pervasive copper and silver minerals to be present in possible economic amounts. The judgment on my part is weakened by the fact that no full visit was made. I therefore have drawn conclusions on White's ability to observe and my examination of a few selected hand specimens. Although these shortcomings cannot be ignored, we cannot on the other hand allow these factors to provide detractions to a potential viable deposit.

The favourable aspects of the property can be summarized as follows:

The copper and silver are associated with volcanic or closely related rocks. More particularly it appears we have a subvolcanic environment with the metallic minerals widely dispersed in a manner not unlike what a bulk low grade deposit might look like. Veining and disseminations are evident over an extensive area in amounts suggestive of 0.5 to 1.0% copper and 1.0 oz. silver per ton. Few conclusions can be drawn from work to date other than that sufficient amounts of metal occur in the right rocks in a favourable geological setting.

cont'd. ...

March 9, 1970

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Proposals for Exploratory Work

A proposal for exploration has been proposed by White, based on a short term program and a longer term program. I agree for the most part with the list of items, a lot of which are non-technical but necessary in this high cost area (helicopter support, radios, etc.). Whereas White favoured extensive trenching right from the start, with stream sediment geochemical surveys, I prefer rock geochemical surveys to select areas to trench.

I recommend a program with short term exploration objectives and modest monetary commitments. Down the line commitments can be escalated to sweeten the deal, but in the initial stage the following program is suggested:

1.	Line cutting - cut base line only, lateral lines to be flagged with limited cutting	\$ 3,000
2.	Rock geochemical survey (includes assays)	5,000
3.	Geological mapping	2,000
4.	Trenching	10,000
5.	Mobilization and logistical support	20,000
6.	Supervision and report writing	5,000
	Contingency	5,000
		<hr/>
		\$50,000

E.A. SCHILLER

March 11th, 1970.

Mr. H. Ewanchuk,
Bethlehem Copper Corporation,
1818 Marine Building,
Vancouver, B.C.

Dear Henry:

Attached are my notes on the Mt. Kitselas property submitted to us by Canadian Industrial Gas and Oil. Hugh Mogensen of C.I.G.O. will be in our offices at 10 o'clock tomorrow morning, March 12th. I would appreciate you meeting with us at that time in order that Mr. Mogensen may present further details of any joint venture proposal.

I must stress that the nature of my enclosure is entirely confidential in view of the other Vancouver based company bidding on the same deal. C.I.G.O. has stressed that it remain confidential in order to avoid embarrassing those who have provided such information.

Looking forward to seeing you tomorrow morning.

Yours truly,

DYNASTY EXPLORATIONS LIMITED,

J. S. Brock,
Vice-President Exploration

JSB/mp
Encl.

CONFIDENTIAL

March 9, 1970

PROPERTY SUBMITTAL

Submitted By: Hugh Mogensen, C.I.G.O. (telephone conversation with J. S. Brock)

Area : N.T.S. 103-I (East Half)
Mt. Kitselas - 3 miles west of
C.N. Railway siding at Usk, about
11 miles northeast of Terrace.

References : -G.S.C. Map 11-1956
-G.S.C. Memoir 329
-C.I.M.M. Special Vol.8 "Tectonic History"

History : Numerous small showings have been reported
in the Kitselas Mountain Area. G.S.C.
Memoir 329 describes 5 separate copper
mineral occurrences here.

Recently two prospectors staked some copper
veins in the Hazelton Volcanics in this
area. The volcanics are thought to be
within roof pendants of the Hazelton Series,
intruded by Coast Intrusives.

During October, 1969, several trenches were
blasted across mineralized areas with the
following results:

<u>Distance to next trench</u>	<u>Sample Length</u>	<u>Description</u>	<u>Assays</u>	
			<u>Cu.</u>	<u>Ag.</u>
	22 ft.	Chip sample across disseminated sulphides in volcanics	1.33	.1
35' West	32 ft.		.91	.9
200' West	0' - 4 ft.	Trench 100' long.	.55	1.2
	10' - 3 ft.	Samples taken at 10' intervals across	.75	1.1
	20' - 4½ ft.	trench	.78	.5
	30' - 4½ ft.		.96	.8
	40' - 4½ ft.		2.64	.64
	50' - 4½ ft.		3.12	1.4
	60' - 4½ ft.		.78	.8
	70' - 4½ ft.		.05	.2
	80' - 4½ ft.		.25	.8
	90'?		-	-
	100'?		-	-

All trenches were not sampled due to snow conditions at that time.

An independent consultant, Gordon White, has prepared a geologic report and recommendations for further work on the property. White proposes an initial expenditure of \$65,000 to complete detailed geologic mapping, geochemical stream sediment sampling around Kitselas Mountain, continued trenching and preparation of a large-scale topo map for accurate compilation of survey and exploration data.

White's geology to date has been elaborated on and amended by others familiar with the area.

- (a) White describes a 'gabbro' unit, samples of which have been investigated by Dr. Carter of the B.C. Department of Mines. Carter calls the gabbro a porphyritic andesite, this porphyritic andesite intrudes the Hazelton type agglomerates and tuffs. White's conclusion is that the property and its environment are similar to the Goosely Lake Area.
- (b) Neil Church of the B.C. Department of Mines has provided data on the Goosely Lake area to an independent geological consultant, Ed Schiller. Schiller concurs with White that the Kitselas Mountain Property bears similarities to Goosely Lake.
- (c) Dr. J. Gower of U.B.C. has apparently examined specimens of the area which caused him to recommend the property to Kennco.

Kennco Explorations have offered a deal to New Goldstar without examining the ground. Kennco's deal involves an exploration commitment of \$800,000 over a 4 year period. Kennco would earn 60% in the property as well as control of New Goldstar Mines.

Present Situation

Canadian Industrial Gas and Oil (CIGO) have been approached and encouraged to offer a 'better deal' to New Goldstar Mines.

CIGO have suggested that they, plus one or two partners, propose a work commitment of \$750,000 over 4 years to earn a 60% interest, a new company would then be formed and financed by all parties with New Goldstar carrying a 20% retained interest.

Recommendations

1. Dynasty is interested in participating in such a venture providing:

- (a) that a third party is involved to minimize risk due to present 'unknowns' because of requirements for an immediate proposal. Such a party would be Bethlehem Copper, who already have been approached by Dynasty.
- (b) that first year expenditures are not in excess of:

Phase I (evaluation	\$60,000 to Aug.15,1970
Phase II(commitment to program)	\$50,000 to Dec.31,1970
- (c) that any Joint Venture Agreement made, provides a clause allowing release from financial commitments should engineering data initially presented be misleading. This would cover eventualities not foreseen because of 'ground examinations' not being practical at this time.
- (d) that exploration work after August 15th be conducted and supervised by Dynasty Explorations.
- (e) that a meeting be convened March 12, 1970, between CIGO, Dynasty and Bethlehem, to further discuss this proposal.

J. S. Brock
Vice-President Exploration
Dynasty Explorations Limited

FIG. 13



0 2 4 6
miles

LEGEND

- Overburden
- Plutonic rocks
- Bowser Group sedimentary rocks
- Hazelton Group; Triassic sediments
- Paleozoic limestone and greenstone
- Gneiss Complex
- Mineral deposit

Geology after Duffell and Souther (1964),
and Hutchison (1967).

General Geology and
Cell Location Map
Terrace, B.C.

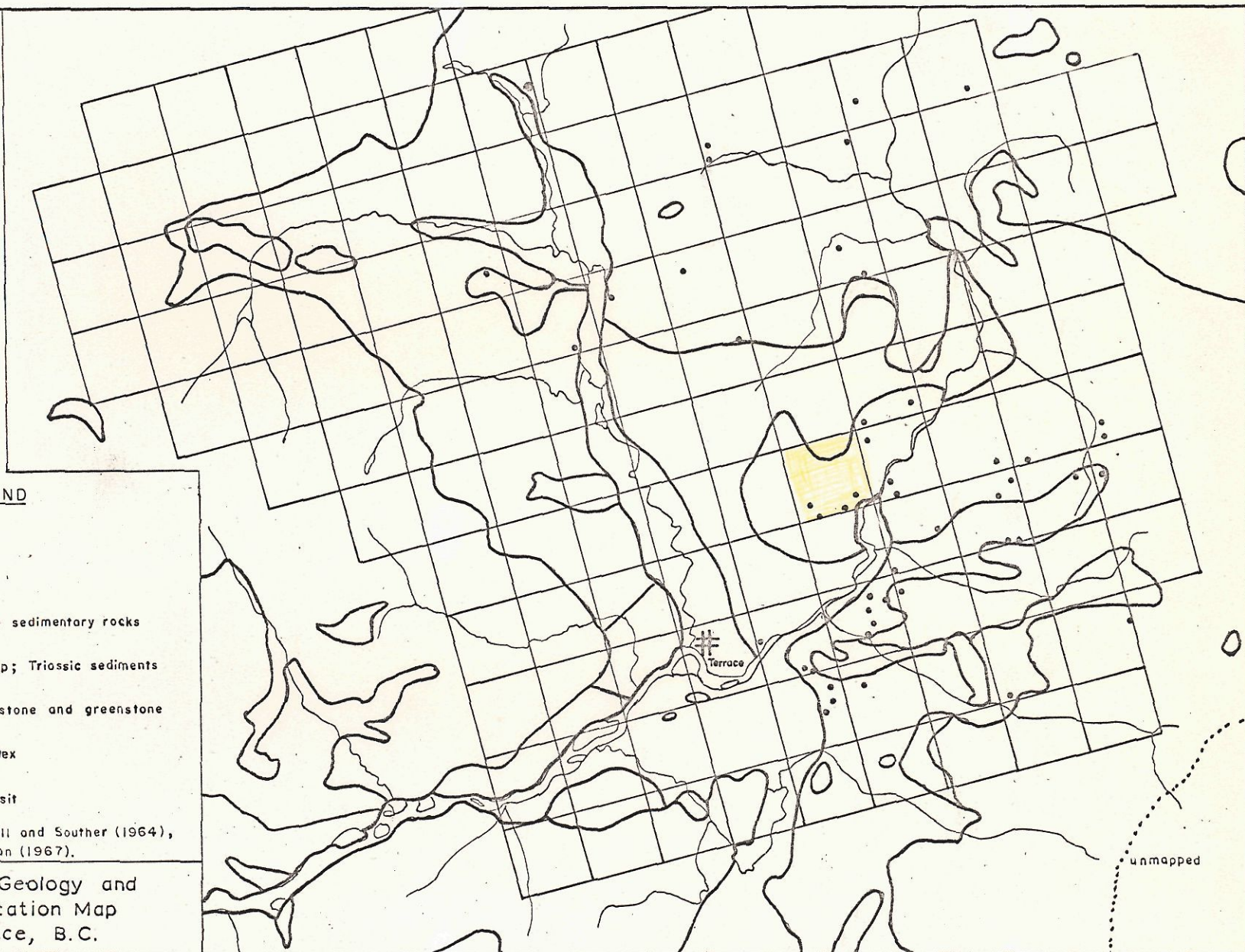


Fig. 14

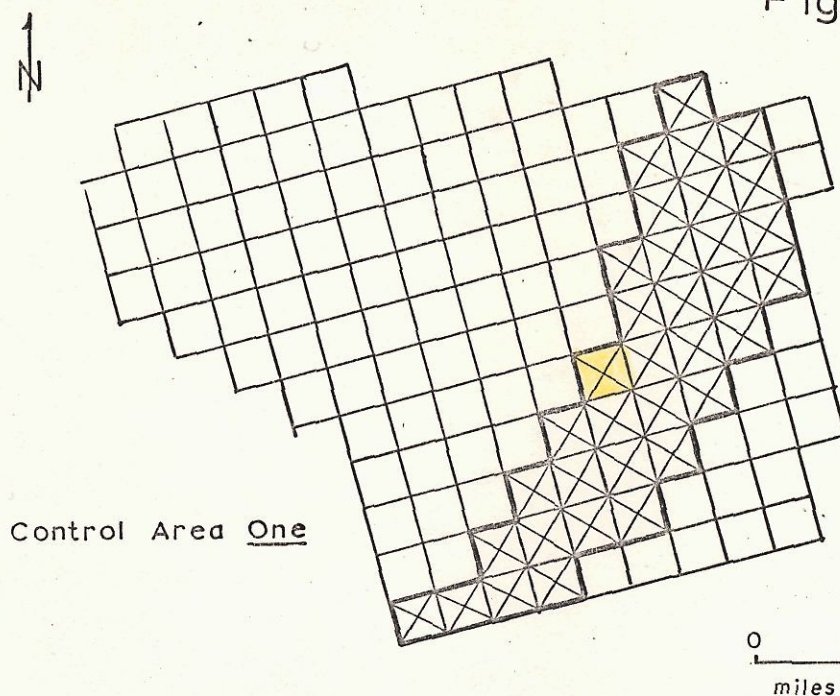


Fig. 15

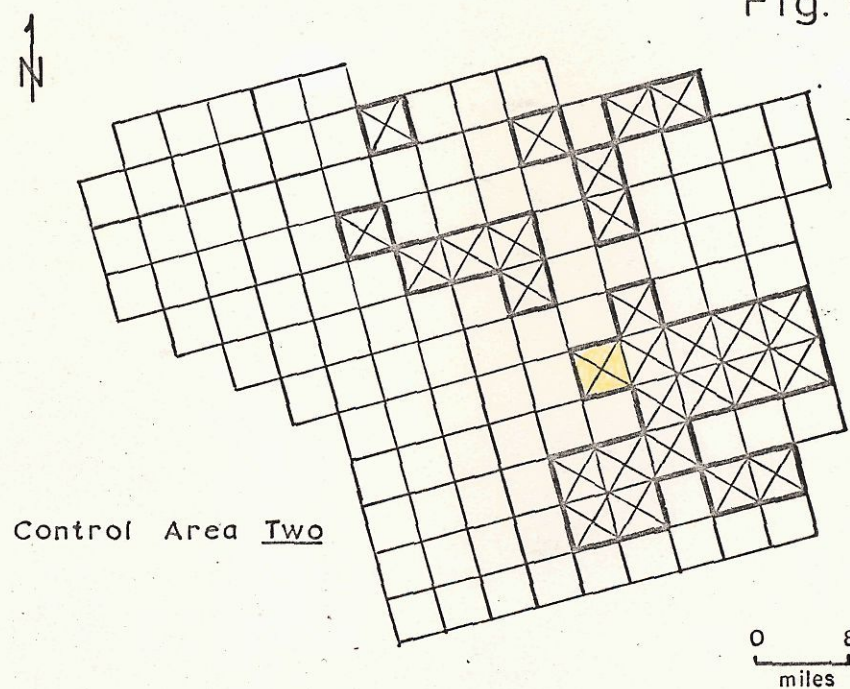


Fig. 16

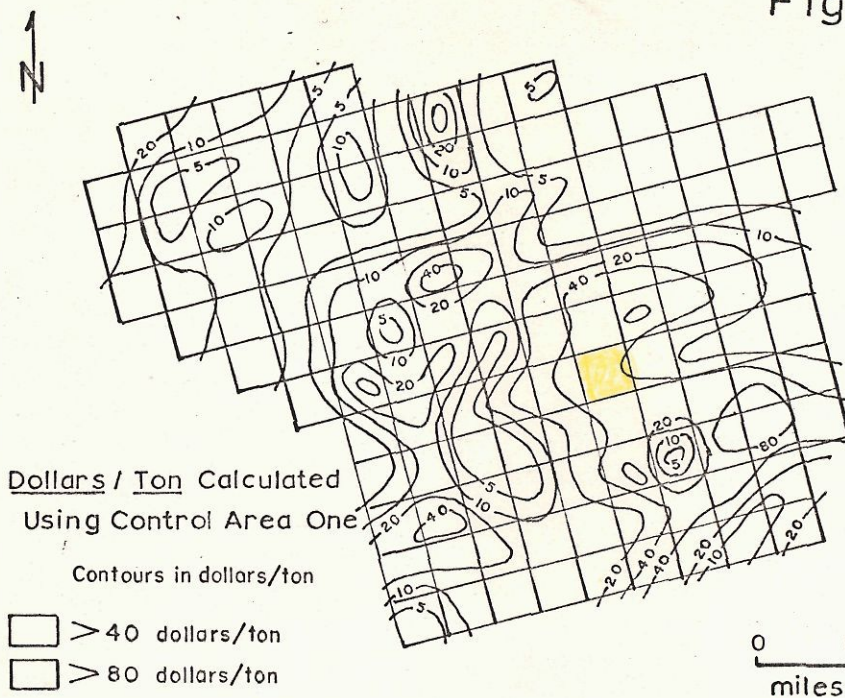


Fig. 17

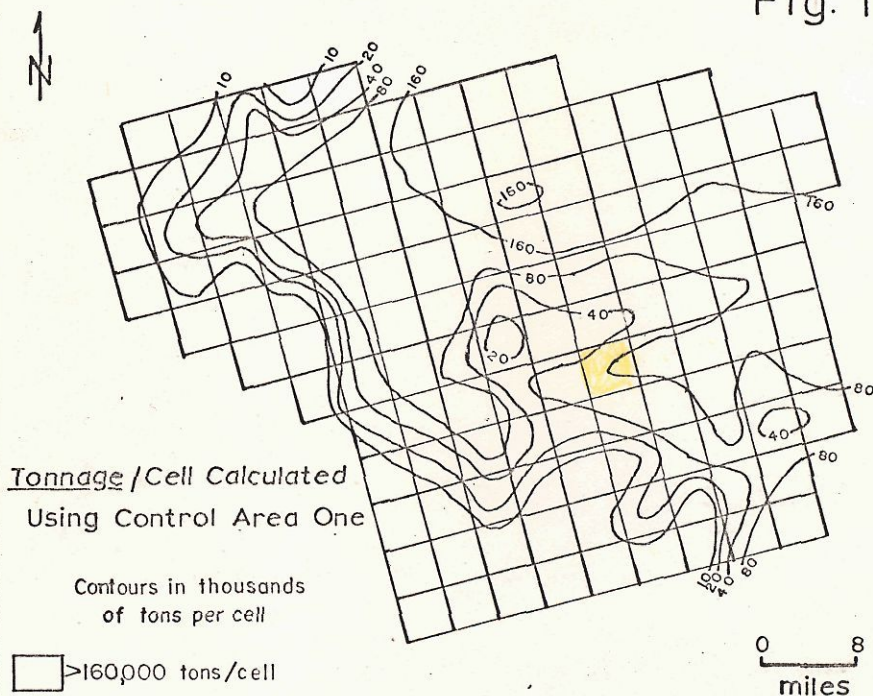


Fig. 18

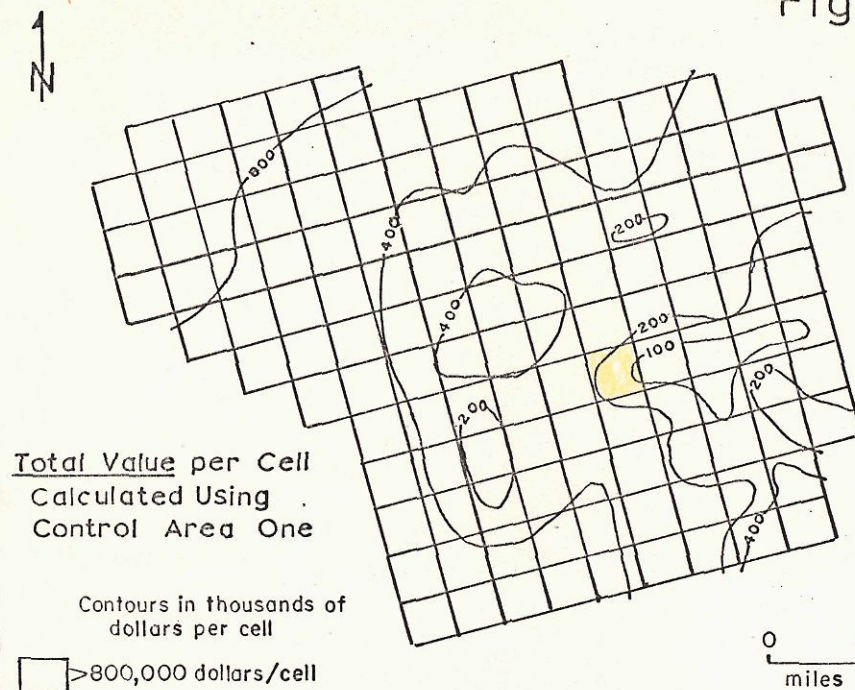
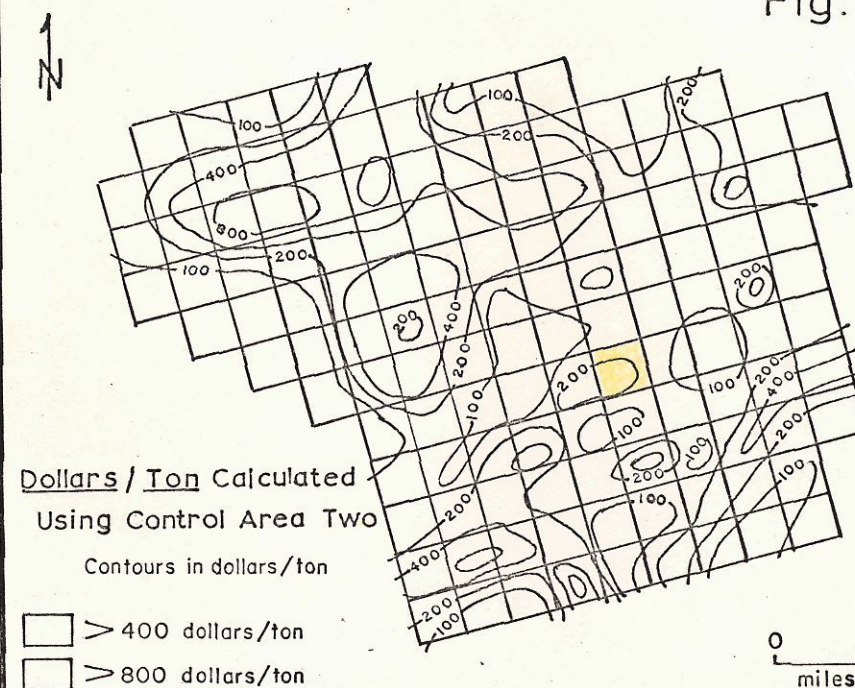


Fig. 19



60,000
10,000

150,000

200,000

300,000

750,000
NEW COMPANY

DYNASTY										CIGU										BETHLEHEM										X									
EXPLORATION AND DEVELOPMENT					CORPORATION					EXPLORATION AND DEVELOPMENT					CORPORATION					EXPLORATION AND DEVELOPMENT					CORPORATION					EXPLORATION AND DEVELOPMENT					CORPORATION				
EXPENDITURE		INTEREST			FINANCING		INTEREST			EXPENDITURE		INTEREST			FINANCING		INTEREST			EXPENDITURE		INTEREST			FINANCING		INTEREST			EXPENDITURE		INTEREST			FINANCING		INTEREST		
ANNUAL	ACCUM.	ASSES.	NON-A.				ASSES.	NON-A.			ANNUAL	ACCUM.	ASSES.	NON-A.			ASSES.	NON-A.			ANNUAL	ACCUM.	ASSES.	NON-A.			ASSES.	NON-A.			ANNUAL	ACCUM.	ASSES.	NON-A.			ASSES.	NON-A.	
1965 th I	24,000										18,000										18,000																		
1970 II	16,000	40,000									12,000	30,000									12,000	30,000																	
71	60,000										45,000										45,000																		
		100,000										75,000										75,000																	
72	80,000	180,000									60,000	135,000									60,000	135,000																	
73	120,000	300,000									90,000	225,000									90,000	225,000																	
			24																																	20	20		
74			24		30%		24%				18		22 $\frac{1}{2}$ %		18%						18		22 $\frac{1}{2}$ %		18%					25%			20	20					

Metallic mineral content of the veins and shear zones is bornite, chalcocite, chalcopyrite, pyrite, and tetrahedrite. Significant assays in silver and copper have been returned from some of the veins.

All the properties listed above are described by Kindle (1937b). Most of them have had some minor underground development or prospecting without too much success. The most developed group, the Singlehurst, is described below.

Singlehurst Group (39)

References. Ann. Rept., Minister of Mines, British Columbia: 1899, p. 655; 1900, p. 786; 1901, pp. 990 and 997; 1902, p. 46; 1914, p. 131. Geol. Surv., Canada, Mem. 212, pp. 30-32, 1937.

This property is situated near the summit of Bornite Mountain at an elevation of 4,700 feet, and was one of the first properties in the area to be seriously worked. Active development began in 1899 and by 1901 a vertical shaft some 130 feet deep had been sunk with crosscuts to the vein at the 60- and 100-foot levels.

At the 30-foot level, 45 feet of drifting has been done on the vein; at the 60-foot level, 16 feet; and at the 100-foot level, some 60 feet. About 5 tons of ore were shipped to a smelter in 1902.

At the shaft the vein is composed of 8 inches of quartz and several inches of altered wall-rock. The vein has been followed for a distance of about 275 feet and has in this distance a thickness between 6 and 10 inches. It occurs in a fault that strikes N20°E and dips 75°SE. A representative sample taken by Kindle from the remains of about fifty bags of crushed ore assayed: gold, 0.02 ounce a ton; silver, 35.64 ounces a ton; copper, 0.20 per cent. Other assays high in silver have been recorded from this property.

Properties on Kitselas Mountain

Properties recorded on Kitselas Mountain near Usk are as follows: Cordillera (35), Lucky Luke (36), Oxford group and Nugget group (38) and Copper King group.

Rocks on Kitselas Mountain consist mainly of metamorphosed sedimentary and volcanic rocks of probable Triassic age and altered volcanic rocks referable to the lower part of the Hazelton Group. The mineral occurrences are similar in character to those on Bornite Range in that they are narrow lenticular deposits occurring in fractures and shear zones carrying a low content of gold and silver but somewhat higher content of copper. Metallic minerals present in the deposits vary a little in the different occurrences. The Cordillera, Lucky Luke, and Nugget properties are characterized by bornite, chalcocite, chalcopyrite, pyrite, and free gold, the Oxford by coarse pyrite, and the Copper King group by pyrite and chalcopyrite.

All the properties except the Oxford and Nugget groups have had some underground development, the Lucky Luke mine having the greatest amount, but no work has been done since the early 1930's.

Lucky Luke Group (36)

References. Ann. Rept., Minister of Mines, British Columbia: 1918, p. 110; 1919, p. 98; 1923, p. 104; 1924, p. 88; 1925, p. 125; 1928, p. 146; 1934, p. C4. Geol. Surv., Canada, Sum. Rept. 1925, pt. A, p. 116; Mem. 205, p. 49, 1937.

The Lucky Luke mine is on the east slope of Kitselas Mountain, at an elevation of 1,000 feet, and about 1½ miles southwest of Usk. A rough road leads from the mine to the railway and thence to Usk, but as no maintenance has been done on this road since 1934 it is not now useable. The property was operated from 1917 to 1923 by L. E. Moodie and R. Lowrie. In 1923 and 1924 S. A. Davis carried on development work and shipped 25 tons of hand-sorted ore, which yielded 18 ounces of gold, 316 ounces of silver, and 11,162 pounds of copper. In 1934 R. W. Seely carried out further development work but nothing has been done since.

The deposit consists of a series of narrow, lenticular quartz lenses in a shear zone that strikes N70°W and dips 65°N. The quartz is mineralized with bornite, chalcopyrite, pyrite, chalcocite, and some visible free gold. The gold is associated with steel-grey chalcocite.

The workings consist of a main crosscut adit at elevation 990 feet that runs S25°W for 120 feet to the mineralized fault zone (Fig. 8). The zone is then followed by a drift in a direction west-northwest for 130 feet, where it is cut by a cross-fault. The cross-fault has been followed southwest for 35 feet without finding any continuation of the shear zone. In the drift, the shear zone varies in width from 3 to 6 feet and the quartz lenses average about 9 inches, though they may pinch out entirely for a few feet.

No drifting has been done on the shear zone east of the crosscut adit. According to Douglas Lay in the annual report of the Minister of Mines, British Columbia, for 1934, the winze that was sunk 80 feet from the adit level showed the vein material to pinch and swell, and in the bottom to be 2½ feet wide. Since 1935 the winze has been full of water and so could not be examined by either Kindle in 1935 or the authors in 1953. At an elevation of about 1,045 feet and some 130 feet south of the main adit portal, a 20-foot adit cuts the shear zone, which is then followed by a drift in a west-northwest direction for 96 feet. In the drift, the shear zone averages 3 feet wide and contains narrow lens-shaped bodies of quartz up to 18 inches wide. The two levels, at 990 feet and 1,045 feet, are connected by a raise on the vein.

During the operation of the mine an aerial tramway one third of a mile long connected the ore bin at the mine with a small mill near the railway at the foot of the mountain.

When the property was visited in 1953 there was no sign of mill or tramway, all buildings were collapsed and the cribbing at the adit portal needed considerable repair. There had been several rock falls in the drift and timbering showed signs of decay. The mine appeared to be very wet and the winze was full of water.

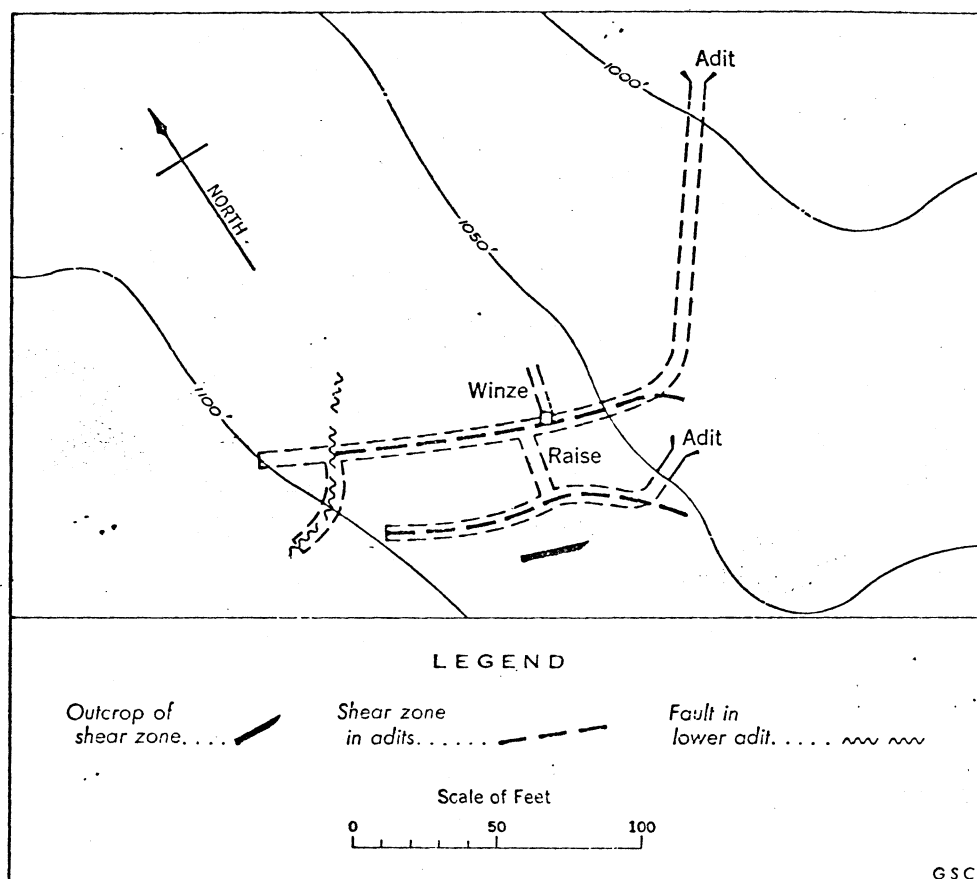


FIGURE 8. Plan of underground workings, Lucky Luke mine (after Kindle, 1937a).

Cordillera Group (35)

References. Ann. Rept., Minister of Mines, British Columbia: 1914, p. 141; 1917, p. 97; 1918, p. 110; 1919, p. 98; 1920, p. 80; 1921, p. 95; 1922, p. 97; 1923, p. 101; 1925, p. 125; 1926, p. 124. Geol. Surv., Canada, Sum. Rept. 1925, pt. A, p. 115; Mem. 205, pp. 46-48, 1937.

This property, a mile southwest of Usk at the base of Kitselas Mountain, was first staked in 1914. Development work was carried out by the Kitselas Mountain Copper Company which built a small amalgamation mill in 1920 and produced some gold, silver, and copper. Further work was done in 1929 and 1930 but nothing since. Exploratory work, consisting of a total of more than 1,650 feet of underground workings on two levels, was done on a system of quartz veins that strike northwest and dip 15 to 35 degrees northwest. The veins are relatively short quartz lenses repeated along strike; some have been exposed for lengths of from 60 to 90 feet. Widths varied from a few inches to 11 feet, the average

probably being less than 3 feet. These quartz lenses are mineralized with bornite, chalcocite, chalcopyrite, and gold. The workings of this property are heavily overgrown with new growth bush and difficult to find; they were not visited by the authors.

Nugget (38) and Copper King Groups

References. Ann. Rept., Minister of Mines, British Columbia: 1914, p. 142; 1923, p. 105; 1928, p. 145. Geol. Surv., Canada, Mem. 205, p. 52, 1937.

These groups are on the Hankin Creek slope of Kitselas Mountain and are reached by a good trail up Hankin Creek from the railway. When visited in 1954 the trails were in fair condition but the workings had deteriorated so that less could be seen than when they were visited by Kindle in 1935. The veins are similar in nature to those on the Lucky Luke and Cordillera, i.e., narrow lens-like quartz bodies mineralized with chalcocite, chalcopyrite, pyrite, and some gold.

Nicholson Creek Mining Corporation (26)

References. Ann. Rept., Minister of Mines, British Columbia: 1934, p. C5; 1935, pp. 7-10; 1936, p. C37; 1938, p. B39; 1939, p. A68; 1940, p. A54; 1941, pp. A41, 55; 1948, p. A76; 1952, p. 85; 1953, p. 92; 1954, p. 85; 1955, p. A21. Geol. Surv., Canada, Mem. 205, pp. 53-57; Paper 36-20, pp. 35, 36.

The Nicholson Creek Mining Corporation owns a large number of claims, covering about 6 square miles between Lowrie and Shannon Creeks, on the west side of Skeena River north of Usk. The company, incorporated in the State of Washington, commenced operations on the property in 1934 and until 1955 carried out a great deal of exploration by surface trenching, diamond drilling, and underground development on the many mineral showings occurring on the claims. Unfortunately no orebody of economic proportions has been discovered to date. Mr. W. D. Galbraith was in charge of the work at the property during the period 1951 to 1955 and showed the authors every courtesy. Some of the claims, such as the Diadem taken over by the Corporation in 1934, already had considerable underground and surface exploration done on them.

The area covered by the Corporation's claims is underlain by metamorphosed sedimentary and volcanic rocks that have been grouped with the Triassic rocks of the map-area. These metamorphosed rocks have been invaded by a tongue of granodiorite extending onto the property from a larger body to the north and west. In effect the bedded rocks are part of the metamorphic zone along the eastern margin of the Coast Range batholith. As a result the sedimentary and volcanic rocks have been sheared, broken, and silicified, and narrow quartz veins and sparsely mineralized lenses have formed along fractured zones. Near the contact of the granodiorite and the bedded rocks the former is in places itself fractured and faulted and veins have formed in these fractures.

In the bedded rocks the veins and mineralized zones carry pyrite, sparse bornite and chalcopyrite, minor scarn minerals, and in places some scheelite. Assays showed that in the precious metal content is low.

Several thousand feet of underground development on mineral occurrences in the bedded rocks has shown little but narrow quartz veins following the sheared zones. On the Diadem claim an adit 1,050 feet long, driven across the strike of the shearing, cut only a few minor stringers. On the Orion claim there are about 1,200 feet of drifts and crosscuts and numerous surface trenches and open-cuts. This work was done on narrow quartz veins that follow shear zones and schistosity in very fine grained silicified bedded rocks. The strike of veins is $N70^{\circ}W$ with a dip of $50^{\circ}SE$.

In the granodiorite tongue near its contact with the bedded rocks several sheared, fractured, and silicified zones are visible on the surface, one as much as 20 feet wide. These zones contain quartz veins that are commonly less than 2 feet wide but may widen to as much as 4 feet. These veins and shear zones carry pyrite and molybdenite with negligible values in gold and silver.

In an attempt to intersect these structures underground, the Corporation in 1934 drove an adit in a direction $S38^{\circ}W$ from a point on the south bank of Shannon Creek at an elevation of 1,533 feet, and approximately $3\frac{1}{2}$ miles from the mouth. The portal of the adit is on the southeast bank of a northerly flowing tributary of Shannon Creek known as Molybdenum Creek. The surface showings are about 1,200 feet southwest of the portal and about 400 to 500 feet higher.

The adit ultimately was extended to over 1,700 feet, all in granodiorite. It intersected dozens of minor faults and shear zones and some narrow quartz veins bearing pyrite and molybdenite but nothing comparable with the surface showings. Many of the sheared zones are filled with dark green dykes that strike $N25^{\circ}W$ and dip $65^{\circ}NE$. Near the end of the adit one of these has been followed south for 225 feet. Other workings off this adit amount to about 300 feet of drifting and crosscutting along sheared zones all of which failed to uncover veins of economic size. Work on this adit was intermittent during the period 1937 to 1948. In 1948 the plant was moved to the Orion claim where underground work proceeded on the showings there. This work was being extended in 1955 but operations ceased in that year.

Properties on Hardscrabble Creek

The properties accessible from Hardscrabble Creek are the Diorite group (22), the Grotto group (21), and the A-B group (23).

The geology and mineralization is similar to that of other properties in Skeena Valley. The contact of the granodiorite of the Coast Intrusions with Triassic rocks and rocks of the Hazelton Group is about 4 miles west of Skeena River on Hardscrabble Creek. The intruded rocks are fractured, sheared, and cut by dykes. Veins and mineralized lenses are present in some of the fractures and along the contacts and walls of dykes.

A-B Group (23)

References. Geol. Surv., Canada, Mem. 205, p. 57, 1937.

The A-B group of claims is on the ridge between Shannon and Hardscrabble Creeks, about 3 miles west of the railway line along Skeena River. From the

CENOZOIC	QUATERNARY PLEISTOCENE AND RECENT	
	8	Sand, gravel, clay, alluvium
	CRETACEOUS OR LATER UPPER CRETACEOUS OR LATER COAST INTRUSIONS	
MESOZOIC	7	Undifferentiated: granodiorite, diorite, quartz diorite, quartz monzonite, adamellite, granite, gabbro Border Facies: 7a, hornblende and hornblende-biotite granodiorite; 7b, hornblende diorite, quartz diorite, migmatite Inner Facies: 7c, white granodiorite; 7d, green granodiorite; 7e, pink granodiorite Pyroxene Quartz Diorite Facies: 7f, border phase; fine-grained, non-porphyritic, pyroxene quartz diorite; 7g, coarse-grained, non-porphyritic phase; pyroxene granodiorite; 7h, porphyritic phase; pyroxene granodiorite and adamellite; 7i, central phase; adamellite and granophyre Gabbro Facies: 7j, olivine gabbro, pyroxene gabbro, diorite
	JURASSIC AND (?) CRETACEOUS UPPER JURASSIC AND (?) LOWER CRETACEOUS BOWSER GROUP	
	6	Greywacke, conglomerate, argillite; minor tuff
	JURASSIC LOWER (?) AND MIDDLE JURASSIC HAZELTON GROUP	
	5	Andesite, basalt, rhyolite, dacite
PALAEOZOIC	4	Andesite, breccia, tuff, greywacke, argillite
	TRIASSIC (?)	
PALAEOZOIC	3	Limestone-boulder conglomerate, greywacke, banded volcanic sandstone, chert
	CARBONIFEROUS AND PERMIAN	
	2	White crystalline limestone
PALAEOZOIC	1	Greenstone, shale, argillaceous limestone, limestone

Bedding (inclined, vertical)	///
Schistosity (inclined, dip unknown)	///
Fault (defined, approximate)	~~~~~
Anticline (defined, approximate)	↕
Syncline (defined, approximate)	↕
Glacial striae	↗
Fossil locality (leaves, shells)	(Fl) (Fs)
Mineral property	34.



45'

30'

INDEX TO MINING PROPERTIES

1. Silver Plate and Silver Cup group
2. Windfall group
3. Seven Sisters group (D and W)
4. Caledonia group
5. Buccaneer of the North group
6. Canadian Swede group
7. September group
8. July group
9. Dry Hill Placer group
10. Patmore group
11. Dorreen Gold Mine
12. Martin group
13. Guld claim
14. Bear claim
15. Black Wolf claim
16. Belway and Rex group
17. Motherlode claim
18. Gold Dome group
19. Keystone and Lucy O'Neil claims
20. Portland claims
21. Grotto group
22. Diorite group
23. A-B group
24. Bradle Bane group
25. St. Elmo group
26. Nicholson Creek Mining Corporation
27. Frisco group
28. M and K group
29. Shenandoah group
30. United Ste-Croix group
31. Zona May group
32. M and M claims
33. Galena group
34. Silver Mitts group
35. Cordillera group
36. Lucky Luke group
37. Independence group
38. Nugget group
39. Singlehurst claim
40. Silver Crown group
41. Silver Basin group
42. Columario Consolidated Gold Mines Ltd.
43. Silver Bow and Silver Cliff groups
44. Avon group
45. Wells group
46. Montana group
47. Zymoetz group
48. Providence group
49. Globe claim