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G.M. EXPLORATIONS LIMITED (N.P.L.)

REPORT ON

PROPOSED EXPLORATION PROGRAM

NICKEL PLATE MOUNTAIN PROPERTIES

HEDLEY, B.C.

Sept. 14/67 Walter E. Clarke, B.Sc., P.Eng.

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I N D E X

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G.M. EXPLORATIONS LIMITED (N.P.L.) REPORT ON PROPOSED EXPLORATION PROGRAM
NICKEL PLATE MOUNTAIN PROPERTIES, HEDLEY, B.C.

INTRODUCTION

This report is presented to outline a preliminary exploration program for copper and gold on the Hedley properties formerly owned and operated by Kelowna Explorations Ltd., and known as the Nickel Plate Mine, Sunnysides and Bulldog ore bodies, now under option to G.M. Explorations Ltd.

The widespread strong alteration and sulphide mineralization of the Nickel Plate formation, the favorable areas as yet only partially explored, and the present economic conditions, particularly in respect to copper, make exploration of this area an attractive venture.

The area south and west of the main gold productive areas, called the South Rim Area, has been selected for initial exploration due to the many occurrences of chalcopyrite mineralization in the old Kingston, Warhorse and Bulldog workings, and the frequent references to chalcopyrite in the logs of diamond drill holes in these sectors. Copper, often associated with gold values, may occur in several horizons and the preliminary longitudinal sections, Maps #3 and #4, which are appended, show the extent of these copper bearing beds.

Future exploration will attempt to locate extensions of known gold ore shoots of the Nickel Plate-Sunnyside systems and other associated copper bearing horizons. This phase should commence after a study of the excellent but voluminous records pertaining to these workings has been completed, and the extensive stoping areas examined and evaluated.

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The writer has examined all accessible old workings in the South Rim Area, carried out preliminary sampling of same, re-logged available diamond drill core, and studied geological records compiled by previous operators. Full use was made of the numerous reports and information, listed in Appendix I, by Charles Camsell; Paul Billingsley; C. B. Hume; Victor Dolmage; C. E. Gordon Brown and Kelowna Exploration geologists. A cursory underground examination was made of the Nickel Plate and Sunnysides mining areas. The report will, therefore, deal primarily with exploration of the South Rim Area.

SUMMARY

1. Total Production, 1904 through to 1955, from all operations on Nickel Plate Mountain is reported to be 3,800,000 tons valued at \$48,000,000.00. Present ore reserves are estimated at 67,118 tons, grading 0.245 oz. Au/ton.

2. The primary objective of this program is to explore in detail the copper bearing zones of the South Rim Area, which include the Warhorse, Kingston and Bulldog, where the presence of important concentrations of chalcopyrite suggest the possibility of outlining copper-gold ore bodies.

3. This view is substantiated by the following information:

(a) The frequent reference to chalcopyrite in the logs of a great number of diamond drill holes from Sunnyside #1 through the Bulldog and along the South Rim Area to the Kingston workings, a dip slope distance of over 4,000 feet and in several horizons, of a 400 foot thickness of sediments.

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(b) Four of the diamond drill holes in the Bulldog area were assayed for copper and gold. They partially explored an area 150 feet x 130 feet, with an average thickness of 60 feet, part of a gold ore bearing horizon, and graded 0.07 oz. Au and 0.84% Cu/ton. The adjoining gold ore shoot averages 0.37 oz. Au/ton for an estimated 5,635 tons.

(c) The Bulldog #1 stope, which is 300 feet down-dip from the ore zone mentioned above and from which 4,328 tons, averaging 0.43 oz. Au/ton was mined, was examined and chalcopryite mineralization is intimately associated with other sulphides.

(d) Two separate areas of copper mineralization on the Warhorse Claim are exposed by old surface and underground workings. The Intervening 400 feet are relatively unexplored. Sampling of the southeasterly workings covering an area 200 feet x 60 feet, gave an average assay of 0.06 oz. Au, 0.61 oz. Ag and 0.80% Cu/ton, while similar sampling of the northwesterly zone covered an area 150 feet x 50 feet, which averaged 0.04 oz. Au, 0.55 oz. Ag and 0.51% Cu/ton. The thickness of the mineralized horizons is not known.

(e) A diamond drilling program comprising 8 holes and a total footage of 3,513 feet, was carried out by Dundee Mines Ltd. on the Warhorse Claim in 1964. Numerous references to copper mineralization occur in the logs to depths of 200 feet below outcrop, but relogging and sampling of the cores to determine copper content has not been completed. Several interesting gold intersections, grading as high as 0.84 oz./ton over a 10 foot core length, were encountered during this program.

(f) On the Kingston Claim, mineralized skarn zones were explored between elevations 3,150 feet and 3,400 feet by 6 short adits and 15 diamond drill holes. The best copper exposures are in the lowest

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adit and in a shallow winze below this level. A 50 foot length in this adit was sampled and averaged 0.07 oz. Au, 0.78 oz. Ag and 1.57% Cu/ton over a 32 foot width. A picked sample of muck from the winze assayed 0.04 oz. Au, 3.15 oz. Ag and 9.25 % Cu/ton.

No drill hole intersections were assayed for copper, although chalcopyrite was noted in most of the logs. Gold values were generally low and erratic.

(g) Copper-gold showings that have received limited exploratory work to date occur on the Rollo, Metropolitan and Princeton Claims.

4. All the maps, diamond drill hole logs and other records relating to former operations and preserved by Kelowna Explorations Ltd. are available for reference and study and have provided much of the information in this report. Continued detailed study and compilation of information, particularly relative to copper bearing horizons in and around the Nickel Plate and Sunnysides workings, is necessary before the future potential of this ground can be assessed.

5. There are indications that structural conditions favorable to ore deposition may occur in the central sector of the property. Examination of existing exploratory drives at the 4,160 foot, 4,500 foot and 5,215 foot elevations will provide much geological information and the headings may be suitably located as bases for future exploration.

6. The following exploration program is recommended to effectively test the property for copper-gold ore shoots. Please refer to Map #2.

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Phase IA

The first objective of the program is to determine the extent of copper mineralization in the South Rim Area, with emphasis on the copper content of the mineralized zones of the Kingston, Warhorse and Bulldog.

The work should include surface and underground geological mapping and sampling, reconnaissance electromagnetic surveying and approximately 6,500 feet of short hole diamond drilling on the three main zones.

Completion date December 1, 1967.

Phase IB

A comprehensive study of maps and records relative to former operations will provide direction for exploration in and around the Nickel Plate and Sunnysides productive horizons.

This phase will include surface and underground diamond drilling to further explore the South Rim Area laterally and at depth, and to commence testing of intermediate mineral occurrences. Total estimated diamond drill footage - 4,200 feet.

Completion date - July 1, 1968.

Phase II

Based on results of earlier work, the surface and underground drilling program will be expanded to complete testing of the South Rim Area and to obtain preliminary information on the potential of the central sector and the former Nickel Plate productive horizons, by geological mapping, sampling and underground diamond drilling.

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A minimum of 6,300 feet of surface drilling is estimated. The balance of work in this phase will be contingent on the results of the geological study.

Completion date - December 1, 1968.

Phase III

An assessment of work to date will be required prior to continued exploration and development. A low level adit may be considered.

7. Costs for the program are estimated as follows:

<u>Phase IA</u>	\$ 63,000.00	
<u>Phase IB</u>	<u>58,000.00</u>	
<u>Total IA & IB</u>		\$123,000.00
<u>Phase II</u>	\$125,000.00	- \$150,000.00

CONCLUSIONS

1. The wide zone of metamorphism associated with dioritic intrusives and the numerous ore bodies controlled by well defined structural features make continued exploration on Nickel Plate Mountain an attractive venture.

2. The economics of former operations were based primarily on gold production. Copper mineralization has been noted in a great many areas, but practically no average grade information is available. The change in the economics of copper suggests that the properties should be reassessed as a combined gold-copper operation.

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3. Preliminary information indicates that the South Rim Area, from the Bulldog northwesterly to the Kingston, has the greatest potential for economical copper-gold mineralization. Two types of mineralized zones may be anticipated:

(a) Moderate sized, medium to high grade gold-copper shoots, associated with the usual structural controls within skarn zones.

(b) High tonnage, low grade, copper deposits in massive limestones of the Nickel Plate Formation.

4. The down-dip continuation of the main Nickel Plate ore system warrants careful examination, as the conditions causing termination of production from this zone are not clear.

5. The central sector of the property, formerly considered to be unproductive, may contain ore shoots related to previous ore bearing structures or similar zones heretofore unknown. Initial exploration can be conducted from existing underground workings.

6. The above conclusions point to a well planned, phased exploration program permitting time and financial resources to fully evaluate the property.

The program should include:

(a) Surface and underground geological mapping and sampling.

(b) Geochemical and geophysical surveying of selected areas.

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(c) Surface and underground diamond drilling - substituted by percussion and longhole drilling where appropriate.

(d) Comprehensive study of all maps and records pertaining to former operations, including re-logging and sampling of available diamond drill core.

(e) Establishment of a new low-level adit of dimensions suitable for production operations.

RECOMMENDATIONS - PROPOSED EXPLORATION PROGRAM

It is recommended that the following exploration program be instituted:

Phase IA

1. Geological mapping and sampling of all mineralized areas, surface pits and underground workings in the South Rim Area. *DONE*

2. Re-logging and re-sampling of diamond drill holes completed by Dundee Mines Ltd. on the Warhorse Claim, and holes drilled in and around the Bulldog Workings. *DONE*

3. Improve access to the Kingston workings with a road suitable for 4-wheel drive vehicle. - Distance approximately $\frac{1}{2}$ mile. *DONE*

4. Conduct reconnaissance electromagnetic survey over areas outlined on Map #2 - 6 line miles. *DONE*

5. Surface and underground diamond drilling in order of priority.

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(a) Kingston

Short surface holes to recheck known mineralized zones over a dip-slope area 100 feet x 300 feet. - 14 holes.

3 Holes totaling 637' drilled

1,750'

STARTED

(b) Warhorse

Short surface holes around present workings.

Dip-slope distance - 800 feet. - 10 holes.

1,500'

14 Holes totaling 2819' drilled

(c) Bulldog

Outline copper-gold ore shoot immediately below #2 level by -

Underground diamond drilling 9 holes 1,200'

Longhole drilling 20 holes 2,000'

Total Drilling 6,450'

DONE

The estimated completion date is December 1, 1967.

Phase IB

1. Comprehensive study and compilation of maps and records relative to former operations which will provide direction for underground remapping, sampling, etc., in and around the Nickel Plate and Sunnysides productive zones.

2. Exploratory surface and underground diamond drilling to check the extensions of areas drilled in Phase IA and determine the character of intermediate mineralized zones.

Please refer to Map #2 for proposed hole locations:

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(a) Kingston	
Holes K1 and K3	1,400'
(b) Warhorse	
Holes W1 and W3	1,200'
(c) Princeton	
Holes P1 and P3	1,100'
(d) Bulldog	
Hole B1	<u>500'</u>
Total Drilling	4,200'

The estimated completion date is July 1, 1968.

Phase II

This will be a continuation of Phase IB and will be based on the results of all prior work. It should include drilling the remainder of the proposed surface diamond drill holes as shown on Map #2, amounting to approximately 6,300 feet.

During this phase, rehabilitation of certain underground workings will be necessary to provide access for underground diamond drilling.

The estimated completion date is December 1, 1968.

Phase III

At this stage, a complete assessment of results to date should be made to determine the proper approach to continued exploration and development, which could include the driving of a low level adit.

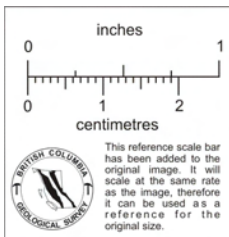
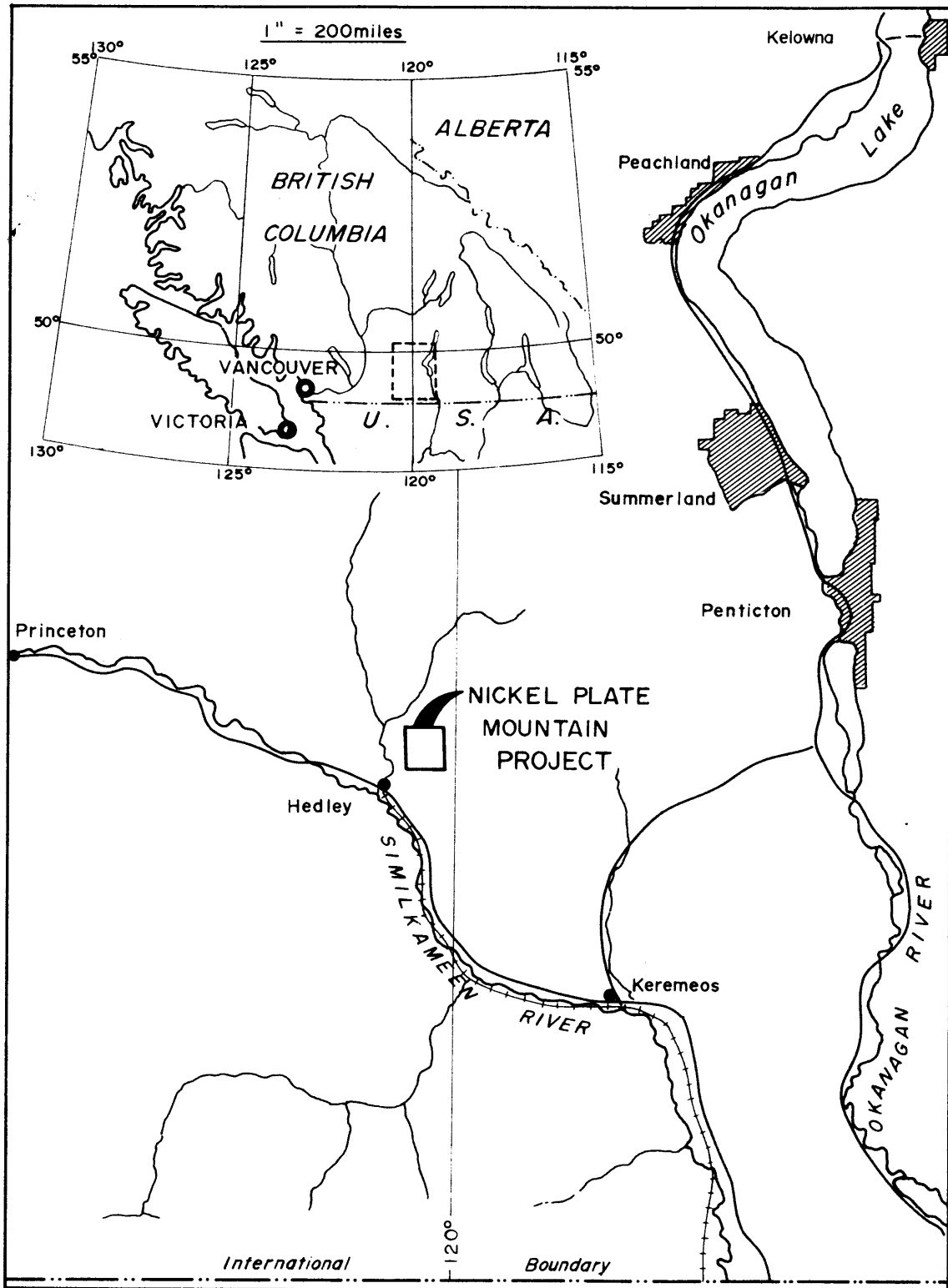
COST ESTIMATE

Phase IA

1. Geological Mapping and Sampling	\$13,000.00	
2. Re-logging diamond drill core	2,000.00	
3. Access road to Kingston	1,000.00	
4. Electromagnetic survey	1,000.00	
5. Diamond drilling		
(a) Kingston 1,750' @ \$8.00/'	14,000.00	
(b) Warhorse 1,500' @ \$8.00/'	12,000.00	
(c) Bulldog		
Diamond drilling 1,200'		
@ \$8.00/'	9,600.00	
Long hole drilling 2,000'		
@ \$3.00/'	6,000.00	
6. Camp improvements	2,000.00	
	<hr/>	
	\$60,600.00	
7. Contingencies	4,400.00	
	<hr/>	
Total Phase IA		\$ 65,000.00

Phase IB

1. Study maps and records	\$ 4,500.00	
2. Underground mapping, sampling	12,000.00	
3. Camp improvements	3,000.00	
4. Diamond drilling		
(a) Kingston 1,400' @ \$8.00/'	11,200.00	
(b) Warhorse 1,200' @ \$8.00/'	9,600.00	
(c) Princeton 1,100' @ \$8.00/'	8,800.00	
(d) Bulldog 500' @ \$8.00/'	4,000.00	
	<hr/>	
	\$53,100.00	
5. Contingencies	4,900.00	
	<hr/>	
Total Phase IB		\$ 58,000.00
		<hr/>
Total expenditure Phase IA and IB		\$123,000.00
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G. M. EXPLORATIONS LTD.	
Nickel Plate Project LOCATION MAP.	
DRAWN : H.W.C.	SCALE : 1" = 8mils. app.
CHECKED : W.E.C.	DATE : SEPT. 1967

To accompany report by W. E. Clarke, September, 1967.

Phase II

A minimum expenditure of between \$125,000.00 and \$150,000.00 should be anticipated in this Phase to provide sufficient information to proceed with Phase III.

LOCATION AND ACCESS

Please refer to Maps #1 and #2.

The properties are located on the southern and western slopes of Nickel Plate Mountain in south-central B.C., about 200 miles east of Vancouver between elevations 3,000 feet and 6,100 feet. The summit of the mountain is two miles northeast of Hedley. The southern Trans-Provincial Highway connects Hedley with Princeton and Vancouver to the west, and with Keremeos, Penticton and other interior towns to the east. Greyhound bus and trucking companies operate on this highway, providing adequate service to the area.

An eleven-mile good gravel road, part of the Hedley-Nickel Plate Lake-Penticton secondary road, connects the former Nickel Plate camp with the highway, one mile south of Hedley. This road traverses the southern and eastern slopes of Nickel Plate Mountain. Narrow mountain roads, suitable for 4-wheel drive vehicles provide access to most of the workings on the western slope of the mountain, except in the precipitous areas of Horsefly Canyon to Windfall Canyon.

PROPERTY

The property is comprised of 83 Crown-granted mineral claims situated in the Hedley District, listed as follows:-

<u>C. of T. No.</u>	<u>District Lot No.</u>	<u>Name of Mineral Claim</u>
9798-D	2832	Czar Fractional
9799-D	2673	Sacramento
9800-D	656"S"	Paris
9801-D	265"S"	Nellie A
9802-D	2666	Red Mountain
9803-D	2819	Banner
9804-D	(2475	Rollo
	(2477	King
9805-D	200"S"	P.S. Fractional
9806-D	(1582"S"	New York Fractional
	(3032	Red Eagle
	(3033	Midday Fractional
	(3037	War Eagle
	(3466	Charter Oak
9807-D	(655"S"	Morning
	(663	Triangle Fractional
	(725	Exchange Fractional
	(735	Nickel Plate Fractional
	(742	Copper Field
	(744	Gold Field
	(745	Electro Plate
	(1581"S"	July Fractional
	(1600	Iron Duke
	(1792	Danube
	(1793	Gold Plate
	(1794	Sunshine No. 1 Fractional
	(1797	Danube Fractional
	(1876	Mound

<u>C. of T. No.</u>	<u>District Lot No.</u>	<u>Name of Mineral Claim</u>	
9807-D cont'd.	(1877	Copper Cleft	
	(2664	I X L	
	(2665	Climax	
	(3410	Windfall	
	(3411	Big Horn	
	(3412	Winchester Fractional	
9808-D	(2474	Kingston	
	(2478	War Horse	
	(2479	Grand View	
	(2480	Metropolitan	
	(2481	Kingston Fraction	
9809-D	(1796	Aorangi	
	(3465	Glenwood Fractional	
an undivided $\frac{1}{2}$ interest in and to	(3464	Stemwinder	
<u>C. OF T.M. No.</u>			
5615	(634"S"	Beaver	
	(2822	Centre Star Fraction	
	(2823	Draw	
	(3034	Mayflower	
	(2476	Princeton	
	an undivided $\frac{1}{2}$ interest in and to	(3464	Stemwinder
	(739	Bull Dog	
	(740	Sunnyside	
	(741	Nickel Plate	
	(743	Silver Plate	
5615	(1798	Woodland	
	(389"S"	Badger	
	(707	Wellington	
	(708	Cracker Jack	
	(852	Alice	
	(679"S"	Dominion	
	(1795	Warrimoo	

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<u>C. of T.M. No.</u>	<u>District Lot No.</u>	<u>Name of Mineral Claim</u>
5615 cont'd.	(1975	Mafeking
	(1980	Iron Plate Fraction
	(3312"S"	Coyote Fraction
	(2903"S"	Kitchener Fraction
	(2904"S"	Salt Lake Fraction
	(2905"S"	Mound Fraction
	(3113"S"	Victoria Fraction
	(3313"S"	Annie Brooks Fraction
	(3314"S"	August
	(3326"S"	Enckechin
	(3327"S"	Synkelip
	(3328"S"	Chinook
	(3398"S"	Chilanko
	(3399"S"	Mowich
	(3400"S"	Cuitan
	(3850"S"	Sage
	(3851"S"	Spruce Fraction
	(3852"S"	Fir Fraction
	(3853"S"	Pine Fraction
	(3854"S"	Juniper Fraction
	(3855"S"	Aspen Fraction
	(3856"S"	Cedar Fraction
	(3878"S"	Thistle No. 2
	(3879"S"	Thistle No. 2 Fraction
	(3880"S"	Thistle Fraction

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PHYSIOGRAPHY

Topography

The Hedley district is situated in the Okanagan range, part of the Interior Plateau. This rather gentle uplift is deeply cut by the Similkameen River and its tributaries. The Similkameen canyon traverses the area from north-west to south-east, is 4,000 feet deep, and in places, less than four miles wide from rim to rim. Twenty Mile Creek cuts this valley from the north at Hedley, in a deep narrow canyon, producing rugged topography. Nickel Plate Mountain lies to the east of this junction, the west flank being along the cliffs of Twenty Mile Canyon and the south along the cliffs of the Similkameen canyon. The east slopes are gentle into 18 Mile Creek, while on the north, the mountain merges into the rolling surface of the plateau with little loss in elevation. The elevation of Hedley is 1,700 feet, and the summit of Nickel Plate Mountain is 6,200 feet.

Climate and Timber

The climate is essentially dry, characteristic of the southern interior of B.C., with hot summers and moderately cold winters, although there is considerable variation between the valleys and mountains. Water supply for a mining operation must be carefully planned.

The lower southwesterly slopes are sparsely wooded, but at higher elevations, dense areas of jack-pine and spruce are found, with ample timber available for mining purposes.

HISTORY

The first claims on Nickel Plate Mountain were recorded in 1894, but it was not until 1898 that mineralization of commercial grade was located. Production commenced in 1904 by the Yale Mining Co., controlled by the Marcus Daly interests of Butte, and to 1909, 167,000 tons averaging 0.696 oz. Au/ton were milled. From that year until early 1931, the Hedley Gold Mining Company operated the various properties, at which time, all known ore reserves were exhausted. Production figures for this period are incomplete, but from 1909 - 1922, 700,000 tons, averaging 0.55 oz. Au/ton were milled. At an increased production rate of 200 tons/day, it is recorded that the average grade dropped to 0.31 oz. Au/ton in 1927, partly attributable to the inclusion of sub-ore grade material to maintain the mill tonnage.

In the fall of 1934, after intensive study by Paul Billingsley, and attendant exploration work, Kelowna Exploration Co. resumed production and carried out continuous operation to August, 1955, when the property was again shut down. Remaining ore reserves were calculated at 67,118 tons, averaging 0.245 oz. Au/ton.

Total production, exclusive of the period 1923 - 1930, amounted to 2,860,790 tons, averaging 0.45 oz. Au/ton.

During the period 1936 - 1949, the portion of the Nickel Plate orebody underlying the Mascot Fraction was mined by the Hedley Mascot Gold Mining Co.

It is reported that total production from all operations on Nickel Plate Mountain was 3,800,000 tons, valued at \$48,000,000.00.

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GEOLOGY

The early Mesozoic sedimentary rocks immediately north of the town of Hedley occupy an asymmetrical anticline several miles wide. The axis strikes N15° E with the east limb being vertical or overturned and the west limb dipping 12° to 40° to the west. The west limb is cut longitudinally by the deep gorge of 20 Mile Creek, which separates Nickel Plate and Stemwinder Mountains. A quartz diorite stock, the Toronto stock, has intruded the sediments, and porphyritic apophyses from this body penetrated the surrounding sediments in the form of sills and dykes, making up a large percentage of the stratigraphic column on Nickel Plate Mountain. The Okanagan granite and granodiorite batholith lies approximately two miles to the north. A granodiorite mass, which dips gently to the west, underlies the sediments and truncates the anticlinal structure at the base of the mountain. A wide granodiorite dyke, an offshoot of the basement intrusive, traverses the western slope of the mountain, cutting both sediments and diorite porphyry sills and dykes.

The sedimentary formations are Triassic in age and form a pile of interbedded quartzites, argillites, limestones and volcanic material from 7,000 to 10,000 feet thick. It is in the impure altered limestones and quartzites of the Nickel Plate Formation that the presently known ore bodies have been found.

Table of Formations

Igneous Rocks

Andesite - Porphyritic, dykes

Granite and Granodiorite - Batholith and basement intrusive

Diorite, Diorite Porphyry - Toronto stock and porphyritic dykes and sills.

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Sedimentary Formations

Aberdeen - Thinly bedded quartzites, limestones, argillites and volcanic material.

Thickness 3,000' - 6,000'

Red Mountain - Tuffs, breccias, quartzites, minor limestones

Thickness 1,200'

Nickel Plate - Interbedded pure and impure limestones and quartzites, subdivided into -

Kingston limestone - mainly coarsely crystalline

300'

Middle Member - interbedded limestone and quartzite, highly metamorphosed 500'

Sunnyside limestone - mainly coarsely crystalline, upper sections with interbedded quartzites

300'

Thickness 1,100'

Redtop - Thinly bedded quartzites, limestones, argillites and tuffs.

Thickness ----- 1,200' -----

Total Sedimentary Series

6,500' - 9,500'

The Nickel Plate Formation has been the subject of extensive study and published geological papers during the past 50 years.

Although it has not been possible to correlate individual beds for any great distances, laterally or down-dip, it has been found that gold deposition has been concentrated in the upper horizons of the

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Middle Member, the main Nickel Plate Ore system, and both immediately above and below the contact between the Sunnyside limestone and the Middle Member, the Sunnysides, Bulldog, Warhorse ore shoots, some 300' - 500' stratigraphically lower. In most cases, ore shoots are in areas of intense silicification, and alteration of the sediments to skarn, the development of garnet, pyroxene, epidote and scapolite. Alteration of quartzites produced chert horizons, while the limestones and limey argillites were more amenable to the development of the skarn minerals.

Sulphide mineralization associated with the areas of alteration are arsenopyrite, pyrrhotite, chalcopyrite and minor pyrite and sphalerite. Gold values are associated with some, but not all phases of arsenopyrite. One writer has noted that gold values are low where chalcopyrite is found. In the South Rim Area, finely disseminated chalcopyrite and pyrrhotite have been observed in relatively unaltered limestone belonging to either the lower portion of the Middle Member or the Sunnyside Limestone horizon and closely associated with other sulphides in areas of intense skarn alteration.

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ORE CONTROLS

For the concentration of ore shoots, it is generally conceded that a majority of the following conditions should obtain:

1. Strong skarn alteration mixed with calcite, close to the edge of the zone of alteration.

2. Strong structure -

(a) Anticlinal or synclinal folds, preferably with one limb steeply dipping.

(b) Strong shearing and faulting, near fold axes or on north dipping limbs of transverse folds pitching N20° - 30°W.

3. A high proportion of diorite porphyry sills and transverse, steeply dipping dykes.

4. Mineralization - Concentrations of arsenopyrite and scapolite usually indicate higher gold values.

Parallelism of the edge of a zone of alteration with any of the structural controls or diorite porphyry sills has been found favorable for the formation of the larger ore shoots.

The limits of skarn alteration are irregular in detail, but in general, form a saucer-shaped area of varying thickness with the Nickel Plate Formation. The alteration may terminate abruptly along the dip or strike of individual beds, or may traverse several beds, forming deep "keels" of alteration, usually closely associated with steeply dipping porphyry dykes.

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It is the writer's opinion that the zones of alteration (the main guide to the location of ore bodies) are primarily controlled and localized by early structural features such as folding, accompanied by shattering and faulting. Into these zones of weakness was intruded diorite porphyry, forming dykes and sills, followed by solutions creating widespread silicification and skarn alteration of limey horizons. In the final stages, sulphides and economic minerals were introduced.

The presently known ore bodies and undeveloped areas of mineralization are all associated with one or more such structural controls close to the periphery of the skarn alteration.

It is significant that, with the exception of the main Nickel Plate ore shoots, very limited exploration has been carried out on ore bearing structures at depth. The extent of mineralization and persistence of favorable structural features along the South Rim are largely obscured on surface by a succession of diorite porphyry sills which dip almost parallel to the westerly slope of Nickel Plate Mountain. Exploration oriented to test the potential of the extension of the structures and mineralized areas now in evidence present interesting possibilities for the location of additional gold-copper ore shoots.

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DESCRIPTION OF OREBODIES AND MINERALIZED AREAS

Please refer to Map Numbers 2, 3 and 4.

1. Nickel Plate Ore System

This is a series of tabular ore lenses, striking N70°W and raking from 30° throughout most of the 3,000 foot length, to 70° in the lower section. The individual ore lenses occupy portions at seven different altered skarnized limestone beds from 10 feet to 100 feet thick, separated by sills of diorite porphyry. The lateral extent of the orebodies is very irregular, but may be as great as 500 feet. The upper limit of the ore is at an elevation of 5,900 feet and the lower at approximately 4,300 feet. All orebodies are near the top of the Middle Member of the Nickel Plate Formation, close to the northern periphery of the alteration zone.

Ore controls involve all of the pre-requisites noted above, with the intersection of porphyry sills and cross-cutting dykes playing an important role in ore concentration.

Copper mineralization was noted in one of the large stopes and a grab sample of broken muck on the stope floor assayed 1.02 oz. Au., 2.60 oz. Ag. and 0.65% Cu/ton. This mining section contributed about 85% of the tonnage mined, but the overall grade was considerably lower than that of the Sunnyside system.

2. Sunnyside Ore System

The five orebodies comprising this system strike and dip approximately parallel to the Nickel Plate system located along a 2,000 foot length of the eastern edge of the zone of skarn alteration, with approximately 400 feet of non-productive ground separating the individual shoots. The orebodies are relatively small, but high grade, with the largest being Sunnyside #2 which produced 100,000 tons, grading 1 oz. Au/ton. The productive horizons are approximately 500

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feet stratigraphically below those of the Nickel Plate System, being immediately above the upper contact of the Sunnyside Limestone, the lowest main member of the Nickel Plate Formation.

Each of the orebodies is closely related to north-westerly trending anticlines or synclines, with attendant faulting and shearing. A diorite porphyry sill is common to each, overlying the orebodies. The intersection of steeply dipping porphyry dykes with intermediate sills localizes ore shoots in the Sunnyside 4½. The Sunnyside 2 and 3 orebodies are cut off by a steeply dipping N.E. striking fault.

3. Bulldog Ore Zone

This area is about 400 feet south of Sunnyside No. 1, occurs in the same stratigraphic horizon, and might be classified as the southern limit of ore occurrences belonging to the Sunnyside system. It also occupies the up-dip extension of the horizons in which such copper and gold mineralized zones as the Warhorse and Kingston are located. It may therefore be considered as the eastern limit of the South Rim Area.

The ore controls are similar to those noted above, and the ore zone is cut off by a steeply dipping east-west striking fault, similar to that which terminates the Sunnysides 2 and 3.

The mineralized zone outcrops on surface and has been partially explored by two adits 100 feet and 200 feet below the outcrop. Diamond drilling from both adits outlined an ore body containing 5,635 tons, averaging 0.37 oz. Au/ton, immediately below the #2 level. Production of 1,169 tons, averaging 0.20 oz. Au/ton, was obtained during development of the #2 level. The down-dip extension of the ore horizon

.26/

was explored from the 800 level of the Nickel Plate workings, 235 feet vertically below #2 level. Production from subsequent stoping above this level amounted to 4,328 tons, averaging 0.43 oz. Au/ton, with remaining ore reserves estimated at 1,000 tons, grading 0.40 oz. Au/ton.

Of particular interest is the presence of copper mineralization in important concentrations in the existing ore shoots and the frequent reference to such mineralization in several separate horizons in the logs of diamond drill holes in the Bulldog area and extending north to Sunnyside #1. Unfortunately, only four of these diamond drill holes, partly within the ore shoot at #2 level, and more importantly in the relatively unaltered limestone below the main productive skarn horizon, were assayed for copper as well as gold. The four holes partially explored an area 150 feet x 130 feet, with a maximum thickness of 60 feet, which averaged 0.07 oz. Au and 0.84% Cu/ton.

4. South Rim Area

As noted above, surface exploration of the area from the Bulldog to the Kingston showings is hampered by the widespread exposure of diorite porphyry. Structural conditions and controls and the extent of mineralization can only be inferred from the work done on several zones located over a distance of approximately 4,000 feet. In general, it would appear that while gold values are not high, there is greater copper mineralization than found in the Nickel Plate and Sunnysides productive areas.

(a) Horsefly

The Horsefly claim on which this showing occurs is just outside the property presently under option, but it is known that low gold values were encountered in a massive sulphide zone, assoc-

.27/

iated with east-west faulting. The enclosing chert and skarn horizon may be as much as 200 feet stratigraphically higher than the Bulldog ore horizon, but the effects of faulting must be studied to verify this opinion.

Several diamond drill holes, both surface and underground, did not prove up commercial quantities of gold ore.

(b) Rollo

Surface work on scattered mineralized zones associated with a flat lying thrust fault and diamond drilling from surface gave inconclusive results. However copper mineralization has been observed on surface and is noted in diamond drill logs to a depth of 400 feet. The best assay obtained during preliminary sampling, graded 0.04 oz. Au, 11.55 oz. Ag. and 1.60% Cu/ton over a 1.0 foot width.

(c) Warhorse

Early surface and shallow underground workings disclosed several zones of mineralized skarn, associated with shearing, folding and diorite porphyry dykes and sills. Chalcopyrite is associated with the usual arsenopyrite and pyrrhotite in most localities. Preliminary sampling of old workings indicated two mineralized zones 400 feet apart, down-dip, which assayed 0.06 oz. Au, 0.61 oz. Ag. and 0.80% Cu/ton, over an area of 200 feet x 60 feet, and 0.04 oz. Au, 0.55 oz. Ag. and 0.51% Cu/ton, over an area of 150 feet x 50 feet.

Dundee Mines Ltd. drilled 8 surface holes in 1964. Five of the holes were largely in diorite porphyry with narrow intersections of skarn. The other holes encountered thicker horizons of skarn and limestone along with diorite porphyry, mineralized in part with pyrrhotite, arsenopyrite and chalcopyrite. Gold values, ranging

.28/

as high as 0.84 oz/ton over a 10 foot core length, were encountered in porphyry, skarn and silicified limestone horizons to a depth of 300 feet. Hole S-3, drilled 100 feet north of the main underground workings, was resampled to evaluate the copper content. Two 4 foot sections assayed about 1% Cu., but for the 170 feet resampled, the copper grade was lower than visually estimated. Resampling the mineralized sections of the remaining drill holes is necessary to properly assess the importance of the copper content.

One of the important results of this drilling program is the greater than anticipated depth of skarn alteration in the Warhorse area, thereby enlarging the zone favorable to ore deposition.

It is of interest to note that copper mineralization was found in two locations on the Princeton claim, due north of the Rollo, and approximately midway between the Horsefly and Warhorse showings. One sample assayed 0.44 oz. Au. and 0.40% Cu/ton over a 3 foot width.

(d) Kingston

This zone is the lowest topographically of any of the ore occurrences on Nickel Plate Mountain, with the #1 level at an elevation of 3,279 feet. The mineralized skarn zones were partially explored by six short adits and fifteen surface diamond drill holes between elevations 3,150 feet and 3,400 feet.

During this exploration period, only gold was considered of prime economical importance. However, in all of the drill

. 29/

hole logs, chalcopyrite was noted accompanying the other usual sulphides. No samples were assayed for copper, and gold values were generally low and erratic. The drill core is no longer available for relogging or sampling.

The No. 1 Adit shows the best copper mineralization and a 50 foot length, recently sampled, averaged 0.07 oz. Au. 0.78 oz. Ag. and 1.57% Cu/ton over a 32 foot width. Muck from a shallow winze sunk on this structure and stored in the old level workings is well mineralized with chalcopyrite. A picked sample of this material assayed 0.04 oz. Au, 3.15 oz. Ag. and 9.25% Cu/ton.

The mineralized skarn horizon at the Kingston appears to be the same as that at the Warhorse. The intervening 800 feet of ground is totally unexplored.

5. Other Areas

The central portion of the widespread alteration zone on Nickel Plate Mountain has been unproductive to date and has received only a minor proportion of the overall exploration and development effort. This is probably due to adherence to accepted geological concepts of ore deposition and the cost of carrying out effective underground exploration in this relatively inaccessible area. However, the downward and lateral extensions of the structures controlling the Sunnysides and South Rim mineralized zones should occur in this area, and the Climax, Exchange and Cleft faults may contribute to the formation of hitherto unknown ore bearing structures.

Exploration drives from the Nickel Plate workings have been extended into this area at elevations of 4,160 feet and 4,500 feet, and when examined should provide valuable geological information.

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The IXL tunnel at elevation 5,215, was driven into the central area and encountered the Climax Fault and interbedded limestones, cherts, garnetized beds and diorite porphyry sills. A preliminary examination of this heading revealed areas of fine grained disseminated pyrrhotite and chalcopyrite mineralization and narrow mineralized skarn horizons. One skarn section assayed 0.20 oz. Au, 5.65 oz. Ag. and 2.00% Cu/ton over a 0.5 foot width. Two samples taken across the Climax Fault averaged 0.10 oz. Au, 0.07 oz. Ag. and 0.22% Cu/ton.

Respectfully submitted,



WALTER E. CLARKE, B. Sc., P. Eng.
Consulting Engineer

September 14, 1967

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APPENDIX I

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APPENDIX I - cont'd.

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C E R T I F I C A T E

I, Walter E. Clarke, of the City of Vancouver, B.C., do hereby certify that -

1. I am a consulting geological and mining engineer.
2. I am a graduate of Queen's University, Kingston, Ontario. (B. Sc. Geology and Mineralogy, 1939).
3. I am a registered Professional Engineer of the Province of British Columbia and Ontario (Mining) and a member of The Canadian Institute of Mining and Metallurgy.
4. I have practiced my profession for over 25 years with Buffalo Ankerite Gold Mines Ltd.; United Keno Hill Mines Ltd.; Geco Mines Ltd.; Rayrock Mines Ltd. and Alrae Explorations Ltd.
5. I have visited the Nickel Plate property optioned by G.M. Explorations Ltd. (N.P.L.) on several occasions, during which time all accessible former workings and diamond drill core in the South Rim Area were examined. I have also studied various engineering and geological reports, maps, diamond drill logs and other records related thereto.
6. I have not received, nor do I expect to receive, any interest either directly or indirectly, in the properties described herein or securities of G.M. Explorations Ltd. (N.P.L.).



WALTER E. CLARKE, B. Sc., P. Eng.,
Consulting Engineer



LEGEND

- DDH (Completed)
- DDH (Proposed)
- ⚡ Underground workings
- Fault

0 1 2 3 4 5
feet

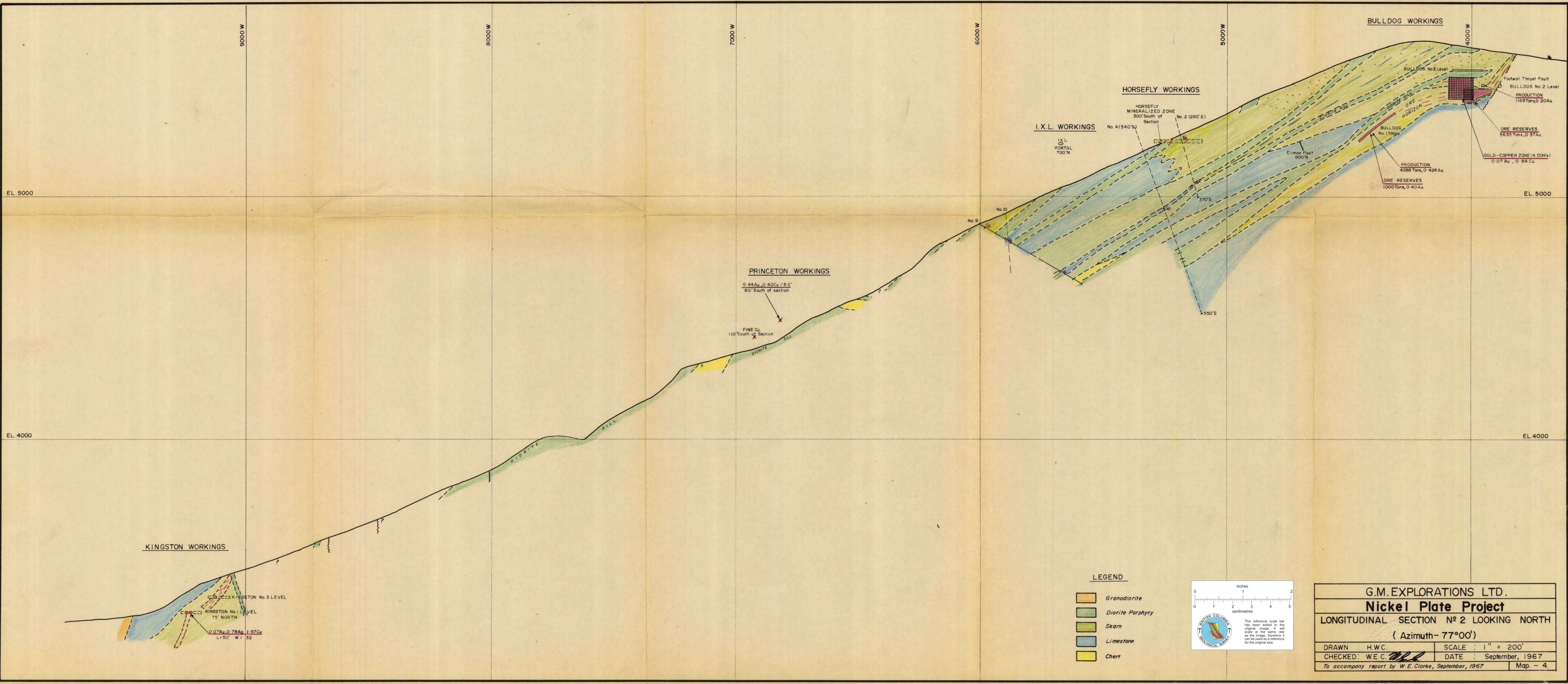
0 1 2 3 4 5
centimetres

This information is for reference only and should not be used for any purpose other than that for which it was prepared.

G.M. EXPLORATIONS LTD.
Nickel Plate Project
 COMPOSITE PLAN
 SHOWING PROPOSED EXPLORATION PROGRAM

DRAWN: H.W.C. SCALE: 1" = 300'
 CHECKED: W.E.C. DATE: September, 1967
 To accompany report by W.E. Clarke, September, 1967

Map-2



EL. 5000

EL. 4000

9000 W

8000 W

7000 W

6000 W

5000 W

4000 W

BULLDOG WORKINGS

HORSEFLY WORKINGS

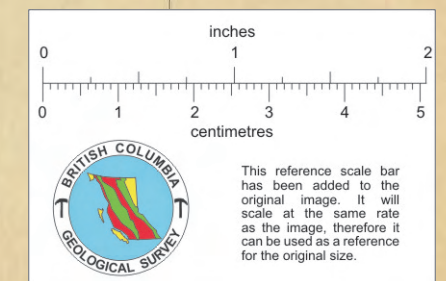
I.X.L. WORKINGS

PRINCETON WORKINGS

KINGSTON WORKINGS

LEGEND

- Granodiorite*
- Diorite Porphyry*
- Skarn*
- Limestone*
- Chert*



G.M. EXPLORATIONS LTD.			
Nickel Plate Project			
LONGITUDINAL SECTION N° 2 LOOKING NORTH			
(Azimuth - 77°00')			
DRAWN: H.W.C.	SCALE: 1" = 200'	DATE: September, 1967	
CHECKED: W.E.C. <i>W.E.C.</i>			Map - 4.
To accompany report by W.E. Clarke, September, 1967			

KINGSTON No. 3 LEVEL
KINGSTON No. 1 LEVEL
75' NORTH
0.07Au, 0.78Cu, 1.57Cu
L-50' W-32

0.44Au, 0.40Cu, 3.0'
80' South of section

FINE Cu.
110' South of Section

HORSEFLY MINERALIZED ZONE
300' South of Section
No. 2 (290'S)

No. 4 (340'S)

PRODUCTION
4388 Tons, 0.428 Au
ORE RESERVES
1000 Tons, 0.40 Au

ORE RESERVES
5635 Tons, 0.37 Au

GOLD-COPPER ZONE (4 DDH's)
0.07 Au, 0.84 Cu

PRODUCTION
1169 Tons, 0.20 Au

Climax Fault
800'N

Footwall Thrust Fault
BULLDOG No. 2 Level

No. 9

No. 10

370'S

350'S

SILL

SILL

DIORITE

DIORITE

BULLDOG No. 3 Level

DIORITE SILL ORE HORIZON

BULLDOG No. 1 Stope

PRODUCTION

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

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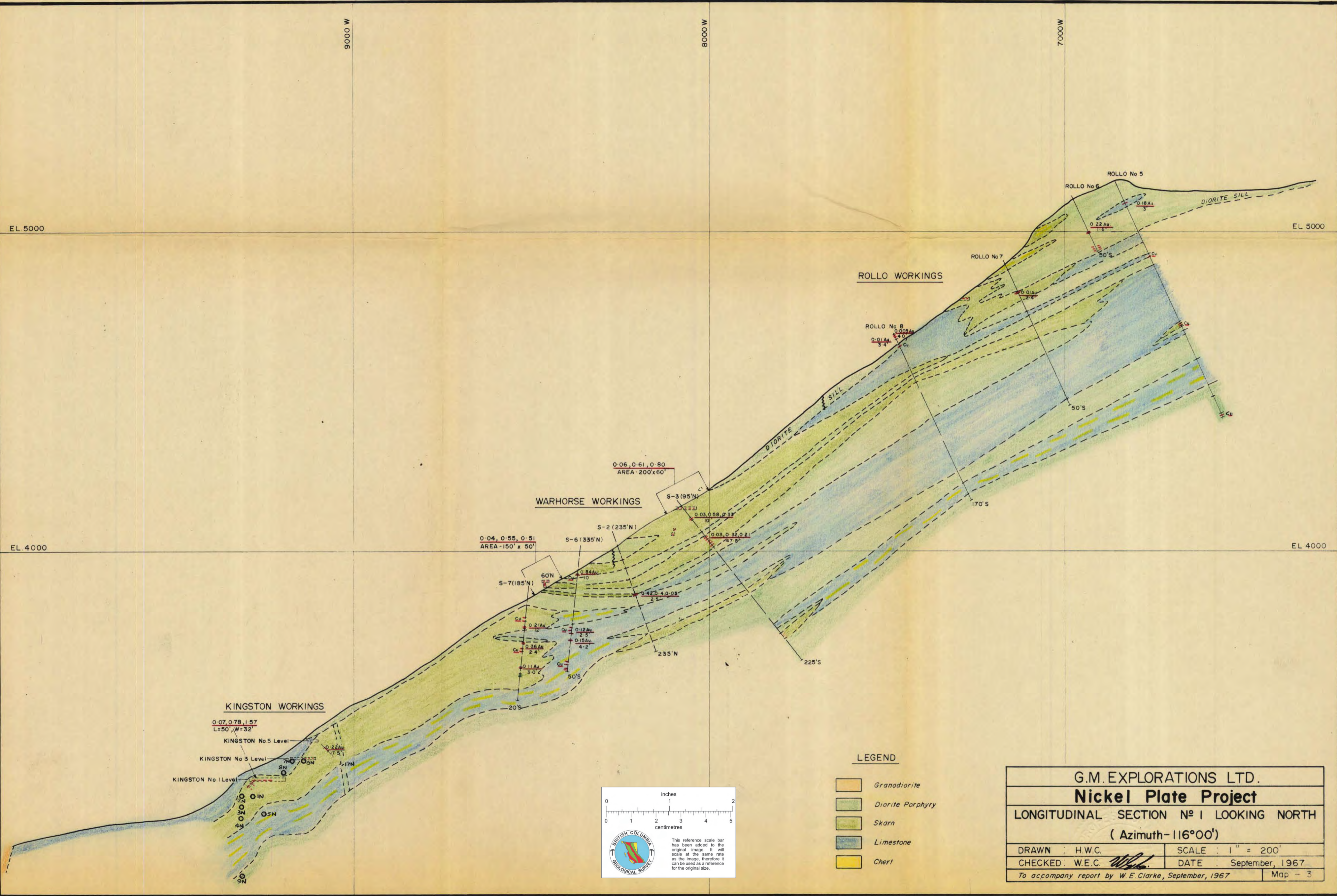
ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES

ORE RESERVES



EL 5000

EL 5000

EL 4000

EL 4000

9000 W

8000 W

7000 W

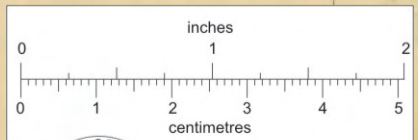
ROLLO WORKINGS

WARHORSE WORKINGS

KINGSTON WORKINGS

LEGEND

- Granodiorite*
- Diorite Porphyry*
- Skarn*
- Limestone*
- Chert*



BRITISH COLUMBIA GEOLOGICAL SURVEY
 This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

G.M. EXPLORATIONS LTD.	
Nickel Plate Project	
LONGITUDINAL SECTION Nº 1 LOOKING NORTH (Azimuth - 116°00')	
DRAWN : H.W.C.	SCALE : 1" = 200'
CHECKED : W.E.C. <i>[Signature]</i>	DATE : September, 1967
To accompany report by W.E. Clarke, September, 1967	
Map - 3	