

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 3351 MAP

82K/9W

REPORT ON GEOLOGY AND SAMPLING
OF THE WOLFENDEN COPPER SHOWING
FOR
PEÑARROYA CANADA LIMITÉE
STARBIRD PROJECT
GOLDEN MINING DIVISION, B.C.

BY

A. C. A. HOWE INTERNATIONAL LIMITED

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3351

REPORT NO. 307
OCTOBER 4, 1971

TORONTO, CANADA



A. C. A. HOWE INTERNATIONAL LIMITED

REPORT ON GEOLOGY AND SAMPLING

OF THE

WOLFENDEN COPPER SHOWING

Baldy Claim Group: 28 miles northwest of Invermere,
British Columbia

Co-ordinates of Showing 116° 26' 30" N Latitude
Located in Baldy Claim #4: 50° 41' 40" W Longitude
Elevation: 7500 feet A.S.L.

Author of Report: N. Brewster

Professional Engineer: A. C. A. Howe

Holder of the Claims: Winston Wolfenden, Brisco, B. C.

Work Undertaken for: Penarroya Canada Limitee

Work done between: July 1st and August 7th, 1971

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SUMMARY

During the months of July and August , 1971 personnel of A. C. A. Howe International Limited carried out a program of geologic mapping, trenching, channel sampling, geochemical sampling and prospecting over the Wolfenden showing, located on Frances Creek, 28 road miles northeast of the town of Invermere, Golden Mining District, British Columbia. The work was performed for Penarroya Canada Limitee who have under option a group of claims owned by Mr. Winston Wolfenden, Brisco, British Columbia.

Copper mineralization was found to occur as exterior staining on the Mt. Nelson limestone and as a secondary mineral in quartz blebs. Copper minerals observed included malachite, azurite and minor chalcopyrite.

The Mt. Nelson limestone in the area of the showing forms a north-westerly plunging anticline with mineralization occurring on the nose and west limb of this structure. Mineralization also occurs in the down dip (limb) direction as far as is possible to see on the outcrop.

Mineralization occurs in association with a minor fault in the Mt. Nelson limestone. A major fault south of the showing cuts off the mineralization in a southward direction and extensive prospecting revealed no copper occurrences north of the showing. Fifty-nine (59) three foot samples taken at 20 foot intervals over a distance of 360 feet resulted in two highs of 1.12 and 1.08% copper. The remaining values range from trace values to 0.80% copper (see Appendix 1). Silt samples taken along Napoleon Creek

(east of the showing) did not reveal significant copper values. Similar results were obtained from silt samples taken along Isaac Creek (west of the showing). Based on these results it is recommended that no further work be carried out on the Wolfenden copper showing.

INTRODUCTION

During the months of July and August 1971 the writer supervised a field investigation of the Wolfenden showing and the surrounding area. The emphasis of the investigation was to determine the possibility of the Mt. Nelson Formation as a locus for the occurrence of large stratabound copper deposits. Contemporaneous to this aspect of the investigation the economic potential of the Wolfenden showing was assessed.

Various methods were employed to realize these objectives including geologic mapping, channel sampling, and geochemical sampling. A Caterpillar D6 bulldozer was employed in an attempt to extend the existing limits of the Wolfenden showing to the north and south.

To gain an understanding of the mode of occurrence of mineralization in this instance, the structural and stratigraphic relationships within and between the Mt. Nelson and Toby Formations were examined.

PROPERTY

The property consists of sixty full sized unpatented mineral claims and three fractional unpatented mineral claims as outlined below:

<u>Full Sized Claims</u>	<u>Record No.</u>	<u>Tag No.</u>
Baldy # 1	16218	106777M
Baldy # 2	16219	106778M
Baldy # 3	16220	106779M
Baldy # 4	16221	205429M
Baldy # 5 - 10 incl.	16222 - 16227 incl.	641394M-641399M incl.
Baldy #11 - 38 incl.	16396 - 16423 incl.	127822M-127849M incl.
Baldy #39 - 53	16424 - 16438 incl.	127851M-127865M incl.
Baldy #55	16561	127868M
Baldy #56	16562	127870M
Baldy #57 & 58	16563 & 16564	72730M & 72731M
Baldy #59	16565	845998M
Baldy #60	16566	127866M
<u>Fractions</u>		
B1 Fraction	16558	127869M
B2 Fraction	16559	127867M
B3 Fraction	16560	61400

LOCATION

Mr. Winston Wolfenden owns the Baldy claim group consisting of 60 claims. The Wolfenden showing situated in the Invermere Area,

Golden Mining Division, British Columbia is located 23 miles northwest of the town of Invermere; a road distance of 28 miles. Situated on a mountain ridge between two tributaries of Frances Creek (Issac and Napoleon Creeks) the approximate coordinates of the showing are $116^{\circ} 26' 30''$ N latitude and $50^{\circ} 41' 40''$ W longitude. Elevation at the site is approximately 7,500 feet A.S.L.

ACCESS

Access is provided by means of good gravel road from Brisco, Radium Hot Springs or Invermere. Invermere was chosen as an operating base because of availability of supplies. The distance from Invermere to the claim group is approximately 28 miles. The showing area may be reached by means of a 4-wheel drive road from Frances Creek.

Brisco, Radium Hot Springs and Invermere are accessible by B. C. Highway 95. A line of the Canadian Pacific Railway also passes through these towns.

TOPOGRAPHY

The region is one of rugged mountainous terrain, with elevations in excess of 9,000 feet in the area of interest. The mountains are dissected by numerous streams forming hanging valleys. The Columbia River has formed an extensive river valley running northwest-southeast along which numerous small population centres are located.

ECONOMY

The economy of the region is supported by numerous small enterprises, including ranches, logging and sawmill operations, Western Gypsum Mines, and independent contractors (construction, bulldozer, and charter aircraft), in addition to the normal clerical, and merchant oriented occupations. However, the single largest source of income is derived from the tourist industry.

HISTORY OF WORK

Prior to recent years and mainly during the late 19th century the area was explored intermittently by prospectors in search of quartz veins carrying high grade values of copper-gold and silver-lead-zinc.

During the 1950's Quebec Metallurgical Industries tested placer deposits on Bugaboo, Vowell and Forster Creeks for the presence of columbium minerals from the outwash waters of glaciers in the peaks of Bugaboo and Horsethief batholiths.

More recently, during 1961, Mr. Howe of A. C. A. Howe International Limited, carried out an exploration program consisting of geological mapping and geophysical surveys in the general area. In 1966 Mr. Timmins, of A. C. A. Howe International Limited, conducted an exploration program in the region. At present, Frances Creek Mines is actively engaged in an attempt to revitalize the Lead Queen and Steel group showings, situated six miles to the west of Wolfenden showing.

GENERAL GEOLOGY OF THE AREA

LEGEND

MESOZOIC	Quartz monzonite, granodiorite
PALEOZOIC	
Cambrian-McKay Group	Limestone, shale, limestone conglomerate
Cambrian-Jubilee Formation	Thinly laminated and massive dolomite
Lower Cambrian-St. Piran Formation	Grits, quartzite, minor argillite
PROTEROZOIC	
Windermere, Horsethief Creek Series	Grey, black, and green slate and Argillite, quartz pebble conglomerate, quartzites and grit, red slate, minor limestone
Toby Formation	Pebble, cobble and boulder conglomerate and breccia
Purcell, Upper Purcell-Mt. Nelson Formation	Buff weathering, grey dolomitic limestone, purple grey and black argillite and slate, white and green quartzite
Dutch Creek Formation	Grey, green, black, argillite and slate, dolomite, argillaceous quartzites

The southeastern portion of the area is underlain mainly by the Mt. Nelson Formation of the Upper Purcell Series. The northern and western portions are underlain by predominately clastic sediments of the Windermere Series, Horsethief Creek Group. The

eastern section appears to be underlain mainly by sediments of the St. Piran and Jubilee Formations of Lower Cambrian and Cambrian Age. There is extensive drift cover of the Columbia River Valley in this section.

The Mt. Nelson Formation consists of limestones, argillites, slates, and quartzites and is overlain conformably and unconformably by the Toby Formation. The Toby Formation is a pebble, cobble, and boulder conglomerate and breccia with a varying matrix of quartzite, argillite or limestone. The unit ranges in thickness from a few feet to 300 feet.

The Toby Formation is in turn overlain by the Horsethief Creek sequence of clastic sedimentary rocks. The Horsethief Creek sequence varies from 3,000 feet in thickness in the northeastern part of the area to over 6,000 feet in the northwest. Four units constitute the sequence an upper shale unit of more than 1,000 feet in thickness, a thinner limestone unit, a lower slate unit similar to the upper unit and an underlying thick (3,000 feet) feldspathic grit unit.

Rapid facies change both on strike and across strike characterize these units so that a consistent division of the series is difficult.

The strata generally strike N 30 - 40° W and are warped into a broad geanticline plunging to the north. Minor folds are superimposed on the major structure and are notable in the limestone and surrounding slates and quartzites. These folds tend to be assymetrical and occasionally overturned to the east.

Quartz veins are numerous occurring parallel to bedding or cutting across bedding at acute angles. The common variety consists of white quartz up to two feet in width, while another variety consists of zones of quartz and country rock up to 50 feet in width, generally buff in colour due to weathering and oxidation of the slates.

ECONOMIC GEOLOGY

Many small prospects mark the locations of mineralized zones throughout the general area. The main sulphides of economic importance are galena and sphalerite, minor chalcopyrite and associated argentiferous tetrahedrite. Many mineralized zones are associated with the dolomitic limestones of the Mount Nelson Formation and the crystalline limestones of the Lardeau series.

Examples are the Mineral King and Paradise Mines. The Mineral King mine at Toby Creek, occurs in dolomitic limestone of the Mount Nelson Formation. The ore minerals are galena and sphalerite commonly in a barite gangue with some chalcopyrite and argentiferous tetrahedrite. The Paradise mine also at Toby Creek is located near a fault zone at the Toby Formation - Mount Nelson Formation contact.

GEOLOGY OF THE PROPERTY

The units underlying the property include the Upper Purcell - Mount Nelson Formations and the Toby Formation. The stratigraphy in the showing area is interpreted as shown in the following diagrammatic section:

of 328/51° SW are present in the limestone. At the showing, the limestone is cut by a fault paralleling the strike of the units and dipping 30° S. In the area of this feature the limestone unit is brecciated and mineralization (malachite - Azurite) occurs. The limestone is subdivided into a number of constituent units on the showing.

The overlying slate occurs in conformable contact with the limestone unit at an attitude of 322/71° SW. This slate is greenish grey in colour and has a similarly coloured streak. The rock exhibits a bluish red luster when exposed to direct sunlight. Cleavage is well developed having an attitude of 154/35° SW. Joints are present in the unit and have an attitude of 235/77° N, the spacing of the joints is 5".

The Toby Conglomerate appears to exist in conformable contact with the underlying Upper Purcell - Mount Nelson Formations. The Toby conglomerate is composed of pebbles, cobbles, and boulders of quartzite (white, pink) and siltstone (buff) ranging in size from 1 mm to 2 feet.

Occasional limestone boulders are found in the conglomerate. The constituents are angular to subrounded and randomly oriented within the matrix of the conglomerate making up 5% to 60% of the rock by volume.

The basal Toby conglomerate exhibits a matrix of blue - black talcose slate in the vicinity of the showing. To the south of the showing the matrix is of a liny character. The slaty

matrix exhibits a blue red luster when exposed to direct sunlight. A well developed cleavage does not seem to have affected the majority of clasts (a minority - approx. 5% - of the clasts exhibit a lensoid shape the long axes of which strike 313°). Individual quartzite boulders exhibit shears (open) which are independent of cleavage in that they are oriented perpendicular to cleavage and do not pass beyond the boundary of the affected boulders. Quartz veins 2" wide and more having an attitude of $360/73^{\circ}$ W cut the Toby conglomerate.

STRUCTURAL GEOLOGY OF SHOWING

A small fold is exposed in old Trench #3 (Howe Report) having an axis of 345° and plunging 13° N.

The showing itself is situated on the anticlinal portion of a folded limestone unit. Upon investigation of the unit numerous small drag folds were found having a distinctive "Z" shape. On a northerly plunging anticline this shape would be characteristic of drag folds occurring on the east limb of the anticline or the west limb of an associated syncline.

Consideration of these indications and the geometric configuration of the limestone members in old Trenches #2 and #3, with the belief that the minor structure will reflect the larger structure leads to the postulation that the showing is situated on the east limb of a northerly plunging fold.

Following an inspection of units lying to the south and to the west of the showing the writer proposes that the prominent ridge above the showing and to the west is part of a synclinal structure. This opinion is based on the attitudes and dip directions of bedding and cleavage found on both sides of the ridge. On the east side of the ridge attitudes normally dip to the southwest, whereas on the west side they normally dip northeasterly.

At the showing the (malachite & azurite) mineralization is found in close proximity to a brecciated fault zone which dislocates the limestone bed. The mineralization is normally found between this fault zone (brecciated) and the limestone-slate contact. The fault zone dips at 30° to the south and runs along the extent of the showing within the limestone.

The southern limit of the showing is truncated by a fault having an approximate strike direction of 332° . This fault dislocates the limestone, slate and overlying Toby Formation. All three of these units are present south of the fault, however prospecting of this area did not reveal any further mineralization.

MINERALIZATION

Copper mineralization occurs in the Upper Purcell - Mt. Nelson Formations between the contact of Mt. Nelson limestone and Upper Purcell slate and a bedding fault lying within the Mt. Nelson Formation. The fault is characterized by brecciation of the limestone and by displacement of minor units within the limestone.

Malachite and azurite mineralization is confined to the limestone unit and occurs as both an exterior stain on the limestone and as a secondary mineral in quartz blebs and veinlets with Cu replacing Ca++ in CaCO₃. Minor (less than 1%) chalcopyrite and pyrite are associated with quartz blebs and veinlets.

The upper extent of mineralization occurs within a foot of the limestone - slate contact with the exception of the No. 3 Trench (HHowe Report). In one instance only was mineralization found in the slates (channel sample No. 19, probably old No. 1 Trench Howe Report) and in this instance it was associated with a quartz zone.

The area below the showing to the east, to the south and the ridge lying above the showing to the west were prospected without any further discoveries of mineralization. Two old caved adit portals were found to the east of the showing.

WORK PERFORMED ON THE SHOWING

The access road was made suitable by the use of a bulldozer for a four wheel drive vehicle to reach the showing. On July 6th, a program of work designed to extend the existing showing to both the north and south was initiated. Trench #1 of the 1961 report was uncovered, however any further southward extension was prevented by extensive caving in of overburden. An attempt to extend the mineralized zone to the north met with little success in that no copper mineralization was found north of old Trench #3. Bulldozer work on the showing was discontinued on July 21.

Due to breakdowns during this period there were only eight operating days.

Only July 6th, clean up operations, rubble removal, construction of footpaths and hand digging of trenches at 20 foot intervals were initiated preparatory to channel sampling.

Channel sampling was begun at the north end of the showing and progressed southward. The footpath and trenches were extended southward in keeping with progress made by the bulldozer.

All samples were taken to a depth of 1 inch and where possible, 3 feet in length, the convention being one sample above the mineralized zone, one across the zone, and one below the zone. There was a discrepancy in size between channel no. 1 and the remaining channels. Channel no. 1 was sampled with a width of eight inches, and it was found that a three foot sample of this dimension was much too large and cumbersome to be contained in the sample bag. Accordingly, subsequent samples were taken with six inch widths.

In total, 19 channels were sampled and 59 samples were cut. Shorter samples were taken where it was not possible to obtain a sample length of three feet.

On July 21st, a soil sampling program was initiated near the showing. Soil samples were taken along three north-south lines spaced 350 feet apart, and designated Starbird 1, 2 and 3.

Samples were taken predominately from loose talus, which were hand screened in the field to remove the larger particles. Where vegetation had developed the samples were taken from the "A" horizon.

Line Starbird 1 lies on the road bed immediately below the showing. Samples were taken at 20' intervals along this line. Starbird 2 and 3 were run across the slope below and to the east of the showing. Samples were taken at 50 foot intervals along lines 2 and 3. To ensure against the inadequacy of sufficient fines, two samples were taken at each location on line Starbird 1.

Line Starbird 2 was extended 400 feet to the south of the southern limit of the showing, which placed it over a talus slope, and 100 feet north of the northern limit of the showing where it abutted against a cliff of Toby conglomerate. Line Starbird 3 was extended 400 feet both to the north and south of the showing limits.

Stream water and silt sampling was carried out on both Napoleon and Isaac Creeks.

The samples taken during the above programs were sent to either Vancouver Geochemical Laboratories or Crest Laboratories for analyses. The samples were screened to -80 mesh and digested in $\text{HClO}_4 + \text{HNO}_3$ after which they were analyzed by the atomic absorption method.

The writer geologically mapped and prospected the general areas lying to the north, south, east and west of the showing. Work on the Wolfenden showing was discontinued on August 7th, 1971.

The season's geological work has been recorded on 6 maps. This compilation consists of three cross section maps labelled AA, BB, and DD; a longitudinal section of the showing, indicating trenching and sample values; a general plan view of the showing area and a silt sample location map. A map showing the geology and distribution of outcrops on the Baldy claim group is included with the above maps.

CONCLUSIONS AND RECOMMENDATIONS

Approximately six weeks were spent in investigation, sampling, mapping and prospecting of the Wolfenden showing and the surrounding area. Copper mineralization appears to be intimately associated with structural events which have provided channelways for the access of mineral bearing solutions. The copper mineralization occurs as a replacement of limestone along a fault zone and a large portion of the mineralized zone has been eroded away. The Mt. Nelson limestone does provide a favourable locus for the deposition of ore bearing minerals where the necessary conditions such as source of elements, mobilization factor, and precipitant factor once existed.

The area surrounding the showing was prospected without further indications of base metal mineralization and the showing could not be extended to the north or south past present limits.

In consideration of the above results no further work is recommended on the Wolfenden showing. However, mines such as the Mineral King and Paradise mine were discovered within the Mt. Nelson limestone, and numerous copper showings are known to

exist in the Mt. Nelson Formation. The past season's work indicates that the possibility for significant copper deposits exists in the Mt. Nelson Formation.

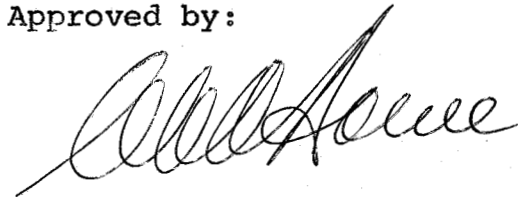
Respectfully submitted,

A. C. A. HOWE INTERNATIONAL LIMITED,



N. Brewster, B.Sc., Ed.

Approved by:



A. C. A. Howe, P.Eng.



DATED AT TORONTO, ONTARIO THIS FOURTH DAY OF OCTOBER, 1971.

Exp. Date October 20, 1972

C E R T I F I C A T E

I, N. Brewster, of 3969 Kingston Road, Scarborough, Province of Ontario, hereby certify that:

1. I am employed as a geologist by A. C. A. Howe International Limited, Mining and Geological consultants, with offices at Suite 826, 159 Bay Street, Toronto 1, Ontario.
2. I am a graduate of Acadia University, Wolfville, Nova Scotia and hold a Bachelor of Science (1969) and Bachelor of Education degrees. In addition I have completed one year's study toward a Master of Science degree at the same University.
3. I have no interest, direct or indirect in Penarroya Canada Limitee or their property, nor do I expect to receive any such interest.
4. This report is based on a study of past works and personal knowledge of the property gained from personal supervision of the program described in this report.

N. Brewster

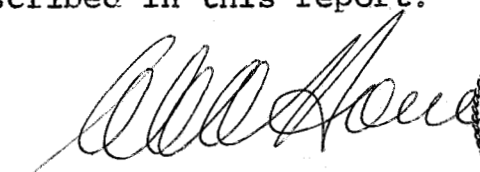
N. BREWSTER, B.Sc., Ed.

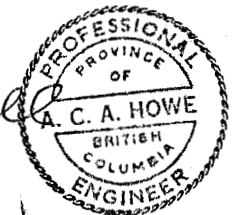
DATED AT TORONTO, ONTARIO THIS 4th DAY OF OCTOBER, 1971.

C E R T I F I C A T E

I, A. C. A. Howe, of the City of Toronto, in the County of York, Province of Ontario, hereby certify that:

1. I am a Mining Engineer with offices at 826, 159 Bay Street, Toronto 1, Ontario.
2. I am a graduate of London University, England, B. Sc., 1949.
3. I am a member of the Association of Professional Engineers of the Province of Ontario and a non-resident member of the Association of Professional Engineers of the Province of British Columbia.
4. I have no interest, direct or indirect, in either the property or securities of Penarroya Canada Limitee, nor do I expect to receive any such interest.
5. This report is based on a study of past work and familiarity of the area following numerous trips over the past few years and supervision of the program described in this report.


A. C. A. Howe, P.Eng.



DATED AT TORONTO, ONTARIO THIS FOURTH DAY OF OCTOBER, 1971.

A P P E N D I X I

C H A N N E L S A M P L I N G R E S U L T S

APPENDIX I - 1

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>LENGTH</u>	<u>ASSAY Cu%</u>
1	Channel 1	3'	Tr
2	"	3'	0.01
3	"	3'	Tr
4	Channel 2	3'	Tr
5	"	3'	Tr
6	"	3'	Tr
7	Channel 3	3'	Tr
8	"	3'	0.31
9	"	3'	0.60
10	"	3'	0.01
11	Channel 4	3'	0.03
12	"	3'	0.50
13	"	3'	0.11
14	"	3'	0.05
15	Channel 6	3'	0.11
16	"	3'	0.39
17	"	3'	0.01
18	Channel 7	3'	0.80
19	"	3'	0.01
20	"	3'	0.01
21	Channel 8	3'	0.09
22	"	3'	0.20
23	"	3'	0.03

APPENDIX 1 - 2

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>LENGTH</u>	<u>ASSAY Cu%</u>
24	Channel 9	3'	0.02
25	"	3'	0.18
26	"	2.5'	0.11
27	Channel 10	2'	0.01
28	"	3'	0.76
29	"	3'	0.09
30	Channel 11	3'	0.0.
31	"	3'	0.72
32	"	3'	0.12
33	Channel 12	3'	0.03
34	"	3'	0.37
35	"	2'	0.08
36	Channel 13	3'	0.25
37	"	3'	0.18
38	"	3'	0.04
39	Channel 5	3'	0.01
40	"	3'	0.59
41	"	3'	0.27
42	Channel 14	3'	1.12
43	"	3'	0.11
44	"	3'	0.04
45	Channel 15	3'	0.01
46	"	3'	0.11
47	"	3'	0.02

APPENDIX 1 - 3

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>LENGTH</u>	<u>ASSAY Cu%</u>
48	Channel 16	3'	0.02
49	"	3'	1.08
50	"	3'	0.02
51	"	3'	0.01
52	Channel 17	3'	Tr
53	"	3'	0.10
54	"	1'	Tr
55	Channel 18	3'	Tr
56	"	3'	0.01
57	Channel 19	3'	0.01
58	"	3'	0.01
59	"	3'	0.01

A P P E N D I X I I

SOIL SAMPLING RESULTS

APPENDIX II - 1

STARBIRD LINE 1

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu ppm</u>
1	3 + 40 S	88
2	3 + 20 S	136
3	7 + 00 S	104
4	2 + 80 S	284
5	2 + 60 S	292
6	2 + 40 S	152
7	2 + 20 S	164
8	2 + 00 S	364
9	1 + 80 S	920
10	1 + 60 S	2000+
11	1 + 40 S	2000+
12	1 + 20 S	1800
13	1 + 00 S	1680
14	0 + 80 S	2000+
15	0 + 60 S	172
16	0 + 40 S	232
17	0 + 20 S	144
18	0 + 00	64
19	0 + 20 N	64

APPENDIX II - 2

STARBUIRD LINE 2

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu ppm</u>
45	3 + 40 S	48
46	3 + 90 S	62
47	4 + 40 S	140
48	4 + 90 S	105
49	5 + 40 S	102
50	5 + 90 S	98
51	6 + 40 S	77
52	6 + 90 S	59
53	7 + 40 S	19
54	2 + 90 S	62
55	2 + 40 S	73
56	1 + 90 S	82
57	1 + 40 S	235
58	0 + 90 S	1065
59	0 + 40 S	1920
60	0 + 10 N	127
61	0 + 60 N	104
62	1 + 10 N	107

APPENDIX II - 3

STARBIRD LINE 3

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu ppm</u>
20	3 + 40 S	60
21	3 + 90 S	36
22	4 + 40 S	24
23	4 + 90 S	52
24	5 + 40 S	24
25	5 + 90 S	28
26	6 + 40 S	20
27	6 + 90 S	20
28	7 + 40 S	24
29	2 + 90 S	72
30	2 + 40 S	52
31	1 + 90 S	52
32	1 + 40 S	56
33	0 + 90 S	124
34	0 + 40 S	1820
35	0 + 10 N	224
36	0 + 60 N	184
37	1 + 10 N	84
38	1 + 60 N	40
39	2 + 10 N	32
40	2 + 60 N	40

A P P E N D I X I I I

S I L T S A M P L E S

N A P O L E O N A N D I S A A C C R E E K S

APPENDIX II - 4

STARBIRD LINE 3
(Continued)

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu ppm</u>
41	3 + 10 N	40
42	3 + 60 N	32
43	4 + 10 N	40
44	4 + 60 N	64
45	5 + 10 N	52

APPENDIX III - 1

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu ppm</u>
63	Napoleon Creek	31
64	"	26
65	"	43
66	"	47
67	"	52
68	"	53
69	"	52
70	"	57
71	"	69
72	"	80
73	"	98
74	"	76
75	"	82
76	"	73
77	"	75
78	"	73
79	"	70
80	"	64
81	"	58
82	"	45
83	"	41
84	Isaac Creek	47
85	"	44
86	"	50
87	"	48
88	"	45

APPENDIX III - 2

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu ppm</u>
89	Isaac Creek	46
90	"	43
91	"	41
92	"	35
93	"	33
94	"	32
95	"	30
96	"	33
97	"	31
98	"	36
99	"	34

A P P E N D I X I V

WATER SAMPLES

NAPOLEON AND ISAAC CREEKS





APPENDIX IV - 1

<u>SAMPLE NO.</u>	<u>LOCATION</u>	<u>ASSAY Cu</u>
1	Napoleon Creek	Nd
2	"	"
3	"	"
4	"	"
5	"	"
6	"	"
7	"	"
8	"	"
9	"	"
10	"	"
11	"	"
12	"	"
1	Isaac Creek	Nd
2	"	"
3	"	"
4	"	"
5	"	"
6	"	"
7	"	"
8	"	"
9	"	"
10	"	"
11	"	"
12	"	"

LEGEND

MESOZOIC	TRIASSIC	7	Quartz monzonite, granodiorite
	DEVONIAN	6	MT FORSTER: Bright red and green argillite; brown weathering limestone
PALEOZOIC	UPPER CAMBRIAN	5	JUBILEE: Thinly laminated and massive dolomite
	WINDERMERE	4	HORSETHIEF: Grey, black, green slate and argillite quartz pebble conglomerate, quartzite, feldspathic quartzite and grit, red slate, minor limestone
PROTEROZOIC		3	TOBY: Pebble, cobble and boulder conglomerate and breccia (mixture of quartzite, argillite and limestone)
	UPPER PURCELL	2	MT NELSON: Buff weathering, grey dolomite limestone, purple, grey and black argillite and slate, white and green quartzite
		1	DUTCH CREEK: Grey, green, black, argillite & slate, buff dolomitic slate, thin bedded buff weathering dolomite, green argillaceous quartzite.

SYMBOLS

-  Fault - Real, assumed
-  Geologic contact - Real, assumed
-  Paved Road
-  Secondary dirt Road

TO ACCOMPANY REPORT BY
A. G. A. HOWE INTERNATIONAL LIMITED
 DATED Oct 4, 1971

M-1

3351

Department of
Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 3351 MAP # 1



GENERAL GEOLOGY MAP
 INVERMERE AREA ~ BRITISH COLUMBIA

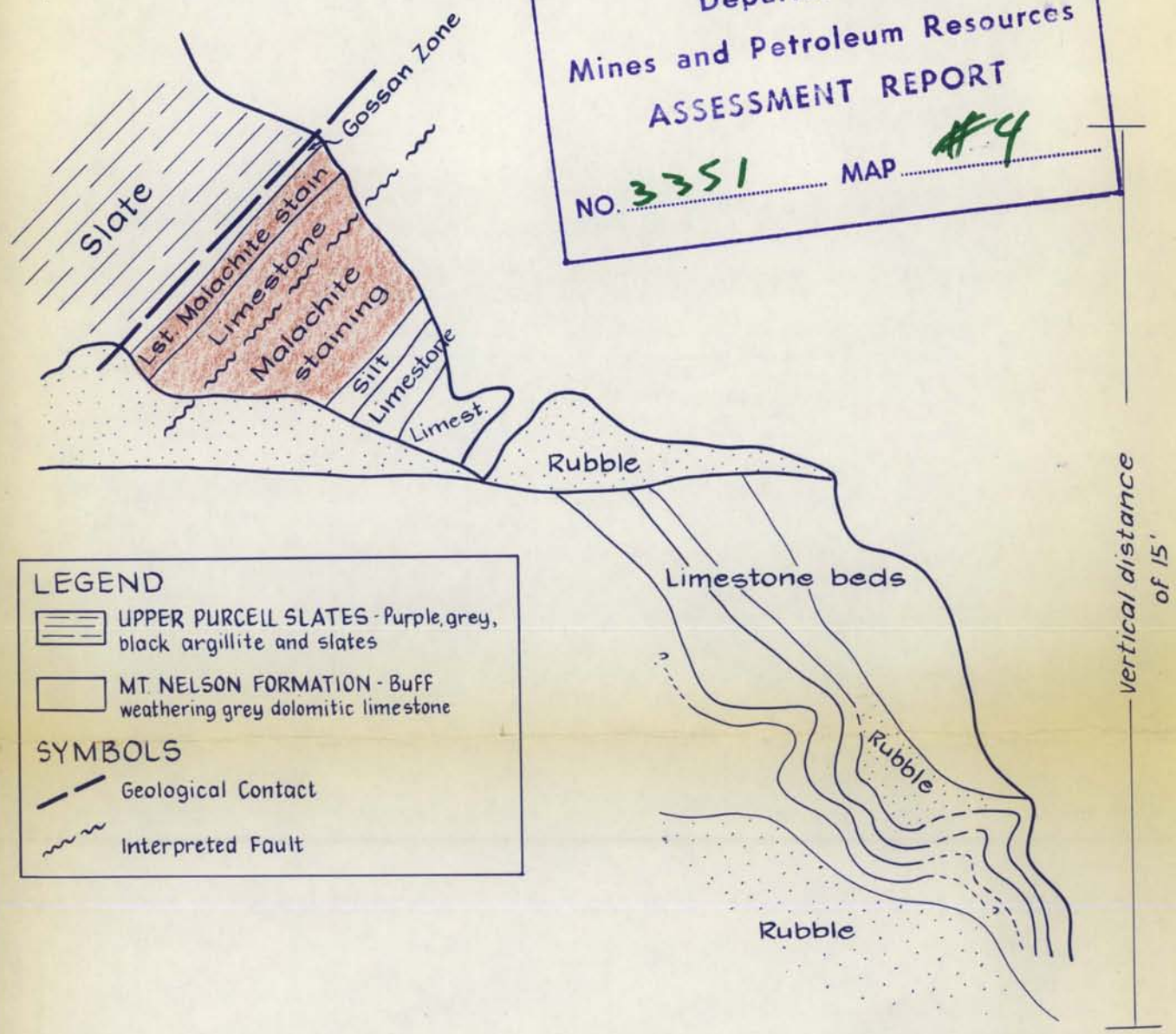
Scale: 0 1 2 3 4 MILES

ACA HOWE INTERNATIONAL LIMITED, N. BREWSTER

Professional Engineer
 C. A. HOWE
 BRITISH COLUMBIA
 ENGINEER

Exp. Oct 4, 1971

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3351 MAP #4



PEÑARROYA CANADA LIMITEÉ
DIAGRAMATIC CROSS SECTION #2

(LOOKING NORTH)
LOCATED AT 1+85 SOUTH

by
A.C.A. HOWE INTERNATIONAL LIMITED

Scale: 1 inch to 2.8 feet



Expiry Date October 20, 1971
July 22, 1971

N. Brewster



TOBY FORMATION

PURCELL SLATES



MT. NELSON LIMESTONE

PROTEROZOIC

LEGEND

-  UPPER PURCELL SLATES - Purple black argillite and slate
-  MT. NELSON LIMESTONE - Buff weathering grey dolomitic limestone

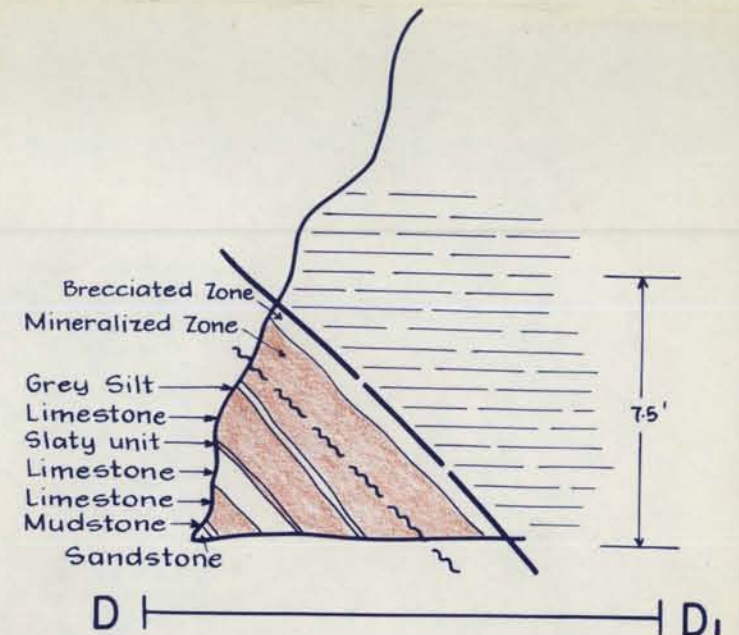
SYMBOLS

-  Geological Contact
-  Interpreted Fault

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 MAP # 3351
 NO. 3351 ON

Blue-grey colour, close to the mineralized zone cleavage is poorly developed. Becomes more evident stratigraphically upward. Streak is grey-white. The rock has a blue shine when exposed to direct sunlight

- Massive blue-grey shaly looking rock type, cleavage poorly developed.
- Malachite and Fe₂O₃ occur along qtz. veins and in limestone. Qtz. veins also carry pyrite. the whole zone is brecciated. Limestone is blue grey in colour. 1% pyrite in limestone
- Grey silty unit, 1 inch thick
- Bl. grey colour calcite and quartz crystals can be seen in little veinlets which penetrate lst. Pyrite <1% rock has banded look due to rust staining along minute fracture planes. Malachite stain appears in rock.
- Gr. slaty unit, cleavable into thin sheets, Malachite staining occurs along the planor features. Grey br. lst. cut by qtz. veins 1mm thick. Malachite staining occurs laterally along the unit on wall zones of qtz. veins.
- Dark, massive, grey black limestone, contains malachite stain in quartz blebs, separated from overlying unit by red siltstone which dies out laterally
- Red mudstone contain limonite stain
- Gritty red sandstone, 1 mm Qtz. veinlets // to bedding, Z shaped drag folds.



PEÑARROYA CANADA LIMITEÉ

**DIAGRAMATIC CROSS SECTION #3
OF MINERALIZED ZONE
(LOOKING SOUTH)**

by
A.C.A. HOWE INTERNATIONAL LIMITED

Scale: 1 inch to 5 Feet

N. Brewster


 A.C.A. HOWE
 BRITISH
 ENGINEER
 N. Brewster
 Expiry Date October 20, 1972
 July 16 / 1971

REPRODUCTION ORDER

Customer A. C. A. HOWE INTERNATIONAL LIMITED
159 BAY STREET, TORONTO 1, ONTARIO

Date Oct 1, 71

Address A.C.A. Howe International

WHEN COMPLETED
THIS IS YOUR

Order No. Auto 926 159 Bay St Toronto 1, Ont

INVOICE

NO. ORIGINALS	NO. COPIES OF EACH	WHITEPRINTS	OTHER - PLEASE SEE LIST BELOW AND SPECIFY	TOTAL SQ. FT.	@		
	1	-	<i>Penanoya</i>	8 1/2	60		5 10
				8 1/2	7		60
							5 70

- | | |
|--|---|
| SEPIAS
TRANSPARENT CLOTH
OPAQUE CLOTH
CRONAFLEX
MYLAR FILM | AUTOPOSITIVES
REPRONEGATIVES
OFFSET
PHOTOCOPIES
XEROX |
|--|---|

FED. TAX	68
PROV. TAX	32
TOTAL	6 70

FRANK P. FOAD LIMITED

175 King Street East,

Toronto 2, Ontario.

Phone 364-1148

24

REPRODUCTION ORDER

Customer A. C. & HOWE INTERNATIONAL LIMITED
150 BAY STREET TORONTO 2 ONTARIO
 Address A C A Howe International
Suite 226, 159 Bay St.
 Order No. Toronto, ont.

Date Oct 13, 1971

WHEN COMPLETED
THIS IS YOUR
INVOICE

NO. ORIGINALS	NO. COPIES OF EACH	WHITEPRINTS	OTHER - PLEASE SEE LIST BELOW AND SPECIFY	TOTAL SQ. FT.	@	
7	1		<i>Aranyia</i>	11 1	7 80	$\begin{array}{r} 77 \\ 80 \\ \hline 157 \end{array}$

- | | |
|--|---|
| SEPIAS
TRANSPARENT CLOTH
OPAQUE CLOTH
CRONAFLEX
MYLAR FILM | AUTOPOSITIVES
REPRONEGATIVES
OFFSET
PHOTOCOPIES
XEROX |
|--|---|

FED. TAX	19
PROV. TAX	9
TOTAL	185

FRANK P. FOAD LIMITED

175 King Street East,

Toronto 2, Ontario.

Phone 364-1148

473

REPRODUCTION ORDER

Customer A. C. A. [unclear] LIMITED
 159 Bay [unclear] Toronto, Ontario
 Address ACA Hotel Inter
Suite 826, 159 Bay
Toronto, Ont
 Order No. _____

Date 5 Oct 21/71

WHEN COMPLETED
THIS IS YOUR
INVOICE

NO. ORIGINALS	NO. COPIES OF EACH	WHITEPRINTS	OTHER - PLEASE SEE LIST BELOW AND SPECIFY	TOTAL SQ. FT.	@	
1	5		Peramoya	60	7	420

- | | |
|--|---|
| SEPIAS
TRANSPARENT CLOTH
OPAQUE CLOTH
CRONAFLEX
MYLAR FILM | AUTOPOSITIVES
REPRONEGATIVES
OFFSET
PHOTOCOPIES
XEROX |
|--|---|

FED. TAX	50
PROV. TAX	23
TOTAL	7 93

FRANK P. FOAD LIMITED

175 King Street East,

Toronto 2, Ontario.

Phone 364-1148

1008

REPRODUCTION ORDER

Customer A. G. A. NINE INTERNATIONAL LIMITED
159 BAY STREET, TORONTO 1 ONTARIO

Date Oct 21/71

Address A.C.A. House International
Suite 826 159 Bay St.
Toronto 1, Ont

WHEN COMPLETED
THIS IS YOUR
INVOICE

Order No. _____

NO. ORIGINALS	NO. COPIES OF EACH	WHITEPRINTS	OTHER - PLEASE SEE LIST BELOW AND SPECIFY	TOTAL SQ. FT.	@	
7	6		<i>Pinaroya</i>	126 8 1/2	7 60	882 510 <hr/> 1392

- | | |
|--|---|
| SEPIAS
TRANSPARENT CLOTH
OPAQUE CLOTH
CRONAFLEX
MYLAR FILM | AUTOPOSITIVES
REPRONEGATIVES
OFFSET
PHOTOCOPIES
XEROX |
|--|---|

FED. TAX	167
PROV. TAX	78
TOTAL	1637

FRANK P. FOAD LIMITED

175 King Street East,

1016


Toronto 2, Ontario.

Phone 364-1148

REPRODUCTION ORDER

Customer A. C. A. Howe International Limited Date Oct 25/71
 Address 159 Bay Street Toronto 1, Ontario
A. C. A. Howe International
Suite 826, 159 Bay
Toronto 1, Ont.

WHEN COMPLETED
THIS IS YOUR
INVOICE

NO. ORIGINALS	NO. COPIES OF EACH	WHITEPRINT	OTHER - PLEASE SEE LIST BELOW AND SPECIFY.	TOTAL SQ. FT.	@	
1	1		<p style="text-align: center;"><u>CRONAFlex.</u></p> <p>make 1 print of the two sections taped together.</p> <div style="text-align: center;">  </div> <p>include this area in the print, making one large copy.</p> <p><u>Penarrogol</u></p>	1 1/2	150	225

- | | |
|-------------------|----------------|
| SEPIAS | AUTOPOSITIVES |
| TRANSPARENT CLOTH | REPRONEGATIVES |
| OPAQUE CLOTH | OFFSET |
| CRONAFLEX | PHOTOCOPIES |
| MYLAR FILM | XEROX |

FED. TAX	27
PROV. TAX	13
TOTAL	265

FRANK P. FOAD LIMITED

175 King Street East,

1131

Toronto 2, Ontario.

Phone 364-1148

REPRODUCTION ORDER

Customer A. C. A. HOWE INTERNATIONAL LIMITED Date Oct 27/71
 Address 159 BAY STREET, TORONTO 1, ONTARIO
A.C.A. Howe International
Suite 824, 159 Bay St.
Toronto 1, Ont.

WHEN COMPLETED
THIS IS YOUR
INVOICE

NO. ORIGINALS	NO. COPIES OF EACH	WHITEPRINTS	OTHER - PLEASE SEE LIST BELOW AND SPECIFY	TOTAL SQ. FT.	@	
2	12		<i>Penanoya</i>	36	7	250

SEPIAS TRANSPARENT CLOTH OPAQUE CLOTH CRONAFLEX MYLAR FILM	AUTOPOSITIVES REPRONEGATIVES OFFSET PHOTOCOPIES XEROX	FED. TAX PROV. TAX TOTAL	30 14 296
--	---	--------------------------------	-----------------

FRANK P. FOAD LIMITED

175 King Street East,

Toronto 2, Ontario

Phone 364-1148

1257

TILDEN

THE ONLY CANADIAN NAME IN WORLD-WIDE CAR RENTALS

1 OWNER - LOCATEUR

TILDEN TRUCK RENTALS
3645 LOUGHEED HWAY
VANCOUVER B.C.
TEL 291-7387

20 CUSTOMER - LOCATAIRE **REC'D AUG 7 1971**
ACA. HOWE INTERNATIONAL
(NORMAN F. BREWSTER)
90 213081
W.M. G. TIMMINS
2554 WHITLEY COURT 17
VAN. B.C.

HEREBY RENTS TO UNDERSIGNED - PAR LA PRESENTE LOUE AU SOUSSIGNE

2 VEHICLE NO. VEHICULE H 149	3 LIC. NO. FAE 704	4 MAKE-MARQUE CARRIALL	5 STYLE 4XY	25 DATE & TIME IN DATE & HEURE 1971 JUL 31 PM 2.45
6 OWNER STAT-PROPRIETAIRE D/T VAN	7 TO BE CHECKED IN AT-ARRIVERA A D/T VAN	8 RETURN DATE-DATE DE RETOUR MONTHLY	26 DATE & TIME OUT DATE & HEURE 1971 JUN 30 PM 2.45	
9 CREDIT CARD - CARTE DE CREDIT NO.	10 DESTINATION GULF AREA RETRY		27	28
11 DRIVER'S LIC. NO. CONDUCTEUR BREWSTER 12047009	12 PROV. EXP. 14/3 73	13 P.O. - BORN DE COMM.	27	28
14 REMARKS - REMARQUES Bent front Bumper Spare wheel assembly Jack and assembly 1 set of YOUR emergency tire		21 IN BY RETOUR PAR	27	28
15 COLLISION DAMAGE WAIVER - EXONERATION POUR DOMMAGES PAR COLLISION IN CONSIDERATION OF THE PAYMENT OF EN CONSIDERATION DU PAIEMENT DE \$ NIL PER DAY PAR JOUR		22 OUT BY DEPART PAR	27	28
CUSTOMER'S LIABILITY FOR DAMAGE TO RENTED VEHICLE INCLUDING WINDSHIELD IS LIMITED TO LA RESPONSABILITE DU LOCATAIRE POUR TOUS DOMMAGES CAUSES AU VEHICULE LOUE EST LIMITEE A: \$ 250.00		23 TRAVEL AGENT DE VOYAGE	27	28
PROVIDED ALL TERMS OF THE RENTAL AGREEMENT ARE COMPLIED WITH. POURVU QUE TOUTES LES CONDITIONS DU PRESENT CONTRAT SOIENT REMPLIES		24 INTERCITY FEE TAUX INTERCITE	27	28
SIGNATURE OF RENTER OR EMPLOYEE OF RENTER SIGNATURE DU LOCATAIRE OU EMPLOYE DU LOCATAIRE X NORMAN BREWSTER		25	27	28
17 HOME ADDRESS ADRESSE DOMICILE CRASSFIELD 9 A BAY ST		26	27	28
CITY VILLE Perth T.O.		26	27	28
18 LOCAL ADDRESS ADRESSE LOCALE		26	27	28
19 TEL. NO. 937-5344		26	27	28
CUSTOMER IS LIABLE FOR ALL PARKING AND TRAFFIC VIOLATIONS. LOCATAIRE RESPONSABLE POUR TOUTES CONTRAVENTIONS DE STATIONNEMENT OU DE CIRCULATION.		26	27	28

DETACH HERE

TILDEN RENT-A-CAR CO.
745 BURNHAMPTON ST. VANCOUVER 1, B.C.
P-115

DETACH AND RETURN THIS PORTION WITH YOUR REMITTANCE TO:
DÉTACHER ET RETOURNER CE COUPON AVEC VOTRE REMISE À:

TILDEN FEATURES CHEVROLETS AND OTHER FINE CARS
TILDEN VOUS OFFRE DES CHEVROLET OU AUTRES SUPERBES VOITURES.

INVOICE - FACTURE
IN THE U.S.A. IT'S NATIONAL CAR RENTALS
AUX ÉTATS-UNIS, NOUS SOMMES AFFILIÉS À LA NATIONAL CAR RENTALS

NET DUE - NET DÙ
\$ **434.70**

15- 65056

**ROCKY
MOUNTAIN
HELICOPTERS LTD.**

Box 424, Invermere, B.C.
September 11, 1971.

STATEMENT OF ACCOUNT.

REC'D SEP 13 1971

To: A.C.A. Howe International,
Suite 826 - 159 Bay Street,
TORONTO, Ontario.

Account rendered July 3, 1971, - - - - - \$208.00

Your attention, please.

Thank you.

13

SHIP TO N. Brewster

197-1

ADDRESS _____

TERMS _____

VIA _____

received on acct

600.00.

D. cat work.

AMOUNT

90

5

95

Wayne Daniels

SALESMAN _____

BUYER _____

5 COPY

DATE (Aug 22) 1971

①

SHIP TO *H. Brewster*

ADDRESS _____

TERMS _____ VIA _____

Received on Acct

Francis C. Cooper prop

576.00

Paul W. Jones

Wayne D. Smith

SALESMAN _____

BUYER _____

October 21, 1971

Dr. P. T. Black,
Penarroya Canada Ltee,
1055 W. Hastings Street, Suite 1960,
Vancouver 1, British Columbia.

In Account With:

A. C. A. HOWE INTERNATIONAL LIMITED

September 1971

Re: Contract No. 71-454
Golden Area Project, Geological Survey
Stage II

To Professional Fees:

N. Brewster	September 1 - 8	
8/30 @ \$ 2,250.00		
✓ Report - 9.1 days @ \$ 90.00 per day		\$ 600.00
		819.00
E. Hart	September 1 - 8	
8/30 @ \$ 1,250.00		
		<u>333.33</u>
Camp rental, including tents and equipment		175 x 3 3
@ \$ 50.00 per month		150.00
Expenses as per attached		
		<u>1,350.33</u>
		<u>\$ 3,252.66</u>

F971

9/8

A. C. A. HOWE INTERNATIONAL LIMITED

September 22, 1971.

Dr. P. T. Black,
Penarroya Canada Ltce,
1055 W. Hastings Street, Suite 1960,
Vancouver 1, B. C.

In Account With:

A. C. A. HOWE INTERNATIONAL LIMITED

AUGUST, 1971

Re: Contract No. 71-454
Golden Area Project, Geological Survey
Stage II

To Professional Fees:

V. I. STEPHENSON
M. Brewster
E. Hart
R. Felix

July and August - 3 1/2 days @ \$159

2,275.00 ✓
2,250.00 ✓
1,250.00
800.00
\$ 5,575.00

Expenses as per attached

1,787.32
\$ 7,362.32

8/1

4871

PENARROYA, CONTRACT 71-454
EXPENSES TO AUGUST 31, 1971

1. Foad	7218	5.60
	7321	11.11
2. L. D. Calls		30.93
3. C.N.C.C. re W. Timmins		74.00
4. Expenses, W. Timmins August 5 - 7		92.40 ✓
5. Expenses, M. Brewster July 28 - August 22		600.92
August 22 - 31		<u>520.14</u>
		1,335.10
	Plus 10%	<u>133.51</u>
		1,468.61
6. Tilden		285.00
		<u>33.71</u>
		\$ 1,787.32
		<u><u> </u></u>

1335.10
 485.00
33.71
 1653.81

August 6, 1971

Dr. P.T. Black,
Panarroya Canada Ltee,
1055 W. Hastings Street, Suite 1960,
Vancouver 1, British Columbia.

In Account With:

A. C. A. HOWE INTERNATIONAL LIMITED

July 1971

Re: Contract No. 71-454
Golden Area Project Geological Study
Stage II

To Professional Fees:

N. Brewster	\$ 2,250.00 ✓
E. Hart	1,250.00 ✓
R. Felix	<u>800.00</u> ✓
	4,300.00
Expenses as per attached	<u>1,355.16</u>
	\$ <u><u>5,655.16</u></u>

Services of W.G. Timmins will be included in August Billing

7/1

F-771

Penarroya Canada Ltee - Contract 71-454
Expenses to July 31, 1971

1. Long Distance Calls		24.31
2. Expenses - N. Brewster	985.58	
	86.65	
	<u>39.84</u>	1,112.07
3. Expenses - W. G. Timmins		<u>95.58</u> ✓
		<u>1,231.96</u>
	Plus 10%	<u>123.20</u>
		<u><u>1,355.16</u></u>

7/1

PENARROYA CANADA LIMITEE

The following declaration sets forth:

- (a) The number of days with dates worked by every person
- (b) The rates of fee, salary or wage paid and the total amount paid to each man
- (c) Itemized other direct costs related to the assessment work for which credit is claimed

1. W. G. TIMMINS, Supervision

July 1-2; 5; 29-30;
August 4(half day); 5; 6; 7;

8.5 days @ \$150.00/day 1,275.00

2. N. BREWSTER, Field Supervisor

July 1-3; 5-9; 12-16; 18; 20-26; 29
August 2-3; 5-6; 12;

27 days @ \$72.61/day 1,960.47

September 14-17; 20-24;

9.1 days @ \$90.00/day 819.00 2,779.47

3. E. HART, Assistant

July 6-10; 13-17; 19-24; 26-29;
August 2-6;

25 days @ \$40.32/day 1,007.96

4. R. FELIX, Assistant

July 6-10; 13-17; 19-23; 26-29;
August 1-2; 4-5;

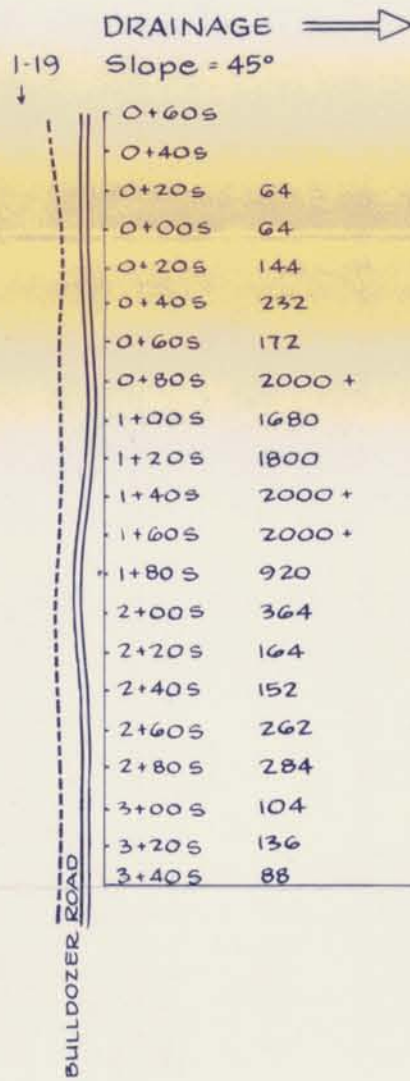
23 days @ \$22.22/day 511.06

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. B351 MAP.....

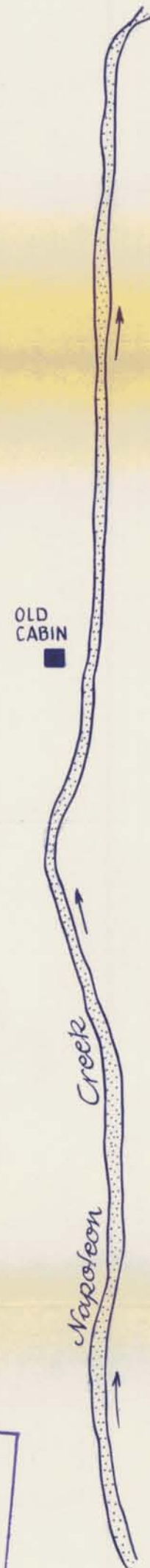


5.	<u>TRUCK RENTAL, (Tilden)</u>		
	July 1 - July 31st		
	One month @ \$310.00/month plus 15¢ per mile plus tax	434.70	
	August 1-7		
	7 days @ \$10.33/day (pro rated) plus 231 miles @ 15¢/mile plus tax	<u>107.90</u>	542.60
6.	<u>HELICOPTER CHARTER</u>		
	July 1 - 1.3 hrs. @ \$160.00/hour		208.00
7.	<u>D6 CAT BULLDOZER, Rental</u>		
	Operator Wayne Dunlop, Invermere, B.C. July 2 - July 21		
	8 days @ \$15.00/hr or \$122.00/day		976.00
8.	<u>FRANK FOAD, Reproduction Services</u>		35.46
9.	<u>DES O'SHANNESY, Draftsman</u>		220.00 (est.)
10.	<u>MRS. L. NOBLE, Typist</u>		
	October 4-5; 27-29;		
	5 days @ \$20.00/day		100.00
11.	<u>LIVING EXPENSES, 3 men</u>		
	3 men @ \$5.00/day/man	570.00	
	W. G. Timmins	<u>187.98</u>	<u>757.98</u>
	(est.) TOTAL		\$ <u>8,413.53</u>



1+10N	107
0+60N	104
0+10N	127
0+40S	1920
0+90S	1065
1+40S	235
1+90S	82
2+40S	73
2+90S	62
3+40S	48
3+90S	62
4+40S	140
4+90S	105
5+40S	102
5+90S	98
6+40S	77
6+90S	55
7+40S	19

5+10 N	52
4+60 N	64
4+10 N	40
3+60 N	32
3+10 N	40
2+60 N	40
2+10 N	32
1+60 N	40
1+10 N	84
0+60 N	184
0+10 N	224
0+40S	1820
0+90S	124
1+40S	56
1+90S	52
2+40S	52
2+90S	72
3+40S	60
3+90S	36
4+40S	24
4+90S	52
5+40S	24
5+90S	28
6+40S	20
6+90S	20
7+40S	24



LEGEND

- Copper showing
- 5+40S 102 Sample station & Copper value ppm
- Stream Flow direction
- Drainage is to the east

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3351 MAP # 2

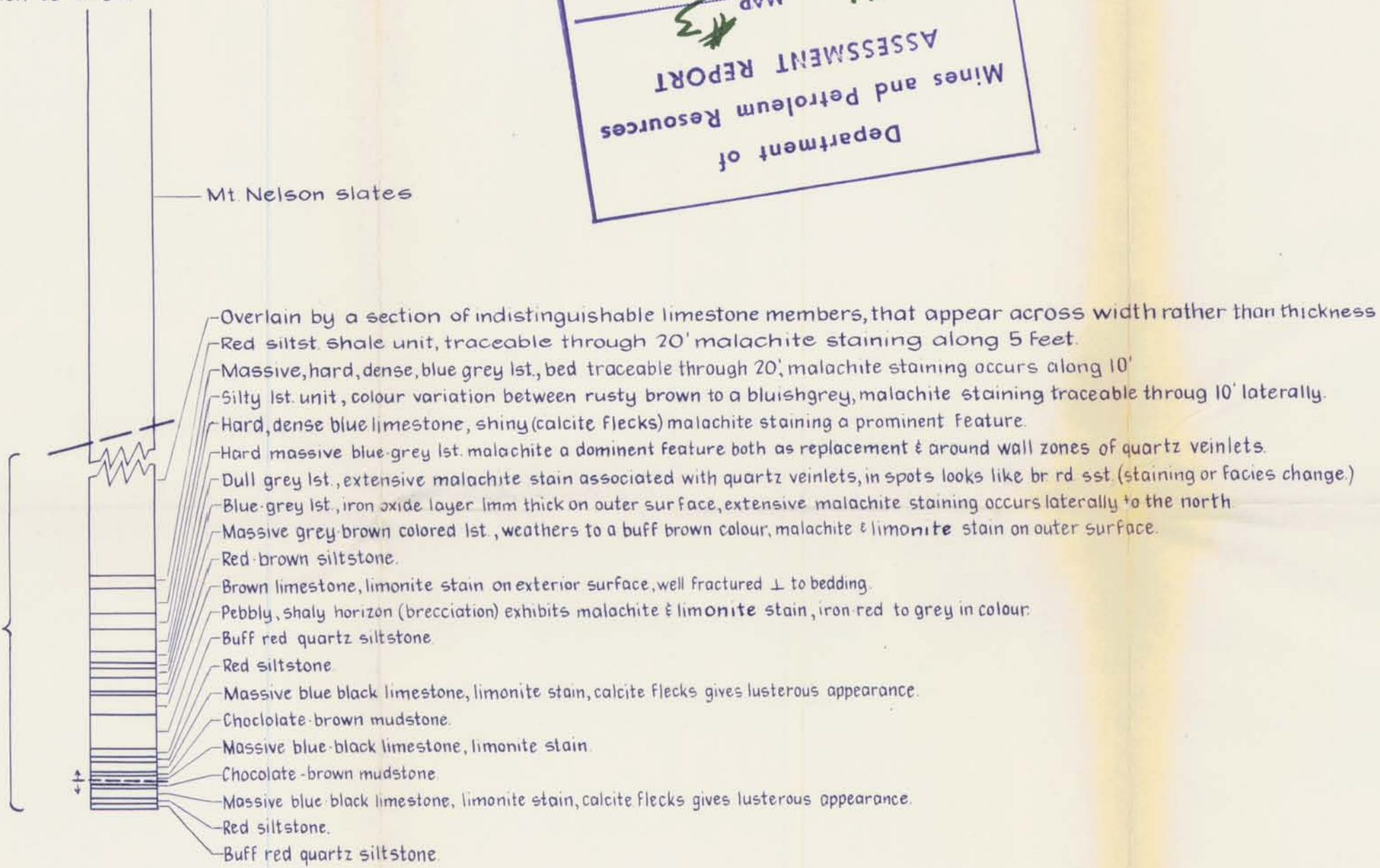
STARBIRD PROJECT
SOIL SAMPLE GRID MAP

by
A.C.A. HOWE INTERNATIONAL LTD.



STRATIGRAPHIC COLUMN

Scale: 1 inch to 5 feet



Mt. Nelson Limestone
Trench #3
Howe Report

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
MAP #3
NO 3351 ON

PEÑARROYA CANADA LIMITEÉ
DIAGRAMATIC CROSS SECTION #1
(Looking south)

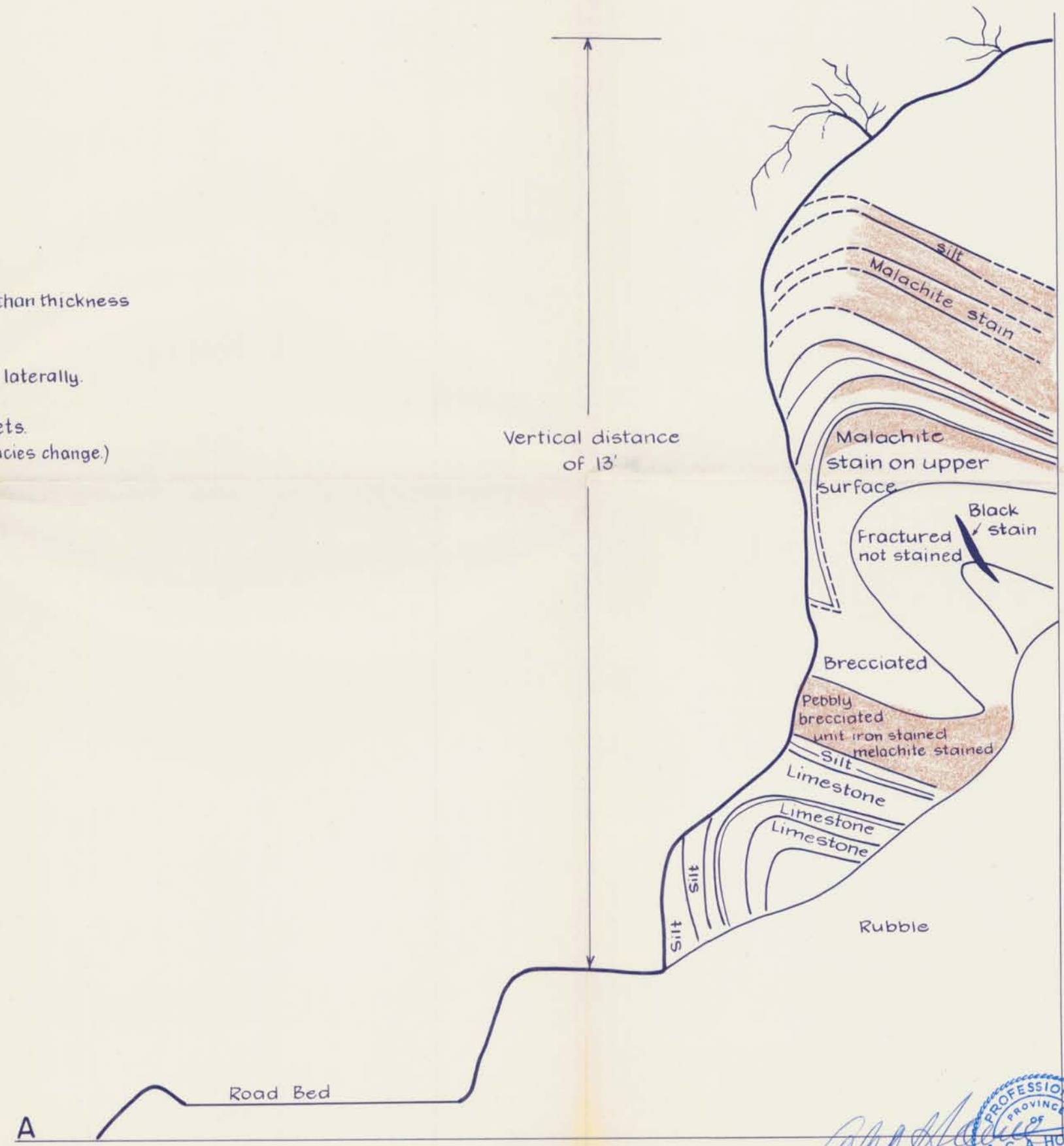
LOCATED AT 0+856

by
A.C.A. HOWE INTERNATIONAL LIMITED

Scale: 1 inch to 2 feet



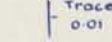


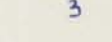
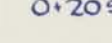
N. Brewster

July 22, 1971

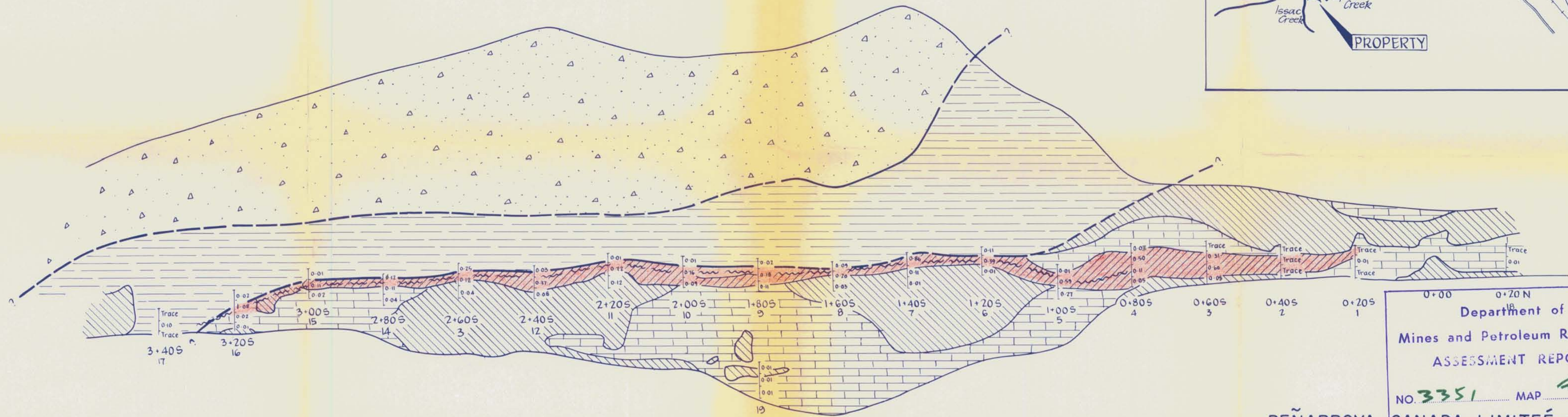
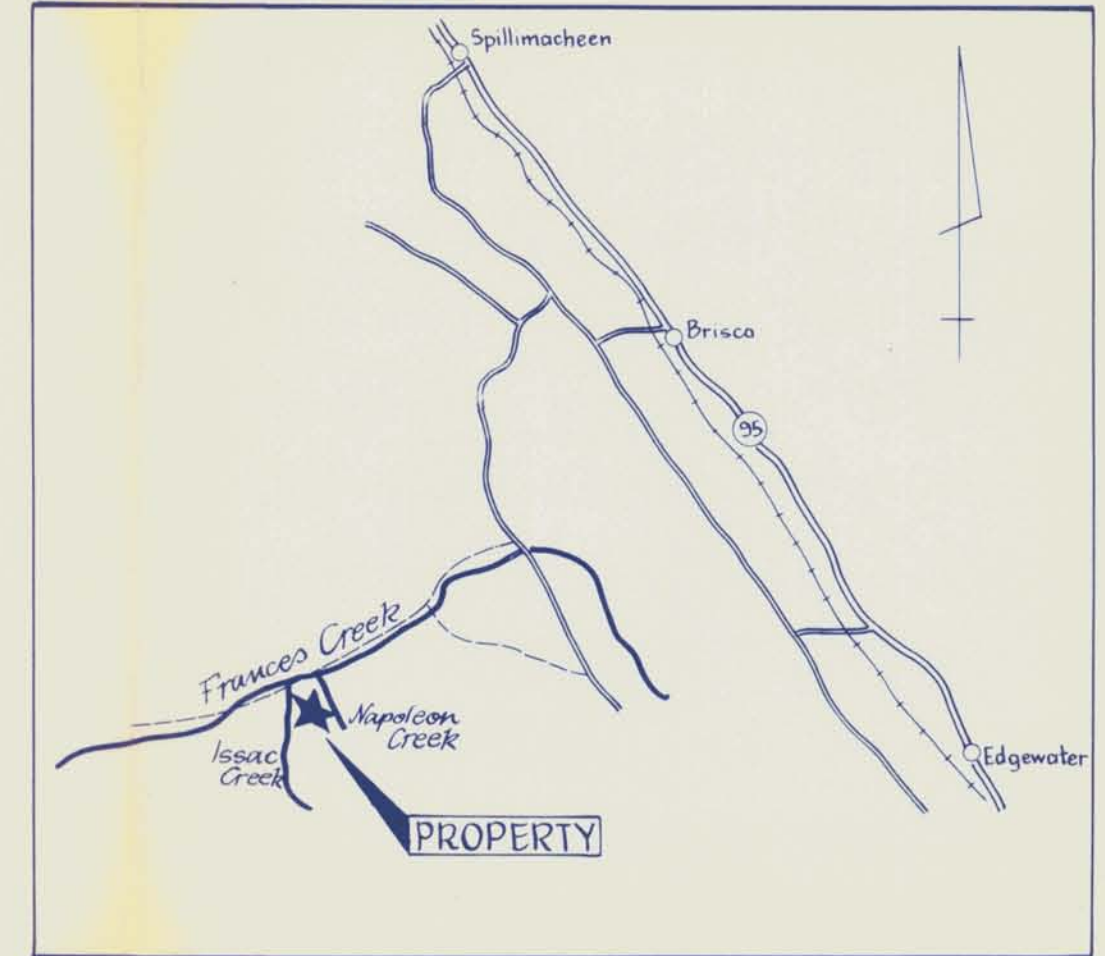


PROFESSIONAL ENGINEER
A.C.A. HOWE
BRITISH COLUMBIA
N. Brewster
Expiry Date October 20, 1972

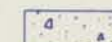

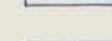
SYMBOLS

-  Mineralized Zone, gossan with malachite, azurite, chalcopyrite.
-  Rubble
-  Channel Sample location with copper values in %
-  Fault - real, interpreted
-  Geological Contact - real, interpreted
-  Sample Number
-  Sample (channel) station

LOCATION MAP



LEGEND

- PROTEROZOIC
-  TOBY FORMATION - Pebble, cobble and boulder conglomerate and breccia
 -  UPPER PURCELL SLATES - Purple, grey and black argillite and slate.
 -  MT. NELSON LIMESTONE - Buff weathering grey dolomitic limestone.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3351 MAP #6

PEÑARROYA CANADA LIMITEE

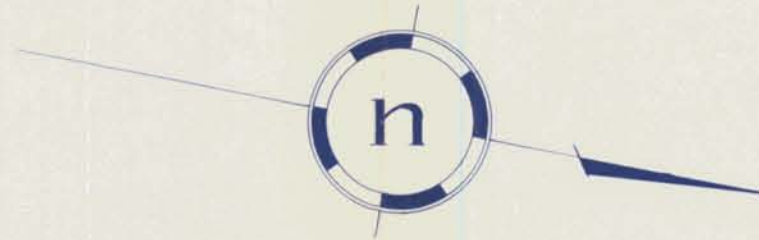
**LONGITUDINAL SECTION
NAPOLEON CREEK SHOWING
(LOOKING WEST)**

A.C.A. HOWE INTERNATIONAL LIMITED

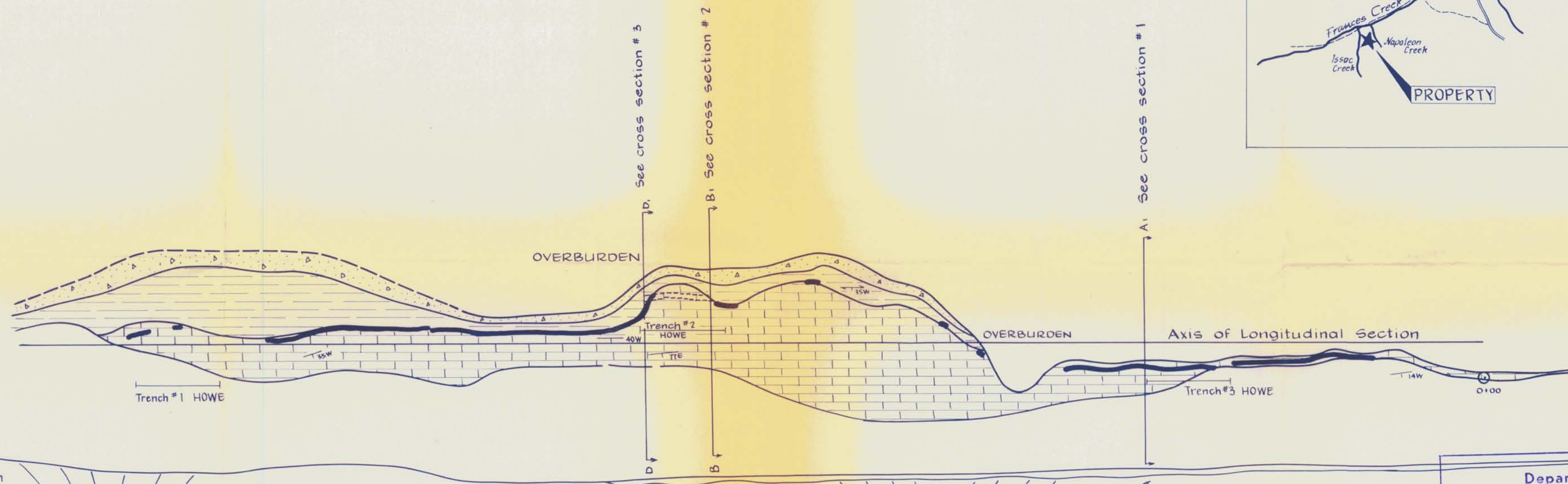
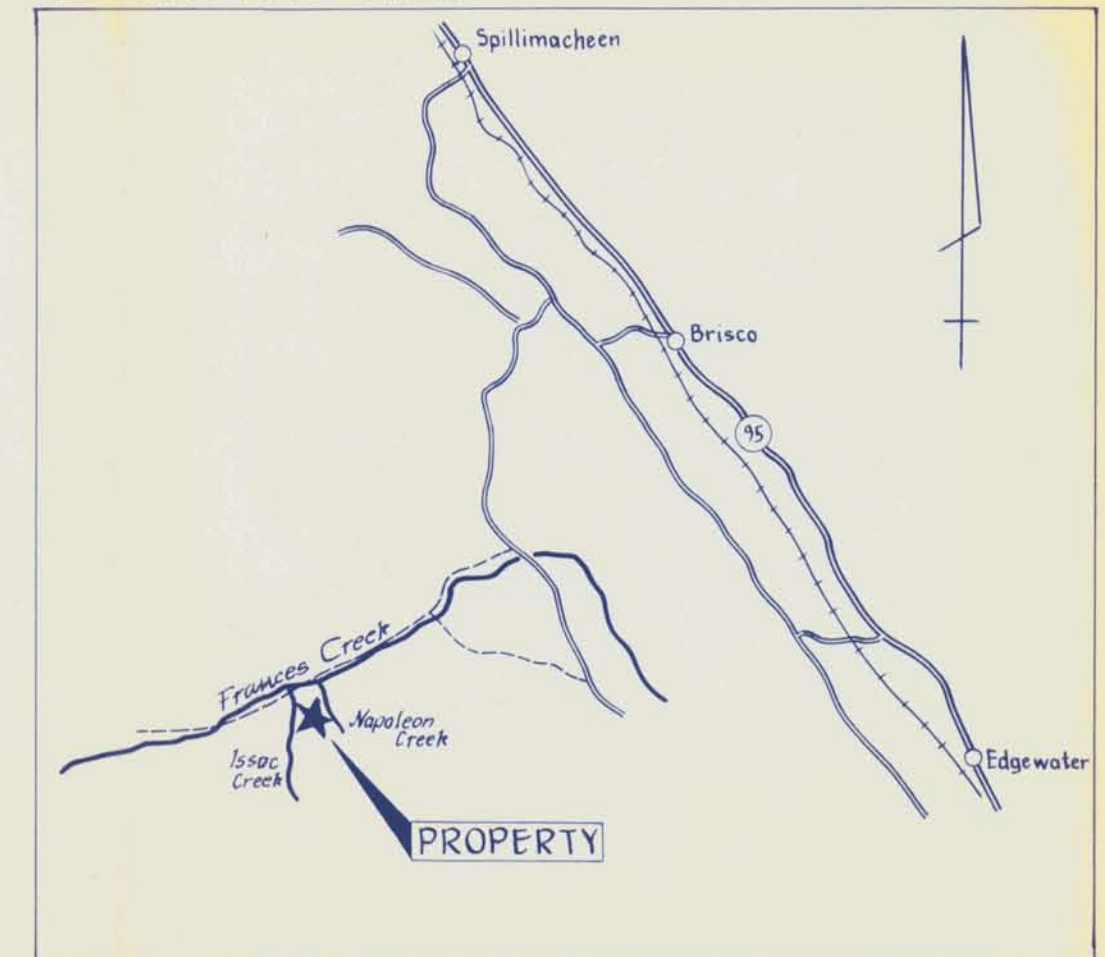


N Brewster, R Felix
Aug 4, 1971





LOCATION MAP



Post #	Claim
Baldy #4	205429
Baldy #1	106777
Baldy #2	106778

LEGEND

- TOBY FORMATION - Pebble, cobble and boulder conglomerate, and breccia.
- UPPER PURCELL SLATES - Purple, grey and black argillite and slate
- MT. NELSON LIMESTONE - Buff weathering grey dolomitic limestone

SYMBOLS

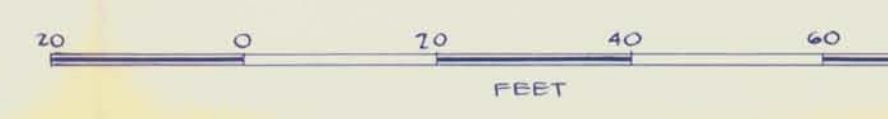
- Base station
- Mineralized gossan zone
- Trench #3 Trench as named in 1961 Howe Report
- Slide
- Bedding inclined dip, Cleavage inclined dip

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3351 MAP #7

PEÑARROYA CANADA LIMITEÉ

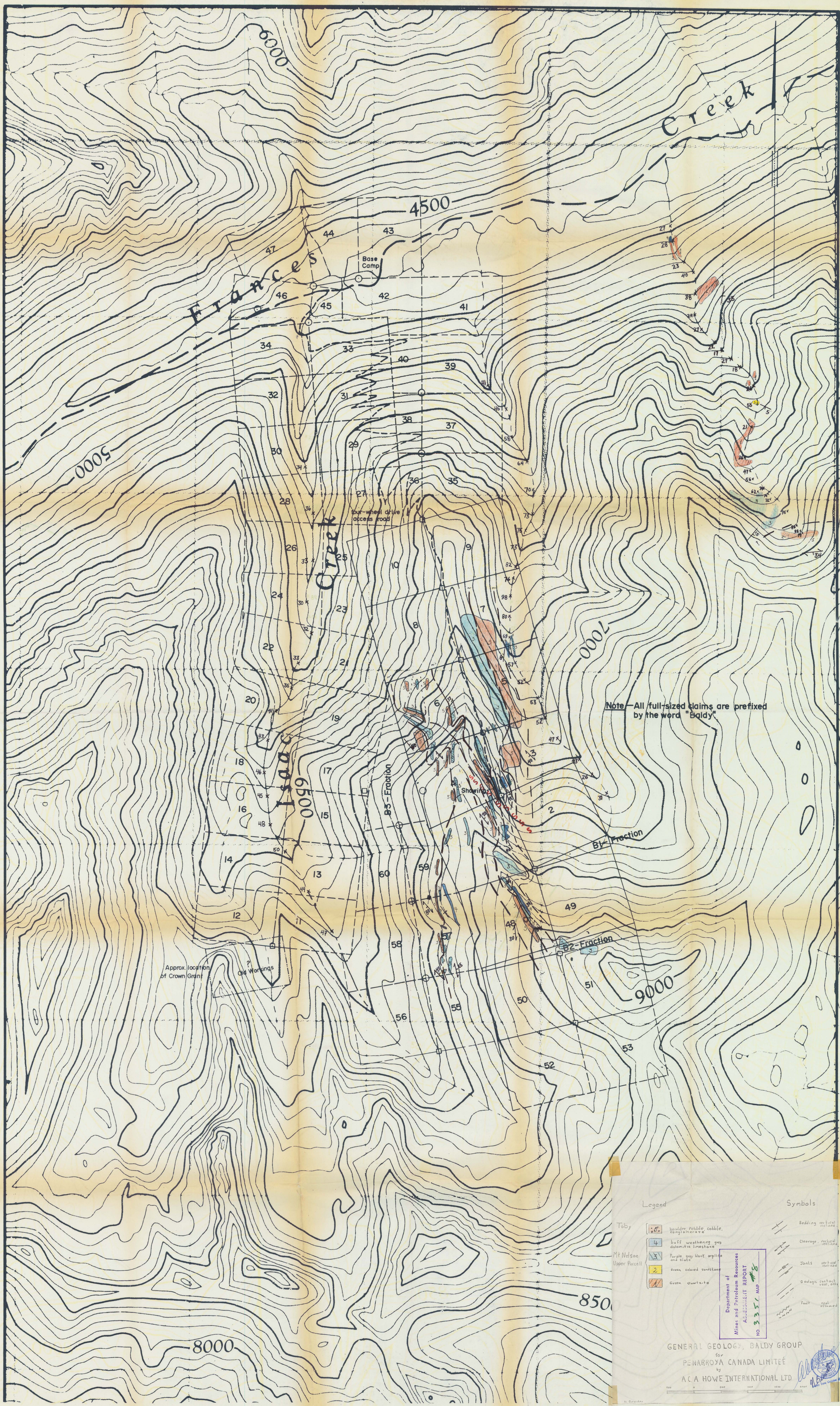
PLAN VIEW
NAPOLEÓN CREEK SHOWING

by
A.C.A. HOWE INTERNATIONAL LIMITED



N. Brewster, R. Felix

Professional Engineer
A.C.A. Howe
October 20, 1972



Note - All full-sized claims are prefixed by the word "Baldy"

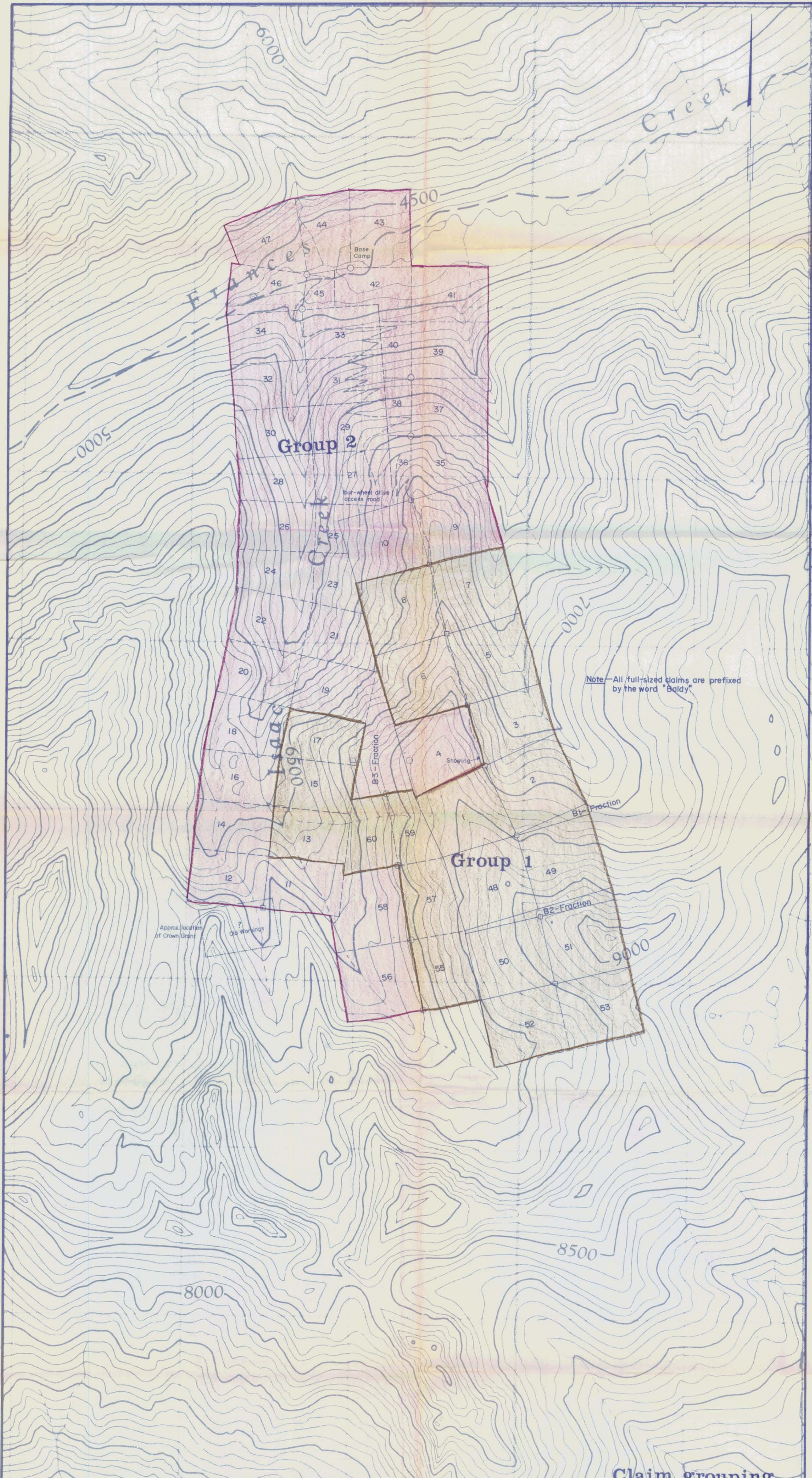
Approx. location of Crown Grant
Old workings

Legend		Symbols	
Toby			
Mt Nelson			
Upper Parcell			

Department of
Mines and Petroleum Resources
ALBERTA REPORT
NO. 3351, MAP 48

GENERAL GEOLOGY, BALDY GROUP
for
PENARROYA CANADA LIMITEE
by
A.C.A. HOWE INTERNATIONAL LTD

1" = 500'



Note - All full-sized claims are prefixed by the word "Baldy"

Claim grouping

- Claim post "tied-in" by chain and compass survey
- Claim post located approx. by topography
- ⊙ Claim post not located, assumed position only

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3351 MAP 49

PEÑARROYA CANADA LIMITÉE - WESTERN DIVISION

Drawn By - RJE	Date - Aug / 71	Title
Approved By -	N.T.S. - 82 K / 9w	Preliminary Plan Chain & Compass Survey of the "Baldy" Claim Group
Drawing No. -	File No. -	
Revised -		

Golden Mining Division
Scale
1" = 1000' 1:12000