

CAULFIELD GROUPAPEX MOUNTAIN EXPLORATIONSTATUS AS OFSEPTEMBER 30TH 1938

1. The exploration work on the Nelson claim of the Caulfield group is intended to test at increased depth the zone of mineralization exposed in the surface croppings which extend southwesterly across the south slope of the Burnt Valley.
2. This zone (Plate 1) follows the Nelson limestone horizon from 20 to 50 feet thick, intercalated among argillites. All formations are altered; the argillites into silicified masses with wavy deformation passing into minute crumpling and brecciation, and the limestone into white marble in part further replaced by a dark greenish mixture of silicates resembling Nickel Plate ore horizons. Shear planes weave along the contacts of the limestone and control the distribution of pyrrhotite with minor chalcopyrite-sphalerite in lenticular masses often several feet thick, with sparse arsenopyrite. Where present, the latter mineral denotes gold values ranging between .10 ounce to 1.00 ounce or even higher in the best stringers.
3. On the surface where the zone is rather well exposed for a length of 700 feet, three segments are most strongly mineralized. The first of these "ore shoots" at the northeast end of the croppings, is 160 feet long, rather solidly mineralized across widths of 2 to 5 feet, and assays from .12 to .98 ounces in a series of connected cuts. The second, beginning 200 feet farther southwest, shows spots and streaks of mineralization over a length of 180 feet, with less consistent but sometimes higher assays. A north-south porphyry dike angles across the middle of this segment. The third lies at the south-west end across a gully and fault zone and while smaller than the others, contains the greatest proportion of arsenopyrite and the highest gold - up to 4 ounces.  

Alteration is strongest and widest in the central shoot, where lime-silicate rock of the Nickel Plate type is over 20 feet thick, with remnants of unreplaced white marble. The relations here are thus similar to those of the Sunnyside ore horizon.
4. Despite the frequent high assays, none of these outcropping shoots is of commercial average. I have regarded them as worth exploration, however, because of this similarity to the productive Sunnyside mineralization, and because of the fact that Sunnyside ore tends to finger out upward into low grade pyrrhotite-chalcopyrite lenses (as at the Bulldog).

5. Considering the high elevation of the Nelson croppings (6850-7100 feet) it therefore has seemed possible that they represent fingers above more substantial orebodies at greater depth; possibly raking southwestward beneath the great silica cap which lies around the rim of Burnt Valley. To test this hypothesis a program has been started of drifting by tunnel at 6800 feet elevation, to be supplemented by diamond drilling to an additional depth.

6. To date the tunnel has been advanced 600 feet, following in general the hanging wall of the limestone, with sundry short crosscuts into the walls. Beneath the first mineralized segment, at depths of 60 to 120 feet down the dip (Plate II - Sections 14, 15, 17) two lenses of pyrrhotite were encountered with some arsenopyrite and values of .30 to 1.00 ounces gold. The maximum width of each lens is 5 feet, the length 20 or 30 feet. This is no improvement over surface, but the depth is slight. Beneath the second segment very substantial mineralization was found, with massive pyrrhotite and some chalcopyrite extending over a width of 40 feet in lime-silicate formation. Arsenopyrite is present sparsely. The showing is definitely better than on surface, which is from 220 to 350 feet up the dip (Plate II, Sections 6, 8, 11).

7. Nothing in the results obtained to date, therefore, invalidates the original program of testing below the tunnel level by diamond drilling. To accomplish this the following work is necessary:

- (a) Crosscut 100 feet into hanging wall south of the first "ore segment" and establish station for drilling to cut vein 100 feet below tunnel.
- (b) Extend drift to southwest limits of second "ore segment."
- (c) Crosscut 100 feet into hanging wall opposite center of this segment as thus outlined and establish station for drilling down as in (a).
- (d) Utilize existing footwall crosscut (see section 6) to drill holes testing this segment between surface and tunnel.

8. Item (a) can probably be done before the close of this season, and hence before the next payment on property (\$2500) falls due in February.

If no ore is encountered in (a), we shall not care to make this payment; yet the substantial character and size of the second shoot make it desirable to test it to the extent covered by (b), (c) and (d).

I propose, therefore, that in this contingency we ask Mrs. Caulfield, the owner, to extend the time for this payment sufficiently to permit the completion of this program, which will require until December 1st 1939. Mr. Wallis Knowles, who is acting as advisor to Mrs. Caulfield, spent a day with us at the property and will recommend this course to her.

Mr John W Mercer (2)  
Mr B W Knowles (1)  
Mr W C Douglass (1)  
Mr Paul Billingsley (1)

Respectfully submitted,

Plate I - Plan of Nelson Tunnel and  
surface cuts.

Paul Billingsley.

Plate II - Sections.

## GENERAL GEOLOGICAL ASPECTS

of

### LOWER LEVEL DEVELOPMENTS

#### SOUTH OF CENTRAL FAULT

OCTOBER 1ST 1938

1. Exploration work during the past summer has made it possible to set up in a tentative way the significant features of structure and mineralization in the large new region lying south of the Central fault zone and below the Nickel Plate 8 level.
2. This region covers the southwestern part of the Iron Duke claim, the southern part of the Mascot Fraction, the southern part of the Morning and the eastern corner of the Nick O'Time (see Plate I).
3. In the Nickel Plate mine work on the 7, 8, 9 and 10 levels has developed the southern Orange and Yellow orebodies well down toward the Mascot's east line. Both horizons should reach this line with a substantial width of ore south of the Central Fault.
4. In addition, the formations below the Yellow ore have been penetrated by a crosscut on the 8 level, which is at present showing very heavy coarse mineralization of quartz and calcite with massive pyrrhotite. Face sample September 30th gave .09 ass gold. While it greatly resembles the marginal mineralization north of the Sunnyside 45 orebody this 8 level showing is in a higher bed being still above No. 1 Sill. It suggests the possibility, therefore, of a new productive horizon. (See Plate II).
5. In the Mascot Fraction, work on the 4800 tunnel level has outlined the structure and drilling below that level has found ore from 200 to 500 feet deeper. The Midway Sill and Yellow ore horizons occupy most of the 4800 level workings in the southern part of the claim (see Plate I), while the drill hole ore (see Plate II) lies immediately above and below No. 1 Sill, associated apparently with erratic porphyry masses. The main body, below No. 1 Sill, may be in the Sunnyside horizon.
6. On the Nick O'Time claim a tunnel is being run at 4300 feet elevation to intersect this deep Mascot ore. This tunnel has now cut the midway sill and is traversing Yellow ore beds which show here, as they did on the 4800 level, strong mineralization in the form of quartz, calcite and pyrrhotite. With an additional 500 feet the 4300 tunnel will cut No. 1 Sill, with a possibility of ore in either or both sides.
7. The tunnel has been aimed to hit the most southerly drill hole which showed ore. It will thus be at the southern margin of this deep orebody. The Yellow orebodies, 500 feet higher, should therefore lie much farther north in accordance with the general established echelon arrangement. For this reason

it appears that the quartz calcite pyrrhotite Yellow bed mineralization seen on the 4300 and 4800 levels is a southerly marginal phase. Development should be pushed northward.

8. Conversely, the low horizon mineralization on the Nickel Plate 8 level lies immediately beneath the large Yellow ore stopes, whereas the ore in the lower bed should be echeloned to the southward. Development therefore should be pushed southward.

9. In general, the structure and mineralization of this region between Nickel Plate 8 and Mascot 4300 level give hope that it may be possible to develop within it systematic ore shoots in the Yellow and lower horizons down to the Sunnyside.

Respectfully submitted,

Paul Billingsley.

Plate I - Developments south of Central Fault in Lower Levels - 1"-100'

Plate II - Section through Mascot tunnels etc. approximately east-west - 1"-100'

Mr John W Mercer (2)  
Mr W C Douglass (1)  
Mr Paul Billingsley (1)

PROSPECTING POSSIBILITIES  
IN THE  
APEX MOUNTAIN REGION  
HEDLEY, BRITISH COLUMBIA  
July, 1936

PAUL BILLINGSLEY  
CONTINENTAL BANK BUILDING  
SALT LAKE CITY, UTAH

484

PROSPECTING POSSIBILITIES IN THE  
APEX MOUNTAIN REGION  
HEDLEY, BRITISH COLUMBIA

July, 1936

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L I S T O F M A P S

Apex Mountain Region . . . . .	. 1 in. - 1500 ft.	Plate I
Part of Nelson Claim, Showing Workings on Ore . . . . .	. 1 in. - 100 ft.	Plate II



PROSPECTING POSSIBILITIES IN THE  
 A P E X M O U N T A I N R E G I O N  
 HEDLEY, BRITISH COLUMBIA

GENERAL

The highest mountain in the Hedley region is Apex Mountain, situated about 7 miles east of the Nickel Plate Mine. The intervening space includes the broad headwater drainage basins of Eighteen and Sixteen Mile creeks, largely blanketed by moraines and drift. On either margin, however, the mountains show bed-rock formations; Nickel Plate and Lookout on the west having west-dipping argillites and limestone, and Apex and its neighbors on the east having similar formations, but east-dipping. Both Nickel Plate and Apex mountains are held up by the presence of widespread silicification ("silica caps"), and both show scattered outcrops of gold-bearing arsenopyrite-pyrrhotite ore.

PROPERTIES (See Plate I)

The more important showings of ore in the Apex Mountain region are covered by the claims of two groups, the Nelson and the Apex. There is also a large gossan on the northeast slopes of Mt. Beaconsfield, but this has not been mapped or sampled.

The Nelson group includes the following claims:

<u>Name</u>	<u>Lot No.</u>	<u>Approximate Area</u>
Independence . . . . .	256S . . . . .	53 acres
Apex . . . . .	659S . . . . .	50 "
Goldsmith. . . . .	1101S . . . . .	38 "
Nelson . . . . .	1102S . . . . .	46 "
Nelson Fraction. . . . .	1103S . . . . .	13 "
		200 "

These form a compact group covering the summit of Apex Mountain and its steep north face, which drops nearly 1000 feet into the basin of Burnt Valley.

The ore is exposed on this north face on the Nelson Claim.

The Apex group includes these claims:

<u>Name</u>	<u>Lot No.</u>	<u>Approximate Area</u>
Australian . . . . .	690S . . . . .	53 acres
Alpha. . . . .	691S . . . . .	53 "
Utopia . . . . .	692S . . . . .	45 "
Acacia . . . . .	694S . . . . .	40 "
Acadia . . . . .	695S . . . . .	53 "
		<u>244</u> "

The Apex claim—693S, 23 acres--originally formed part of this group but is not now listed by the owners. The group lies on the northeast spur of Apex Mountain north of the Burnt Valley and laps over into the Green Valley still farther north. Its surveyed position, with respect to Apex Mountain and the Nelson group, has been found to be seriously in error. Thus the ore showings, reported to lie on the Apex Claim, seem by rough triangulation to be on the Acacia.

#### GEOLOGY

The eastern and northeastern shoulders of Apex Mountain, which include between them the Burnt Valley, are composed of argillites, striking northeasterly and dipping to the southeast. They include lime argillites, siliceous argillites and micaceous argillites, with at least two beds of limestone, one of which outcrops on the south side of Burnt Valley, and one on the north ridge. The former carries the Nelson outcrops of ore, the latter the Apex.

This northeasterly belt does not continue across to the west slopes of Apex Mountain. It gives way abruptly, at the summit and along the crest to the northwestward, to a belt of steep-dipping formations, also argillites running northwesterly, directly across the other trend. The line of separation is probably a sharp fold, intensified into thrust faulting. The beds near it are



mashed, schistose, dynamically crumpled and metamorphosed. A granitic intrusion, elongated in the northwest direction, also marks the line. It is a main regional break and is the probable deep penetrating channel, carrier of alteration and ore fluids. Along its course is silicification which, on the northwest shoulder of Apex Mountain, spreads into a "silica cap" covering two or three hundred acres, comparable in intensity and size to that of Nickel Plate Mountain, overlying the ore bodies.

#### ORE SHOWINGS

The outcrops of the Nelson and Apex prospects are adjacent to this silica cap, lying northeast of it, and a few hundred feet lower. It is possible, therefore, that they represent fingertips of ore, extending out from a mineralized zone beneath the capping and along the Apex Mountain break. This possibility gives the showings an interest beyond their actual demonstrated size and value.

The Nelson ore outcrops (See Plate II) lie in a belt of limestone, intercalated in the argillites on the north flank of Apex Mountain above Burnt Valley. The more westerly showings, which adjoin a fault zone (N. 20° E., 70° E. dip) are irregular, with bunches of sulphides in boxwork fashion on fault strands. Pyrrhotite, chalcopyrite and arsenopyrite are found, with good gold content (1.00 oz., 1.20 oz., Bostock's samples). The irregularity of the mineralization, however, makes it doubtful if there is any important quantity of this grade. The Healey Gold Mining Company, under Gomer P. Jones, attempted to explore these westerly outcrops and sank an incline shaft 50 feet on one of the better bunches.

The easterly showings, about 400 feet to the northeast along the limestone belt, and 200 feet lower, are more consistent. A lens-shaped outcrop of sulphide ore has been exposed in cuts for a length of over 100 feet, with a

maximum width of 10 feet. Bostock's samples show grades of .35 oz., .10 oz., .70 oz., .80 oz., .32 oz., and .08 oz. in the successive cuts. This ore body may be persistent toward the main break, angling southward down the dip of the beds.

The Apex ore body outcrops on the crest of the ridge north of Burnt Valley. It has been developed by a shaft sunk on the ridge and connected with a tunnel, 100 feet lower, on the south slope. The ore outcropping at the shaft collar, occupies a sharp crumple in the beds, and plunges out of the shaft before the tunnel level is reached. It consists of pyrrhotite, chalcopyrite, bornite and a little arsenopyrite, in a small and irregular ore shoot. The gold value has yet to be determined.

#### RECOMMENDATIONS

The favorable structures, widespread silicification, and occurrence of gold-bearing arsenopyrite ore on the Nelson Claim, demand that some attention be given to this Apex Mountain region.

1. We should obtain favorable options on the Nelson and Apex groups and should locate, temporarily at least, enough claims to fill the intervening gap and cover the silica cap.

2. Thus protected, we should make a rough topographic map (200 feet to 1 inch) of the area (including also the gossan on Mt. Beaconsfield) and map on this the geology.

3. Meanwhile, the Nelson and Apex workings should be mapped (30 feet to 1 inch), and the ore sampled.

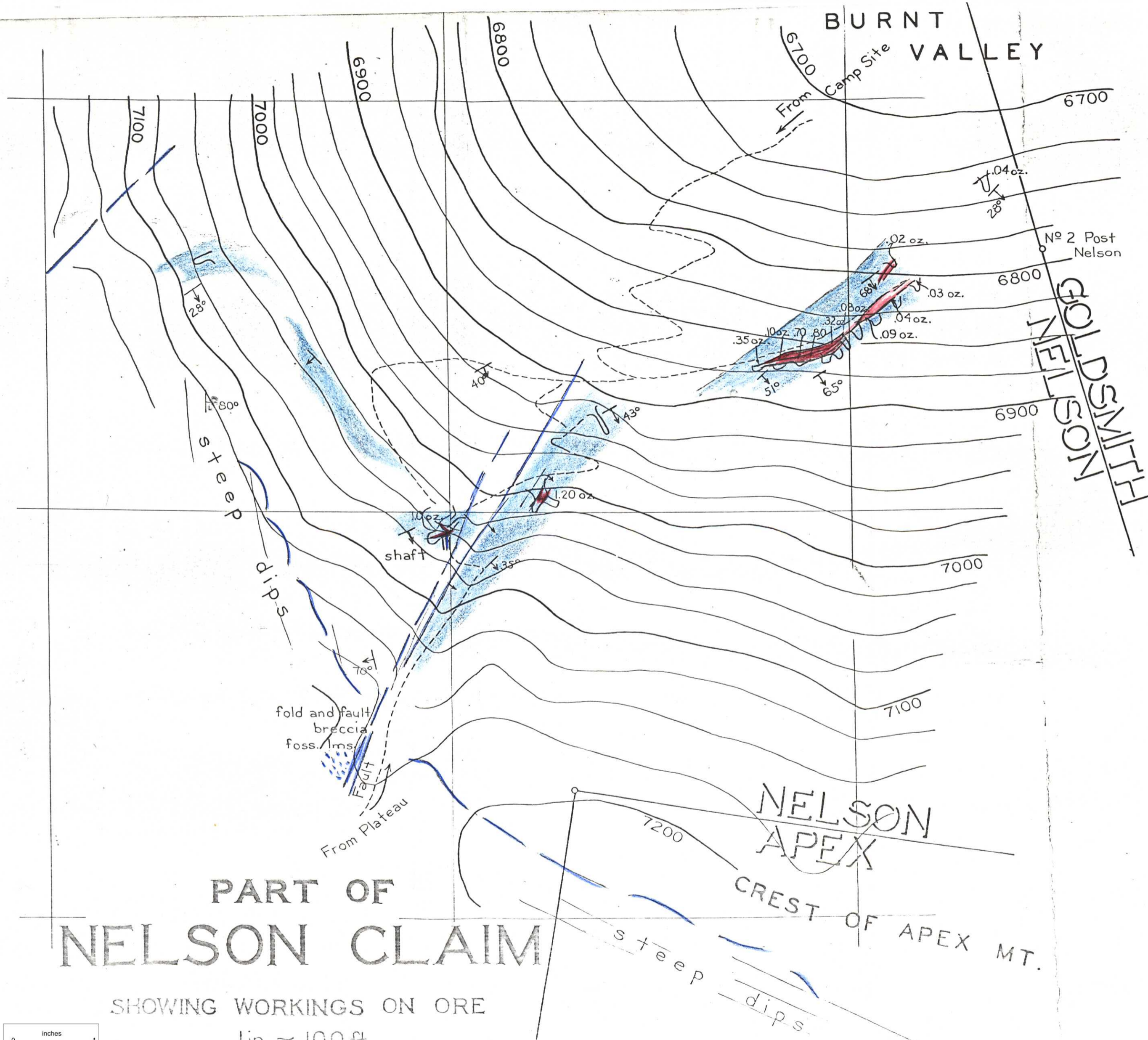
4. If the easterly Nelson showings give assays confirming Bostock's, they should be developed by a tunnel crosscutting in at 6750 feet under the east end of the outcrop, turning southwest as a drift on the ore.

5. The crew for this work can be housed in tents in Burnt Valley and

supplied via the old road connecting with the Nickel Plate road on Keremeos  
Creek (Plate I).

Respectfully submitted,

Paul Billingsley



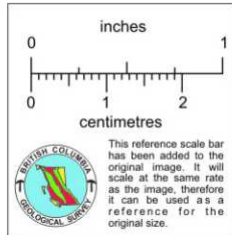
BURNT VALLEY

GOLDSMITH

NELSON APEX

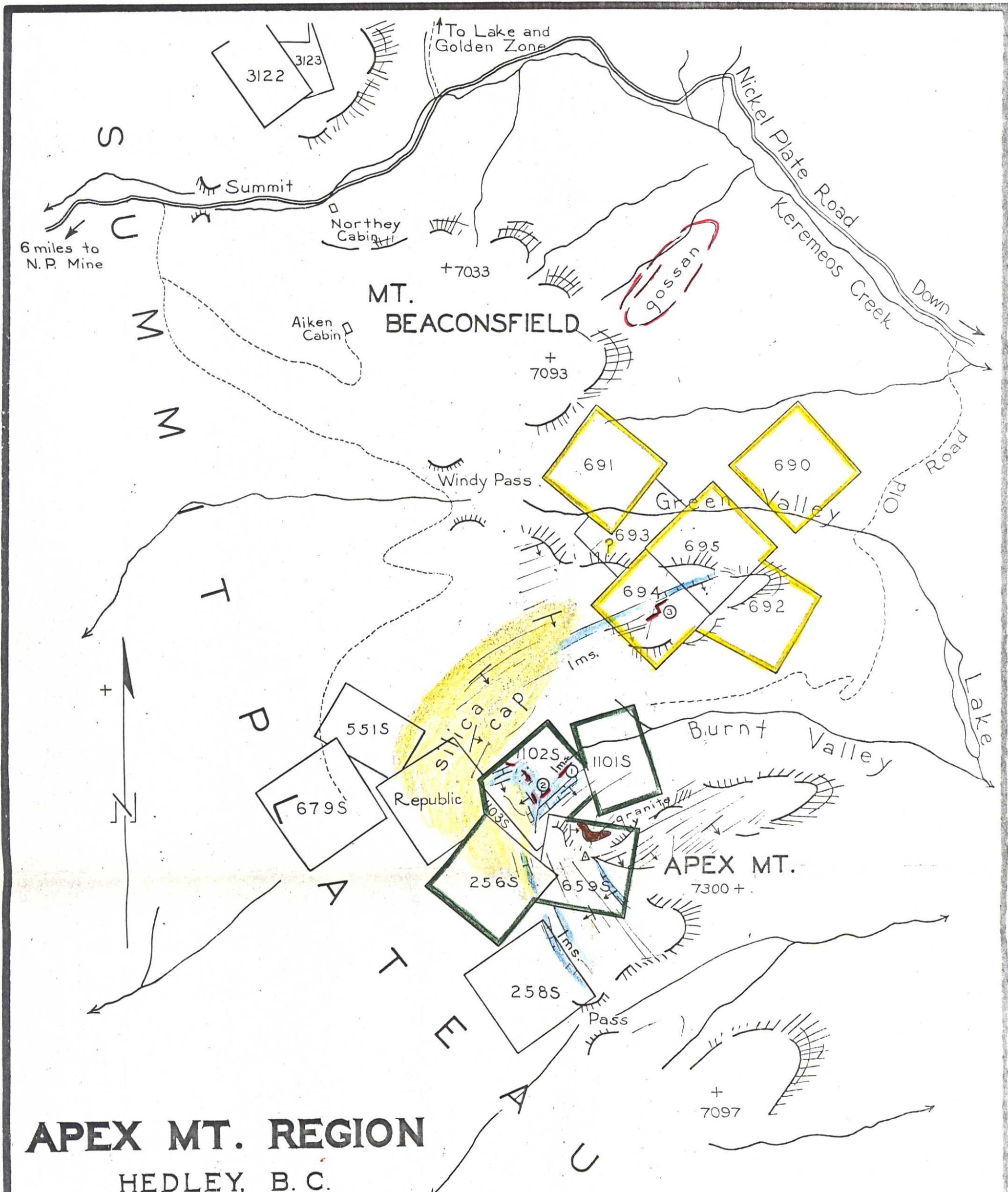
PART OF  
NELSON CLAIM

SHOWING WORKINGS ON ORE  
1 in. ~ 100 ft.  
(Survey and samples by Bostock, C.G.S.)



■ Limestone built in argillites  
■ Ore





**APEX MT. REGION**  
**HEDLEY, B. C.**  
 lin. ~ 1500 ft.

- |                    |                          |
|--------------------|--------------------------|
| Nelson Group       | Apex Group               |
| 256S Independence  | 690 Australian           |
| 659S Apex          | 691 Alpha                |
| 1102S Nelson       | 692 Utopia               |
| 1101S Goldsmith    | 694 Acacia               |
| 1103S Nelson Frac. | 695 Acadia               |
| +                  | 693 Apex - not in group? |
- Ore Bodies
- ① Lower Nelson
  - ② Upper Nelson
  - ③ Apex

PLATE I

