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**FILE**

**REPORT  
ON**

HOPE PROJECT, B.C.

1966

NEW WESTMINSTER

MINING DIVISION

Vancouver, B.C.

Dec. 22, 1966

E.D. Dodson

Original to Dr. A. S. Dadeon, Toronto (Feb. 3/67)

1 - Files

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Figure 1



Figure 2

## ILLUSTRATIONS

- Map 1 - Following page 3.  
Sketch map showing geology of portions of Mt. Breakenridge.
- Map 2 - In pocket.  
Hope Project. Showing major areas worked during 1966 season.
- Map 3 -  
Geology, Pitt Lake, B.C.      Map 4, - Hope, B.C.
- Fig. 1 - Frontispiece.  
Logging road on the ridge to the east of Mt. Cheam. The photo was taken at approximately 4,000 feet above sea level. The Fraser Valley lies to the right.
- Fig. 2 - Frontispiece.  
Mt. Breakenridge. The rock in the foreground is glacially fluted and polished quartz-diorite.
- Fig. 3 - Facing page 4.  
Aerial view of the Mt. Breakenridge breccia pipe. The pipe occupies the area above the red line on the photo.
- Fig. 4 - Facing page 4.  
The Breakenridge breccia pipe. The contact is indicated in red with the quartz-diorite lying to the left. The altitude of the contact at this point is  $317^{\circ}/85W$ .
- Fig. 5 - Facing page 5.  
Detail of breccia pipe material. The white rimmed dark areas are quartz-lined druses. The fragments are altered quartz-diorite.

## INTRODUCTION

The Hope area as referred to herein is bounded on the south by the 49th parallel, on the north by the 50th parallel, on the east by the 121st meridian and on the west by the eastern boundary of Garibaldi Park (in the vicinity of 122°30' W).

(See Map in pocket)

The area was chosen on the premise that, like many areas of favourable geology and ready accessibility, it had been prospected at a time when little or no interest was aroused by low grade copper and molybdenum mineralization. In addition, the area lies so close to Vancouver that most of the major companies would be unlikely to institute a large scale program.

The geology is described in Geological Survey Memoir 335. Vancouver North, Coquitlam and Pitt Lake Map-Areas, B.C. by J.A. Roddick and in the map and marginal notes of Geological Survey map #737A - Hope by C.E. Cairnes. Copies of the geological maps are enclosed as maps 3 and 4 of this report (in pocket).

In general the area is underlain by coast intrusives of pre-Jurassic to Miocene (?) age, intruding sediments and volcanics of pre-Pennsylvanian to Eocene (?) age.

Within this region specific targets were located on the basis of geology, air-photo study and aerial reconnaissance.

Transportation was by helicopter (chiefly June and September), truck, motorcycle, and freight canoe. The network of logging roads served as access routes for the motorcycles, and in some instances the truck. In the case of the latter, however, much time was wasted seeking access permission. Further, no week-end work could be done in active logging areas because of locked gates. A third motorcycle would have added greatly to the efficiency of the operation.

The crew employed consisted of four students working as prospectors (a fifth was employed for a three week period in August). The writer's time was spent largely in reconnaissance plus the usual chores of expedition.

Prospecting methods were of the simplest sort - float checks of various creeks, checking of rusty areas and silt and soil sampling of favourable areas.

As work progressed many areas were first designated worthy of further checking; then eliminated as prospecting bets. Three areas were brought to the point where further work is required to complete their evaluation. Following is a descriptive list of the more significant areas worked; with recommendations for further work where required.

(1) GREENDROP LAKE Area

The area was chosen as a target because of a colour anomaly observed during fixed wing reconnaissance in 1965. The rocks are mapped as Custer granite gneiss of early Jurassic age, probably metamorphosed Hozameen (late Paleozoic), and the Chilliwack Batholith of Miocene age. The area of interest is chiefly within the batholithic rocks.

The Bo group of 20 claims was staked to cover an altered area within the granitic rocks west of Greendrop Lake. These rocks are converted to a large degree to sericite and quartz and contain varying amounts of pyrite. Locally small veins of quartz, tetrahedite, sphalerite, galena, and arsenopyrite occur. Molybdenite occurs locally as isolated flakes. In one instance float of brecciated appearance contained a small patch of molybdenite. The area of interest is largely below timberline and is partly overburden covered. In evaluation of the outcrop areas leaching of molybdenum values must be considered probable. Preliminary soil samples taken by the prospectors ranged from less than 1 ppm to greater than 100 ppm molybdenum.

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In mid-October a two-man crew spent a week on grid-sampling the lower slopes where outcrop is not predominant. Unfortunately the key areas were not covered because of a 'lack of soil'.

#### Recommendations

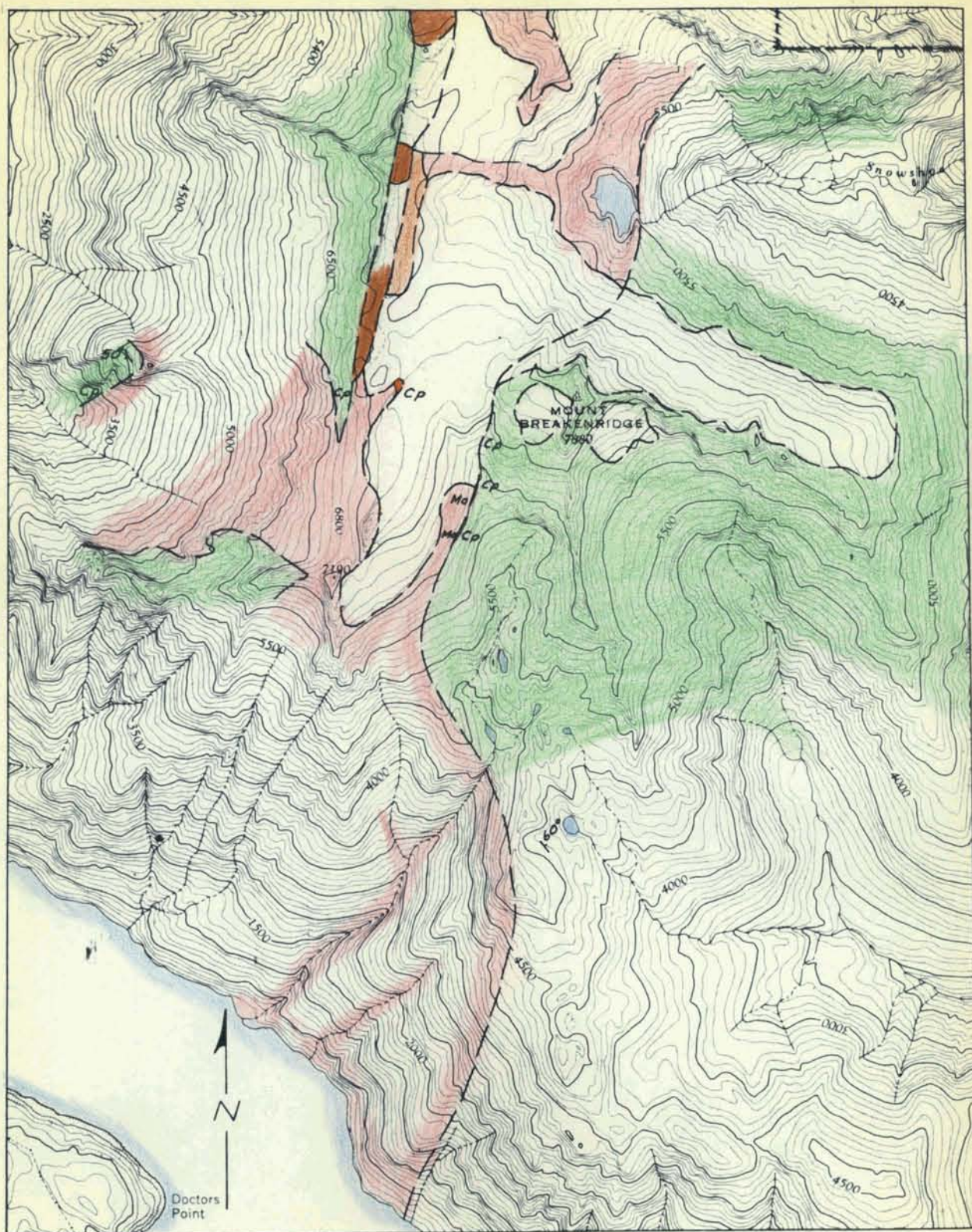
It is difficult at this time to propose a concrete program for the property. The geochemical survey while of some value failed to eliminate or outline the area of possible interest. The next logical step is geological mapping of the claims using existing aerial photography as a base. This would be directly aimed at outlining and locating controls for alteration and mineralization.

The mapping should take approximately one month. Should any locus of mineralization be disclosed, geology and topography would dictate the type of physical work required. In any event the cheapest means of access would appear to be a three mile cat-road to the area. A further allowance for fifteen days of trenching is included in the cost estimates. Should trenching appear unwarranted or unfeasible due to topography, drilling would have to be considered. An allowance of 1,200 feet of AX wireline drilling should serve as a preliminary test to establish sub-surface grades and/or the possible existence of a breccia pipe.

#### (2) MT. BREAKENRIDGE Area

The Breakenridge area was outlined originally from fixed wing aircraft as a potentially interesting area. Several helicopter landings in late 1965 confirmed the presence of quartz-diorite, schist, a breccia pipe and weak chalcopyrite mineralization. Work in August of this year indicated a broad area of intermittent sub-marginal copper and molybdenum mineralization. The copper is present in both schist and intrusive. The molybdenum is almost entirely confined to the intrusive.





## LEGEND

- Chilliwack Gp. (?)  
schists and gneisses.
- Quartz diorite plus  
undivided intrusives.
- Diorite.
- Aplite
- Breccia pipe (?)
- Cp Mineralized area—  
chiefly chalcopyrite.
- Mo Mineralized area—  
chiefly molybdenite.

Geology from observations  
by: T. Hoy  
R. M<sup>c</sup>Burnie  
E.D. Dodson

Scale: 1:50,000

Sketch map showing  
**GEOLOGY**  
of portions of  
**MT. BREAKENRIDGE**



Figure 3



Figure 4

The Kerb group of two mineral claims was staked to cover a breccia pipe in quartz diorite at the 7,000 foot level on Mt. Breakenridge. The writer examined the area in August of this year and although no detailed map was prepared a sketch map of the vicinity is included in this report (see map opposite page). The pipe is exposed for a horizontal distance of 500 feet and a maximum width of approximately 250 feet (see fig. 3). Only a small segment of the contact is visible; the remainder is hidden below glacier ice (see fig. 4). The pipe consists of chips and blocks of quartz diorite from a few inches to several feet in maximum dimension. Locally the fragments may be clearly identified but in most areas the boundaries of fragments may be discerned with difficulty (see fig. 5). New

Mineralization within the pipe consists primarily of transparent though not flawless slender quartz crystals of up to four inches in length and occasionally three-quarters of an inch in diameter in druses between the fragments. Some druses show remnants of largely dissolved fillings of dolomitic carbonate. In a rather indefinite zone adjacent to the contact chalcopyrite is interstitial to the quartz, in some druses. The zone of copper mineralization would at no place exceed fifty feet in width and is perhaps exposed for one hundred feet. No ore-grade or near ore-grade material was seen.

The best hope for ore-grade material lies at depth. This could be checked with two vertical drill holes. The depth placed on the holes must be arbitrary. A preliminary goal might be set at 300 feet with sufficient equipment on the job to reach 500 feet should results prove encouraging.

The suggestion has been made that better material may be ice-covered. Checks of the moraines at the foot of the ice were not encouraging. However, further data on surface showings and geological environment could be readily obtained if desired. Carbon-dusting of the snow as part of the helicopter check-out in the spring should expose much new outcrop during the ensuing melt-period. Our real cost on this operation would be negligible.



Figure 5

(3) EAGLE CREEK Area

Eagle Creek, a headwaters tributary of Chehalis River, is at present simply a favourable prospecting locality. Two attempts to prospect this region failed: the first because of an abundance of snow, the second because of the lateness of the season and the departure of the students to school.

The rocks are chiefly volcanics of the Fire Lake group; Upper Jurassic and Lower Cretaceous in age, underlain and intruded by the Coast Plutonic rocks which occupy the valley bottoms and much of the area to the north and west.

Known mineralization is confined to the Fire Lake rocks. Float containing sphalerite, pyrrhotite, chalcopyrite, and galena is common in the streams and talus. Some of the float is readily accounted for by narrow discontinuous veinlets and pods. All may be from equally unproductive sources. However, there is a fair possibility that this well-mineralized area may contain more substantial deposits of copper and zinc.

It is suggested that a two-man crew supplied via private logging road from Harrison Mills be placed in the area for the month of August. The two employed for the job should be capable of intelligently soil-sampling and prospecting; and of producing a geological sketch-map.

(4) STEIN RIVER Area

Aerial reconnaissance enroute to another area resulted in the discovery of two very large gossan areas on the Stein River to the north and east of the map area. The first of these was investigated on the ground and proved to be chiefly pyritized volcanics and porphyritic intrusives. The second was not checked on the ground because of the difficulty of landing in high winds.

An effort should be made to check both of the above with geochemical methods. This could best be done during August or early September. Transportation would have to be by helicopter. A two man crew could advantageously spend a week on the first location. In the meantime, the second location could be checked to see what work is warranted.

Dr. K.C. McTaggart of the University of British Columbia reports 'pale rusty granite' on a ridge south of the Stein about opposite Cottonwood Creek. This should be checked while in the area as a possible copper or molybdenum prospect. I had a verbal agreement with Dr. McTaggart to give him the same deal as we offered on another molybdenum bet on Spuzzum Creek. I think this should be honored if anything materializes.

The areas described below have received varying amounts of attention. They have been prospected and to some extent soil-sampled without sufficient positive results to encourage further work. They are listed here chiefly to avoid the possibility of others duplicating the work.

(5) The Trio Creek area is underlain by Mesozoic volcanics, locally pyritized, and coast intrusives. A few narrow, discontinuous veins of sphalerite-galena and quartz were seen. Precious metal values are low.

(6) The Mystery Creek area is underlain by Mesozoic volcanics, in large part tuffs and breccias. Barren quartz veins are abundant. Locally the volcanics are pyritized.

(7) The Brett Creek - Weaver Lake area was the focus of attention of at least one crew for a major portion of the summer. This area is underlain chiefly by Mesozoic Volcanics and sediments. Three small stocks (?) intrude the above. Pyritization is prevalent throughout the area but is particularly strong in a north-south belt through Weaver Lake. Locally veins of sphalerite, pyrite, galena and chalcopyrite occur. Precious metal values are low. The veins are not known to exceed two feet in width and are thought to be lenticular.

The area was chosen for work because of the pervasive introduction (?) of sulphur and the presence of base metals. It was hoped that adjacent to the intrusives the tuffs and breccias might contain massive replacement orebodies of the Noranda-Mt. Shasta type. No evidence of such mineralization was found.

(8) The Chehalis area is underlain by coast intrusives. Locally these intrusives contain abundant late potash feldspar. In two instances argillic alteration is evident. As these features are often associated with copper and molybdenum deposits the area was checked. Very minor molybdenite and chalcopyrite were found in scattered occurrences.

(9) Dewdney Peak area is a potash-rich phase of the Coast intrusives. Much of the potash is evidently introduced late in the history of the mass as indicated by the vein - like potash rich zones. No significant mineralization was found.

(10) Norrish Creek is another potash-rich area in the coast intrusives. Very minor molybdenite was found and locally the rocks are moderately pyritized.

(11) Deroche Creek area is underlain chiefly by Mesozoic volcanics. Pyritic areas are common, very minor chalcopyrite was seen but no mineralization of economic significance was detected.

(12) Harrison Hill is composed chiefly of dioritic rocks of the Coast intrusives. On the west end of the hill a local prospector, Harry Barley, is working on a small area of chalcopyrite mineralization in an old quarry.

Prospecting indicated the presence of disseminated chalcopyrite in much of the diorite. Nothing was seen that approached ore grade.

(13) Agassiz humps are two hills projecting from the Fraser River sediments near the town of Agassiz. The sediments of which they are composed have been converted in large part to hornfels. In one area veinlets and patches of coördierite up to one quarter inch wide occur. Pyrrhotite, and some chalcopyrite occur on the joint planes of portions of the more southeasterly hump.

(14) Clear View - This area is underlain by coast intrusives, chiefly quartz diorite and locally quartz-monzonite. The section adjacent to the northern contact is pyritized over a broad area. Prospecting and geochemistry failed to indicate the presence of copper or molybdenum.

(15) The Depot Creek area is underlain by the Hozameen Groups (Carboniferous?) the Skagit formation (of lower Cretaceous) and the coast intrusives. Pyritization is prevalent throughout the area. Locally, there are small showings of sphalerite and chalcopyrite. No deposits of economic interest were seen.

(16) The Skagit area is well known, having been extensively prospected in the past. The rocks are chiefly Dewdney group sediments with minor quartz-diorite intrusives. The Dewdney rocks are in part converted to hornfels and contain disseminated pyrrhotite. The Canam copper breccia pipe is located just to the southeast of the area worked. An abundance of boron in the pipe (as tourmaline) and in the nearby sediments (as axinite) suggested that the pyrrhotite-axinite bearing sediments had been soaked with the mineralizing fluids. It was hoped that further concentrations of copper might be found, either as pipes, or in other forms. Geochemical sampling and prospecting failed to locate any such zones.



(17) The Dewdney Creek area was chosen for work because of the presence of a small unmapped stock and an extremely rusty contact aureole, both readily discernible from the air. The stock proved essentially barren; minor galena and very minor molybdenite were seen. The hornfelsed sediments contain quartz veins with minor arsenopyrite and chalcopyrite. Pyrrhotite is common as disseminations and coatings on joint planes of the sediments.

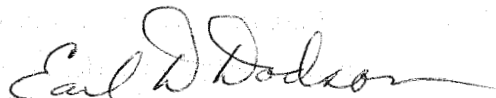
(18) The Tulameen area is underlain chiefly by Nicola volcanics and gneissic Eagle granodiorite. The volcanics are carbonated, pyritized and rusty weathering. The writer found very minor amounts of sphalerite and chalcopyrite. No other mineralization was indicated.

#### SUMMARY & RECOMMENDATIONS

Specific sections of the Hope area were designated as targets for prospecting in 1966. Four of these require further work.

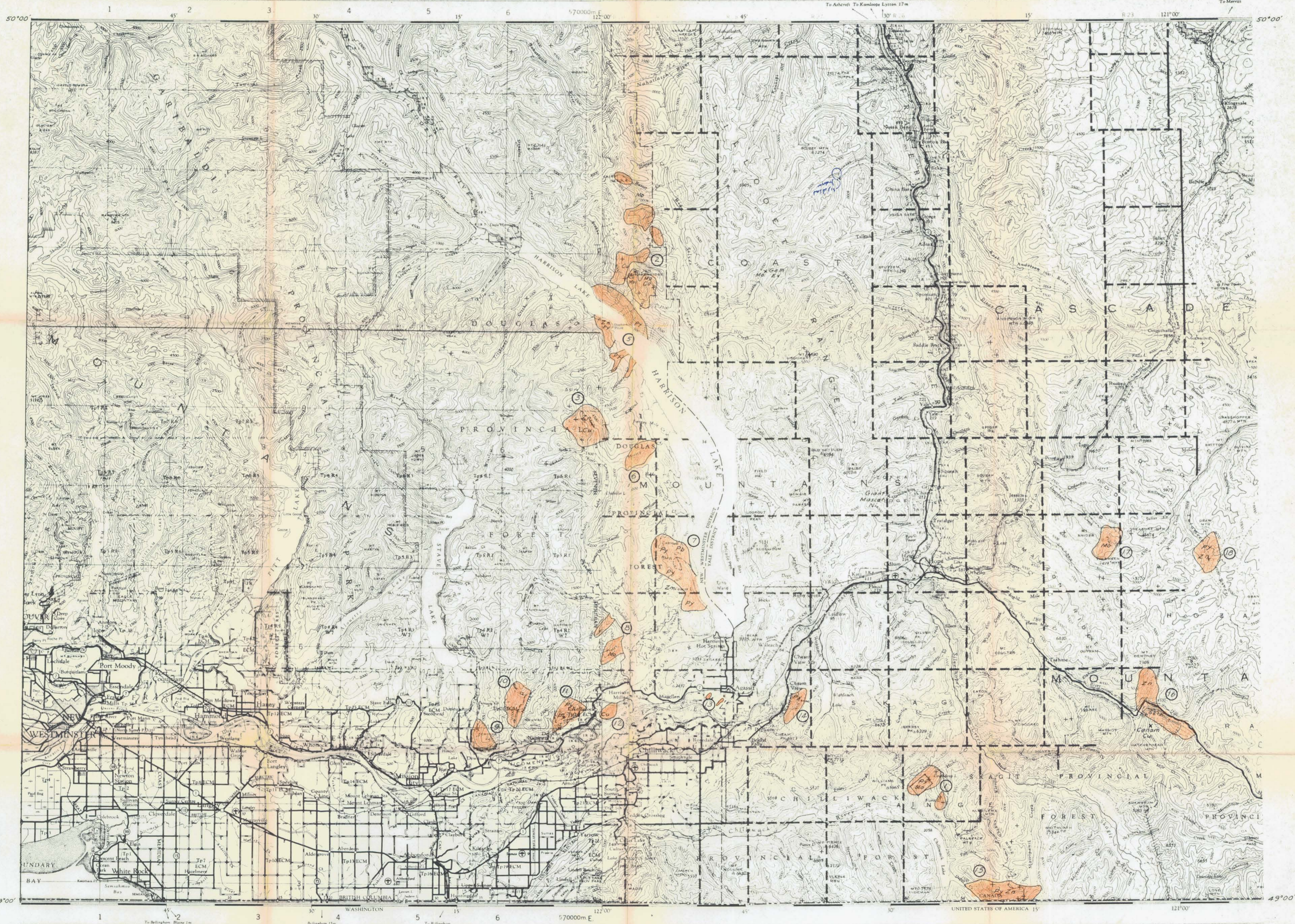
- (1) Greendrop Lake area - geological mapping and trenching or possibly drilling.
- (2) Mt. Breakenridge area - diamond drilling plus carbon-dusting to melt snow-cover.
- (3) Eagle Creek area - mapping, soil-sampling and prospecting.
- (4) Stein River area - soil sampling and prospecting.

No further regional work is recommended.



Earl D. Dodson

Vancouver, B.C.  
December 22, 1966



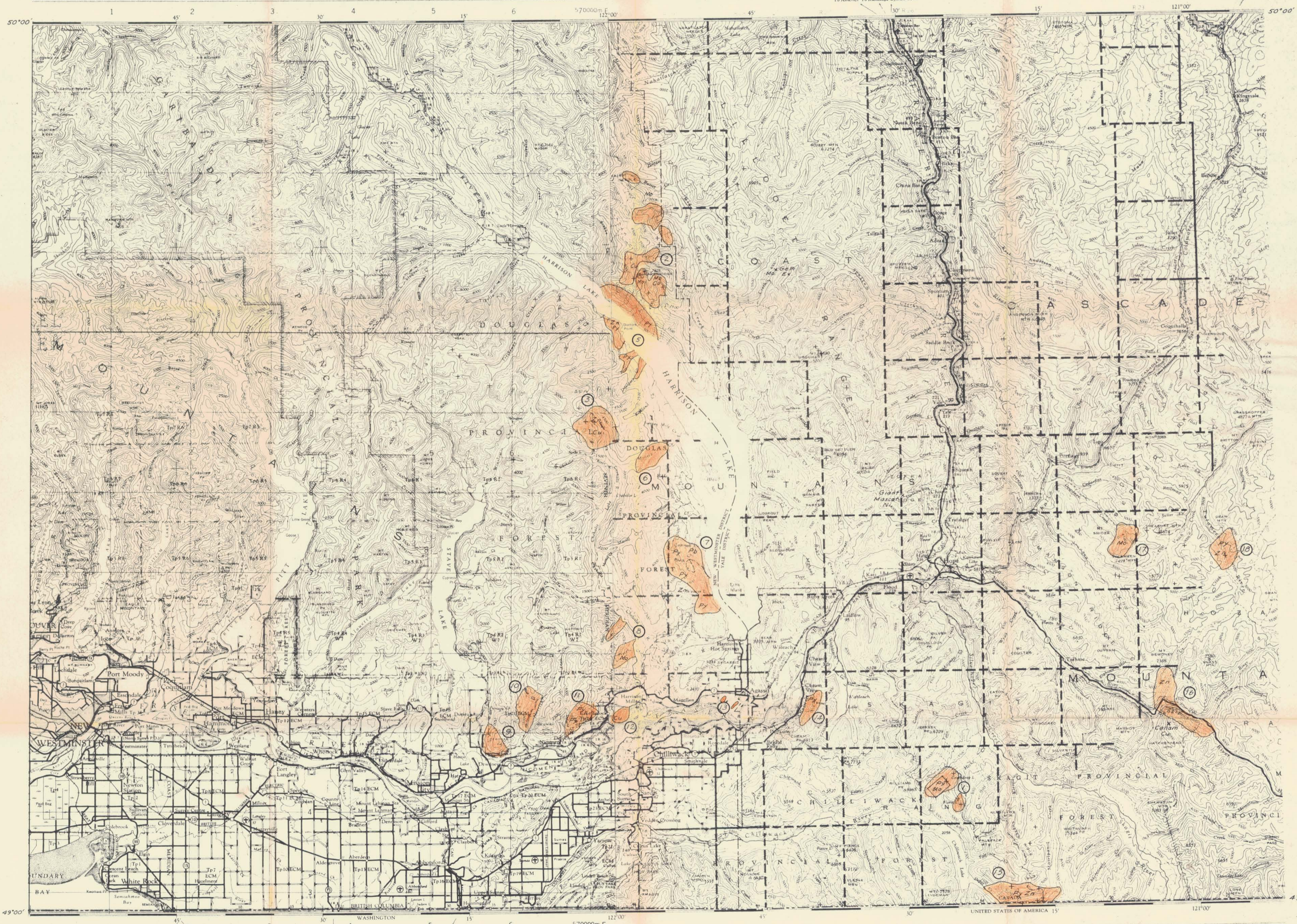
HOPE PROJECT  
Showing major areas worked in the 1966 field season.

REFERENCE table with symbols for Post office, School, Church, Boundary monument, etc.

REFERENCE table with symbols for Road, Rail, Pipeline, etc.

LEGEND table with symbols for Helicopter Landing, Area investigated, Pyritized rocks, Molybdenum, Copper, Lead, Zinc.

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92 H W 1/2



HOPE PROJECT

Showing major areas worked in the 1966 field season.

REFERENCE

- City or large town, Town, Village or settlement, Streams, etc.

REFERENCE

- Roads, Railroads, etc.

LEGEND

- Helicopter Landing, Area investigated, Pyritized rocks, Molybdenum, Copper, Lead, Zinc

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