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FRIDAY MINES LIMITED (N.P. L.) KING EDWARD PROPERTY - REVIEW AND EVALUATION

April 2, 1963 

- Gordon E. Leonard

REVIEW OF AN EXPLORATION PROGRAM CONDUCTED

MAY TO AUGUST, 1962 ON THE KING EDWARD

PROPERTY OF FRIDAY MINES LIMITED (N. P. L.) NEAR

KEREMEOS, OSOYOOS MINING DIVISION, B. C. WITH

RECOMMENDATIONS FOR FUTURE WORK IN THE AREA.

By: Gordon E. Leonard,
Geologist,
Friday Mines Limited (N.P.L.),
2nd April, 1963.

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(After report by Chapman, Wood and Griswold Ltd. dated July 5, 1962)

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Canada Department of Mines and Resources

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Friday Mines Limited (N.P.L.)

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Chapman, Wood and Griswold Ltd.

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#### SUMMARY AND RECOMMENDATIONS

The King Edward copper-molybdenum prospect is located on Susap Creek, Hunter Creek and the intervening ridge. The claims lie 7 miles south of Keremeos, B. C. and from 2 1/2 to 4 miles west of the Similkameen River.

Copper-molybdenum mineralization has been encountered intermittently along a strike length of 5, 200 feet from Susap Creek in the west to Hunter Creek in the east.

The main showing on Susap Creek was cross cut by an old adit 150 feet below the surface exposure. This adit exposed a 60 foot width of copper-molybdenum mineralization with low gold and silver values. A later adit higher up the hill and somewhat to the east, again intersected the mineralized zone and when work ceased, the face was still in good mineralization.

A composite of eight 5 foot channel samples from this upper adit gave assay values of:

Αu	Ag	Cυ	MoSa
oz./ton	oz./ton	<u>%</u>	<u>%</u> 2
0.087	0.69	1.36	0. 24

The Hunter Creek showing, 5,000 feet to the east-north-east, exposes mineralization of similar type. A short adit explored this occurrence for only 30 feet along the strike. Limited sampling of this adit has given average assay values of:

<b>Α</b> υ	Ag	Cu	MoSo
oz./ton	oz./ton	<u></u>	
0.01	0. 55	1.25	0.84

Consideration of the nature of the mineralization, mainly concentrations along slips and fractures in a complex, blocky fracture zone, indicate that bulk sampling will be required to provide a valid estimate of grade.

Four short X-Ray diamond drill holes have been completed at the Susap Creek showings. While the results are somewhat inconclusive, these holes have served to give some indication of the general structure of the mineralized zone in this area.

An AFMAG survey has been run in the area between the Susap

Creek and Hunter Creek showings covering a block of ground approximately

5,000 feet long by 1,500 feet wide. The Susap or "A" zone of mineralization is estimated to be about 75 feet wide by 400 feet long and at least 150 feet deep. The interpretation of AFMAG data over weakly conductive zones

associated with the present type of mineralization is more difficult and less certain than the interpretation of data obtained over strongly conductive, massive sulphide type deposits.

Analysis of the AFMAG data was made by Dr. Stanley H. Ward, Associate Professor of the Department of Mineral Technology at the University of California. Dr. Ward concluded that the weakly conductive "A" zone had been picked up by the survey. He further stated that a broad zone of greater conductivity was indicated adjacent to the base line from station 7E. to station 10E., a distance of some 1, 100 feet.

It is recommended that future work initially be confined to the area of the AFMAG anomaly noted above and be directed toward the further elucidation and explanation of the anomaly. Considering the lower topographic relief of this area and the nature of the soil cover, a geochemical survey might locate an anomalous distribution of molybdenum and/or copper in the overburden. Bulldozer trenching, possibly combined with limited diamond drilling, could follow the geochemical survey to determine the nature of the casual factor or factors producing the AFMAG anomaly.

#### HISTORY AND GEOLOGICAL SETTING

The King Edward property is located in a remnant wedge of Kruger Syenite flanking the great Similkameen Batholith on the north. The property is situated about 7 miles south of Keremeos and 2 1/2 to 4 miles west of the Similkameen River in the Osoyoos Mining Division of southern British Columbia. To the southeast, across the Similkameen River valley, a band of Kruger Syenite, some 1 1/2 miles wide, flanks the margin of the batholith as it swings south across the international border. In this band is located the Horn Silver Mine. To the southwest, in the Snowy Mountain region, there is another flanking area of syenite which contains old prospects.

The area is rugged and mountainous and is bounded on the south by Susap Creek and on the northeast by Hunter Creek. The elevations range from 3,300 feet on Hunter Creek to 5,000 feet on the ridge between Susap and Hunter Creeks.

Damming of these creeks at suitable, available locations would provide a dependable year-round water supply.

Southern Transprovincial Highway No. 3 passes through Keremeos.

A cut-off road which follows the Similkameen River south from Keremeos and then crosses the Richter Pass to Osoyoos is currently being paved.

A branch line of the Great Northern Railway system runs north along the Similkameen River from the international boundary near Nighthawk.

Present access is by a 2 1/2 hour horseback ride from the Richter Ranch, a few miles south of Cawston.

All the claims, (see Friday Mines Ltd. map F. M. K. E. -2) lie within the present boundary of District Indian Reservation No. 13, District Lot 3117s.

Maps available are topographic and geological sheets Nos. 341A, Canada Department of Mines and Resources and map 82E/SW, Penticton, Department of Lands and Forests, B. C.

The area is mentioned in the Annual Reports, Minister of Mines, B. C., for 1903, page 175, and 1921, page 176.

Mineralization as molybdenite, chalcopyrite, pyrite and sparse arsenopyrite, is found along a blocky fracture complex closely following an east-north-east trending contact between augite-syenite and intrusive granodiorite of Upper Mosozoic age.

In the early work the claims, as two separate properties, were developed as a gold, silver, copper prospect. The main showing on Susap

Creek was cross cut by an adit 150 feet below the surface. It is felt that cessation of this work was due to a poor financial climate coupled with an insufficient gold content.

About this time the Hunter Creek showing was explored by a short shaft and a 30 foot adit along strike.

In 1918, some further work was done on Susap Creek as a result of the interest in molybdenum produced by war-time conditions. At this time, a 35 foot adit was put in higher up the hill and further to the east than the old adit. Again an intersection of the mineralized zone was made. The face was in good mineralization when work ceased. The end of the war probably accounted for the termination of this work.

#### EXPLORATION

An initial examination was made on March 18, 1962. A small scale exploration programme was conducted from early May to late August, 1962.

The properties were inspected on June 18 and 19, 1962 by John A. Wood of Chapman, Wood and Griswold Ltd., Consulting Mining Engineers and Geologists, who supplied consulting services for the balance of the programme.

Full details of the progress and results of the exploration activity are to be found in the Daily Reports, Semi-monthly Reports and maps produced by Friday Mines Limited staff and in the Progress Reports, proposals and maps of Chapman, Wood and Griswold Ltd. This data is on file at the Head Office of Friday Mines Limited (N. P. L.), 230 West Broadway, Vancouver 10, B. C. and at the field office near Keremeos, B. C.

An outline only will be given here of the exploration programme.

- 1. The general area was prospected.
- 2. The main, lower adit on Susap Creek was rehabilitated and timbering installed to protect the portal approach and the first 5 feet of the adit proper. Loose in the back was barred down. The east wall, most of the

back and part of the west wall were cleaned off in the zone of mineralization. A reconnaissance map was made of the geology and a detailed examination of the character of the mineralization. Owing to the geometry of the mineralized fractures channel sampling would not produce valid results and bulk sampling is required.

- 3. Six 5 feet channel samples were cut in the old pits on the surface outcrop.
- The short, upper adit on Susap Creek was cleaned out and eight
   feet chip-channel samples taken.
- 5. Old cuts on the crest and slopes of the ridge between Hunter and Susap Creeks were mucked out and cleaned up with a brush. The exposures were examined in detail.
- The old adit on Hunter Creek was examined and three channel samples were cut.
- 7. A baseline was laid out and traversed. The bearing of the baseline was accurately determined by sighting on Polaris. All features of interest were tied in by triangulation and traversing. A claim survey was made and tied in to an old Crown Grant legal survey.
- 8. Four fractional mineral claims were staked to cover open, stakeable ground.
- 9. The geology was mapped where not covered by the extensive over-burden.

- 10. Four X-Ray diamond drill holes, D. D. H. 's K. E. 1, 2, 3 and 4, were drilled in the vicinity of the old adits and cuts on Susap Creek.

  (See Profile Section A A', Chapman, Wood and Griswold Ltd. Drawing No. 157)
- 11. An AFMAG survey covering a block 5,000 feet long and approximately 1,500 feet wide was carried out between Susap and Hunter Creeks.

  (See Chapman, Wood and Griswold Ltd. Drawings No. 155 and No. 156.)

#### RESULTS AND CONCLUSIONS

The "A" block in the Susap Creek area is estimated to be about 75 feet wide by 400 feet long and at least 150 feet deep. This zone is cut by a high angle post-mineral fault on its eastern limit and is covered by talus on the west.

Results of sampling in this area and in the Hunter Creek area are shown in Tables 1 - 3. Because of the character of the mineralization, the sampling serves only to indicate the range of values which might be encountered. Bulk sampling will be required to establish true metal values of mineable bodies.

The true dimensions of the Hunter Creek showing are unknown.

The old adit explored the occurrence for only 30 feet along the strike.

The basic problem in the development of this prospect is to establish whether there are present extensive deposits, amenable to relatively low cost extraction, or whether the occurrences are of limited extent.

Analysis of the data resulting from the AFMAG survey by Dr.

Stanley H. Ward, Associate Professor of the Department of Mineral Technology at the University of California, indicates that there is a broad zone of

moderate conductivity adjacent to the base line from Station 7E. to Station 10E., a distance of about 1,100 feet.

It is recommended that future work initially be confined to the area of the AFMAG anomaly noted above and be directed toward the further elucidation and explanation of the anomaly. Considering the lower topographic relief of this area and the nature of the soil cover, a geochemical survey might locate an anomalous distribution of molybdenum and/or copper in the overburden. However, it is possible that such a geochemical survey might fail to indicate the presence of an underlying mineralized zone, since the anomaly might be seasonal in character as has been indicated by geochemical work over a deposit in the Merritt area of B. C.

Bulldozer trenching, possibly combined with limited diamond drilling, could follow the geochemical survey to determine the nature of the casual factor or factors producing the AFMAG anomaly.

A photo-geologic interpretation of the area might supply valuable information.

The implementation of the recommended exploration programme has been in abeyance from September, 1962, to date, owing to the necessity of acquiring the mineral rights on a section of District Indian Reserve No. 13

which intervenes between two claim groups and is an area of interest. The successful conclusion of protracted negotiations with the Department of Indian Affairs appears to have been reached and the way is now clear for implementation of the recommended programme.

Respectfully submitted,

Gordon E. Leonard,

Geologist,

Friday Mines Limited (N. P. L.)

g. C. Leonard.

TABLE ONE

King Edward - Susap Creek - Surface Sampling

Sample No.	Thickness	Au. oz.	Th x Au	Ag. oz.	Th x Ag	Cu %	Th x Cu	MoS2%	Th x MoS2	\$ Value
34401	5.0	0.005	0.025	0.15	0.75	0.07	0.35	0.17	0.85	per ton *
34402	5.0	tr.	0	0.05	0.25	0.10	0.50	0.04	0.20	
34403	5.0	tr.	0	0.10	0.50	0.10	0.50	0.05	0.25	
34404	5.4	0.04	0.216	0.20	1.08	0.20	1.08	0.15	0.81	
34405	5.0	0.005	0.025	0.10	0.50	0.20	1.00	0.37	1.85	
34406	5.0	0.005	0.025	0.15	0.75	0.72	3.60	1.02	5.10	
	(30.4)		(0.291)		(3.83)		(7.03)		(9.06)	
	Avg.	0.009		0.13		0.23		0.30		
	\$	0.32		0.13		1.15		8.40		\$10.00

<sup>\*</sup>Gross value, Canadian funds, before allowance for metallurgical losses.

Au - \$36.00/oz.

Ag - \$1.00/oz.

Cu - \$ 0.25/lb.

 $MoS_2$  - \$ 1.40/lb.

TABLE TWO

King Edward - Susap Creek - B Adit - Sampling

Sample No.	Thickness	Au. oz.	Th x Au	Ag. oz.	Th x Ag	Cu %	Th x Cu	MoS <sub>2</sub> %	Th x MoS2	\$ Value
34408	5.0	0.25	1.25	0.70	3.50	1.80	9.00	0.45	2.25	per ton.*
34409	5.0	0.35	1.75	0.40	2.00	0.40	2.00	0.34	1.70	
34410	5.0	0.05	0.25	0.30	1.50	0.50	2.50	0.08	0.40	
34411	5.0	0.02	0.10	1.60	8.00	2.82	14.10	0.18	0.90	
34412	5.0	0.005	0.02	0.75	3.75	1.85	9.25	0.08	0.40	. •
34413	5.0	0.015	0.07	0.70	3.50	1.10	5.50	0.10	0.50	
34414	5.0	0.005	0.02	0.50	2.50	1.65	8.25	0.35	1.75	
34415	5.0	0.005	0.02	0.60	3.00	1.85	9.25	0.36	1.80	·
	(40.00) Tot		(3.48)	(	(27.75)		(54.35)		(9.70)	
	Avg.	0.087		0.69	•	1.36		0.24		
	\$	3.13		0.69		6.80		6.72		\$17.34

<sup>\*</sup>Gross value, Canadian funds, before allowance for metallurgical losses.

Au - \$30.00/oz.

Ag - \$1.00/oz.

Cu - \$ 0.25/lb.

 $MoS_2$  - \$1.40/lb.

TABLE THREE

King Edward - Hunter Creek Adit - Sampling

Sample No.	Thickness	Au. oz.	Th x Au	Ag. oz.	Th x Ag	Cu %	Th x Cu	$MoS_2\%$	Th x MoS2	\$ Value
34416	3.5	0.01	.035	0.50	1.75	1.22	4.27	0.31	1.08	per ton *
34417	3.0	0.01	.030	0.55	1.65	1.65	4.95	2.21	6.63	
34418	4.0	0.01	.040	0.60	2.40	0.97	3.88	0.27	1.08	
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	(10.5)		(1.05)		(5.80)		(13.10)		(8.79)	
	Avg.	0.01		0.55	·	1.25		0.84		
	\$	0.36		0.55		6.25		23.52		\$30.68

<sup>\*</sup>Gross value, Canadian funds, before allowance for metallurgical losses.

Au - \$36.00/oz. Ag - \$1.00/oz. Cu - \$0.25/lb.

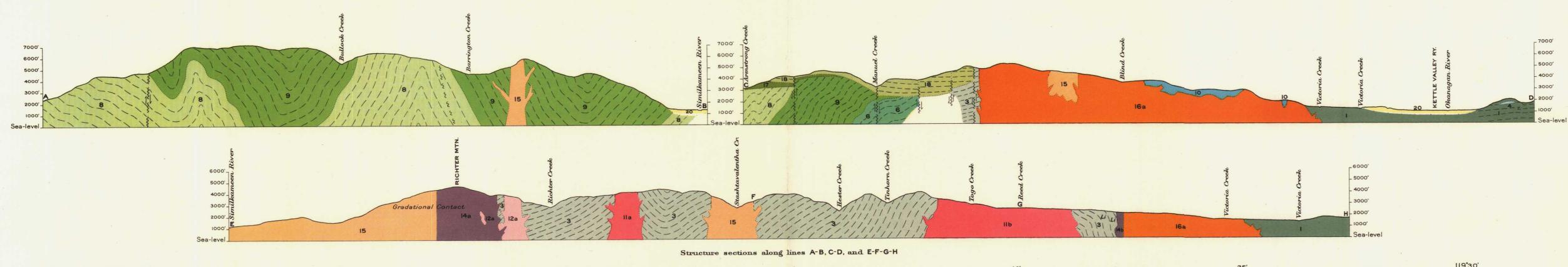
 $MoS_2$  - \$ 1.40/lb.

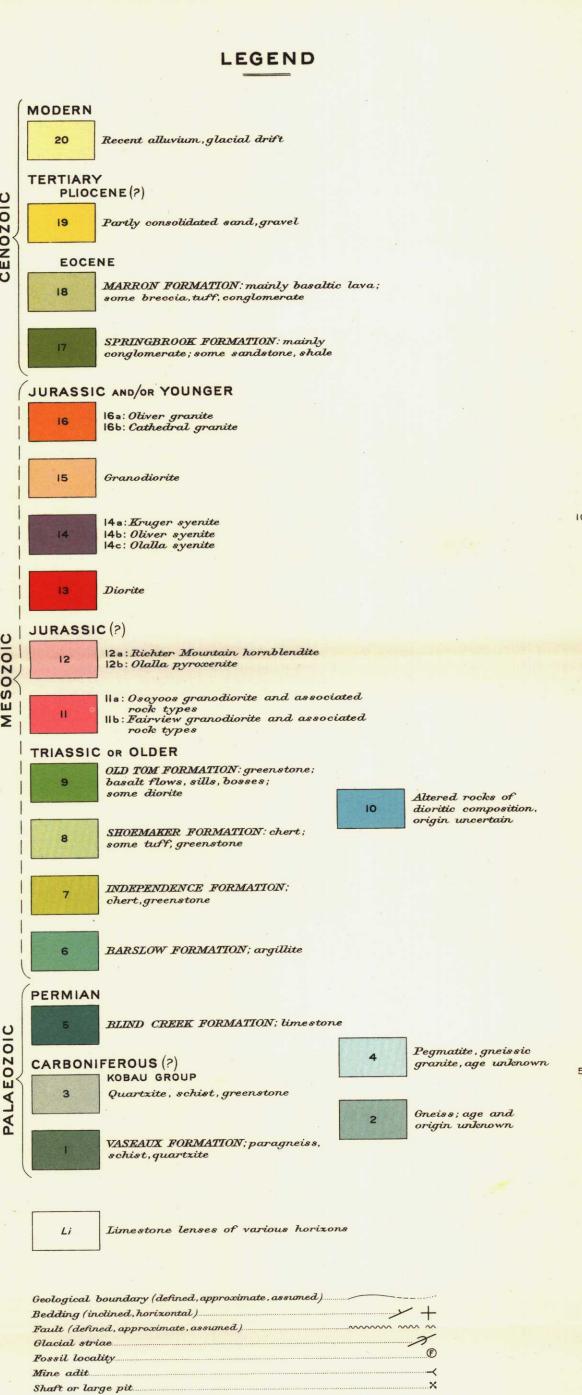
Canada Department of Mines and Resources

- Map 341 A

### CANADA DEPARTMENT OF MINES AND RESOURCES

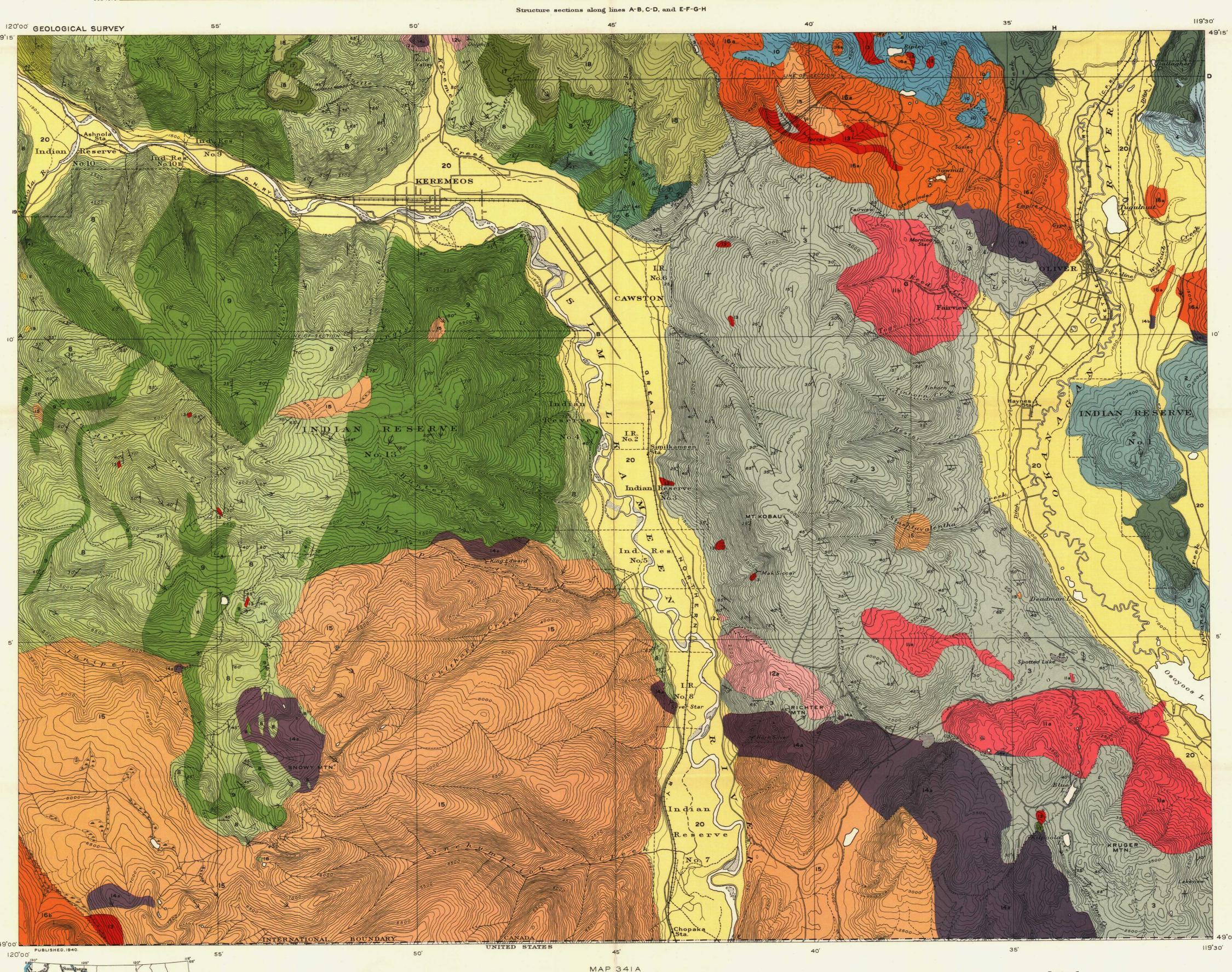
MINES AND GEOLOGY BRANCH BUREAU OF GEOLOGY AND TOPOGRAPHY





Names of Mineral Properties shown thus: Empire

Geology by H.S. Bostock, 1929, 1930.



## DESCRIPTIVE NOTES

Mining has been in progress in one or other part of the map-area since the early nineties when the gold-bearing veins of Fairview camp were discovered. Since that time gold, silver, copper, magnesium sulphate, silica, and lime have been produced. The veins of Fairview camp and vicinity are grouped in a northwesttrending belt and occur mainly in rocks of the Kobau group (3) and within a mile of the contact of the Oliver granite (16a). Gold-bearing veins are also found in this granite. Copper deposits are grouped about the Olalla pyroxenite stock (12b). Syenite bodies (14a) along the borders of the granodiorite (15) on either side of and close to Similkameen river contain deposits which have produced silver. Prospects have also been found in these rocks on Susap creek and Snowy mountain.

An area of Mesozoic and earlier stratified rocks extends from east of Okanagan valley westwardly to Princeton. It is cut by intrusives and partly covered by Tertiary rocks but as a whole forms a nearly continuous belt. It is divisible into four irregular segments, each composed of a group of rocks that on the whole is younger than the group forming the adjoining segment to the east of it. The Vaseaux formation (1) and other gneissic rocks of mainly Palaeozoic age lie along Okanagan valley and form the easternmost segment. To the west of this, between Okanagan and Similkameen valleys, is a segment occupied by the Kobau group of late Palaeozoic age. West of this is a third segment extending northwesterly along Similkameen valley to Winters creek beyond the map-area. This segment is composed of a group of several, closely-folded formations including the Blind Creek (5), Barslow (6), Independence (7), Shoemaker (8), and Old Tom (9). The Blind Creek formation contains Permian fossils and is believed to be the lowest member of the group on the east side of the segment; on the west side, beyond the map-area, the lowest members are the Bradshaw and Independence formations in the latter of which fossils of doubtfully Mesozoic age have been found. The strata of the third segment are thus believed to be either of Permian age or Permian and younger. Still farther west is a fourth segment of formations bearing Triassic fossils and in which all the strata are presumably of Triassic age or younger. The relationships between the four segments are obscured by drift-filled valleys, faults or intrusive contacts. Okanagan and Similkameen valleys may follow fault zones along which the formations to the east have been uplifted with respect to those to the west. In the present area the Kobau group dips west under Similkameen valley and underlies the formations farther west. The same general relationship holds west of Blind creek.

The Vaseaux formation includes abundant conspicuously stratified gneisses of various types and also schists, quartzites and small lenses of limestone. The formation is intruded by a great many sills of pegmatite and gneissic granite some of which are apophyses from larger, separately mapped bodies, (4). West of Okanagan river the position of the boundary between the Vaseaux formation and a group of altered rocks, (10), is uncertain owing to metamorphism in the proximity of the Oliver granite and to a paucity of outcrops. The massive granite-gneiss (2) shows no stratification. The Kobau group comprises a great thickness of metamorphosed, stratified rocks mainly of sedimentary origin. The quartzite members are thinly-bedded and commonly micaceous or graphitic. There are also fine grained, siliceous, mica schists and others containing chlorite, hornblende, graphite and talc. The associated greenstones are variously sheared. The rocks between Blind and Keremeos creeks are greatly faulted and it is probable that slices of other formations than those represented are present. The Shoemaker formation is composed mainly of dark, bluish-grey chert. Similar chert forms part of the Independence formation. Some light grey, green and red cherts occur in the Old Tom formation, but the principal members are green lavas. The Old Tom also includes small intrusive bodies of similar composition and related to the volcanic

The altered rocks of group (10) are commonly foliated or stratified. They vary in grain and in mineral composition. Patches of quartzite and of massive hornblende-rich diorite are present. In part, the members of the group appear to underlie areas of the Shoemaker formation to the north of the map-area and elsewhere they may represent metamorphosed equivalents of the Independence and still older formations.

The intrusive rocks of the area, with the exception of the Fairview (11b) and Osoyoos (11a) bodies, indicate a succession from ultrabasic and alkaline to more siliceous types. The syenites (14) have been invaded and largely replaced, except on their outer margins, by intrusions of granodiorite and granite. The Kruger syenite (14a) and granodiorite (15) exhibit a concentrically zoned structure centred where Similkameen river crosses the International Boundary. The outer zone of the syenite, half a mile wide, is medium-grained and rich in dark minerals, mainly pyroxene. Inward from this body a second zone, composed of medium-grained, dark, and more feldspathic alkali syenite, forms the main part of the Kruger syenite and extends from Similkameen river to the International Boundary. Inward from this, a third zone, about 1,000 feet wide, follows the contact between the Kruger syenite and the granodiorite. It is composed of rocks that are coarser-grained and considerably more feldspathic than those of the outer two zones. Despite its relative narrowness, this third zone is continuous from near the Horn Silver mine in Similkameen valley to the Boundary. The granodiorite adjacent to it and for over a mile from it contains syenitic phases. Typical granodiorite forms the hill adjacent to the river at the International Boundary. Other areas of Kruger syenite are of similar types to those of the interior zones just described. Though adjacent phases of the Kruger syenite and the granodiorite grade into each other, dykes of interior phases intrude the exterior phases and, west of Similkameen river, the granodiorite intrudes the syenite. The Oliver granite is mainly porphyritic except in its central part where it has a uniform texture. Towards its contacts it becomes more basic and on its south side it grades, in places, into a dark syenite (14b). The diorite (13), and granodiorite, (15), lying within the area of Oliver granite, have been intruded by the granite. Elsewhere diorite is intruded by granodiorite. The Osoyoos and Fairview intrusives (11a and 11b) include types varying from granite to diorite, granodiorite and quartz diorite being the most abundant. Some of the small bodies mapped as diorite are like dioritic phases of the Osoyoos and Fairview intrusives and may be contemporaneous with them. The age of the Osoyoos and Fairview bodies (11) relative to other intrusives in the map-area is not known, but they are believed to be older as they are more sheared and altered.

The Springbrook formation (17), rests upon a pre-Tertiary rock surface of steep relief. It is composed of soils, alluvium, talus, stream and lake deposits which accumulated in the valleys before and during the earlier extrusions of the Marron volcanics, (18). In its thicker parts the Springbrook formation is composed of coarse, basal conglomerates containing huge angular boulders. These grade upwards into more worn and sorted conglomerates. Uppermost strata include beds of polished pebbles, sandstones and white tuffaceous silts. In adjoining areas to the north these beds contain plants of presumably late Eocene age. The volcanic rocks of the Marron formation were extruded over hills of pre-Tertiary rocks and into valleys partly filled by the Springbrook formation. They filled these valleys and accumulated to a thickness of over 4,000 feet and are believed to have covered all but the highest parts of the map-area.

Glacial striations and deposits are present up to the highest summits in the area. The steep relief of ridges transverse to the movement of the ice protected many parts from scouring. Deeply-weathered rocks underlie the sides of the deeper parts of some creek gulches, notably those between Susap and Snehump-

# KEREMEOS

SIMILKAMEEN DISTRICT BRITISH COLUMBIA

Scale, 63,360 or I Inch to I Mile Miles Contour interval 100 feet Elevations referred to Mean sea-level

Approximate magnetic declination

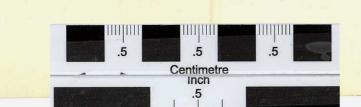
Scale, 1 Inch to 200 Miles

82E/4W

Marsh..... Road not well travelled .... Power transmission line..... International boundary..... Indian Reserve boundary...... Contours

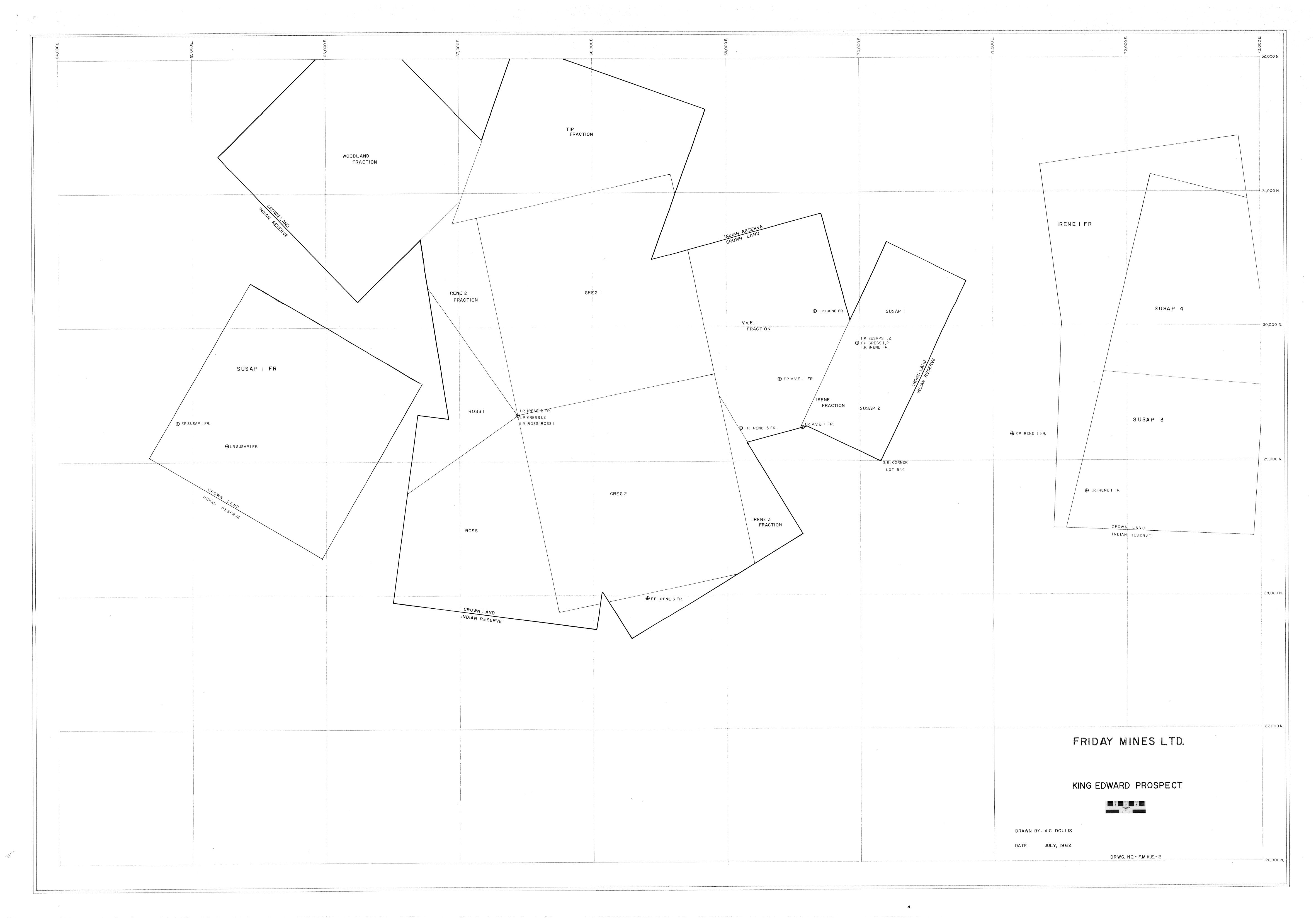
Legend Stream (flow disappearing in places)...... Sand or gravel bar Pipe line ..... =5000= Lake and stream (position approximate) ---- Contours (position approximate) = 5000 Intermittent lake and stream \_\_\_\_\_ Depression contour

> Base-map prepared by the Topographical Survey, 1935, from map supplied by the British Columbia Department of Lands. Cartography by the Drafting and Reproducing Division, 1939.



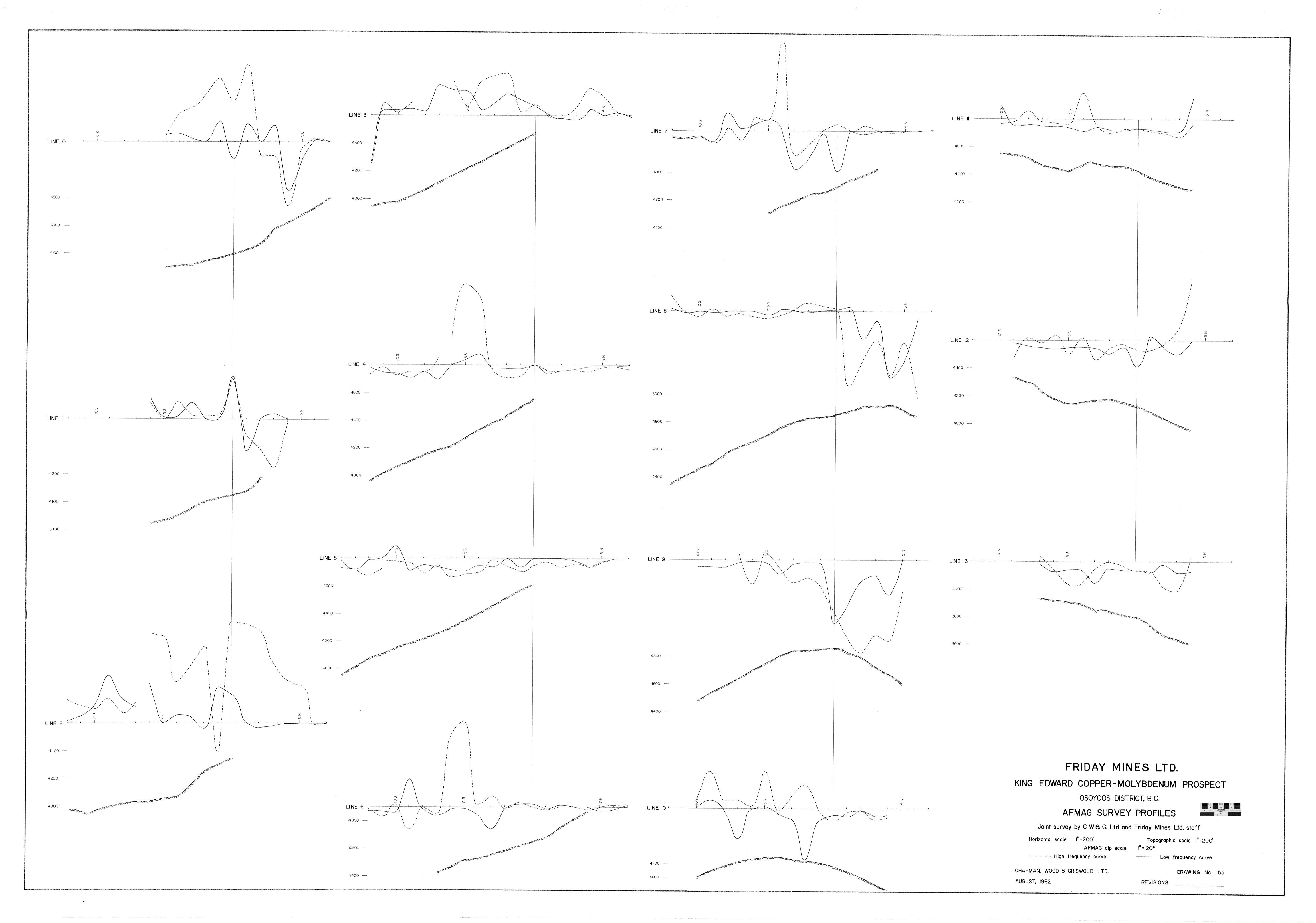
Friday Mines Limited (N.P.L.)

- Drawing F.M., K.E.-2



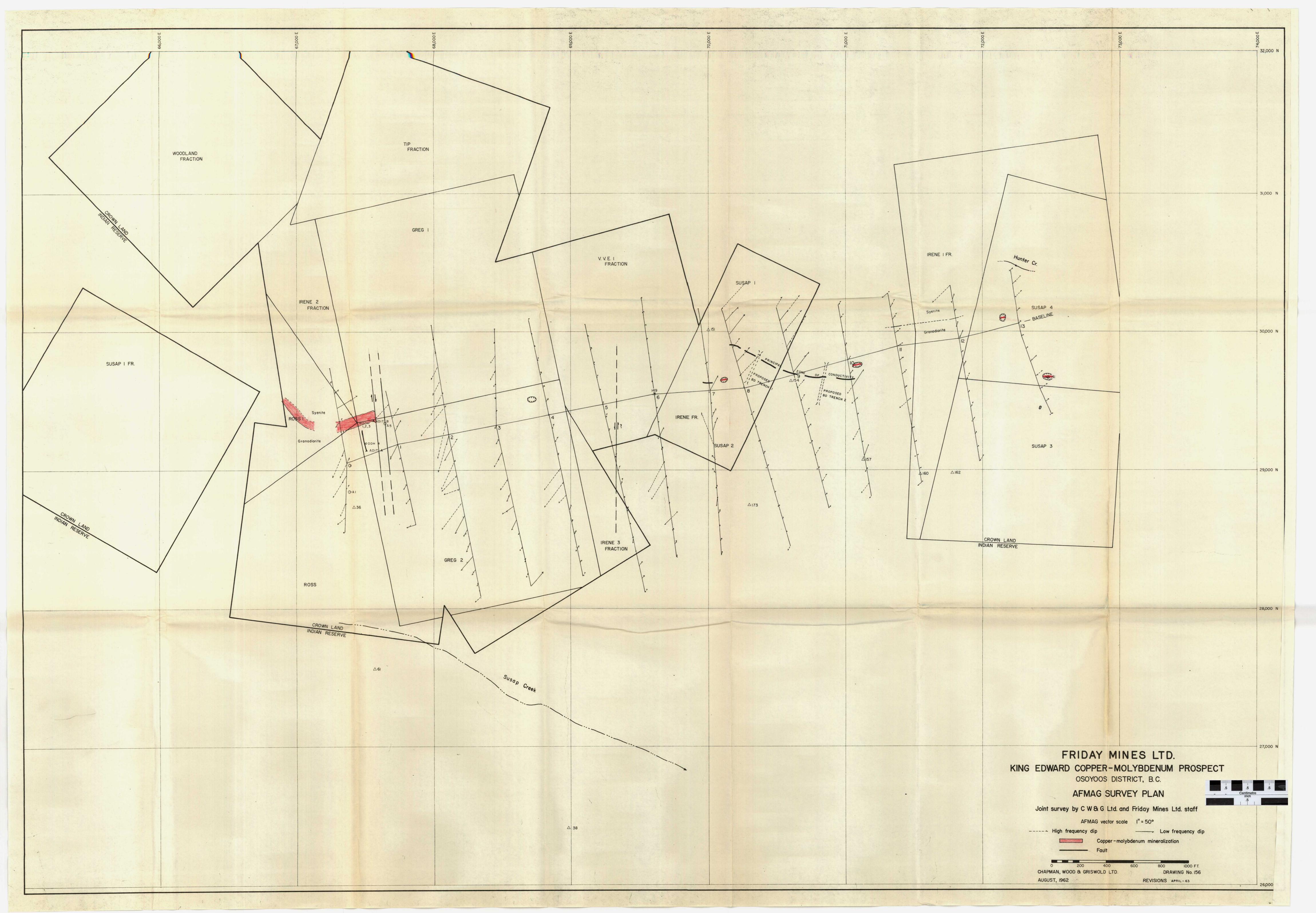
Chapman, Wood and Griswold Ltd.

- Drawing No. 155



Chapman, Wood and Griswold Ltd.

- Drawing No. 156



Chapman, Wood and Griswold Ltd.

- Drawing No. 157

-SUITE 408- 80 CRANVILLE SIREET
-YANGOUVER, CANADA

