941

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

ON

RAY 1 - 15 MINERAL CLAIMS

Kennedy Mountain Area, Similkameen M.D., B. C.

49° 120° S.W.

by

Charles A. R. Lammle, P.Eng.,

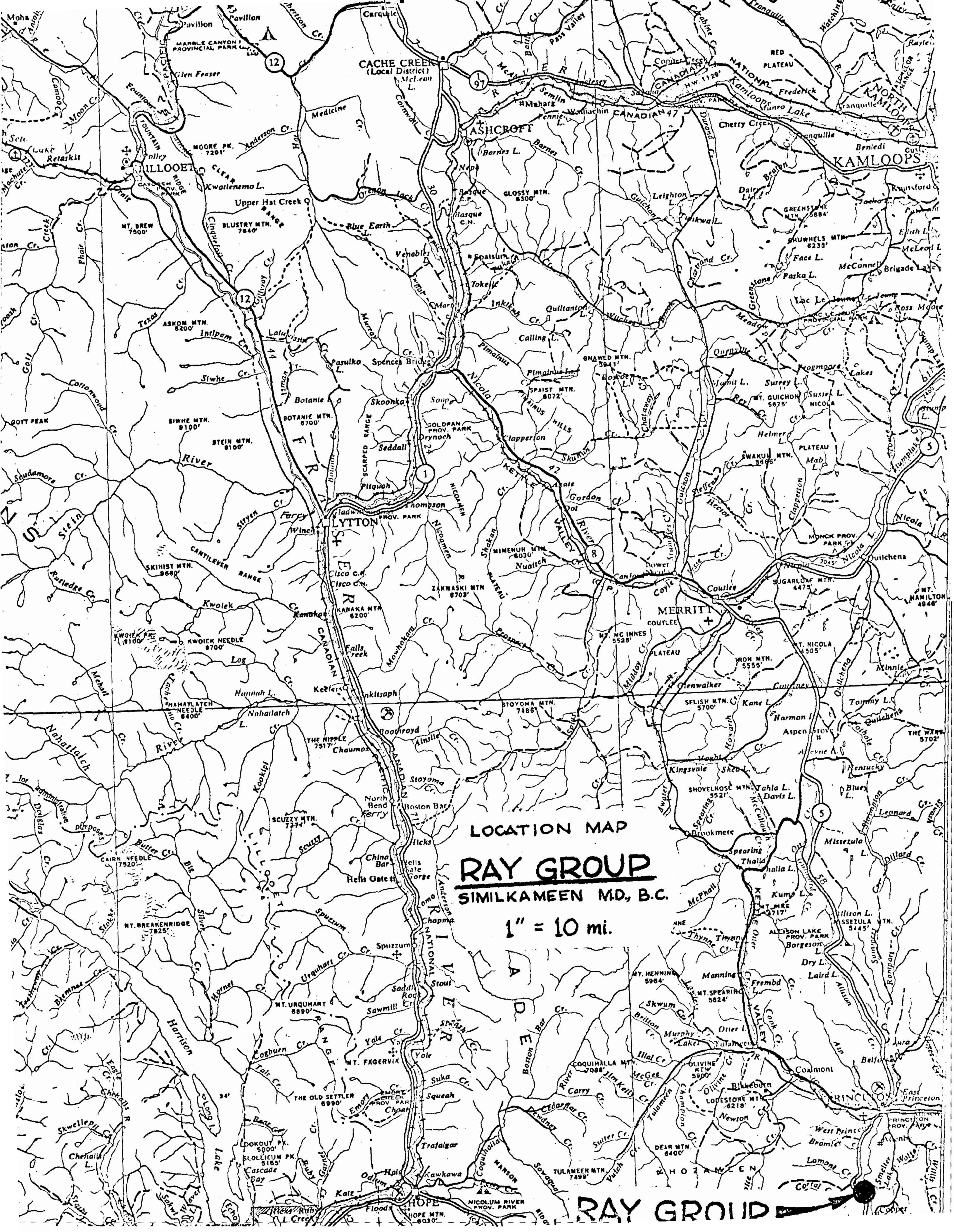
Adera Mining Limited

Claims held by

Adera Mining Limited

Vancouver, B.C.

Work performed between May 7 - Sept.20, 1966.


LOCATION MAP
RAY GROUP
SIMILKAMEEN M.D., B.C.
1" = 10 mi.
RAY GROUP
CACHE CREEK
(Local District)
ASHCROFT
KAMLOOPS
LILLOOET
LYTTON
MERRITT
HOPE
Princeton
Boston Bar
North Bend
Spences Bridge
Brookmere
Coalmont
Tulameen
Quilchena
Nicola
Coutlee
Yale
Hells Gate
China Bar
Spuzzum
Kingsvale
Aspen Grove
Kamloops Lake
Nicola L.
Harrison Lake
Thompson
Fountain
Pavilion
MARBLE CANYON PROVINCIAL PARK
GOLDPAN PROV. PARK
MONCK PROV. PARK
ALLISON LAKE PROV. PARK
LAC LE JEUNE PROVINCIAL PARK
NICOLUM RIVER PROV. PARK
EMORY CREEK PROV. PARK
CANADIAN NATIONAL
CANADIAN PACIFIC
CLEAR RANGE
CANTILEVER RANGE
SCARPED RANGE
KETTLE VALLEY
MT. BREW 7500'
BLUSTRY MTN. 7640'
MOORE PK. 7291'
GLOSSY MTN. 6300'
ASKOM MTN. 6200'
SIWHE MTN. 9100'
STEIN MTN. 9100'
BOTANIE MTN. 6700'
SKIHIST MTN. 9660'
KANAKA MTN 6200'
ZAKWASKI MTN 6703'
MIMENUH MTN. 6030'
STOYOMA MTN. 7486'
THE NIPPLE 7517'
SCUZZY MTN. 7274'
CAIRN NEEDLE 7520'
MT. BREAKENRIDGE 7825'
MT. URQUHART 6890'
THE OLD SETTLER 6990'
MT. FAGERVIK
DOKOUT PK. 5000'
SLOLLICUM PK. 5165'
HOPE MTN. 6030'
TULAMEEN MTN. 7499'
DEAR MTN. 6400'
COQUIHALLA MTN. 7088'
OLIVINE MTN 5900'
LODESTONE MTN 6218'
MT. HENNING 5964'
MT. SPEARING 5824'
SHOVELNOSE MTN. 5521'
SELISH MTN. 5700'
IRON MTN. 5556'
MT. MC INNES 5525'
MT. NICOLA 4505'
SUGARLOAF MTN. 4475'
MT. HAMILTON 4946'
SWAKUM MTN. 5666'
MT. GUICHON 5675'
SPAIST MTN. 6072'
GNAWED MTN. 5941'
GREENSTONE MTN. 5884'
SHUWHELS MTN. 6235'
MISSEZULA MTN. 5445'
THE WART 5702'
NAHATLATCH NEEDLE 6400'
KWOIEK NEEDLE 6700'
KWOIEK PK. 8100'
GOTT PEAK

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ATTACHMENTS

1. Ray Group Geology 1" -- 200' 2
2. Ray Group Geochemical Survey 1" -- 200' 3
3. Ray Group Magnetometer Survey 1" -- 200' 4
4. Ray Group Induced Polarization Survey Report 1
R. D. Falconer, July 25, 1966

Vancouver, B. C.,
January 30, 1967.

ADERA MINING LIMITED

RAY GROUP MINERAL CLAIMS

Similkameen M.D., B.C.

GEOLOGICAL, GEOCHEMICAL and GEOPHYSICAL REPORT

by

Chas. A. R. Lammle, P. Eng.

INTRODUCTION Adera Mining Limited signed an option agreement dated April 22, 1966, with Copper Mountain Consolidated Limited whereby, after completing over a period of time a series of payments and exploration commitments, Adera would be entitled to acquire outright ownership to the Ray Group. The option called for a firm commitment of a $10,000 exploration program during the first year. The exploration work carried out on the property under this commitment consisted of line cutting, claim and topographic surveying, soil sampling, and geologic, magnetometer and induced polarization surveys -- the latter by a contract arrangement with Canadian Aero Surveys Limited. The field work was carried out at intervals between May 7 and Sept. 20, 1966; the drafting and report were deferred until this time so that the summer field season could be more fully utilized for other projects.

The program was designed to detect low grade copper sulphide mineralization having sufficient volume to be economically mined. The existence

of ore of this type on the property was considered possible because of the several low grade Ray Group showings, because of the nearness of substantial and encouraging exploration work by Newmont, and because of the proximity of the former underground and open pit Granby operation on Copper Mountain.

This report will describe the work performed and the results obtained. Interpretations, correlations and conslusions will be given. A separate account describing and interpreting the induced polarization survey by Ralph D. Falconer, Canadian Aero geophysicist, dated July 25, 1966, is submitted herewith as part of this report.

SUMMARY The Ray Group of mineral claims, located 8 airmiles SSW of Princeton, B.C., and 2 airmiles NW of Granby's former mining operation on Copper Mountain, covers a northerly trending phase of the economically important Copper Mountain stock. The granitic rocks consist of a syenite-monzonite intrusive complex and the adjacent Nicola rocks consist of a massive assemblage of andesite; the contact between the two is thought to be a fault zone. Unconformably overlying are andesites of the younger Princeton Group. Several areas of copper mineralization in the granitic complex are exposed on the property, the most important one being the Armstrong Bluff Showings. This showing could cover an area of at least 1000' NS by 400' and consists of widely disseminated chalcopyrite and pyrite. A smaller portion of this area, some 400' by 200' has received the main exploration attention to date, the results of which indicate a range in grade of 0.10% Cu to 0.18% Cu. The several other showings are either weaker or smaller. Exploration work carried out on the property by Adera has not indicated any better, near surface extensions to the known mineralization. Exploration work on nearby properties, however, is yielding promising results.

CONCLUSIONS Conclusions drawn from the text of the report are as follows:

1. The granitic textured complex on Ray Group probably formed as a late phase of the differentiating Copper Mountain Stock.
2. On the mapped area, the contact between the complex and the Nicola rocks is probably a fault zone, Geophysical evidence suggests this contact dips at a moderate angle to the east. The relationships between this contact and another strong west dipping fault in the volcanic is not clear.
3. On Ray Group, a system of NNE to NE faults in the granitic complex, continuous with similar important faults to the south, are the apparent mineralizing control.
4. Of the four main showings on the property the best and most completely known is the Armstrong Bluff Showings which has a possible size of at least 1000' NS by 400'. Reliable surface and subsurface sampling of the better portion of this showing, an area 400' by 200', indicates a range in grade of 0.10% Cu to 0.18% Cu. The other showings, as presently exposed, are either weaker or very much smaller.
5. Individual geophysical results correlate well with the geology and known mineralization, but generally these results do not correlate well with each other.
6. The exploration program carried out on the property does not indicate areas of appreciable extension to the known mineralization, and the better showings on the ground would have to be considerably better in grade to be economically important in the foreseeable future. However, as the program was designed to detect large areas of low grade mineralization within a few hundred feet of the surface, the possibility remains for such mineralization to exist at greater depth, or for small areas of mineralization to exist within that depth. No intriguing targets of this type were developed.

RECOMMENDATIONS As the known areas of mineralization are considered well explored, as they and their possible extensions are considered sub-economic under the foreseeable range of metal prices, and as no additional intriguing target areas were developed, no further exploration work is advised for the property at this time. It is therefore recommended that notice terminating the Adera-Copper Mountain Consolidated agreement of April 22, 1966, be forwarded to Copper Mountain Consolidated.

Respectfully submitted,

Chas A. R. Lamble

CHAS. A. R. LAMBLE, P. Eng.

January 30, 1967.

PROPERTY AND HISTORY

As optioned, the property consisted of 12 contiguous claims, Ray 1 - 12 inclusive, as shown on Map 1. Because of a minor dispute between the original stakers and another party, and prior to the claim survey, four additional claims were staked, Ray 13 - 16Fr. inclusive, to protect suspected internal fractions. Subsequently it was found that, because of previous overstaking, the Ray 16Fr. covered no open ground. Pertinent details regarding the claims are tabulated below:

R A Y G R O U P

Ray Claim	Record No.	Tag No.	Assessment Anniversary
1	9386	347468	10/26/70
2	9387	347469	"
3	9388	227785	"
4 Fr	9704	347474	3/19/72
5	10111	347478	6/27/71
6	10112	347479	"
7	10113	347480	"
8	10114	347481	"
9	11201	448551	3/20/68
10	11202	448552	"
11	11342	478612	5/6/68
12 Fr	11343	347482	5/6/69
13 Fr	17862	667776	5/27/67
14 Fr	17863	667777	"
15 Fr	17864	667778	"
16 Fr	17865	667779	"

The bulk of Ray 10, an area of approximately 1500' x 650', is separated from the main group by pre-existing claims, but a small portion is contiguous.

Claims adjoining to the south including the crown granted Copper King and Mogul are on option to Newmont. Those to the east are on option to Cumont, those to the north including St. Patrick and Kennedy are held by J. Quinn, and those to the west are held by prospectors and speculators from the Princeton area. The Jubilee crown grant is held by H. G. Englund for the estate of two prospectors.

The original exploratory work on the Ray Group area dates back to the turn of the century, and most of the showings were formerly

held by crown granted claims, all of which have now reverted. In the early 1960's, Copper Mountain Consolidated Ltd. acquired the key claims and began an exploration program that involved prospecting, additional staking, extensive sampling, geophysical work, bulldozing and diamond drilling. This work was concentrated on four main showings herein referred to as the "Adit" Showings, Magnetite Breccia Showings, Ray Showings and the Armstrong Bluff Showings. Geologic examinations have been carried out on the Armstrong Bluff area by Joe Montgomery in connection with his doctorate dissertation on the Copper Mountain ores, by members of the B.C. Department of Mines, by John Wood of Chapman, Wood and Griswold Ltd. on commission to Copper Mountain Consolidated, and by the writer during previous employment with American Smelting and Refining Co. Reports on the area by the Dept. of Mines are available in the annual reports of the Minister of Mines, and Copper Mountain Consolidated has provided complete information obtained from the other investigators.

LOCATION AND ACCESS

The property is located on the northeast slope of Mt. Kennedy, 8 air miles SSW of Princeton, B.C., and 2 miles NW of Granby's old glory holes on Copper Mountain. Similkameen River canyon approximates the eastern property limits. Elevations range from 3600' to 2300'; precipitation is light; the hills are sparsely wooded with pine and fir. B. C. Highway 3 passes across the claims and a number of old roads, bulldozer tracks and foot trails provide easy access to much of the ground. The location map (faceplate) shows the location with respect to main geographic features.

PROGRAM AND EMPLOYEES

Exploratory work on the property began on May 7, 1966 and continued intermittently until Sept. 20, 1966, and consisted of the following:

1. Linecutting (continuous with Newmont grid)
   - Baselines — 1 mile
   - Cross lines (pickets at 100' intervals) — 9½ miles
2. Soil Geochemistry
   - Samples @ 100' intervals — 9½ miles

3. Magnetometer
   Readings at 100' intervals — 9½ line miles

4. Geology, topography and claims

5. Induced polarization survey
   including detailing — 10 line miles

6. Bulldozing — 2170 lineal feet

Employees and/or contractors were Ed Mullin, Dave McLean and Wm. Armstrong, all of Princeton, B.C., and all under the supervision of the writer. Time distribution of the field work in days was as follows:

	Lammle	Mullin	Armstrong	McLean
Linecutting	2	contract	---	---
Geochemistry	1	4½	---	---
Magnetometer	6	---	---	---
Geology, etc.	14½	1	1	---
Induced Polarization	2	---	---	1
Bulldozing	3	---	5	---

GENERAL GEOLOGY The most noteworthy feature of the Copper Mountain country is a group of geologically and economically peculiar crystalline rocks intrusive into Nicola Group volcanics. The intrusive rocks form several petrographically related bodies which are all distinctively deficient in quartz. One of these intrusive bodies, the Copper Mountain Stock, is a magmatically differentiated pluton having a syenite core and a gabbro rim. A northern marginal facies of the stock consists of a complex of syenitic and monzonitic material. It is generally conceded that the late phases of the differentiation process gave rise to the numerous copper occurrences in the Copper Mountain area. Granby's former operation near the gabbro contact has yielded substantial amounts of copper over the years and will, no doubt, yield additional copper in the future.

Three separate types of deposits occur around the periphery of the Copper Mountain Stock, principally in the volcanic rock but also in the granitic. These have been classified as Bornite Deposits, Chalcopyrite-Pyrite Deposits, and Chalcopyrite-Hematite Deposits. Most of Granby's production from the district has come from deposits of the first type that occur in fragmental and tuffaceous

volcanic horizons adjacent to the contact of the stock. The ore minerals there occurred with pegmatitic materials along fractures alligned perpendicular to the contact, the "density" of the fractures bearing a direct relationship to the grade of the mineralization. Some production, however, came from nearby deposits of the second type that are gradational with the first.

Some of the better known showings in the area are listed below according to their type:

Bornite	Chalcopyrite-Pyrite	Chalcopyrite-Hematite
Copper Mountain	Ingersoll Belle	Voigt's Camp
Friday Creek	Red Buck	
Deep Gulch	Duke of York	
	Ray Group	

LOCAL GEOLOGY The western contact of the Copper Mountain Stock follows a remarkably straight northerly course for more than 4 miles, then thins to a narrow NNE trending body some 2 miles long by 1/2 mile wide. Unlike the gabbroic rim of the main part of the stock, this narrow body is composed mainly of intermixed monzonite and syenite with variable amounts of hornfelsic materials. The northern half of this NNE trending contact is covered by Ray Group, the southern half by ground on option to Newmont. Some 3500' from Ray 4Fr. on crown grants Ingersoll Belle and La Reine, extensive exploratory work by Newmont has yielded promising results along a NNE trending, steep dipping fault zone. Where intersected by NW trending fracture systems as at Ingersoll Belle and Red Buck, (Newmont, 700' south of Ray 4Fr.) the granitic rocks along the fault zone are locally well mineralized with pyrite and chalcopyrite. Low-grade mineralization and NNE trending fractures on Ray 4Fr. undoubtedly reflect the mineralizing control of this fault zone, or Inger Bell structure as it has been called.

A more detailed description of the geology and mineralization on Ray Group follows.

Rock Types (See Map 1)

Nicola Basalt: On the Ray Group, three outcrops of basalt occur

along the west margin of the granitic complex, two in road cuts near the southern property limits and the third at the northern extremity of the map area. As mapped they are confined within 800' of the contact. However, as no contacts are exposed, as no attitudes are evident, and because of the considerable distance between outcrops, the continuity and form of the basalt horizon remains obscure.

The outcrops consist of faulted and badly broken, aphanitic to slightly porphyritic black basalt flows. Where porphyritic, the phenocrysts consist of a fine grained equidimensional mafic mineral, probably augite. The portion of the south outcrop nearest the contact is reduced to gouge; the other outcrops are faulted ina NW direction, roughly perpendicular to the contact. No sulphides are evident in the rock.

Nicola Andesite: A thick assemblage of massive andesites lie west of the basalt formation. These are known to continue for a considerable distance beyond the mapped area. Reliable attitudes were not recognized but lineations and a faint indication of a flow contact west of Ray 8 suggest that these strata strike NW and dip steeply NE.

The rocks are light gray to green in colour, fine to medium grained and have variable porphyritic and/or amygdaloidal textures in places; the porphyritic textures are caused by pyroxene crystals, and the amygdules are filled with calcite and a zeolite. Neither of these textures could be followed consistently enough to provide useful stratigraphic data. A few scattered outcrop are brecciated, the fragments being healed with a dense, black non-magnetic material. Widely scattered cubes of pyrite and a weak schistosity have developed in the rocks near a zone of northerly faulting. In places small amounts of red hematite and calcite have developed in the rock. All of the rocks, however, are relatively very fresh and show very little metamorphism, this being in sharp contrast to the general regional metamorphism common to the Nicola rocks.

Copper minerals are known to occur in volcanic rocks to the southwest

on adjoining ground, but none were observed in the andesites on Ray Group.

Syenite-Monzonite Complex: A complex group of granitic rocks consisting largely of monzonite and syenite and some more basic rocks occupies the eastern part of the claim group. They are well exposed along Similkameen Canyon for more than a mile in length and for some 300' in depth. Although they join with the distinctly differentiated gabbro rim of the Copper Mountain Stock, their relationship to the stock or others in the group cannot be determined from the limited mapping on Ray Group. Montgomery, on the basis of more extensive and more discriminating petrographic work, maps the rocks northeast of the 2900' contour (roughly) as belonging to diorites and gabbros of the Smelter Lake Stock, and those in vicinity of Armstrong Bluffs as belonging to a different group of augite diorites. The rocks northeast of the 2900' contour are relatively uniform in colour, texture and composition and might very well be a part of a separate stock, but as the contact was nowhere clearly observed no attempt has been made herein to outline the units separately.

The writer prefers to interpret the variations in colour, texture and composition in the rocks at Armstrong Bluffs as being due to hornfelsic pendants, wedges, streaks and fragments of the older, intruded Nicola Group in variable stages of magmatic assimilation. Some of the lighter coloured hornfelsic material could be due to quartzite while the various black hornfels could be remanent basalts or dykes from the Nicola rocks. The general inhomogeneity of the granitic material here is thought to be due to contamination resulting from the assimilation.

The rocks of the unit are dull pink to pinkish-brown in colour, fine to medium grained, and generally granitic textured. Minor zones showing trachytic textures were found. Mafic minerals constitute 20-30% of the rock and are essentially all augite. Plagioclase and orthoclase make up the remainder. Small amounts of hornblende and magnetite occur however, but there is no biotite. A host of other secondary minerals, in minor quantities, has been reported.

The hornfelsic remnants are dense, very hard and brittle rocks. Most are black, a few are light gray to nearly white. The black variety have a remarkable variation in magnetic susceptibility as demonstrated by a small pencil magnet.

Sulphides are scattered through the complex and in the hornfels.

Trachyte: These rocks form narrow, irregular, often discontinuous dykes in the syenite-monzonite complex. A group of these on Armstrong Bluffs strike northerly and dip very steeply -- essentially vertically; another on Ray 12 strikes NE and probably has a vertical dip as well. They are a dense, pink, feldspathic rock probably composed largely of orthoclase. They likely formed during a late stage of the magmatic differentiation and were injected along fractures and weaknesses in the solidifying granitic complex. They differ completely in age and lithology from the cream coloured felsite and quartz porphyry "Mine Dykes" at Copper Mountain. They cannot be properly referred to as pegmatites for they do not have the necessary coarsely crystalline texture.

The trachyte dykes are essentially barren of visible mineralization, but sulphides generally occur near them.

Gabbro: A small area of gabbroic rock was mapped near the showings on Ray 12. It is a gray, medium to coarse grained pyroxene gabbro. Its contacts with the other granitic rock is not well exposed and its relative age with respect to these rocks is not clear. Some sulphides occur near it, but none of consequence were found in it.

Princeton Andesite: Two outcrops of tan coloured, fractured and slightly vesicular andesite flows occur on the Ray Group. The country between the two exposures is heavily overburdened, and it is possible for them to be continuous under overburden along a narrow northerly trough. The same rocks occur much more extensively to the east, across the river, where they form a high cavernous cliff, and to the north on St. Patrick

and Ray 10. In these areas they probably form the base of the Princeton Group which, however, is largely sedimentary in origin being composed of arkose, sandstone, shale, and coal measures. The group unconformably overlies the other rocks and they post date the mineralization.

Structures

The main structural feature on the Ray Group is the NNE trending contact of the granitic complex with the Nicola Group andesites. This contact is not exposed on the property, but it can be closely positioned from geologic and geophysical data. The contact is thought to be a faulted zone for the following reasons: (1) basaltic rocks near the contact on Ray 1 and Ray 12 are severely crushed, the southern exposure being reduced to northerly trending gouge over a width of about 10'; (2) andesites adjoining to the west are not appreciably metamorphosed as would be expected if the contact were intrusive; (3) the granitic rocks near the contact on Ray 1 are also badly crushed; and (4) there is no chilling or change in texture in the granitic rocks near the contact. Magnetic and resistivity data suggest that the contact, near its inferred position at least, dips at a moderate angle to the east. If the strike of the contact on Ray Group is more or less due north like the remainder of the contact to the south, a dip of about 30° east and the 700' difference in elevation would account for the NNE trend of its surface trace.

The volcanic rocks of the area have been mapped on a regional scale by Rice of G.S.C., who shows them to be broadly forded on a northerly axis. According to this mapping, the volcanics near Ray Group would occupy the eastern limb of a major anticline. Although severe distortions near granitic rocks would be expected, the vague indications of attitudes on Ray Group are in accord with the regional interpretation. The absence of severe distortion near the contact adds to the previous inference that the granitic contact is faulted.

The volcanic and granitic rocks are both strongly faulted. Probably the strongest faulting in the granitic complex is a vertical

NNE trending system that cuts across Ingersoll Belle and Red Buck. This system is reflected by a similar series of small faults on Armstrong Bluffs. Rocks near this structure are pervasively mineralized, but the overall tenor is very low. Two other fault systems, one NW, the other NE, were mapped in the granitic rock. The NW fault crosses the NE corner of Copper King and passes near the Ray Showings. It appears to be a post mineral fault. The NE system on Ray 12 is shown offsetting the contact by 250'. Ancestral stresses related to this system probably controlled the injection of trachyte in this vicinity and likewise probably allowed access to mineralizing fluids. Joint patterns reflect all three fault systems.

A major northerly fault system dipping 40° to the west in the andesites on Ray Group has been traced by geophysical means and bulldozing from its only exposure in road cuts on the St. Patrick claim. By southerly projection, it is apparent that this system might coalesce with the granitic contact and it might form some association with inferred faulting along this contact. The structure is unmineralized. However, graphitic material and sparse disseminations of cube pyrite have developed along it. Weak schistosity and some jointing reflect the presence of the faulting.

Mineralization — Mineralized showings occur in four principal localities, all within the syenite-monzonite complex. The "Adit Showings" on Ray 12FR consists of two small streaks of good chalcopyrite mineralization in the granitic rocks near a trachyte dyke. Two or three short adits were dug by old timers following these showings but bulldozing has nearly destroyed these. The mineralization is very confined; it is not disseminated, and as presently known, is much too limited to make ore. Somewhat similar chalcopyrite occurs with magnetite along NNE jointing 1200' to the south on Ray 6. Two streaks of mineralization occur here, each 6" to 10" wide and separated by 2' of syenite. The joints controlling the mineralization can be traced for about

5' in an old open cut. A minor disseminated chalcopyrite occurrence occurs 700' further to the south on Jubilee.

The Magnetite Breccia Showings is a magnetite occurrence in the granitic complex. It covers a more or less circular area some 300' in diameter on the boundary between Ray 1 and Ray 5. The westernmost trench reveals an area of breccia that has been healed with seams of coarse magnetite up to 1/2" across, the eastern exposures show disseminations and small northerly streaks of the mineral. Weaker disseminated magnetite extends southerly on to Copper King. Despite a thorough search, only one small hand specimen showing signs of copper could be found at the showings.

The Ray Showings consist of weak and widely disseminated grains and occurrences of chalcopyrite with some bornite. These have been developed by a series of old hand cuts, pits and a small adit. More recent work consists of bulldozer trenches but no pervasive nor continuous mineralization was uncovered. Strong NW faulting here has permitted decomposition and oxidation of the rock but the faults themselves are unmineralized. The weakly mineralized ground seems to extend to the southwest across the highway onto Copper King. Some of the better mineralization here occurs in a road cut. A 30' sample taken from this cut by the author several years ago yielded less than 0.2% Cu.

The Armstrong Bluff Showings on Ray 4Fr. have received the bulk of exploration attention. Here weakly disseminated and minor fracture fillings of pyrite-chalcopyrite mineralization occurs over a broad area. Although there has been insufficient work done to adequately delineate the size of the mineralized area it can be considered to cover an area 1000' NS by at least 400', the extreme western exposures having the better grade. The showing has been explored by sampling, bulldozing and 6 diamond drill holes. The results of the surface and subsurface sampling are as follows:

ARMSTRONG BLUFF SURFACE SAMPLING RESULTS

Copper Mtn. Consol.	Chapman, Wood and Griswold			Asarco		
	Ft.	% Cu.	Ft.x % Cu	Ft.	% Cu.	Ft.x % Cu
Weighted Avg. ---	25	0.13	3.25	15	0.13	1.95
	40	0.29	12.60	17	0.02	.34
109 Samples --	45	0.16	6.40	13	0.07	.91
0.57% Cu	25	0.21	5.25	15	0.04	.60
	30	0.14	4.20	20	tr	--
	48	0.24	11.52	30	0.11	3.30
	35	0.16	5.60	20	tr	--
Average ---	50	0.16	8.00	25	0.13	3.25
	16	0.10	1.60	20	tr	--
379 Samples --				20	0.11	2.20
				20	0.14	2.80
0.52% Cu	314		58.42	25	0.06	1.50
				20	0.15	3.00
				20	0.17	3.40
				20	0.15	3.00
				20	0.22	4.40
				320		30.65
	Weighted Avg. - 0.18% Cu			Weighted Avg. - 0.10% Cu		
	Average - 0.17% Cu			Average - 0.09% Cu		

ARMSTRONG BLUFF DRILL CORE SAMPLING RESULTS

DDH No.	Interval	Thickness	% Cu	Th x % Cu
1	0 - 51	51	0.22	11.22
	51 - 90	49	--	--
		100	0.11	11.22
2	0 - 60	60	0.17	10.20
4	0 - 170	170	0.33	56.1
	170 - 275	105	--	--
		275	0.20	56.1
5	0 - 30	30	0.43	12.9
	30 - 172	142	--	--
		172	0.07	12.9
6	0 - 160	160	0.39	62.4
	160 - 250	90	--	--
		250	0.25	62.4
TOTAL WEIGHTED AVERAGE		857	0.18	152.8

The extensive sampling carried out by Copper Mountain Consolidated covered most of the Armstrong Bluff area and adjoining trenched areas; the sampling by Chapman, Wood and Griswold was more or less continuous along the base of the bluffs for 400', and the sampling by Asarco roughly included the same 400' along the base of the bluffs but extended some 200' to the north along the top of the bluffs, some 200' higher in elevation. The Copper Mountain Consolidated samples were taken by prospectors on commissioh, and probably were not taken as regularly spaced chip samples as were the samples of the latter two organizations, and this no doubt accounts for the great discrepancy in results obtained. The difference between results obtained by Chapman, Wood and Griswold and Asarco is due principally to the larger area sampled by the latter. The drill cores were split and assayed at 10' intervals and the results, presented as analysed by John Wood, are in good agreement with his surface sampling. It can be reasonably concluded that the general range in copper values over a 400' by 200' area on Armstrong Bluffs is between 0.10% and 0.18% Cu, and it seems apparent that the grade would be closer to the low side of the range over an area sufficiently large to accomodate bulk mining methods. It is probable that the mineralization continues to the southwest across Mogul and on to Red Buck where some strong, local mineralization occurs in the zone. Surface indications indicate the mineralization does not persist to the west nor to the north. Similar mineralization is known to occur east across the river on Duke of York, (Cumont).

Float A train of mineralized float extends across the eastern portion of Ray 3 and can be traced for a considerable distance to the south. It consists of angular blocks of syenitic, monzonitic and hornfelsic material, and the chalcopyrite mineralization is often quite rich, comparable to that in Ingersoll Belle and Red Buck. The float occurs high in a column of alluvial gravels and sands and has probably been transported to the site by an ancient ice-marginal course of the river. No comparable mineralization is known on Ray

Group, and it is unlikely that the float originated on the property.

GEOCHEMICAL REPORT

INTRODUCTION A program of geochemical soil sampling was carried out on the property as part of the exploration program, the purpose of which was to detect possible areas of Cu-Mo mineralization under the alluvial cover and to provide data to correlate with geological and geophysical surveys. Some 470 samples were taken for the study, all at 100' intervals on lines spaced 400' apart. All samples were taken by E. Mullin, Princeton, B.C. Except for localities near swampy areas, all were taken from the soil profile below the horizon carrying humus material. Screening of samples and analyses for the two metals were carried out by Technical Service Laboratories, Vancouver. The analytical procedures used were extraction of metals by hot HCl digestion and determination of copper by atomic absorption and molybdenum by the dithiol method. Results are shown individually on Map 2 and collectively in graphical fashion - (page 18).

DETERMINATION OF THRESHOLD VALUE The accurate determination of the metal concentration separating background and anomalous concentrations, i.e., the threshold value, is essential in any geochemical study. The copper threshold on Ray Group has been determined statistically by logarithmic probability plot of the copper distribution. This technique requires the assumption that geochemical data are log normally distributed, as they are frequently found to be, and works on the principle that concentrations belonging to a single population plot as a straight line on log probability paper. If more than onepopulation exists, each is reflected by separate straight lines whose intersections can be taken as population boundaries. The higher populations must be assumed to be anomalous. Geochemical data are often found to be imperfectly

distributed in this log normal fashion, and the resulting graphs are gentle curves. However, distinct breaks in the curvature are probably as valid in determining threshold as any other empirical method. The threshold value determined for copper on Ray Group in this way is 33 p.p.m., and this value is in good agreement with published data on the subject - (Warren et al, Western Miner, Feb. '66).

The molybdenum threshold could be determined in this way as well, but on Ray Group the bulk of the concentrations are very low, below the useful sensitivity of the analytical technique, and hence the limits of the unimportant background range cannot be meaningfully established. The molybdenum threshold, however, can be empirically placed at 3 p.p.m.

RESULTS AND INTERPRETATIONS

Copper: The distribution plot shows that approximately 11% of the higher copper concentrations belong to a separate, presumably anomalous population, and Map 2 shows about half of these to be distributed more or less equally, but in irregular fashion, over the northern and southern parts of the syenite-monzonite complex. A conspicuous portion of the anomalous population, about 35%, occurs adjacent to the highway, the remainder is separately and widely scattered. The concentrations over the granitic rock, both at the north and the south, can be considered anomalous, and they undoubtedly reflect the copper mineralization related to the "Adit" and Armstrong Bluff Showings in these areas. The float train at Armstrong Bluffs is undoubtedly reflected as well. No large areas of bedrock mineralization better in grade than already exposed is indicated however. The concentrations along the highway are likely due to contamination related to construction and maintenance or automotive traffic. The remaining scattered anomalous concentrations are due to factors unknown, some float probably and possibly some surface accumulation in nearby swampy areas. In any event, these scattered samples are without meaningful pattern and too localized to reflect any appreciable bedrock mineralization. There is no association of

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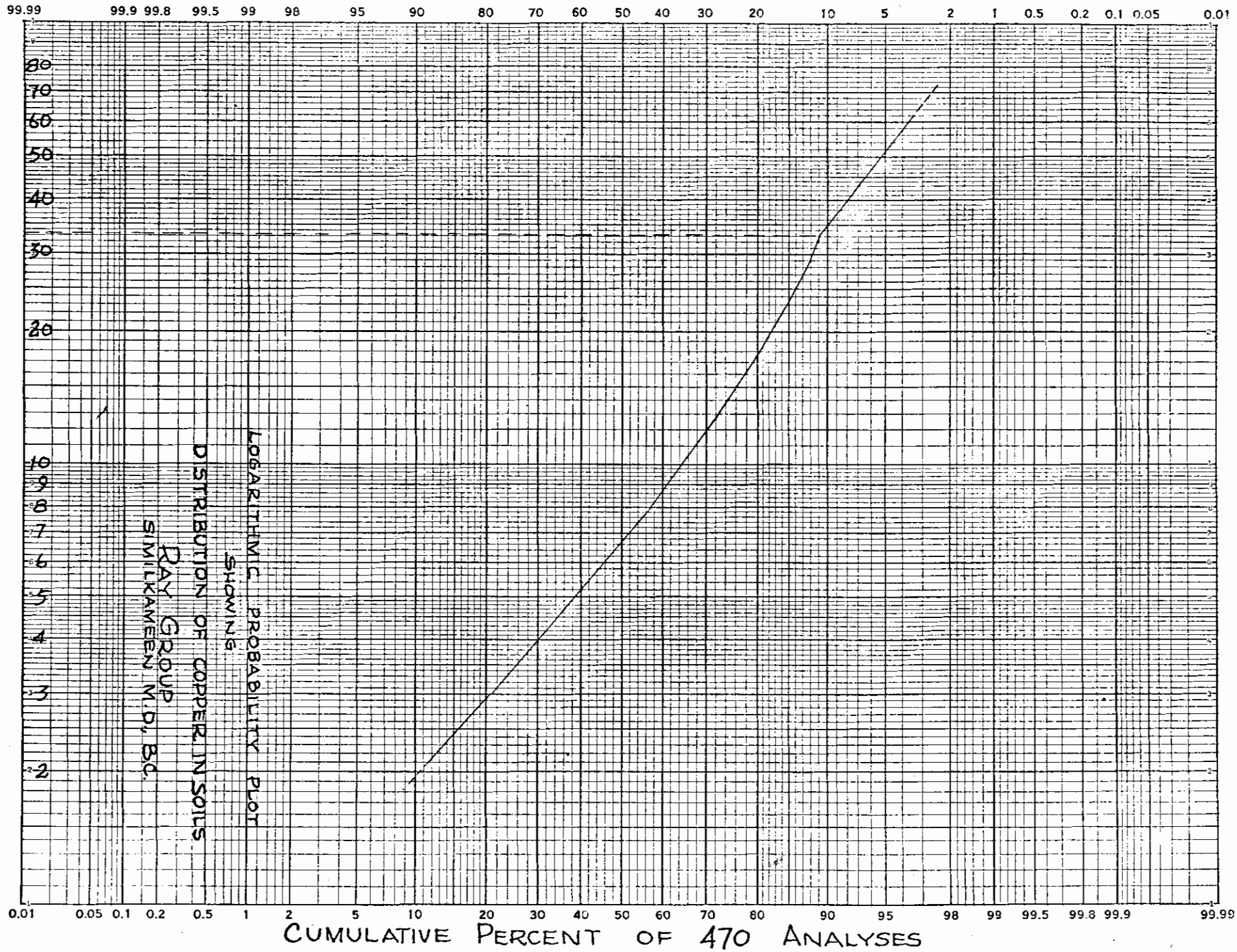

copper indicated at the magnetite Breccia Showing.

Molybdenum: Only eight percent of the samples showed molybdenum concentrations of 0.5 p.p.m. or more. Only two samples contained more than 3 p.p.m. and one of these was near the highway and is considered contaminated. No definite association of copper and molybdenum is indicated and no real or significant molybdenum soil anomaly exists on the property.

GEOPHYSICAL REPORT

INTRODUCTION A magnetometer survey was carried out on the property as part of the exploration program, the purpose of which was to assist in tracing bedrock structures, and to extend areas of copper mineralization where there was a known association of magnetic minerals. It was hoped that data obtained would provide useful correlations with other geological, geochemical and geophysical results.

The instrument used was a McPhar M500 direct reading fluxgate magnetometer, an instrument designed to measure the vertical component of the earth's magnetic field. The instrument can measure a range of magnetic intensity of 300,000 gammas, either positive or negative, by using 6 selector ranges. Its sensitivity varies with the selector range used; the sensitivity being 20 and 50 gammas per scale division on the selector ranges used in the survey.

FIELD PROCEDURES The survey was started by adjusting the instrument to zero at grid co-ordinate 92N, 20W and then by quickly making a closed survey of all stations on the main base line (line 20W) and adjusting these so as to be relative to the reading at the point of origin. Then readings were taken at 100' intervals on all the crosslines using the established control at approximately hourly intervals for diurnal corrections.

The operation of the instrument consists of levelling and maintaining a constant instrument-operator-magnetic field orientation during readings to minimize possible extraneous magnetic influences. At each station the direct reading galvanometer was read to the nearest one-half scale division. The instrument operator was the writer.

FACTORS INFLUENCING THE EARTH'S MAGNETIC FIELD

1. Variations in the amount of magnetic minerals in bedrock.
2. Variations in the amount of detrital magnetic minerals in overburden.
3. Concentrations of magnetic minerals.
4. Depth to the center of influence of an anomalous magnetic material.
5. Alteration and/or destruction of magnetic minerals.
6. Combinations of the above.

RESULTS AND INTERPRETATIONS Results of the survey are plotted on Map 3, which shows the general magnetic intensity over the granitic rocks to be variable and relatively high, in the order of 1000 to 2000 gammas, and uniform and relatively low, in the order of 1000 to -300 gammas over the Nicola rocks. Trends over the granitic rock are NNE, those over the volcanics are irregular and unsystematic. Four small anomalous areas are apparent, three overlying the volcanics on Ray 1, Ray 3 and Ray 9, and one overlying the granitic complex on Ray 5 at the Magnetite Breccia Showing.

The two anomalies on Ray 1 and Ray 7 are similar in size, (400' x 300') northerly elongation, and magnetic relief, (-6000 to -8000 gammas). Both are magnetic lows. The relatively small size and sharp relief of each anomaly suggests that the causative material is of small dimension and shallow depth. The southernmost of the two coincides with road cut exposures of basalt and it is likely that the anomaly is due to some peculiarity of these rocks, possibly some form of remanent magnetic orientation. Because of the similarity and proximity

of the northern anomaly, it is reasonable to assume its cause to be comparable.

The anomalous high and accompanying low on Ray 5 is undoubtedly caused by the magnetite exposed in the showing. The sharp relief and size of the anomaly suggest the volume of magnetite rich rock is small and confined near the surface. The anomaly trails off to the SSW and indicates a weaker continuation of magnetic minerals in this direction.

The small, single station anomaly on Ray 9 might be caused by magnetite rich float very close to the point at which the reading was taken.

An interesting aspect of the magnetics is the fact that the higher range in readings over the granitic complex begins several hundred feet east of the geologically inferred position of the contact.

GEOLOGICAL, GEOCHEMICAL and GEOPHYSICAL CORRELATIONS

Data from the geochemical and geophysical surveys correlate very well individually with exposed geology but there is no striking coincidence of results common to all the surveys. Low order copper anomalies in soils correlate well with known mineralization at the "Adit" Showings and Armstrong Bluff Showings and fairly well with the Ray Showings. There is no correlation of molybdenum with copper in the soils. There is no correlation between the geochem, magnetics nor induced polarization.

The magnetics correlate well with rock types and the Magnetite Breccia Showing. Induced polarization results coincide with a strong, graphitic fault zone exposed by the road cut and bulldozer trenches, but not with magnetics nor geochemistry. None of the surveys suggest appreciable areas of mineralization better in grade than presently known.

The magnetic data, as mentioned previously, and the resistivity data, both increasing to higher readings over the granitic complex but both being

shifted several hundred feet east of the geologically inferred contact, suggest that the contact dips to the east at a moderate angle.

Respectfully submitted,

Chas. A. R. Lamble

CHAS. A. R. LAMBLE, P. Eng.

January 30, 1967

A P P E N D I X 1

TRENCHING DETAILS

Ten separate trenches were excavated by D7 caterpillar to expose bedrock over induced polarization responses and near geochemical responses. Details regarding these trenches are tabulated below:

Trench	Width (ft.)	Depth (ft.)	Length (ft.)	Length x Depth
1	15'	10	210	2100
2	15	8	200	1600
3	15	3	150	450
4	15	5	500	2500
5	15	4	180	720
6	15	8	240	1920
7	15	5	230	1150
8	15	4	130	520
9	15	10	100	1000
10	15	8	230	1840
			2170	13800

In all 2170 lineal feet of trench, 15' wide and averaging better than 6' in depth were excavated.

APPENDIX 2

STATEMENT OF EXPENDITURES INCURRED

(Applicable for Assessment Credit)

				Sub Totals
Linecutting	E. Mullin (contract)	10.5 miles @ $80	840.00	
	Lammle (supervision)	2 days @ $35	70.00	
	Laths, ribbon, misc.		24.78	934.78
Geology, claims	Lammle	14½ days @ $35	507.50	
	Armstrong	1 day @ $24	24.00	
	Mullin	1 day @ $24	24.00	
	Drafting, report	9 days @ $35	315.00	
	Maps, Rileys		4.97	
	- colouring		7.50	882.97
Geochem	Mullin	4½ days @ $25	112.50	
	Lammle (supervision)	1 day @ $35	35.00	
	Analyses (T.S.L.)		1,027.65	
	Sample bags, misc.		17.92	
	Drafting, report	5 days @ $35	175.00	
	Maps, Rileys		6.65	
	- colouring		7.50	1,382.22
Mag	Instrument rental	15 days @ $ 9	135.00	
	Lammle	6 days @ $35	210.00	
	Drafting, report	5 days @ $35	175.00	
	Maps, Rileys		6.65	526.65
I. P.	C.A.M.S. (contract)		3,543.40	
	Lammle (supervision	2 days @ $35	70.00	
	D. McLean (labour)	1 day @ $20	20.00	3,633.40
Bulldozing	D-7 cat	45 hours @ $22	990.00	
	- moving		45.00	
	Armstrong	5 days @ $25	125.00	
	Lammle (supervision)	3 days @ 35	105.00	1,265.00
	Total applicable expenditures incurred			8,625.02
	Assessment credit applied for			$8,600.00

Declared before me at the city of Vancouver

of , in the

Province of British Columbia

this 31 of March, 1967, A.D.

Chas. A. R. Lammle

CHAS. A. R. LAMMLE, P. Eng.

ADERA MINING LTD.
RAY GROUP

B.C. Similkameen M.D. Princeton Dist.

Geology

SCALE	DATE	DRAWN		MAP NR
1"=200'	JAN. 67	R.L.		1

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Jan. 31/67

Legend

Tertiary — Volcanic
- ANDESITE, PRINCETON GROUP

Unconformity

Triassic — Intrusive
- GABBRO
- TRACHYTE
- SYENITE-MONZONITE COMPLEX

Faulted Contact (?)

Upper Triassic — Volcanic
- ANDESITE
- BASALT
- HORNFELS

} NICOLA GROUP

- Copper mineralization – cpy, bn
- Iron mineralization – py, mag.
- Graphite

- Outcrop areas
- Geologic contact, inferred
- Fault
- Bedding
- Schistosity
- Jointing, steep & inclined
- Diamond Drill Holes
- Claim Boundaries
- Claim Posts
- Picket lines
- Trenches
- Old Roads
- Water course
- Topographic contours (100' intervals)

RAY 10 — KENNEDY

"ADIT" SHOWINGS

RAY 12 FR.

ST. PATRICK

PRINCETON 10 mi.

B.C. HIGHWAY 3

RAY 11

RAY 9

RAY 14 FR.

RAY 6

RAY 7

JUBILEE L. 814

RAY 18 FR.

RAY 8

RAY 13 FR.

MAGNETITE BRECCIA SHOWINGS

RAY 5

RAY 1

RAY SHOWINGS

RAY 15 FR.

COPPER KING SHOWINGS

Trenches

RAY 2

RAY 3

COPPER KING L. 403

SIMILKAMEEN RIVER

ARMSTRONG BLUFF SHOWINGS

RAY 4 FR.

MOGUL L. 255

Talus

40 W · 36 W · 32 W · 28 W · 24 W · 20 W · 16 W · 12 W · 8 W · 4 W · 0 W · 4 E · 8 E · 12 E

92 N · 88 N · 84 N · 80 N · 76 N · 72 N · 68 N · 64 N · 60 N · 56 N · 52 N · 48 N · 44 N · 40 N ·

ACCURACY – CLAIM OUTLINES BASED ON PACE & COMPASS TRAVERSES FROM NEAREST STATIONS ON PICKET LINES

TOPO CONTOURS BASED OF ELEVATIONS TAKEN WITH POCKET-SIZED ALTIMETER.

GEOLOGY BY CHAS. A. R. LAMMLE, USING PICKET LINE CONTROL

TO ACCOMPANY REPORT ON RAY GROUP, SIMILKAMEEN M.D., B.C., DATED JANUARY 30, 1967, BY CHAS. A. R. LAMMLE, P.ENG.

Chas. A. R. Lammle
Jan. 31/67

9411

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SOIL GEOCHEMISTRY Cu & Mo

SCALE	DATE	DRAWN		MAP NO
1"=200'	JAN. '67	RL		2

Chas. A. R. Lammle Jan 31/67

Legend

SAMPLE LOCATION
Copper ppm.
Molybdenum ppm.
Where no figure is shown for molybdenum, the analysis was reported as < 2.5 ppm.

COPPER COLOUR CODE ppm

0 - 8	
9 - 17	
18 - 34	Threshold
35 - 68	
69 - 136	
> 136	

KENNEDY

RAY 10

PRINCETON 10

ST. PATRICK

B.C. HIGHWAY 3

RAY 12 Fr.

RAY 11

RAY 9

RAY 6

RAY 14 Fr.

RAY 7

JUBILEE L. 814

RAY 8

RAY 15 Fr.

RAY 5

RAY 1

RAY 2

RAY 15 Fr.

RAY 3

COPPER KING L. 403

RIVER SIMILKAMEEN

MOGUL L.295

RAY 4 Fr.

941

40 W 36 W 32 W 28 W 24 W 20 W 16 W 12 W 8 W 4 W 0 W 4 E 8 E 12 E

92 N 88 N 84 N 80 N 76 N 72 N 68 N 64 N 60 N 56 N 52 N 48 N 44 N 40 N

ACCURACY - CLAIM OUTLINES BASED ON PACE & COMPASS TRAVERSES FROM NEAREST STATIONS ON PICKET LINES

ANALYSES - TECHNICAL SERVICE LABORATORIES, VANCOUVER. EXTRACTION BY HOT HCl DIGESTION; COPPER DETERMINATIONS BY ATOMIC ABSORPTION; MOLYBDENUM DETERMINATIONS BY THE DITHIOL METHOD.

TO ACCOMPANY REPORT ON RAY GROUP, SIMILKAMEEN M.D., B.C., DATED JANUARY 30, 1967, BY CHAS. A. R. LAMMLE, P.ENG.

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Magnetometer Survey

SCALE	DATE	DRAWN		MAP NO
1"=200'	JAN. 67	RL		3

Chas. A. R. Lammle
Jan 31/67

Legend

INSTRUMENT READINGS SHOWN ALONG PICKET LINES, CONTOUR INTERVAL - 1000 GAMMA

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 941 MAP 4

KENNEDY

RAY 10

PRINCETON 10 mi

ST. PATRICK

B.C. HIGHWAY 3

RAY 12 FR.

RAY 11

RAY 9

RAY 6

RAY 14 FR.

RAY 7

JUBILEE
L. 814

RAY 8

RAY 15 FR.

RAY 5

RAY 1

RAY 2

RAY 3

COPPER KING
L. 403

RAY 4 FR.

MOGUL
L. 255

SIMILKAMEEN RIVER

ACCURACY - CLAIM OUTLINES BASED ON PACE & COMPASS TRAVERSES FROM NEAREST STATIONS ON PICKET LINES

INSTRUMENT - McPHAR M 500 FLUXGATE MAGNETOMETER — READINGS REPRESENT RELATIVE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD. READINGS CORRECTED FOR DIURNAL VARIATIONS ON A SEMI-HOURLY BASIS.

TO ACCOMPANY REPORT ON RAY GROUP, SIMILKAMEEN M.D., B.C., DATED JANUARY 30, 1967, BY CHAS. A. R. LAMMLE, P.ENG.

Chas. A. R. Lammle
Jan 31/67

941