

## LIST OF CONTEMTS



## MARS (in Folder)

1. Coology of Haskins Kountain seals $1^{\prime \prime}=200^{\prime}$
2. Haskins tountain - Main Gally
(Assay plan) $\quad 1^{\prime \prime}=100^{\circ}$

## RISPORT ON

# ZDNC GROUPS, HASKINS MOUNTATK <br> MCDAME ARBZA, B.C. <br> by <br> D. R. DKRRY 

## TIYERODUCTIOA

Salphide mineralization was first found on Hastins Mountain somo forty yoars ago by Haskins, after whom the mountain is mamed. Haskins started a promotion on the property and raised quite a sum of money, mostly in Fingland, but he died before going very far. At that time the discovery was hundreds of milea from any fom of transportation and it would clearly have been imposaible to carry out any successful operation.

In June 1948 D. R. Derry and M. K. Pickard examined the showing for Yukon Ranges Prospeoting Syndicate. Although some claims staked at the time of the original activity had been Crow granted and subsequentiy bought for taxes by two individual: in Telegraph Greek, it was found that the main showing was open. The mineralized zone looked good onough to warrant further investigation and accordingly 5 olaims were staked. Proliminary sampling indicated interesting quantities of zinc with eome lead and silver in certain portions of the showing. Accordingly, in 1949 a party was sent in to do assesament work and to carry out a programse of mapping, rock trenching to expose fresh material and more thorough sampling. This work indicatod the deposit to be more extensive than first appeared and, accordingly, 9 additforal claime were ataked, making total of 14 claims.
when it was first discovered by reason of (a) The building of the Alaska Highway during the war, which passes within 70 miles of the showing; (b) The building in 1948 of a truck road rrom a point on the Alaska Highway just west of Watson Lake to the placer workinge of Mocassin Mines on McDame Creek. This road is about 75 miles long and reaches a point within 4 miles of Haskins Mountain; (c) The possibility of a rallroad being built from the prosent end of steel to Alaska. The projected route of this railroad would pass within 45 miles of the property.

The improved transportation facilities, coupled with the indications of quite extensive mineralization, sake the ahowing of definite interest at this time.

## LOCATHON

Haskins Mountain, on which the zine Groups have been staked, is at lat. 59021 N. and long. 129030'W. It lies on the north side of wodame Creek about 12 air miles northpest of Madame post on the Dease River. The property can be reached by (a) plane from Watson Lake or Lower post to Poorman's Lake one mile northeast of the mountain. A rough trail, 2 miles long, leaves the west end of the lake, skirts the foot of the mountain on the northwest aide and leads to the bottom of the gully in which the main showing lies; (b/ truck using the new road which runs from Mile 649 on the Alaska Highway for about 70 miles to the Mocassin Mines and then 6 miles Nest up McDame Creek to Joe Rood's Cabin. From here it is about 4 miles by trail to the top of the mountain.

## TO POGRAPHY, TMABER AND MATER

The top of Haskins (alevation 5500 to 5900 reet) is relatively level but the sides, particularly to the west and morthwest, are intersected by sharp gullies and are vexy steep and preeipitoun. For this reanon many of the showings to the west and northwest are difficult and dangerous to reach. The monntain can be climbed most easily from the wouth.

Timber line ia at an elevation of approximately 4300 feet. Above this the only vegetation is "buek brush", grass and the odd stunted bush.

Water for diamond drilling shonid be obtainable from melting mow up to the end of July but in Angust the mountain top is apt to be dry. The highest permenent water supply would be at an elevation of about 4800 feet.

## REGIONAL CEOLOGY

The area in which Eusirins Mountain is aituated lies on the east flank of the Cassiar Batholith wich forms a long and relatively narrow belt from near Finlay Forks northwesterly into central Fakon. The rocks, mainly sedimentary, which this batholith intrudes are in three main series (I) Late Precambrian sediments, now mainly sekists, termed the Beltian Series in wouthern B.C. and the Yukon Seriea in the Yukon. Theae rocks do not appear in the McDame area but do occur on the east Mank of the batholith further north. (2) A series cf Palaeozoic sediments, mainly limestones, shales and quartzites, to which different names have been given in different areas. In the McDame area they have been called the "Dease Series" and probably range in age from Lower Cambrian to Pennaylvanian. Limestones of Lower Cambrian age lie at the base, overlain by quartaites (in which the Haskins Mountain deposit occurs) and then by more limestones. (3) A series of Mesozoic andesitic lavas with associated sediments, terned the mucheod Series" in the MeDame area.

Smail stocks of gramitic and porphyritic rocks intrude the above series beyond the linits of the Cassiar batholith. They are assumed to be of the same general age as the batholith itaelf.

Last of the MoDsife area post-Coast Renge sediments oceur in the basin of the Lase and Liaid Rivers. Meietocene and/or Recent gravels, conteining placer gold, lie in most of the river and creek beds.

In structure the main feature is a gyclinal axis running abont paxallel to the margin of the batholith and abont four miles east of it. Ths Mesczoic Meiaod Series" ocoupies the centre of this ayncline with sediments of the Dease Series dipping in towards the axis from both sides. At least one, and probably two anticlinal axes lie to the east of thia and also rum in a roughly N. N.-S. F. airectione The prevailing dips are usually


Saulting has not been worked out axcept locally but it is probable that strice faults are munero, particularly in the valleys. The one strong tault observed on Haskins Mountain has a N. W.-S.E. atrike and a steop northeasterly aip.

## HEOPRRTY GMOLOGY

Haskins Lountain lies on the east Ihank of the major synelime montioned above. The sedinents, all of Pelasozoic age (Dease Series), strike northweaterly and dip southwesterly exeept on the more northerly claing where a local anticline appears. Although the atretigraphy has not yet been aatisfactorily moried out (due to poesible repetition by folding ana faulting) the suceession appears to be as follows :-

Youngest - Cherty bedded quertzite. (Outeropping maing south of the clains.)
Gray, shaley limestone, banded and somewhat sandy at the base grading upwards into gray limestone which becomes shaley near the top. The true thickneas of the menber is probably under 100 reet.
juartzite, ranging from white to rusty red (uhere mineralized and altered). One phase, which may be a distinct horizon or may be the lass altared phase, is gray and slightiy gritty. Over most of the property it is cherty and breaks into sharp, ungular iragments. Bedding, slthough not prominent, can uspally be distinguished. One or two limey and ehaley beds are interbedded with the more typical quartzite near the base. This quartzite foms the main mass of the mountaln.

Olceet - Linestone (or Dolomite), buff to groy. This meaber appears on claime Zinc 10 , Zinc 11 and Zinc 14 dipping under tho quartzita.

Another cryatalline limestione or dolonite appesrs on clain Ziuc \#8. This occurs on an isolated group of outcrops, separatad from the main mass of hasains kountain by grownd neavily drift-covered. As a result, the strucbure, and hence tise stratigraphie melationships of this member, have not been solved. It overlios a quarteito that appears sinilar to that on Haskins Hountain and eo it seam likely that this limestone ip younger than the series listed above.

Vifthin the linits of the property the above seriea is intruded by one stock. This is a muskovite granite in its cosurer phase in the centre of the stock, but grades into a mierogranite or aplite mear its margins. It has only been seen in contact with the quertnite and here there is a auggestion of a replacement type of invasion, the one rock grading into the other. However, as most of the contact is formed by a fanlt it is not possible to draw any definite conclusions on this poist. A second stock oecurs a short distance north of the property boundaries.

Structure: It was mentionea ebove that Laskinis somatain iles on the asat flank of a major synclize, and that the prevailizg dips are southwesterly. There appests, however, to be local snticline baving its axis running in a northweterly direction. Its presence is somewhat obscured by a atrike
fault (see below) which cuts out the aper of the fold but northeasterly aips prevail on olaim Zinc 4,22 and 6, as opposed to southwesterly dips ofer most of the reat of the property.

There is a auggestion of a loeal anclinnl axis just southwest of the antiolinal axis montioned above, passing through the "ialand" of linestome mear the top of the mountain. The narrow belt of gray 1 imes to running routheastarly through claize Union Jack and Meteor Flag (omed by G. F. Dalziel) Bay indicate a contimation of this myelinal axis. Another alight downwarp is indicated by the amaller "ialand" of limeatome in the Capilano clain adjoining the zinc gropp to the south.

One important strike favit has been noted and is of particular interest in thet it appears to be associated with the ore deposits. This muns in a H. W. -S. R. Airection (avarage 320 T.) and dips northeast at about 80 degrees. It probably juns through the entire property although its identity towards the southeast is uncertain. As far as can be ascertained from mapping to date it correspends fairly clowely with the antielinal axis mentioned abote and appeare to cet out the apex of the fold, bringing north-east-dipping beds in contact with beds having a more gentle onthwesterly dip. This situation, however, is restricted to the northwest part of the property. To the moutheast the beds dip mouthwesterly on both sides of the fanlt projection.

Several northeasterly-striking raulta probably cear. One pretty definite one ia on clain Zine \#11. Several others are auggested by topography and Iracturing in the gally on claijas Zinc \#3 and H6, where they ran out from the main fault.

## KINERAL IZATION

type in which the comoner mineral in order of abundance are pyrihotite, sphalerite, pyrite, gelena and chalcepyrite. An appreciable silver content is limited to those parts of the mineralization showing galena. Gold is absent or present in very finor amonnts. Typically, these motalic minerals occur as disseminationt and replacementa accompanied by silicification which has produced line silicates where limestone forms at least one wall. Apart fron the lime silicates and other altered host rock material, there is rarely any gangue mineral such as quartz or ealcite.

With regard to the age and origin of the mineralizing solutions, it is assmued that they are associated with the granite which forms a stock in the northweatern part of the property. Tais granite, wieh intrudes rocks of older Palaeozoic age, is in turn asmunad to be associated with the Cassiar batholith which intrudes rocks of Palaeozoic and Mesonoic age. The association of the mineralizing solutions with the granite stock on the Haskins Mountain clain is not ontirely based on propinquity. There is some indication of a zoning effect in following the main vein as it departs from the granite contact. In structural control of the ore deposition it in apparent that two main features predoninate. The first is the tendency of the ore solutions to form replacenent bodies along limestone-quartelte contacta. Although the majority of such eases are where limestone overlien quartzite, several mineral occurpences have been men in the reverse condition. As a rule it is the limentome (quite altered to a dense lime silicate) rock) wich forme a host for the mineralization rather than the quartzite. The second and economically more important structural control is a feult or fault zone transecting both the wedimentary and intrusive rocks of the property. Thie favit zone has a northwest-bouthoast strike and a vertical to steep northeast dip. It is most prominentiy developed in a
steep guily from the northwest slope of the nountain but it can be traced with reasonable confidence across the suanait of the mountain and with somewhat less certainty down the southeast slope. As mey be seen in the more detailed descriptions below, the best grade of mineralization follows this fault zone. Since, however, the fault forms, along part of this length, the contact between limestone and quartzite the relative importance to ore deposition between the fanlt and the limestone contact is difficult to assess. Certainly it is a fact, on observations to date, that mineralization containing appreciabie lead and ailver is confined to the fault zone while the limestone contacts away from the fault have only sphalerite-pyrrinotite mineralization.

Individual zones or areas of mineralization are described as fcllows :-

Main (or Fault) Zone:
Suliphide minerelization has been indicated along the northwestsouthesst fanlt zone over a total length of 2700 feet. This does not include several more or less isolated patches of mineralization along the southeast alope of the mountain. Within this length the mineralization is best developed at the top of the gully that runs down the northwest slope. Here, trenching end natural exposurea have shown the following sections:
(1) A length of continuoug ore for 300 feet with an average width of 19 feet and an arerage grade of zine $8.46 \%$, lead 2.68\%, silver 2.66025. The minaralization ranges from almost solid eulphides in which pyrrhotite is the commonest mineral and sphalerite next, to disseninated ore where the sulphides are distributed through a dense, hard, dark green rock which probably consista largely of lime silicates. The lead and ailver values tend to be concentrated on the southwest, or footwall, side.
(2) Continuing northwest from the above is a section of ore with a length of 740 feet, an average vidth of 11.5 feet and an average grade of zinc $8.93 \%$, lead $0.13 \%$, silver 1.06 ozs. Exposures are leas Frequent than in the first section and the steepness of the slope and amount of talue has made trenching inpossible. The exposures are numeroua onough, however, for it to be asmad provisionally that contimous mineralization exiats. The total width of mineralization is rarely oxposed in this section and the average width given is calonated fron the exposed widths only.
(3) Beyond this section again in a northwest direction sulphide mineralization is exposed at imregular intervals over a length of 1660 feet and amples have show only low values in zinc. since a large proportion of the zone is here covered with talus it is possible that lenses of better grade ore occur.
(4) Thirty-five feet west of and parallel to what is considered to be the main zone at the northwest end of (2) above is a aparsely mineralized zone some 10 feet wide which is assoolated with a metamorphie ampibolite. Fifty feet farther west is another aparsely mineralized zone which is some 15 to 20 feet wide. Where exposed these zones do not seem to be of economic importance but the extensions which are largely covered with talus may be of intereat.

## Imestone-Quartaite Contact Derosits:

(a) Summit Deposit_- Approximately at the sumat of the mountain (although not actually the highest point) is en "islend" cr capging of gray shaley limestone. This is truncated on the northeast side by the fault zone describod abote. Against the fant the limestone is steeply fclded and contorted but away fron it the dips are more gentle in a generel southwesterly
direction. The ore at the fault contact has already been deseribed. Away from the fault mineralization of some sort is more or less continuons but concentrations of heavier mineralization end greater widths occur at various points probably by reason of local folds. The mineralization consists mainiy of pyrrhotite and sphalerite. It has not been possible to sample the contact systeratically but some trenches have been put in both on the east and west edges of the liwestone capping. Thrse amples on the ast contact on clain Zinc \#4 gave an average grade of zine $3.96 \%$, silvar a. 35 ozs. The true thickness here is difficult to determine but zopears to be something over 5 feet. Samples taken alorg the mame contact near the northwest point of the limestone gave an average grade of zinc $9.24 \%$, lead $1.21 \%$, silver 1.28 ozs. These samples were difficult to obtain and the reaulte may be higksp then true grade. Purther south along the west contact three areas sampled gave an average grade of zinc $2.62 \%$, silver 0.2502 s , each being taken at local bulges or concentrations. The contact around the southern end of the limestone capping ia more aparsely minerslized and does not appear to be of ore grade. It seems probable, therefore, that the northern half of the island or capping of limestone is underlain ty ephaleritepyrrhotite mineralization, probably with a geod deal of variation in both thickness and grade.
(b) Hogt_Knob Depoait =- In the relatively low ground to the northwest of haskins hountain within timber growth and at an elevaition of 3700 feet above sea level, a group of outerops occurs in which some old trenching was found. This trenching $11 e s 4600$ feet in a northwesteriy direction from the top of the gally in which the main ore zone occurs and is 2100 feet vertically lower than the highest occurrence. The lest Knob showing is
ovidentiy not on the direct continuation of the Main, or Fault, Zone but would lie a short distance to the southwest of the projection of this zone. The inineralization appears to follew the approximate contact of quartzitic sehist and white to buff iimestong. Where mineralized this contact strikes in a roughiy northerly direction and dips about 65 degrees to the east, but a short distance further north the bedding atrikes in a northesterly direction and dips southwesterly so the showing may be at a local dragfold. The Old trench orosses the zone and exposes it to a depth of about 5 feet. The trench shows a horizontal width of about 20 feet of ore but due to a combination of dip and slope this is probably exaggerated and a true width of 6 to 10 foet may be assumod. A sample representative of the mineralized material on the dump from this trench gave the following assays - zine 12.16\%, Lead $0.76 \%$, allver 0.52 ozs/ton, copper $0.70 \%$, niekel Nil.

About 200 feet east of the above showing another patch of mineralization is exposed in the bed of a areek. Thia appears to have a roughly eastwest strike and a north dip and the host rock is breeciated quartzite. The mineralization consists mainly of pyrrhotite and does not appear to be of much importance.
(c) Northeast Slope Showings -- Along the northeast alope of the mountain a short distance below the sumit a contact of quartzite overlying limestone can be tracod atriking in a roughly northwost direction and dipping southwesterly into the mountain. In this case the quartzite is overiying the limestone. Mineralization occurs sporadically along the contact and appears to form concentrationa which be governed by local folds or cross fractures. Dae to the amount of talus it is difficult to assess how continuous the ore is between the exposed showings. Three pita were found and re-sampled.

The details of these may be seen on the accompanying map. The average grade from the mamles taken was zine 7.83\%, lead Trace, silver 2.40 ozs.

This mineralized contact appeara to be alfferent one fron that In wich most of the other contact deposits were found. The limestone is less shaley; of a lighter colour and appears to underlie the main Haskine Mountain quartzite. The etructure is somewhat obscure in that although west dips prevail in the area where mineralization was found the dips observed in the quartzite further northweat become vertical and then to the northeast and the 1 imeatone could no longer be found. Assuming that the contact in the area where it is nineralized continues to dip in a southwesterly direction, it would eventually come into the region of the main fault wich would give a very favourable condition for large seale ore replacencnt. Purther work is needed before the chances of this occurring can be properly assessed.
(d) Upper Adit Showing_- An old adit put in probably thirty or forty years ago mas found on clain Union Jack lying approximately 4500 feet southeasterly from the cormer posts of Zinc Nos. 1 to 4 inclusive. $\ln$ is adit Lies very elose to the projection on atrike of the main fault. It is possible that the ore itself is on this fault plase but, if so, the fault is far less definitaly developed in this area. The minerelization, consisting of pyrriotite, aphalerite, pyrite and a little gelena, occurs along a fracture striking southeasterly and dipping ateeply northeast but also tends to run ont along subaidiary fractures. The mineralization is fairly heavy at the mouth of the adit and in the face of the adit (wich is only a few feet deep). A trench running up over the hill above the adit showe shearing to continue but the mineralization becomes weaker.

The showing is of intereat in indicating the comtinuation of cineralization this far fron the main zone but does not appear to be of great pronise in itself.
(e) Other poesible alain Zone Showing $=$ In the area between the main zone showing at the hoad of the gally and the Uppor Adit described in the last paragraph there are two places where mineralization including zine may be aean. These are marked in on the attachea map. Relatively little 1s known about them end they appear to be fairly emall in themealves. It seems likely that they may follow breaching fractures from the main fanlt zone.

IL Lower Adit:- The lower edit lies 2600 foet from the Uprer Adit and at an elevation of 4500 feet above sea level. The adit is again a part of the original work carried out many years ago. It has been put in at the mineralized contact between quartaite (to the northeast) and Iimestone (to the southreat). In this case the limestone is overlying the quartzite with a dip of approximately 70 degrees to the soathwest. There is a fairly strong development of dark groen 1 imo silicates along the contaet and this forms the host mock for the mighides which are disseninated to maseive. Pyrihotite is again the commonest sulphide but sphalerite is fairly abundant and galena rare. The mineralization in the adit is exposed over a width of 9 feet. It can be traced only 40 or 50 feet in length over the crest of a ridge and is corered by taius on its extent in both directions. A sample taken across 9 feet assayed zine 4.6\%, silver 2.62 ozs.

## CONCLUSIOKS AKD RKCOIDREDATIONS

The ocourrence of heavy aniphide ineralization, containing zinc with some lead and silver, in association with a strong, stoeply-aipping fand is pronising and deserven farther developsent. Of secondary, but not inconsiderable, interest is the prevalence of ginc-bearing inineralization along many limestono-quartzite contades in the vieinity. Fren though the phyaieal difficultien of terrain and traneportation are severe, the posaibilities of a large tonnage are good onogig to justify thorough inveatigation. The propesed Alaska Railroad, under prosent investigation by a U.S. Senate Comittoo, wonld pass within 45 air $n$ iles of the doposit. If this were built it would memove one of the biggest obstales to the development of e base netal depostt in this area.

Fox the furthow development of the deposits on Haskins Nountain I would recomend the following action :Sarface Nork:

Stripping and rock trenching on the more pronising contact zones to establish the grade of the un-oxidized material and, as far as posible, their extent. This would require four men with two gasolene reck drills for a period of about one month.

## Diamond Drilling:

(1) Main or Pault Zone. Four holes of 150 to 200 feet each to test the dommerd continuity of the higher grade shoot. Six holes of about the same length to test the next 740 feet to the northwest. About 2000 feet in all.
(2) "Sumait Deposit" About ten mort vertieal holes (probably most under 100 feet each) to test the contimity and grade of the mineralization under the "capping" of gray limestone. Probably about 1000 feet in all.
(3) Three verticel holes of about 250 feet each, to test the continuity of the contact zone at the "Northeast shope ahowings". (450 feet)
(4) Three holes of about 100 feet each to test the contimuity of the "West Knob showing". (300 reet)

Allowing som additional footage for tenting other mowing depending on surface reonlts, and for followiag up any favourable indications on the holes suggeated above, this would require between 4000 and 5000 feet of drilling. The drilling would best be carried out in July and Angust, doing the higher elevation work firgt while there was atill enffieient water trom melting mow. Since contract prices for drilling are high for this distriet the posaibility of buying or renting a drill and hirimg a good man to man it should be considered. This policy would have the aditional advantage of not being tied down to a fixed miniman footage, hould the eaxly results not seern to justify it.

## SUMMARY

1. The host-rock of the ore at Haskins Mountain are quartzite and limestone of probable Upper Cambrian age. These rocks are intruded by a granitic stock which is probably an offshoot of the Casaiar batholith of Mesozoic age.
2. The main ore zone is in a steoply-dipping strike fault. Over part of its exposed extent one wall of this fault is limestone and the other quartzite. The bast ore found to date is in this condition. Sampling on trenches or natural exposures at regular intervals has indented a length of 300 feet, a width of 19 feet and a trade of $8.46 \%$ mine, $2.68 \%$ lead and $2.66 \mathrm{ozs} /$ ton silver.
3. An additional 740 feet extent to the northwest of the above shoot is indicated by less regular exposures in which the fall width is not always seen. Over a sampled average width of 11.5 feet thin length has given an average grade of $8.93 \%$ zinc with negligeable lead and 1.06 02s/ ton silver.
4. Mineralization, containing between $2 \%$ and $12 \%$ zinc and occasional lead, has been found on limestone-quartzite contacts at a number of places over the property. One of these extend out from the fault zone. Another dips towards it.
5. The total length of the area in which the above generalized showings have been found is $\mathbf{1 0 , 0 0 0}$ feet, and the maximum difference in elvaLion is 2100 feet.



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