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June 24, 1968

REPORT ON THE PROPERTY OF HART RIVER MINES LTD. -  
 HART RIVER AREA, YUKON TERRITORY

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A visit to the property of Hart River Mines was made on June 24th, 1968. Access to the property was by helicopter from Fairchild Lake. Mr. Dennis McKelvie, geologist of Alrae Explorations, showed me around the property and discussed the current work with me. I also met Mr. Allen MacDonald, a second geologist working on the property.

This prospect is covered by Mark Claim Nos. 1 to 38, inclusive. They lie in the Mayo Mining District, on Claim Sheet No. 116 A/10. The showings are at latitude 64° 38 mins. north, longitude 36° 50 mins. west at an elevation of approx. 4,000 feet on the east side of the Hart River Valley. The showings were found by prospecting gossan zones in 1966. Soil sampling and E.M. 16 surveys in 1967 outlined distinct anomalies. Two packsack drill holes put down late in 1967 on the geochemical highs intersected 2% copper.

The showings consist of massive sulphides, pyrite, pyrrhotite, sphalerite, chalcopyrite, galena, in a zone striking south 80° west with a dip about 80° to the south. The dip seems to vary and may dip to the north at the western end of the zone. This may represent a shear zone. The true width of the massive sulphides zone from the drill hole data available so far appears to be about 50 feet. In addition, there is a zone of disseminated sulphides in the hanging wall which may be as wide as 30 feet. To the east of the main showing area, that is, the area where the packsack holes were put down in 1967, and where Drill Hole Nos. 1 to 4 were collared in 1968, the zone has been traced by trenching about 1,000 feet, and there is a suggestion of folding in this eastern section.

Mr. McKelvie does not expect any great persistence of the zone along strike to the west. Within the sulphide zone, there appears to be some differentiation or banding. This is apparent visually in that the sulphides carrying more chalcopyrite generally appear to have less sphalerite and vice versa, and it is reflected also in the assays from Drill Hole No. 1, which are the only ones published so far.

#### GEOCHEMISTRY

All the geochemical work carried out on this property has been soil sampling. This work has produced distinct anomalous zones over the main showing area, and possible extensions of it. Lead and zinc values in these zones are in excess of 1,000 ppm. To the west, both the lead and zinc zones are cut off sharply at the Hart River. In general, the lead anomaly is more restricted in extent than is the zinc anomaly, as would be expected. A copper anomaly covers a fairly broad area over the main showing and to the southeast. It is less well defined to the west. Background value for copper is about 30 ppm and values within the broad anomalous zone rise to 300 ppm with a peak copper high (1 sample) of 2,200 ppm.

GEOPHYSICS

The Ronka EM 16 shows a conductor over the showing zone.

DRILLING

At 11:30 a.m., June 24th, 1968, Drill Hole No. 9 was drilling at 117 feet.

Drill Holes 1, 2, 3, and 4 were drilled from approximately the same set-up located on the main showing at the site of the 1967 pack-sack drilling. Hole No. 1 was vertical. Holes 2 and 3 were drilled from the same set-up to the north and to the south to test the width of the zone. Hole No. 4 was drilled to the southwest obliquely across the zone, and was collared about 30 feet north of Holes 1, 2, and 3. This Hole (No. 4) reached a vertical depth of 200 feet and intersected good sulphides.

Holes 5, 6, 7, 8, and 9 were drilled from a point approximately 116 feet west of Holes 1 to 4, inclusive. Hole No. 6 was vertical and was drilled to a depth of 88 feet. It intersected the foot wall at 42 feet. Holes 5, 7, 8, and 9 were collared about 15 feet north of No. 6 and were all drilled to the south.

Hole No. 5 was at an angle of  $- 60^{\circ}$

Hole No. 7 was at an angle of  $- 75^{\circ}$

Hole No. 8 was at an angle of  $- 67^{\circ}$

Hole No. 9 was at an angle of  $- 45^{\circ}$

The collars of Holes 5 to 9, inclusive are about 25 feet lower in elevation than the collars for Holes 1 to 4, inclusive.

I was able to inspect core from Drill Holes Nos. 6, 8, and 9.

DRILL HOLE NO. 6

0 - 13 feet	overburden
13 - 42 feet	massive sulphide zone
42 - 88 feet	footwall, some intrusive material

DRILL HOLE NO. 9 - collared in sulphides

0 - 65 feet	good sulphides
65 - 112 feet	disseminated sulphides
112 - 117 feet	massive sulphides, good chalcopyrite

This is the furthest intersection of sulphides into the footwall so far, and the re-appearance of massive sulphide mineralization is something new.

ASSAYS

To date, assays on Drill Hole No. 1 only have been received. Core from Holes 4 and 5 were sent to Vancouver on Friday, June 21st, 1968.

On Hole No. 1, the assays are as published.

<u>From</u>	<u>To</u>	<u>Width</u>	<u>oz. Au</u>	<u>oz. Ag</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>
19.0	85.0	66.0'	0.059	0.75	1.58	0.21	2.68
85.0	95.0	10.0'	0.065	0.80	0.75	0.83	8.36
95.0	145.0	50.0'	0.149	2.03	1.96	0.28	3.76
19.0	145.0	126.0'	0.095	1.26	1.67	0.28	3.56
145.0	153.0	8.0'	0.020	1.00	0.25	0.34	1.36
153.0	231.0	78.0'	0.133	3.20	0.81	1.63	11.49
AVERAGE OF MAIN MINERALIZATION ASSAYS:							
19.0	231.0	212.0'	0.106	1.96	1.30	0.78	6.39
AVERAGE LOWER GRADE SECTION:							
231.0	294.0	63.0'	0.010	0.42	0.23	0.40	1.35
AVERAGE OF TOTAL CORE LENGTH:							
19.0	294.0	275.0'	0.084	1.60	1.05	0.69	5.24

The highest values obtained in this Hole were as follows:-

- Silver = 6 ozs.
- Copper = 3.48% over 5 feet
- Gold = 0.24 ozs.
- Zinc = 24%

The section in Hole No. 1 from 160 feet to 225 feet ran 0.81% copper, 13% zinc, about 2 ozs. of silver and about 0.1 ozs. of gold. The gold values in this material are interesting and appear to occur with zinc as well as with the copper.

Drill Hole No. 9 is the last hole from the second set-up. The next set-up will be located about 75 feet further west.

A second zone has been outlined about 1,000 feet south of the main showing. This zone has a strong EM 16 response with a fairly long strike length. One trench on this zone exposed a vein 5 feet wide carrying 30% lead. Due to its narrow width, no further work was done on this zone. Despite the lead content, there is no lead soil geochemical anomaly here. There is a zinc soil anomaly in excess of 1,000 ppm, of limited extent. It is possible, the strong EM conductor here is caused by graphitic material in the argillites, although Mr. Sevensma doubts that this is the case. More work is required on this second zone, including an evaluation of its possible relationship to the main showing area. It possibly could represent another limb of a fold structure.

NEW STAKING

Considerable new staking has been done in the area by Hart River Mines, and also by E. O. Chisholm and Haida Helicopters, by Iskut Silver, by Montana Mines, by Reindeer Exploration, and for another client by Allen Geological Engineering of Vancouver. An up-to-date staking map showing all the staking to June 24th including that not yet recorded is on file in Vancouver office.

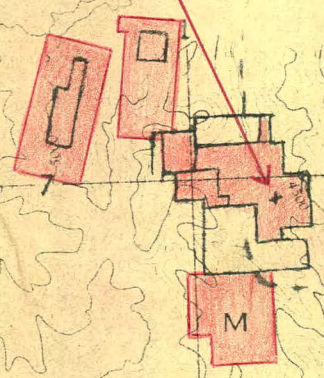
At this time, the Hart River Mines prospect represents an interesting situation which should be watched for further developments. Although the zone presently being investigated is quite narrow, and probably of a vein type or shear zone, relatively little is known yet of the overall structure, and the broad copper geochemical zone to the east and southeast may be reflecting a more substantial zone of mineralization. The grade of mineralization is quite good from assays to date and from visual inspection. Considerably more work, particularly diamond drilling, is required in order that this prospect can be fully evaluated. I propose to keep in touch with further developments.

J. B. P. Sawyer  
Regional Manager - Western Canada

LH MH  
LG MG

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W E R N  
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HART RIVER MINES LTD.



M O U N T A I N S



HART RIVER MINES LTD. July 10/68

SECOND DRILL ORDERED FOLLOWING GOOD RESULTS OF FIVE D.D. HOLES - H.A. Briden, president of Hart River Mines Ltd., states in a recent report that "The first 14 diamond drill holes on the property of Hart River Mines appear to have substantiated the presence of a multi-metal ore body with large tonnage probabilities, "Assays have been received from 4 of the first 5 holes & a brief outline of the assay results is as follows:

Hole No.	Footage	Length of Intersection	Gold	Silver	Copper	Lead	Zinc
1	10.0-231.0	212	0.106 oz.	1.96 oz.	1.30%	0.78%	6.39%
2	(assays not complete)						
3	22.0-47.0	25	0.04	1.03	1.85	0.04	1.72
4	13.0-75.0	62	0.06	0.95	1.73	0.37	3.37
	113.0-245.0	132	0.07	2.65	0.89	1.64	9.50
<b>Total</b>							
	Intersection 13.0-245.0	232	0.06	1.87	1.00	1.04	6.43
5	21.0-60.0	39	0.025	0.34	1.45	0.06	0.34
	60.0-135.0	75	0.02	0.10	0.52	0.09	0.85
<b>Total</b>							
	Intersection 21.0-135.0	114	0.02	0.18	0.83	0.08	0.68

"Holes 5 to 9 are located 110 feet west of holes 1 to 4.

"D.L. McKelvie, company engineer, states the diamond drilling to date indicates a true width for the ore body of between 35 and 50 feet of massive sulphides with an additional 30 feet of hanging wall rocks that are well mineralized and may achieve ore grade status. The drill program is continuing to extend the ore to the west of the discovery trench, and is following a 1200 foot electromagnetic conductor. The ore body is open in all directions for development.

"The exploration and development programme is to be expanded immediately by adding a second drill to test 13 additional anomalies in the immediate area."

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HART RIVER MINES LTD. July 16/68

STEP-OUT HOLES EXTEND FURTHER KNOWN GOOD MINERALIZATION - Further good results are reported from the drilling program on the Mark property of Hart River Mines Ltd. The holes reported are located on the first step-out along strike, reports H.A. Briden, president.

Hole No. 6 - a flat test into the footwall, cut a 25 foot zone of sulphides averaging 0.03 ounces of gold, 0.73 ounces of silver, 1.45% copper, 0.12% lead, and 1.08% zinc.

Hole No. 7 - tested a portion of hanging wall only and was not assayed.

Hole No. 8 - cut very impressive grade mineralization - assayed as follows over 148 feet: Gold 0.03 ounces per ton, Silver 1.10 ounces per ton, Copper 2.44%, Lead 0.38%, Zinc 1.69%. Copper assays as high as 7% average were encountered over a 5 foot section. One 40 foot section (from 100 to 140 feet) averaged 5.03% copper.

The bottom 26 feet of hole which was mineralized hanging wall averaged in itself 1.13% copper.

Development drilling along strike continues with very favourable rate of progress. For previous report, see GCNL No. 141.)

HART RIVER MINES LTD.

MASSIVE SULPHIDES DRILLED TO DATE ALONG STRIKE FOR LENGTH OF 335 FT. TO WEST OF DISCOVERY TRENCH

- In an interpretation of diamond drilling results to date at the Yukon property of Hart River Mines Ltd.,

D.L. McKelvie, P. Eng., has reported to Alex Briden, president, that drilling to date "has indicated the presence of an important metalliferous sulphide deposit. Of particular significance is the fact that drilling has continued to encounter massive sulphides 335 feet along strike to the west of the discovery trench while surface work in 1966 and 1967 indicated the sulphides continuing for several hundred feet to the east of the same trench. The length of the zone is indicated by electromagnetics, drilling and surface trenching is greater than 1,500 ft. and is still open to the east."

In introducing his interpretation, dated July 15, 1968, the consultant points out that the drill program begun in 1968 was designed to probe the massive sulphide showing and coincident electromagnetic-geochemical anomalies outlined over a length of up to 3,500 ft. Two short "pack sack" holes gave the following averages for 52 ft. of core: lead 0.33%; zinc 2.02%; copper 1.75%; silver 1.60 oz/ton; gold 0.04 oz/ton. The systematic program was initiated in May. He notes that parallel conductors of more than 1,000 ft. are associated with the surface showing and that the geochemical anomalies of high lead and zinc (+1,000 ppm) were found over lengths of 2,300 and 3,500 ft., respectively.

Due to the topography, the choice of drill sites is restricted and the first sites were located in a saddle which developed along the sulphide zone. As a result, several of the first holes collared in ore-grade material. Mr. McKelvie, incorporates in his report the exact hole locations, angles, azimuths and total lengths. These details cover a total of 18 holes, No. 18 now drilling. Assays are not complete for hole 2 and for holes 9 - 18. He gives complete results of Holes 1, 3, 4, 5, 6 and 8, and his summary as reported in the first paragraph above is based on these results. His interpretation continues:

"From the data collected to the present, the massive sulphide zone is between 35 and 50 feet in width with an additional 30 feet of hanging wall material that carries up to 1.5% copper in the sections which have been assayed. Further sampling of the hanging wall is necessary. The strike of the deposit is within a few degrees of True East and the preliminary drilling suggests an easterly plunge. The dip varies widely in the drilled section from -80° south near hole No. 1 to -45° south near Hole No. 10.

"The tenor of the mineralization in the sulphide zone varies widely from hole to hole. As can be noted from the grade averages, Hole No. 1 encountered sections in which the relative proportions of the metals changed considerably and similar differences are noted in other holes. Mineralogically the composition changes, abruptly in some cases, gradually in others, from mainly pyrite to high pyrrhotite and/or sphalerite. Chalcopyrite is the principal copper mineral with minor bornite appearing in some sections. Better silver values appear to be confined to the zinc minerals while gold values are associated with the high pyrite mineralization. In the massive sulphide zone, total sulphides are greater than 85% of the core, with calcite and quartz being the non-metallic minerals. In addition to the massive material in some of the holes a distinctly banded material containing 20 - 60% sulphides with argillite and/or argillaceous limestone is found, usually near or at the footwall.

"Detailed geological mapping is being done in order to outline the structural features of the deposit and surrounding areas. Severe changes in strike and dip, abundant cleavages, fractures and jointing, and the presence of a major dioritic intrusive have all complicated the structural picture. Evidence to date suggests a replacement of argillite and/or argillaceous limestone near the edge of a diorite sill which is texturally andesitic near the sulphides. Further drilling and detail work is necessary before any interpretation can be reasonably accurate. The first 18 drill holes have proven the existence of a massive sulphide deposit which carries impressive quantities of copper, silver, zinc, gold and lead in

No.	Footage	Length of Intersection	oz. Au.	oz. Ag.	% Cu.	% Pb.	% Zn.
1	19 - 85	66'	0.059	0.75	1.58	0.21	2.68
	95 - 145	50'	0.149	2.03	1.96	0.28	3.76
	153 - 231	78'	0.133	3.20	0.81	1.63	11.49
	19 - 231	212'	0.106	1.96	1.30	0.78	6.39
	19 - 294	275'	0.084	1.60	1.05	0.69	5.24
3	22 - 47	25'	0.04	1.03	1.85	0.04	1.72
4	13 - 75	62'	0.06	0.95	1.73	0.37	3.37
	113 - 245	132'	0.07	2.65	0.89	1.64	9.50
	13 - 245	232'	0.06	1.87	1.00	1.04	6.43
5	21 - 60	39'	0.025	0.34	1.45	0.06	0.34
	60 - 135	75'	0.02	0.10	0.52	0.09	0.85
	21 - 135	114'	0.02	0.18	0.83	0.08	0.68
6	20 - 45	25'	0.03	0.73	1.45	0.12	1.08
8	19 - 166.8	147.8'	0.03	1.10	2.44	0.38	1.69
	100 - 140	40'	0.03	0.89	5.03	0.10	0.64

the portion so far tested. From the electromagnetic, geochemical and surface trenching data, it is obvious that only a small part of a large anomalous area has been probed, and, if future results are consistent with those of the initial drilling, a multi-million ton massive sulphide zone is indicated."