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8th April, 1953.

Mr. Emery H. Willes,
Chief Engineer,
The Argonaut Co. Ltd.,
P.O. Box 1000,
Campbell River, B. C.

Dear Mr. Willes:

Thank you very much for your letter of March 30th and accompanying material. I propose to have your letter referred to Dr. Black, who will be away until the end of this week. Our reports deal with the situation when properties are examined or at the end of the calendar year. I am glad to have the information concerning the present company officials and think that it should be incorporated. Possibly you could let me know approximately when the changes took place.

In regard to the interpretations in Dr. Black's report, I think that they are indicated as interpretations. Experience in several other replacement deposits in the coastal area leads me - and other members of our staff - to believe that replacement may well take place in greenstone in preference to limestone. That is not saying that in any particular case the replaced rock must be greenstone but the observation has been made in several places that greenstone has been more completely replaced than limestone lying next to it. I agree that we should do more work on replacement mineralization in the coastal area and elsewhere and I am glad to know your feeling on the matter. I shall be disappointed if we do not take advantage of the proposal you have made to do further work in the Iron Hill area.

Yours truly,

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HS/bl

M. S. Hedley,
for Chief, Mineralogical Branch.

JM

THE ARGONAUT CO. LTD.

P.O. BOX 1000 - CAMPBELL RIVER

TELEPHONES: 169 - 179

MARTIN SPYNE

BA

March 30th, 1953.

3030K

Mr. H. Sargent,
Chief, Mineralogical Branch,
Department of Mines,
Victoria, B. C.

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Dear Mr. Sargent:-

This will acknowledge receipt of your letter of February 20th and the manuscript of Dr. Black. My delay in answering has been due primarily to a wish to go over this report in some detail and the abundance of other problems that seemed at the moment most important.

There have been a few changes in our staff since Dr. Black was here, namely: A. F. Geiger replaces M. E. Broan as General Manager and John Martin replaces W. J. Christensen as Mill Superintendent. Other than that I find no major errors in reporting the facts, however, I do not agree with Dr. Black's interpretation of the facts, primarily on two counts:

1. Dr. Black states that the Limestone appears to be a single group of beds folded into an overturned syncline. On the other hand I believe this to be two unreplaced islands of limestone separated by a central sill and no syncline.
2. Dr. Black believes that the greenstone has been the primary host rock whereas I believe the limestone is the host rock.

To me this difference in theories is fundamental and means considerable in future exploration. It is my belief that the future of the Iron & Steel industry in B. C. depends to a major extent upon the ore reserves that are yet to be found. The ability to find future ore reserves is dependent to a great extent upon the correct interpretation of the genetic process involved, hence I recommend that the Department do considerable more work in the study of hydro thermal metamorphism as now is exposed and presently will be exposed in the Iron Hill deposit.

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Mr. H. Sargent

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March 30th, 1953

I am enclosing a panorama view of the pit as of March 1st and a Pit level map for your study. As I see it the outline of the magnetized zone is only what could be expected from hydro thermal metamorphism accompanying the Diorite and Granodiorite intrusion. I believe that through the process of assimilation and partial fractional crystallization during the cooling of the batholith, the limestone bed sandwiched between two volcanic flows was entirely cut through. What is left is a remnant of the old bed giving us a beautiful example of this process halted by cooling of the batholith, hence from a pure science point of view as well as National Resources the study of this hill should be very important.

Sincerely yours,

THE ARGONAUT CO. LTD.


Emery M. Willes
Chief Engineer

EHW:jm
Encl.

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REFERRED TO	DATE	INITIAL
ENTL.		
M.G.C.		
G.C.		
Accs.		
C.M.B.	✓	H/A
C.I.		
C.A.		
R.&T.		
J.H.B.	✓	RS
FILING CLERK	2/4	HC

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COMPARISON OF VARIOUS ORE RESERVE ESTIMATES

Japanese Estimate:

1,200,000 tons concentrate from mining 5,000,000 tons ore.

A.P. Fawley Estimate:

Ore	- 5,000,000 tons	
Concentrate	- 1,200,000 tons	
Tailings Concentrate	- 300,000 tons	
Old Concentrates	- <u>20,000 tons</u>	
Total Concentrate	- 1,520,000 tons	58% Iron

Peter Kiewit Estimate:

	(1,350,000 cu. yd.)	
Ore	- 4,050,000 tons	
Concentrate	- 1,010,000 tons	
Tailings Concentrate	- <u>125,000 tons</u>	
Total Concentrate	- 1,135,000 tons	60% Iron

J.G. Matthews Estimate:

Ore - Proven	- 354,500 tons	- 37% Fe
Probable	- 159,000 "	
Possible	- <u>304,000 "</u>	
	817,500 tons	
Concentrate	- 327,000 tons	
Tailings Concentrate	- <u>200,000 tons</u>	
Total Concentrate (60-65% Fe)	- 527,000 tons	

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Comparison with Argonaut Operation

	<u>Argonaut</u>	<u>Proposed Operation</u>
Materials Mined	- 8,800,000 long tons	1,600,000 long tons
Ore Mined	- 3,600,000 " "	817,500 " "
Concentrate Produced	- 1,887,985 " "	327,500 " "
Average Mill Heads	- 40%	
Average Concentrate Grade	- 56.3%	

Ratios

$\frac{\text{Materials Mined}}{\text{Concentrate}}$	=	$\frac{4.7}{1}$	$\frac{5}{1}$
$\frac{\text{Ore Mined}}{\text{Concentrate}}$	=	$\frac{2}{1}$	$\frac{2.5}{1}$

Tailings available at the mine amount to about 1,300,000 tons believed to grade about 20% iron. At a concentration ratio of 6.3 to 1 as indicated in tests, these tailings will therefore produce 200,000 tons of concentrate. Adding this to the total estimated reserves of proven, probable and possible ore in terms of concentrate, total reserves are therefore 527,500 tons.

SUMMARY OF ORE RESERVES IRON HILL

	TONS		TONS		TONS		VOLUME ORE & WASTE TO MINE PROV.&PROB. ORE: CU.YD.
	Proven Ore	Grade Fe	Probable Ore	Grade Fe	Possible Ore	Grade Fe	
SECTION 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	15,000	58%	6,000	?	-	-	20,000
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	28,000	47.5%	9,000	?	39,000	-	33,000
8	52,000	40.5%	40,000	?	-	-	178,000
9	112,000	33 %	32,000	?	-	-	170,000
10	-	-	-	-	-	-	-
11	101,000	35.16%	43,000	?	-	-	300,000
12	30,000	35 %	10,000	?	100,000	-	36,000
13	7,500	21.2%	6,000	?	20,000	-	41,000
14	9,000	38%	13,000	?	45,000	-	36,000
TOTALS	354,500	37%	159,000	?	304,000	?	814,000

Proven Ore - 354,500 Tons - 37% Fe
 Probable Ore - 159,000 Tons - ?
 Possible Ore - 304,000 Tons - ?
 Total - 817,500 Tons

Assuming a concentration ratio of 10:4 which is the ratio obtained during period June 1, 1953, to December 1, 1953, when mill heads averaged 35.6% Fe, reserves in terms of concentrates are as follows:

Proven - 142,000 Tons
 Probable - 63,500 Tons
 Possible - 122,000 Tons
 Total - 327,500 Tons