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O T T A W A

January 14th, 1942.

R E P O R T
of the
ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1148.

The Determination of Gold Values in
Ore from the Lone Star Mine, Dawson,
Yukon Territory.

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Bureau of Mines
Division of Metallic
Minerals

Physical Metallurgy
Research Laboratories

CANADA

DEPARTMENT
OF
MINES AND RESOURCES

Mines and Geology Branch

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Shipment:

20 tons of ore, contained in 498 bags, were received on October 7th, 1941, from the Pioneer Gold Mines of B. C. Limited, Vancouver, British Columbia. This material consisted of 35 samples taken from the property of the Lone Star Mine, Dawson, Yukon Territory.

This shipment was made to determine whether the

(Shipment, cont'd) -

usual sampling practice of bulk samples for assay would apply to the ore from the Lone Star property. The gold in this ore body is reported to occur in part as residual placer gold and in part as free gold in small quartz stringers which are almost flat. Some is also found associated with pyrite.

Sampling:

Each of the 35 samples was crushed to approximately 1/8 inch, and cut into four quarters in a riffle sampler. The first and third quarters were united and again quartered, yielding one-eighths of the original weight. The second and fourth of these quarters were united and quartered, yielding one-tenths of the total weight. The first and third of these quarters were united and ground to minus 14 mesh. The above procedure was then followed until $\frac{1}{4}$ of the minus 14 mesh portion was obtained. This was ground minus 35 mesh, quartered as above, and ground minus 100 mesh. This was further reduced in bulk and a minus 200 mesh portion obtained for assay.

Assays:

Ten one-assay-ton fusions were made on each of the 35 samples. No erratic assays were obtained from any of the samples, indicating the absence of spotty, high values.

The averages of the 10 assays made, together with the weights of the samples, are shown below:

(Continued on next page)

(Assays, cont'd) -

Sample No.	Weight, pounds	Assay, Au oz./ton	Weight X assay
1	1,620	0.37	599.40
2	1,521	0.0175	26.62
3	1,598	0.0025	3.99
4	1,464	0.25	366.00
5	1,249	0.0075	9.37
6	1,773	0.051	90.42
7	1,670	0.041	68.47
8	1,619	0.0075	12.14
9	1,218	0.015	18.27
10	1,668	0.084	140.11
11	1,635	0.035	57.23
12	1,244	0.122	151.77
13	1,238	0.0075	9.29
14	1,078	0.01	10.78
15	1,223	0.045	55.04
16	1,236	0.074	91.46
17	1,223	0.0225	27.52
18	1,249	0.021	26.23
19	1,203	0.048	57.74
20	1,252	0.032	40.06
21	1,206	0.015	18.09
22	1,199	0.035	41.97
23	980	0.202	197.96
24	974	0.023	22.40
25	919	0.015	13.79
26	807	0.035	28.25
27	806	0.02	16.12
28	845	0.085	71.83
29	792	0.0525	41.58
30	802	0.03	24.06
31	806	0.009	7.25
32	655	0.0075	4.91
33	992	0.0025	2.48
34	427	0.005	2.14
35	401	0.005	2.01
	40,592		2,356.75

Assay of total shipment = $\frac{2,356.75}{40,592}$ = 0.0581 oz./ton.

MILL RUN:

The lot after sampling was fed to a ball mill which discharged into a Denver gold jig where a sulphide-gold concentrate was obtained. The jig tailing was then passed over a 60-mesh screen, the oversize being returned to the ball mill. The minus 60 mesh material passed over a corduroy strake and thence to flotation. The flotation tailing was passed over a Wilfley table.

At the conclusion of the run the ball mill pumps, etc., were cleaned out, and the cleanings were passed through the jig and over the blankets. The flotation cells were run until a barren froth was obtained, and then were cleaned out and the cleanings run over the blanket strakes and the Wilfley table.

Operating samples were taken at 5-minute intervals. All jig and blanket concentrates were dried, weighed, and amalgamated. The amalgamation residues were assayed. The amalgam was retorted and the resulting gold was assayed.

The flotation concentrate and that from the Wilfley table were dried, weighed, and assayed.

The results of the mill run are as follows:

Product	Weight, pounds	Assay, Au oz./ton	Au oz. cont'd.	Distri- bution, per cent
Mill feed	40,592	0.0603 [Ⓞ]		
Gold recovered from jig concentrate			0.53704	43.9
Jig concentrate after amalgamation	12	6.09	0.03654	3.0
Gold recovered from blanket concentrate			0.15157	12.4
Blanket concentrate after amalgamation	115	0.426	0.02449	1.9
Flotation concentrate	254	2.45	0.31115	25.4
Flotation tailing		0.02		
Wilfley table concentrate	66	0.104	0.00343	0.3
Wilfley table tailing	40,145	0.008	0.16056	13.1

[Ⓞ] Calculated from products.

Conclusions:

The gold content of the 20-ton sample, as calculated from the products of the mill run, is 0.0603 ounce per ton. The average assay obtained by sampling and assaying each of the 35 samples is 0.0581 ounce per ton. The difference amounts to 0.0022 ounce, or approximately 3.6 per cent.

It is evident that the usual sampling procedure as applied to bulk samples yields accurate results with ore of this nature. However, as none of the 35 samples contained excessively high values, the effect of the absence of this factor on the sampling cannot be estimated.

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