

METALLURGICAL TESTS ON A SAMPLE OF

"DUSTY MAC" GOLD - SILVER ORE

submitted by

CANNON - HICKS ASSOCIATES LTD.

Our Project No: B300

Date: February 16, 1971

BRITTON RESEARCH LIMITED

1612 WEST THIRD AVENUE

VANCOUVER 9, B. C.

CANADA

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Consulting Metallurgists

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JOHN W. BRITTON, A.R.S.M., B.Sc., P.Eng.
PRESIDENT

February 16, 1971.

PHONE: 738-7195
AREA CODE: 604

Mr. H. Brodie Hicks,
Cannon-Hicks Associates Ltd.,
714-744 West Hastings Street,
Vancouver 1, B. C.

Dear Brodie,

Re: "Dusty Mac" mine

Results of our flotation and cyanidation tests on the composite sample of "Dusty Mac" gold - silver ore, which we received on January 7, 1971 were as follows:

Head assays

		<u>Direct assays</u>	<u>Calculated assays</u> (from test results)
Gold	(Au)	0.28 oz/ton	0.30 oz/ton
Silver	(Ag)	5.65 oz/ton	5.91 oz/ton

Flotation test

A 3000 gram sample of minus 10 mesh ore was ground wet in a ball mill to 82% minus 200 mesh and floated; the rougher concentrate was cleaned once. Test conditions and results are shown in tables 1 and 2; a screen analysis of the flotation feed is given in table 7.

Comments: 92.1% of the gold and 83.1% of the silver were recovered in the cleaned concentrate, which assayed 14.52 oz/ton gold and 255.6 oz/ton silver. An additional 0.5% of the gold and 1.7% of the silver were present

in the cleaner tailing. Only 0.2% of the gold and 0.8% of the silver were recovered in the scavenger concentrate. 7.2% of the gold and 14.4% of the silver were lost in the scavenger tailing.

Allowing for recirculation of cleaner tailings, it is expected that at least 92% of the gold and 84% of the silver would be recovered if similar ore is treated in a full-scale mill. (A coarser grind, say 60-65% minus 200 mesh, may be possible without seriously reducing the gold and silver recoveries.)

Cyanidation tests

Two 1000 gram samples of minus 10 mesh ore were ground for 15 and 20 minutes respectively at 60% solids. After thickening to 40% solids, the pulps were cyanided for 40 hours in an open rolling bottle, followed by filtering and washing of the residue. Test conditions and results are given in tables 3 to 6 inclusive.

Comments: After grinding to 67% -200 mesh, 96.4% of the gold and 94.4% of the silver were extracted by cyanidation. Cyanide and lime consumptions (0.62 lb NaCN/ton and 3.94 lb Ca(OH)_2 /ton) were satisfactory; the pulp filtered rapidly. Finer grinding, to 82% minus 200 mesh, improved the gold and silver extractions by only 0.3% and 0.7% respectively.

Yours sincerely,

BRITTON RESEARCH LIMITED

John W. Britton, P.Eng.
Consulting Metallurgist

JWB/l
Mr. H. Brodie Hicks (3)

Test 300 - Fl conditions

Table 1

	STAGES								Total
	1	2	3	4	5	6	7	8	reagents
Reagents: Lb/ton of ore									
H_2SO_4	-	-	-	-	-	1.5	-	-	1.5
$CuSO_4 \cdot 5H_2O$	-	-	-	-	-	0.3	-	-	0.3
CX-51 (a)	-	0.10	-	0.10	0.10	-	0.10	0.03	0.43
Pine oil	-	0.024	-	0.012	0.012	-	-	-	0.048
Aerofloat 31	-	0.032	-	-	0.016	-	0.016	-	0.064
Pulp volume - ml (b)	-	9000	9000	9000	9000	9000	9000	2600	-
% solids	60	28	28	-	-	26	26	6	-
Time - minutes	(c)	5	5	5	5	5	5	10	-
pH	-	8.4	8.5	8.6	8.7	6.7	7.6	8.5	-
Temperature - °C	-	22	22	23	23	23	24	20	-

Notes: (a) Potassium amyl xanthate; (b) Per 3000 grams of ore; (c) 3 batches of 1000 grams -10 mesh ore each ground for 20 minutes at 60% solids, combined for flotation.

Stages:

1. Grinding (82% -200 mesh)
2. Conditioning
3. Rougher flotation - 1st stage
4. " " - 2nd "
5. " " - 3rd "
6. Conditioning
7. Scavenger flotation
8. Cleaning (of rougher concentrate only)

Test 300 - F1

Table 2

Individual results

#	Product	Weight %	Assays		Distribution %	
			Au oz/ton	Ag oz/ton	Au	Ag
1	Cleaner concentrate	1.91	14.52	255.6	92.1	83.1
2	" tailing	3.23	0.05	3.13	0.5	1.7
3	Scavenger concentrate	1.03	0.06	4.75	0.2	0.8
4	" tailing	93.83	0.023	0.90	7.2	14.4
5	Head (calculated)	100.00	0.30	5.88	100.0	100.0
5	Head (direct assays)		0.28	5.65		

Cumulative results

1	Cleaner concentrate	1.91	14.52	255.6	92.1	83.1
1 + 2	Rougher "	5.14	5.43	96.9	92.6	84.8
1 to 3	Ro. + scav. concentrates	6.17	4.53	81.6	92.8	85.6

Test 300 - C1

Grind: 67% -200 mesh, 49% -325 mesh (1000 grams minus 10 mesh ore ground for 15 minutes at 60% solids)

Table 3

Metallurgical results

#	Product	Cyan. time- Hours	Amount	Assays		Distribution %	
				Au	Ag	Au	Ag
1	Cyan. filtrate*	40	3 litres	3.360 mg/l.	64.130 mg/l.	96.4	94.4
2	Residue	-	100.03%	0.011 oz/ton	0.331 oz/ton	3.6	5.6
3	Head (calculated)	-	100.00%	0.30 oz/ton	5.94 oz/ton	100.0	100.0
3	Head (direct assays) -			0.28 "	5.65 "		

* Including washes.

Table 4

Cyanide and lime consumptions

Stage	Cyan. time- Hours	Sodium Cyanide		Lime			
		Lb. 100% NaCN/ton of ore Added	Consumed	Lb. 100% Ca(OH) ₂ /ton of ore Added		Consumed	
				Ind.	Cum.	Ind.	Cum.
Grind	-	-	-	5.00	5.00)		
Cyanidation	40	7.76	0.62	2.00	7.00)	3.94**	3.94**
Total	-	7.76	0.62	7.00	7.00	3.94	3.94

** Including Ca(OH)₂ added to grind.

Test 300 - C2

Grind: 82% -200 mesh, 62% -325 mesh (1000 grams minus 10 mesh ore ground for 20 minutes at 60% solids)

Table 5

Metallurgical results

#	Product	Cyan. time- Hours	Amount	Assays		Distribution	
				Au	Ag	% Au	% Ag
1	Cyan. filtrate*	40	3 litres	3.350 mg/l.	64.35 mg/l.	96.7	95.1
2	Residue	-	100.20%	0.010 oz/ton	0.290 oz/ton	3.3	4.9
3	Head (calculated)	-	100.00%	0.30 oz/ton	5.92 oz/ton	100.0	100.0
3	Head (direct assays)	-		0.28 "	5.65 "		

* Including washes

Table 6

Cyanide and lime consumptions

Stage	Cyan. time- Hours	Sodium Cyanide		Lime			
		Lb. 100% NaCN/ton of ore		Lb. 100% Ca(OH) ₂ /ton of ore			
		Added	Consumed	Added	Consumed	Ind.	Cum.
Grind	-	-	-	5.00	5.00)		
)	4.36**	4.36**
Cyanidation	40	7.76	0.68	2.00	7.00)		
Total	-	7.76	0.68	7.00	7.00	4.36	4.36

** Including Ca(OH)₂ added to grind.

Screen analyses

Table 7

Mesh (Tyler)	<u>Feed to ball mill</u>			<u>Feed to test 300-C1</u>			<u>Feed to tests 300-C2 and 300-F1</u>		
	% retained Ind.	% retained Cum.	% passing Cum.	% retained Ind.	% retained Cum.	% passing Cum.	% retained Ind.	% retained Cum.	% passing Cum.
10	-	-	100.0	-	-	100.0	-	-	100.0
14	2.9	2.9	97.1	-	-	100.0	-	-	100.0
20	12.8	15.7	84.3	-	-	100.0	-	-	100.0
28	23.7	39.4	60.6	-	-	100.0	-	-	100.0
35	12.3	51.7	48.3	-	-	100.0	-	-	100.0
48	10.3	62.0	38.0	0.2	0.2	99.8	-	-	100.0
65	7.9	69.9	30.1	1.0	1.2	98.8	0.1	0.1	99.9
100	5.3	75.2	24.8	4.2	5.4	94.6	0.7	0.8	99.2
150	4.1	79.3	20.7	10.7	16.1	83.9	4.2	5.0	95.0
200	4.0	83.3	16.7	17.3	33.4	66.6	13.5	18.5	81.5
+325	3.7	87.0	13.0	17.7	51.1	48.9	19.6	38.1	61.9
-325	13.0	100.0	-	48.9	100.0	-	61.9	100.0	-
Total	100.0	100.0	-	100.0	100.0	-	100.0	100.0	-