DEPARTMENT OF MINES AND RESOURCES

BUREAU OF MINES

CANADA

Ottawa, November 13, 1946.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 2138.

Preliminary Report on Jigging and Flotation Tests on Lead-Zinc Ore from the Candego Mines Limited, Marsoui River, Gaspe Nord, Quebec.

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Note:
This report relates essentially to the samples as received. It shall not, nor any correspondence connected therewith, be used in part or in full as publicity or advertising matter for the sale of shares in any promotion.

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(Copy No. 5.)

1947

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
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Shipment:

A shipment of 100 pounds of ore from the Candego Mines, Marsoui River, Gaspe Nord, Quebec, was received at these Laboratories on September 23, 1946. In a covering letter dated October 4, 1946, Mr. E. H. Monroe, Candego Mines Limited, 1085 Beaver Hall Hill, Montreal 1, Quebec, requested that test work be undertaken on the sample to obtain both lead and zinc concentrates of marketable grades.

Chemistry and Mineralogy:

The iron and lead sulphides are coarsely crystalline; zinc is the resinous type of sphalerite. Pyrite is interspersed through both the lead and zinc, but from the various specimens examined there would not appear to be any close or intimate association of the lead and zinc. Quartz stringers veined the various samples examined.

Analysis of the head sample gave the following results:

Gold	-	0.05	oz./ton
Silver	-	10.51	"
Zinc	-	15.30	per cent
Lead	-	0.70	"
Iron	-	15.50	"
Arsenic	-	0.18	"
Copper	-	0.07	"
Bismuth	-	N.d.	

N.d. = None detected.

TEST WORK:

Small-scale jigging and flotation tests were made on this ore. Unfortunately, the sample submitted was too small for proper jig testing at a coarse size and had to be crushed to minus 20 mesh. This was found to be too fine to give the best results.

On the basis of the jig tests made on the minus 20 mesh ore, this method of treatment shows promise of yielding a high-grade lead concentrate.

The ore is readily amenable to concentration by selective flotation.

Test No. 5 - Jig Test.

Five thousand grams of minus 20 mesh ore was fed to a Denver Mineral Jig fitted with a 48-mesh screen and an artificial bed of 20-mesh magnetite. The results of this test are shown in Table I.

(Table I follows,)
(on Page 3.)

(Test Work, cont'd) -

TABLE I. - Results, Test No. 5.

Product	Weight, per cent	Analysis, per cent Pb	Analysis, per cent Zn	Distribution, per cent Pb	Distribution, per cent Zn
Hutch	4.4	85.20	0.20	33.5	0.1
Bed	6.0	24.49	13.23	13.3	5.3
Tailing	89.6	6.60	15.92	53.2	94.6
Total	100.0	11.11*	15.07	100.0	100.0

* This calculated head is higher than the head sample analysis but it was noted, in all tests, that the calculated head approximated 10.3 per cent lead rather than 9.70 per cent lead as analysed.

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Test No. 9. - Flotation Test.

Two thousand grams of ore at 60 per cent solids was ground in a ball mill to 57 per cent minus 200 mesh. The pulp was then transferred to a flotation cell, where the following flotation concentrates were removed:

(a) lead rougher concentrate (at a pH. of 7.4),
(b) lead scavenger concentrate,
(c) zinc rougher concentrate (at a pH. of 10.8), and
(d) zinc scavenger concentrate.

Both rougher concentrates were then cleaned by flotation.

Table II shows the amount and point of addition of the various reagents used, while Table III gives the results obtained on this test.

TABLE II. - Reagent Consumption, Test No. 9.

Point of Addition	Reagents, pounds per ton feed. Na_2CO_3	$ZnSO_4$	NaCN	Barrett's #4	Sodium ethyl xanthate	Cresylic acid	CaO	$CuSO_4$
Ball mill	3.0	1.0	0.2	0.09	0.10	0.04	-	-
Lead rougher flot. cond.	-	-	-	-	0.05	0.04	-	-
Lead scav. flot. cond.	-	-	-	-	0.05	0.04	-	-
Zinc rough. flot. cond.	-	-	-	-	0.15	0.04	2.0	1.5
Zinc scav. flot. cond.	-	-	-	-	0.10	-	-	0.5
Zinc cleaner flot. cond.	-	-	-	-	-	-	0.5	-
Total consumption	3.0	1.0	0.2	0.09	0.45	0.16	2.5	2.0

(Test Work, cont'd) -

TABLE III. - Results, Test No. 9.

Product	Weight, per cent	Assays Oz./ton Au	Ag	Per Cent Pb	Zn	Distribution, per cent Au	Ag	Pb	Zn
Test Heads (calc.)	100.0	0.045	10.12	10.27	14.85	100.0	100.0	100.0	100.0
Lead cleaner conc.	10.8	0.04	73.08	80.22	0.20	9.5	78.0	84.0	0.1
Lead cleaner tailing	3.6	0.18	11.88	9.00	2.48	14.3	4.2	3.1	0.6
Lead scavenger conc.	15.6	0.12	9.12	6.08	6.44	41.1	14.1	9.3	6.8
Zinc cleaner conc.	19.5	0.01	0.45	0.27	60.33	4.4	0.8	0.5	79.3
Zinc cleaner tailing	9.7	0.06	0.92	0.65	14.50	12.7	0.9	0.6	9.5
Zinc scavenger tailing	6.0	0.05	1.23	1.25	5.88	6.6	0.7	0.7	2.4
Flotation tailings	34.8	0.015	0.375	0.54	0.56	11.4	1.3	1.8	1.3

Summary of Results:

This ore is very easily treated, by flotation, to obtain both a lead and a zinc concentrate. Most of the silver in the ore is recovered in the lead concentrate.

Analysis of finished concentrates:

	Lead Concentrate	Zinc Concentrate
Gold, oz./ton -	0.04	0.01
Silver, " -	73.08	0.45
Lead, per cent -	80.22	0.27
Zinc " -	0.20	60.33
Iron " -	3.75	3.15
Copper " -	0.23	0.03
Arsenic " -	0.083	0.01

Recommendations:

This ore is readily treated by flotation, and in all probability any mill constructed on the property should be a flotation operation. However, jigging tests

(Recommendations, cont'd) -

indicated a definite possibility of concentrating most of the lead at a coarse grind, and it is felt that further test work on a larger sample should be undertaken. It is quite possible that a cheaper overall operation could be obtained by installing jigs ahead of the flotation circuit and it is strongly recommended that further test work on a continuous basis, along these lines be undertaken before a mill is installed on the property. A continuous test of this nature, using a two-compartment jig, would require a minimum of 1,000 pounds of ore.

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