TRI-53-54
R.290

MONTANA SILVER LEAD N.L.

FLOTATION OF NICKEL COPPER ORE FROM NORTH "CuNi" AREA

Investigation

Diamond drill cores were received from the Montana Silver Lead Company for splitting and assay for copper and nickel, and later a request was made for flotation tests to obtain some information as to the possible concentration of the copper and nickel minerals. The very limited amount of sample presented a problem to perform tests, and the results obtained can be taken more as a guide as to the recoveries obtainable by flotation concentration. It was not possible to determine optimum grade of concentrate.

The core tested was obtained from 123 feet to 134 feet and was low-grade, with sulphides generally disseminated as compared with the dense sulphides obtained at 136 feet to 139 feet. The material tested was virtually free of pyrrhotite as distinct from the high pyrrhotite content found in cores from 136 feet to 139 feet.

Copper and nickel minerals have not been identified, but it is assumed that they are principally the same as the dense ore from the lower elevation, i.e., chalcopyrite and pentlandite.

Results

Flotation resulted in a recovery of 91.6 per cent of the copper and 81 per cent of the nickel in a concentrate amounting to 12.6 per cent by weight, and assaying copper 8.14 per cent, nickel 3.96 per cent and sulphur 15.7 per cent. The ore contained 1.12 per cent of copper, 0.62 per cent of nickel and 2.1 per cent of sulphur.

The grade of concentrate could probably be doubled by controllable cleaner flotation which was not possible with the small quantity available for this test.

Flotation Conditions

	Lbs. ton/minutes	
	Rougher	**Cleaner**
Sodium Silicate	2/5	1/5
Copper Sulphate	1/5	0.25/5
Amyl Xanthate	0.5/5	0.25/2
Pine Oil	0.1	....
Flotation time/mins.	/4	/4
pH value	/8.7	/8.9

Grind. Stage screening to—85 mesh B.S., containing 72 per cent—200 mesh.

Product	Per cent				Per cent Distribution		
	Wght.	Cu	Ni	S	Cu	Ni	S
Cleaner concentrate	12.6	8.14	3.96	15.7	91.6	81.0	94.6
Cleaner tailings	9.4	0.5	0.25	0.7	4.2	3.7	3.2
Rougher tailings	78.0	0.06	0.12	0.06	4.2	15.3	2.2
Composite	100.0	1.12	0.62	2.1	100.0	100.0	100.0