

O T T A W A

September 10th, 1942.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1295.

Concentration of a Zinc Ore  
from Haynes Fork of Lynn Creek,  
British Columbia.

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Concentration of a Zinc Ore  
from Haynes Fork of Lynn Creek,  
British Columbia.

*Vancouver Island,*

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Shipment:

Two sacks of ore, net weight 130 pounds, were received on July 15th, 1942, from Palisades Zinc Mines Limited, 1489 McRae Avenue, Vancouver, B. C.

The two sacks, as received, each contained a bulk sample plus two canvas sacks. Channel Samples Nos. 1 and 2 were together in one sack, and Channel Samples Nos. 3 and 4 were in the other sack. The channel samples were identified by their number and the bulk samples by the markers of the channel samples in the sack in which they were found.

Location of Property:

The property of the Palisades Zinc Mines Limited, from which the present shipment was received, is located about seven miles up Lynn Creek from the Diversion Dam of the North Vancouver water supply system.

Sampling and Analysis:

All six samples were crushed, sampled, and assayed by standard methods. The samples were then combined, and the composite was resampled and used for test purposes. The analyses of the samples are as follows:

|                                      | Zn,<br>per cent | Pb,<br>per cent | Au,<br>oz./ton | Ag,<br>oz./ton |
|--------------------------------------|-----------------|-----------------|----------------|----------------|
| Channel Sample #1 -                  | 6.45            | None det'd.     | Trace          | 0.13           |
| " " #2 -                             | 6.83            | "               | "              | 0.21           |
| " " #3 -                             | 4.18            | "               | "              | 0.06           |
| " " #4 -                             | 23.46           | "               | "              | 0.05           |
| Bulk Sample<br>(1 & 2 Sacks) -       | 16.22           | "               | "              | 0.07           |
| Bulk Sample<br>(3 & 4 Sacks) -       | 17.51           | "               | "              | 0.12           |
| Composite Sample<br>from 114 pounds- | 15.79           | "               | "              | 0.10           |

Characteristics of Ore:

Six polished sections were prepared and examined microscopically for the purpose of determining the character of the ore.

Gangue -

In the polished sections, gangue material consists of moderately hard, mottled, light-green rock which bears a few local, light-brown stains of iron oxides.

Metallic Minerals -

In their order of abundance the metallic minerals visible in the sections are: sphalerite, chalcopyrite, and pyrite.

Sphalerite predominates as small masses and coarse to very fine irregular grains in gangue. It contains numerous

(Characteristics of Ore, cont'd) -

inclusions of gangue and medium to small grains of chalcop-  
pyrite and pyrite. The latter are locally abundant but  
only a small percentage of the copper and iron sulphides  
occur in this way.

Minor quantities of chalcopyrite and pyrite are  
present in the ore, largely as medium to fine irregular  
grains disseminated through gangue, but, as already men-  
tioned, small amounts occur in sphalerite also. The chalcop-  
pyrite encloses inclusions of gangue and grains of the other  
sulphides; in one of the polished surfaces pyrite veins both  
chalcopyrite and sphalerite.

Conclusion from Microscopic Examination -

To make an acceptable zinc concentrate from this  
ore should present no great difficulty.

Summary of Investigation:

No trouble is anticipated in the treatment of  
this ore and a zinc grade of 53 to 55% zinc, with a recovery  
of 90 to 95%, should readily be obtained, as demonstrated  
in the following metallurgical balance:-

| Products   | Weight,     | Assays, |      | Distribution, |        |
|------------|-------------|---------|------|---------------|--------|
|            | per<br>cent | Zn      | Fe   | Zn            | Fe     |
| Feed       | 100.00      | 15.79   | 6.50 | 100.00        | 100.00 |
| Zinc conc. | 26.95       | 54.75   | 9.50 | 93.38         | 39.38  |
| Tailing    | 73.05       | 1.42    | 5.39 | 6.62          | 60.62  |
| Products   | 100.00      | 15.79   | 6.50 | 100.00        | 100.00 |

Grind, 91.9% - 200 Mesh.

Ratio of Concentration = 3.6 to 1.

(Continued on next page)

(Summary of Investigation, cont'd) -

Reagents -

|                             |   | <u>Lb./ton</u> |
|-----------------------------|---|----------------|
| Ca(OH) <sub>2</sub>         | - | 6              |
| CuSO <sub>4</sub>           | - | 1              |
| Potassium ethyl<br>xanthate | - | 0.20           |
| Cresylic acid.              |   |                |

The samples as submitted showed considerable evidence of oxidation, requiring 6 to 9 pounds of lime per ton of ore to maintain adequate alkalinity. This should be reduced considerably if treating fresh ore.

Details of Investigation:

No difficulty was experienced in the treatment of this ore, consequently three tests only were run. Details of these were as follows:

|                    | Test No. 1. |          |       |               |        |
|--------------------|-------------|----------|-------|---------------|--------|
|                    | Weight,     | Assays,  |       | Distribution, |        |
|                    | per         | per cent |       | per cent      |        |
|                    | cent        | Zn       | Fe    | Zn            | Fe     |
| Zinc cleaner conc. | 16.56       | 53.83    | 9.71  | 53.9          | 24.15  |
| " " tailing        | 16.30       | 38.73    | 11.00 | 38.1          | 26.93  |
| " middling         | 2.72        | 9.64     | 12.00 | 1.5           | 4.89   |
| Final tailing      | 64.42       | 1.66     | 4.55  | 6.5           | 44.03  |
| Products           | 100.00      | 16.56    | 6.66  | 100.0         | 100.00 |

Grind, 91.9% - 200 Mesh.

Reagents -

|                             |   | <u>Lb./ton Ore</u> |
|-----------------------------|---|--------------------|
| Ca(OH) <sub>2</sub>         | - | 6                  |
| Potassium ethyl<br>xanthate | - | 0.22               |
| CuSO <sub>4</sub>           | - | 1                  |
| Cresylic acid.              |   |                    |

Zinc float cleaned once - no reagents.

(Details of Investigation, cont'd) -

Test No. 2.

|                      | : Weight,<br>: per<br>: cent | : Assays,<br>: per cent |         | : Distribution,<br>: per cent |          |
|----------------------|------------------------------|-------------------------|---------|-------------------------------|----------|
|                      |                              | : Zn                    | : Fe    | : Zn                          | : Fe     |
| Zinc recleaner conc. | : 11.13                      | : 55.35                 | : 9.94  | : 35.61                       | : 15.30  |
| " " tailing          | : 14.81                      | : 51.81                 | : 11.04 | : 44.34                       | : 22.67  |
| " cleaner tailing    | : 6.84                       | : 37.34                 | : 12.80 | : 14.74                       | : 12.24  |
| " middling           | : 2.84                       | : 9.41                  | : 13.90 | : 1.56                        | : 5.42   |
| Final tailing        | : 64.38                      | : 1.01                  | : 4.96  | : 3.75                        | : 44.37  |
| Products             | : 100.00                     | : 17.30                 | : 7.19  | : 100.00                      | : 100.00 |

Grind, 87.6% - 200 Mesh.

Reagents -

|                          | <u>Lb./ton Ore</u> |               |
|--------------------------|--------------------|---------------|
| Ca(OH) <sub>2</sub>      | - 8                | (pH, 9.2)     |
| Potassium ethyl xanthate | - 0.10             |               |
| Amyl xanthate            | - 0.04             | (to middling) |
| CuSO <sub>4</sub>        | - 1                |               |
| Cresylic acid.           |                    |               |

Zinc float cleaned twice with 1 lb. Ca(OH)<sub>2</sub> per ton.

Test No. 3.

|                      | : Weight,<br>: per<br>: cent | : Assays,<br>: per cent |         | : Distribution,<br>: per cent |          |
|----------------------|------------------------------|-------------------------|---------|-------------------------------|----------|
|                      |                              | : Zn                    | : Fe    | : Zn                          | : Fe     |
| Zinc recleaner conc. | : 18.91                      | : 54.75                 | : 9.50  | : 65.19                       | : 27.77  |
| " " tailing          | : 8.29                       | : 44.22                 | : 9.50  | : 22.89                       | : 12.18  |
| " cleaner tailing    | : 3.22                       | : 15.79                 | : 13.15 | : 3.19                        | : 6.54   |
| " middling           | : 3.75                       | : 19.78                 | : 13.35 | : 4.61                        | : 7.73   |
| Final tailing        | : 65.83                      | : 1.01                  | : 4.50  | : 4.12                        | : 45.78  |
| Products             | : 100.00                     | : 16.03                 | : 6.45  | : 100.00                      | : 100.00 |

Grind, 85.7% - 200 Mesh.

Reagents -

|                          | <u>Lb./ton Ore</u> |  |
|--------------------------|--------------------|--|
| Ca(OH) <sub>2</sub>      | - 9                |  |
| Potassium ethyl xanthate | - 13               |  |
| CuSO <sub>4</sub>        | - 1                |  |
| Cresylic acid.           |                    |  |

Zinc float cleaned twice with 1 lb. Ca(OH)<sub>2</sub> per ton.

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