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THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

DEPARTMENT OF METALLURGY

December 21st, 1973.

Mr. Peter Dyas,
Anvil Mining Corporation Ltd.,
P.O. Box 1000,
Faro,
Yukon Territory.

Dear Mr. Dyas:

The work on the analysis of the samples you sent us is now complete. I am enclosing the report and computer data herewith.

Due to some economics of probe time, it turned out that the total cost of this work is somewhat less than I had originally anticipated. Accordingly, the revised cost is $1,050.00. I have asked our accounting department to look after the billing procedures, and you will be hearing from them soon.

Yours sincerely,

E. Teghtsoonian,
Head of the Department.

ET/dc

Encl.

March 12, 1974

Mr. R. Butters
Department of Metallurgy
and Mineral Processing
University of British Columbia
Vancouver, B.C.

Dear Sir:

Subsequent to our telephone conversation last week, I would like to confirm in writing our requirements for future work with your Micro Probe Analyser:

(i) We would like you to re-assess the bivalent metal ion total in the zinc mineral lattice. As I mentioned, I think most of your figures show a mole percent 3 to 4% below the 67% limit, indicating a machine bias, which may be due to the use of pure metal standards.

(ii) Two samples of lead concentrates are now en-route to you for analysis for silver minerals. My observations during the last four years have suggested that the silver is dissolved in the PbS lattice - the dissolution concentration varying from place to place in our open pit. However, if you can locate any silver "hotspots" indicating a possible silver mineral presence, I can initiate a detailed study to attempt to improve our silver recovery.

(iii) A few samples of zinc concentrates, April 1973 to December 1973, are also en-route for a standard examination for dissolved contaminants in the sphalerite lattice.

Please keep in touch during your investigation and do not hesitate to contact us if you require clarification on any points. Should you require additional data about our process, I would be glad to forward it to you at U.B.C.

Regards,

ANVIL MINING CORPORATION LIMITED

P. J. Brown
Chief Metallurgist

cc: NGC; RLH; RF; LPT; RLC; DAB
/peg File

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

DEPARTMENT OF METALLURGY

May 17, 1974

Mr. P.J. Brown
Chief Metallurgist
Anvil Mining Corporation Ltd.
P.O. Box 1000
Faro, Yukon

Dear Sir:

Enclosed please find a computer read-out of a repeat analysis on your April 1973 zinc concentrate sample.

In order to try to resolve the problem of the abnormally high sulphur results obtained on your samples, we repeated the analysis on one sample. After extensive discussion, the only logical explanation that could be reached for the high sulphur (by difference) values was that the carbon film which we placed over the surface of the specimen to render it electrically conductive was absorbing some of the characteristic radiation from the metallic elements. Since the standards (pure Zn, Fe and Mn) were not coated with carbon, the net result would be that the apparent metal content of the sphalerite grains would be low.

In order to prove this, the April 1973 sample (which was the worst example of high sulphur content) was repolished and recoated with carbon under conditions such that the thinnest possible layer of carbon consistent with a reasonably conductive surface was deposited. Nineteen grains of this sample were then analysed for zinc and iron only and the results submitted to the computer program for corrected results. As suspected, the sulphur (by difference) values were reduced from 40.39 ± 0.04 wt.% to 36.77 ± 0.4 wt.%. Since very little manganese was originally detected in this sample, there was no need to analyse for the manganese content in this last run.

In order to check to see if the relative metal analyses were affected by the thickness of the carbon film, the ratios of zinc to iron were calculated for both runs and were found to be essentially unaffected (wt.% ratio 6.69 and 6.52 for the first and second runs respectively).

Considering that these two runs involved a different group of mineral grains and considering the basic limitations of the accuracy of the microprobe technique (generally considered 1-2% of the amount present under the best conditions), I feel that there is justification in assuming that the sulphur content is 50 wt.% and scale the metal values accordingly. This should introduce no relative error in the zinc, iron and manganese results, since any absorption of their radiation by the carbon film should be almost the same for each.

I had a look at the repolished April 1973 sample on our Scanning Electron microscope just to see if anything might show up that wasn't visible on the microprobe. Nothing significant was observed, but I have included one photograph and two non-dispersive analytical read-outs just for information.

The chart plot labelled "clean grain" is a qualitative analysis of a single sphalerite grain which showed no detail or substructure at any magnification. As expected, the analysis shows Zn, S, Fe and a small amount of Cu. The other plot (#4671) shows the analysis of two regions of a sphalerite grain with a visible substructure. The areas analysed are marked on the accompanying photograph as small squares. Area (1) analyses as a normal iron containing sphalerite and Area (2) shows the presence of a significant amount of lead as well as iron, zinc and sulphur. I don't know whether Area (2) is just galena and the zinc radiation is the result of fluorescence from the adjacent sphalerite or if the area represents some other sulphide containing both zinc and lead. This grain is typical of many that could be easily observed in the sample using an ordinary optical microscope. The lead containing area appears white compared to the bluish gray sphalerite.

I hope that these results may be of some use to you. So far I have not received the other samples that you mentioned in your letter.

Yours truly,

R Butters

R.G. Butters

/jnh

Encl.

ANVIL MINING CORPORATION LIMITED

From: **P. J. BROWN** Date 17/12/74

To: OCT ZINC COMP.

	Zn	Fe	Mn
U.B.C EST.	56.5	10.2	1.4
RESCALED.	55.6	10.0	1.4

Anvil Mining Corporation Limited

July 19, 1974

Dr. R. J. Butters
University of British Columbia
Department of Metallurgy
Vancouver 8, British Columbia

Dear Dr. Butters:

Many thanks for your report on silver distributions in the Anvil lead concentrates. We were especially interested to learn that you believe that there exists some possibility of a discrete silver rich mineral in the ore.

We have in the past attempted correlations between silver and various minor elements (Cu, Sb, As, Bi), without notable success. However, I have always been suspicious of some of the data - particularly minor element determinations, and therefore do not attach too much importance to the lack of clear cut correlations.

Please continue your work on three more samples of lead concentrates (the particular samples are immaterial), and keep us informed. In view of the importance of your work to us, I would be most grateful if you would send additional sets of photographs and copies of communication to those listed below:

Mr. R. Fukuhara
Plant Metallurgist

and

Mr. D. A. Blundell
Chief Assayer

Many thanks for your help,

P. J. Brown
Chief Metallurgist

cc: N. Cornish
R. Haffner
F. Taggart
D. Blundell
R. Fukuhara
R. Cook

/peg

Post Office Box 1000, Faro, Yukon Territory Telephone (403) 994-2600 Telex 0498277

P.J.B.

Cyprus Anvil Mining Corporation

Post Office Box 1000
Faro, Yukon Territory
Y0B 1K0
Telephone 403) 994-2600

Telex 036-8-208

November 27, 1974

University of British Columbia
VANCOUVER 8, B. C.

ATTENTION: Dr. R. G. Butters

Dear Dr. Butters:

As yet we still haven't received any more data regarding your work on silver in our lead concentrates. The work is of considerable interest to us since the recent increase in silver prices. Please let me know if you have problems with the scheduling of the three lead samples for examination.

On route to you now are ten zinc concentrate samples. Would you subject them to a microprobe scan and estimate Zn, fe, Mn, and S please, corrected for carbon absorption. We have reason to believe that some of these samples will show a marked departure from those you previously examined.

Many thanks for your help.

Yours truly,

Peter J. Brown
Chief Metallugist

cc: J. F. Olk
R. L. Cook
D. A. Blundell
R. S. Fukuhara
N. G. Cornish

PJB/nae

CYPRUS