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Cyprus Anvil Mining Corporation

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August 10, 1981

Dr. Tetsuro Urabe
Institute of Geology
Faculty of Science
University of Tokyo
Hongo, Bunkyo-Ku
Tokyo, Japan

Dear Tetsuro:

We have read with interest your progress reports on the DY deposit and respectfully offer the following comments. Unfortunately, your reports arrived in Faro shortly after Brian wrote to you on 3 June, 1981; thus this follow-up letter (belated by the Canadian mail strike).

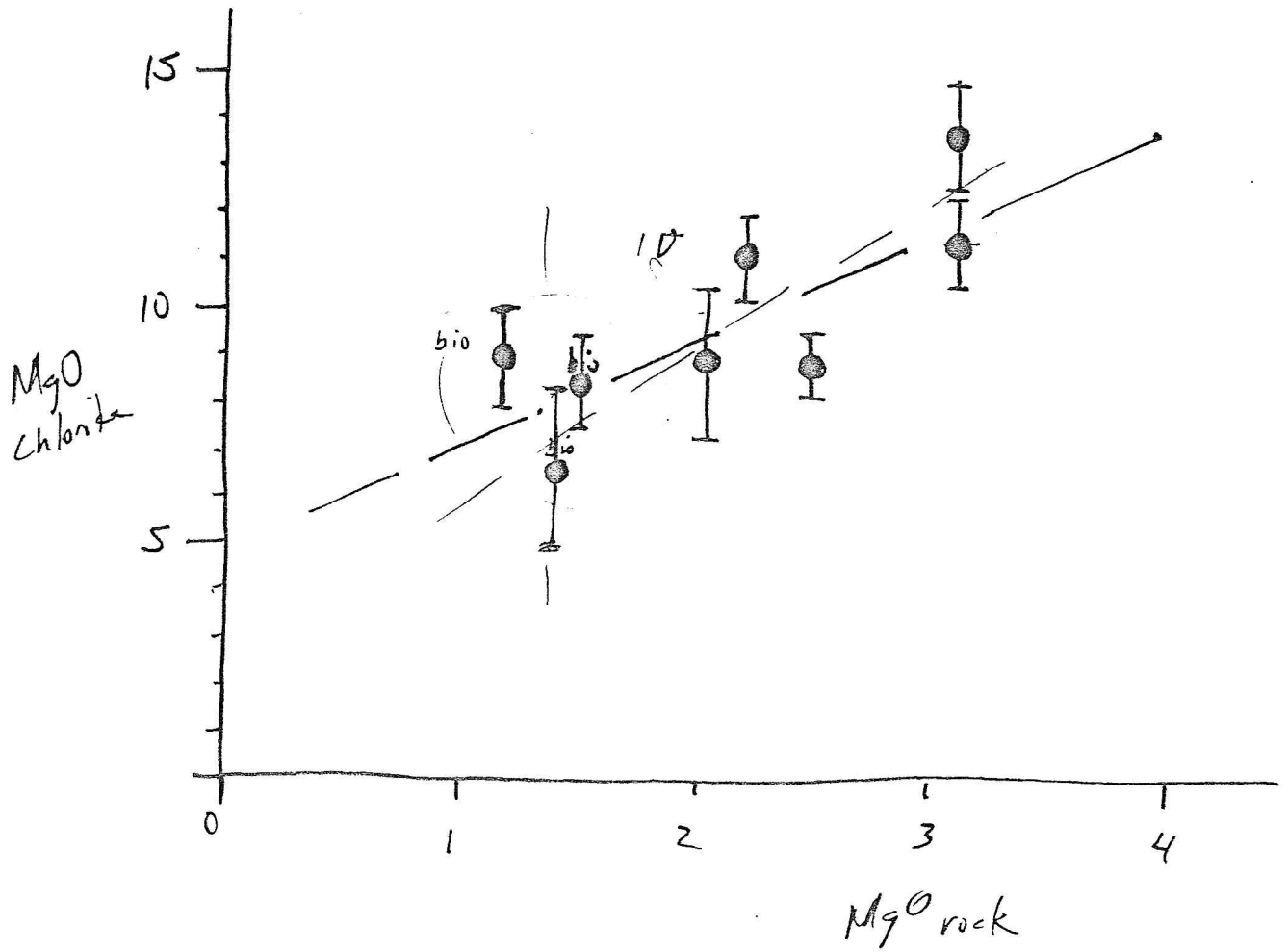
Your work on the baritic units is encouraging and should be useful in the physio-chemical modelling of an "Anvil Cycle", as well as defining zonation trends which could be useful as: (a) an exploration tool (if the Fe/Mg trends can be related to grade), (b) a top indicator and local correlation indicator. In general, we feel this work is worthwhile. Our only additional comments are: (a) you might look more closely at vertical systematics within a single baritic horizon, i.e. intra-horizon vertical as well as lateral variation; (b) you might consider the possibility that $A_{Fe}/Fe+Mg$ variation within a single grain of dolomite or siderite may be due to variation in A_{Fe+2} during metamorphism. Keep in mind, these deposits have been twice regionally metamorphosed and at least partially (if not totally) recrystallized during both events. We're troubled that you tend to treat the potential effects of metamorphic recrystallization lightly.

While the work on the baritic units seems well conceived and potentially useful, your 4L study causes us some concern for numerous reasons:

1. You originally intended to study the 4L facies of horizon 5 - presumably the least overprinted by successive hydrothermal (?) events. Quite why you chose 4L associated with horizon 1 is a minor mystery.
2. Having chosen horizon 1 4L, we are at a complete loss to understand why you have analysed chlorites from both 4L and 3G (or at least questionable 4L at best) and treated them as all coming from 4L. It seems to us this is comparing apples to oranges.

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CYPRUS



November 12, 1980

Dr. W.C. Shanks
University of Wisconsin-Madison
Department of Geology and Geophysics
Lewis G. Weeks Hall for Geological Sciences
1215 W. Dayton St.
Madison, Wisconsin
53706

Dear Pat:

Both Tetsuro and I were pleased to learn from your letter of October 6 that you will join us in our study of alteration in the DY deposit. Oxygen isotopes will be an important part of the research and cannot be done in isolation from the other work that we are planning. We agree with you that a co-authored paper (or papers) should be the eventual goal. If you are indeed able to do hydrogen isotopes in 1981, this will likely be an important addition to the project. I was obviously mistaken about your doing a regional oxygen isotopic survey of the Cyprus-Anvil deposits (must have muddled something that Dave Jennings told me) although, looking to the future, it might be a natural follow-up to the detailed study at DY.

At present, Tetsuro is doing the bull work on thin sections preparatory to selecting samples for major element and REE analysis. We are doing the rare earths by neutron activation using our facilities here at Toronto. Tetsuro estimates that these analyses will be underway in about one week. It takes approximately forty days to complete one batch of analyses, mainly because of the cooling off required from the reactor for the long half-life isotopes. When these and the majors are done, we will send the results to you and we can then collectively discuss which samples ought to be processed for oxygen, and eventually, hydrogen isotopes. We will, of course, keep Dave and Brian Hall up to date on our progress as well.

I am sorry that we will not meet at GSA but a new

Dr. W.C. Shanks

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November 12, 1980

arrival in your family is a far more important occasion.

With best wishes,

Sincerely yours,

Steven D. Scott
Professor and Associate Chairman

SDS:sls

cc: Dave Jennings
Tetsuro Urabe

June 9, 1980

Mr. Dave Jennings
Cyprus Anvil Mining Corp.
330-355 Burrard St.
Vancouver, B.C. V6C 2G8

Dear Dave,

When we met in Whitehorse in December Steve Scott and I (Tetsuro Urabe) promised to send you a proposal requesting to do research on the DY deposit, Cyprus Anvil mine. I saw Brian Hall again in Halifax in May and explained my plan to visit your mine for a couple of weeks. As we discussed before, Steve and I are doing a comparative study of Japanese Kuroko deposits with massive sulfide deposits in Canada. We are planning to stress sediment-hosted massive sulfide deposit, especially DY deposit, this year. The reasons why we have selected this deposit are many. First, there are nearby volcanics and we can check the genetic relations, if any, between the ore and volcanism. Also we learned at the Whitehorse meeting that your geological staff is very knowledgeable and there are a lot of geologic data on the deposit.

We are interested in doing, (i) Rare Earth Element (REE) study on barite and phosphate, (ii) strontium isotope study on barite, (iii) detailed mineralogical (Electron Microprobe, XRD) and geochemical (XRF, etc) studies on footwall sediments, (iv) sulfur isotope study on both ore minerals and footwall sediments, and (v) lead isotope study (if possible) together with the geological description of the deposit.

I learned from Brian that a graduate student from the

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University of Minnesota will do some sulfur isotopic work on the DY deposit. If that is the case, we will either not do this ourselves or will co-operate with her and analyze samples different from her.

The main intentions of our investigation are; (i) to deduce the origin of metals by means of REE, Sr isotope, and Pb isotope studies, (ii) to establish the alteration mineralogy within the footwall unit by means of detailed mineralogical study, and (iii) to know the shape and lateral extent of the depositional basin by geological and geochemical studies.

I am writing to request your permission to visit the mine and to do research on it. If you agree to allow me to do so, I prefer to visit 2-3 weeks from July 21st to middle August. I am planning to attend the International Symposium on Water Rock Interaction which will be held in Edmonton on July 16 - 20 and fly to Whitehorse on July 20th. I will look forward to your reply with eager anticipation.

There is one thing to be explained clearly again here. The bulk of the financial support for this research is coming from a Research Award given to Steve By Riocanex in Toronto. The money is given to him with "no-strings attached" to do pure academic research and is regarded to be no different from grants obtained from government agencies. Riocanex agreed wholeheartedly that all data that we collect must be given immediately to whoever owns a particular deposit we may study. Likewise, as is the case for the government grants, we must be free to publish our results three months after we have filed our reports. We have such an agreement with all other parties with whom we are involved. I hope that the source of funds is not a problem for you. Actually, we had no problems in this regard during the research last year. You may recall that when we explained

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the situation to you in Whitehorse you saw no problem with our Riocanex support. Steve might also add that despite this generous support we are nevertheless short of funds to carry out our project so any logistic or other type of support that Cyprus Anvil could give us would be greatly appreciated.

I hope that our proposed work on DY deposit will be of interested and again I will look forward to hearing "good news" from you.

Sincerely yours,



Tetsuro Urabe
Visiting Researcher

cc: Steve Scott

P.S.; Steve has learned that George Gorzinski will be doing a Master thesis at UBC with Colin Godwin on the barites at your Cirque deposit in central B.C.. George is a 1980 Toronto graduate and took the fourth year ore deposits lecture from Steve and labs from me. He is a good man and if he retains some of what we taught him, he should do a fine job for you.

P.P.S.; Please find few reprints of my paper on Kuroko deposits.

July 28, 1980.

Dear Tetsuro Urabe:

Further to our conversations over the last week, this letter summarizes the consenses of opinion which was arrived at. The studies which you will undertake will be restricted to:

- 1) Sr isotopes and REE distribution patterns of the baritic massive sulphides and;
- 2) the alteration overprint and possible lateral equivalents outside the orebodies.

The study of the Sr isotopes and REE patterns will be conducted in concert with Drs. Jennings and Ryan. The alteration overprint study we have, as Cyprus Anvil's representative, Brian Hall, who will assist and oversee the project.

The objectives of the Sr isotope and REE distribution studies will concentrate on establishing patterns diagnostic of possible source rock lithologies for the ore forming solutions.

For the alteration overprint study, the objectives will be:

- 1) determine the spatial relationships of the various alteration facies within the alteration overprint lithology (4L).
- 2) document the mineralogical changes coming into the alteration overprint.
- 3) determine the chemical signatures of the various alteration facies, with regard to their spatial distribution.
- 4) conduct systematic mineral analysis of diagnostic minerals within the various alteration facies, in conjunction with the whole rock analysis.
- 5) accurate mineralogical identification of the alteration overprint mineralogy.
- 6) document the spatial distribution of the Ti bearing phases, both within the alteration overprint and the surrounding country rock.

Financial aid where required will be forthcoming and negotiated when the need arises.

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This is indeed an ambitious undertaking and I hope everything turns out as planned.

I trust that the above conditions are satisfactory to all parties concerned.

B V Hall

B.V. Hall.

T. Urabe

Dr. T. Urabe,
July 28, 1980.