

June 15. 1992

NOTE TO : EXPLORATION SERVICES MANAGER - P. STOKER
ATTENTION : P. FORRESTAL. K. MAIDEN. S. BROWN
FROM : PROJECT GEOLOGIST - K. HANNAN
SUBJECT : BLOODWOOD BORE - COMMENT ON P. STOKER MEMO (3/6/92)

Peter Stoker's Memorandum concerning my Filenote on mineralisation at Bloodwood Bore raised some interesting questions and highlighted the need to clarify one or two of the conclusions presented in the Filenote. The opportunity is also taken to present oxygen-isotope data from the B1 copper prospect north of Bloodwood Bore. Peter's questions are dealt with sequentially. A copy of the Memo. with enumerated points and comments, is attached to this Note.

point 1

No. the Pb-Zn and Cu ore systems of Mount Isa can't be distinguished isotopically. There is certainly a need to look *more closely* at the oxygen-isotope signature of dolomite associated with Pb-Zn mineralised horizons at Mount Isa and Hilton.

point 2

The proto-ore brine would not have been Pb-Zn- or much less. Cu-charged until it had become hotter, more reduced and more acidic by interaction with deeper basinal sediments or basement. It is possible that the sporadic and low-grade disseminated base-metal mineralisation observed regionally throughout some horizons of carbonate-rich units of the region indicate the widespread effects of early, 'immature' basinal brines during diagenesis.

point 3

No. I made isotopic and textural *comparisons*: namely, (a) that BB mineralisation is texturally similar in some respects to MVT/Irish-style mineralisation, and (b) that BB mineralisation is isotopically similar to M^c Arthur River's in terms of dolomite $\delta^{18}O$ values (but *not* $\delta^{34}S$ values). Thus, I did not conclude that mineralisation at Kamarga is "related" to the M^c Arthur River mineralisation: rather, I pointed out that *despite* differences in style (reflecting *local* controls), the fluids responsible may have *evolved* in a similar manner (in terms of tectonic setting, type of source rocks and temperature).

point 4

Analyses of B1 Cu Prospect dolomite were received soon after the BB Filenote was produced. To summarise, the dolomite of wallrocks intersected by DDH BB003 is considerably ^{18}O -depleted. Their $\delta^{18}O$ values are similar to the vein/mineralisation dolomite of the JB Zn prospect (*i.e.*, 13-16‰). One vein in BB003 yielded a value

of 11.9‰, and its wallrock host a value of 16.2‰. Such disequilibrium, as discussed elsewhere, probably indicates the effects of a small and relatively non-penetrative hydrothermal system. The sharp decrease in wallrock $\delta^{18}\text{O}$ values from 16.2‰ at 100m to about 13.5‰ at 200m downhole supports this conclusion.

Importantly, the data indicate that fluids associated with copper mineralisation in the northern Lawn Hill Platform were capable of *significantly* depleting host rock $\delta^{18}\text{O}$ values, as they were in the Mount Isa district, the southern Lawn Hill Platform (*i.e.*, Buckley River area), and deposits such as McLeod Hill (refer Hannan, 1992). The comment suggesting otherwise in my Filenote therefore seems, fortunately for us, to be incorrect.



Keith Hannan

Reference

Hannan, K.W., 1992. Comments on the Waring (1991) isotope report: MIMEX Filenote to Principal Geologist (KJM), 7pp with 1 table.

KWH c:\mim\report\note7

MEMORANDUM

To : Peter Forrestal
Attention : Keith Hannan
From : Peter Stoker
Date : 3 June, 1992
Subject : **Bloodwood Bore**


I read with interest Keith Hannan's file note dated 7/4/92, "A Discussion of Mineralisation at Bloodwood Bore".

I have several questions:

1. In the discussion of the "dolomite stable isotope compositions" (bottom p2, top p3). Is the $\delta^{18}\text{O}$ -depleted dolomite at Mount Isa a function of copper mineralisation or lead-zinc mineralisation, or both, or don't we know that yet? If it is of either copper mineralisation or the cause is not known, then if we have only minor copper mineralisation close by at Kamarga, perhaps this is not a crucial point. (1)
2. In the section on p4 on "Discussion and Implications," on the point about the Kamarga fluid exchanging with a reservoir of heavy sulphur before mineralisation, could Keith offer some thoughts as to what may have happened if that proto ore-brine was copper and lead-zinc bearing at that point. If mineralisation may have been deposited at that location, has Keith got any indications as to where this postulated exchange may have taken place? (2)

Keith seems to draw the conclusion that the fluid and mineralisation at Kamarga is related to the McArthur River mineralisation. He also draws the conclusion that it may be related to zinc-dominated Irish-style deposits and MVT deposits. I would have thought these two were different. If the Kamarga mineralisation is related to McArthur style ore, then it would appear worth pursuing. If it is not, then I tend to agree with his comments in the last paragraph. (3)

One thing that is not addressed in this memo which I think would be useful is, does Keith have any information on the isotopic composition of the dolomites associated with the copper at the B1 copper deposit. There is no mention of this in the whole of the memo and with our priority being copper mineralisation, I would have thought it should have deserved a place in such a file note. (4)



Peter Stoker
Manager - Exploration Services

cc. DOZ
KJM