CURRAGH RESOURCES INC.

Inter-Office Memorandum

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cc: **Toronto Office**
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RE: GEOSTATISTICAL STUDY

DATE: 05 29 1990

Apologies on the sluggish delay in getting back to you on geostatistics. I take it Mohan Shrivastava did not reply to the request for proposal, he has visited the site previously and already has some of the geology and data under his belt. His text book on geostatistics was recently published, by the way.

I am strongly supportive of this investigation. We carried out a similar review shortly after reopening the mine. At that time, the conclusion was that the geologic complexity of the deposits was the primary detriment in the reliability of tonnage and grade estimation and that geostatics could not help with that. Due to the unclustered nature of the data points (except Grum), it was felt that kriging would not necessarily help improve grade estimation on the basis of diamond drill hole data available at that time.

The situation has changed dramatically now that the drill density has been increased, thus I feel that it is more likely that geostatistics and kriging will be of value. For one thing, the data is now clustered more at Faro. But mostly I suspect you now will be able to get a meaningful variogram from diamond drill hole data - this could not be done before.

I believe the objectives outlined in Dagbert's letter are good ones but I would like to see consideration of the applications of geostatistics to grade control in the pit added to this list.

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I recommend some things be done before the selected geostatician arrives:

1. Compile blasthole data for several benches with XYZ coordinates - I suggest using the core data that we put into a PCXPLOR database some time ago;

2. get deep blasthole data (if available) and diamond drill hole composites for the same benches organized into files;

3. get the original geological interpretation on the bench and the final interpretation from pit mapping for the same benches - have this digitized and standing by;

4. select benches with good blasthole data, not 40' holes split into parts, etc., also preferably benches that were mined on grade; (these to limitations may not be possible to live within); and

5. do several contiguous benches, preferably the lowest four benches in the pit.

I feel very strongly that geostatistics offers us powerful capabilities in the grade control practices in the open pit. I doubt the current area of influence method really grades ore adequately. The concept that one blasthole in the centre of a 1,200 tonne block of ore adequately evaluates the grade of that block is naive at best.

Assuming that the grade could be representative, it is not likely that the variance of the sample of cuttings is the same as the 1,200 tonnes of sulphides - it is a virtual certainty that the variance will be different. I believe the blasthole, and it's neighbours, give us some idea of the probability that that block is ore or waste. It is that probability we should be estimating by kriging and establishing our pit operational decisions on a threshold probability that a block is ore. I believe the field here is called indicator kriging.

Please note that these applications of geostatistics in the pit can only be realized if the data is organized and the methodologies are streamlined. This can be done with our current tools but our staff are not sufficiently trained in the intricacies of their use and have neither the time nor hardware to get the plan done. Nonetheless, the data must be organized and spatially related - without this there will be no application of modern geostatistical technology possible in our ore control practice.

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ORECONTROL, by GEMCOM is a tool currently available that is compatible with our other software, that will accomplish this spatial organization and relieve technicians of unproductive data entry digitizing and plotting. Without the purchase of such a tool, there will be no possibility of realizing the benefits of modern geostatistical science at the Faro Mine.

I look forward to the results of this investigation. Please do not hesitate to contact me if our staff can help in the preparation and presentation of data and goelogic concepts to aid the investigation.

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