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CURRAGH RESOURCES INC.

INTER OFFICE MEMORANDUM

DATE: November 14, 1990

To: Eric Beaumont, Manager of Processing
From: Gordon Wilson, Chief Metallurgist
Subject: VANGORDA CAP METALLURGY PROGRESS REPORT 12/11/90

1.0 Objective

To record the work of the Curragh Metallurgical Section, in determining a processing route for the Vangorda Cap Materials.

2.0 Background

2.1 Different ore bodies are known to exhibit characteristics that require varied metallurgical treatment routes. At the time of writing, the Curragh Faro orebody is almost depleted and Vangorda Cap ore is being mined and stockpiled, ready for processing. In 1988, to anticipate processing changes necessary for Vangorda ore treatment, samples of drill core were sent to Lakefield Research. This allowed development of an economical treatment route within the Curragh processing plant (see Lakefield Progress Report No. 1 January 18, 1989).

Six major ore types were found in the Lakefield work but one processing route was recommended. Compared to Faro treatment this was principally additional grinding, coupled with extra reagent dosage. Of the six ore types, one was found to be "refractory", i.e. difficult to respond. However, this could be successfully treated by blending with the other Vangorda ore types. A maximum blend of 15% weight of the refractory (1A) ore type was recommended.

2.2 In early October, 1990, with exposure of the first of the Vangorda Cap ore, samples were collected for laboratory flotation at Curragh. In essence this was to confirm, and refine, Lakefield's work on drill core.

It was immediately apparent that the samples collected floated quite differently from the Lakefield testwork on drill cores. Much of the zinc floated in the rougher concentrate, producing a bulk concentrate. In the early tests 87% zinc reported to the lead concentrate. This was obviously of concern, particularly since some 300,000 tonnes of Vangorda ore were already stockpiled, and a full scale plant trial was imminent.

2.3 Laboratory work proceeded to try to obtain a differential float of lead concentrate, followed by zinc concentrates. The work was done at Curragh laboratory from the early days of October, 1990, together with a representative of Lakefield.

3.0 Outcome

It was found that dissolved metals, particularly copper ions, coated the zinc sulphides. This caused them to float readily to lead concentrates. (This was a mechanism similar to the normal addition of copper sulphate to the Faro zinc circuit.)

The dissolved metals were generally associated with fine sands, as opposed to competent rock. Therefore the processing route recommended at this stage is to screen out the fines -7/8", and blend the +7/8" fraction with competent Faro or Vangorda (below cap) ore.

At the time of writing:

- a) The tonnage of the affected cap material is estimated to be 0.9 - 1.1 m tonnes. Screening at 7/8" will give about 57% recovery by weight before processing. Metal recoveries will approximate 66% for lead and 75% for zinc.
- b) Even with screening the material should be blended. The recommendation at this stage is Faro 75%, Vangorda 25%.
- c) Tuning work continues to determine the optimum screen size and optimum blend to maximize revenues. This in turn will effect the mine plan. (25% Vangorda blend will meet the present mine plan objectives). In summer months screening would present less practical difficulties. The material may be washed and screened in one operation. The recommended screen size, in this scenario, will be under 3/4".
- d) Stockpiled material, 300,000 tonnes, will have to be similarly processed.
- e) Lakefield testwork will continue with the objective of determining a chemical reagent regime for all ore sizes.
- f) Mineralogical findings are still to be reported. (Vancouver Petrographics and University of Western Ontario.)

Two points should be highlighted as marketing concerns:

- a) Like all previous Vangorda testwork, zinc grade in lead concentrates are higher than Faro (about 10 - 12%).

- b) High copper values are present in lead concentrates, even when blended 75% Faro, 25% Vangorda (just below 2% Cu).

Metallurgical testwork will continue in an attempt to separate copper from the lead concentrate i.e. produce a copper concentrate.

A quick synopsis has been given. The remainder of this report will discuss in more detail some of the more important findings.

Gordon Wilson
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GW/jdm