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THE VANGORDA DEPOSIT

Cyprus Anvil Mining Corporation

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Cyprus Anvil Mining Corporation

300, 355 Burrard Street
Vancouver, British Columbia
V6C 2G8
Telephone (604) 687-2586

Telex 04508594

THE VANGORDA DEPOSIT

The Vangorda deposit, discovered in 1953 by the late Mr. Al Kulan, was the first mineral deposit discovered in the Anvil District. The property was subsequently explored by Prospector's Airways Co. Ltd., a subsidiary of Kerr Addison Mines Ltd. During 1954 and 1955, the deposit was diamond drilled on a 60 metre grid pattern with fill-in holes at 30 metre spacing along alternate cross sections giving an estimated reserve of 8.5 million tonnes of ore assaying 3.2% lead, 5.0 % zinc and 49.9 gms/tonne of silver.

A preliminary mining and cost study was conducted by General Engineering Company Ltd. in 1964. The results of this study indicated a probable open pit minable ore reserve of 5.6 million tonnes with grades of 3.09% lead and 4.9% zinc, 50.9 gms/tonne of silver and 0.75 gms/tonne of gold. This data was based upon a 10% dilution factor and upon those reserves contained in the thicker, northwesterly section of the deposit.

Analysis of the earlier Vangorda diamond drill data indicated serious deficiencies in the identification of those geological units now recognized as critical to the understanding of deposits in the Anvil District. Poor core recoveries, inadequate logging techniques, assaying inconsistencies and sample deterioration further complicated the task.

Early metallurgical testwork performed on samples of this core produced eratic results reflecting, not the quality of the work done, but rather the lack of sample consistency. Perhaps the only common factor that emerged from the work conducted by a number of reputable metallurgical authorities was to demonstrate the need for fine grinding to ensure adequate liberation of the finely disseminated mineral particles.

Following an analysis of the early diamond drill data, and the associated metallurgical testwork, a comprehensive drilling program was initiated in 1979 to re-drill that portion of the deposit between sections 2 West and 12 East exclusive at 30 metre centres along sections which were 60 metres apart. Fifty-three holes representing approximately 32,000 feet were drilled in an area approximately 800 metres long (NW-SE) by 200 metres wide (NE-SW). The objectives of this program were identified and are listed below:

1. To collect sufficient data for a detailed tonnage and grade model in the area 2 W to 12 E.

2. To evaluate the area immediately southwest of the deposit as a suitable dumpsite location.

3. To construct geological reference sections through the deposit as an aid to the stratigraphic and structural interpolation of the ore body.

4. To develop a drilling system that would be capable of generating meaningful information from the portion of the deposit between sections 14 E and 28 E which historically had yielded extremely poor ore recoveries.

5. To provide adequate samples of fresh core for a comprehensive metallurgical test program.

Samples were assayed for lead, zinc, silver, copper, gold, barium oxide, mercury, manganese, soluble iron and insoluble iron with specific gravity determinations on those intersections grading in excess of 3% combined lead/zinc.

Pending the complete analysis of all the raw data generated by the drilling program a preliminary geological reserve was calculated and is reported below at a 4.0% (Pb + Zn) cut-off grades. Based on this data minable open pit reserves were also computed.

Preliminary Vangorda Reserves

	Tonnage (tonnes 000's)	% Pb	%Zn	Ag (g/tonne)
Geological Reserves	6,751	3.5	4.6	50.7
Minable Reserve	6,134	3.5	4.6	50.2

The attached "Vangorda Deposit Isopach Map" illustrates the thickness of the mineralized regions in relation to the 1979 drill hole collar locations.

The 1979 drilling and assaying program cost approximately $900,000.

In 1979 a study of limited scope was conducted to investigate alternate means of diverting the Vangorda Creek around the proposed open pit. This work, costing approximately $10,000 was concluded in 1979 and resulted in the conceptual design of a diversion canal located to the west of the proposed ultimate pit limit.

Based upon samples of fresh core generated by the 1979 diamond drill program, an extensive metallurgical test program was designed and carried out on ore species selected to be representative of the three major types within the deposit; namely 'baritic' and 'quartzitic' ores. The program was designed to establish a metallurgical profile for each ore type at various ore grades.

The results of this work were used to predict an average metallurgical response for each ore type. These were then weighted, depending upon the relative occurrence of each ore type within the deposit to produce the overall plant metallurgical performance shown below.

	Grade				Recovery			
Product	Pb	Zn	Au	Ag	Pb	Zn	Au	Ag
Lead	50	-	6.5	575	80	-	35	55
Zinc	-	52.8	-	-	-	77	-	-

The total cost of the 1979 metallurgical test program amounted to approximately $90,000.

In 1980 some limited diamond drilling work was carried out on the Vangorda deposit to confirm proposed dump site locations. Experiments were conducted with the reverse circulation drilling equipment in an effort to improve the reliability of the data covering the portion of the deposit East of section 12 E. The total cost of this program amounted to $200,000.

The detailed results of the 1979 drilling program were analysed in 1980 and used to develop improved estimates of both the geological and minable ore reserves. The most current information is reported below at 4.0% (Pb + Zn) % cut-off grade.

Interim Vangorda Reserves

Au gms/tonne	Tonnage (000's)	% Pb	% Zn	Ag (g/tonne)	
Geological Reserves	5,209	3.3	4.3	47.8	0.74
Minable Reserves	4,520	3.3*	4.3*	47.0	0.73

* Lead and zinc grades adjusted by minus 3%.

Additional work was performed in 1980 on each ore type to determine the effect of extremely fine primary grinding on metallurgy. The results suggested that metallurgical improvements would continue to occur as fineness of grind was increased. Also, in 1980 a minor test program was executed to determine the effects of attempting to process Vangorda ore at a relatively coarse grind. These tests revealed that, without the benefit of very fine grinding, a separation of the lead-zinc mineral was almost impossible without incurring substantial metal losses.

The total cost of the 1980 metallurgical test program was approximately $18,000.

A substantial amount of work remains to be done before the Vangorda deposit becomes a producing, open-pit mine.

Extensive work is in progress to improve the definition of the deposit to the East of section line 12 E. To this end the 1979 drilling pattern has been extended to the East using rotary, reverse circulation drilling equipment. At this point no assay data is available. The collar location of these holes, and those drilled in 1979 is shown on the attached "Vangorda Deposit Drill Hole Plan".

Based on further geotechnical test programs pit slopes must be finalized and the ultimate pit design modified from the computerized configuration to represent a workable open pit.

Hydrological and geotechnical studies must be implemented to finalize the design of the Vangorda Creek diversion ditch and appropriate regulatory approvals must be sought for this phase of the work.

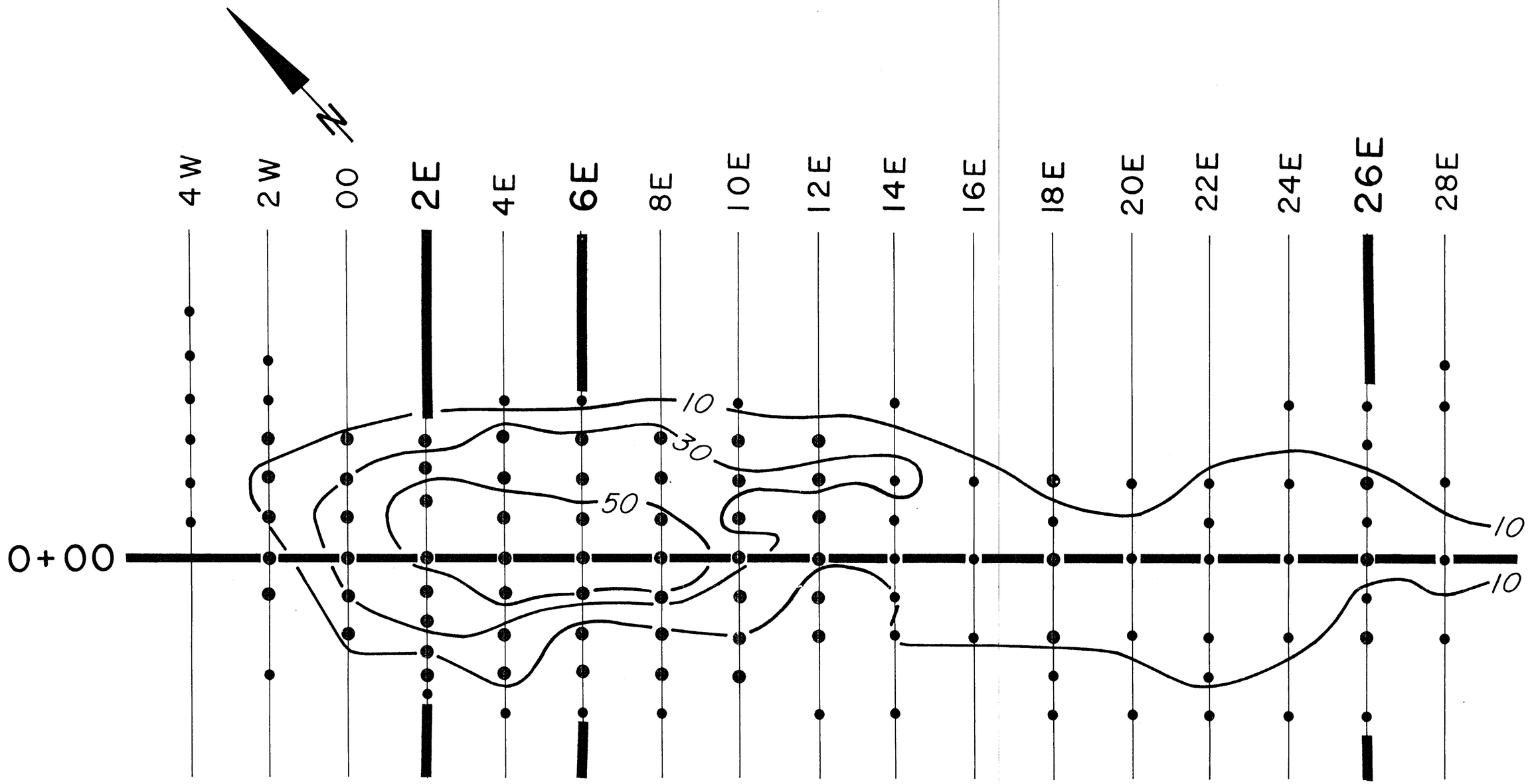
In conjunction with these projects that relate specifically to the Vangorda Deposit studies are either in progress or will be implemented to examine the overall development of the Vangorda Plateau ores. Thus, ore haulage systems, in-pit crushing concepts, power requirements and supply, garage and service facilities, water supply, etc., will all receive considerable attention in the months ahead to ensure the smooth integration of the Vangorda and Grum ores into the overall ore supply schedule to the Cyprus Anvil concentrator.

CYPRUS ANVIL MINING CORPORATION

Costs Relating to the Vangorda Deposit 1979, 1980

	1979 $	1980 $
Drilling and Assaying	900,000	200,000
Vangorda Creek Diversion	10,000	-
Metallurgical Testing	90,000	18,000

It should be noted that the costs shown in 1979 for "metallurgical testing" includes prorated metallurgical consultants fees and one third of the pilot plant test program on the basis that the work performed was to design a flowsheet capable of handling Faro, Grum and Vangorda ores.



VANGORDA DEPOSIT
ISOPACH MAP
10m CONTOURS

- K.A. DRILL HOLES
- C.A.M.C. 1979 DRILL HOLES

METRES
0 100 200 300

inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

YUKON GEOLOGICAL SURVEY

BASE LINE

BASE LINE

RUINS

RUINS

V-76-RH (Rotary Hole)

V-55-R & V-55 RH (Rotary Hole)

V-57-R

LEGEND

MAIN ROAD		RIVER, LAKE	
SECONDARY ROAD		INTERMITTENT RIVER	
TRACK OR TRAIL		TREED AREA	
RAILWAY		INDIVIDUAL TREE	
HEDGE FENCE		SPOT HEIGHT	× 900.1
BRIDGE CULVERT		CONTOURS	900
SWAMP		DEPRESSION	890
UTILITY POLE		CONTROL	△

NORTH WEST SURVEY CORPORATION INTERNATIONAL LTD.

- ⊙ V-60-R — Vangorda DDH redrilled by C.A.M.C. in 1979
- ⊙ V-301 — C.A.M.C. 1979 DDH
- ⊙ 81-VR-05 — C.A.M.C. 1981 rotary drill hole program

inches 0 1 2 — centimetres 0 1 2 3 4 5

This reference scale bar was plotted on the original image. It will change if the image is enlarged or reduced, therefore it is only accurate for the original size.

NORTH GEOLOGICAL SURVEY

CYPRUS ANVIL MINING CORPORATION

VANGORDA DEPOSIT

DRILL HOLE PLAN

SCALE 1:1000

METRES 20 10 0 20 40 60 80 100 METRES

CONTOUR INTERVAL 1 METRE

SHEET 1 OF 1

DATE OF PHOTOGRAPHY AUGUST 1979

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