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CURRAGH RESOURCES
LONG RANGE DEVELOPMENT PLAN
OVERVIEW
FARO AREA
MARCH, 1987

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1.4 Why Develop the Vangorda Plateau?

Curragh Resources will be developing the Vangorda Plateau deposits to enhance and extend its Faro mineral production. This development will ensure a steady ore feed to the Faro concentrator to 1999. Other deposits such as Swim and Dy should subsequently extend our operations well into the next century.

Without the development of the Vangorda Plateau, mining in the Faro area will cease with the exhaustion of the Faro Pit in 1991. Along with the ceasation of mining, will come the end of any significant economic activity in the Faro area and a return to the situation Faro and Yukon faced before the Faro mine was reopened.

The development of the Vangorda Plateau orebodies, will result in significant public benefits rather than a potential drain on the public purse often associated with mine closures.

Development of the Vangorda Plateau orebodies will result in:

1. 3700 additional person years of direct employment.

2. $185 million of additional direct wages to Yukoners.

3. Continuation of mining operations in the Faro area least until 1999.

4. Generation of significant tax and royalty revenues to the federal, territorial and municipal governments.

5. Stabilization of NCPC's revenues necessary to service such capital investments as Whitehorse #4 and the grid extension.

6. Significant spin-off employment and business benefits throughout Yukon.

7. Additional capital expenditures of $60 million between 1987 and 1999.

8. Contribution of approximately one billion dollars to Canada's net exports.

The development of additional orebodies at this time is essential to avoid gaps in production that would result in the loss of market share in what will be, with completion of Red Dog in Alaska, a highly competative concentrate market in the 1990's.

1.5 Planning Methodology:

The development and mining plans presented herein are based on extensive exploration, planning and pre-development work carried out by Kerr Addison Mines, AEX Minerals, and Cyprus Anvil Mining Corporation. This prior work includes:

1. Major renovations to the Faro concentrator to handle finer grind.

2. Study of transportation alternatives between the Plateau and the Faro concentrator.

3. Metallurgical testing of Vangorda Plateau ores.

4. Extensive fill-in drilling and geological interpretation directed at revised reserve calculations.

5. Preliminary mine plans.

6. Environmental baseline studies relevant to mining development on the Plateau.

Curragh's objective has been to develop a comprehensive mine plan for the Grum and Vangorda deposits to replace declining production from the Faro Pit as it nears exhaustion. Updated reserves amenable to computer-aided mine design were calculated by Curragh. Additional planning objectives are:

1. To use current production statistics and costs for the Faro operation with adjustments to reflect Vangorda Plateau ore versus Faro.

2. To use, as much as possible, surplus equipment from the Faro operation as it becomes available and minimize the aquisition of further equipment.

3. To develop a plan requiring the minimum pre-production capital investments possible and levelize stripping.

4. To consider a minimum of 500,000 DMT per annum of concentrate for at least 10 years.

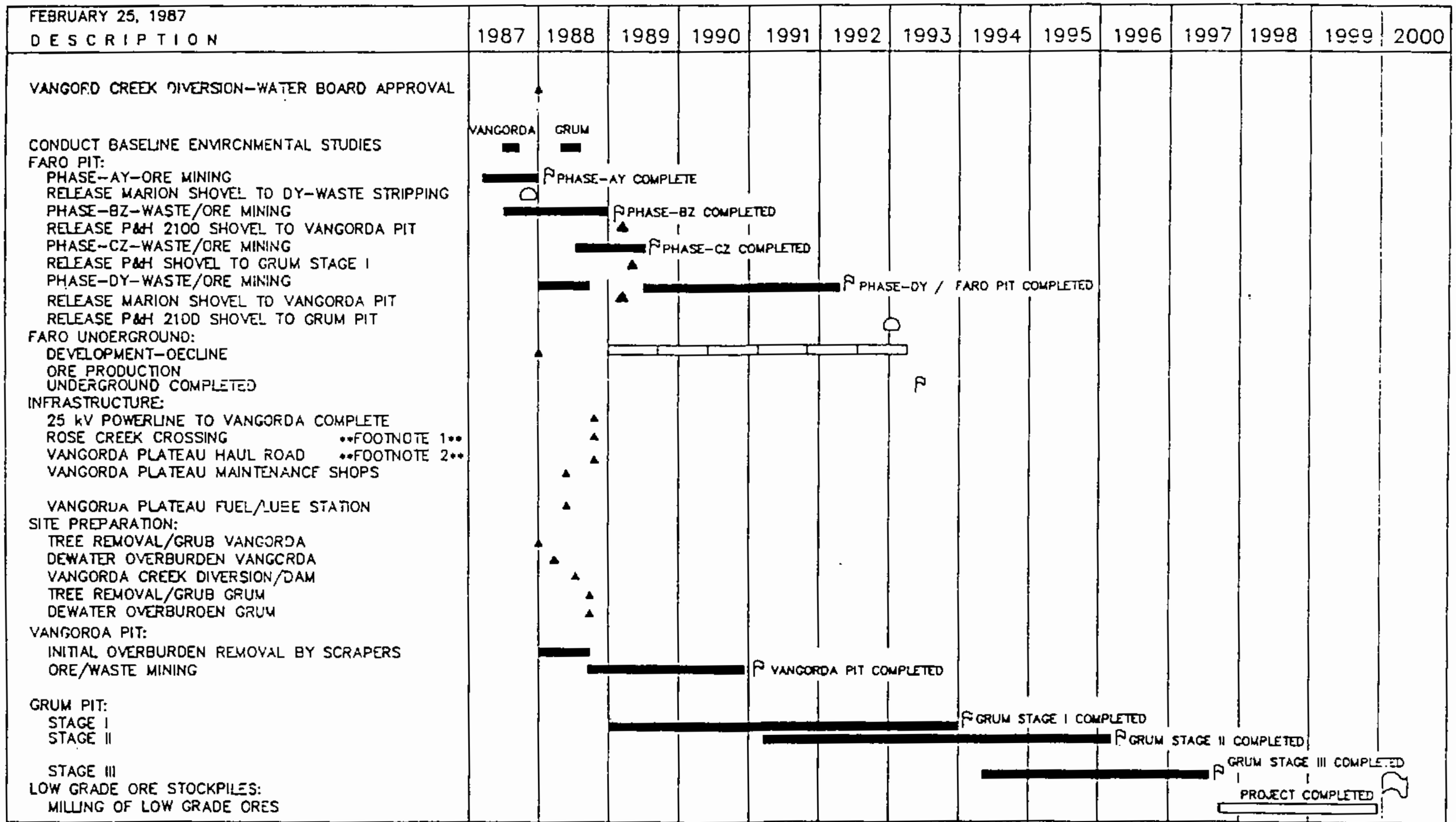
5. To plan underground mining at Faro Pit to fill in ore shortages as required.

6. To incorporate environmental protection measures.

7. To carry out sensitivity analyses on critical elements such as pit equipment productivities, feed grade, mill recoveries, etc.

8. To thoroughly review the basic geologic data, identify shortfalls and implement plans to rectify.

9. To evaluate all potential points of weakness in the plan and propose future work to eliminate them.



FOOTNOTE 1 ACCESS REQUIRED FOR SHOVEL MOVE FROM FARO TO VANGORDA PIT

FOOTNOTE 2 ROAD REQUIRED FOR VANGORDA ORE HAULAGE

▲ LATEST IMPLEMENTATION DATE

KILBORN

DRAFT SCHEDULE

FIGURE: 3
CURRAGH RESOURCES
FARO—AREA DEPOSITS STUDY
IMPLEMENTATION, EVENTS & ACTIVITIES

2. Geology and Reserves

2.1 District Geology

The Anvil Range contains four lead-zinc-silver deposits in addition to the Faro deposit. The aggregate geologic reserve of the five deposits is 91 million tonnes averaging 9.4% lead plus zinc and 58 grams/tonne silver.

The ore deposits of the Anvil Range are sediment hosted, stratiform, pyritic, massive sulphide deposits. They are hosted by lower Paleozoic metamorphosed shales. The deposits consist of one to five ore layers originally deposited parallel to bedding within a 150 metre thick stratigraphic section. The layers are generally 10 metres to 40 metres thick and are now contorted into complex fold structures.

The ore horizons are strongly zoned with respect to ore type and ore grade. The central and upper ore type in a given horizon is variably baritic, massive sulphide. The lower and peripheral ore type is hard, carbon rich quartzite containing disseminated sulphides. The zoning is significant to mine planning since the ore types have differing metallurgical performance, physical properties and grades. Different deposits are composed of different proportions of ore types thus ore in the Anvil Range cannot be assumed to be the same as Faro ore.

Strong metamorphism accompanied the deformations that folded the Anvil Range ore deposits. This metamorphism recrystallized the ores; it varies in intensity throughout the district adding further variety to the ore types and their metallurgical performance.

2.2 Faro Geology and Reserves

The Faro deposit is a flat lying to gently southwest dipping lens that varies from a few metres to 40 metres thick. In cross-section the deposit is highly assymetric with a thick northeast edge, tapering to a thin southwest edge.

Based on metallurgical performance there are currently three ore types recognized at Faro.

- BG: massive to disseminated pyrite, spalerite and galena in a quartz or barite gangue
- A: Disseminated pyrite, sphalerite and galena in a carbonaceous quartz gangue
- H: massive, fine grained pyrrhotite with galena and sphalerite

The northeast part of the deposit is low grade because it contains a high proportion of nearly barren massive and semi-massive sulphides interbanded with thin high grade "BG" zones. The southwestern part of the deposit is higher grade and largely the "BG" ore type. The "H" type is erraticly distributed in the

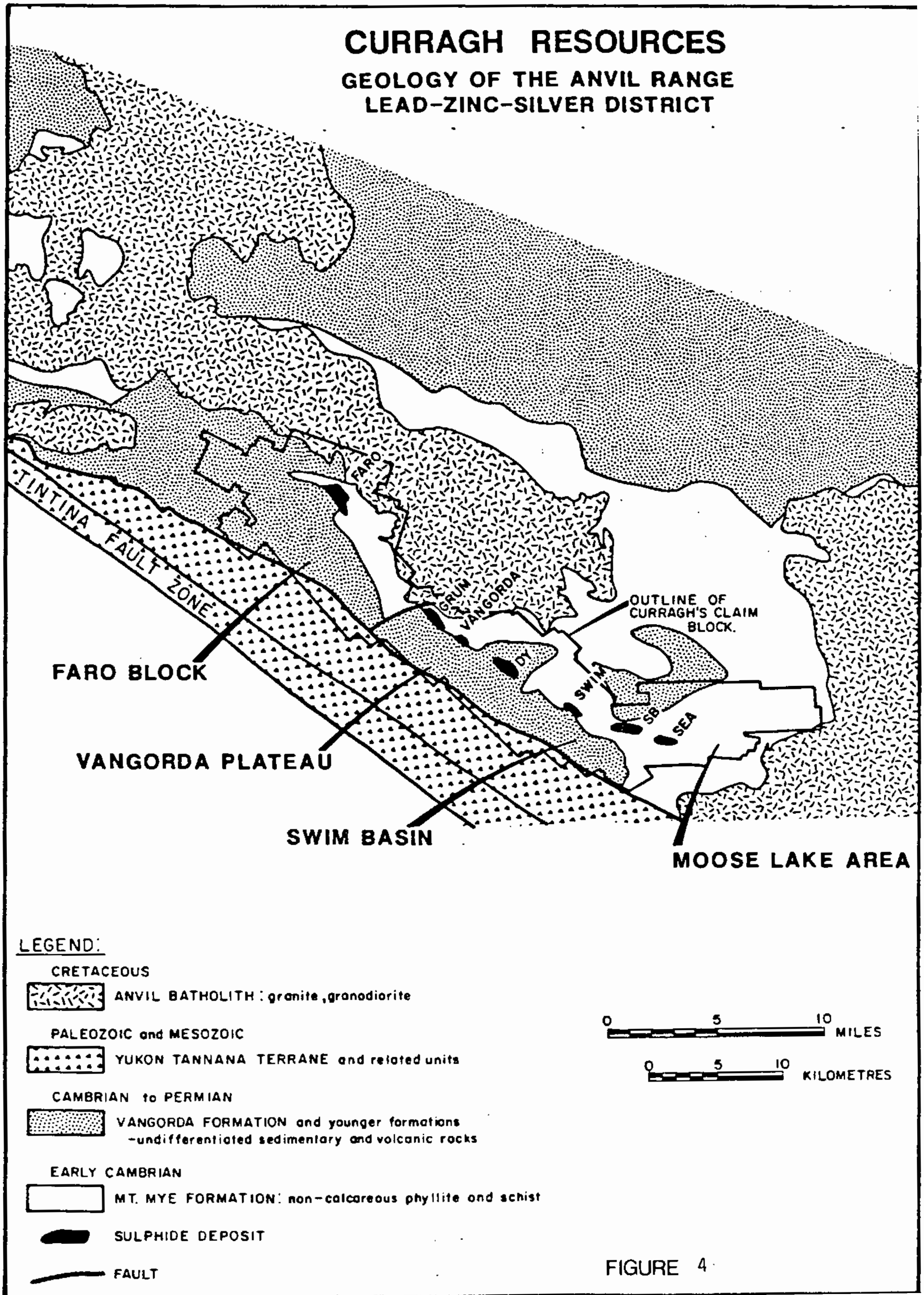

CURRAGH RESOURCES
GEOLOGY OF THE ANVIL RANGE
LEAD-ZINC-SILVER DISTRICT
TINTINA FAULT ZONE
FARO
GRUM
VANGORDA
DY
SWIM
SB
SEA
OUTLINE OF CURRAGH'S CLAIM BLOCK.
FARO BLOCK
VANGORDA PLATEAU
SWIM BASIN
MOOSE LAKE AREA
LEGEND:
CRETACEOUS
ANVIL BATHOLITH : granite, granodiorite
PALEOZOIC and MESOZOIC
YUKON TANNANA TERRANE and related units
CAMBRIAN to PERMIAN
VANGORDA FORMATION and younger formations
-undifferentiated sedimentary and volcanic rocks
EARLY CAMBRIAN
MT. MYE FORMATION: non-calcareous phyllite and schist
SULPHIDE DEPOSIT
FAULT
0 5 10 MILES
0 5 10 KILOMETRES

FIGURE 4

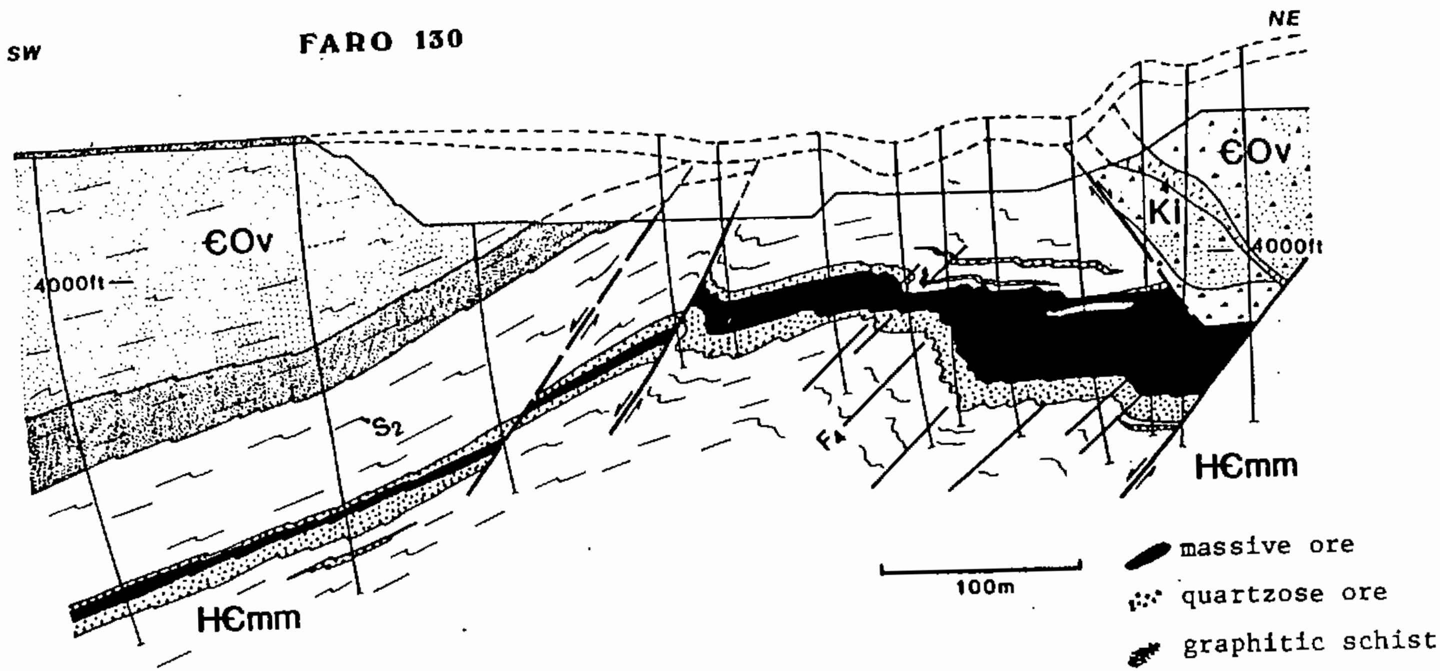


Figure 5. Cross section 130 through the southeast end of Zone 3. The pit outline is as of the June 1982 suspension of mining. The deep sulphides at the southwest end of the section are part of the area of proposed underground mining.

southwestern part of the deposit. A basal unit of "A" type carbonaceous quartzite with disseminated sulphides occurs throughout the deposit; it is generally low grade but in the northeast is sulphide rich and some very high grade zones are present.

The shallowly dipping orebody is strongly layered parallel to its tabular dimension. The layering is discontinuous and layers change thickness eratically. The deposit is offset by a number of significant normal faults adding to the complexities of tracing ore. External contacts of the orebody are sharp and visually distinct against barren phyllite. Dilution from this material is easily controlled. Internal to the sulphide mass, ore grade mineralization cannot be separated visually from sulphide waste thus dilution from this material can only be controlled by blasthole assays and dilution is high where high grade layers are thin.

Geologic reserves at the start of 1986 were 29.3 million tonnes at 3.13% lead 5.03% zinc and 40.8 grams/tonne silver (undiluted at a 4% lead plus zinc cutoff), 1.8 million tonnes of which was mined in 1986. The deposit is, for the most part, sufficiently well drilled off that the reserves can be considered proven.

Southwest of the present open pit area is a part of the deposit too deep to mine by open pit methods. Geologic reserves in this area are estimated to be 2.6 million tonnes at 5.03% lead 7.72% zinc and 67.3 grams/tonne silver. Part of this geologic reserve overlaps that given above thus they are not additive. Further drilling is needed in this area to delineate the reserves in detail.

2.3 Grum Geology and Reserves

The Grum deposit is structurally and stratigraphically more complex than the Faro deposit. Grum consists of three to five separate sulphide horizons with appreciable thicknesses of intervening barren phyllite. The ore horizons are contorted into a complex polyphase fold structure. The fold plunges northwest about 11°. The upplunge end of the deposit has been truncated by erosion but is buried beneath thick glacial overburden thus Grum is essentially a blind deposit. This extensive cover by glacial overburden or bedrock has protected the Grum ores from oxidation.

Grum consists of the same ore types as Faro but the A type is much more abundant and higher grade. The A type carbonaceous sulphide bearing quartzites comprise 35% of the Grum Reserves. The massive sulphide ores at Grum are finer grained and have more complex mineral intergrowth textures than Faro ores. This neccessiatates a finer grind than Faro ores. The Faro concentrator has previously been modified to accomodate this grind but the tonnage throughput must be lower than for Faro ores to achieve the finer grind.

At a given cutoff grade Grum ores are higher grade that Faro ores, this is particularly true for precious metals. Gold at Grum is 8 to 10 times higher than in Faro ores. Because of the volume of production, the Anvil Range will be one of the largest gold

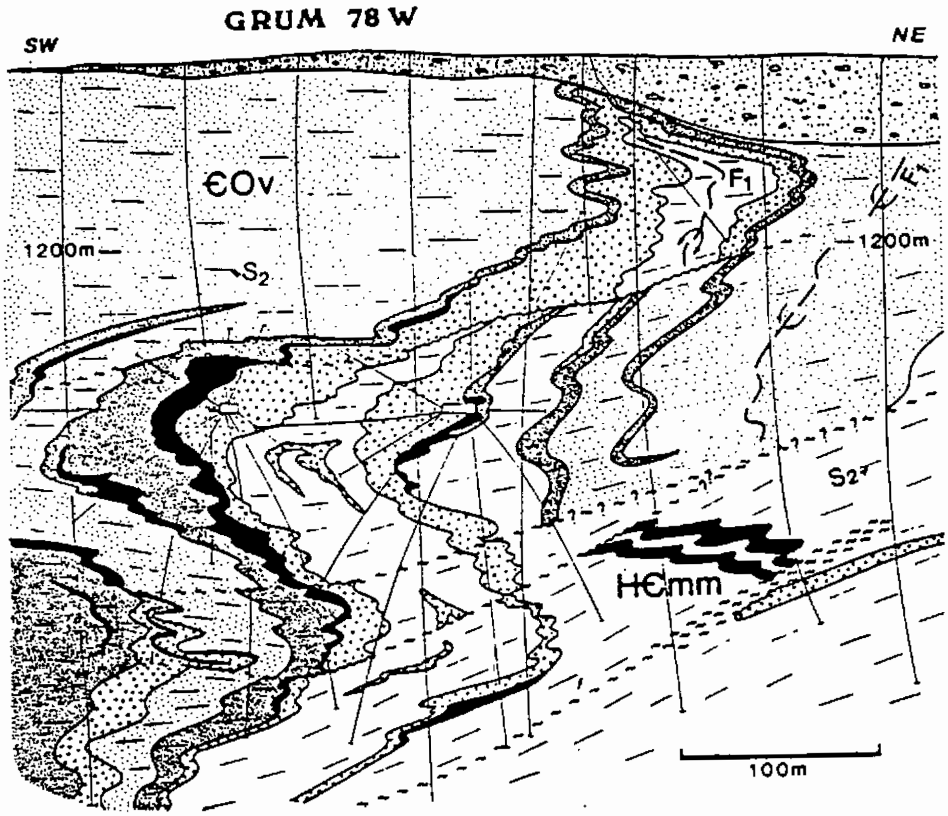
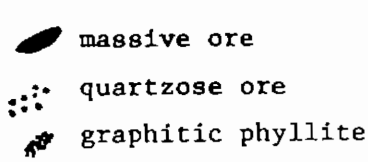


Figure 6. Cross section 78 W through the Grum deposit. The section is close to the northwest limit beyond which the high grade massive sulphides near the underground workings cannot be mined by open pit methods because of high stripping requirements This ore would be left for underground followup not included in the current mine plan.



producing districts in the Yukon when the Vangorda Plateau deposits come on stream.

Geologic reserves for the main part of the deposit have been newly calculated from base principles by Curragh staff. At a 4% lead plus zinc cutoff grade the geologic reserves are 30.6 million tonnes averaging 3.4% lead, 5.6% zinc, 57 grams/tonne silver and 0.95 grams/tonne gold (undiluted). These reserves are well defined by surface drilling, underground sampling and underground diamond drilling and are considered proven reserves.

In addition to the main deposit is the Champ Zone, adjoining to the southeast, which contains probable reserves of 1.7 million tonnes averaging 3.5% lead 4.3% zinc and 46 grams/tonne silver.

To the northwest of the main deposit, down the fold plunge, there is potential for a further five to ten million tonnes of high grade sulphides in areas not yet drilled off. These sulphides are too deep for open pit mining. The deep extension, when added to the high grade proven ore beneath the current pit design, indicates a potential for underground followup similar to that planned for Faro, but on a larger scale.

2.4 Vangorda Geology and Reserves

The Vangorda Deposit is similar to Grum but smaller and shallower. The deposit cosists of one major ore horizon which is contorted into a subhorizontal to slightly northwest plunging fold. Rock and glacial overburden cover is not great thus the stripping ratio for Vangorda is much lower than Grum. Because of the shallow depth of burial there is a possibility that oxidation of Vangorda ores may be significant, particularly in the southeast part of the deposit.

Most of the high grade ore at Vangorda is barite bearing massive sulphide. There is relatively little of the A type ore at Vangorda. Like Grum ores, the Vangorda ores are finer grained than Faro and richer in precious metals.

Geologic reserves for Vangorda have been newly calculated based on a intensive geologic re-interpretation of existing data by Curragh staff. The geologic reserves are 7.5 million tonnes averaging 3.9% lead, 4.9% zinc, 53 grams/tonne silver and 0.69 grams/tonne gold (based on a 4% lead plus zinc cutoff grade and no dilution). More drilling is required to delineate the reserves in greater detail. Results of this drilling will not only enhnace the reliability of the bench by bench reserves but also provide data from metallurgical testing for oxidation limits.

A relatively gold rich zone of more than 2 million tonnes averaging approximately 0.9 grams/tonne gold and 22 grams/tonne silver with minor lead and zinc underlies the lead-zinc rich massive sulphides. Some of this material will be moved to gain access to the lead-zinc zone. The amenability of this material to treatment will be studied.

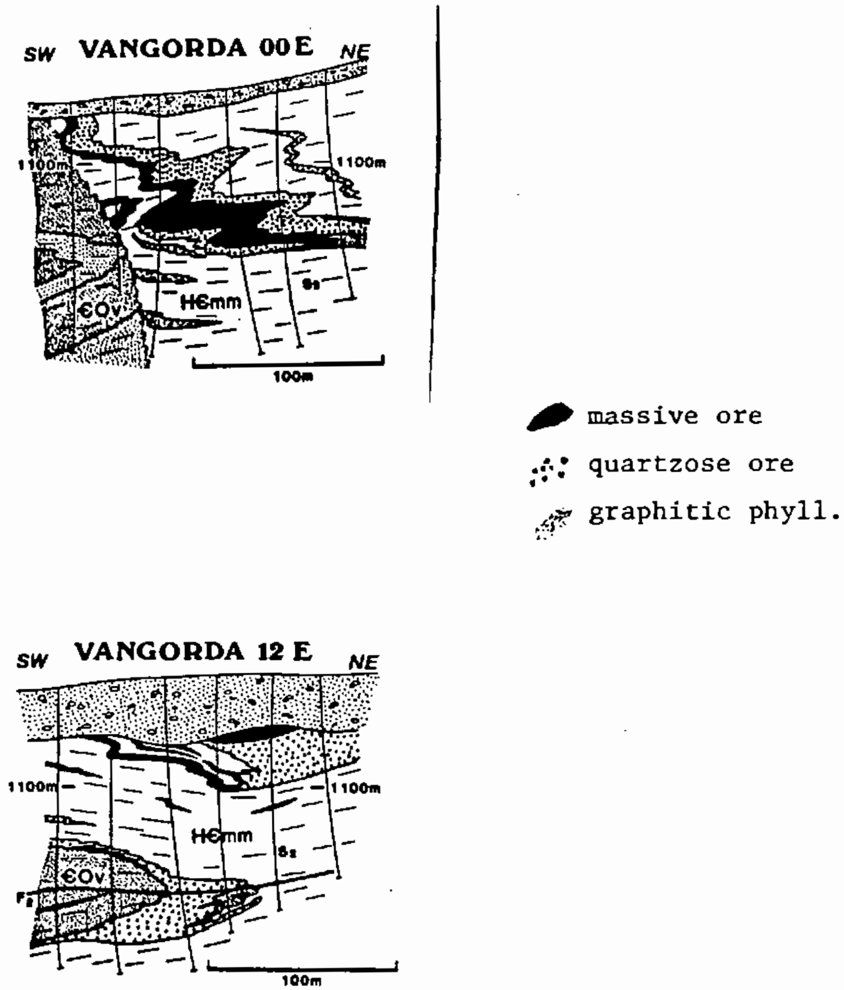


Figure 7. Cross sections through the Vangorda deposit. Note the difference in size and depth of burial between Vangorda and the other deposits

2.5 Other Reserves and Potential in District

The current mine plan does not exhaust all reserves in the district. In addition to the Champ zone of the Grum deposit, further Faro underground and Grum underground, there are two known deposits, DY and Swim. Further anomalies exist that indicate other possible reserve potential.

The DY deposit has geologic reserves of 21.0 million tonnes averaging 5.5% lead, 6.7% zinc, 84 grams/tonne silver and 0.95 grams/tonne gold (at a 9% lead plus zinc cutoff and no dilution).

DY is very deep (500m to the top) and thus far has been drilled from the surface only. The deposit is open to the southwest and southeast. Because of the sparse drilling pattern a major underground exploration program will eventually be required at DY.

Most DY ore is high grade massive sulphide. The deposit will be similar to Grum in other respects.

The Swim deposit has geologic reserves of 4.3 million tonnes averaging 3.8% lead, 4.7% zinc and 51 grams/tonne silver. (at a 6% lead plus zinc cutoff, undiluted). Further work is required to bring the confidence of these reserves up to a level required for a production decision.

Swim is similar in most characteristics to Grum but smaller and lower grade.

Exploration potential still exists on the Vangorda Plateau where blind fold noses could contain another Vangorda sized deposit and extensions to Grum and DY are indicated.

In the Swim basin there is potential for open pit ore remaining as well as deeper possibilities.

Northwest of Faro, exploration is needed along the favourable trend of the existing deposits.

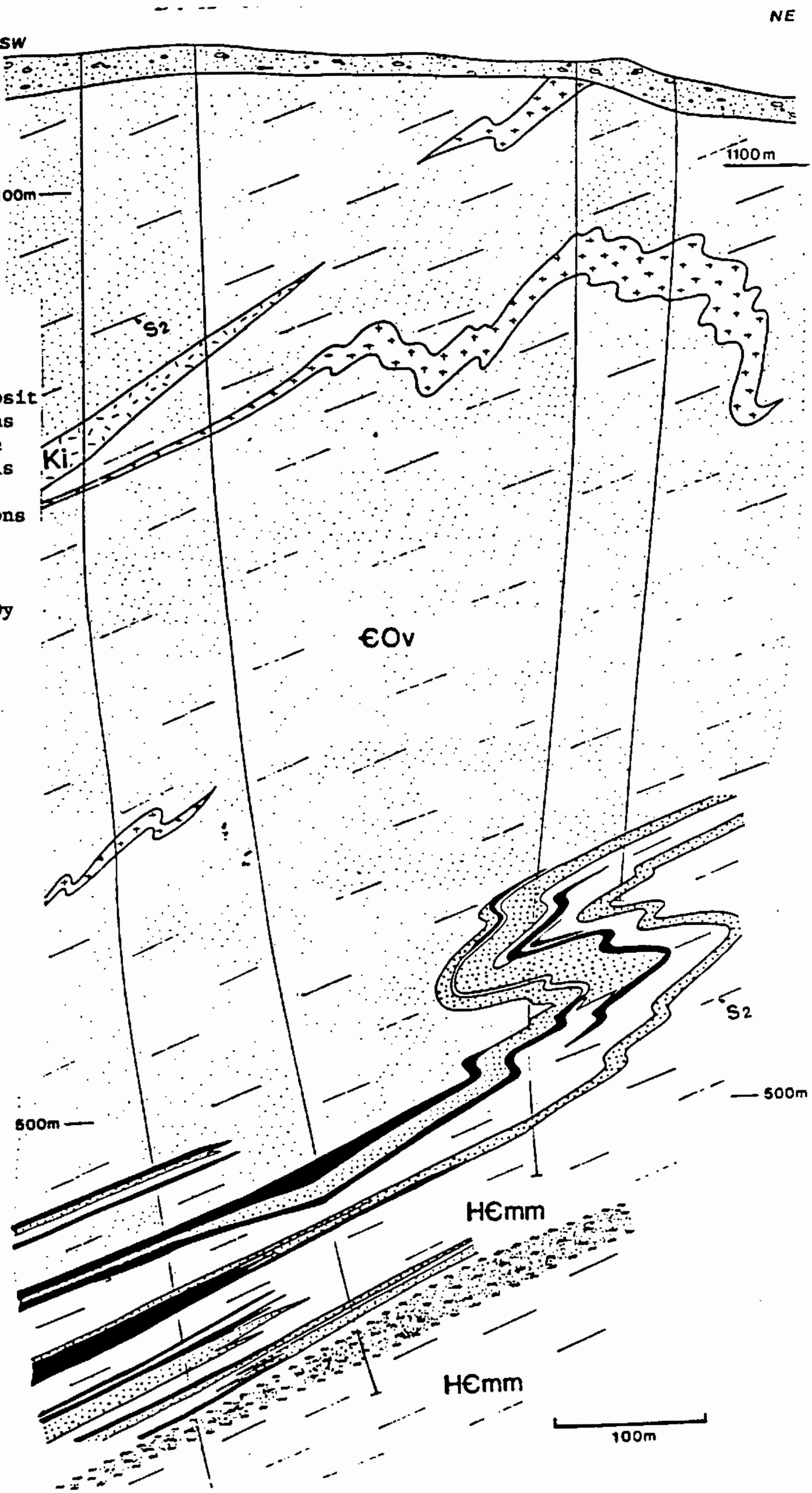


Figure 8

Schematic section through the DY deposit at the same scale as the sections of the other deposits. This is not one of the best drilled sections of the deposit but it illustrates the relative paucity of information at Dy and the difficulty of obtaining more.

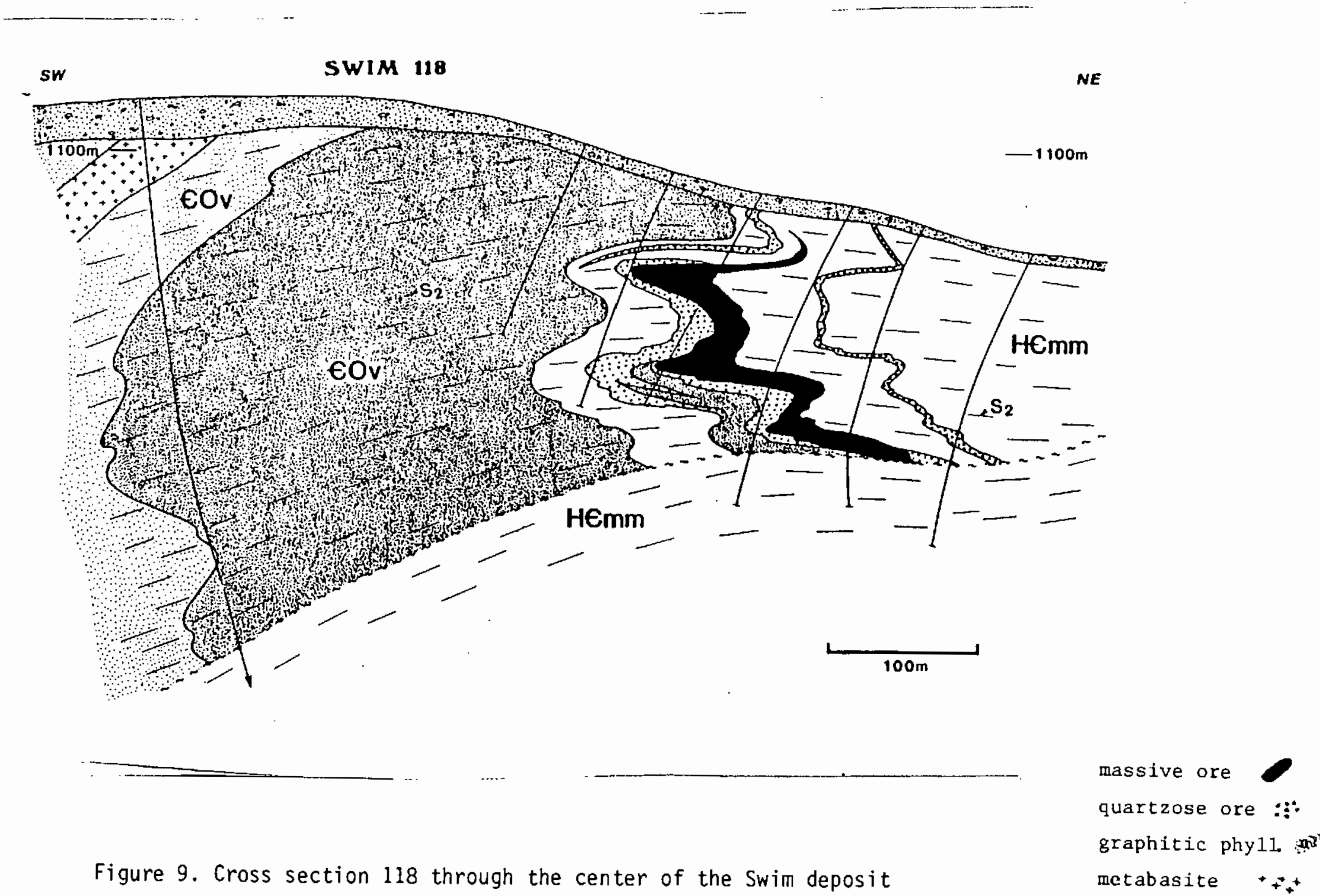


Figure 9. Cross section 118 through the center of the Swim deposit

3. Infrastructure

Most of the infrastructure required for mining developments of this scale is in place and will be utilized. At the Faro minesite this includes offices, shops and major maintnenance facilties, adequate power supply, mill and a tailings disposal area already expanded to handle Plateau production. Off site, the existing infrastructure includes highway access, townsite and port facilities as well as existing supply lines and services. New infrastructure required is outlined below.

3.1 Ore Haulage

Ore from the Vangorda Plateau will be hauled to the Faro concentrator over the Vangorda Haul Road (figure 10).

Present plans call for ore mined in the pits to be hauled to a stockpile located near the pit entrance. From the stockpile, ore will be loaded onto haulage trucks and hauled to the Faro concentrator. At the present time, it is planned to use 154 tonne, rear-dump haulage trucks for the ore haul.

The Vangorda Haul Road will be constructed as a mining haul road and as such will conform to the applicable mining regulations.

The location of the Vangorda Haul Road was originally developed in 1980 by Stanley Associates Engineering Ltd. of Whitehorse for Cyprus Anvil Mining Corporation. Curragh Resources has realigned the first 3000 metres of the Stanley design in order to reduce the adverse grade on that portion of the haul. Also, the last 3000 metres of the road will be realigned to bring the road south of the Grum pit.

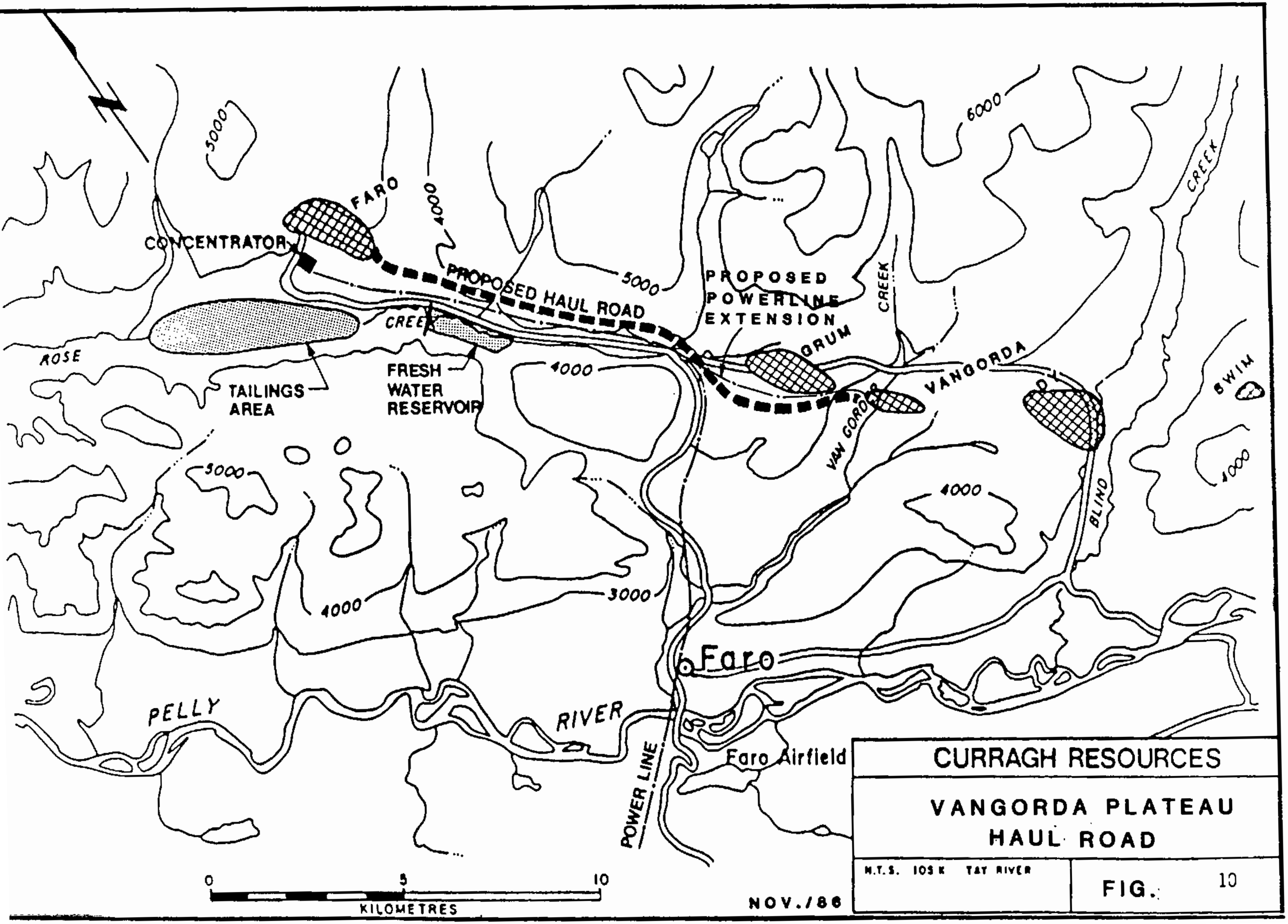
Construction of the Vangorda Haul Road has already begun. Since October 1986 waste rock from the Faro pit has been used for construction of the first stage of the road construction: the crossing of the North Fork of Rose Creek.

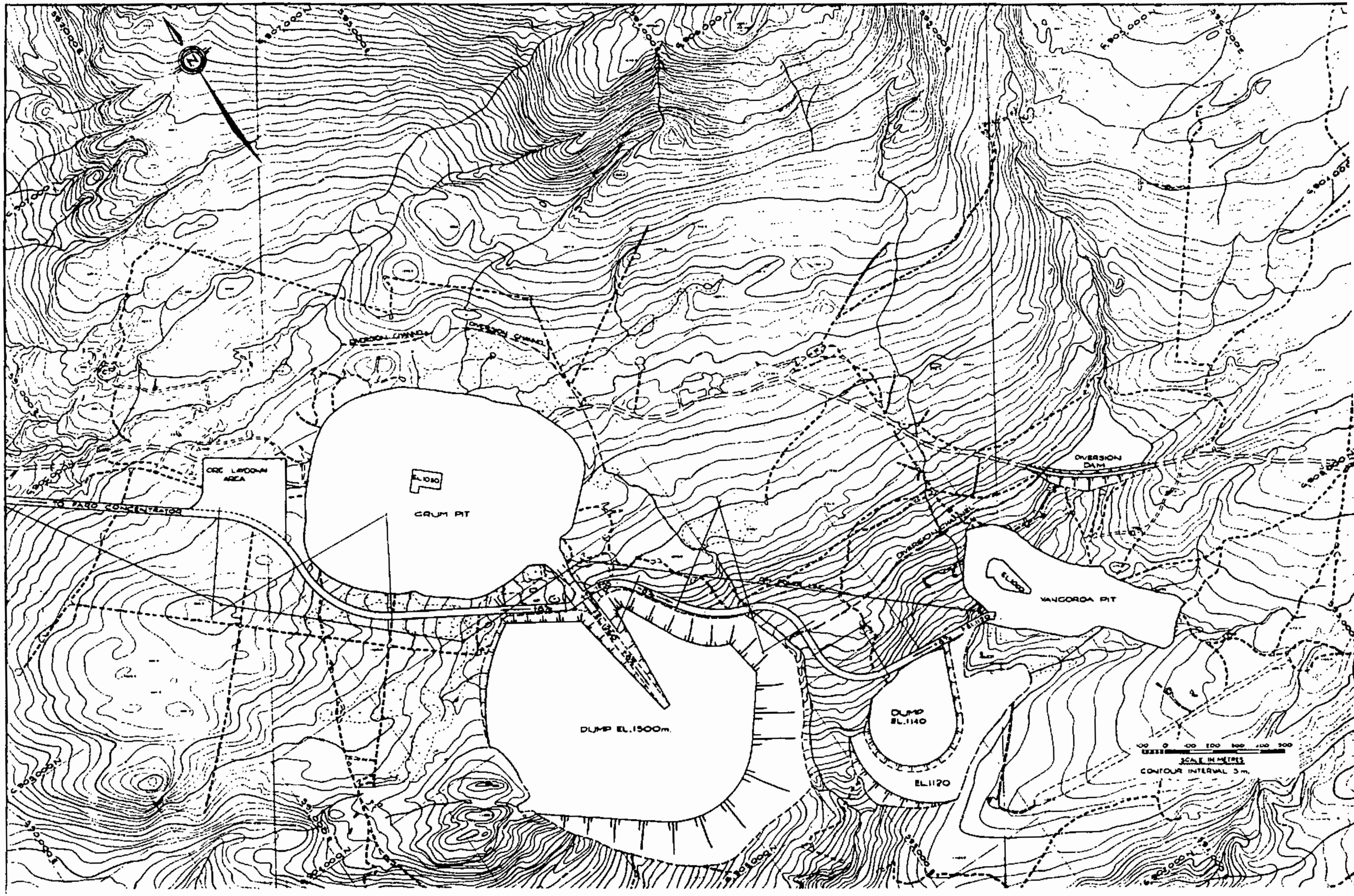
Completion of the second stage of the road construction, from the Rose Creek crossing to the Grum and Vangorda pits, is expected to take two years. The road is to be completed by the third quarter of 1989.

3.2 Power

Electrical power must be provided to the Vangorda Plateau in order to operate the electric shovels and drills and to supply the service facilities to be constructed.

The most practical apparent alternative for power supply consists of one 10 MVA, 138 kV/34.5 kV substation located near the main mine road and tapped off the 138kV line feeding the Faro minesite. A new 5000 metre, 34.5 kV line would be built to the Vangorda Plateau, where a 10 MVA, 34.5 kV/4.16 kV substation would feed the mobile equipment in the pit.


CONCENTRATOR
FARO
PROPOSED HAUL ROAD
PROPOSED POWERLINE EXTENSION
GRUM
VANGORDA
VAN GORDA
CREEK
ROSE
CREEK
TAILINGS AREA
FRESH WATER RESERVOIR
SWIM
BLIND
5000
4000
6000
3000
Faro
PELLY
RIVER
POWER LINE
Faro Airfield
0
5
10
KILOMETRES
NOV./86
CURRAGH RESOURCES
VANGORDA PLATEAU HAUL ROAD
N.T.S. 105 K TAY RIVER
FIG. 10



SCALE 1:8000	CURRAGH RESOURCES	FARO AREA DEPOSITS
J.B.T.	FARO, YUKON	VANGORDA PLATEAU SITE PLAN
P.A.H.	KILBORN	3309

FIG. 1

It is anticipated that the primary 10 MVA, 138 kV/34.5 kV substation would be the responsibility of NCPC, who would recoup their capital cost through a new rate schedule.

Electrical distribution within the pit will be similar to present practice in the Faro pit. That is, power will be supplied to the individual pieces of operating equipment through the use of standard (approved) switch houses and trailing cables.

3.3 Vangorda Creek Diversion

In order to mine the Vangorda pit, Vangorda Creek must be diverted away from the pit area. This will require construction of a diversion dam, a diversion channel, and an outfall structure to return to the water flow to the creek bed (See Figure 12).

The final location and capacity of the diversion structure has to be selected. One option being considered is to construct a dam at the 1180 m elevation, and a diversion channel on the west valley wall to an existing drainage path, returning the water flow to the original creek bed.

The final design will be completed and approvals sought from appropriate regulatory agencies in a manner timely enough to allow the commencement of mining activities in the Vangorda pit.

3.4 Grum Area Water Control

Much of the unconsolidated overburden in the Grum pit area is water saturated. In addition, Doal Lake extends inside the pit perimeter. Before mining can commence (as well as during mining) groundwater control measures will be required in and around the Grum pit area.

Water control measures which may be employed would include surface diversion ditches, well construction, and reclamation of the exploration adit for an underground sump installation.

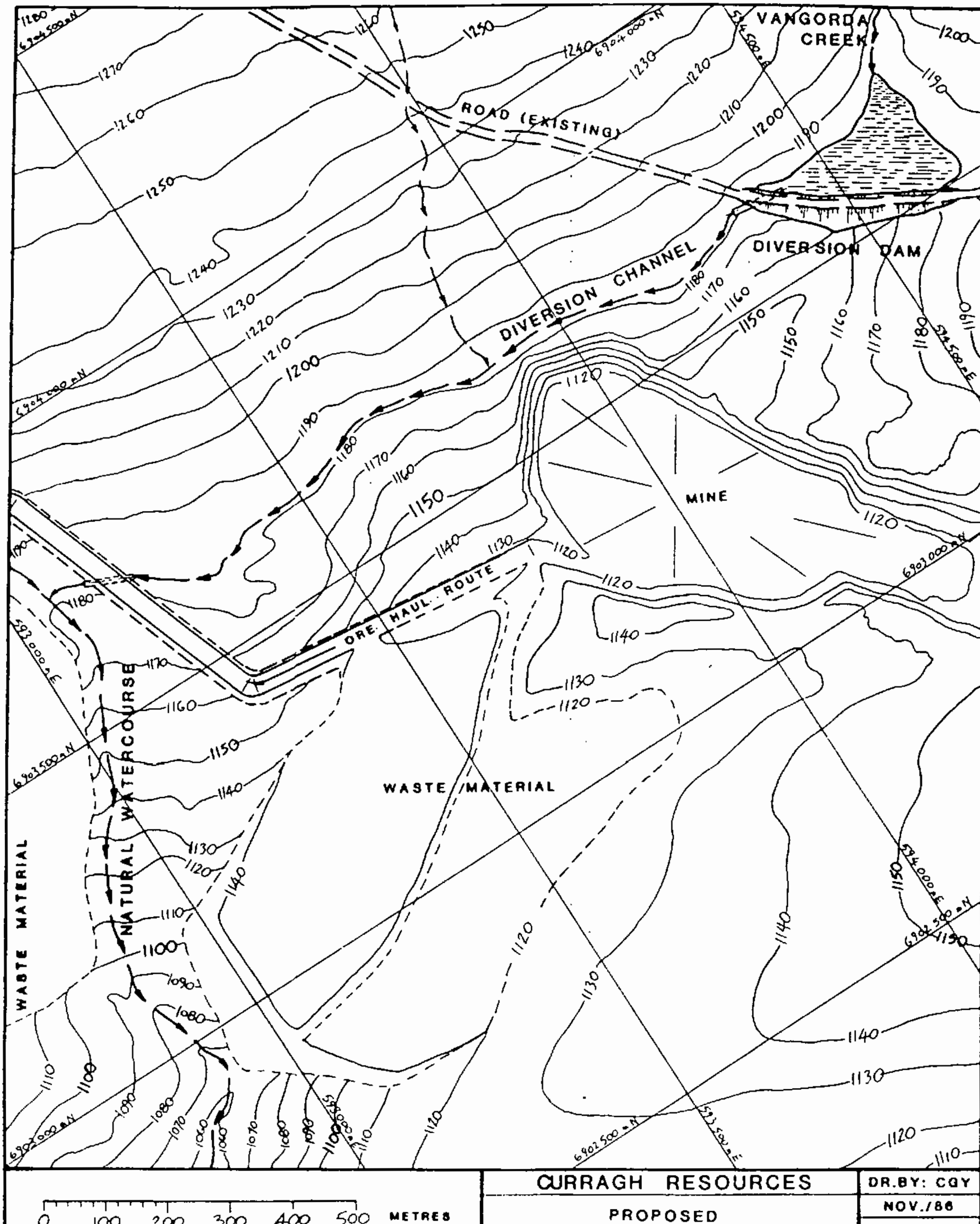
Water released as a result of these measures will likely require treatment before being released to the environment.

The final design and nature of treatment, if required, will be determined after the completion of baseline environmental studies.

3.5 Buildings

Because of the proximity of the facilities at the Faro mine (shops, offices, dry etc.) only a minimum number of new buildings will be required at the Vangorda Plateau.

A lube and fuel station will be required near the Grum pit to service the operating equipment. This station will include facilities for bulk storage and dispensing of all fuels, lubricants, coolants, and hydraulic fluids. The location and design of the storage facilities will be selected so as to minimize the risk of environmental damage through spills.



CURRAGH RESOURCES

PROPOSED
VANGORDA CREEK DIVERSION

DR.BY: CGY
NOV./86

FIGURE 12

A two-bay maintenance facility will also be required for minor servicing of the mobile equipment. This would be a pre-engineeered building intended for PM's and minor repairs only. Major equipment servicing and repairs would be done at the Faro facilities.

4. Mine Design and Ore Reserves

Ore feed to the concentrator must come from three sources in addition to the Faro pit in order to sustain production through 1999. These are two new open pits at the Vangorda and Grum deposits and an underground mine southwest of the Faro open pit.

4.1 Faro Open Pit

4.1.1 Pit Design

The Faro pit design followed in this plan is essentially that presented in 1985 in a report by Kilborn Engineering when start-up of the mine was proposed. The sequencing of the pit has been optimized and the mining rate increased. There are four mining phases from northwest to southeast referred to as AY, BZ, CZ and DY.

4.1.2 Ore Reserves

Ore reserves for the Faro pit as of April 1, 1987 are listed below. These reserves are based on a 4% combined lead and zinc cutoff grade and have been adjusted to reflect a 95% mining recovery and a 15% waste dilution.

Waste: 53.6 million tonnes

Ore: 20.6 million tonnes at an average grade of 2.8% lead, 4.3% zinc, 35 grams/tonne silver and 0.10 grams/tonne gold.

In addition at April 1, 1987 there will be a stockpile of previously mined ore totaling 402,500 tonnes averaging 1.9% lead, 3.1% zinc and 26 grams/tonne silver.

4.2 Faro Underground

4.2.1 Mining Method

The underground extension of the Faro deposit will be accessed by a ramp driven from the 3670 level in the Zone I pit. The ramp will be driven at -15% to the 3500 level. A 14' X 15' pilot drift will be driven along the strike of the deposit at the 3500 level. The ramp will continue to loop down to the 3400, 3300 and 3200 foot levels where similar drifts will be driven along strike.

Pilot drifts will be spaced at approximately 200 foot intervals along the dip of the deposit. Slopes will be developed up dip from the pilot drifts as outlined in figure 13.

Rooms 30' wide will be mined out between 30 wide pillars. Narrow ore zones will be mined in one lift. Wide zones (greater than 15 feet thick) will be mined in two or more lifts as required. After mining the rooms, the pillar will be cut square in retreat. A 50' crown pillar will be left between the pit and underground.

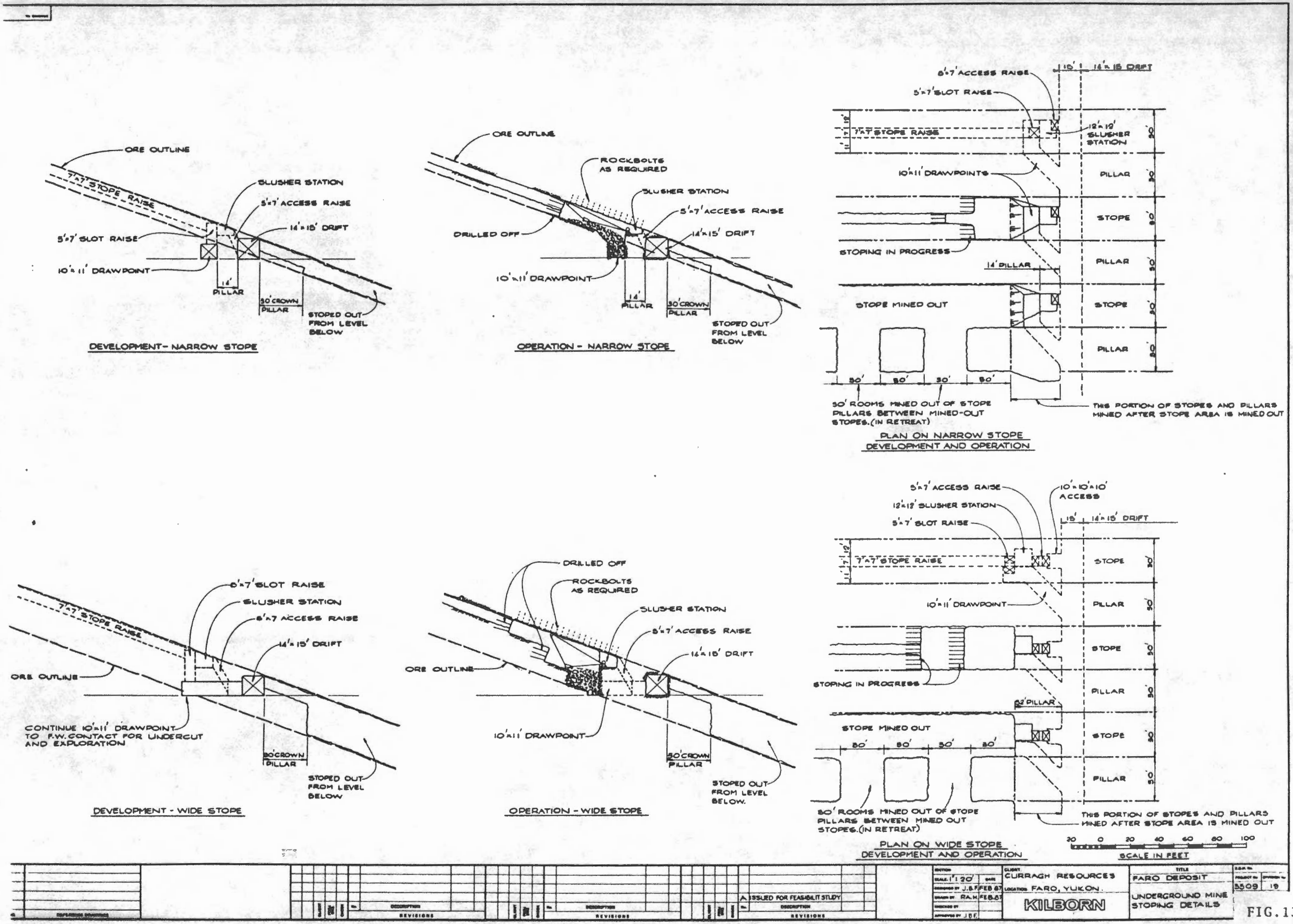

ORE OUTLINE
7'x7' STOPE RAISE
SLUSHER STATION
5'x7' ACCESS RAISE
14'x15' DRIFT
5'x7' SLOT RAISE
10'x11' DRAWPOINT
14' PILLAR
30' CROWN PILLAR
STOPED OUT FROM LEVEL BELOW
DEVELOPMENT - NARROW STOPE
ROCKBOLTS AS REQUIRED
DRILLED OFF
OPERATION - NARROW STOPE
12'x12' SLUSHER STATION
10'x11' DRAWPOINTS
STOPING IN PROGRESS
STOPE MINED OUT
PILLAR
STOPE
30' ROOMS MINED OUT OF STOPE PILLARS BETWEEN MINED-OUT STOPES.(IN RETREAT)
THIS PORTION OF STOPES AND PILLARS MINED AFTER STOPE AREA IS MINED OUT
PLAN ON NARROW STOPE DEVELOPMENT AND OPERATION
CONTINUE 10'x11' DRAWPOINT TO F.W. CONTACT FOR UNDERCUT AND EXPLORATION
DEVELOPMENT - WIDE STOPE
OPERATION - WIDE STOPE
10'x10'x10' ACCESS
32' PILLAR
PLAN ON WIDE STOPE DEVELOPMENT AND OPERATION
SCALE IN FEET
A ISSUED FOR FEASIBILITY STUDY
REVISIONS
SCALE 1"=20'
DESIGNED BY J.B.F. FEB 87
DRAWN BY R.A.H. FEB 87
APPROVED BY J.B.F.
CLIENT CURRAGH RESOURCES
LOCATION FARO, YUKON.
KILBORN
FARO DEPOSIT
UNDERGROUND MINE STOPING DETAILS
3509 19

FIG.13

Mining rate will be 500,000 tonnes per year.

This mining method is a variation on the method used for most shallowly dipping orebodies. It is currently in use for mining uranium ore at Elliot Lake, Ontario.

Current planning would be to contract out the Faro underground mining.

4.2.2 Ore Reserves

Ore reserves have been newly calculated by Kilborn Engineering using polygonal methods and pre-existing data.

Preliminary underground mineable reserve is 2.0 million tonnes averaging 11.59% combined lead and zinc. This reserve has been adjusted to reflect 10% dilution by waste. A 70% recovery of the geologic reserves is planned.

4.3 Vangorda Pit

4.3.1 Geotechnical

Geotechnical parameters for the Vangorda pit area were studied in 1980 by Cyprus Anvil Mining Corporation.

In summary, the 1980 report found that foliation surfaces would be the most prominent discontinuity affecting wall stablility. Specifically, the S_2 foliation, striking 130° and dipping 23-27° to the southwest, has been identified as the most important structural feature. Since this foliation will be dipping into the pit on the northeast wall, that wall will be built at a shallower angle. The slope design parameters as determined by CAMC are summarized below:

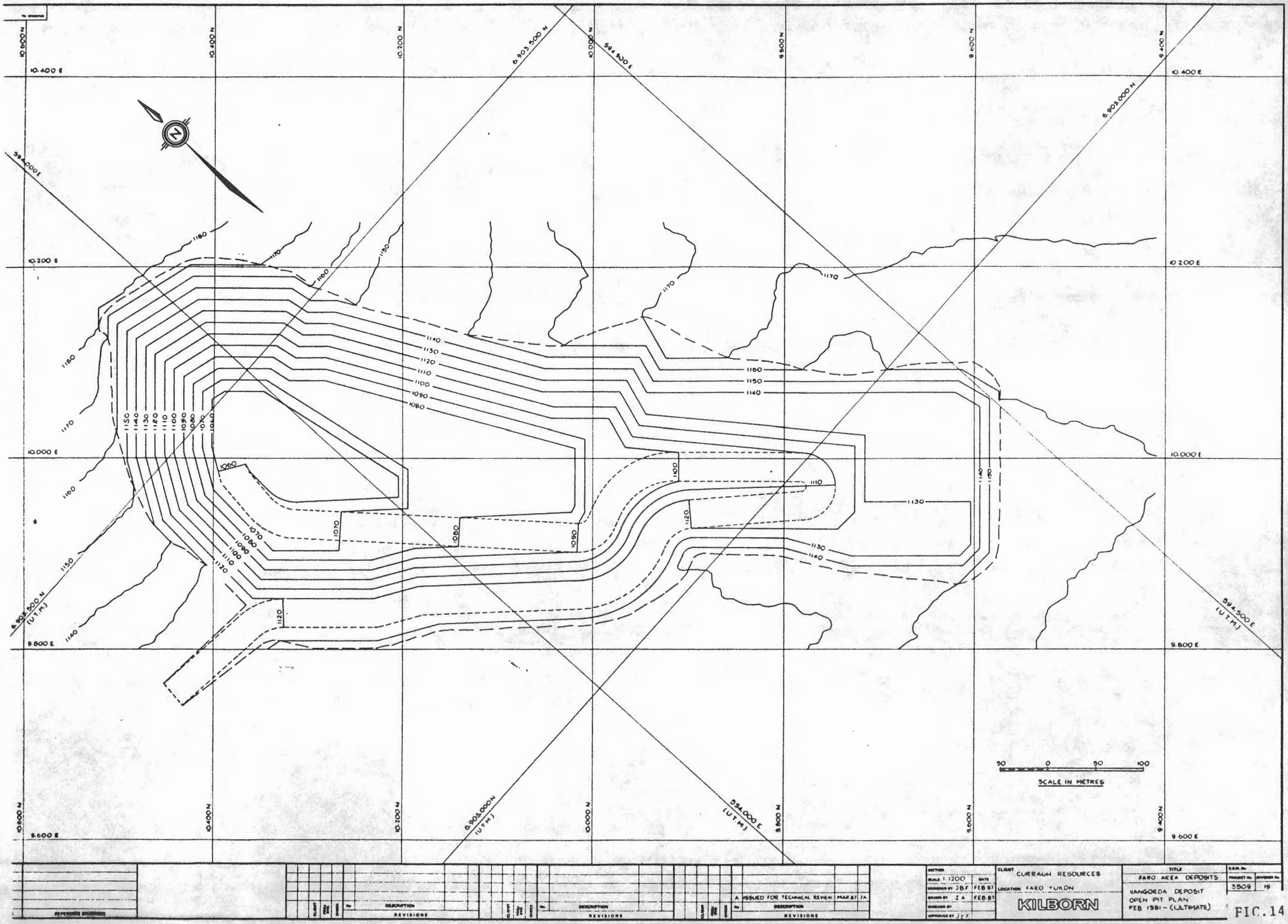
NE Wall - 40° slope overall
SW Wall - 45° slope overall

The CAMC report also identified two key weaknesses in the geotechnical assessment:

1. The orientation of the S_2 foliation is not accurately known. Local variations in the orientation are known to occur, and these variations could affect the local stability. More information on the orientation will be gained geological mapping once mining begins.

2. Local groundwater conditions are not well known. Specifically, it is not known how the diversion of Vangorda Creek will affect the local groundwater regime.

These weaknesses indicate that further geotechnical studies are to be carried out in the design stage. Furthermore, a need for continual monitoring and assessment of wall stability is indicated.



SCALE IN METRES
A ISSUED FOR TECHNICAL REVIEW MAR 87 ZA
REVISIONS
SCALE 1:1200
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DRAWN BY ZA FEB 87
APPROVED BY JPF
CLIENT CURRAGH RESOURCES
LOCATION FARO YUKON
KILBORN
TITLE FARO AREA DEPOSITS
VANGORDA DEPOSIT
OPEN PIT PLAN
FEB 1981 – (ULTIMATE)
5509
19

FIG. 14

4.3.2 Overburden

Unconsolidated overburden within the pit and waste dump areas consists mainly of a glacial till, with thickness ranging from 2 to 30 metres. The till is relatively consistent across the site and is primarily composed of sandy silt with some clay and gravel. Overburden slopes have been designed at 35°.

4.3.3 Pit Design

The Vangorda pit has been designed based on geotechnical parameters to provide the most economic utilization of the orebody, without compromising the safety of operations and the potential for further development while minimizing damage to the environment.

4.3.4 Ore Reserves

Ore reserves for the Vangorda Pit are listed below. These reserves are based on a 4% combined lead and zinc cutoff grade, and have been adjusted to reflect a 95% mining recovery and a 15% waste dilution.

Waste -	overburden	9.1 million tonnes
	rock	12.4 million tonnes
	TOTAL	21.5 million tonnes

Ore: 6.46 million tonnes at an average grade of 3.5% lead, 4.5% zinc, 49 g/t silver and 0.59 g/t gold.

4.3.5 Waste Dumps

A preliminary waste dump site has been selected southwest of the pit, in the Vangorda Creek valley. This location offers the advantages of being located close to the pit exit and contained within one water drainage area, an environmental advantage.

The final dump location will be determined in conjunction with the final alignment of the Vangorda Creek diversion.

4.3.6 Water Quality Management

Water quality management will require careful planning. Water discharged to the environment from the Vangorda pit will come from two sources: surface flows occuring as a result of precipitation and melting, and groundwater flows pumped out of the pit. Before this water is released to the environment, it is to be contained and treated in a settling pond downstream of the pit. The location of the pond will be chosen so as to accumulate all of the affected water at one point.

4.4 Grum Pit

4.4.1 Geotechnical

Geotechnical parameters for the Grum pit area were studied in 1979 by Montreal Engineering Co. Ltd. (Monenco).

In summary, the 1979 report found that foliation surfaces would be the most prominent discontinuity affecting wall stablility. Specifically, the S_2 foliation, striking 180° and dipping an average 34° to the southwest, has been identified as the most important structural feature. Since this foliation will be dipping into the pit on the northeast wall, that wall will be built at a shallower angle. The slope design parameters as determined by Monenco are summarized below:

NE Wall - 40° slope overall
SW Wall - 45° slope overall

The Monenco report also identified two key weaknesses in the geotechnical assessment:

1. The orientation of the S_2 foliation is not accurately known. Local variations in the orientation are known to occur, and these variations could affect the local stability. More information on the orientation will be gained through oriented core drilling and through pit mapping once mining begins.

2. Local groundwater conditions are not well known.

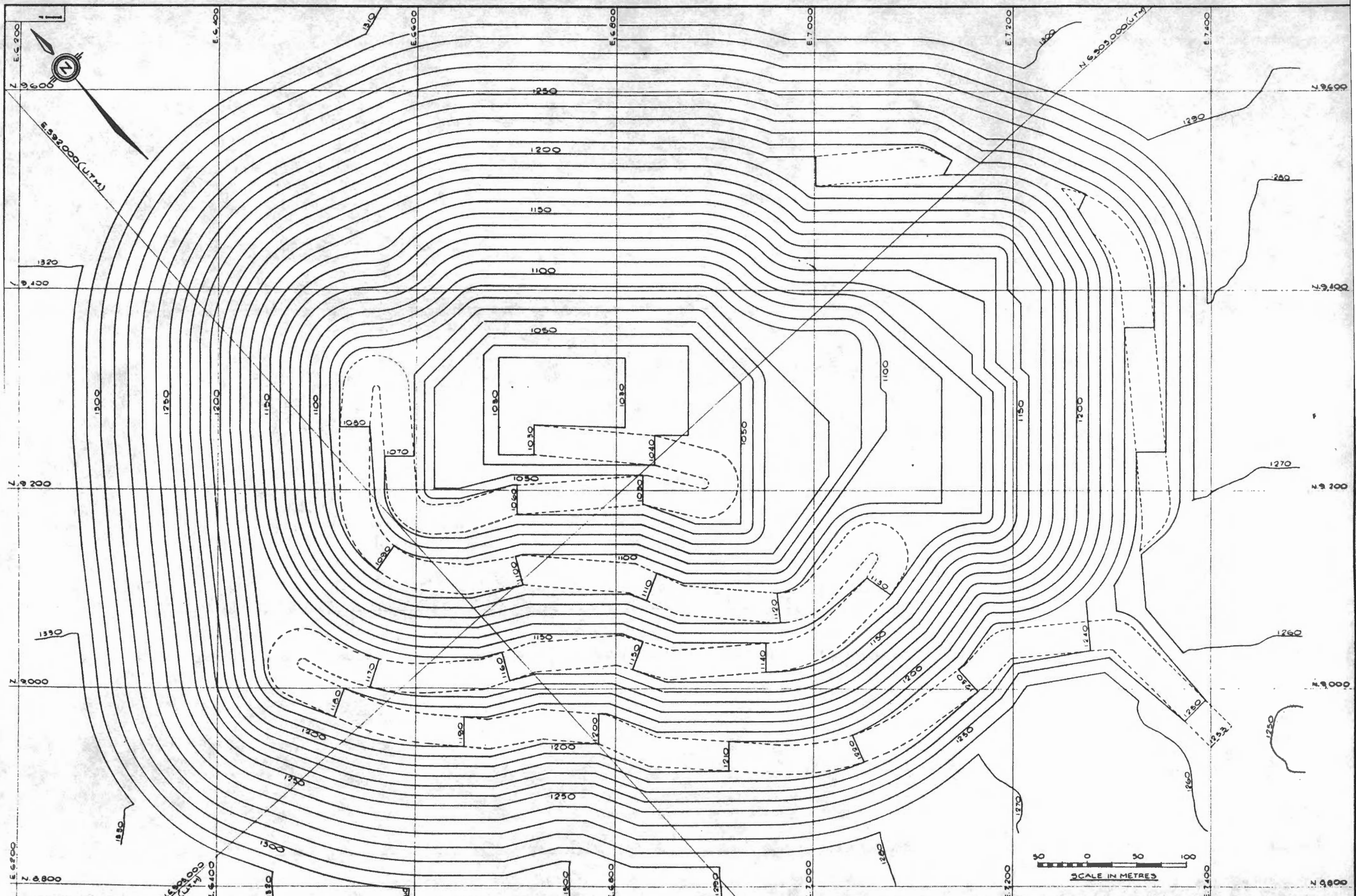
These weaknesses indicate that further geotechnical studies be carried out in the design stage. Furthermore, a need for continual monitoring and assessment of wall stability is indicated.

4.4.2 Overburden

Unconsolidated overburden within the pit and waste dump areas consists mainly of glacial till, with thickness ranging from 10 to 100 metres. The till is relatively consistent across the site and is primarily composed of sandy silt with some clay and gravel. Overburden slopes have been designed at 35°.

4.4.3 Pit Design

The Grum pit has been designed based on geotechnical parameters to provide the most economic utilization of the orebody, without compromising the safety of operations or potential for further development while minimizing damage to the environment.



A ISSUED FOR TECHNICAL REVIEW MAR 1987

SCALE 1:1200	DESIGNED BY JBF FEB 87	DRAWN BY RAH FEB 87
CHECKED BY	APPROVED BY JBF	

CLIENT: CURRAGH RESOURCES

LOCATION: FARO, YUKON

KILBORN

TITLE: FARO AREA DEPOSITS

CRUM DEPOSIT
OPEN PIT PLAN
MAY 1997 - ULTIMATE

PROJECT No. 3509 | DRAWING No. 19

FIG. 15

4.4.4 Ore Reserves

Ore reserves for the Grum Pit are listed below. These reserves are based on a 4% combined lead and zinc cutoff grade, and have been adjusted to reflect a 95% mining recovery and a 15% waste dilution.

Waste -	overburden	31.6	million tonnes
	rock	199.1	million tonnes
	TOTAL	230.7	million tonnes

Ore: 24.99 million tonnes at an average grade of 3.0% lead, 5.0% zinc, 49 g/t silver and 0.81 g/t gold.

4.4.5 Waste Dumps

A preliminary waste dump site has been selected south of the pit. This location offers the advantages of being located close to the pit exit, and contained within one drainage area, an environmental advantage.

The final dump location will be determined in conjunction with the final alignment of the Vangorda Creek diversion.

4.4.6 Water Quality Management

Water quality management will require careful planning. Water discharged to the environment from the Grum pit will come from two sources: surface flows occuring as a result of precipitation and melting, and groundwater flows pumped out of the pit. Before this water is released to the environment, it is to be contained and treated in a settling pond downstream of the pit. The location of the pond will be chosen so as to accumulate all of the affected water at one point.

5.0 Work Systems

5.1 Underground Mining Operations

The mining operations will be standard trackless jumbo and scoop tram/haulage truck operations. Blasting will be carried out by qualified persons following all applicable regulations. Supply of explosives will be from the existing supplier. Surface haulage of ore to the mill will be by existing open pit haulage trucks.

Ventilation and emergency escape provisions will adhere to all applicable regulations. Roof support will be maintained throughout the operation by rock bolting as required.

The final design of the underground operation will determine the exact specifications.

5.2 Open Pit Mining Operations

Open pit mining operations at the Vangorda and Grum pits will employ conventional truck-shovel mining techniques similar to those currently being used at the Faro pit operation. All operations will conform to the applicable Mining Regulations, Blasting Regulations, and other applicable regulations.

Shovel operations will employ shovels or front end loaders loading waste and ore onto haul trucks. The pit will be mined in benches, and the bench height will be limited by the ability of the excavating equipment.

Waste and ore will be hauled out of the pit by conventional haul trucks. Waste will be taken to a waste dump area where it will be dumped over an embankment. Ore will be taken either to a stockpile or hauled to the Faro concentrator over the Vangorda Haul Road. All haul roads will be maintained in good condition, and dust suppression will be accomplished by the application of water to the road surface.

Drilling operations will use rotary blasthole drills similar to those currently in use at Faro. Dust suppression will be accomplished by injecting water into the drill hole.

Blasting operations will use bulk AN/FO and slurry explosives. These explosives will be delivered from the existing bulk storage facilities located near the Faro pit. Since explosives magazines are currently being used at the Faro pit, no new magazines are expected to be required during the initial development of the Vangorda and Grum pits.

All blasting operations will be carried out in a manner similar to current practices at the Faro pit, and will conform to the Blasting Regulations and Mine Safety Regulations.

5.3 Work Schedule

The Vangorda and Grum pits will operate 24 hours per day, seven days per week, as will the ore haul. The work schedule will be the same as that for the Faro pit.

Currently the Faro pit operates on a six day, 12-hour shift rotation, where a full shift cycle consists of three 12-hour day shifts followed by three 12-hour night shifts followed by three days off.

6.0 Production Schedule

Mining operations in the Faro pit will continue until 1992. Underground development at Faro will begin in 1988, with ore production starting in 1989. Underground mining will also be complete in 1992.

Development of the Vangorda pit will begin in 1988, with ore production starting in 1989. The Vangorda pit will be completed in 1991.

Development of the Grum pit will begin in 1988, with ore production starting in 1991. The Grum pit will be completed in 1997.

6.1 Mining

The mining plan has been developed under the following guidelines:

1. Provide a constant mill feed of the best ore possible at the maximum capacity of the mill.
2. Targeted mill feed rates are 13,500 t/d for Faro ore and 11,000 t/d for Vangorda Plateau ore, to a maximum concentrate production rate of 1,600 t/d.
3. As much as possible, delay waste stripping while maintaining item 1 above.
4. As much as possible, maintain the existing operating equipment fleet size.

The annual mining schedule is presented in Table 1.

6.2 Operating Equipment

Operating equipment in the pits has been estimated based on the following:

Shovels:	As required by mine plan
Trucks:	As required by mine plan
Tracked dozers:	One per operating shovel
Rubber-tired dozers:	One per two operating shovels
Graders:	One per two operating shovels, plus one for Vangorda Haul Road after 1989
Drills:	One per two operating shovels

Additionally, front end loaders have been scheduled to handle stockpiled ore, based on the following:

- Rehandle 30% of mill feed from Faro pit
- Rehandle all mill feed from Vangorda and Grum pits
- Rehandle all ore in long-term stockpile
- Productivity of 415 metric tonnes per hour

Scrapers will be used for overburden removal at Grum and Vangorda alone from 1988 to 1994. It is contemplated that this operation will be contracted.

The underground mining will likely be contracted.

Operating equipment is summarized in Table 2.

6.3 Milling

The milling schedule was produced under the following guidelines:

1. Mill feed rate of 13,500 tonnes/day for Faro ore, and 11,000 tonnes/day for Vangorda Plateau ore.

2. Mill feed come from highest grade ore available.

3. Maximum concentrate production of 1,600 tonnes/day.

The mill feed schedule is presented in Table 3.

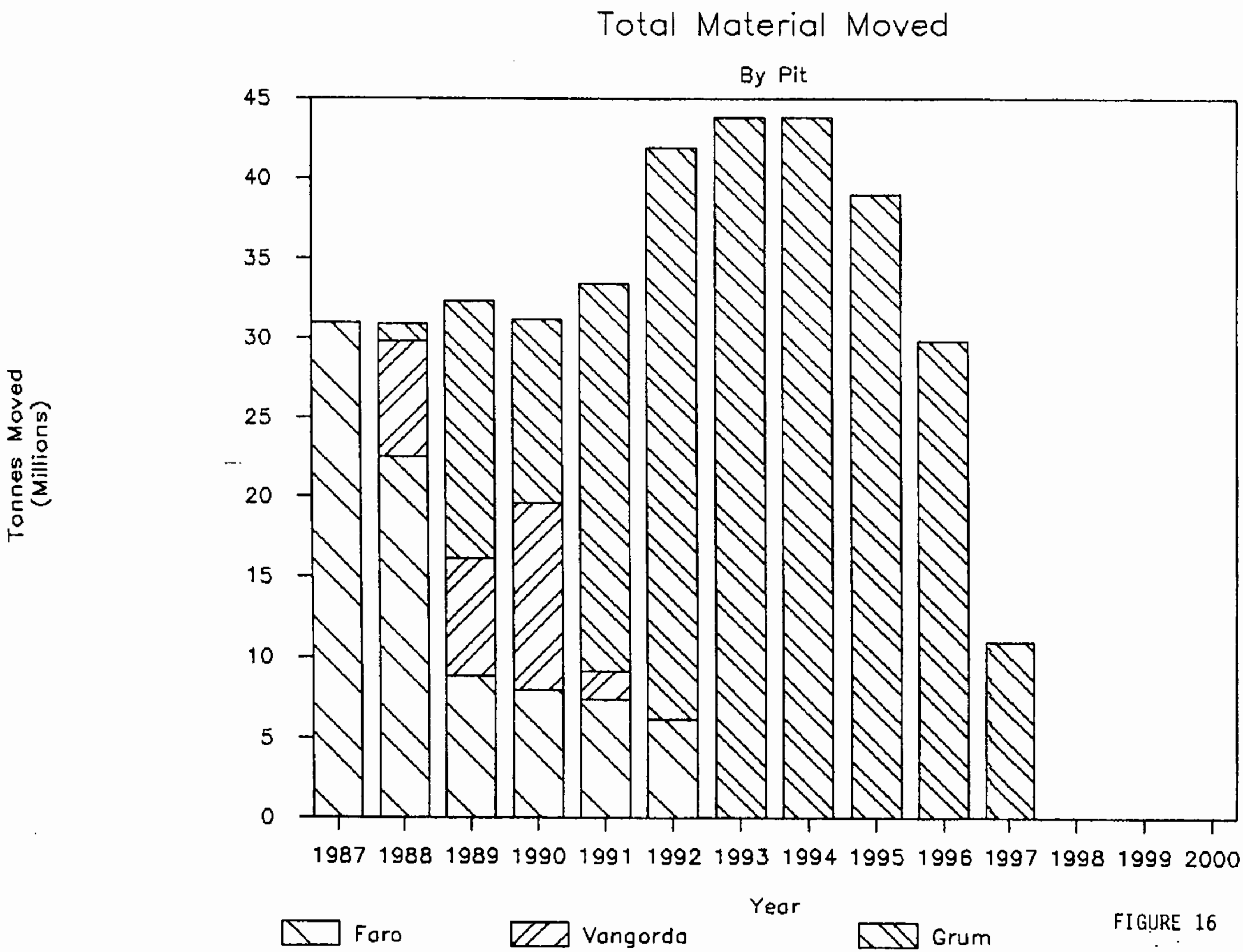
Mill tailings for the whole period, can be accomodated in the existing tailings area. However, at the end of the Faro pit's life (1991) the objective will be to use this mined out pit to store and contain tailings. The existing dam has to be raised prior to 1992, and, if the Faro pit cannot be used to store tailings the dam will have to be raised further during 1994-95.

TABLE 1

CURRAGH RESOURCES

VANGORDA PLATEAU - SCRAPER CASE

DESCRIPTION	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTAL
FARO PIT															
All Waste	20,375,000	15,794,350	5,511,620	7,832,603	4,966,372	2,341,599	0	0	0	0	0	0	0	0	56,821,544
Ore	3,792,000	6,739,025	3,336,756	121,506	2,431,292	3,800,099	0	0	0	0	0	0	0	0	20,220,678
FARO U/G															
Ore	0	0	500,007	500,007	500,007	500,007	13,633	0	0	0	0	0	0	0	2,013,661
VANGORDA PIT															
All Waste	0	6,665,590	6,029,032	8,132,170	660,575	0	0	0	0	0	0	0	0	0	21,487,367
Ore	0	0	1,836,991	3,536,416	1,085,358	0	0	0	0	0	0	0	0	0	6,458,765
GRUM PIT															
All Waste	0	1,068,143	16,139,767	11,303,990	22,471,232	33,502,418	40,037,474	39,283,190	34,351,328	26,150,241	7,014,706	0	0	0	231,322,489
Ore	0	0	52,328	268,926	1,766,554	2,274,337	3,823,196	4,577,467	4,677,002	3,628,173	3,925,407	0	0	0	24,993,390
SCRAPER FLEET															
Overburden Mined	0	8,000,000	8,000,000	8,000,000	6,000,000	6,000,000	4,000,000	2,643,153	0	0	0	0	0	0	42,643,153
TOTAL MINED															
Waste	20,375,000	23,528,083	27,680,419	27,268,763	28,098,179	35,844,017	40,037,474	39,283,190	34,351,328	26,150,241	7,014,706	0	0	0	309,631,400
Ore	3,792,000	6,739,025	5,726,082	4,426,855	5,783,211	6,574,443	3,836,829	4,577,467	4,677,002	3,628,173	3,925,407	0	0	0	53,686,494
TOTAL	24,167,000	30,267,108	33,406,501	31,695,618	33,881,390	42,418,460	43,874,303	43,860,657	39,028,330	29,778,414	10,940,113	0	0	0	363,317,894



Total Material Moved
By Pit
Tonnes Moved (Millions)
45
40
35
30
25
20
15
10
5
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Faro
Vangorda
Grum

FIGURE 16

TABLE 2

OPERATING EQUIPMENT SUMMARY

Shovels:													
Marion	1.0	0.0	0.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.1	0.0	0.0
P & H 2100	3.0	2.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.7	0.8	0.0	0.0
Shovel Years	4.0	2.8	3.3	4.0	4.0	4.0	4.0	4.0	4.0	3.7	0.9	0.0	0.0
Trucks													
Euclid 154 tonne	12	12	12	12	12	12	16	20	22	22	11.6	4.9	0
Wabco 109 Tonne	16	5.8	6.9	9.9	16	16	7.5	12.9	15.2	12.2	0	0.7	4.1
Front End Loader	0.4	0.8	1.2	1.6	1.3	1.3	1.5	1.5	1.4	1.6	1.5	1.6	1.6
Dozer Tracked	4.0	2.8	3.3	4.0	4.0	4.0	4.0	4.0	4.0	3.7	0.9	0.0	0.0
Dozer Wheeled	2.0	1.4	1.6	2.0	2.0	2.0	2.0	2.0	2.0	1.9	0.4	0.0	0.0
Grader	2.0	1.4	2.6	3.0	3.0	3.0	3.0	3.0	3.0	2.9	1.4	1,0	1.0

TABLE 3

MILL SUMMARY	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTAL
Mill Feed	3,564,069	4,791,321	4,324,747	3,997,068	4,879,716	4,466,176	4,374,324	4,015,000	3,800,000	4,088,273	4,015,000	4,147,856	4,018,403	0	54,481,
% Pb+Zn	8.11	7.90	8.57	9.02	7.79	8.35	7.56	8.92	9.58	8.38	8.30	4.08	4.36	0.00	
CONCENTRATE PRODUCED															
Lead Conc Tonnes	150,465	194,800	202,862	235,492	206,735	174,190	156,404	181,190	180,814	171,517	162,821	74,754	78,278	0	2,170
Zinc Conc Tonnes	269,555	355,206	345,732	311,243	350,245	378,787	319,620	345,518	361,435	326,566	318,959	140,516	152,975	0	3,976
Total Conc Tonnes	420,020	550,006	548,615	546,735	556,980	552,967	476,023	526,708	542,249	498,083	481,781	215,270	231,262	0	6,146

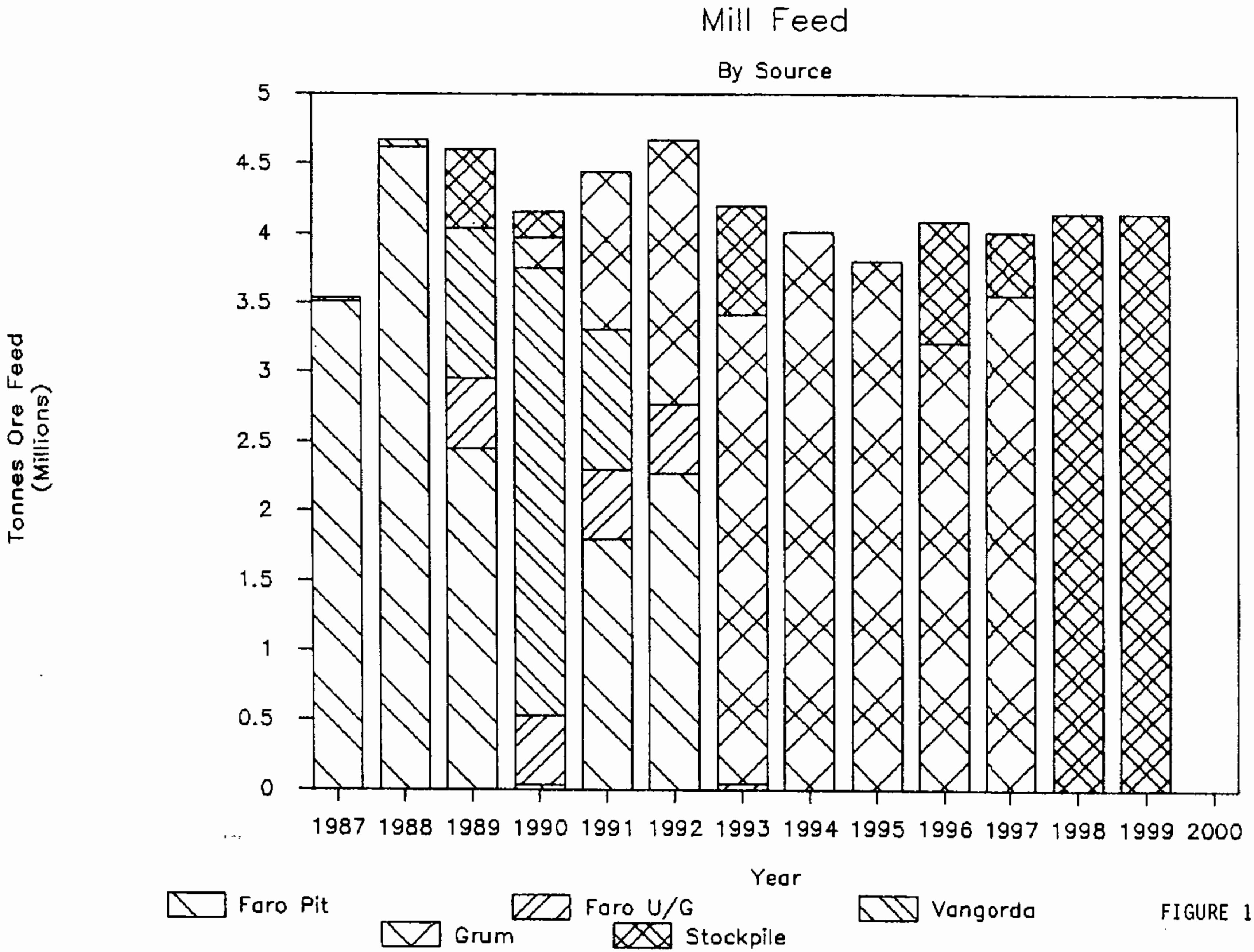

Mill Feed
By Source
Tonnes Ore Feed (Millions)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Faro Pit
Faro U/G
Vangorda
Grum
Stockpile

FIGURE 17

7.0 Manpower

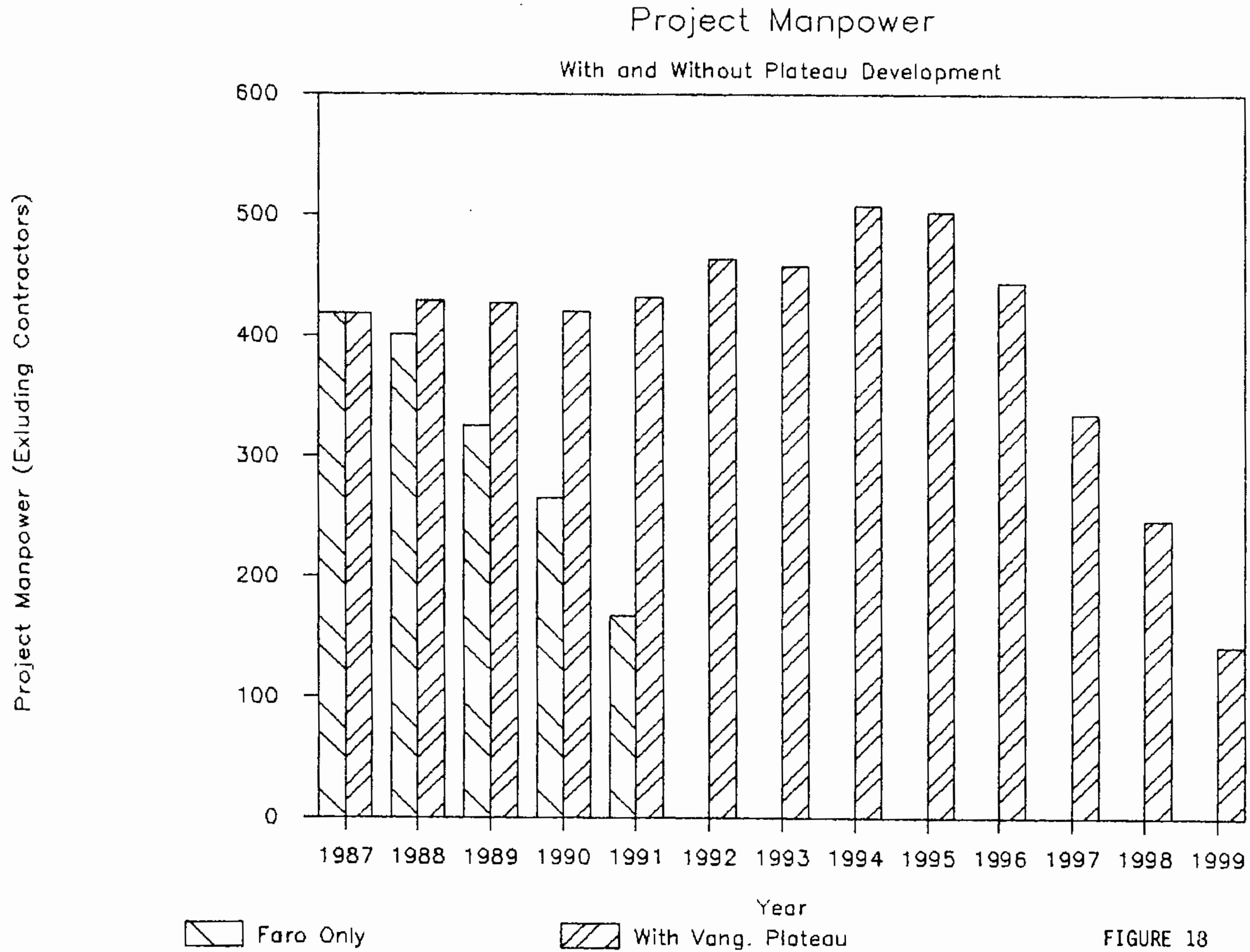
Manpower forecasts are presented in Table 4. The hourly forecast is based on the current three crew shift cycle.

Salaried manpower is presented in Table 4. Table 4 does not include contractor manpower which would be employed in underground mining at Faro or preproduction stripping at Grum and Vangorda.

TABLE 4

CURRAGH RESOURCES
VANGORDA PLATEAU PROJECT
MANPOWER SUMMARY

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	PROJECT TOTAL
HOURLY MANPOWER															
MINE OPERATIONS	143	103	116	133	151	151	138	158	179	167	66	31	22	0	1558
MINE MAINTENANCE	89	80	87	97	107	107	100	112	123	116	52	33	25	0	1129
MINE TOTAL	232	183	203	231	258	258	238	270	302	283	118	64	47	0	2687
MILL OPERATIONS	60	60	60	60	60	60	60	60	60	60	60	60	30	0	750
MILL MAINTENANCE	48	48	48	48	48	48	48	48	48	48	48	48	24	0	600
MILL TOTAL	108	108	108	108	108	108	108	108	108	108	108	108	54	0	1350
MATERIALS MANAGEMENT	10	10	10	10	10	10	10	10	10	10	10	10	10	0	130
TOTAL HOURLY	350	301	321	349	376	376	356	388	420	401	236	182	111	0	4167
SALARIED MANPOWER															
MINE	36	36	36	36	36	36	36	36	36	36	29	9	4	0	402
MILL	30	30	30	30	30	30	30	30	30	30	30	30	15	0	375
CONTROLLERS GROUP	13	13	13	13	13	13	13	13	13	13	13	13	7	0	163
MATERIALS MANAGEMENT	5	5	5	5	5	5	5	5	5	5	5	5	3	0	63
HUMAN RESOURCES	8	8	8	8	8	8	8	8	8	8	8	8	4	0	100
SALARIED TOTAL	92	92	92	92	92	92	92	92	92	92	85	65	32	0	1102
PROJECT TOTAL															
(EXCLUDING CONTRACTORS)	442	393	413	441	468	468	448	480	512	493	321	247	143	0	5269



Project Manpower
With and Without Plateau Development
Project Manpower (Exluding Contractors)
600
500
400
300
200
100
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
Year
Faro Only
With Vang. Plateau

FIGURE 18

8.0 Environmental and Land Use Planning

8.1 Introduction

Since the development of the Grum and Vangorda will be incorporated into the existing Faro operations, many of the environmental concerns associated with totally new mining operations will not be applicable. This project will utilize the existing mill water supply, milling facilities, tailings disposal facility, town site, workforce, and transporation system.

The Vangorda Plateau has been under active exploration and evaluation for over 25 years. The information base from both a geological and environmental point of view is well developed. Development of these orebodies as an extension of Faro operations will result in minimal environmental disturbances relative to a new mine in a new region. Furthermore, there should be no significant land use conflict issue as there is no commercial timber and low recreation potential.

8.2 Regulatory Requirements

The right to mine is provided by the Yukon Quartz Mining Act. Although Curragh Resources', as the holder of the mineral leases has the right to mine the Vangorda and Grum deposits, mining activities must conform with other legislation including the Northern Inland Waters Act and the Fisheries Act. In particular, altering water flows or discharging wastes requires approval from the Yukon Territory Water Board in the form of a water use licence.

8.3 Baseline Environmental Data

8.3.1 Summary of Existing Data

Development of the Grum and Vangorda deposits has been under active consideration for over 10 years. During this period, substantial environmental information has been collected. The most comprehensive work was carried out by Montreal Engineering on behalf of Kerr-AEX Grum Joint Venture from 1975-77. This work was continued by Cyprus Anvil Mining Corporation once it obtained control of the properties.

Kerr-AEX was considering the development of the Grum deposit as a stand alone project. Thus, it required extensive information on water supply (hydrology), tailings pond sites and power supply as well as baseline environmental information. CAMC intentions were to develop Grum and Vagorda in order to extend the life of its Faro operations, similar to Curragh's plans.

Hydrology

Montreal Engineering collected Vangorda Creek flow data for three summers 1975-77.

Hydrocon Engineering prepared a hydrology study in 1979 in order to assist Golder Associates prepare a Vangorda Creek Diversion structure. It computed that the 50 year flood event translated into 20.5m^3/sec at the diversion. The mean annual flood event was 3.0m^3/sec.

Climate

Montreal Engineering collected information on precipitation temperature, wind, and daylight. Average annual percipitation was estimated at 304mm. Temperatures ranged from -50°C to 30°C. "High winds are rare with 38 mph wind speed being about the maximum."

Landforms, Soils and Vegetation

Montreal Engineering prepared maps on landforms, soils and vegetation. It also addressed the potential impacts of mine development. Most of the concerns related to adequate water supply for a mill and a suitable location for a tailings facility which are not of concern to this plan.

Wildlife

Possible impacts on the seasonal migration of Fannin Sheep was identified by Montreal Engineering. This work was expanded by a joint CAMC/Yukon Government study in 1981 (McLeod 1981). The fact that mining activities will pose a problem to sheep migration is yet to be established.

Water Quality

Montreal Engineering conducted an extensive water quality montitoring program from 1975-77. Water quality was sampled above and below the Grum mine site. This sampling was continued by CAMC in 1979-80 and by DIAND on an ongoing basis. Surface water, groundwater and minewater were sampled. This baseline information will be of assistance in developing water discharge standards.

Benthic Ecology

Aquatic benthic macroinvertebrates sampling was carried out in 1975-77 and 1980. Sampling has also been carried out every two years on Rose Creek as part of Curragh's water licence. Results indicated that Vangorda Creek is typical of unstressed Yukon mountain streams.

Fish

Montreal Engineering conducted a survey of the local fish population as well as analyzing muscle tissue for heavy metals. This survey was carried out from 1975-77. Curragh began fisheries impact studies near the Faro operation in 1986; this work has not shown any significant impact on fish population.

8.4 Environmental Issues

8.4.1 Haul Road

Stream Crossings

The haul road will cross several streams. The first crossing, a rock drain causeway across the North Fork of Rose Creek, is already under construction and has been approved by the Department of Fisheries & Oceans. The other stream crossings will be conventional culvert crossings. Previous design work by Stanley and Associates provides details on the culvert size and gradiant necessary to meet DFO requirements with respect to flood design criteria and fish passage.

Construction Materials

The haul road will be constructed as a fill road utilizing waste rock from the Faro and Vangorda Plateau pits. Only non-sulphide rock will be used to ensure that leaching of acids or heavy metals does not occur. The fill road design utilizing waste rock will result in a minimum disturbance to the surface area as the existing ground cover will be left in place and it will avoid the requirment for extensive burrow pits along the route.

Sheep Migration

Fannin Sheep migrate in the spring and fall between Sheep Mountain (south of the haul road) and Mount Mye (north of the haul road). Concern has been expressed by Wildlife officials that the haul road and mining activity may interfere with this migration; this must be confirmed and recommendations for mitigative measures, if required, should be developed with the Department of Renewable Resources.

8.4.2 Vangorda Creek Diversion

Vangorda Creek must be diverted around the Vangorda pit and waste dumps. The proposed diversion is indicated in figure 12. Preliminary information indicates that this creek does not contain fish in the area of the diversion or upstream. Thus, the design of the diversion need not consider fish habitat or fish passage. However, impact on downstream water quality and hydrology will be addressed.

The diversion structure will be designed to handle a 50 year flood event (estimated at 20.5 m^3/sec) to maintain a stable channel. Implementation of the creek diversion will occur, if possible, during the spring run-off to minimize the impact of the temporary increased suspended solids associated with the initial use of the diversion channel.

8.4.3 Vangorda Waste Dump

The Vangorda waste dump is located in the Vangorda Creek Valley (see figure 11). The diversion of Vangorda Creek around the dump area will lower water flow in the area of the dump thereby reducing the potential for heavy metal or acid leaching from the waste dumps. Any water coming into contact with waste in the dump may have to be collected and treated before it enters Vangorda Creek. Care in locating sulphide waste rock within the dump may also help avoid this problem.

8.4.4. Vangorda Pit Dewatering

During operations, dewatering of the pit will be required. Information on the expected water quality or quantity will be gathered as part of the environmental program and this information will be taken into account during the final stages of detailed planning. If determined, a settling pond may be required to treat the pit water in order to meet required standards set by the water licence.

8.4.5 Grum Waste Dump

The Grum waste dump, containing 90 million BCM of waste, will be located in a small valley southeast of the pit (see figure 11). Locating the dump in the valley will provide for a long term stable dump with a minimum impact on local drainage patterns and surface area. However, as the dump is located in a drainage area, surface run-off will be diverted around the waste dump. Most of the waste to be removed from the Grum pit is calcareous phyllite with considerable buffering capacity. Final design of the dump will allow the calcareous material to provide some buffering between acid generating waste and the environment.

8.4.6 Pit Dewatering

Historically, water pumped from the Grum adit has required treatment in a settling pond prior to discharging to Vangorda Creek. Thus, it is anticipated that provision will have to be made for treatment of pit water in a settling pond.

8.4.7 Doal Lake

A small shallow pond (Doal Lake) presently exists within the final pit confines of the Grum deposit. This lake will have to be drained prior to developing the pit.

Doal Lake does not appear to contain any fish nor is it potential fish habitat. Thus, the elimination of this lake should not contravene the Fisheries Act.

8.4.8 Abandonment Plan

Primary concern in the abandonment plan will be the long term impacts on water quality. This will mean oxidizing sulphides in contact with water flows will be minimized. Creek diversions and surface run-off diversions at abandonment will be compatable with long term performance.

8.4.9 Dust and Noise

Mining and ore hauling activities have the potential to impact on the local environment particularly the wildlife and the Town of Faro. Mitigative measures such as dust control will be developed to minimize impacts.

8.4.10 Faro Water Supply

The Town of Faro water supply is from a well located adjacent to the Pelly River and upstream of the mouth of Vangorda Creek. Water is drawn from a deep aqifier whose recharge does not include Vangorda Creek basin waters. Due to the water supply's location, any changes in Vangorda Creek water quality should not affect Faro's water supply. However, this issue is of concern and will be closely monitored.

8.5 1987-88 Environmental Program

8.5.1 Introduction

Although an extensive environmental baseline data base exists, it has not been updated since 1980. A basic sampling program will be undertaken during the summers of 1987-88. In addition, follow-up work will be carried out on fisheries work incorporating the latest development plans.

8.5.2 Baseline Data Program

Water Quality

During the summer of 87-88 monthly water samples will be taken on Vangorda Creek above and below the Grum and Vangorda deposits similar to that currently being done around the Faro operation.

Benthic Invertebrate Community

Two replicant samples will be taken on Vangorda Creek above Shrimp Creek.

Fisheries Habitat

Streams to be crossed for the haul road will be sampled for the presence of fish. Fish and fish habitat above the Vangorda Creek diversion will be evaluated. This work is in addition to the existing study on North Fork Fish Habitat.

Wildlife

Fannin Sheep is the major wildlife species that may be affected by Vangorda Plateau development.

Appropriate monitoring should be carried out with the Yukon Government Wildlife Branch.

8.6 Summary and Conclusions

Montreal Engineering reached the following conclusions based on its biophysical and socio-economic studies.*

"Based on the 1975 biophysical field program, there do not appear to be any unduly sensitive bophysical elements likely to be sigificantly influenced by the proposal Kerr-AEX development, if accepted waste management practices are applied.

Elements of the proposed development may interfere with the migration of Fannin Sheep in the area, and consideration will have to be given to their protection if the existing populations are to be maintained.

Neither Vangorda Creek nor Rose Creek, which are potential receiving streams for the treated mine effluent, support important fish species in their upper reaches.

Water quality monitoring conducted in 1975 indicates that both lead and mercury levels in the natural streams of the area exceed drinking water standards on occasion. all surface waters in the area have very high levels of turbidity during spring runoff, which will be reflected in the mill water supply for a period of several weeks each year."

* Montreal Engineering Company, Limited 1976.

Subsequent studies, data collection and discussions with regulatory agencies have not identified any additional environmental concerns nor have they altered the initial conclusions.

8.7 Regulatory Process

Applications for surface leases and water use licence will be prepared in a manner allowing for the timely development. Applications should be submitted by December 1987 in order that development can proceed in the summer of 1988.

9.0 References:

Cyprus Anvil Mining Corporation, 1980, Vangorda Geotechnical Study - Feasibility

Golder Associates, 1979, A Report to Cyprus Anvil Mining Corporation on Engineering Recommendations for the proposed diversion of Vangorda Creek.

Ken Weagle Environmental Consultant Ltd., 1980. Benthic Community Monitoring Program at Cyprus Anvil Mine.

McLeod, H. 1981 Cooperative Investigation of Migration Patterns of the Mt. Mye Sheep Population.

Montreal Engineering Company, Limited. Kerr-AEX Grum Joint Venture.

- 1975 Biophysical and Socio-Economic Program January, 1976.
- Preliminary Engineering and Environmental Investigation of the Proposed Kerr-AEX Grum Joint Venture January, 1976.
- Kerr-CNRL Grum Joint Venture Environmental Baseline Monitoring Results of 1976 Program February, 1977.
- Kerr-CNRL Grum Joint Venture Environmental Baseline Monitoring Results of 1977 Program April, 1978.

Stanley Associates Engineering Ltd. Vangorda Plateau Haul Road Preliminary Design Study December, 1980.