1983 Summer Program

- one month at Faro
- logged 5000m in 15 DDH on 88W, 108W, at and near Firth
- mapped near Firth to confirm structural interpretation from core logging
- described and selected typical rock unit examples for the Vangorda Plateau reference collection
- cleaned out Watson Lake warehouse and moved equipment to Faro

Grum Deposit

- brief discussion of Grum deposit structure and implications for further exploratory drilling
- connection of Grum to Firth and implications for economic potential of the Firth area
- proposal for drilling at NW and SE ends of deposit can tailor total dollars and number of holes to suite overall company needs - have more to do than can be done at once
- formation of Grum group to solicit input from various interested parties and keep them informed of progress

Vangorda Plateau Remapping Project

- to remap surface outcrops on Vangorda Plateau, relog drill holes away from deposits and feedback subsurface data to surface interpretation
- objective is to unify Dy, Vangorda, and Grum into one overall framework allowing better definition of further exploration projects
- a full 4 month season for two geologists could finish this, but deposit related work will compete for time - cost is salaries plus minimal support

Grum Deposit

The Grum deposit is a complexly folded set of sheets of massive and disseminated sulphide mineralization. The folded structure as a whole plunges 11° towards the northwest. The southeast end of the deposit is truncated by the erosion surface but is covered by 50 to as much as 100 m of sand and gravel overburden.

Several sets of reserve figures are available for the best known portion of the deposit. The attached table shows selected numbers from these various sets of figures; the numbers are selected to be comparable in cutoff grade and area of deposit concerned. All reserve figures to date are calculated on the drill proven portion of the deposit from 62W to 8#W. Additional mineralization exists at the southeast end (Champ zone) and the northwest end (Grum extension) of the above volume. Extensive drilling will be required to raise this mineralization to the status of drill proven reserves. The total geological reserve could be raised by about 30% (mainly in the NW) on completion of this drilling.

At present only interim computer models are available for Grum. An acceptable model is required in order to evaluate the impact of various degrees of open pit and underground extraction on the economics of the deposit. It now appears that the maximum open pit could seriously compromise underground reserves.

A preliminary set of cross sections has been completed for Grum. Inspection of these sections shows several discrepencies between sections in connection of ore horizons and in the treatment of faults. The available sections are based on horizontal projection of drill data which introduces both error and confusion. A new set of cross sections is being constructed to attack these problems. By consultation with previous sections the most internally consistent connection of ore intersections will be arrived at and shown on these new sections. The impact of shallowly dipping faults on the Grum structure will be more adequately considered. These faults can be expected to be serious problems when encountered underground and must be more carefully defined. A new drill hole projection method has been devised that corrects for the plunge of the deposit and these new sections are based on this down plunge projection.

The database used to construct sections at Grum has over the years become out of date. Extensive revisions are necessary to make use of the plotting capabilities of CAMC and Dome computers. These revisions are now underway.

Our target date for the 13 cross sections from 62W to 86W spaced every 200' is 1 June 1984. There are 13 additional cross sections that should be completed. These are 100' spaced intermediate sections and at least provisional 200' spaced sections showing the Champ Zone as well as 88W. There are 19 complete or partial long sections at Grum. Since the deposit spans nearly 500m of elevation there will be a large number of bench plans (perhaps 75) few of which will be as simple as those at Faro. Clearly a complete cross and long section and bench plan program for Grum will take a very long time. We are presently considering possibilities to short cut some of this work. Some possibilities are to develop a mine model using closely spaced (100') cross sections only or the combined cross and long sections only.

Open Pits @ 4% Cutoff

tonnes	Pb%	Zn%	Ag gm/tonne	strip ratio m^3/tonne
Olk Pit '83 (shown in block model)				
17,055,000	3.4	5.9	59	2.91
KA Noranda-computer				
15,583,000	3.1	5.0	47	2.90
CAMC interim computer*				
16,875,000	3.0	4.9	47	2.72 (thought to be too low by Clark

Geological Reserves @ 4% cutoff

K.A. handcrank				
26,083,000	4.1	6.4	62	
KA Noranda Computer				
27,650,000	3.1	4.9	48	
CAMC interim computer				
30,781,000 ?	3.1	4.9	49	

High Grade Reserves - Underground Cutoff of 8%

K.A. handcrank				
15,784,000 ?	5.2	8.3	78	
CAMC '83 handcrank (may not be exactly comparable with above number)				
10,960,000	4.5	7.8	78	

* these are the numbers on the District tonnage and grade compilation

As ore is deep G.J. indicates a pass pit of only 10 million Tonnes.

max 2000 tonnes

8 years ± 1 yr
includes oxide stockpile
low grade stockpile ?

Requirement for drill testing Grum extension

Exploration drilling of the Grum extension (i.e. the down plunge extension of the folded Grum structure) to define additional underground reserves.

A 120m (400') X 60m (200') grid pattern with 1500' - 1700' holes - to framework the deposit extension
- approx 13 holes = approx 21,000' (6400m) @ approx $60/ft
  = $1.26 x 10^6

B additional drilling to fill in to 60m X 60m (200'X 200') grid
- approx 14 holes @ approx 1600' each
  = $ 1.3 x 10^6

C underground development and detail drilling to prove up ore indicated above
- $1 x 10^6 to dewater and rehabilitate existing underground workings
- perhaps an additional $5 x 10^6 to advance workings and ring drill the ore

This is the order of expenditure required to advance suphides in the Grum extension to the status of drill proven reserves. Initial drilling can be done in stages starting with a wider drill spacing and closing down as required.

The target here is somewhere between 5 and 12 million tonnes by extrapolation of drill indicated reserves at the NW end of the deposit into this area.

Champ Zone

The Camp Zone is defined by Kerr Addison to be bounded by 51W and 63W cross sections and 13S to 1S long sections.

They suggest that the zone contains 1.7×10^6 tonnes @ 7.8% Pb+Zn + 46 gm/tonne Ag (at 4% cutoff) of drill indicated reserves. Little if any of this mineralization is included in the current Grum reserve statement.

This mineralization is in the upper horizons and is close to the surface. 4000' of drilling in at least 6 fill in holes would be required to define this mineralization on a 100' x 200' grid pattern at which time it could be considered drill proven and entered into open pit planning.

- 4000' x $60/foot = $240,000

Section 92W

4 holes spaced 400 - 800 feet - 2 holes are too short to hit ore. Best hole is A18 which has no backup drilling within 800' except towards SE. From SW to NE the holes are:

A-18 92W 2N TD: 448.4m

- hit sulphides at 311.2 - 341.4m

  including 6.6m @ 15.4% Pb+Zn
  2.7m @ 13.6% "
  6.3m @ 4.4% "
  4.8m @ 11.6% "
  } separate intervals within 31m

- also hit second horizon @ 420.5 - 425.8m
  includes 5.3m @ 7.98% Pb+Zn

A-15 92W 10N TD: 250m

- sulphides at 138.1 - 153m
  includes 14.9m @ 8.24% Pb+Zn
- also second intersection at 167.6 - 189.9m
  includes 22m @ 4.5% Pb+Zn

A-146 92W 14N TD: 149.4m

A-148 92W 18N TD: 113.7m

- both holes are too short hence no sulphides

Between sections 92W and 108W

4 scattered holes drilled at irregular intervals mostly northeast of areas of high potential. From SW to NE have:

A-57 100W 6N TD: 416.4m

- hit sulphides at 206.6 - 329.0m mostly < 5% but includes
  8.5m @ 5.2% Pb+Zn
  6.7m @ 8.2% "
  7.2m @ 4.7% "
  3.1m @ 8.9% "

A-34 104W 8N TD: 273.9m

- hit sulphides at 232.4 - 259.4m mainly 3.3% or less but includes 1.5m @ 13% Pb+Zn
  (NB: Too short for sure)

A-16 98W 12N TD: 304.5m

- sulphides at 196.3 - 275.2m all < 3% Pb+Zn except 12.7m @ 5.6% Pb+Zn

A-25 96W 16N TD: 315.2m

- too short - no sulphides

Section 108W

4 holes spaced 400' apart across down plunge extension of deposit. From SW to NE the holes hit:

A-29? 108W 4N TD: 465.7m

368.0 - 382.0m = 14.0m @ 3.07%Pb+Zn
386.0 - 394.0m = 8.0m @ 4.21 "
406.6 - 414.5m = 7.9m @ 6.04 "
436.0 - 439.8m = 3.8m @ 11.55 "

A-64 108W 8W TD: 432.2m

385.6 - 389.2m = 3.6m @ 3.82% Pb+Zn
390.9 - 398.8m = 7.9m @ 7.79% "
this includes 3.0m @ 10.64% "

A-86 108W 12N TD: 616.2m

376.5 - 388.9m = 12.4m @ 4.23% Pb+Zn
includes 2.0m @ 6% Pb+Zn
508.8 - 509.7m = 0.9m @ 8.41% " (best assay in hole)

A-94 108W 16N TD: 301.1m

- too short - no sulphides

108W to Firth and Firth itself

Minimal drilling in this interval. From SE to NW:

A-91 112W 10N TD: 541m

- sulphides at 366 - 414m mainly 4AC at 3% Pb+Zn or less, also 414 - 419m massive sulphides (4EO) not assayed but judged to be barren.

A-101 124W 14N TD: 269.7m

- sulphides at 174 - 179m and 216 - 227m - no assays done but 1.3m of latter interval is judged to be 8% Pb+Zn

(NB: This hole hits sulphides in the Tie fault zone)

Firth Zone

A-98 128W 14N TD: 145.5m

- hit sulphides at 24.4 to 30.2m
  2.6m assayed runs 5.34% Pb+Zn

A-97 128W 16N TD: 100.0m

- hit low grade sulphides from 18.8 - 28.6m
  best assayed is 1.3m @ 2.93% Pb+Zn

This table summerizes reserves 30.5m(100') either side of a given cross-section. It is intended to illustrate trends heading NW toward the Grum extension

Cutoff	86W	84W	82W	80W	78W	76W	74W	72W	70W	68W	66W	64W	62W
+ 12% mt	0.4	0.2	1.0	1.0	1.0	0.9	1.2	1.0	1.0	0.6	0.4	0.3	0.1
+12% av.gr.	14.7	16.2	15.5	14.3	15.8	16.5	14.9	14.8	17.4	17.1	16.0	17.5	21.6
+8% mt	1.0	0.6	1.4	1.7	1.7	1.5	1.9	1.3	1.6	1.0	0.6	0.4	0.2
+4% mt	1.6	1.4	2.2	3.0	2.9	2.7	2.8	2.2	2.2	1.6	1.0	0.8	0.5
+4% av.gr. Pb+Zn	12.5	8.9	11.4	9.4	10.2	10.3	10.8	10.6	12.2	11.0	10.8	11.1	10.7
+4% av.gr. Ag g/t	55	53	69	56	50	61	66	63	67	73	62	66	60
+4% aver. Pb/Zn	0.62	0.59	0.56	0.64	0.59	0.65	0.63	0.63	0.64	0.71	0.66	0.59	0.64

Notes

1) 62W to 68W may contain additional reserves obscured by Kerr Addison's accounting procedure.
2) all sections from 78W to 62W are partially truncated by erosion, the extent increasing towards the SE, i.e. towards 62W.

A-18 two boat beyond 86W.
A-15 " "