

## MEMORANDUM

**TO:** Don Hindy  
**FROM:** Ion Vintila  
**DATE:** March 17, 1995  
**RE:** **Grum Pit Long Range Plan**

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The following material comments on the Grum Pit Long Range Plan and contains a production schedule for the pit material to be moved.

### 1. PRODUCTION

I tried various alternatives of scheduling the production, taking into consideration the reserves calculated by Anvil with the last geological model, but I could not find an acceptable one mainly because of the front end volume of waste in Phase II.

For that reason I decided to change the limit between Phase II and III to reduce the volume of Phase II by 25% and increase the volume of Phase III with the difference.

The schedule was done taking into consideration the following:

- Final pit limits and the limits of Phase I remain the same;
- Assume all 3 shovels will work permanently in waste;
- Assume loading the ore will be done with other equipment;
- The remaining reserves in Vangorda Pit (~ 1,000,000t) will be mined by contractor when the ore is needed;
- Assume that if some stripping is required by a contractor that it will be delayed as long as possible;

No waste removal will be done by contractor starting with 2nd Quarter of 1995. The result of that analysis is shown in detail in the table on Page 15.

### Page 1

Shows the volume of waste excavated and the proportional ore release by quarters working only with the existing (three) shovels owned by Anvil Range. Details on a bench by bench basis are shown in the tables on Pages 3-10.

The figures show:

- At the end of 1995 the production of ore (high and low grade) will be 2.4 - 2.5Mt.
- In 1996 the production could reach 4.1-4.2Mt.
- Starting with 4th Quarter of 1995 one of the shovels can be moved into Phase II without difficulty.
- In 1997 Phase I will be finished moving the equipment into Phase II, one shovel at the beginning of the year and the other in 2nd Quarter.
- In the 2nd Quarter the production in Phase II will start.
- The production in Grum Pit and the stockpile will not be able to cover the capacity of the plant (0.7 - 0.8Mt from other source).
- I recommend that in 1997 the remaining reserves in Vangorda Pit (approx. 1Mt) be mined by a contractor.
- In 1998 there will not be any problems meeting production targets.
- In the 2nd Quarter one of the shovels can be moved into Phase III and another one in the 3rd Quarter.
- Without any supplementary waste removal, feeding the plant in 1999 is impossible. The total release of ore will be 2.4Mt and there will be practically nothing in the stockpile at the beginning of the year.
- To feed the plant at capacity it will be necessary to excavate a surplus of a minimum of 8Mt of waste in 1998 and 1st Quarter of 1999 (see Page 2).

- In 2000 mining will be in the bottom of the pit and the feeding of the plant will not be a problem.
- In year 2001 Grum Pit will be mined out.

Page 2 shows the schedule including contractor.

The above evaluation was done applying a theoretical division of the waste and ore between Phase II and Phase III.

For the final schedule I proposed a plan, showing the new highwall between Phase II and Phase III.

I suggest the new proposed limits of Phase II be digitized and the reserves recalculated for Phase II and Phase III.

The new reserves should be used for the schedule of the production for Grum Pit.

## **2. PIT LIMITS**

- The new geological cross sections show that there are no important changes in the geological interpretation of the Grum deposit. I feel that only new geotechnical data concerning the stability of the highwalls has to be taken into consideration for the new evaluation of the slopes, and only for the final limits of the pit. I feel that the limits of Phase I will be to be changed.

## **3. ACCESS ROAD IN THE PIT**

- The access road in the pit was located only on rock. I do not recommend any permanent road in till for geotechnical reasons.
- I feel that the existing ramp can be adapted to satisfy the need of Phase I.

- A more detailed design is needed for Phase II and III. In any case the access from the east side for Phase II and III can not be accepted not only for geotechnical reasons (location in till area) but also for technical reasons.

#### **4. EXTENSION OF PHASE I IN THE AREA OF PHASE II**

I do not recommend the extension for the following reasons:

- The high grade ore in Phase II over the elevation 1210m has 6.5% Pb & Zn, comparing with 8% over the same elevation in Phase I.
- If the extension is mined the grade of the front end production (high grade) of 3.4Mt will be approx. 7.7%, comparing with 8.4% with no extension.
- I estimate the stripping ratio in the extended area is probably more than 10-12t/t.
- The ore, if I am correct is mostly graphitic.
- In a normal sequence this ore would be mined in the middle of 1997. With the extension that ore will be mined at the end of 1995 and beginning of 1996.

#### **5. CHAMP AREA**

Although the new geological sections for this area were not reviewed, this area should not be included in Phase I, because of the high front end volume of stripping. In 1988 I tried to design a pit there but the stripping ratio was more than 10/1.

#### **6. ELECTRIC LINE TO VANGORDA**

The line was built to satisfy the standards for high voltage, to be used later for Dy Mine. I think the line has to be kept as it is and extend the overburden spoil in the direction of the Vangorda Pit.

If you have other questions I will be glad to help.

# GRUM PIT ORE RELEASE ANVIL RANGE EQUIPMENT 3 SHOVELS

①

(t x 10<sup>3</sup>)

YEAR	Q	PHASE						TOTAL		@UM ORE
		I		II		III		WASTE	ORE	
		WASTE	ORE	WASTE	ORE	WASTE	ORE	WASTE	ORE	
1995	1	8450	330					8450	330	
	2	6350	424					6350	424	
	3	6350	830					6350	830	
	4	4250	878	2100				6350	878	
	Tot	25400	2462	2100				27500	2463	2463
1996	1	4250	1020	2100				6350	1020	
	2	4250	1143	2100				6350	1143	
	3	4250	1122	2100				6350	1122	
	4	4250	863	2100				6350	863	
	Tot	17000	4148	8400				25400	4148	6611
1997	1	2100	730	4200				6300	730	
	2	1176	410	5124	47			6300	457	
	3	-	-	6350	537			6350	537	
	4	-	-	6350	1056			6350	1056	
	Tot	3276	1140	22024	1630			25300	(2770)	10381
1998	1			6350	1133			6350	1133	
	2			4200	1420	2100		6300	1420	
	3			3000	1417	3300		6300	1417	
	4			2100	867	4250		6350	867	
	Tot			15650	4837	9650		25300	4837	14218
1999	1			2100	972	4250		6350	972	
	2			7630	1198	4670		6300	1198	
	3			130		6350		6350	-	
	4					6350	245	6350	245	
	Tot			3730	2170	21620	245	25350	2415	16633
2000	1					6350	1156	6350	1154	
	2					6350	1446	6350	1446	
	3					6350	3005	6350	3005	
	4					9505	1985	3105	1985	
	Tot					24655	7895	21155	7895	24527
TOTAL		45676	7750	51904	8637	58825	8140	150405	24527	

INCLUDES 1000.000 t FROM VANGORJA CONTRACT

# GRUM PIT ORE RELEASE

ANVIL RANGE EQUIPMENT (3 SHOVELS)  
+ 8 MIL. T CONTR. (WASTE) 1998/99

(2)

(t x 10<sup>3</sup>)

YEAR	QX	PHASE						TOTAL		CUM ORE
		I		II		III		WASTE	ORE	
		WASTE	ORE	WASTE	ORE	WASTE	ORE	WASTE	ORE	
	1	8450	330					8450	330	
	2	6350	424					6350	424	
1995	3	6350	830					6350	830	
	4	4250	878	2100				6350	878	
	TOT	25400	2462	2100				27500	2463	2463
	1	4250	1020	2100				6350	1020	
	2	4250	1143	2100				6350	1143	
1996	3	4250	1122	2100				6350	1122	
	4	4250	863	2100				6350	865	
	TOT	17000	4148	8400				25400	4148	6611
	1	2100	730	4200				6300	730	
	2	1176	410	5124	47			6300	457	
1997	3			6350	537			6300	537	
	4			6350	1056			6300	1056	(KX)
	TOT	3276	1140	22024	1630			25300	2770	10381
	1			6350	1133			6350	1133	
	2			4200	1420	4100		8300	1420	
1998	3			3000	1417	5300		8300	1417	
	4			2100	867	6250		8350	867	
	TOT			15650	4837	15650		31800	4837	15218
	1			2100	972	6250		8350	972	
	2			1630	1198	4670	17	6300	1215	
1999	3					6350	570	6350	570	
	4					6350	1083	6350	1083	
	TOT			3730	2170	23620	1670	24350	3840	19058
	1					6000	1537	6000	1537	
	2					3355	1750	3355	1725	
2000	3					2100	1492	2100	1492	
	4					2100	1691	2100	1691	
	TOT					13555	6470	13555	6470	25527
TOTAL		45676	7750	51904	8637	52845	8140	150495	24727	25527

(K) INCLUDES 2000.000 t BY CONTRACTOR (WASTE)

(KX) INCLUDES 1000.000 t FROM VANCOUVER (ORE)

DATE

JOB

CH/D BY

EST BY

UNIT

QUANTITY

GRUM PIT

Lx 103

PRODUCTION SCHEDULE  
PHASE I

YEAR 1995

(3)

BENCH	TOTAL 01.01		1 <sup>st</sup> Q		2 <sup>nd</sup> Q		3 <sup>rd</sup> Q		4 <sup>th</sup> Q		TOTAL 1995		IN PIT 31.12	
	WASTE	ORE	W	O	W	O	W	O	W	O	W	O	W	O
>1264	2541	451	2541	451							2541	451		
1252	5583	264	5583	264							5583	264		
1240	7256	484	326	21	6350	424	580	39			7256	484		
1228	6181	847					5770	792	411	56	6181	847		
1216	5207	1115								822	3835	822	1368	293
1204	4355	1098											4355	1098
1192	3662	1018											3662	1018
1180	3119	830											3119	830
1168	2683	504											2683	504
1156	2068	462											2068	462
1144	1486	480											1486	480
1132	1024	329											1024	329
1120	511	274											511	274
1108														
1096														
1084														
1072														
1060														
1048														
<1036														
TOTAL	45676	7750	8450	330	6350	424	6350	830	4250	878	25400	2462	13926	5288
H.G				130		340		720						911

GRUMP PIT PRODUCTION SCHEDULE PHASE I

YEAR 1996

(4)

$\times 10^3$

BENCH	TOTAL 01-01		1 <sup>st</sup> Q <sup>t</sup>		2 <sup>nd</sup> Q <sup>t</sup>		3 <sup>rd</sup> Q <sup>t</sup>		4 <sup>th</sup> Q <sup>t</sup>		TOTAL		INVENTORY 31.12	
	WASTE	ORE	W	O	W	O	W	O	W	O	W	O	W	O
1264														
1252														
1240														
1228														
1216	1368	293	1368	293							1368	293		
1204	4355	1098	2882	727	1473	371					4355	1098		
1192	3662	1018	2777	772	885	246					3662	1018		
1180	3119	830			3119	830					3119	830		
1168	2683	504			246	46	2437	458			2683	504		
1156	2068	462					1813	405			1813	405	255	57
1144	1486	480											1486	480
1132	1024	329											1024	329
1120	511	274											511	274
1108														
1096														
1084														
1072														
1060														
1048														
1036														
TOTAL	11826	4811	4250	1020	4250	1143	4250	1122	4250	863	17000	4148	3276	1140
H/G														

S.T.







# PRODUCTION SCHEDULE

## PHASE II

GRUM PIT  
( $\times 10^3$ )

YEAR 1998

8

BENCH	TOTAL	01-01	1 <sup>st</sup> Q	2 <sup>nd</sup> Q	3 <sup>rd</sup> Q	4 <sup>th</sup> Q	TOTAL	IN PIT 31.12						
>1264														
1252														
1240														
1228														
1216														
1204														
1192	2132	385	2732	388			2732	493						
1180	2835	417	2835	417			2835	417						
1168	2407	576	1383	337	1024	245	2407	576						
1156	2154	708			2154	708	2154	708						
1144	1857	849			1022	467	1857	849						
1132	1668	838					1668	838						
1120	1602	636			497	197	1602	636						
1108	1590	685					995	428	1595					
1096	1270	585							1270					
1084	913	508							913					
1072	952	821							952					
1060														
1048														
1036														
<b>Total</b>	<b>19380</b>	<b>7067</b>	<b>6350</b>	<b>1193</b>	<b>4200</b>	<b>1420</b>	<b>3000</b>	<b>1417</b>	<b>2100</b>	<b>867</b>	<b>15650</b>	<b>4837</b>	<b>3730</b>	<b>2170</b>
H.C.														

# PRODUCTION SCHEDULE

GRUM PIT  
(t x 10<sup>3</sup>)

PHASE II

YEAR 1999

9

BENCH	TOTAL	01-01	1 <sup>st</sup> Q <sup>r</sup>	2 <sup>nd</sup> Q <sup>r</sup>	3 <sup>rd</sup> Q <sup>r</sup>	4 <sup>th</sup> Q <sup>r</sup>	TOTAL	IN PIT 31.12
>1264								
1252								
1240								
1228								
1216								
1204								
1192								
1180								
1168								
1156								
1144								
1132								
1120								
1108	595	257	595	257				
1096	1270	585	1270	585				
1084	913	508	235	130	678	377		
1072	952	821		952	821	130	112	
1060								
1048								
1036								
<b>Total</b>	<b>3730</b>	<b>2170</b>	<b>2100</b>	<b>1972</b>	<b>1630</b>	<b>1198</b>		
H.C.								

