

To: Kresho Galovich

Date: Dec 13, 1988

From: Peter Healey SRK

Kresho, please find enclosed preliminary drawings (plan and sections) for the Vengorda Pit wall Till cover at abandonment. From the sections you will note that to provide a stable base for the upper till cover above the water line, the design involves placing a rock cover at a slope close to the natural angle of repose. The till cover ~~itself~~ would be placed at a slope of 3:1 (horizontal to vertical) and steepening to about 35 degrees near the edge.

Prior to placing the cover loose rock would be removed to provide a relatively clean surface.

A riprap zone would be provided in the region above the till/rock interface at the water level to inhibit wave erosion of the till.

The estimated quantities are as follows:

Waste Rocks	85,760 cu.m.
Glacial Till/Overburden	145,500 cu.m.

To estimate costs for <sup>constructing</sup> this type of cover, could you provide me with a unit rate for placing the material.

604 985-9176

Your comments and figures could be faxed to 604 985-1956

Thank you for your assistance.

P. Healey

MEMO

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TO: KRESHO GALOVICH

FROM: JACK BOWERS

RE: VANGORDA TILL COVER AT ABANDONMENT.

DATE: JANUARY 18, 1989

AT PETER HEALEY'S REQUEST I HAVE CALCULATED THE VOLUMES OF TILL AND ROCK REQUIRED TO COVER THE EXPOSED SULPHIDES THAT ARE LEFT ALONG THE NORTH AND SOUTH VANGORDA PIT WALLS. COST ESTIMATES ARE INCLUDED BASED ON INCREMENTAL HAUL DISTANCES FOR WASTE ROCK WHILE THE COST OF THE TILL PLACEMENT IS BASED ON POZING TILL FROM THE PERIMETER OF THE PIT ITSELF. PRELIMINARY ESTIMATES OF VOLUMES PROVIDED BY PETER PROVED TO BE INSUFFICIENT, PRIMARILY BECAUSE OF THE METHOD OF PLACEMENT OF THE MATERIAL. AS WELL, THE REVISED VANGORDA PIT DESIGN (DEC/88) HAS SIGNIFICANTLY CHANGED THE LOCATION OF THE PIT WALLS. I AM CONFIDENT THE VOLUMES AND COSTS PROVIDED ACCURATELY REFLECT WHAT IS REQUIRED TO PLACE A TILL COVER OVER EXPOSED SULPHIDES LEFT IN THE VANGORDA PIT WALLS.

J. Bowers

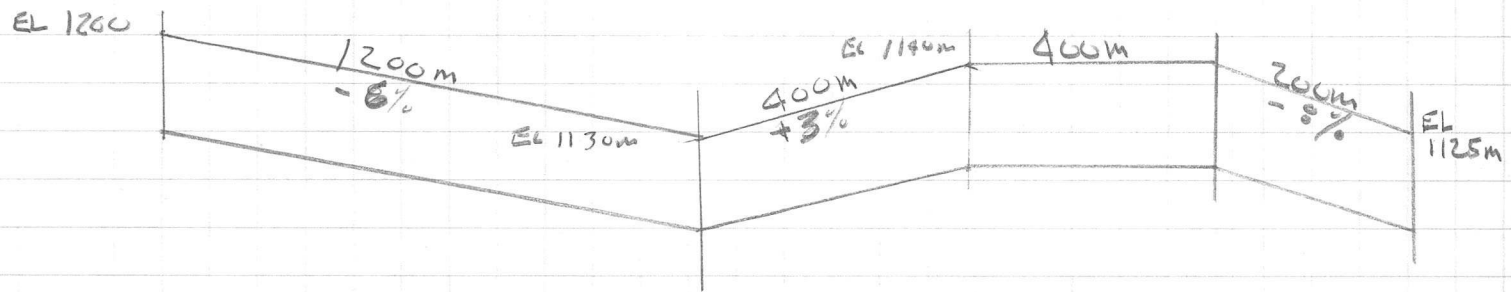
SHORT RANGE PLANNING ENGINEER

# CALCULATION :::

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## ROCK BASE

### 1994 - GRUM TO VANGORDA - INCREMENTAL WASTE HAUL PROFILE



TOTAL INCREMENTAL DISTANCE = 2,200m

AVERAGE SPEED ON GRADE = 21 Km/HR.

$$\text{TRAVEL TIME} = \frac{2,200\text{m} \times 2}{21\text{ Km/HR} \times 1000\text{m/km}} \times 60\text{ min/HR} = 12.6\text{ min/LOAD}$$

PAYLOAD = 127 TONNES/TRUCK

TOTAL BACKFILL WASTE ROCK TONNES = 747,280 T

$$\text{TOTAL LOADS} = \frac{747,280}{127} = 5884$$

$$\text{TOTAL INCREMENTAL HOURS} = \frac{5884\text{ LOADS} \times 12.6\text{ min/LOAD}}{60\text{ min/HR}} = 1,236\text{ HRS}$$

1994 EUCLID COST/HR = \$150.<sup>00</sup>

THEREFORE

$$\text{TOTAL INCREMENTAL HAUL COSTS} = 1,236\text{ HRS} \times \$150.<sup>00</sup> = \$185,346.<sup>00</sup>$$

$$\text{DOZER COST TO PLACE ROCK} = \$200.<sup>00</sup>/HR \times 300\text{ HRS} = \$60,000.<sup>00</sup>$$

$$\text{TOTAL COST OF ROCK BASE PLACEMENT} = \$ \underline{\underline{245,346}}$$

2/ TILL PLACEMENT:

EQUIPMENT: CAT D10N POWER

1994 ESTIMATED RENTAL COST/HR = \$200.00 (PELLEY CONST.)

PRODUCTIVITY, BCM PLACED/HR = 200.

TOTAL TILL PLACED 332,500M<sup>3</sup>

TOTAL COST OF TILL COVER  $\frac{332,500 \text{ M}^3}{200 \text{ M}^3/\text{HR}} \times \$200/\text{HR} =$   
\$332,500.00

3/ ADDITIONAL WORK

1/ DOZING LOOSE SULFIDE ROCK OFF OF WALLS

100 HRS  $\times$  \$200/HR = \$20,000.00

2/ PLACEMENT OF RIPRAP COVER OVER TILL COVER

@ X-SECTION 20 E 100M  $\times$  50m  $\times$  1m = 5000M<sup>3</sup>

50 HRS @ \$200.00/HR = \$10,000.00

GRAND TOTAL - TILL COVER - VANGORDA ABANDONMENT PLAN

= \$67,846.00

# VANGORDIA BACKFILL VOLUMES

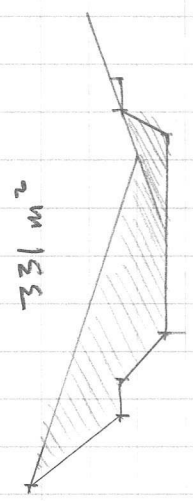
X-SECTION No	AREA M <sup>2</sup>	TILL M <sup>3</sup>	AREA M <sup>2</sup>	ROCK M <sup>3</sup>	TOTAL M <sup>3</sup>
14	679	33,950	1342	67,100	101,050
16	459	56,900	1121	123,150	180,050
18	480	46,950	822	97,150	144,100
20	348	41,400	525	67,350	108,750
22	430	38,900	268	39,650	78,550
24	598	51,400	180	22,400	73,800
26	331	46,450	0	2,000	55,450
		16,550			16,550
		332,500 M <sup>3</sup> OR * 453,200 TONNES	425,800 M <sup>3</sup> OR * 747,280 TONNES		758,300 M <sup>3</sup> OR <u>1,201,180 TONNES</u>

1.365 T/M<sup>3</sup>  
1.755 T/M<sup>3</sup>

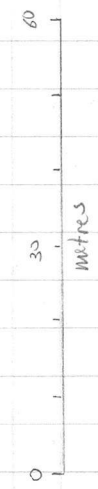
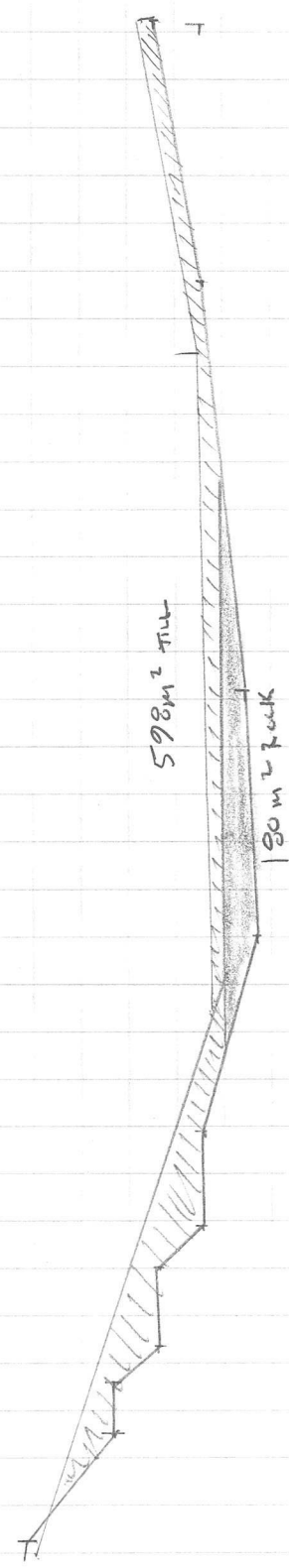
\* TONNES BASED ON A SWELL FACTOR OF 35% AND A DENSITY OF 2.7 T/M<sup>3</sup> (BANK)

X-SECTION 2C

1152  
1140  
1138  
1134  
1130  
1128  
1126

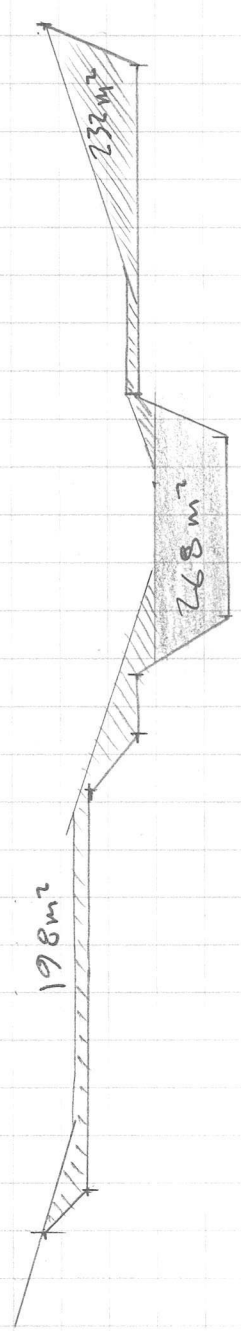


11211  
11212  
11221  
11211  
11281  
11281  
11311  
11411  
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11511



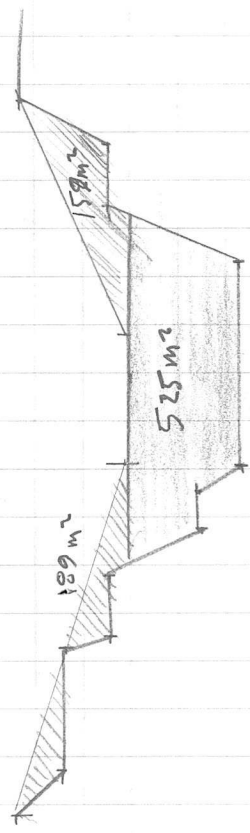
X-SECTION 24

1140  
1128  
1116  
1111  
1128  
1128  
1134  
1134  
1140



X-SECTION 22

1140c -  
 1128T -  
 1128I -  
 1111T -  
 F.L. →  
 1111T  
 1116C  
 1116T  
 1128C  
 1128T -  
 1134C -  
 1134T -  
 1140c -



X-SECTION 20







X SECTION / 4