

## MEMORANDUM

TO: Mr. W. S. Row                      DATE     July 20, 1964.

FROM: Edward Futterer

RE:     Comparison of Vangorda Net Smelter Returns  
        Pennaroya vs. Metallgesellschaft

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Net smelter returns as calculated on the basis of the Northgate-Metallgesellschaft contract have been compared to the returns which would accrue, based on Pennaroya standard terms.

The Pennaroya formula was provided in a memo from Mr. Driver to Mr. Row - July 3, 1964.

The Metallgesellschaft formula was applied in the General Engineering - Vangorda feasibility report.

Summary:

1. Pennaroya terms provide approximately \$2.00 - \$2.50 per ton of ore higher net smelter return than that Northgate would receive from Metallgesellschaft for a similar concentrate.
2. This return increase places the Vangorda deposit in a substantially more favourable economic position and suggests the advisability of further metallurgical testing.

Concentrates Evaluated

	<u>Test No. 73</u> <u>3rd. Cleaner Conc.</u>		<u>General Eng.</u> <u>Predicted Conc.</u>	
	<u>Conc.</u> <u>Grade</u>	<u>Metal</u> <u>Price</u>	<u>Conc.</u> <u>Grade</u>	<u>Metal</u> <u>Price</u>
Lead	24.2%	11.0¢	19.0%	11.0¢
Zinc	32.5%	13.0¢	33.0%	13.0¢
Silver	8.74 oz/t	\$1.40	7.0 oz/t	\$1.40
Copper	1.56%	32.0¢	1.4%	32.0¢
Gold	0.11 oz/t	\$37.80	0.09 oz/t	\$37.80
Conc. Ratio	10.5%		12.5%	

Comparison of Net Smelter Return

	<u>Test No. 73</u> <u>3rd. Cleaner Conc.</u>		<u>General Eng.</u> <u>Predicted Conc.</u>	
	<u>Metall.</u> <u>\$ Can.</u>	<u>Pennar.</u> <u>\$ Can.</u>	<u>Metall.</u> <u>\$ Can.</u>	<u>Pennar.</u> <u>\$ Can.</u>
<b>Payments:</b>				
Lead	46.64	47.90	35.20	37.60
Zinc	63.44	59.10	64.35	60.00
Silver	10.84	10.84	8.40	8.40
Copper	1.66	1.30	0.64	0.50
Gold	<u>3.74</u>	<u>3.06</u>	<u>3.06</u>	<u>2.31</u>
	126.32	122.20	111.65	108.81
<b>Charges:</b>				
Basic	14.00	13.40	14.00	13.40
Lead	7.00	2.19	5.28	1.72
Zinc	28.56	10.67	28.91	10.82
Refining	<u>0.50</u>	<u>0.50</u>	<u>0.26</u>	<u>0.26</u>
	50.06	26.76	48.45	26.20
<b>Net Smelter Return</b>				
Before Freight				
Per S.D.T. Conc.	76.26	95.44	63.20	82.61
<b>Net Per Ton Ore</b>	8.00	10.00	7.90	10.32
<b>Advantage Pennaroya</b>	\$2.00/ton ore		\$2.42/ton ore	

Sample CalculationPennaroya Terms

Basis - G. Eng. Predicted Concentrate

Cu - 32¢, Pb - 11¢, Zn - 13¢, Ag - \$1.40, Au - \$37.80.

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Sample Calculation (Cont'd)Payments / S.D.T.

Pb	-	19	x	0.90	x	$\frac{2,000}{100}$	x	0.11	=	\$ 37.60
Zn	-	33	x	0.70	x	$\frac{2,000}{100}$	x	0.13	=	\$ 60.00
Ag	-	(7 - 1)	x	1.40	=	\$ 8.40				
Cu	-	(1.4 - 1.3)	x	$\frac{2,000}{100}$	x	(32 - 7)	=	\$ 0.50		
Au	-	{0.09 - (0.03215 x $\frac{2,000}{2,240}$ )}	x	37.80	=	\$ 2.31				
										<u>\$108.81</u>

Charges / S.D.T.

Basic	-	5	x	3.00	x	$\frac{2,000}{2,240}$	=	\$ 13.40				
Pb	-	$\frac{9}{240}$	x	3.00	x	19	x	0.90	x	$\frac{2,000}{2,240}$	=	\$ 1.72
Zn	-	$\frac{42}{240}$	x	3.00	x	33	x	0.70	x	$\frac{2,000}{2,240}$	=	\$ 10.82
Refining	-										=	\$ 0.26
												<u>\$ 26.20</u>

Net Smelter Return before Freight = \$ 82.61 / S.D.T.

Respectfully submitted,



Edward Futterer.

EF:sr