



To: T. J. Desanti

Subject: Giant Yellowknife Refined Arsenic Trioxide

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GEN. ENGR.

INTER-OFFICE MEMORANDUM

From: D. N. Zeraldo

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Copies to: DNZ, File

During October, 1978 a preliminary investigation of the market for Giant Yellowknife crude arsenic trioxide (88-92% As_2O_3) was conducted. At the conclusion of the investigation only one U.S. company, namely Koppers Company Inc., was interested in purchasing the material. The remaining consumers all indicated that they required a feedstock with a minimum 98% As_2O_3 grade.

During the months of November and December 1978 discussions were held with Koppers Company Inc. regarding the possible sale of 3,000 ST/year of crude arsenic trioxide. The discussions culminated in late January 1979 when Koppers rejected Falconbridge's draft letter of intent on the basis that it did not contain terms which provided Koppers with an adequate monetary incentive. Furthermore, test work done by Koppers on samples of Giant's crude material concluded that the iron content was much too high, and ultimately rendered the material unsuitable as a feedstock for Koppers' process. Koppers consequently recommended that the material be upgraded.

In January, the engineering department began designing and costing a process to upgrade the 88-92% material to better than 99% As_2O_3 , meanwhile FNML was upgrading samples on the bench scale and obtaining a product with 99.5% As_2O_3 and very low levels of deleterious elements.

Those companies identified and contacted during the original market survey in October 1978 were visited during February 1979 in order to ascertain their degree of interest in purchasing Giant Yellowknife refined arsenic trioxide. Our inquiries were very well received by the consumers and set forth below in tabular form is a list of firms which indicated a strong interest in purchasing refined arsenic trioxide, along with the annual quantity each potential customer indicated it might purchase. Also find in the Appendix several letters from companies indicating their interest.

Company	Plant Location	Products Produced	Annual Consumption(ST)	Est'd Share of 1980 Consumption Obtainable by Giant
1. Voluntary Purchasing Groups, Inc.	a) Bonham, Texas b) Houston, Texas	agricultural chemicals	5,000-10,000	2,000
2. Pennwalt Corp.	Bryan, Texas	agricultural chemicals	4,000-5,000	2,000
3. J.H. Baxter	Salt Lake City Utah	wood preservative	500	300

Company	Plant Location	Products Produced	Annual Consumption(ST)	Est'd Share of 1980 Consumption Obtainable by Giant
4. Osmose Wood Preserving Co.	Memphis, Tenn.	wood preservative	2,000-3,000	1,200
5. Koppers Co. Inc.	Conely, Georgia	wood preservative	2,000-3,000	500
			13,500-21,500	6,000

The above tabulation shows that Giant should be able to sell 6,000 short tons per annum of refined arsenic trioxide amongst the 5 major U.S. consumers. Indications are that all companies would be prepared to negotiate 2-3 year contracts.

Set forth below are 3 mine netback calculations based on a preliminary indication of trucking costs from the mine to the various consuming plants, and the assumption that Giant would choose to sell its refined product at the same delivered buyer's plant price as Asarco. One netback calculation is based on Asarco's current Tacoma price of 23.2¢ US/lb and the other two netback calculations are based on a 5¢ US/lb and a 10¢ US/lb reduction in the current Tacoma price.

Mine Netback CalculationUS¢/lb Refined Arsenic Trioxide

	<u>Case 1</u> <u>Current</u> <u>Asarco Price</u>	<u>Case 2</u> <u>5¢/lb</u> <u>reduction in</u> <u>Asarco Price</u>	<u>Case 3</u> <u>10¢/lb</u> <u>reduction in</u> <u>Asarco Price</u>
1. Asarco price f.o.b. railcars Tacoma.	23.2	18.2	13.2
2. Approximate weighted average rail-freight cost to consumers.	1.8	1.8	1.8
3. Weighted average price delivered consumers.	25.0	20.0	15.0
4. Less: Giant approximate weighted average truck freight cost to consumers.	12.0	12.0	12.0
5. Giant Yellowknife Mine Netback			
- US¢/lb	13.0	8.0	3.0
- US\$/ST	260.0	160.0	60.0

The above netback calculations indicate a current Giant weighted average netback of \$US 260/ST, with reductions of \$US 100/ST in the netback for each 5¢ US/lb drop in the Asarco Tacoma price.

Using these estimated netback figures, and assuming a \$US 900,000 capital cost for the installation of the refinery plus further assuming a \$US 34/ton refinery operating cost three R.O.I. calculations have been done. These calculations can be found in the Appendix and are summarized below. Please note that these calculations do not include the savings to Giant in no longer having to dispose of the As2O3 in underground stopes, nor do they include possible additional revenues to Giant from the sale of gold bearing residues it will produce from the refining process.

Giant Return on Investment Summary (2 year project period)

	<u>Case 1</u> current Asarco price	<u>Case 2</u> 5¢/lb reduction in Asarco price	<u>Case 3</u> 10¢/lb reduction in Asarco price
1. Project after Tax N.P.V. (at i=12%) \$US	626,120	119,100	(636,350)
2. Project after Tax Internal Rate of return	63%	22%	nil
3. Project Payback	12 months	18 months	6 years

The summary shows that the project at current prices represents a very lucrative venture. If the price were to drop by 5¢/lb (or 22%) the venture still looks very attractive. In the worst case if the price dropped 10¢/lb (or 43%) the investment would pay for itself in 6 years. Certainly these calculations are crude and are based on the roughest estimates, however they serve their purpose in indicating the attractiveness of this project.

The market is currently in a state of shortage and most of the companies spoken to indicated that they are on allocation by their current supplier (Asarco). The timing for Giant to enter this market is ideal and is likely to remain so for another 12 months. If a decision is made in the next few months to proceed with construction of a refinery at the mine the 1980 and 1981 productions could be sold under contracts by 3Q/79 thus capturing and guaranteeing the current excellent market prices for this product.

At this time we are awaiting the completion of the capital cost estimate being done by engineering.