

ARSENIC PILOT TESTING

In 1979 - 1980, the market for highgrade arsenic trioxide was pretty strong and wood preservative manufacturers were interested in our underground stockpile. Unfortunately, crude dust could not be used in the manufacturing process and testwork at FML and at Giant was begun to try to develop an upgrading process.

In the meantime an effort was made to market crude dust to Koppers, Inc, who had their own upgrading process, and though the FML and GYK testwork was successful, the Koppers process was not and eventually crude arsenic sales were stopped. — 1985 —

Shortly after the Giant pilot testing was completed, Con mine, having an arsenic storage problem, built an upgrading plant using the hot water leach technology developed at Giant. Their effort has been very expensive and only marginally successful, which is not surprising since the Giant pilot tests indicated that their feed would be very difficult to treat using the HWL process.

*D. Arthony
says 20 M.*

The fuming process tested in lab scale by FML showed a lot of promise and was metallurgically much simpler than the Con HWL or the Koppers ammonia leach processes. Since there is no recycle of solutions in the fuming process, buildup of contaminants is not a problem as it is in the other processes.

Following the FML lab testing, Simon Fekete reviewed the results and designed a flowsheet for a 40 kg/hr pilot plant. This design forms the basis for the testwork that will be conducted by RPC over the next few months.

Research and Productivity Council is a metallurgical testing facility in Fredericton, N.B. that was set up in 1962 and originally funded by the provincial government. It now operates independently and recovers operating costs by charging fees for its work. They have developed an expertise in fluid bed technology over the past 15 years and now have a number of various sized fluid bed reactors available for pilot testing. In addition to roasting of complex base metal sulphides, they have examined a number of other fluid bed processes including removal of arsenic from copper concentrate and roasting of antimony sulphide to produce an upgraded antimony oxide product.

Our first contact with RPC was a query from them in early Feb, 1987 as to the possibility of their custom roasting gold concentrates for us in their largest fluidbed reactor, 10/15 mtpd. They also sent along a brochure describing their facility.

Benefits of As reclaim - Gross value -

- 1. An value in As dust? \$99,000,000*
- 2. As value in dust. 101,000,000 @ 50¢ 145,000,000 @ 40¢*
- 3. An value in crown pillars. 11,700,000*
- 4. Eliminate costs of storage. 5,000,000 over 20 yrs?*
- 5. Eliminate environmental threat. ?*

In early August of this year, we began investigations into doing our own pilot testing in a plant built on site. It quickly became apparent that a pilot plant with the level of sophistication that we needed would be very expensive. It would also be difficult to staff with full time professionals. In considering alternatives, RPC was contacted and early discussions indicated to us that pilot testing in their facility would be preferable. Details for testwork were ironed out and a proposal has recently been agreed to.

\$55,000

*Approx
\$55,000
Setup &
rental fees.
test con-
sumables
& labour.*

They will test material from current production and from two locations underground to determine the range of operating conditions that the plant would require.

In full scale operation, plant feed will normally be fed into the reactor as a dry powder though some of the stored arsenic is damp and it is likely that recovery will involve slurrying the material and pumping it to surface. Dewatering equipment will therefore be required in the plant as well.

*B2 33
9000 t.
B2-300
2200 t.*

The basic process is as follows:

Dry feed shipped to N.B. in drums will be fed into a 6" fluidbed reactor at a rate of 25 to 40 kg/hr. The freeboard of the roaster will operate at a temperature of 400 deg C and space velocity will be such that not only sublimed arsenic but particulate as well will be carried off. The gas handling system will be kept hot so that arsenic will not condense out prematurely. The gas stream will pass through a hot baghouse, which has only become technologically feasible in the past year or so, fabric capable of withstanding these temperatures having only recently become available. The particulate, including gold that originally escaped the cottrell, will be captured in the hot baghouse and will be tested for gold extraction. The arsenic fume will pass through the hot baghouse to the condenser, there to be mixed with tempering air in stages that will enhance crystal growth. The crystals will be packaged in drums and sold to the nearest buyer.

*Next! - 3 m
Polytonale
P.S.*

B2-14 B2-36 CURRENT PROD'N.

Cost of the testwork, which may take up to 6 months, is expected to be as much as \$293,000, not including the cost of reclaiming and shipping the 50 ton test sample. This may cost an additional \$100,000.

Additional testing related to the handling of wet feed, eg thickening, filtering, centrifuging, etc, could cost an additional \$15,000 for a total cost of \$408,000, almost 13% over the budget of \$362,000. This is due to the fact that when the original estimate was submitted, only a rough idea of RPC charges was available and there was no thought of including dewatering testwork.

<i>Ship 50 tons @ 660</i>	<i>33000</i>
<i>Purchase 315 drums @ \$8</i>	<i>15120</i>
<i>Access B2-14 drums</i>	<i>10,000</i>
<i>Labour to fill drums.</i>	<i>10 000</i>
<i>Local ventilation and</i>	
<i>vacuum piping to drums</i>	<i>10 000</i>
<i>misc & Contingency</i>	<i>22 380.</i>
	<hr/> <i>\$120,000.</i>