

06 DEC 88

AREA TITLES MANAGER  
VANCOUVER

J+L

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INTERESTING NOTE FROM AUSTRALIA REGARDING THE J & L PROPERTY NORTH  
OF REVELSTOKE. I THINK TOM MIGHT ALSO LIKE TO KNOW ABOUT THIS PROCESS.  
TOM SCHROETER THAT IS...

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PHIL WELOCK

covery Systems Inc., are working toward commercialization of the Cashman Process, a patented system for treating arsenical materials that fixes arsenic in highly insoluble precipitates. Metal values can then be recovered from solution.

Cashman has demonstrated his process on a pilot scale, and his privately owned CSS Management Corp. and Artech are in a 50-50 joint venture to find commercial applications. Artech is handling the commercial aspects of the venture, while Cashman continues to refine the technology.

The Cashman Process aerates a mixture of finely ground arsenic-bearing ore, concentrate, or flue dust with sulfuric acid and water under pressure of 40 to 50 lb/in<sup>2</sup> at about 120° C in a titanium reactor. The reaction requires from 15 min to two hr, depending on the complexity of the material. The reaction precipitates arsenic in insoluble iron and calcium arsenates. The combined arsenic-iron-calcium residue exceeds EPA's standard solubility test for the disposal of waste. Recoverable metal values can then be precipitated from the remaining solution. For copper, recovery might be as an atacamite precipitate for smelting or as metal electrolyzed from solution.

Calcium for the reaction is usually obtained from limestone, calcium oxide, and calcium chloride, either individually or in combination.

Cashman discovered and began developing his process during the early 1970s while trying to find a way to deal with high-arsenic ore from his Apex mine in the Cascade mountains east of Seattle. Apart from the chemistry, Cashman has invented some unique processing equipment to handle the corrosive liquids that characterize the process. Current work is based on a 400-gal reactor at the Apex concentrator site.

Cashman and Artech have an agreement with Atlantic Richfield to treat 360,000 st of flue dust at Atlantic Richfield's shut-down Anaconda, Mont., smelter. The flue dust contains high levels of arsenic trioxide that can be stabilized by the Cashman Process. The flue dust also contains up to \$200/st copper, silver, gold, zinc, and lead values, depending on metal prices, which are to be recovered in a saleable form.

Cashman said that the Anaconda plant would be based on parallel lines and that the arsenic-fixing reaction will remain a batch process.

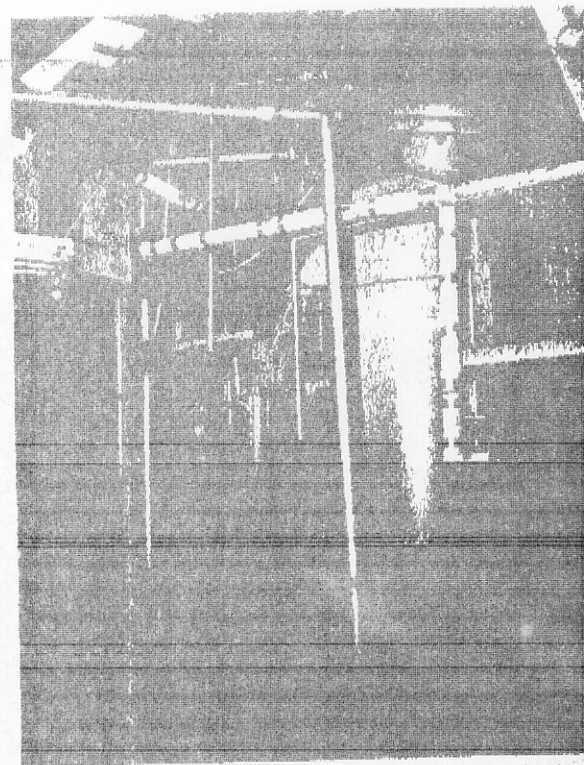
Minproc Engineering, which owns about 5% of Artech stock, is preparing a preliminary feasibility study for the Anaconda flue dust project based on plant feed of 100 st/d at startup and an increase to 400 st/d later in the first year. If all goes according to plan, plant engineering will begin in early 1988, and production will be under way before the end of the year. Costs are projected at \$70/st for plant operations, \$10/st payment to Arco, and \$33/st for capital and interest, so the profit potential for the project is an estimated \$87/st. In September, Artech was

the processing facility.

The Anaconda smelter is only one of about a dozen flue dust sites in the US that may have potential for treatment using the Cashman Process.

Artech is also investigating possible applications of the Cashman Process to arsenic-pyrite gold ores, either as a joint-venture partner in mining operations or as operator of a treatment plant near a mine, processing concentrates on a toll basis. In June, Artech acquired a 6% interest in Pan American Minerals, Inc., a Canadian exploration company that holds a 75% interest in a massive sulphide deposit in British Columbia. Indicated reserves are 3.71 million st of ore grading, 0.17 oz/st Au, 1.72 oz/st Ag, 2.15% Pb, 4.04% Zn, and 4.86% As.

Artech shares are listed on NASDAQ. The initial public offering was made in March 1986, when \$3.3 million was raised through sale of 2.2 million shares at \$1.75/share. Inquiries about the Cashman Process can be directed to Sam Parks, Chairman, Artech Recovery Systems, Inc., 10655 NE 4th Street, Suite 604, Bellevue, Wash. 98004 USA.



Cashman Process reactors are fed from a preheating tank, where the temperature of corrosive solutions is raised to about 120° C.