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Richard L. Mieritz  
MINING CONSULTANT  
307 E. INDIAN SCHOOL RD.  
PHOENIX, ARIZONA  
AMHERST 5-1607

April 20, 1959

Mr. H. Clark Ford  
5230 North 23rd Street  
Phoenix, Arizona.

Dear Mr. Ford:

At your request I have completed an investigation covering the various phases of "processing tin cans", the production of which can be sold to the Arizona copper industry for use in their operations of producing copper by the precipitation method.

The following therefor is my report of investigation including a capital investment cost estimate.

INTRODUCTION

As part of the investigation I personally visited the two "local" tin can processing plants to learn of their equipment designs, probable processing costs and any other pertinent information which would aid in evaluating the project. A plant in Tucson was also observed but the owner was not contacted. Except for minor refinements, this operation was similar in size to the smaller plant in Phoenix.

The entire process consists of purchasing tin cans locally, processing through a continuous incinerator to clean the cans by heat, mechanically "crumpling or shredding" the cans and shipping to market.

CONCLUSIONS

Information obtained by observation, inquiries, correspondence and the writers personal knowledge has contributed to the following conclusions:

- (1)- A capital investment from \$26,000 to \$27,100 will be required to adequately launch the proposed project,
- (2)- An assured market for at least two years is required in order to recapture the capital investment plus a reasonable interest rate,
- (3)- That a two year assured raw material supply is necessary, and
- (4)- That a third valley operation could create competitive prices for the product and also the raw material, thus causing a narrowing profit margin and a forced closing of some plant.

## RAW MATERIALS

Tin cans, up to a gallon size capacity, are purchased locally for \$16.00 per ton from the "dump scavengers". All indications point to this being a stable price but both operators advised that it was becoming increasingly difficult to obtain cans. It could be that "dump scavengers" are turning to other occupations. This condition may create a required price adjustment in the near future for the raw material. Such price increases might be passed on to the consumer, but then again the operator may have to absorb it, particularly if there are three plants in operation.

## MARKET

The important phase of this project is the market for the product. The market for the processed tin cans would be those Copper Companies which use leaching operations and who do not make their own iron as a by-product from the crude copper ore. Among these are Miami Copper, Miami; Inspiration Copper, Inspiration; Kennecott Copper at Ray; Kennecott Copper at Morenci; Phelps Dodge at Ajo; and Phelps Dodge at Bisbee.

Two near-future markets could be Magma Copper at Superior and San Manuel near Oracle. Cananea, Mexico might be a possibility. A detail check to determine the volume of the markets might be more easily completed by yourself and or associates at a less expense than were the writer to do it since it would require a personal visit with each purchasing agent at the locality.

## COMPETITION

Competition in this field of endeavor would be the two local operations as well as possibly Tucson, the West Coast and El Paso, Texas.

Competition as such may not be in the market phase but more so in the raw material supply phase, at least in Phoenix. I estimate the Phoenix area and outlying districts could provide a total of 600 tons of cans per month.

## PROCESS OPERATION

Processing of tin cans for use in the copper industry merely requires the cans to be clean, freed of any protective coatings and foreign metals and "crumpled" such that the buoyancy has been reduced to zero to permit sinking to bottom of the precipitating tanks but not compressed to such a degree that surface exposure of the can is destroyed.

The cleaning phase is accomplished by immense heat within a rotating "furnace". The writer suspects the hottest portion of the furnace will reach a temperature of 1800 to 2200° F. Iron melts at 2770° F.

After the cleaning process, cans are "crumpled" by a

hammer mill type crusher, or similar piece of equipment, adapted to complete the necessary job. A jet of water is sprayed on the "hot" cans as they leave the "crumpling" machine for cooling and to extinguish any fire carried by the can.

If the proper precautions for clean cans has been taken, no difficulties should be experienced in the operation of the process. Only two maintenance may cause shut-down periods. The first is of more frequency, being the constant necessity to rebuild by welding the hammers within the hammer mill. The second maintenance required is the replacement of the first section of the furnace at which point the heat is concentrated.

### ESTIMATED CAPITAL INVESTMENT

There are two ways to enter into this endeavor of "processing" tin cans and both are exhibited by each of the two operations here in the valley. The first is to "poor-boy" the operation as evidenced by the small operation and the second is to properly equip the operation similar to the large one here in the valley.

Were the smaller plant operated continuously for an 8 hr. period, 26 days per month, its production would equal slightly in excess of 400 tons per month. This is based on a 2 ton per hour capacity of the unit as told to the writer by the operator.

Ways and means within the operation can also provide an efficient operation at a slightly greater capital investment but at a minimum operating cost as contrasted to a lesser capital investment with perhaps a greater operating cost.

The writer will attempt to estimate the minimum-maximum investment costs by the following tabulation. You advised the writer than an acre of ground was at your disposal. I will assume this plot of ground to be 200 x 200 feet. The following estimate does not provide for using used equipment, new prices being used throughout the estimate. Not more than 15% might be saved through use of used equipment.

	Fence (around acre) 800 feet @ \$2.00/ft.	\$ 1600	\$ 1600	
	Small Office building	\$ 1500	\$ 1500	
	Office Supplies and equipment	\$ 400	\$ 400	
	Scales-10 ton-Conc. platform, 10 x 22 ft.	\$ 3000	\$ 3000	
3500	Furnace unit-30 ft. long 22" dia. 5 HP.	\$ 3500	\$ 3500	3500
	Shredder (Hammer Mill) not too common	\$ 3000*	\$ 3000*	
	Adaptation, installation and 40HP motor	\$ 500	\$ 500	
	Conveyors-rubber & cleats 2 req.	\$ 1500		
1500	Conveyors-rubber and steel 1 ea. req.	\$	\$ 2000	2000
45000	Tractor-scoop and scraper	\$ 3000*		5500
	Feeder bin & Product Bin		\$ 3000	
	Conveyor, truck or railroad loading		\$ 500	
	<b>Totals</b>	<b>\$18000</b>	<b>\$19100</b>	
	Operating capital, raw material, etc	\$ 8000	\$ 8000	
		<b>\$26000</b>	<b>\$27100</b>	

\* Some saving might be effected if used equipment is used but in good condition.

No provision has been made for concrete foundations except in the case of the shredder. Used truck scales are very rare.

The minimum estimate employs the use of a tractor but no bins except a small feed hopper. Discharge of the product is made directly into a truck or railroad car,--no product storage.

The maximum estimate employs the use of bins and eliminates the tractor as well as one man or employee. A minimum of two men will be required.

Early omissions of equipment with improvements at a later date will not materially reduce the estimated capital investment below \$20,000 since the bulk of expenditures are allied to the essential equipment as scales, incinerator, movement of the feed and operating expenses.

Respectfully submitted,

R. E. Mieritz, Reg. Eng.

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307 E. INDIAN SCHOOL RD.  
MINING CONSULTANT  
R. E. Mieritz

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PHOENIX, ARIZONA  
AMHERST 5-1607

April 20, 1959

Mr. H. Clark Ford  
5230 North 23rd Street  
Phoenix, Arizona

Dear Mr. Ford:

This portion of my report has been prepared separately since its contents should not be of any concern to anyone except yourself, at least for the time being.

Considering all angles of the proposed project and the ramifications of same, I feel I can say that the venture could prove to be a profitable one. There are two points of concern which I want to stress to you in this second letter. The first one is the matter of supply of cans. This is extremely hard to check into and the word of your possible associate must be taken at its face value. The second concern is that of a continuing market for your organization. It is true that a considerable tonnage is required by the copper industry and will continue to be so required for some time, however, correspondence from some of the mining companies indicates a struggle might be encountered to break into the supply end, since many of the companies are tied to long term contracts. A reduced price may be the wedge. The indicated margin of profit may be ample to accomplish the wedge and eventually the true supplier.

In order to obtain a contract as a supplier you will first have to produce a product which they will accept. This means actual operation and production. I at this time cannot see any difficulty in making the proper product but Maffeo claims to make the best "product" and he is very secretive about anyone seeing the operation, even with my story of a client for S. A.

To give you some idea as to the margin of profit available, the following production estimates of cost have been prepared as I analyze the operation.

	200 tons	400 tons
Purchase raw Material	\$ 16.00	\$ 16.00
Operating Costs (Processing)	7.78	4.89
Truck haul charge (Miami, Ray, Etc)	7.00	7.00
Totals	\$ 30.78	\$ 27.89



## EQUIPMENT RECOMMENDATIONS

All equipment except the shredder, scales and possibly a conveyor must be fabricated either on location or in a machine shop. Before erection can be accomplished, a design of the equipment must be made, not only a layout design but also a design of each individual piece of equipment, this to include the furnace, conveyors, bins, etc.

For the construction of this plant I would recommend that bins with automatic feeding be used, rather than loading the feed end by tractor or some other means.

We all have a general idea of the flow sheet so in the following description I will start at the very beginning with the scales.

Scales: A pit must be excavated for the scales. The dirt removed from this pit can be used to provide a small ramp to a small feed bin.

Feed Bin: This bin need not be too large since it is merely a mechanical means to control the feed to the furnace and should only require an occasional checking. A small excavation at the discharge of this bin will be required to permit the cleat conveyor to obtain a proper load of cans.

Conveyor: Observation of the feed conveyors indicates that each is too steep since many cans are continually rolling backwards, this being particularly true for the gallon size cans. Cleats must be design to accomodate this size can. Conveyor should be screen covered in sections on hinges to prevent spillage of paper and cans.

Incinerator: Design of this unit is very important. Boiler steel must be used throughout the furnace to withstand the terrific heat emanating from the burner. The proper angle of decline and the length of time the can remains in the furnace is very important. Coupled to this requirement is also the speed at which the furnace rotates. Incomplete cleaning of the cans by burning may cause rejection at the market. This unit therefor is the "key" to successful operation and a good product.

Shredder: This unit is a high speed hammer type crusher which is a standard manufactured piece of equipment but it will have to be adapted to the use which it is intended for. The smallest unit one should consider is a 12" by 24" opening.

Product Conveyor: Cans being discharged from the shredder are quite hot. If cans are to be air cooled, a metal conveyor must be installed. The best way to accomplish this would be a bucket elevator which would discharge into a storage bin. It is advisable to keep the product as free from dirt as possible. If product is dumped on the ground, a magnet crane would be required.

PHOENIX, ARIZONA  
SOL E. INDIAN SCHOOL RD.  
MINING CONSULTANT

W. H. H. H.

	<u>Wood</u>			<u>Concrete</u>	
<u>Scales</u>	- 15 ton -	$(1416 + 1000 + 104)$	2530	$(1744 + 1100 + 130)$	2974
	20 ton	$(1908 + 1500 + 145)$	3553	$(2228 + 1600 + 170)$	3998
Fence - Chainlink - 6 ft - Barbed wire -			\$1350 <sup>00</sup>	\$1660 top Rail - Installed	<sup>1.65</sup> 1770
Hammer Mill Crusher - 12-24 -			\$2600 <sup>00</sup>		3,000
Tractors - <del>Mittelman</del> -			\$3510	hadn't 3 Seneca -	

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Information obtained by observation, inquiry, and correspondence and the writer's personal knowledge, has contributed to the following conclusions.

- (1) A capital investment of from \$26,000 to 27,100 will be required to adequately launch the proposed project.
- (2) An assured ~~market~~ <sup>and</sup> market ~~must~~ for at least two year period is required in order to recapture the capital investment, plus a reasonable interest rate.
- (3) That ~~the~~ <sup>two year</sup> assured raw material supply is necessary and
- (4) that a third vally operation could create competitive prices for the product and also the raw material, thus causing a narrowing profit margin and a forced closing of some plant.

Miami E. F. Habich  
Ray-Ken W. E. Sawyer  
RD-Douglas K. A. Ables. Asst.  
Inspir. K. W. Whiteaker.

Fernholtz Macher Co.  
18" x 20 - W-20 - Buffalo Hammer Mill  
Unit, base, 5 H.P. (220/440) V Belt Drive  
50 H.P. Rated Voltage

Richard E. Mieritz  
MINING CONSULTANT  
307 E. INDIAN SCHOOL RD.  
PHOENIX, ARIZONA  
AMHERST 5-1607

April 21, 1959

Mr. H. Clark Ford  
5230 North 23rd Street  
Phoenix, Arizona

Dear Mr. Ford:

Enclosed herewith is my invoice for Services Rendered in connection with the investigation of "Tin Can Processing" in the Phoenix, Ariz. area.

If any questions arise in your project which I might be able to answer for you, please don't hesitate to call.

I will follow this up with you as progress is made.

I hope we can get a little more encouragement as to immediate markets, much more so than we have gotten to date.

Sincerely,

R. E. Mieritz