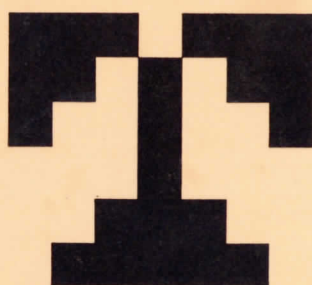


P-954

**EMPRESA MINERA ESPECIAL TINTAYA S.A.**

**REGION INKA**



**EXPOMIN 92**

**PROJECTS BOOKLET**

**MAYO 1992**

**LIMA**

**PERU**

27 ABR. 2001



I N D E X

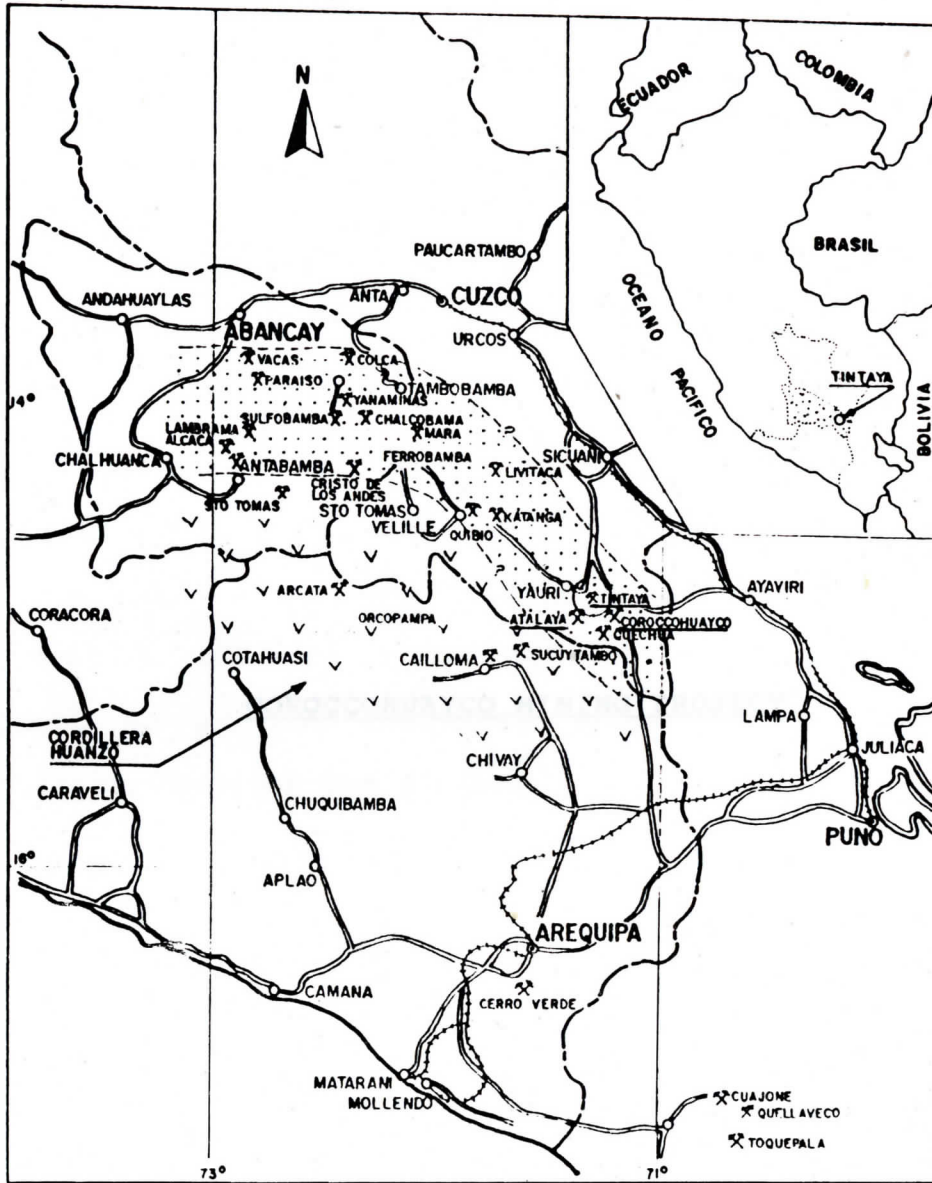
	<u>PAGS.</u>
1.0 GENERAL INFORMATION	01
2.0 COROCCOHUAYCO MINING PROJECT	02/04
3.0 CHABUCAS MINING PROJECT	05
4.0 ATALAYA MINING PROJECT	06/07
5.0 HIDROMETALLURGICAL OXIDE PROJECT	08/11
6.0 TINTAYA SMELTING PROJECT	12/13

1.0 GENERAL INFORMATION








The Tintaya Projects in development stage, are located within a 10 Kms radius from the present mine and metallurgical operation; into the Inka Region, Cusco Department and Espinar Province at 4,200 m altitude above sea level.

The area is normally accessible by road from Cusco and Arequipa through unpaved roads of 250 and 260 Kms respectively.

The present information is related to three Mine Projects and two Industrial Projects in different development levels.



LEYENDA

-  CARRETERA
-  FERROCARRIL
-  LIMITE DEPARTAMENTAL
-  METALOTECTO FERROBAMBA
-  CAPITAL DE DEPARTAMENTAL
-  CAPITAL DE PROVINCIA
-  MINA EN PROYECTO

ESCALA :



FECHA :

ABRIL , 1,991



EMPRESA MINERA ESPECIAL TINTAYA S. A.  
GERENCIA DE EXPLORACIONES PROYECTOS Y DESARROLLO

PLANO DE UBICACION DEL DISTRITO TINTAYA

CODIGO :

P. U. D. T.

LAMINA N°

COROCOCHUAYCO MINING PROJECT

Feasibility Study of the Project.

COROCCOHUAYCO PROJECT

PRESENT SITUATION

The Tintaya officials are in negotiations with Minero Perú S.A. in order to carry out the development of the Project. The future mine operation would be a mechanized underground mine with a rate of 2,400 TPD of ore using Trackless equipment to produce concentrates as recommended in the Feasibility Study of the Project.

COROCCOHUAYCO PROJECT

TECHNICAL AND ECONOMIC SUMMARY

1.0 TECHNICAL FACTS

1.1 MINERAL DEPOSIT

Copper skarn type deposit in igneous and calcareous rocks. Main economic sulphides are bornite, chalcocite and chalcopyrite.

1.2 ORE RESERVES (1.0 % Cu Cut off)

Geological	:	15'225,000	MT, 2.88 % Cu
Mineable	:	14'041,000	MT, 2.59 % Cu

1.3 MINING SYSTEM

Mechanized underground system Trackless equipment.

1.4 PRODUCTION

Mine Ore	:	2,400	MTPD
		720,000	MTPY
Concentrates	:	48,000	MTPY with 35.0 % Cu, 4.5 Oz.Ag, 0.15 Oz Au/TM

1.5 MINE LIFE

20 Years

2.0 ECONOMIC FACTS

2.1 CAPITAL COST

US \$ 42.6 Million

2.2 CONSTRUCTION PERIOD

03 Years

2.3 ANNUAL PRODUCTION COST

US \$ 12.4 Million

2.4 DISCOUNT CASH FLOW RATE OF RETURN (IRR)

22.78 %

2.5 LABOR FORCE

260 Men

NOTE:

The economics figures has been calculated on the basis of constant price of US \$ 0.75 per pound copper (1987).





CHABUCAS MINING PROJECT

CHABUCAS PROJECT

PRESENT SITUATION

The Chabucas Project has been explored by 465 DDHs with a total of 45,500 m from 1952 to 1990, putting in evidence proven geological reserves in the order of 25.6 million metric tons of copper ore grading 2.15 % Cu as sulphides into a skarn mineral deposit to be mined by underground system using the Trackless equipment.

Positive geological results and metallurgical tests allow us to obtain high copper concentrates (+ 30 % Cu) by flotation process. The project has the technical factors to go ahead with the Feasibility Study which is planned to be executed this year by an International Consulting Company.

The cost of the Project shall include only the establishment of the infrastructure in the mine for a production capacity of 2000 to 4000 TPD of ore to be concentrated in the flotation plant and infrastructure of Tintaya.

ATLANTA, GEORGIA  
MAY 19, 1964

Dear Mr. [Name]:

The Atalaya deposit is a large, high-grade, primary copper-molybdenum deposit located in the Atalaya area of the Atalaya Mountains, approximately 300 km in length.

**ATALAYA MINING PROJECT**

The mine project and primary reserves are in the order of 2.5 million tonnes of ore with a grade of 1.5% copper and 0.1% molybdenum. The deposit is situated in a geologically favorable area and is expected to be operated for a period of 20 years. The project is being developed by [Company Name] and is expected to be completed by [Year].

The mine will be operated on a 24-hour basis and is expected to produce approximately 100,000 tonnes of copper and 10,000 tonnes of molybdenum per year. The project is being developed in accordance with the requirements of the [Government] and is expected to be completed by [Year].

ATALAYA PROJECT

PRESENT SITUATION

- 1.0 Is located at 20 Km by road from the Tintaya's mining and metallurgical complex.
- 2.0 The mineral deposit is a copper skarn type, related of monzonitic rocks in contact with calcareous beds within an important and large metallogenetic province of approximately 200 Km in length.
- 3.0 Mine proved and probably reserves are in the order of 2.04 million metric tons of ore with 2.23 % Cu. Good geological possibilities for additional 19.0 million tons exist into the mine area. The mine will be operated by underground methods by means of vertical and inclined shafts and Trackless equipment. Labor force is estimated in 280 people.
- 4.0 Mining and Metallurgical operation is stopped from 1984 up to now due to financial and economic troubles. The mine works are presently flooded.

5.0 The Banco Minero, Minpeco and Tintaya S.A., are considering to reactive the operation at the present capacity of 700 MTD of ore.

6.0 The investment and operation costs have been estimated (1986) in US \$ 2'000,000 and US \$ 15.0/TM of ore respectively, without depreciation and financing costs. It is anticipated six to twelve months to put the mine in operation.

7.0 Assuming US \$ 0.70 per pound of copper (1986), the following are some of the main financing figures:

- Annual income	:	US \$	5'229,650
- Annual operating profit	:	US \$	2'060,300
- Internal rate of return (IRR)	:	69.0 %	

HIDROMETALLURGICAL OXIDE PROJECT

HIDROMETALLURGICAL OXIDE PROJECT

PRESENT SITUATION

This project is being development to treat by hidrometallurgical process the Tintaya copper oxide ores, to produce high grade (99.98%) copper cathodes as final commercial product. Oxide ores were mined and stockpiled as part of the stripping of the sulphide operation.

In 1989 The Canadian International Development Agency (CIDA) agreed to finance the revision and bring up to date the COMMSA Feasibility Study. So that the Canadian Consultant KILBORN LIMITED was recommended by the CIDA to study the feasibility of stablishing a copper oxide plant.

From the begining of 1990, we are operating a pilot plant with a capacity of 50 MTPD to investigate the tolerance of this copper oxide ore to the Leaching, Solvent Extraction and Electrowinning process in order to develop testworks to have confidence figure on acid consumption and energy since both are the mayor components of the operating cost. Such testworks are scheduled to be finished this year. The construction of Industrial Plant, at a capacity of 2,600 TPD, will take about 24 months.

OXIDE PROJECT

1.0 RESERVES

1.1 Geological	MT : 16.2 Million
	GRADE : 1.73 % Sol Cu
1.2 Mineable	TM : 10.0 Millions
	GRADE : 2.09 % Sol Cu

2.0 PROCESS

- 2.1 Crushing
- 2.2 Agglomeration
- 2.3 Leaching
- 2.4 Solvent Extraction
- 2.5 Electrowinning

3.0 OPERATION

3.1 Mining	:	3,000 MTPD
3.2 Metallurgy	:	2,600 MTPD
		910,000 MTPY
3.3 Project life	:	11 Years

4.0 PRODUCTION SCHEME

4.1 High grade Copper Cathodes (99.98%)	
	:
	46.0 MTPD
	15,786 MTPY



5.0 INVESTMENT

5.1 Total capital cost :US \$ 45.58 millones

5.2 Distribution :Local Currency US \$ 21.65 million  
Foreing Currency US \$ 23.93 million

5.3 Financing : 36.5 % Equity US \$ 16.64 million  
63.5 % Debt US \$ 28.94 million

6.0 PRODUCTION COST

6.1 Mining : US \$ 1.93/MT ore  
0.05/lb.Cu

6.2 Metallurgy : US \$ 11.97/MT ore  
0.30/lb.Cu

6.3 Sales and Adm. : US \$ 2.81/MT ore  
0.06/lb.Cu

6.4 Total Prod.Cost: US \$ 16.71/MT ore  
0.41/lb.Cu

7.0 ANNUAL REVENUE

15,786 MT x 2,200 lb/MT x US \$ 0.75/lb = US\$ 26.05  
Million

8.0 NET PRESENT VALUE

US \$ 16.9 million at 12%

9.0 DISCOUNT CASH FLOW RATE OF RETURN (DCFROR)

14.6 %

10.0 DEBT COVERAGE

2.5 Years

11.0 PLANT CONSTRUCTION

24 Months

12.0 LABOUR FORCE

120 Men

NOTE :

The economics has been calculated at constant values,  
US \$ 0.75/lb Cu (1989)

TINTAYA COPPER SMELTING PROJECT

The project, to be located in the Tintaya area, is in the order of 100,000 tons of capacity, and will be operated as follows:

PRODUCTION OF COPPER CONCENTRATE

Malaya King

**TINTAYA COPPER SMELTING PROJECT**

Tintaya Project

The copper smelting plant will be a continuous process, and will produce several products:

- Copper
- Sulphur
- Iron
- Silica
- Slag
- Other

TINTAYA COPPER SMELTING PROJECT

1.0 The project, to be feasible, requires of ore reserves in the order of 100 million from Tintaya mine, Tintaya Projects and nearby producers.

<u>PRODUCTION SOURCE</u>	<u>MINERAL DMT x 10<sup>6</sup></u>	<u>COOPER TMS x 10<sup>6</sup></u>	<u>CONC. % Cu</u>	<u>FINE COOPER TMS x 10<sup>6</sup></u>
Tintaya Mine	50.0	2.5	30.0	750.0
Nearby Producers	15.0	1.8	25.0	200.0
Tintaya Projects	35.0	1.75	30.0	525.0
	<u>100.0</u>	<u>5.05</u>		<u>1,475.0</u>

2.0 The copper concentrates have, in average, the following mineral composition:

Copper	:	30.0 %
Sulphur	:	30.0 %
Iron	:	20.0 %
Silica (SiO <sub>2</sub> )	:	14.0 %
Lime (CAO)	:	5.0 %
Others	:	1.0 %

3.0 A Technical and Economical Feasibility Study was made in 1987 by COMMSA, a Peruvian Consulting Enterprise, recommending the Outokumpu process to produce "blister" and sulfuric acid for local consumption.

4.0 Technical and Economical factor of the project are as follows:

- Capacity : 600 MTPD/200,00 MTPYT of concentrates
- Production : 58,000 MTPY of "Blister"
- Capital Cost : US \$ 95.0 Million
- Annual Income : US\$ 85.0 million a US\$ 0.65/lb Cu
- Operative smelting cost : US \$ 13.0 Million year
- Concentrates value : US \$ 46.5 Millions
- Profit after amortizac. :
  - First year : US \$ 7.6 million
  - Last Year : US \$ 16.5 million
- Discount cash flow rate of return (IRR) : 26.6 %
- Time to build up the complex : 36 months
- Life of smelter : 25 years

rvz\*