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PRINTED: 09/21/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: INSPIRATION SMELTER

ALTERNATE NAMES:

INTERNATIONAL SMELTER
MIAMI COPPER SMELTER
CYPRUS MIAMI COPPER SMELTER

GILA COUNTY MILS NUMBER: 161F

LOCATION: TOWNSHIP 1 N RANGE 15 E SECTION 19 QUARTER C
LATITUDE: N 33DEG 24MIN 57SEC LONGITUDE: W 110DEG 52MIN 05SEC
TOPO MAP NAME: GLOBE - 7.5 MIN

CURRENT STATUS: PRODUCER

COMMODITY:

MILL CU SMELTER

BIBLIOGRAPHY:

ADMMR INSPIRATION SMELTER FILE
PHOTO FILE - P7

06/09/88

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: INSPIRATION SMELTER

ALTERNATE NAMES:

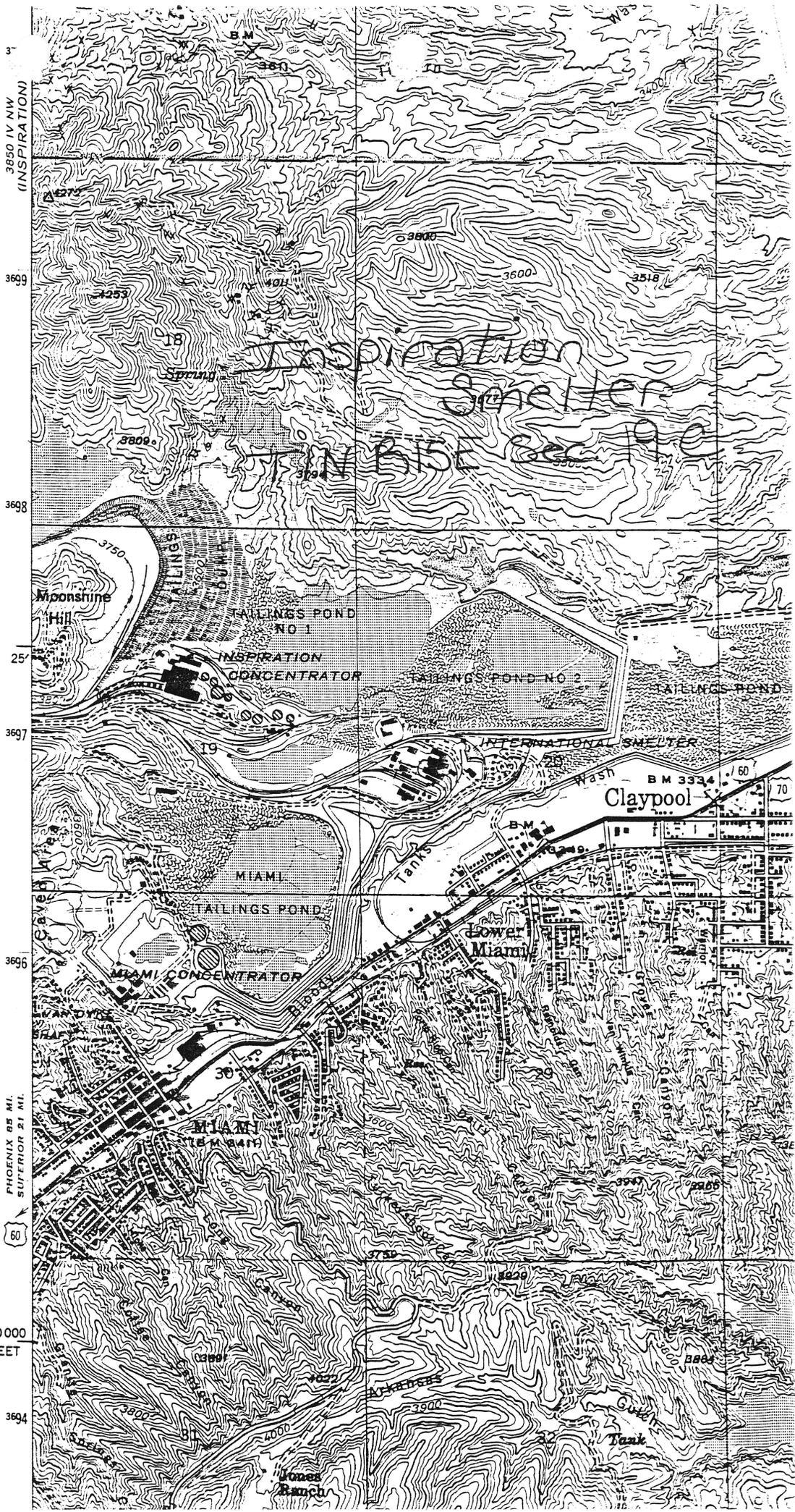
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CURRENT STATUS: PRODUCER

COMMODITY:
COPPER

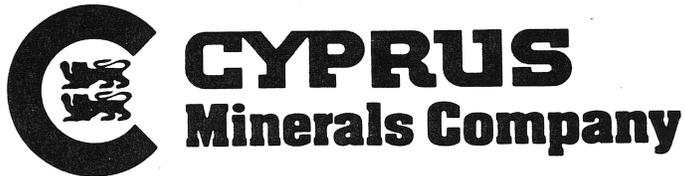
BIBLIOGRAPHY:
ADMMR INSPIRATION SMELTER FILE



Globe 7.5'

Cyprus Inspiration Smelter, (C)

on file
SD



Cyprus Minerals Company
9100 East Mineral Circle
Post Office Box 3299
Englewood, Colorado 80155
(303) 643-5000

NEWS

For immediate release

CYPRUS MINERALS ANNOUNCES MAJOR COPPER SMELTER MODERNIZATION AND EXPANSION

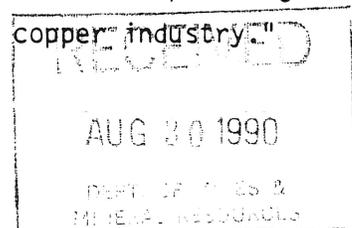
Denver (August 27, 1990) -- Cyprus Minerals Company (NYSE: CYM) today announced a major modernization and expansion of its Miami, Arizona smelter which is designed to make Cyprus self sufficient in copper smelting for the long term and reduce the Company's overall cost of production. Cyprus' Board of Directors approved plans for the \$92.5 million modernization that will increase the throughput capacity of the smelter from 450,000 tons to 650,000 tons of copper concentrates annually.

The first step in the Miami project will be to obtain the necessary state and federal approvals. Completion of construction and start-up is anticipated in mid-1992. The expansion of the smelter will include the addition of an oxygen enriched combustion process that will reduce the consumption of high-cost electric power for smelting.

The modernization is expected to lower the cost of copper produced from the Sierrita-Twin Buttes copper complex near Tucson, at Bagdad in northern Arizona, and at other Cyprus locations. The greater copper concentrate throughput will also increase the production of acid used in leach copper operations at Miami and other locations, and should eliminate the need to buy acid from outside sources.

"This is a strategic investment which will strengthen Cyprus' position in the copper business," said Kenneth J. Barr, Chairman and Chief Executive Officer of Cyprus Minerals Company. "It will have a positive impact on our operating costs and will improve Cyprus' competitive position in the copper industry."

- more -



Also Cyprus announced that the mill expansion at its Bagdad, Arizona copper mine has been completed and began operation August 20.

The expansion increases Bagdad's annual copper production by 40 million pounds to more than 220 million pounds. The addition was designed to reduce production costs through added processing capacity and improved productivity. The addition of a fifth grinding line increases daily mill throughput from 60,000 tons to 75,000 tons of ore.

Cyprus Minerals Company, headquartered in Englewood, Colorado, is a major producer of copper, molybdenum, lithium, coal, and talc. Cyprus produced about 600 million pounds of copper in 1989.

####

August 27, 1990
Mike Rounds
Media Relations Advisor
(303) 643-5186

INS.P. Smelter (A)

93909050

MS on
041680
Gary

Office of State Mine Inspector

705 W. Wing, Capitol Building
Phoenix, Arizona 85007

FEB 27 1989

NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with Arizona Revised Statute 27-303, we are submitting this written notice to the Arizona State Mine Inspector (705 West Wing, Capitol Building, Phoenix, Arizona 85007) of our intent to start/stop (please circle one) a mining operation.

COMPANY NAME JAMES & LUTHER, INC.

CHIEF OFFICER NEAL LUTHER

COMPANY ADDRESS 4585 RIPLEY, EL PASO, TX

COMPANY TELEPHONE NUMBER 915-833-1171

MINE OR PLANT NAME CYPRUS MIAMI COPPER CO.

MINE OR PLANT LOCATION (including county and nearest town, as well as directions for locating by vehicle)

CLAYPOOL AZ, GILA COUNT, US HIGHWAY 60-70

TYPE OF OPERATION SMELTER PRINCIPAL PRODUCT COPPER

STARTING DATE 2-13-89 CLOSING DATE 4-15-89

DURATION OF OPERATION 2 MO.

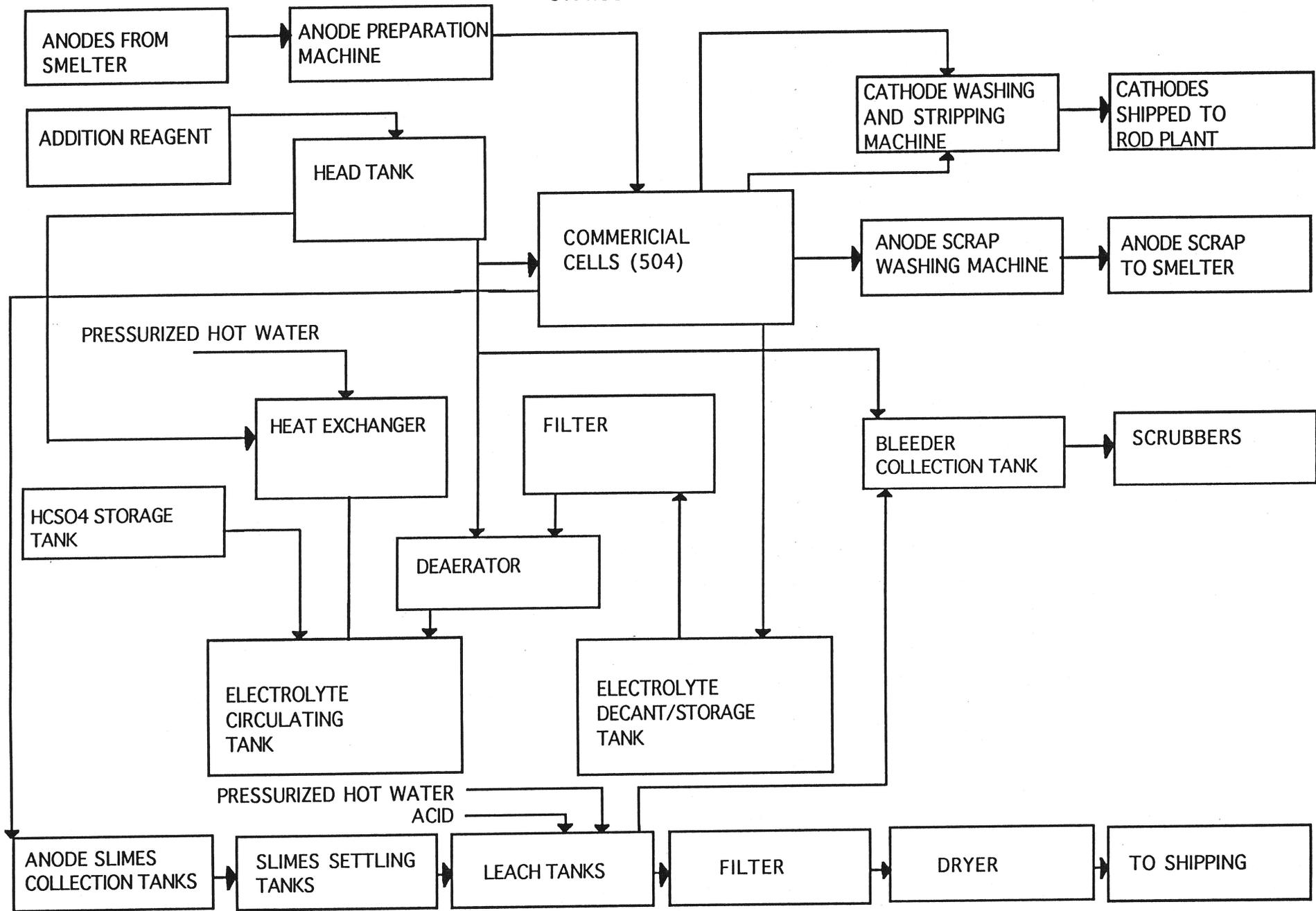
PERSON SENDING THIS NOTICE MIKE HODGES

TITLE OF PERSON SENDING THIS NOTICE VICE-PRESIDENT

DATE NOTICE SENT TO STATE MINE INSPECTOR 2-13-89

PLEASE NOTE: Any operation found operating, without having sent this notice to the Arizona State Mine Inspector, will be charged with a petty offense.

CYPRUS MIAMI ELECTROREFINING OVERALL PROCESS FLOWSHEETS



INSPIRATI N SMELTER FILE

6/94

R

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1992

Inspiration Smelter file
Gila

Cyprus Miami Mining Corp.

Miami T1N R14E Sec. 24, 25, 26, 35

P.O. Box 4444, Claypool, AZ 85532 - Phone 473-7150 - Employees: 1000 - Open pit oxide copper mine - Dump leach - Solvent extraction - electrowinning plant - 120,000 TPY Smelter - Acid plant - Electrolytic refinery - 100,000 TPY continuous rod plant - 24,000 TPD concentrator is inactive.

Vice President & General Manager Dennis Mortensen
Manager, Technology Ken Larson
Manager, Mining Operations John Fenn
Manager, Smelter/Rod Plant Operation Al Tittes
Manager, Plant Operations Howard Bardwell
Manager, Human Resources Chuck Rising
Manager, Administration Randy Hoffman
Superintendent, Leaching Operations and Solvent Extraction Gerald F. Fountain
Superintendent, Tankhouse Mark Peabody
Superintendent, Plant Services John C. Lorenzen
Superintendent, Rod Plant Luis Constandse
Superintendent, Metallurgical Control Eric Selley
Superintendent, Environmental Services Bob Ressler
Superintendent, Smelter Operations Don Nelson
Superintendent, Smelter Maintenance Scott Vandela
Superintendent, Smelter Technical Services Rex Henderson
Superintendent, Smelter Resource Recycling Larry Le Compte
Materials Management Hugo Schriewer

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1991

CYPRUS COPPER COMPANY

(A subsidiary of Cyprus Minerals Company)

P. O. Box 1126, Green Valley, AZ 85622 - Phone 628-4000.

Executive Vice President James C. Compton

Vice President Technical Services Ron Kellner

Miami TIN R14E Sec. 24, 25, 26, 35

P.O. Box 4444, Claypool, AZ 85532 - Phone 473-7150 - Employees: 1013

- Open pit oxide copper mine - Dump leach - Solvent extraction - electrowinning plant - 120,000 TPY Smelter - Acid plant - Electrolytic refinery - Electrolytic refinery - 100,000 TPY continuous rod plant - The 24,000 TPD concentrator is inactive.

Vice President & General Manager Dennis Mortensen

Public Relations Director Dean Lynch

Manager, Technology Ken Larson

Manager, Mining Operations Carl Waggoner

Manager, Smelter/Rod Plant Operation Al Tittes

Manager, Plant Operations Howard Bardwell

Manager, Human Resources Chuck Rising

Manager, Administration Randy Hoffman

Superintendent, Leaching Operations & SX Gerald F. Fountain

Superintendent, Tankhouse Mark Peabody

Superintendent, Plant Services John C. Lorenzen

Superintendent, Rod Plant Luis Constandse

Superintendent, Metallurgical Control Eric Selley

Superintendent, Environmental Services Tom Larsen

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P.O. Box 4444, Claypool, AZ 85532 - Phone 473-7150 - Employees: 1013

- Open pit oxide copper mine - Dump leach - Solvent extraction - electrowinning plant - 120,000 TPY Smelter - Acid plant - Electrolytic refinery - Electrolytic refinery - 100,000 TPY continuous rod plant - The 24,000 TPD concentrator is inactive.

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Manager, Mining Operations Carl Waggoner

Manager, Smelter/Rod Plant Operation Al Tittes

Manager, Plant Operations Howard Bardwell

Manager, Human Resources Chuck Rising

Manager, Administration Randy Hoffman

Superintendent, Leaching Operations & SX Gerald F. Fountain

Superintendent, Tankhouse..... Mark Peabody

Superintendent, Plant Services John C. Lorenzen

Superintendent, Rod Plant Luis Constandse

Superintendent, Metallurgical Control Eric Selley

Superintendent, Environmental Services Tom Larsen

Superintendent, Smelter Operations Don Nelson

Superintendent, Smelter Maintenance Scott Vandela

Superintendent, Smelter Technical Services Rex Henderson

Superintendent, Smelter Resource Recycling Larry Le Compte

Materials Management Hugo Schriewer

ABSTRACTED FROM ADMMR ACTIVE MINES 1989

CYPRUS METALS COMPANY
(A subsidiary of Cyprus Minerals Company)

1855 La Canada, Green Valley 85622 - Phone 628-4000.

Senior Vice President C. J. Janes

Cyprus Copper Company

Senior Vice President - Operations Jake Timmers

Cyprus Miami Mining Corp.

Miami

TIN R14E Sec. 24, 25, 26, 35

P.O. Box 1559, Claypool 85532 - Phone 473-7150 - Employees 1013 - Open pit oxide copper mine - Heap leach - Dump leach - Solvent extraction-electrowinning plant - 120,000 TPY Smelter - Acid plant - Electrolytic refinery - Electrolytic refinery - 100,000 TPY continuous rod plant. The 24,000 TPD concentrator is inactive.

Vice President & General Manager Dennis Mortensen
Public Relations Director Dean Lynch
Manager, Technology Ken Larson
Manager, Mining Operations Carl Waggoner
Manager, Smelter/Rod Plant Operation Al Tittes
Manager, Technical Services Noel Gillespie
Manager, Plant Operations Howard Bardwell
Manager, Human Resources Chuck Rising
Manager, Administration Randy Hoffman
Supervisor, General Accounting Joe Bost
Superintendent, Leaching Operations Gerald F. Fountain
Superintendent, Tankhouse Mark Peabody
Superintendent, Plant Services John C. Lorenzen
Superintendent, Rod Plant Luis Constandse
Superintendent, Projects John Chism
Superintendent, Metallurgical Control Eric Selley
Superintendent, Environmental Services Tom Larsen
Superintendent, nt, nt, Smelter Operations Don Nelson
Superintendent, Smelter Maintenance Scott Vandela
Superintendent, Smelter Process Control Robert Tunis
Superintendent, Smelter Technical Services Larry Lee
Superintendent, Smelter Resource Recycling Larry LeCompte
Materials Management Hugo Schriewer

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY 1988

CYPRUS SMELTING & REFINING

9100 E. Mineral Circle, P.O. Box 3299, Englewood, CO 80112 - Phone (303) 643-5000.

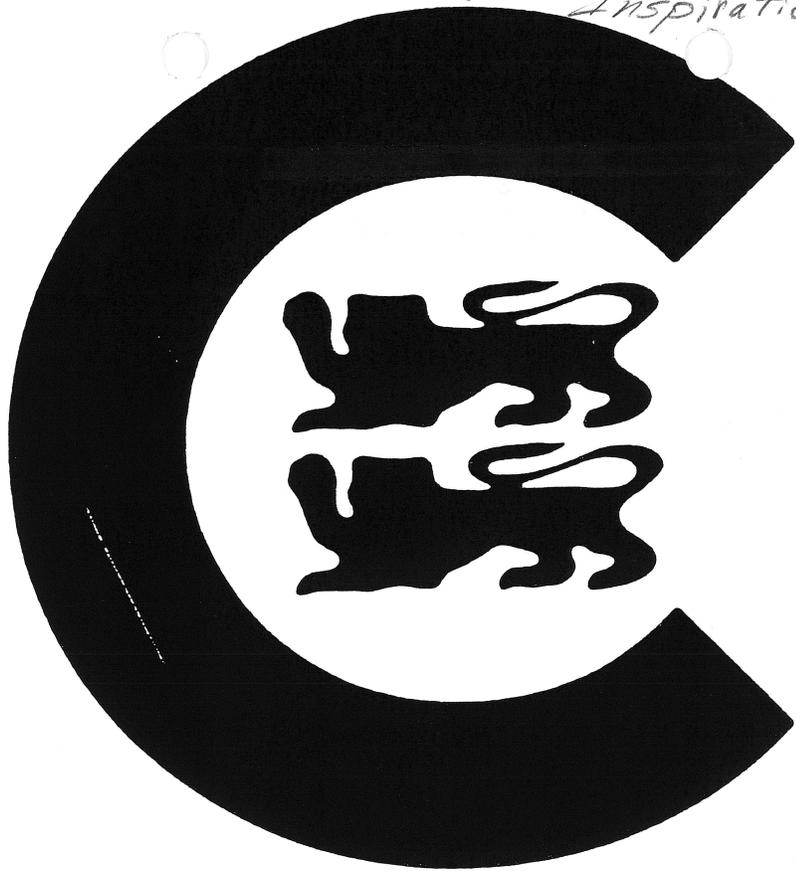
Miami

T1N R14E Sec. 25

P.O. Box 1559, Claypool 85532 - Phone 473-7150 - Employees 900 - Three open pit copper mines and 24,000 TPD concentrator which are inactive - Ferric-cure dump leach - Solvent extraction-electrowinning plant - 120,000 TPY smelter - Acid plant - Electrolytic refinery - 100,000 TPY continuous rod plant.

Manager, Technology Al Tittes
Manager, Mining Operations Don Prah1
Manager, Smelter/Rod Plant Operation Kenneth Larson
Manager, Accounting Joe Bost
Manager, Technical Services Noel Gillespie
Manager, Plant Operations Howard Bardwell
Superintendent, Leaching Operations Gerald F. Fountain
Superintendent, Tankhouse..... James Garvey
Senior Staff Project Engineer Charles Orsen
Superintendent, Plant Services John C. Lorenzen
Rod Plant Superintendent Luis Constandse
Superintendent, Environmental Services Tom Larsen
Manager, Human Resources Chuck Rising
Manager, Human Resources Craig Patrick
Manager, Materials Management Hugo Schriewer

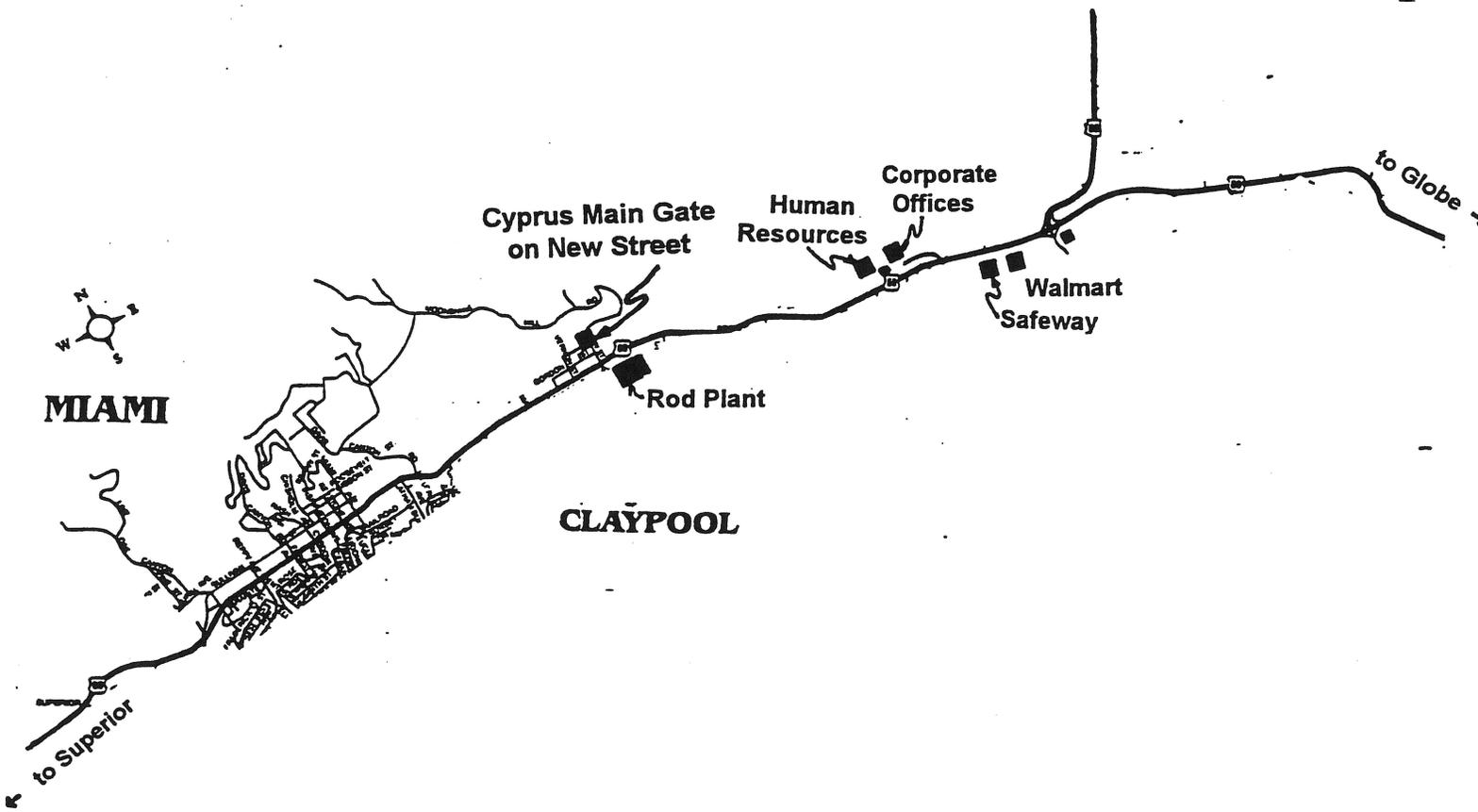
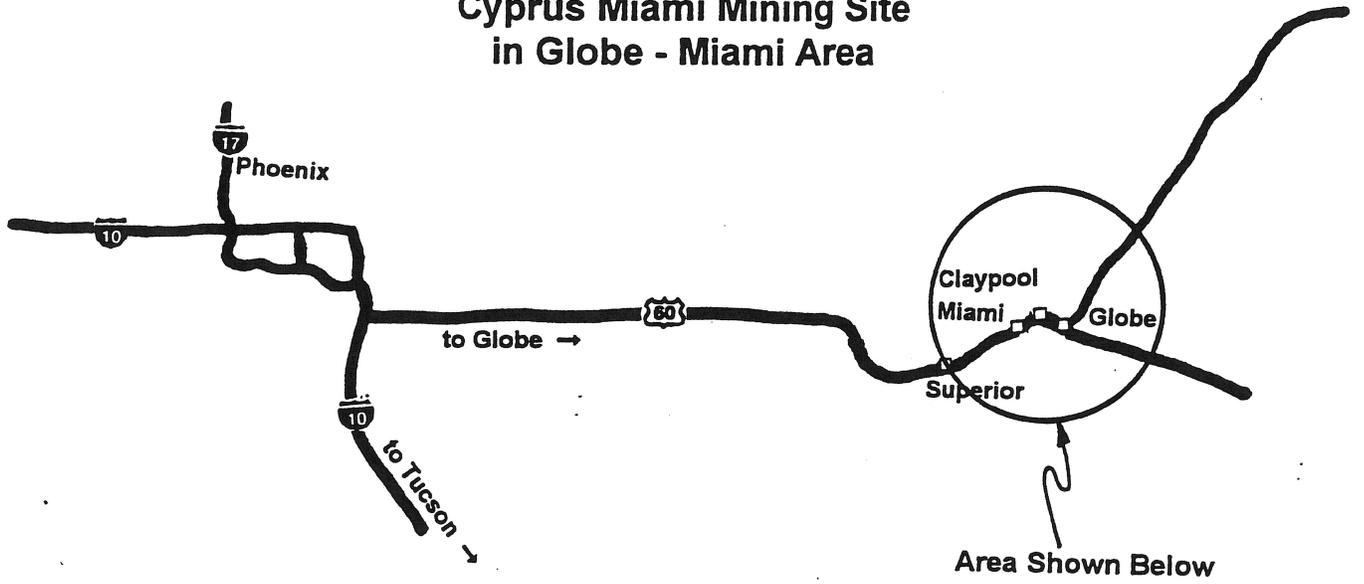
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file*

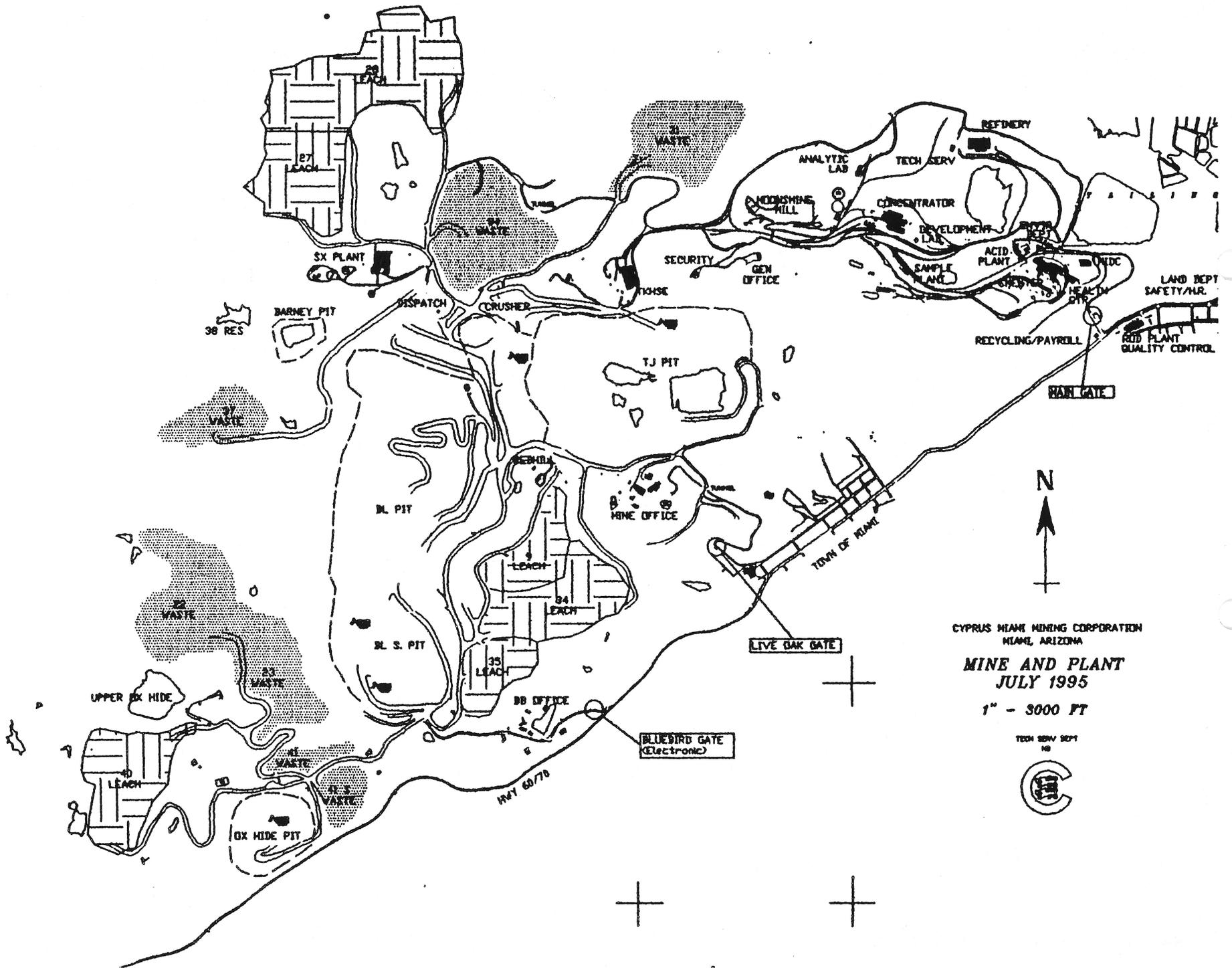


CYPRUS

**MIAMI MINING
CORPORATION**

Map Showing Route to Cyprus Miami Mining Site in Globe - Miami Area





CYPRUS MIAMI MINING CORPORATION
 MIAMI, ARIZONA
MINE AND PLANT
 JULY 1995
 1" = 3000 FT



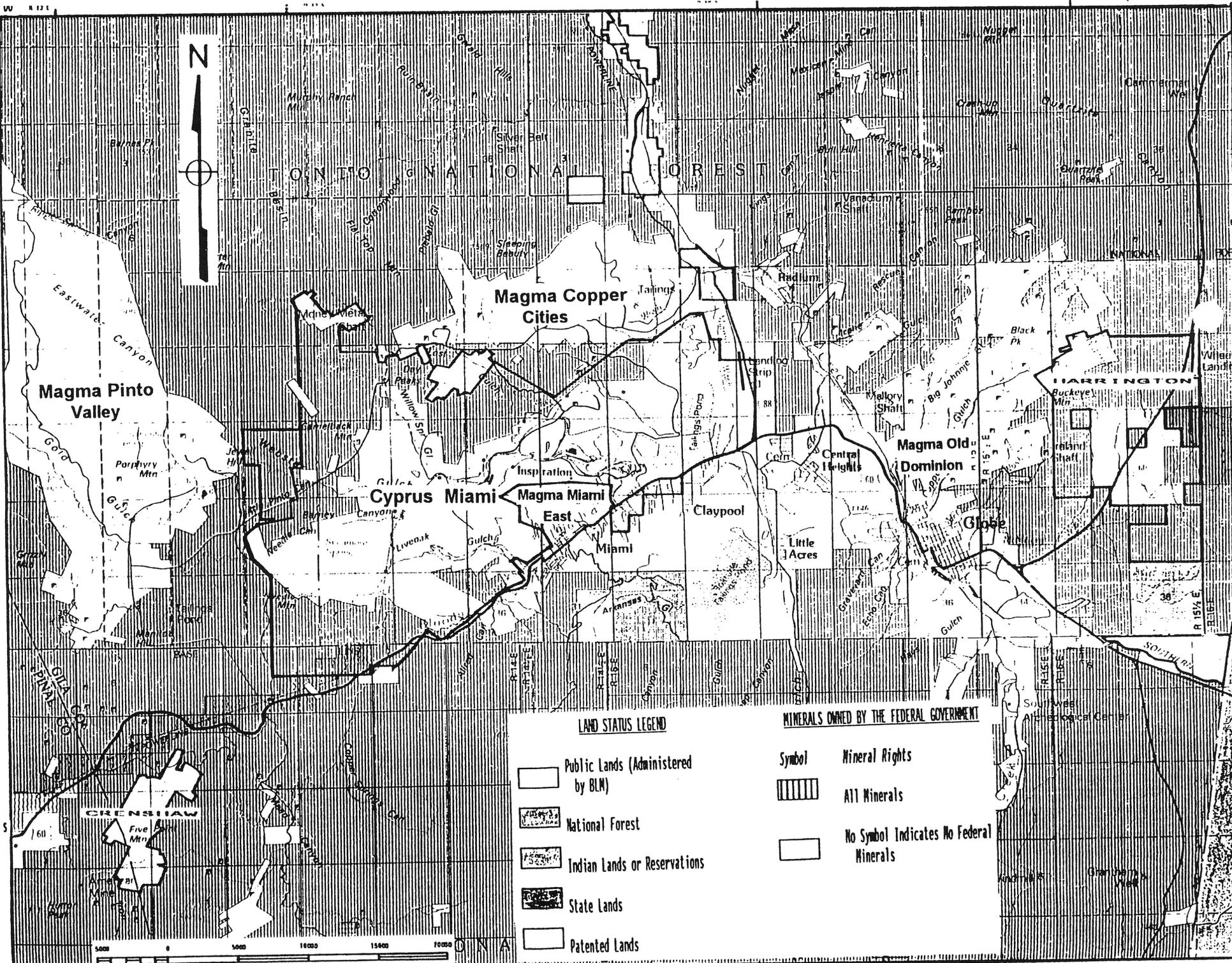
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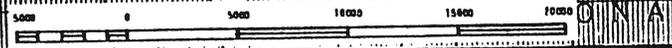


LAND STATUS LEGEND

-  Public Lands (Administered by BLM)
-  National Forest
-  Indian Lands or Reservations
-  State Lands
-  Patented Lands

MINERALS OWNED BY THE FEDERAL GOVERNMENT

-  Mineral Rights
-  All Minerals
-  No Symbol Indicates No Federal Minerals



CYPRUS MIAMI MINING CORPORATION

History

- 1880 Mineralization discovered.
- 1888 First exploration tunnel driven.
- 1911 Inspiration Consolidated Copper Company formed.
- 1915 Full scale underground production began.
- 1948 First open pit ore mined along with underground.
- 1954 All ore now mined from open pits (18 square miles in area).
- 1986 Shut down sulfide ore mining and closed concentrator. Began mining and leaching oxide ore from Bluebird pit.
- 1988 Assets of Inspiration Consolidated Copper Company acquired by Cyprus Minerals Co.

Employees (Approximately at year end).

610 Hourly
238 Salaried
948 Total

2,366,208 1994 Employees hours worked.

Payroll & Benefits (Annual)

\$39,280,000 Payroll + \$14,437,000 fringe benefits.
\$14.85 Average Hourly Wage
42% Employee Benefit Rate

Major Taxes (Annual)

\$3.5 Million - Property Tax
\$1.6 Million - Severance Tax
\$ 350,000 Sales Tax
\$ 310,000 Use Tax

Major Purchases (Annual)

\$49 Million - Operations & Repair Supplies
\$18.8 Million - Services
\$3.6 Million - Natural Gas
\$29.5 Million - Electricity
\$2.9 Million - Freight

\$65,600.00 Local Contributions

Mine

75,000 Tons Per Day Oxide Leach Ore - 184,000 Waste
0.40% Copper Leach Ore Grade (Average Grade)
5 - Shovels - 1 - 32 Cubic Yard Capacity
 2 - 23 Cubic Yard Capacity
 2 - 53 Cubic Yard Capacity
26 - 240 Ton Capacity Trucks
1 - Bucket Loader - 20 yards & 1 - 994 20 Yard Loader

Leaching

Approximately 500 Acres Under Leach (9 acres with collection ponds).
365,000 Pounds Copper Leached Per Day

Solvent Extraction

2 Solvent Extraction Plants
8,600 Gallons Per Minute Total Feed Solution Containing 3.37 Grams of Copper Per Liter of Solution.
365,000 Pounds Per Day of Copper.
2,200 Gallons Per Minute of Extract With Copper Pumped to Tankhouse Electrowinning Circuit.

Tankhouse

220 Electrowinning Cells - 133,333,000 Million Pounds Per Year Copper

Electrorefinery

18 Sections - 380,000,000 Million Pounds Per Year Capacity

Smelter

Feed - 650,000 Tons Concentrate Per Year Plus Cement Copper Capacity
Production - 450 Million Pounds Per Year of Anodes (99.8% Purity)
Sulfuric Acid Production - 1,620 Tons Per Day
No Ambient Air Violations Since August, 1985

Rod Plant

Production - 270 Million Pounds of 5/16" Copper Rod Per Year
Treats Electrowon and Electrofinned Cathodes
Equipment - Southwire/Morgan Continuous Cast Rod Mill



CYPRUS MIAMI MINING CORPORATION COPPER PRODUCTION PROCESSES

Modern copper production is a complicated and highly technical process. Cyprus Miami Mining Corporation currently produces approximately 133,000,000 pounds of domestic copper cathodes in the leaching and solvent extraction process, and 380,000,000 pounds of electrorefined cathodes annually. The operation's production process is comprised of six basic units: (1) Mining and Leaching, (2) Solvent Extraction, (3) Tankhouse (electrowinning), (4) Smelting, (5) the Refinery (electrorefining), (6) the Rod Plant. Briefly described, the basic steps of copper production at Cyprus Miami are as follows:

MINING AND LEACHING

The open pit operation produces approximately 80,000 tons of ore per day containing 0.45% copper. First, overburden material is stripped and hauled to overburden deposition areas. The material is loaded with electric shovels, ranging from 23 to 53 cubic yards in capacity, and is transported in 240 ton haul trucks. The ore is then drilled, blasted, loaded and transported to leach pads which are constructed in 15 foot lifts. Once in place on the leach pads, the ore is sprinkled with a dilute solution of sulfuric acid. As the solution percolates downward through the ore, it dissolves the copper. Water containing the copper then flows down gradient from the base of the leach pad, and the solution is captured in solution collection reservoirs. The leach solutions are then pumped through pipelines to the solvent extraction plants. Cyprus Miami operates approximately 500 acres of leach pads and produces 365,000 pounds of contained copper in solution per day.

SOLVENT EXTRACTION PLANTS

Cyprus Miami operates two solvent extraction plants that process 9,500 gallons per minute of leach solutions. The solution contains about 4 grams of copper per liter, and through the use of an organic extractant, it is further concentrated to approximately 46 grams of copper per liter. The upgraded solution, known as electrolyte, is then pumped at a volume of 2,200 gallons per minute to the Tankhouse for electrowinning.

TANKHOUSE

The Tankhouse contains 220 electrowinning cells that process the electrolyte solution pumped in from the Solvent Extraction plants. In the electrowinning process, the electrolyte is circulated through the cells which are subjected to an electrical current. Ultra pure copper is thereby plated out of the solution onto starter sheets to a purity of 99.99% copper. This copper, now in cathode form, is then sent to the Rod Plant for production of copper rod. Cyprus Miami produces 133,000,000 pounds of copper per year through the electrowinning process.

SMELTER

In the smelting operation copper concentrates, provided by toll customers and running about 30% copper, are fed into a tall cylindrical furnace while blowing oxygen enriched air through a vertical lance into the furnace's slag bath. The molten material is periodically tapped and fed to an electric furnace for matte/slag separation. The furnace charge is kept at about 2300° F. The heavier copper bearing material, known as matte, settles to the bottom of the furnace, and the lighter waste material, known as slag, floats to the top. The valueless slag is skimmed and removed from the matte. The matte is then tapped from the furnace and transported to converters where air is forced into the bath to oxidize the sulfur and iron in the matte. The oxidized iron (FeO) is returned to the electric furnace as slag, and the oxidized sulfur (SO₂) exits the converter in the gas stream. The remaining copper in the converters is then transferred to the anode plant where it is cast into anode shapes on an anode casting wheel. The copper anodes are then allowed to cool before being shipped to the Refinery for electrorefining into copper cathodes.

The off gas containing SO₂ from the electric furnace and converters is routed through an electrostatic precipitator which removes any small dust particles. The gas proceeds through the system to a sulfuric acid plant where the gas is scrubbed, cooled, dried and converted to sulfuric acid (H₂SO₄). The sulfuric acid is consumed in the leaching process described above. The present smelter capacity is 650,000 tons per year of concentrates which allows for the production of 398,000,000 pounds of copper anodes annually. At the present time, none of the smelter's concentrate feed is produced by Cyprus Miami's mining operation.

REFINERY

The Refinery contains 504 electrorefining cells that process copper anodes produced by the smelter. Smelter anodes are 99.80% pure copper. The anodes are placed in cells and the copper is electrochemically dissolved from the anodes into solution. From there the copper migrates to the cathode, where it is plated onto stainless steel starter sheets to a purity of 99.99% pure copper. This copper, now in cathode form, is then sent to the rod plant for production of copper rod. Cyprus Miami produces 380,000,000 pounds of copper per year through the electrorefining process.

ROD PLANT

The Rod Plant is a continuous melting, casting and rod rolling operation. Cathode copper is melted in a vertical shaft furnace and then is sent through a skim basin and a holding furnace which remove any possible slag or gases. The holding furnace temperature is maintained at approximately 2040° F, and molten copper exits the furnace into a pour pot where it is cast into a square 5 inch bar. This continuously produced bar is then fed into grooved rolls that decrease in size until the feed bar finally emerges as 5/16 inch copper rod. This rod is coiled in 5,900-15,500 pound coils for shipping. Annual production of copper rod is approximately 274,000,000 pounds.

THE CYPRUS MIAMI ELECTROREFINERY

The Cyprus Miami Electrorefinery, a department of Cyprus Miami's Copper Products Division, began electrorefining copper cathode in mid October of 1994. The electrorefinery's main supplier of copper anodes is the Cyprus Miami smelter. The 875 pound anodes containing an average copper grade of 99.60% are received at the refinery dock by rail. Copper cathode, anode scrap, and anode slime products are shipped out both by rail and commercial trucking.

Copper anodes are off loaded from rail cars onto the dock or into the AISCO anode preparation machine. The anode preparation machine is a highly technical and unique system as it has the ability to prepare or reject anodes based on parameters entered into its programmable logical control network. Anodes are first checked by the AISCO system for weight tolerances and then enter the body press station where the anode body and lugs are horizontally pressed. The anode then goes through a vertical lug press and a lug milling station. The lugs are milled with 5° offsets to ensure highly efficient contact points and a vertical plumb hanging position in the cells. After the milling station of the anode preparation system, the anodes are elevated via an incline chain conveyer to the cell floor where they are spaced 3-29/32 inches or 99 mm center to center. Anodes may be spaced in lots of 60 or 61 pieces awaiting installation into the cells.

The two isle cell layout consist of 504 polymer concrete cells. The 504 cells are divided into 18 sections of 28 cells each or 36 half sections of groups of 14 cells each. The cell pattern layout is a very unique design as the sections take on a horse shoe appearance optimizing short crane traveling patterns. The 36,300 amps of direct current power is delivered by two AB rectifiers through a bus system to each section. Sections are energized by the use of pneumatic shorting switches controlled either by the control room plc data highway system or remotely in the field. Current travels from cell to cell by the utilization of a dogbone inner cell bus bar system.

The anodes are transported and installed into the cells in lots of 60 or 61 pieces by either of two Noell overhead cranes. The 27 ton Noell cranes are a highly sophisticated pieces of equipment. The overhead cranes may either be operated through the Allen Bradley plc data highway system originating in the electrorefinery control room or by one step computer input functions by the crane operator in the cab. In unique situations the crane operator may operate the cranes in manual mode. The Noell cranes locate their target locations through a computer grid program loaded into their plcs. Strong back hooks are closed and spaced for both cathodes and blanks through a preprogramed hydraulic system.

Stainless steel mother blanks are loaded between the anodes into the cells with the overhead cranes in lots of 60. The mother blanks were designed by CRL, in Queensland Australia, and afford a place for copper ions to plate in an area of 3100 square inches or 2.0 square meters. The mother blanks are equipped with two Quadna CPVC or ABS edge strips secured by one top pin and two five pin inserts each. The bottom of the mother blank is double dipped in hot wax to provide insulation and prevent enveloping between the two cathodes. This process of utilizing

stainless steel mother blanks with edge strips and bottom wax to plate cathode copper is referred to as the ISA process.

Cathodes are harvested every seven days while the anode life cycle is 21 days. The mother blanks are harvested in lots of 60 and contain two 123 pound cathodes of 99.99% copper each. The laden mother blanks are loaded onto the TM stripping machine transfer system and enter a high pressured hot water wash cycle. The washing serves three purposes. The hot wash water melts the bottom wax so that it may be reused again, washes any electrolyte and slimes off of the cathode and ensures clean contact points on the mother blank hanger bar for reinstallation into the cell.

After the washing process, the copper laden mother blank is introduced into the flexing station where hydraulic flexing arms flex the copper loose from the mother blank. Large wedge shaped knives then separate the cathodes from the blanks. The cathodes are then packaged to meet customers' needs, weighed, and bar code labeled with pertinent data in regards to quality and origin as required by the customer.

The mother blanks are then transported along the automatic stripping machine conveyer at which time the operator may reject a defective blank for reconditioning or allow the mother blanks to be rewaxed. After the double waxing the mother blanks are accumulated, spaced in lots of 60 and transported to the appropriate refinery bay for reinstallation into the cells.

On the third cathode harvest or at the end of the anode life cycle, the anode scrap averaging 12 to 15% of its original weight is removed with the overhead cranes from the cells. The anode scrap is placed onto the AISCO scrap machine conveyer where it is washed to remove any loose slime material. The scrap is then packaged in a horizontal fashion running in either two or four directions depending on customer needs. The scrap is then weighed and banded ready for shipment.

The electrolyte circulation is stopped in the cells during an anode change allowing the cell technicians the opportunity to decant all but 10 inches of electrolyte in each cell for reuse in the system. The remaining 10 inches of electrolyte contains the anode slimes consisting of valuable insoluble metals such as some copper, gold, silver, platinum, and others. The slimes are washed from the bottom of the cells and pumped to the slimes treatment area for further processing. Copper is leached from the slimes by means of an autoclave. The slime material is then dried in a filter press and further dried by two screw dryers to meet customer requirements. Slimes are packaged in 55 gallon barrels for shipment.

The electrolyte is gravity flowed back into the cells from one of two head tanks depending in which of the two circulation systems the section being worked on belongs. The electrolyte, consisting of 44 - 46 grams per liter (gpl) of copper and 180 - 200 gpl of sulfuric acid, is further cleaned of slime material through the use of Schriver filters. The electrolyte is heated to 149°F by the use of steam heated water passing through plate and frame heat exchangers. Individual cell flow valves allow the cell attendants to maintain a flow rate of 7 - 10 g.p.m. as conditions require.

Employee development and ownership are stressed at the Cyprus Miami electrorefinery. Employees are divided into self starting work teams. Team work and

process problem skills are mandatory work ethics instilled into all electrorefinery team members. The combination of team problem solving skills and a very rigorous skill base cross training program results in a highly trained and an exceptionally flexible work team at the Cyprus Miami electrorefinery.

The Cyprus Miami electrorefinery places a strong emphasis on safety with the active participation of the Dupont STOP program, along with monthly OSHA topic safety meetings at all levels. Safety is emphasized further through such programs as weekly safety tailgate meetings, weekly safety audits, a safety suggestion program, and daily equipment and area checklist. Safe and productive team members are recognized as a group through such things as a luncheon or barbeque to a quarterly bonus system.

A highly motivated and trained work force is the key to success at the Cyprus Miami electrorefinery. An industrial culture with an emphasis on safety, skill base cross training, and in depth communication not only enables the Cyprus Miami electrorefinery to produce 190,000 stpy of quality copper cathode but provides for a world wide competitive edge in the copper industry.