



CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
602-771-1601
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

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Preliminary Report

SANCHEZ DEPOSIT

RECOMMENDATIONS

1. A complete revision of previous geologic interpretations based on:
 - (a) Re-mapping the surface geology with emphasis placed upon an accurate description and subsequent accurate naming of the various lithologic units and an accurate measurement of visible geologic structures.
 - (b) Re-logging of the available old core with emphasis on the type of mineralization, ore-host relationship, accurate description of the rock type, denoting of structures within the core (faults, contacts etc.), rough determination of the type and extent of alteration present, if discernible.
 - (c) Thin sections of selected portions of core and surface rock should be made to aid in determining an accurate name of individual lithologic units and a more accurate interpretation of the types of alteration present on the property.
 - (d) Polished thin sections should be made from selected samples of core in order to determine the type of mineralization, ore-host relationships, and the proper paragenetic sequence of mineralization.
 - (e) Additional geophysics to aid in delineating subsurface structures as well as determining new areas for exploration drilling.
 - (f) Re-assaying of selected intervals of core for gold and silver to determine the validity of the conclusions reached

by the regression analysis. If the results are encouraging, then the combined metals value of the Sanchez Deposit should be investigated.

2. A testing of the old diamond drill holes to determine if they're open and could be re-entered for a subsequent deepening of the hole.
3. The selection of future diamond drill sites for:
 - (a) the increasing the present known sulfide reserves
 - (b) trying to delineate the extent of the sulfide zone
 - (c) a determination of the size of the two zones of enrichment.

ABSTRACT

The Sanchez Property is a porphyry-type copper deposit located in the Lone Star Mining District of southeastern Arizona. The oxide copper deposit was developed prior to completing a thorough geologic investigation of the property. The indications of a very large sulfide zone are evident, but the lack of information prevents an accurate estimate of its grade and size. In addition, the amount of gold and silver present and the extent of chalcocite enrichment need to be determined.

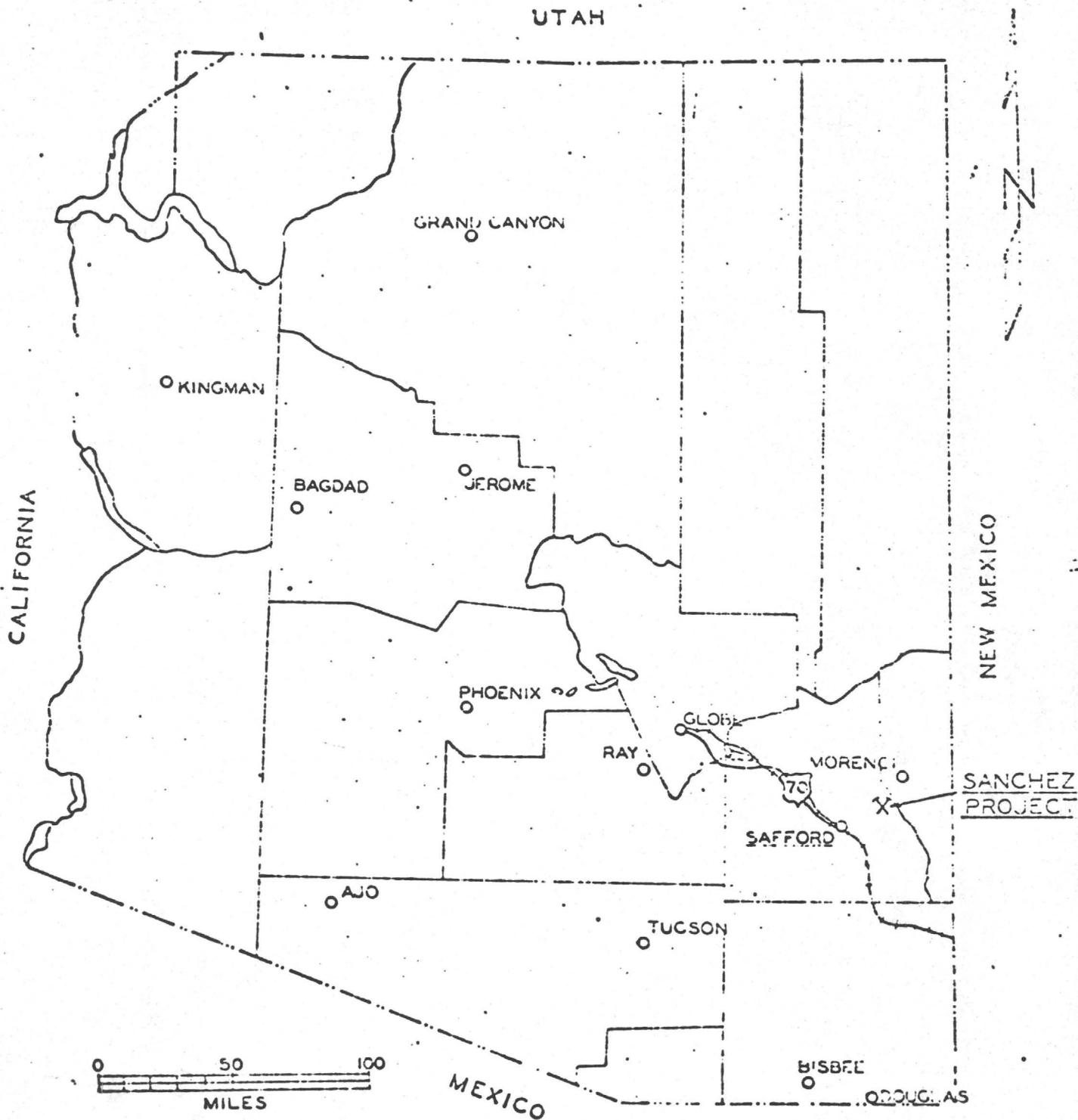


FIGURE NO. 1
INDEX MAP SHOWING THE LOCATION
OF THE
SANCHEZ PROJECT

INTRODUCTION

Location:

The Sanchez Property is a porphyry-type copper deposit located in the Lone Star Mining District of southeastern Arizona. This property lies approximately 11 miles northeast of the town of Safford (Fig. 1) and approximately 1 mile north of the Gila River.

Access:

The property is easily accessible from State Highway 70 and is paved road to within 3 miles of the property. The last 3 miles is a moderately, well maintained, gravel road.

An alternative route is available, but it requires 7 miles of gravel road travel, and may be impassable during periods of high water.

Topography:

The area lies at the southeast end of the rugged Gila Mountains and is typical of the mountainous regions within the Basin and Range province. It is a faulted mesa and exhibits deep canyons adjoining a large valley. Although relief is severe near the mesas and canyons, the overall relief is moderate. The average elevation is 3200 feet above sea level.

Climate:

The climate and vegetation is typical Sonoran desert. The average rainfall is 8.5 inches. The summer temperatures average 82°F but temperatures exceeding 110°F are not uncommon. The winter temperatures average 48°F but temperatures below 32°F are not uncommon.

UTILITIES AND FACILITIES

Electricity:

A source of electrical power is available and the old report states that up to 40,000 kilowatts at a cost of less than one cent per kilowatt hour was available. Two substations are located relatively close to the property, one has a capacity of 69,000 volts and is within 3.5 miles of the property; the other station is about 12 miles to the south and has a capacity of 60,000 kilowatts. The power company would install a substation at the mine, at their expense, if the mine required in the neighborhood of 4,000 kilowatts.

The previous mentioned power costs and availability were as of April, 1973 and need to be updated in view of the current events.

WATER

Industrial:

The availability of water was determined to be sufficient. Anticipated water consumption for a 15,000 tons per day production was determined to be 3,000 gallons per minute. Currently on the claim group there are three wells prepared for production and three others that could be enlarged to produce an estimated total production of 1860 gal./min. A recently acquired 89 acre parcel of farmland, adjoining the property, overlies a good aquifer. The estimated well production is between 3,000 and 10,000 gal./min.

Two types of ground water exist on the property. One is produced from the Gila River Valley and is cool, the other is warm (85°-120°F) and is found on the claim group, deep in the Safford

basin. Both types of water have been determined suitable for a leaching operation.

Potable:

Safford city water is available adjacent to the property and a hookup to the water line is easily obtained.

Railroad:

A railroad siding at the town of Solomon is 9 miles from the mine and could easily be put into service.

Buildings:

Several buildings exist in and around the property and presently are being used primarily for storage. The main office is still supplied with power and water, but would require a good cleaning prior to being used.

Previous Work:

Prior to being leased by Inspiration Consolidated Copper Co. in 1969 the property had been optioned by various individuals and mining companies.

To date 133 diamond drill holes have been drilled by six companies. Complete logs and/or samples are available for only 62% of the drilling, the rest of the drilling information is incomplete.

Although some drill holes are greater than 2000 feet deep, the majority of drilling was usually less than 1200 feet. The drilling programs completed to date have dealt solely with the outlining of the copper oxide deposit. In addition, all the metallurgical testing, calculation of ore reserves and development

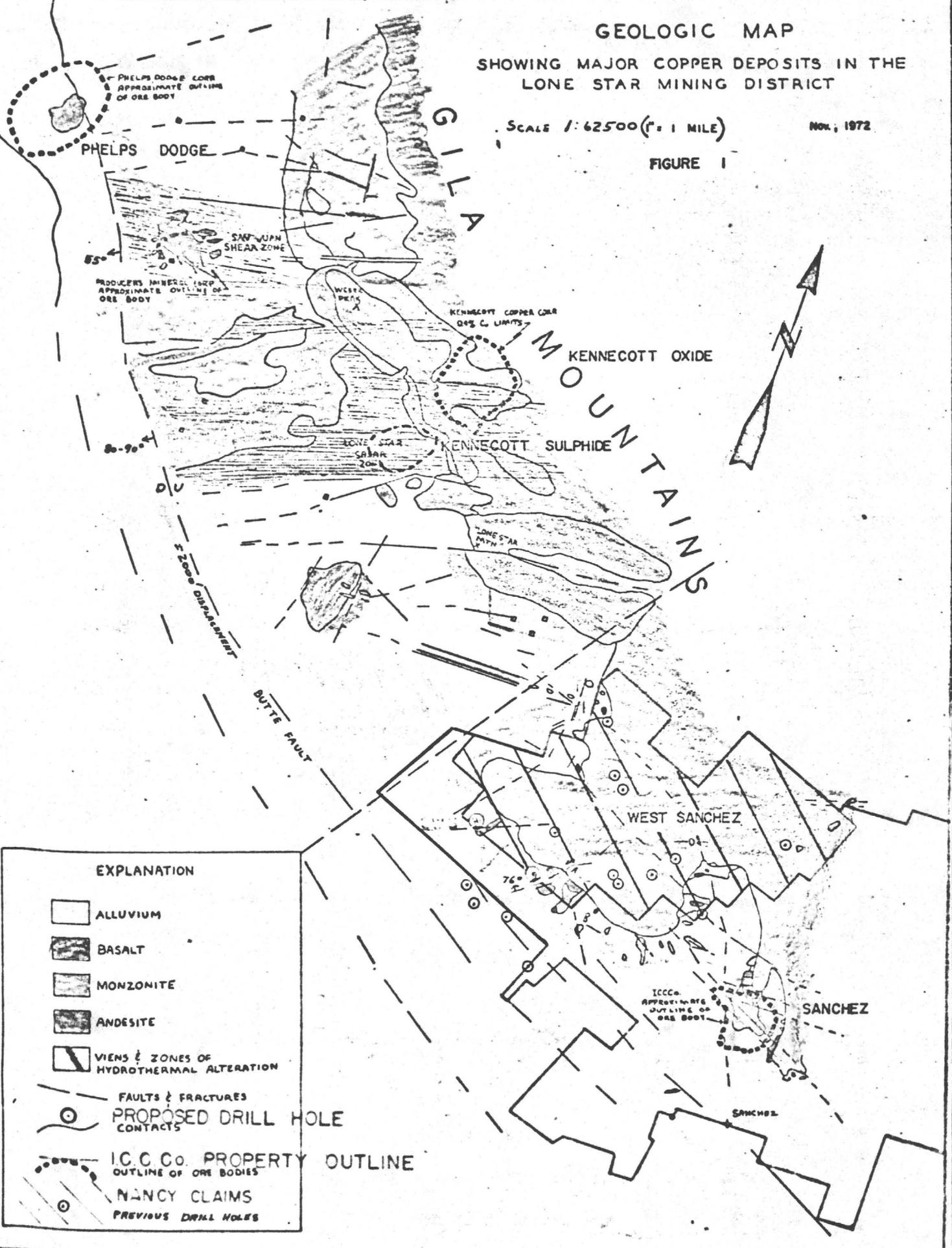
GEOLOGIC MAP

SHOWING MAJOR COPPER DEPOSITS IN THE
LONE STAR MINING DISTRICT

SCALE 1:62500 (1" = 1 MILE)

Nov., 1972

FIGURE 1



EXPLANATION	
	ALLUVIUM
	BASALT
	MONZONITE
	ANDESITE
	VEINS & ZONES OF HYDROTHERMAL ALTERATION
	FAULTS & FRACTURES
	PROPOSED DRILL HOLE
	CONTACTS
	I.C.C. Co. PROPERTY OUTLINE
	OUTLINE OF ORE BODIES
	NANCY CLAIMS
	PREVIOUS DRILL HOLES

plans have been based on the mining of an oxide deposit.

No attempt was made to determine the extent of either the sulfide mineralization, or the amount of precious metals (Au/Ag) present in the oxide and sulfide zones.

Land Status:

Presently the property is covered by 368 lode claims and 200 millsite claims. An additional 10 acres is being leased from Sanchez and another 240 acres is leased from the State of Arizona.

GENERAL GEOLOGY

Regional Setting

The deposit lies at the southeastern edge of the Gila Mountains. These mountains belong to a group of several north-westerly trending ranges characteristic of the Basin and Range physiographic province of southeastern Arizona. This range is on the eastern side of the Mountain Region or Mexican Highlands that separates the Colorado Plateaus province from the Sonoran Desert. Tertiary basalt and andesite, overlying Cretaceous(?) andesite and flow breccia, making up the range, were subjected to basin-and-range faulting. As a result of this faulting, which may have caused displacement of as much as 2,000 feet, and subsequent erosion, the present-day outline of the range was formed.

The highest parts of the range consist of the Tertiary younger and intermediate series of volcanic rocks, which dip to the north and northeast from 10 to 12 degrees. On the southern flanks of the mountains, except where covered by terrace gravel

and basin fill, the Cretaceous(?) older volcanic series crop out with their attendant intrusive plutonic and volcanic rocks.

Because of the northwesterly trending basin-and-range faulting, the predominant and obvious structural trend in the area parallels this direction. However, in the older volcanics of the Lone Star District strong northeast faulting and shearing that appear to have controlled mineralization are evident. Dikes follow this trend, and stocks and plugs appear to have their longer axes elongated in this direction.

At this time two large disseminated porphyry copper deposits are in various stages of development and production (Fig. 2), the first deposit, located and owned by the Phelps Dodge Corporation. They report the present deposit to be 400,000,000 tons of ore averaging 0.72% copper. This deposit, although some vein structures outcrop on the property, was found only through an extensive exploration drilling program as the currently outlined deposit starts 1,000 feet below the ground surface. A good review of this property is covered in the February 22, 1975 issue of the Skillings Mining Review. This deposit lies approximately 9 miles northwest of the Sanchez Deposit.

The second large disseminated porphyry copper deposit is owned by Kennecott Copper Corporation and lies approximately 4½ miles northwest of the Sanchez Deposit. An extensive exploration drilling program resulted in the delineation of this ore body. It occurs in the older volcanic series where northeast shears and faults in the porphyritic andesite were intruded by the acid-intermediate series

of dikes, plugs and a volcanic vent.

Sedimentary Rocks

The oldest rocks exposed consist of small xenoliths of quartzite, as much as 250 feet long and wide, in the Lone Star Quartz Diorite stock. The rock resembles the Cambrian Cornado Quartzite at Morenci. The only other sedimentary rocks, terrace gravel and basin fill, constitute the youngest formations present. These sediments are interbedded with the so-called Gila Conglomerate at various locations in the area.

IGNEOUS ROCKS

Regional Extrusive Rocks

The older volcanic series, in which the Kennecott ore body occurs, is overlain by two later volcanic units--the younger and the intermediate volcanic series. On the basis of potassium-argon age determinations (58 m.y. or Eocene) made on two stocks, the San Juan and Lone Star, intruding only the older volcanic series, both of these later units are believed to be middle or late Tertiary in age. (Fig. 3)

The older volcanic series consists of a dark gray massive porphyritic andesite and fine textured flow breccia with intercalated tuff beds. They are overlain unconformably by the intermediate volcanic series, consisting of dacite, andesite, latite, flow breccia, and tuff. They range from 0 to 820 feet thick over the Kennecott ore body. The younger volcanic series, consisting of basalt flows, tuff, and agglomerate, disconformably overlies the intermediate volcanic series. This series may be as much as 750 feet thick over

the Kennecott ore body.

Regional Intrusive Rocks

All of the known intrusive rocks in and adjoining the Kennecott ore body penetrate only the older volcanic series. Although a few basalt and rhyolite dikes a few feet wide are post-mineral, the bulk of them are pre-mineral in age.

The San Juan stock (Eocene) is composed of quartz monzonite porphyry, granodiorite porphyry, and granodiorite. It is known to intrude the porphyritic andesite at the San Juan Mine.

The Lone Star pluton, also Eocene in age, consists of quartz diorite, minor granodiorite, and quartz monzonite. This pluton also intrudes the porphyritic andesite.

Local Extrusive Rocks

The ore deposit presently outlined at the Sanchez Property occurs within andesites believed similar to those at the Kennecott and Phelps Dodge deposits. In addition to the mineralized andesite, drill core indicates a significant amount of mineralization within the intrusive bodies within the andesite.

The relationships between the various lithologic units at this property is not thoroughly understood at this time. At present it is assumed that the lithology present is similar to or the same as that covered under the preceding section on regional geology. Detailed geologic work should determine the accuracy of the preceding statement.

STRUCTURE

Regional

The regional structure, partially described earlier in this paper is represented by the northwest-trending-Gila Mountains and the associated southwesterly dipping Butte Fault (Fig. 4). Based on the difference in altitude of the unconformable surface between the older and younger volcanics on both sides of the fault, the throw may be as much as 2,000 feet. As a result of this major structural disturbance, the Gila Mountains were tilted 10 to 12 degrees to the northeast.

Local Structure

A recent study by the Resident Geology Department shows that much of the structure previously reported was based on incomplete information. Although the Butte Fault is one of the major regional structures, its relationship to mineralization is undetermined at this time.

A combination of underground mapping sheets, drill logs and surface mapping were combined to give the following picture. To date three different fault systems are known to exist on the deposit, they are: a northwest group dipping moderate to steep to the southwest; a northeast set dipping moderate to steep to the southeast; and an east-west set dipping moderate to steep to the south. One of the east-west set dips to the north.

Present information indicates the influence of Butte Fault system to be highly conjectural whether assumed to be pre- or post-mineral.

Until more detailed work is finished the structural relationships

present at the Sanchez Deposit are subjects of speculation and misinterpretation.

MINERALIZATION

Controls

The Sanchez Deposit, like the Phelps Dodge and Kennecott deposits occurs in the older volcanic series. Unlike the Kennecott deposit no determination has been made of the presence of a series of shears and faults existing prior to the emplacement of mineralization. Incomplete information concerning ore-hosts relationships combined with too little information concerning the size and extent of mineralization prevents a more definitive picture being presented at this time.

Type

The mineralization observed to date can be divided into three zones:

The first zone is now dominantly oxides that contain a few relict sulfides, plus other minor secondary minerals. The oxide zone consists predominately of chrysocolla and copper pitch with minor amount of malachite, cuprite, and chalcantinite. Oxide mineralization roughly extends about 900 feet underground, although two drill holes on the southeast edge of the oxide zone show oxide copper to exist approximately 1,800 feet beneath the surface. This irregularity is believed due to major faulting and it is presently under investigation.

The second zone of mineralization can best be described as a transitional zone. It varies in thickness from a few feet to almost 200 feet. Mineralization is comprised predominately of a mixture of

native copper, copper oxides and copper sulfides. When well developed, the native copper is dominant and the other copper minerals are secondary.

The third and final zone of mineralization is the sulfide zone and at present time its extent is unknown. A recent study shows sulfide mineralization to extend at least 2,450 feet vertically and presently the horizontal extent of sulfide mineralization is undefined. A close examination of the 50 foot bench plans just completed by the Resident Geology Department shows the greatest portion of sulfide mineralization to start at the 2450 Bench and extend uninterrupted for 1,400 feet to the 1050 Bench (See Table 1, page Statistical Analysis)

To date, no attempt has been made to evaluate the gold and silver values present in the deposit. The presence of molybdenum has been determined, but the values are so minor that no attempt, at this time, was made to evaluate its significance.

A regression analysis was used to check the hypotheses that a relationship exists between the copper sulfides and the gold-silver values.

A significant relationship between copper and gold is established, as well as a good relationship between gold and silver. A copper to silver relationship exists, but was not used as a predictor due to its lower correlation coefficient. The results of the statistical analysis are shown on Tables 2, 3 and 4.

The relationships established by the regression analysis need to be tested. Since many of the previous diamond drill holes were never assayed for gold or silver, selected intervals taken from the

Table 1

Tables of Statistical Symbols and Their Meanings

- X = variable (independent)
- Y = variable (dependant)
- N = population (number of samples)

Moments About Origin

- $\sum X$ = Sum of all X's
- $\sum X^2$ = Sum of all X's squared
- $\sum Y$ = Sum of all Y's
- $\sum Y^2$ = Sum of all Y's squared
- $\sum XY$ = Sum of all individual (X)(Y)

Central Moments About Mean

- \bar{X} = Average of all X's
- \bar{Y} = Average of all Y's
- $\sum x^2$ = Square of the Differences Between Individual X's and \bar{X}
- $\sum y^2$ = Square of the Differences Between Individual Y's and \bar{Y}
- $\sum xy$ = Sum of (x)(y)

- r^2 = Coefficient of Determination
- r = Correlation Coefficient

Regression of Y on X

- s^2_x = Variance of Sample
- s_x = Standard Deviation of Sample
- V_x = Coefficient of Variation
- $\hat{\sigma}^2_x$ = Unbiased Estimate of Population Variance
- $\hat{\sigma}_x$ = Unbiased Estimate of Standard Deviation of Population
- $\hat{\sigma}_{\bar{x}}$ = Standard Error of the Mean
- $\bar{x} + \alpha$ = } 95% Confidence Limits of the Mean
- $\bar{x} - \alpha$ = }
- b = Slope of Regression line of Y on X
- a = The Y Intercept of the Regression Line of Y on X
- E_{y^2c} = Explained Variation in Y
- E_{y^2s} = Unexplained Variation in Y
- $s^2_{y \cdot x}$ = Error variance of Y
- $s_{y \cdot x}$ = Standard Error of Estimate of Y on X
- $\hat{\sigma}^2_{y \cdot x}$ = Unbiased Estimate of Error Variance of Y
- $\hat{\sigma}_{y \cdot x}$ = Unbiased Standard Error of Estimate of Y on X

$$\hat{Y} = a + bX = \text{Prediction Equation}$$

* Inverse Regression X on Y

Table 1 Cont.

ρ = Measure of the Linear Covariation of the Variables
(It measures the Degree of Linear Association between them)

Z = Normal Approximation

L_1 } Confidence Intervals
 L_2 }

$1-\alpha$ = Confidence Interval

$\frac{\alpha}{2}$ = Area Bounding the Confidence Limits

Table 2

Regression and Correlation Cu / Au for DDH # 123

95 % Confidence Interval

Sulfide Zone Tested

x = Cu

y = Au

N = 64

Regression and Correlation of Y on X

Moments About Origin	{	$\sum X = 41.709$
		$\sum X^2 = 33.385813$
		$\sum Y = 0.405$
		$\sum Y^2 = 0.003693$
		$\sum XY = 0.338242$

Central Moments About Mean	{	$\bar{X} = 0.6517031$
		$\bar{Y} = 0.0063281$
		$\sum x^2 = 6.2039285$
		$\sum y^2 = 0.0011302$
		$\sum xy = 0.074306$

$r^2 = 0.7874432$

$r = 0.8873799$

Regression of Y on X	{	$s^2_x = 0.0969363$	= 0.0000176
		$s_x = 0.3113459$	= 0.0041952
		$V_x = 0.4777419$	= 0.6629478
		$\hat{\sigma}^2_x = 0.0984749$	= 0.0000178
		$\hat{\sigma}_x = 0.3138071$	= 0.004219
		$\hat{\sigma}_{\bar{x}} = 0.0392249$	= 0.0004472
		$\bar{x} + \alpha = 0.7285839$	= 0.0072046
		$\bar{x} - \alpha = 0.5748223$	= 0.0054516
		$b = 0.0119772$	= 65.7458856
		$a = -0.0014774$	= 0.2356566
		$\sum y^2 c = 0.0008899$	= 4.8853137
		$\sum y^2 s = 0.0002403$	= 1.3186198
$s^2_{y \cdot x} = 0.0000037$	= 0.0206033		
$s_{y \cdot x} = 0.0019235$	= 0.1435384		
$\hat{\sigma}^2_{y \cdot x} = 0.0000038$	= 0.0212679		
$\hat{\sigma}_{y \cdot x} = 0.0019493$	= 0.1458351		
		=	

Regression of X on Y

$\hat{Y} = a + bX$

Table 3

Regression and Correlation Cu / Ag for DDH # 123

95 % Confidence Interval

Sulfide Zone Tested

x = Cu

y = Ag

N = 62

Regression and Correlation of Y on X

Moments About Origin	{	$\sum X = 41.007$
		$\sum X^2 = 33.132913$
		$\sum Y = 5.05$
		$\sum Y^2 = 0.4955$
		$\sum XY = 3.78609$

Central Moments About Mean	{	$\bar{X} = 0.66140322$
		$\bar{Y} = 0.08145161$
		$\sum x^2 = 6.01075116$
		$\sum y^2 = 0.08416937$
		$\sum xy = 0.4460043$

$$r^2 = 0.39318347$$

$$r = 0.62704343$$

Regression of Y on X	{	$s^2_x = 0.09694759$	}	$= 0.00135757$
		$s_x = 0.31136407$		$= 0.03684521$
		$V_x = 0.47076285$		$= 0.45235704$
		$\hat{\sigma}^2_x = 0.09853689$		$= 0.00137982$
		$\hat{\sigma}_x = 0.31390586$		$= 0.03714592$
		$\hat{\sigma}_{\bar{x}} = 0.03986602$		$= 0.00471699$
		$\bar{x} + \alpha = 0.73954061$		$= 0.09069691$
		$\bar{x} - \alpha = 0.58326583$		$= 0.07220631$
		$b = 0.07420109$		$= 5.29889079$
		$a = 0.03237478$		$= 0.22980004$
		$\sum y^2_c = 0.033094$		$= 2.36332807$
		$\sum y^2_s = 0.05107537$		$= 3.64742309$
		$s^2_{y \cdot x} = 0.00082379$		$= 0.0588294$
		$s_{y \cdot x} = 0.02870174$		$= 0.24254772$
$\hat{\sigma}^2_{y \cdot x} = 0.00085125$	$= 0.06079038$			
$\hat{\sigma}_{y \cdot x} = 0.02917618$	$= 0.24655705$			
		$=$		

Regression of
X on Y

$$\hat{Y} = a + bX$$

Table 4

Regression and Correlation Au / Ag for DDH # 123

95 % Confidence Interval

Sulfide Zone Tested

x = Au

Y = Ag

N = 62

Regression and Correlation of Y on X

Moments About Origin

ΣX	= 0.399
ΣX^2	= 0.003675
ΣY	= 5.05
ΣY^2	= 0.4955
ΣXY	= 0.03993

Central Moments About Mean

\bar{X}	= 0.0064354
\bar{Y}	= 0.0814516
Σx^2	= 0.0011073
Σy^2	= 0.0841695
Σxy	= 0.0074358

$r^2 = 0.5922514$

$r = 0.7695787$

	$s^2_x = 0.0000178$ $s_x = 0.004219$ $V_x = 0.6555925$	= 0.0013575 = 0.0368442 = 0.4523447
Regression of Y on X	$\hat{\sigma}^2_x = 0.0000180$ $\hat{\sigma}_x = 0.0042426$ $\hat{\sigma}_{\bar{x}} = 0.0004472$ $\bar{x} + a = 0.0073119$ $\bar{x} - a = 0.0055589$	= 0.0013797 = 0.0371443 = 0.0047116 = 0.0906863 = 0.0722169
	$b = 6.7152533$ $a = 0.0382363$ $\Sigma y^2_c = 0.0499332$ $\Sigma y^2_s = 0.0342363$ $s^2_{y \cdot x} = 0.0005521$ $s_{y \cdot x} = 0.0234968$ $\hat{\sigma}^2_{y \cdot x} = 0.0005706$ $\hat{\sigma}_{y \cdot x} = 0.0238872$	= 0.0883431 = -0.00067602 = 0.0006569 = 0.0004504 = 0.0000072 = 0.0026832 = 0.0000075 = 0.0027386 =

Regression of X on Y

$\hat{Y} = a + bX$

Table 5

Check of Correlation Coefficient for 95% Confidence Limits

$$L = z \pm t_{\alpha/2}(\infty) \frac{1}{\sqrt{n-3}}$$

a) Cu/Au $N=64$

$$r = 0.8873799$$

$$z = 1.41$$

$$L_1 = 1.41 - 1.96 \left(\frac{1}{\sqrt{61}} \right) = 1.41 - 0.25 = 1.16 \rightarrow \rho_1 = 0.8210$$

$$L_2 = 1.41 + 1.96 \left(\frac{1}{\sqrt{61}} \right) = 1.41 + 0.25 = 1.66 \rightarrow \rho_2 = 0.9302$$

$\therefore \rho_1$ and ρ_2 are the 95% confidence limits for the unknown pop. correlation coefficient.

b) Cu/Ag $N=62$

$$r = 0.62704343$$

$$z = 0.74$$

$$L_1 = 0.74 - 1.96 \left(\frac{1}{\sqrt{59}} \right) = 0.74 - 0.26 = 0.48 \rightarrow \rho_1 = 0.4462$$

$$L_2 = 0.74 + 1.96 \left(\frac{1}{\sqrt{59}} \right) = 0.74 + 0.26 = 1.00 \rightarrow \rho_2 = 0.7616$$

$\therefore \rho_1$ and ρ_2 are the 95% confidence limits for the unknown population correlation coefficient.

c) Au/Ag $N=62$

$$r = 0.7695787$$

$$z = 1.02$$

$$L_1 = 1.02 - 1.96 \left(\frac{1}{\sqrt{59}} \right) = 1.02 - 0.26 = 0.76 \rightarrow 0.6411$$

$$L_2 = 1.02 + 1.96 \left(\frac{1}{\sqrt{59}} \right) = 1.02 + 0.26 = 1.28 \rightarrow 0.8565$$

$\therefore \rho_1$ and ρ_2 are the 95% confidence limits for the unknown population correlation coefficient.

old core should be re-assayed for gold and silver. Thus the existence of a copper sulfide to gold relationship can be checked and the use of copper sulfide assays as a predictor of gold values would be established.

Although the old assays show the existence of gold and silver in the oxide zone, the relationship between copper oxides and the gold and silver cannot be determined. The high mobility of copper during oxidation combined with the immobility of gold and silver during the same process prevents using oxide values of copper as a predictor of gold and silver values. However the Au/Ag relationship is shown to still exist. The combined metals value of the deposit should be determined.

Primary vs. Secondary

The original primary minerals are believed to be pyrite, chalcopyrite, chalcocite(?) and bornite(?).

The current lack of information prevents an accurate determination of the original primary minerals.

Secondary minerals include all those present in the oxide zone, transitional zone, and some of the sulfides (chalcocite).

The question of supergene enrichment cannot be fully explained at this time. The recent bench plan map of the sulfide reserves show two areas of suspected supergene enrichment (See Fig. 5). These areas exist at different levels under the surface, the one to the southwest is fairly shallow and occurs approximately 800 feet beneath the surface. The second area, to the southeast, is much deeper, and much higher grade. It occurs approximately 2,000 feet under the surface, and presently shows the edge of a zone 100 feet thick

averaging greater than 1.00% Cu. The disparity of supergene enrichment values between these two areas may be the result of structural control. The first zone is presently being re-oxidized, whereas the second zone is much deeper and it is not being re-oxidized and thus preserves all of its supergene sulfide enrichment.

Extent

The extent, as mentioned earlier, is not defined. A study of the grade and tonnage on the various bench plan maps gives a rough idea of the vertical dimensions of the sulfide deposit. This aspect is summarized on the tables used to determine the sulfide reserves covered in the section on reserves.

ALTERATION AND SULFIDE ZONING

Alteration

A recently completed study of the available information indicates previous alteration zones reported to be incorrect. The effect of deuteric alteration and later uralitization of the pyroxenes was never studied. The alteration present was just assumed to be all related to hydrothermal activity and the textbook haloes were applied accordingly.

A broad propylitic zone is exposed to the north of the presently outlined oxide deposit. This zone appears to extend as a halo westward into the Sanchez West area. The drilling to date reflects this relationship.

An argillic type alteration is indicated around diamond drill holes 303, and 307. This possibly extends from north to south of the oxide deposit. As this zone moves south it appears to increase

in intensity until at the southern most portions a strong secondary biotite zone is encountered. Recent studies completed at the Ray Deposit indicate that this strong secondary biotite zone may actually indicate a phyllic-type alteration in the andesite.

The lack of understanding of the types alteration present, as well as their distribution, prevents an accurate determination of their relationships to mineralization, or their use as indicators of areas of suspected mineralization.

Sulfide Zoning

No information is presently available concerning the presence of sulfide zoning.

The presence of sulfide zoning, if developed, would aid in the evaluation of the total alteration and mineralization pattern developed at the Sanchez Deposit.

RESERVES

Previous Reports

The geologic reserves indicated the presence of 208 million tons of 0.28% copper, of which 166 million tons average 0.33 reserves indicate 250 million tons of 0.25% copper ore in the oxide zone with an estimated additional 130 million tons of mixed and sulfide are averaging 0.30% copper underlying the oxides.

Calculated ore reserves from two independent studies on open pit designs show:

	<u>ORE</u>	<u>WASTE RATIO</u>
Design 1	79,363,000 Tons @ 0.36% Copper	1.49:1
Design 2	116,000,000 Tons @ 0.37% Copper	1.78:1

Current Sulfide Reserves

The Resident Geology Department just completed a study of the sulfide reserves. The interpretation is based on interpolation of less than 400 feet between drill holes, the benches were set at 50 feet intervals. The sulfide zone was started on the 2600 Bench (approximately 650 feet below the surface) and calculated on each bench down to the 900 Bench. A value of 0.30% Cu was used as a cut-off. The individual benches are summarized on Table 1.

The sulfide reserves calculated to date are 52,737,000 tons of ore @ 0.448% Cu. This estimate is very conservative as the sulfide zone is insufficiently drilled. The tonnage could reasonably be doubled without appreciably changing the grade based on the information now available.

Based on the relationships established by statistical analysis a prediction of the amount of gold-silver now present in the existing sulfide reserves.

	<u>ORE</u>
52,737,000	Tons @ 0.446% Cu
337,517	Ozs Au @ 0.0064 oz./T
4,097,665	Ozs Ag @ 0.0777 oz./T

If the above mentioned sulfide tonnage is doubled by future drilling, as is expected, then the amount of precious metals currently in the sulfides doubles.

The gold-silver values are shown to occur in the oxide zone as well as the sulfide zone. The overall average of gold-silver in both zones is 0.0070 ozs.Au/Ton, and 0.0852 ozs. Ag/Ton.

Using the previously determined tonnage for the oxide deposit and applying it to the overall assay the figures greatly increase in their

SANCHEZ SULFIDES ONLY

2/21/15

BENCH	0.30-0.40	GRADE	0.40-0.60	GRADE	0.60-0.80	GRADE	0.80+	GRADE	
2600	0.08	0.39	0.75	0.50	0.13	0.63			
	3,333.36		31,250.25		5,416.71				40,000.66 @ 0.508
2550	0.19	0.38	0.74	0.48	0.50	0.70	2.46	2.08	
	7,916.73		30,833.58		20,833.50		102,500.82		162,084.63 @ 1.515
2500	0.20	0.35	0.40	0.53	0.44	0.67	2.99	1.30	
	8,333.40		16,666.80		18,333.48		124,584.33		167,918.01 @ 1.107
2450	0.94	0.35	2.61	0.47	0.78	0.66	2.86	1.43	
	39,166.98		108,750.87		32,500.26		119,167.62		299,585.73 @ 0.856
2400	3.72	0.34	4.03	0.47	3.16	0.69	0.75	1.10	
	155,001.24		167,918.01		131,667.72		31,250.25		485,837.22 @ 0.528
2350	1.78	0.32	5.56	0.50	2.38	0.68	2.08	1.15	
	74,167.26		231,668.52		99,167.46		86,667.36		491,670.60 @ 0.623
2300	4.56	0.32	6.86	0.46	4.07	0.65	2.37	1.15	
	190,001.52		285,835.62		169,584.69		98,750.79		744,172.62 @ 0.559
2250	13.10	0.38	1.05	0.46	4.47	0.64	1.00	0.95	
	545,837.70		43,750.35		186,251.49		41,667.00		817,506.54 @ 0.472
2200	15.48	0.33	16.89	0.44	1.67	0.62			
	645,005.16		703,755.63		69,583.89				1,418,344.68 @ 0.398
2150	25.20	0.32	18.96	0.52	12.44	0.72	1.28	0.83	
	1,050,008.40		790,006.32		518,337.48		53,333.76		2,411,685.96 @ 0.482
2100	26.88	0.34	31.68	0.52	7.20	0.68	0.08	0.80	
	1,120,008.96		1,320,010.56		300,002.40		3,333.36		2,743,355.28 @ 0.464
2050	24.60	0.35	27.72	0.49	11.28	0.71	4.96	0.94	
	1,025,008.20		1,155,009.24		470,003.76		206,668.32		2,856,689.52 @ 0.508
2000	50.72	0.33	34.52	0.49	8.20	0.70	0.76	0.86	
	2,113,350.24		1,438,344.84		341,669.40		31,666.92		3,925,031.40 @ 0.425
1950	45.96	0.33	29.20	0.47	3.24	0.60	3.40	0.92	
	1,915,015.32		1,216,676.40		135,001.08		141,667.80		3,408,360.60 @ 0.415
1900	57.52	0.36	41.56	0.48	0.12	0.62			
	2,396,685.84		1,731,680.52		5,000.04				4,133,366.40 @ 0.41
1850	33.68	0.32	39.16	0.46	3.89	0.65	0.01	0.80	
	1,403,344.56		1,631,679.72		162,084.63		416.67		3,197,525.58 @ 0.408
1800	41.51	0.32	18.34	0.45	3.24	0.65			
	1,729,597.17		764,172.78		135,001.08				2,628,771.03 @ 0.374
1750	29.88	0.34	4.12	0.44	7.08	0.69	1.48	0.89	
	1,245,009.96		171,668.04		295,002.36		61,667.16		1,713,347.52 @ 0.427
1700	23.16	0.36	18.80	0.48	6.00	0.69			
	965,007.72		783,339.60		250,002.00				1,998,349.32 @ 0.448
1650	41.12	0.36	19.44	0.46	3.96	0.66			
	1,713,347.04		810,006.48		165,001.32				2,688,354.84 @ 0.408
1600	13.24	0.36	20.76	0.51	11.40	0.64			
	551,671.08		865,006.92		475,003.80				1,891,681.80 @ 0.498
1550	21.60	0.36	32.88	0.48	4.28	0.63			
	900,007.20		1,370,010.96		178,334.76				2,448,352.92 @ 0.446
1500	23.84	0.34	30.28	0.50	1.80	0.70	0.24	0.84	
	993,341.28		1,261,676.76		75,000.60		10,000.08		2,340,018.72 @ 0.439
1450	15.44	0.34	16.64	0.46	4.36	0.65	0.08	0.81	
	643,338.48		693,338.88		181,668.12		3,333.36		1,521,678.84 @ 0.432

16500 N

16000 N

15500 N

15000 N

14500 N

14000 N

13500 E

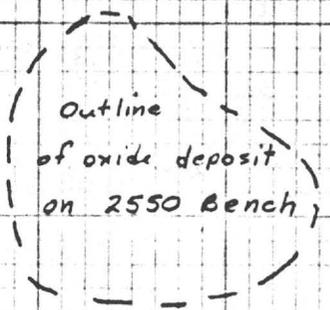
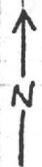
14000 E

14500 E

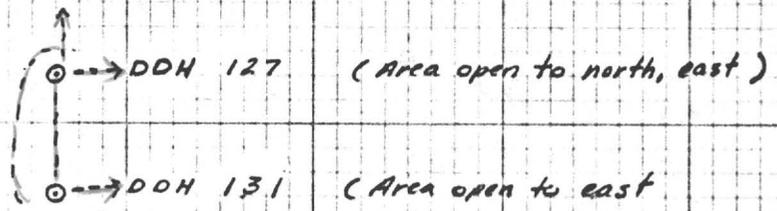
15000 E

15500 E

16000 E



DDH 967
Area open
to the west, south, and east



Areas of Possible
Supergene Enrichment

Scale 1" : 500'

Fig 4 3/4/75

significance.

	<u>ORE</u>	
Design 1 plus current sulfide reserves	132,100,000 Tons @ 0.394% Cu	
	924,700 Ozs.Au @ 0.0070 ozs./Ton	
	11,254,920 Ozs.Ag @ 0.0852 ozs./Ton	
Design 2 plus current sulfide reserves	168,737,000 Tons @ 0.394% Cu	
	1,181,159 Ozs.Au @ 0.0070 ozs./Ton	
	14,342,652 Ozs.Ag @ 0.0852 ozs./Ton	

The above figures are becoming too large to ignore. They help point out the need for re-assaying some of the old Sanchez core in order to check the reliability of the results obtained from the regression analysis. If the new assays check with the old assays then a study should be made to determine whether or not the gold and silver present is recoverable.

SUMMARY AND CONCLUSIONS

The information gathered to date on the Sanchez Deposit is incomplete. It is known to occupy a large altered area. Unlike other prospects, it is known to contain several million tons of low grade ore, in addition to the alteration zones.

The critical problem at present is the lack of sufficient information to properly evaluate the deposit. This fact becomes critical when a determination must be made as to a property's potential value prior to making the decision to keep it, sell it, or drop it.

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

June 20, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

This will acknowledge receipt of the expense check for the Sanchez examination, and your kind letter of June 9th.

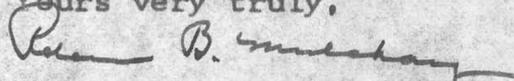
In case you may have missed an article in the Wall Street Journal of May 30th, I am enclosing a Xerox copy. Anglo-American, through two of its subsidiaries, will invest nearly 36 million to purchase stock held by the Crane Company and 850,000 shares of unissued Inspiration stock; this would give Anglo-American a 30% interest in that company. Although stockholder approval must be voted for this substantial dilution of presently outstanding shares, it seems likely that the approval will be forthcoming, as Inspiration badly needs additional capital.

The opportunity to obtain a favorable business arrangement on the Sanchez property was probably a one time, short term possibility. The acquisition of very large, if low grade, copper reserves in the United States, held by Inspiration in the main mines at Inspiration and at the Christmas and Sanchez prospects, undoubtedly held primary interest for Anglo-American. My interest in the Sanchez prospect, and Inspiration itself, appears to have been fully justified by the large Anglo-American investment. I am not sure that the Inspiration management fully realizes that the 30% to be held by Anglo-American will represent working control, and unless favorable results can be produced there will likely be some changes made !

I will be glad to refer interesting prospects, if any, to you; however, I hardly hope to have another like the Sanchez in the near future. Drilled out reserves, even low grade ones, that can be favorably obtained are not to be expected often.

With best personal regards

Yours very truly,



Roland B. Mulchay

RBM:m

6/11/75

GEORGE R. BROWNELL

ATTORNEY AT LAW

1345 AVENUE OF THE AMERICAS

NEW YORK, N. Y. 10019

(212) 765-3000

OF COUNSEL

RAGAN & MASON

THE FARRAGUT BUILDING

900 SEVENTEENTH STREET, N. W.

WASHINGTON, D. C. 20006

(202) 296-4750

June 9, 1975

Mr. Roland B. Mulchay
2732 Wren Road
Salt Lake City, Utah 84117

Dear Mr. Mulchay:

There is enclosed a check of National Bulk Carriers, Inc. in the amount of \$358.05 in payment of your invoice in respect of expenses incurred in examining the copper property in Arizona. I was also quite disappointed that the matter was not pursued. I think that both Mr. Hollett and Mr. Patrick, who are the officials in charge of mineral development, would have liked to pursue this matter. The real reason I believe is that there have been a good many activities being pursued and the general feeling was that there was not enough personnel to take on this additional project at this time.

I do hope that you will continue to think of National Bulk Carriers in the future if any new matters develop. As you know, the situation can change here quite rapidly.

I would like to extend my very best personal regards and I hope that you will be passing through New York in the near future.

With best wishes,

Sincerely,



Enc.

CHECK NO.

M 4737

Endorsement and negotiation of the check bearing the same number as this voucher constitutes an acknowledgment of receipt in full for the below account and a certification that said account is true and just and that payment therefor has not been heretofore received.

NATIONAL BULK CARRIERS, INC.

DATE OF INVOICE	DESCRIPTION	AMOUNT
05-07-75	for expenses incurred 03/31 to 04/06/75 <i>T-C checking</i>	\$358.05

DETACH

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

May 10, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

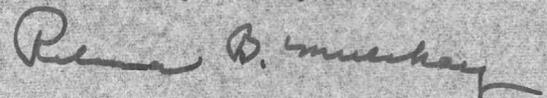
Enclosed is a statement of the expenses incurred in early April in the reconnaissance examination of the Sanchez Prospect, Graham County, Arizona, owned by Inspiration Consolidated Copper Company.

I was very disappointed that the present copper reserve and future possibilities of the Sanchez property were not considered favorably by National Bulk Carriers. Although there is now a surplus of copper in the world, this situation will change, both physically and economically, within a short number of years, and the present opportunity to obtain a sizeable copper reserve in the United States, without extensive exploration, may not soon occur again. In the light of the very unstable world political situation, the location of the Sanchez deposit within the continental United States, by itself, might be sufficient reason to warrant acquisition of the property.

Please accept my sincere thanks for your consideration and aid in the Sanchez matter. I appreciate very much your help in presentation of the data to the National Bulk staff, and your efforts to have a decision made promptly.

With best personal regards

Yours very truly,



Roland B. Mulchay

RBM:m

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

May 7, 1975

TO

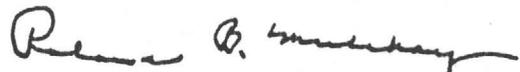
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Expenses incurred in reconnaissance
examination of the Sanchez copper property,
owned by Inspiration Cons. Copper Company,
in the field and at Inspiration, Arizona,
from March 31 to April 6, 1975, inclusive:

Transportation	
Airline: Salt Lake City- Phoenix and return	\$122.74
Hertz car - Phoenix May 31 - April 6	130.21
Gasoline	7.10
Mileage and parking	<u>16.00</u>
	\$276.05
Inspiration Guest house - tips	11.00
Food and meals	54.05
Telephone: March and April	15.85
Postage	<u>1.10</u>
TOTAL	\$358.05

Kindly have check forwarded to me at
2732 Wren Road, Salt Lake City, Utah 84117.

Yours very truly,



Roland B. Mulchay

RBM:m

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

May 7, 1975

TO

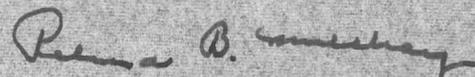
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

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Food and meals	54.05
Telephone: March and April	15.85
Postage	<u>1.10</u>
TOTAL	\$358.05

Kindly have check forwarded to me at
2732 Wren Road, Salt Lake City, Utah 84117.

Yours very truly,



Roland B. Mulchay

RBM:m

Lessor: The Hertz Corporation

Rental Agreement No.



2871 SKY HARBOR BLVD.
PHOENIX, ARIZONA 85034
PHONE: (602) 254-7051

8167909 | 5

SHOW THIS NO. ON ALL CORRESPONDENCE

BASIC CHARGE ONE DAY PLUS MILEAGE

CAR CHECKED IN AT AREA/LOC. CITY/STATE
Phoenix AZ

TO BE PAID BY
5606 043 7
ROLAND B MULCHAY
2732 WREN ROAD
SALT LAKE CITY UTAH

CREDIT CARD #1 CLUB NO. CREDIT APPROVAL
OTHER IDENTIFICATION C.D.P. I.D. NO.
DRIVER'S LICENSE NO. STATE EXPIRES
HOME OR BUSINESS ADDRESS
CITY/STATE ZIP CODE
CAR TO BE CHECKED IN AT (CITY/STATE) LOC. NO. DATE DUE AM
PHOENIX AZ 02180 1/21/87 PM
CAR RENTED AT (CITY/STATE) AREA & LOCATION NO.
SKY HARBOR AIRPORT # 1 2180-11
LOCAL ADDRESS PHONE NO.
ADDITIONAL AUTHORIZED OPERATOR(S) STATE LIC. EXPIRES

Customer authorizes Lessor to process a credit card voucher (if applicable) in Customer's name for charges. Customer agrees not to permit use of Vehicle by any other person without obtaining Lessor's prior written consent. Vehicle shall NOT be operated by any person except Customer and the following Authorized Operators who must be validly licensed to drive and have Customer's prior permission: persons 21 or over who are members of Customer's immediate family and permanently reside in Customer's household; the employer, partner, executive officer, or a regular employee of Customer; additional authorized operator(s) identified above. THE VEHICLE IS RENTED UPON THE TERMS SHOWN ON THIS PAGE AND UPON THE REVERSE HEREOF. CUSTOMER REPRESENTS HE HAS READ, UNDERSTANDS AND AGREES WITH THE TERMS. ALSO SEE NOTE BELOW.

MULCHAY R MR SN PAEQ045
SINAR 1315 RV0278 07DAYS COO 11
RESERVATION I.D. NO. REFERRAL SOURCE PREPAID/TOUR
090093568 YES NO
I.T. NO. VOUCHER NO.

FOR RENTALS WITHOUT GAS ONLY
MINIMUM RENTAL 1 DAYS
EXTRA DAYS \$
EXTRA HOURS \$
MILEAGE ALLOWED (If Any)
EXTRA MILES
TIME IN 756 AM 1/21
TIME OUT 1031 AM 1/21
RATES INCLUDE GASOLINE RATES DO NOT INCLUDE GASOLINE
GASOLINE QUANTITY
IN E 1/8 1/4 3/8 1/2 5/8 3/4 7/8 F
OUT E 1/8 1/4 3/8 1/2 5/8 3/4 7/8 F

MILEAGE IN 5606 DAYS 22
MILEAGE OUT 5606 HRS 375
MILES DRIVEN 243 WKS. 110 11000
MILEAGE ALLOWED (If Any)
MILES CHARGED 243 MILES @ 22/534/6

VEHICLE NO. 7155757 SUBTOTAL 1603.46
CAR LIC. NO. 57A 715 STATE 211. 3269
CAR MAKE CHRYSLER BODY STYLE 2
OWNING CITY/STATE 2180 SERVICE CHARGE 130.00

OWNING CITY LOC. NO. RIH/LIT % REFUELING SERVICE
60 80 100
ACCEPTS CDW: X COLLISION DAMAGE WAIVER (CDW) DECLINES CDW: X CDW (Per Day) \$ 2.00
BY INITIALS, Customer accepts or declines CDW at rate shown in adjoining column. CDW IS NOT INSURANCE. See para. 3 (2) (b) on reverse side. (MAXIMUM FIVE (5) TIMES DAILY FEE FOR EACH FULL WEEK.)
ACCEPTS PAI: X PERSONAL ACCIDENT INSURANCE (PAI) DECLINES PAI: X TAX Reimbursement \$ 1.00
BY INITIALS, Customer accepts or declines PAI. If "Accepts", Customer accepts coverage at rate shown and acknowledges to have read the SYNOPSIS of Coverage furnished by Lessor at time of rental.

CASH REFUND EXPLANATION: AMOUNT TOTAL CHARGES 137.31
LESS: GAS - OIL REPAIRS 7.10
NET DUE 130.21
I ACKNOWLEDGE RECEIPT OF ABOVE AMOUNT: X
DEPOSIT \$ LESS: DEPOSIT (If Any)

R/A PREPARED BY (LAST NAME)
R/A COMPUTED BY (LAST NAME)
NET DUE
DRB DATE PAID BY CASH CHECK DIRECT BILL CENT. BILL AIR TRAVEL INTL. BILL GUAR. ANTEED LOCAL REC. (CODE NO.)

DATA

053175 1310
Rental Agreement No. 8167909 | 5 2180
4-1-2 (Formerly 405-A) 1/75

DO NOT PAY FROM THIS COPY
NOTE: CHARGES SUBJECT TO FINAL AUDIT
Mail all correspondence to:

ACKNOWLEDGE RECEIPT OF TICKET(S) FOR CHARGES DESCRIBED HEREON. PAYMENT IN FULL TO BE MADE WHEN BILLED OR IN EXTENDED PAYMENTS IN ACCORDANCE WITH STANDARD POLICY OF COMPANY ISSUING CARD. I ALSO AUTHORIZE ANY NECESSARY ADJUSTMENT OF THESE CHARGES BY HUGHES AIRWEST TO COMPLY WITH TARIFFS ON FILE WITH C.A.B. AND/OR C.T.C.(A)."

PASSENGER'S COPY

003 448 1160912

X *Ronald D. Mulchay*
SIGNATURE OF CARDHOLDER OR HOLDER OF ONE TRIP ORDER

DATE OF ISSUE
04/06/75

ISSUED BY
HUGHES AIRWEST

APR 6 1975

MULCHAY/R
NAME OF PASSENGER

TOUR CODE

X/O	NOT GOOD FOR PASSAGE	CARRIER	FLIGHT	CLASS	DATE	TIME	STATUS	FARE BASIS/TKT. DESIGNATOR	NOT VALID BEFORE	NOT VALID AFTER	ALLOW
	FROM VOID				VOID						
	TO VOID				VOID						
	TO VOID				VOID						
	TO PHOENIX	RW	878	S	06APR	0135P	OK	S			
	TO SALT LAKE CITY	IF EXT'D. PAY DSRD. CIRCLE NO. OF MOS. 3 6 9 12					CREDIT CARD NAME/CODE		APPROVAL CODE <i>U/2720</i>		

FARE	TAX	TOTAL	FARE CALCULATION			
56.82	4.55	61.37	SC	0.37	PHX RW	SLC 61.37

FOR ISSUING OFFICE ONLY

EQUIV. AMT. PD.	ROUTE CODE	CPN	AIRLINE	FORM	SERIAL	CK
					003 4481160912 4	

OTATO NO.

CONNECTION OF PASSENGER WITH SUBSCRIBER

AIRLINE FORM SERIAL NUMBER
 003 4481142591

"I ACKNOWLEDGE RECEIPT OF TICKET(S) FOR CHARGES DESCRIBED HEREON. PAYMENT IN FULL TO BE MADE WHEN BILLED OR IN EXTENDED PAYMENTS IN ACCORDANCE WITH STANDARD POLICY OF COMPANY ISSUING CARD. I ALSO AUTHORIZE ANY NECESSARY ADJUSTMENT OF THESE CHARGES BY HUGHES AIRWEST TO COMPLY WITH TARIFFS ON FILE WITH C.A.B. AND/OR C.T.C.(A)."

PASSENGER'S
 COPY
 03/30/75
 DATE OF ISSUE

MULCHAY/RB

X SIGNATURE OF CARDHOLDER OR HOLDER OF ONE-TRIP ORDER

VOID
 NAME OF PASSENGER *Ronald D. Mulchay*

ISSUED BY
HUGHES AIRWEST

VOID
 FOUR CODE

X/O	NOT GOOD FOR PASSAGE	CARRIER	FLIGHT	CLASS	DATE	TIME	STATUS	FARE BASIS/TKY. DESIGNATOR	NOT VALID BEFORE	NOT VALID AFTER	ALLOW
	VOID				VOID						
	FROM SALT LAKE CITY	RW	720	S	31MAR	1255P	OK	S			
	TO PHOENIX										
	TO 56.82 SC 0.37	SLC	RW	PHX	61.00	S					
	TO 4.55 61.37	IF EXT'D. PAY DSRD. CIRCLE NO. OF MOS. 3 6 9 12				CREDIT CARD NAME/CODE			APPROVAL CODE 5/20		

FARE 61.37	FARE CALCULATION
TAX	
TOTAL	

FOR ISSUING OFFICE ONLY

EQUIV. AMT. PD.	ROUTE CODE	CFN	AIRLINE	FORM	SERIAL	CK
					003 4481142591	2

OTATO NO. CONNECTION OF PASSENGER WITH SUBSCRIBER

4/10/75

AIRLINE Mar 31 2LC-PHX
Apr. 6 PHX-2LC

61.37
61.37

105
15
525
105
1575

Hertz

122.74

Gas

130.21

Mileage 105 @ 15
Park

7.10

15.55

~~170.80~~
276.05

Meals

3/31 22.00

4/2 3.25

4/4 1.65

9.05

4/5 17.50

54.05

Hotel

4/6 Tips 11.00

11.00

Tel

Mar 7 C. Eastwick
Sufford

3/31 .20

Monthly bill to 3/28 9.95

To 4/28 5.70

15.85

15.85

Postage

1.12

1.12

~~157.35~~

358.05

WRD. APR. 23, 75

ALICE HAD CALL FROM
BROWNELL, N.Y.

LUDWIG WILL RETURN
NY ON WED. APR. 30TH AND
HINE GROUP WILL PRESENT
JANCHEZ TO HIM.

ITINATED THAT HOLLETT -
PATRICK SHOULD HAVE CONTACTED
RBM INSTEAD OF LEAVING IT TO
H.H. HAVE RBM CALL IF
ANY QUESTIONS.

3:25 PM 4/11/75

Call from Browne -
out of town - Monday -

Says Patuch & Hollett is
what, probably will call RBH.
He expects them in NY next
week -

Talk him I hoped to
play golf tomorrow - he is
going fishing - opening
of trout season - will get
in touch with RBH next week.

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

March 29, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

I have your letter of March 27th, and will hasten to answer it before I leave for Arizona on Monday.

I am completely without experience in arrangement of remuneration such as noted in the final paragraph of your letter. As I told you at length some years ago, I have always tried to avoid any personal interest in properties which I have examined. However, this is such an unusual case, where a property, which I believed might have important possibilities, became open for acquisition, that I felt it was worthwhile to present it to you. My estimates of the possibilities are based upon the geology and assay records I have previously seen.

From brief verbal communications about development and exploration results in the past few years, it appears likely that these possibilities have been enhanced rather than diminished. On this optimistic view, any remuneration agreed upon should be substantial.

If the reports are substantiated, we are considering a property which may in the future produce several billion pounds of copper, part of which will be amenable to open pit operations. Although I understand some metallurgical difficulty was encountered in the small scale operations attempted, the rock and mineral relationships do not suggest any problems which could not be solved by adequate technical research.

Future copper prices in the United States may be expected to be above 75c per pound through eventual growth in demand and inflationary pressures. There seems little doubt that a large low grade copper reserve would form the basis for an important mining enterprise with gross production measured in very large sums indeed. While these possibilities may appear

Mr. George R. Brownell

(2)

March 29, 1975

fantastic, and may be disproven by analysis of the available geologic and assay data, at least at the start we can hope for great long range developments.

Again stressing my lack of experience in such matters, I suggest that my remuneration be based upon the degree to which the large possibilities may be realized, and upon the assumption that business arrangements suitable to National Bulk Carriers can be made with the owners. If the major developments cited above may be realized, I suggest a 1% carried interest in the part of the enterprise obtained by National Bulk Carriers, or associates. As any gain from such an agreement would probably be obtained only after my life expectancy, an alternate manner of compensation might be the payment of \$25,000 per year for ten years. This would be started after National Bulk Carriers reached agreement with the property owners, and payments would be terminated at any time prior to completion should the venture be abandoned by National Bulk Carriers or succeeding interests. The present value of such payments would not appear unreasonable in amount.

If the property does not measure up to the very large possibilities noted above, but is still attractive to National Bulk Carriers as a prospect, the suggestions in the previous paragraph could be scaled downward to a mutually agreeable amount.

During the period of contract negotiations with the owners and following exploration, should National Bulk Carriers wish to utilize my services as a consulting geologist, such employment would be on the regular consulting fee basis. Participation in the development of another major copper deposit would, of course, have an intense professional interest for me.

I will review data on the property during the coming week and will probably spend two days in the field. I will expect to call you toward the end of the week to report progress on the examination.

With best regards

Yours very truly,


Roland B. Mulchay

RBM:m

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

March 29, 1975

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1345 Avenue of the Americas
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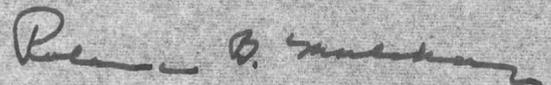
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Yours very truly,



Roland B. Mulchay

RBM:m

GEORGE R. BROWNELL

ATTORNEY AT LAW

1345 AVENUE OF THE AMERICAS

NEW YORK, N. Y. 10019

(212) 765-3000

OF COUNSEL

RAGAN & MASON

THE FARRAGUT BUILDING

900 SEVENTEENTH STREET, N.W.

WASHINGTON, D.C. 20006

(202) 296-4750

March 27, 1975

Mr. Roland B. Mulchay
2732 Wren Road
Salt Lake City, Utah 84117

Dear Mr. Mulchay:

This will confirm the arrangements made with you over the telephone today. You are proceeding to obtain information concerning the copper prospect you mentioned. National Bulk Carriers, Inc. will pay you for your expenses but you will contribute your time for your own account. You expect that this trip will take about one week. After looking over the data you will then make a recommendation to National Bulk Carriers, Inc.

We also discussed that a mutually satisfactory arrangement would have to be made concerning any compensation to you or other interest in the properties if the matter goes forward. I would appreciate your thoughts on what you think might be appropriate.

With best wishes,

Sincerely,



cc: A. B. Hollett
J. L. Patrick

4/4 Call to Brownell in NY - collect
212-765-3000

Call Brownell on Monday,

Told him much more work done than expected - 10 holes in 1966, 133 now - have probably eliminated chance for good 1% orebody, but have large low grade reserve (0.4%) and are conducting computer study to segregate smaller tonnage of better grade to start operations. Told him both ox. and sul. reserves in sight, large tonnages.

RBM will send summary report by Tues. - Brownell wants call on Monday, so copy of report can be sent to Hollett in Wyoming who is leaving NY on Tues.

RBM will call Monday from SLC.

MEMO

To RBH Date 2/27/57 Time 11:30 AM.
 Phone from Brownell
 Place Cu in Ariz.
 Present _____

Patrick - white Pine
 AC THOLET in charge
 mining
 dept.

Tell him property in Arizona, owned by small Cu Co., wants to get rid of but retains interest or joint venture. RBH has gotten in touch thru Co. contact. Kern., P.D., Exxon and Grace interested.

Substantiate one reserve, tried to reach, unsuccessful by drilling

RBH believes nothing is metallurgically shown he has to tough with cheap acid available in SW. Does not believe owners recognize potential chance to develop considerably more than presently indicated. Could be important nobody, -

scale of billion lbs of Cu ore imp. - commercial on low grade probably 75% + 1% Cu.

RBH would like to examine at their expense determine if future possibilities still exist, and then recommend. Would like to have substantial findings for a small sized interest. Giving an important mine, he believes such an arrangement warranted.

He will discuss with Patrick - Hollett, decide whether or not

at start, gave property payment or about \$110,000 plus assessment work; probably would be required to conduct exploration in next 18-24 months, should show at possible expenditure of \$2,000,000 in that period. (over)

MEMO

To RBU Date 6/16 Time 7 PM.
 Phone from Med Eckman - LA To _____
 Place _____ Subject SANCHEZ
 Present _____

Wanted to discuss effect of Anglo-American purchase of Insp. stock in relation to Sanchez. Told him I believed opportunity for favorable deal was gone, but having information might be valuable in future. Pickard interested in sulphide possibilities; will visit ground with Eastlick, who says there has been no official notification of change in Co. policy.

Also discussed Anasco pull-out from 4 HERMANOS, and chances for large development of 0.4% Cu there. No appreciable secondary in holes to date. Says they have good Mex. partner (in Balsas River prospect?) but believes Hebeke's demands too tough.

General discussion of conditions in foreign countries in regard to exploration and development - Union management does not regard such exploration favorably.

Invited Eckman to party 6/21, but says he will be in Mex. City.

6/2/75

MINERALS EXPLORATION COMPANY

P.O. BOX 54945

LOS ANGELES, CALIFORNIA 90054

May 30, 1975

E. H. EAKLAND, JR.
PRESIDENT

461 SO. BOYLSTON ST.
LOS ANGELES, CALIF. 90017
AREA CODE (213) 486-6931

Mr. R. B. Mulchay
2732 Wren Road
Salt Lake City, Utah 84117

Sanchez Copper Prospect
Safford Area, Arizona

Dear Mul:

Thanks very much for the report on Inspiration's Sanchez copper prospect near Safford, Arizona. It arrived while I was away and Gene Lindsey sent it on down to Paul Pickard. Paul attended the Silver City, Mexico meeting where he ran into John Eastlick and they had a chance to discuss the present status of the work at Sanchez, inasmuch as I had called Paul and alerted him shortly after our conversation.

The Sanchez property does appear to be low grade. In fact it sounds as though it is probably something that might have to be put back on the shelf for a period of time. Past history indicates that on the average copper prices seldom stay in a depressed condition for more than 18 to 24 months, barring a major depression. I wish you would tell me if we are in a temporary turndown in business, a short-term slowdown in consumer buying, an inflation-fed recession, or just an old fashioned honest-to-God depression. If I tried to explain our financial position here and the restraints which we have on any new commitments, such restraints would include any major payments to Inspiration, for at least this year. However, as soon as Paul has finished his review and made his recommendations, I'll let you know as to our possible further interest.

Despite your hostile attitude, I still would rather tackle Andacollo, but it is quite probable that we are going to do neither in the immediate future. We do have, of course, a lot more data on Andacollo than was available to you at the time Anaconda did its drilling. Considering the location, accessability to a well developed port, and the ease of year-round operations, I still feel that Andacollo would be an attractive initial step into Chilean mining affairs. I agree that of the properties we looked at, and excluding El Abra as too closely tied to the Chilean government because of its proximity to Chuqui, that Los Pelambres is the most attractive; but production from there is probably five to ten years down the road, and I think Andacollo could be making money in four to five years.

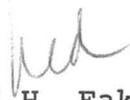
Mr. R. B. Mulchay

-2-

May 30, 1975

With best regards to you and Alice and I hope that our paths will cross someplace in the immediate future.

Sincerely,



Edward H. Eakland, Jr.

EHE:mm

MINERALS EXPLORATION COMPANY

P.O. BOX 54945

LOS ANGELES, CALIFORNIA 90054

SLC
5/17/75

May 14, 1975

E. H. EAKLAND, JR.
PRESIDENT

461 SO. BOYLSTON ST.
LOS ANGELES, CALIF. 90017
AREA CODE (213) 486-6931

Mr. Roland B. Mulchay
2732 Wren Road
Salt Lake City, Utah 84117

Sanchez Copper Property
Graham County, Arizona
(Owned by Inspiration Cons.
Copper Company)

Dear Mr. Mulchay:

This will acknowledge receipt of your letter of May 10 and the report on the captioned property.

Mr. Eakland is presently out of town and you will be hearing from him upon his return. In the meantime, Mr. Eugene Lindsey, our Chief Geologist, is looking into the matter.

Sincerely yours,

Margaret Matney

Secretary to
Edward H. Eakland, Jr.

mm

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

May 10, 1975

Mr. E. H. Eakland, Jr., President
Minerals Exploration Company
P. O. Box 54945
Los Angeles, Calif. 90054

Dear Ned:

Following our telephone conversation this morning, I am enclosing a copy of the report on the Sanchez property, Graham County, Arizona, which I prepared and presented to National Bulk Carriers. You are, of course, at liberty to use any of the data contained, but the National Bulk name should be excluded at all times.

I have also written a more informal letter to them which outlines the Union Pacific joint venture agreement, and included some personal opinions about negotiations with the management. If you decide to have any interest in the property, I could also forward a copy of that letter.

Inspiration corporate offices are now in New Jersey. Officers are

Mr. H. Myles Jacob, Chairman of the Board

Mr. Richard R. Hyde, President

Inspiration Cons. Copper Company
55 Madison Avenue, Morristown, N. J.
07960

At Inspiration, Mr. Douglas Middleton is General Manager and Vice President. He says he takes little part in corporate policy, and is interested in operations. Mr. Jack Kuhn, New Projects Director, is immediately concerned with the Sanchez matter, and is apparently in close contact with the corporate offices about it. Mr. Jack Eastlick, geologist at Inspiration has all the available data, and helped me greatly in accumulation of the information in the report. The Inspiration address is in care of the company, Inspiration, Arizona, 85537

Mr. E. H. Eakland, Jr.

(2)

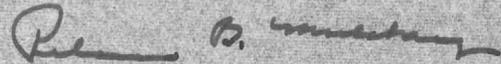
May 10, 1975

Hope you have good luck with your Campo Morado property. We are still hopeful about the Cuatro Hermanos, out of Hermosillo. Amoco has done a lot of drilling, and hopefully will make the next property payment at the end of June. Plans are finally being made to map the breccias, and to drill the good looking porphyry where Occidental had some interesting showings. Ralph Tuck and I were down there two weeks ago, and mapped some more drill core.

I enjoyed our conversation this morning, and hope you may find some interest in the Sanchez.

With best regards

Yours very truly,



Roland B. Mulchay

RBM:m

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

April 8, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

Enclosed is a copy of a reconnaissance report on the Sanchez copper property near Safford, Arizona, prepared from data obtained from the Inspiration Consolidated Copper Company, the owners, at the Inspiration offices, and on a quick visit to the claims on April 4th.

As expected, there is a substantial tonnage of low grade copper bearing material, both in oxide (0.36% Cu) and sulphide (0.45% Cu) form, indicated by drilling done to date. There has been extensive exploration since my visit to the property several years ago, and development of large tonnages of 1.0% copper sulphide ores, which could have been projected at that time, are not now to be expected in the areas tested. The sulphide ore possibilities have not yet been fully explored, and there are very long chances for good grade sulphide ores related to a small breccia pipe structure exposed at surface northwest of the Carpenter Shaft.

I am impressed with the indicated reserve tonnages, good possibilities for additional sulphide mineral development, and projections of future, very profitable operations at increased copper prices. If the Mining Department of National Bulk Carriers is similarly impressed, negotiations for an option arrangement could be started with Inspiration officials at the corporate headquarters at Morristown, New Jersey. Mr. Richard H. Hyde is president of the company, and Mr. H. Myles Jacob is board chairman.

I was told at Inspiration on April 2nd, by one of the local officials of the company, that W. R. Grace & Co. had just made an offer on the Sanchez property. Later, I learned informally that the offer was for a joint venture agreement, similar to that made with Union Pacific Mining Company in 1973-74.

As outlined in a Union Pacific report, on file at Inspiration, the agreement provided that Union Pacific would provide 60% of the first \$19.1 million in capital costs in order to reimburse Inspiration for the after tax effects of their investment of \$5,231,000 to that date. Additional capital costs would be supplied at 49% by Union Pacific; Inspiration would retain control, act as the operator, and pay 51% of further costs.

From the Union Pacific figures, it can be estimated that Inspiration now has about \$5,650,000 in the property, and is obligated for the 1975 expenditures of about \$129,456 for property payments and \$36,800 for assessment work. The Union Pacific letter-of-intent agreement provided

for an extended examination period and an opportunity to check earlier drill hole results by drilling. Six holes were drilled; comparisons satisfied Union Pacific engineers that the Inspiration work had been accurately done. All Union Pacific projections were based upon copper at 56¢ per pound, and calculations showed profitable operations with a reasonable payout period. The agreement is reported to have been terminated when Union Pacific proposed changes in the terms, and Inspiration refused.

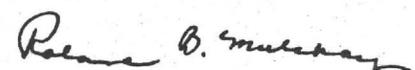
Off the record, Inspiration is now badly in need of cash, and is threatened with an active takeover attempt by the Crane Company. Inspiration has been seeking cash through sale of treasury stock in an amount equal to about 10% of the 2,439,059 shares issued; 22,200 shares are held in the treasury. Several organizations have been invited to make an overall review of the Inspiration ore reserve position and future prospects for consideration of such a purchase. Homestake engineers have recently conducted a review at Inspiration. At first glance, a stock purchase might be attractive, as the Inspiration ore reserves are reported very large and the Christmas property should eventually be a large low grade copper operation. Anaconda holds about 28% of Inspiration stock, and the Inspiration management undoubtedly feels that with another 10% in friendly hands, a takeover attempt would not be successful.

Inspiration has had, in recent years, more than its share of technical operating difficulties. The necessity for elimination of air pollutants at the old smelter caused the erection of a largely untested, new electric smelting furnace which has been plagued by many breakdowns. The great expenditure at the new smelter plus the lower production caused by the delays and decreased copper prices have brought on a very difficult period for the Company. It is my belief that all available competent staff will be needed to manage Inspiration and future Christmas operations. For that reason, it is suggested that any agreement reached on the Sanchez should vest control with National Bulk, and operations be divorced from Inspiration supervision.

As the total pounds of copper indicated at Sanchez are substantial, a type of joint venture agreement might be the only feasible approach. Possibly the offer of a loan to Inspiration of an amount approaching its investment in the Sanchez property might be sufficient to influence an advantageous agreement, at this time, for future exploitation of the Sanchez reserve. Such an agreement might provide that, if a third party entered as the operator, such as a well financed Canadian or international group, both National Bulk and Inspiration would sell equivalent percentages of their interests to the proposed third party.

The local Inspiration management was most cooperative, and made the very comfortable guest house available during my visit. Mr. Jack Eastlick, resident geologist at Inspiration, supplied all of the information in reports and maps, and accompanied me to the property on April 4th.

Yours very truly,


Roland B. Mulchay

Report on
RECONNAISSANCE EXAMINATION

SANCHEZ COPPER PROPERTY

Graham County, Arizona

Owned by

Inspiration Cons. Copper Company

INTRODUCTION

The information contained in the following report was obtained from incomplete examination of reports, drill records and maps at the offices of the Inspiration Consolidated Copper Company at Inspiration, Arizona from March 31 to April 5, 1975, and during a brief visit to the Sanchez property on April 4th. About ten years ago the prospect was visited by the writer, and then available drilling data were reviewed.

LOCATION AND PHYSICAL FEATURES

The Sanchez copper property is located in the Lone Star Mining District, Graham County, Arizona, about eleven miles by road northeast of Safford. The claims are situated in Sections 25, 26, 35 and 36, Township 6 South, Range 27 East, Salt River Base Line.

Safford is a thriving agricultural community of about 6000 people in the Gila River valley. The town is on Highway 60 - 70, and is served by the Bowie - Globe branch of the Southern Pacific Railroad. A siding at Solomonville, east of Safford, and about nine miles from the property, would be available for freight shipments.

The claims are located near the southerly end of the Gila Mountains in rolling topography with higher basalt covered hills to the east and north. The present surface at about the 3200 ft. elevation is some 150 ft. above the Gila River valley elevation, and about one mile north of the valley boundary.

Climate may be classed as temperate although high temperatures are common in summer; there would be no ordinary interruption of year round operations. Rainfall is about 8.5 inches per year; there is sparse desert type vegetation. Adequate water supply is reported available from wells in the valley at the Grijalva farm and the state lease. A power line reaches the property, and a power supply for a large operation is reported available. There is no nearby source of timber. Supplies for mining operations would come from Tucson, Arizona and El Paso, Texas. Safford would be the residence for employees, though housing is reported scarce.

The road from Safford passes the hard surface Safford airfield where air - radio communications are installed. A gravelled airstrip has also been established at the property.

There is no equipment in the mine area, and only limited material at the test leaching site. An adequate office building for exploratory work

is located near the river. Good graded roads reach all parts of the property. Core from the drill holes is stored in two old buildings near the river.

HISTORY AND RECENT DEVELOPMENTS

Prospecting and very small scale copper ore production have been in progress at the Sanchez property since 1899. In 1964, Harpoon, Inc., a subsidiary of United Nuclear, started active exploration of the area, and in 1969 the property was acquired by Inspiration Consolidated Copper Company, which has corporate headquarters at Morristown, N. J., and mining operations at Inspiration and Christmas, Arizona. Except for continuing advance royalty payments on the Carpenter lease, by the end of 1975 almost all property payments will have been completed by Inspiration.

The Lone Star district will be the next large scale mining center in Arizona. In the late 1950's Phelps Dodge Corporation started exploration in an area about nine miles northwest of the Sanchez, and has had outstanding success. Two deep shafts and connecting crosscuts are now being driven to test drilling results, and to prepare a large underground mining project for production. Reserves are reported by that company to be 400 million tons of 0.72% copper; it is stated informally that a substantial part of this reserve will average 1.0% copper.

About five miles northeast of the Sanchez, since 1955 Kennecott Copper has explored and partly developed a very large, mixed oxide - sulphide copper deposit. It is reported that Kennecott will re-evaluate this deposit since the success by Phelps Dodge in deeper exploration.

Essex International and Towne Mining are also now conducting drilling exploration projects in the district.

In 1973-74 Union Pacific Mining Company by letter of intent arranged an option period on the Sanchez ground which would have developed into a joint venture agreement with Inspiration. Six holes were drilled to check Inspiration results, and the project was recommended by Union Pacific geologists. Modifications of the original agreement were sought by Union Pacific; rejection by Inspiration brought abandonment of the agreement.

Data on the Sanchez has recently been reviewed by Kennecott, Homestake, Phelps Dodge and W. R. Grace. The Homestake review was perfunctory as regards Sanchez; principal emphasis was upon investment in Inspiration itself. W. R. Grace is reported to have made an offer for a joint venture agreement on April 2nd.

PROPERTY

By purchase and location, Inspiration holds 368 unpatented claims, of which 16 are being presented for patent. There are also 200 millsite claims which cover some lode locations; these locations will be dropped when the millsites are patented. Eighty nine acres of valley land are being purchased from Mr. P. Grijalva on small yearly payments (\$12,000 plus interest to be

paid after 1975), and 240 acres are held on a state commercial lease in the valley. Ten acres are leased from Mr. M. Sanchez.

Assessment work aggregating \$36,800 must be done in 1975; that under the provisions of the Carpenter lease should be accomplished by June 30, 1975 and the remainder by September 30th. Property payments, including the Carpenter lease advance royalty, amount to \$129,456 for 1975.

The Carpenter lease provides for a royalty of \$0.007 per pound of copper produced, or a minimum advance of \$100,000 per year. The Grijalva payments are at the rate of \$3,000 per year.

GENERAL GEOLOGY

In the Lone Star district an older series of volcanic rocks, largely andesitic tuffs and agglomerates, are overlain by recent basalts and associated late volcanics. Quartz monzonite intrusive stocks and dikes, and closely related, slightly younger, fine grained acid intrusive rocks cut irregularly through the older volcanic series. The ore deposits appear to be closely related to the quartz monzonite and later intrusives.

SANCHEZ PROPERTY

At Sanchez, dikes and stock--like masses of coarse, biotite-rich quartz monzonite porphyry cut steeply through the andesites. Late, narrow dike-like acid intrusives, probably rhyolitic, cut both quartz monzonite and andesites, and appear related to irregular pebble-dike type breccias which cut monzonite and andesites, often near the contacts. Although the geologic notes on the drill holes are not specific, stronger mineralization may have occurred near these breccias.

About 250 ft. northwest of the Carpenter shaft at surface, there is a poorly exposed breccia, possibly part of a breccia pipe structure, about 75 by 100 ft. in area; the southern extension is covered by recent alluvium. Three drill holes, E-1, 401 and 403 in the immediate area of this breccia, contain much stronger copper values than generally cut in the other drill holes. The breccia has been cut on the Carpenter shaft 200 level, and large boulders of it can be seen in the stockpile at the leach test area. Fragments of coarse quartz monzonite are engulfed in fine grained, dense, gray, probably rhyolitic rock with fine quartz phenocrysts. Both rock types are weakly brecciated, and sealed with irregular iron oxides, some quartz, and erratic copper oxide minerals. The fine grained rocks are cut locally by six inch stringers of glassy quartz with prominent lacing of oxide copper seams. The downward extension of this possible breccia pipe structure has not been delimited.

As indicated by steep drill holes at Sanchez, thick, but highly variable, zones of oxide copper minerals with prominent iron oxides are cut near surface and extend to depths of more than 1200 ft. The principal copper oxide minerals reported are chrysocolla ($\text{CuSiO}_3 \cdot 2 \text{H}_2\text{O}$) with considerable tenorite (CuO), and some malachite, cuprite and chalcantinite. A zone of

strong native copper often occurs near the base of the oxide section, and suggests there may have been late oxidation of a previously secondarily enriched chalcocite (Cu_2S) zone.

Recent faulting, probably of relatively small displacement, appears to have influenced near surface oxidation, and may offset both oxide and underlying sulphide mineral zones.

Below the oxide copper sections there are localized strong sulphide copper minerals in seams and disseminations associated with pyrite. The sulphides are generally of primary origin and include chalcopyrite, prominent bornite, and little molybdenite. Quartz occurs in seams with the sulphides, and there are numerous late calcite seams. A few drill holes show some chalcocite enrichment below the oxide zone. Additional exploration may disclose more of this type of mineral than indicated to date.

There is a small, but possibly important, gold and silver content indicated by incomplete assay data, but mineral relationships have not been determined.

Distribution of alteration zones is masked by the intense oxidation features, and has not been clearly developed. There is some evidence of an outer chlorite zone with pyrite; clay alteration and sericite are noted, but the limits are not defined. Strong, second stage fine biotite is widely distributed but, again, the limits are not determined. Although late biotite alteration has not been widely described in the geologic literature on copper deposits, it is an important and prominent alteration feature at El Teniente in Chile; at Pachon, Argentina; at Cananea and Nacozari in Mexico, and at Ray in Arizona. It is not unlikely that much of the intense sericite alteration described at various large copper districts is the result of breakdown of second stage biotite.

Much of the Sanchez surface, and partly over the presently recognized copper metallization, is covered by recent alluvium to the south and west and by basalt on the higher hills to the east. There are thus possibilities that separate areas of intrusive activity, mineralization and brecciation may be concealed in the vicinity.

DRILLING AND DEVELOPMENT

At Sanchez, exploration and development have been by the Carpenter shaft and a short underground level at 200 ft. below surface, which could be easily made accessible, and by steep diamond drill holes. To date 133 holes have been drilled, some to depths of more than 2000 ft. The deeper holes have been surveyed, and some show wide variations from the vertical. Many holes have not been surveyed; geologic and assay data are very difficult to interpret in these sections.

The holes total more than 200,000 ft. in length. Core recovery has been very good, and checks made by Union Pacific geologists indicated assaying and sample preparation had been done competently. Most of the core is reported

to be available for review.

In the early drilling programs emphasis was placed on oxide copper development. More recently, increased attention has been given to underlying sulphide copper possibilities. Several old holes have been deepened and others drilled into the sulphide zone. It does not appear that the sulphide possibilities have yet been fully explored, laterally or at depth.

INDICATED RESERVE TONNAGES

OXIDE COPPER

Computer designed open pit models prepared by Inspiration indicate 79,363,000 tons @ 0.36% oxide copper could be mined from an open pit with a 1.49:1 waste to ore stripping ratio; 0.2% copper was used as a cutoff grade.

A careful check of these calculations was made by Union Pacific geologists and their outside consultants. Three particular benches were selected and reserve blocks were individually calculated. Using the Union Pacific figures for the benches, extrapolation to the Inspiration design would have shown a total of 86,000,000 tons at 0.35% copper.

A later independent estimate by Union Pacific and consultants developed a new oxide pit design which showed a total of 116,000,000 tons at 0.368% oxide copper, and a stripping ratio of 1.8:1; a 0.2% copper cutoff was also used.

A recent computer study of better grade oxide reserves, directed to estimate a tonnage of better grade material, showed a total of 30,520,000 tons at 0.50% oxide copper between the 3200 and 2700 elevation benches. Most of this reserve would fall within the limits of the designed pit. Thus, an operation could be started on better grade material to amortize plant and stripping costs more rapidly than by use of calculated average grade reserves.

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The Inspiration geological department, using available sulphide data, has calculated a sulphide reserve on benches from 2600 to 900 ft. elevation, without regard to open pit design, which showed a total of 52,737,000 tons at 0.45% copper, using a 0.3% copper cutoff. They believe that this indicated reserve might be greatly increased by further exploration. Probably much of this tonnage would not be available for open pit extraction.

There is an appreciable low grade gold and silver content shown by scattered analysis of copper samples. Statistical analysis by Inspiration indicates that this may average 0.007 oz. gold per ton, and 0.085 oz. silver per ton. The assay data is incomplete, and the mineral relationships are unknown. However, it appears that an important credit in precious metals might be recovered from the sulphide ores. It is unlikely that such credit would be obtained in a leaching operation. Data on the molybdenum content is inconclusive, and the possible molybdenum recovery may not be sufficient to deserve consideration.

METALLURGY

Inspiration has conducted bulk sulphuric acid leaching tests at the property on the oxide materials. A start was made with straight heap leaching; this was modified by tests of leaching techniques developed at Mangula, Rhodesia, which were considered successful.

In the leaching tests, material obtained from the Carpenter 200 level, with some surface material, was blended to obtain a grade of 0.36% oxide copper, and crushed to $-\frac{1}{2}$ mesh. Fines were removed. Tests were initially on small lots, but finally a 5000 ton lot was leached on a specially constructed concrete pad with asphalt facing. After a 21 day leach period, a 61% recovery was obtained. In this process, copper would be removed from the leach solutions by solvent extraction, as determined by tests by General Mills, followed by electro-winning to cathode copper. The abundant sulphuric acid now being made by copper smelters in the Southwest should insure supply of this reagent at reasonable cost in the future.

The writer believes that additional testing, with probably indicated increased plant investment, would show substantially better recoveries at costs which would be economic. The Union Pacific investigation in 1973-74 indicated the Inspiration test leaching operation would be economic at 56¢ copper.

CONCLUSIONS AND RECOMMENDATIONS

The impressive indicated low grade copper reserve at the Sanchez property, much of which would be available for low cost, open pit mining operations, deserves close consideration as a future economic resource. In the expectation that the price of copper, during the projected twenty year life of the enterprise at 20,000 tons per day and a start-up date some years in the future, will be at least from 20 to 30% higher than the present 63¢ price, the exploitation of the Sanchez deposit could be a very profitable venture.

Present exploration has not eliminated chances for substantial increases in low grade sulphide reserves. There are very long chance possibilities for discovery of higher grade primary ores related to the small breccia exposed at surface and partly explored by three drill holes. This area could be further explored by deep, inclined holes from surface.

If satisfactory business arrangements can be made with the Inspiration Company, it is recommended that a joint venture agreement be made with provision for an option period for a geological examination of drill records and cores, and additional drilling. If these investigations have favorable results, further metallurgical testing would be in order.

Richard B. Mulholland

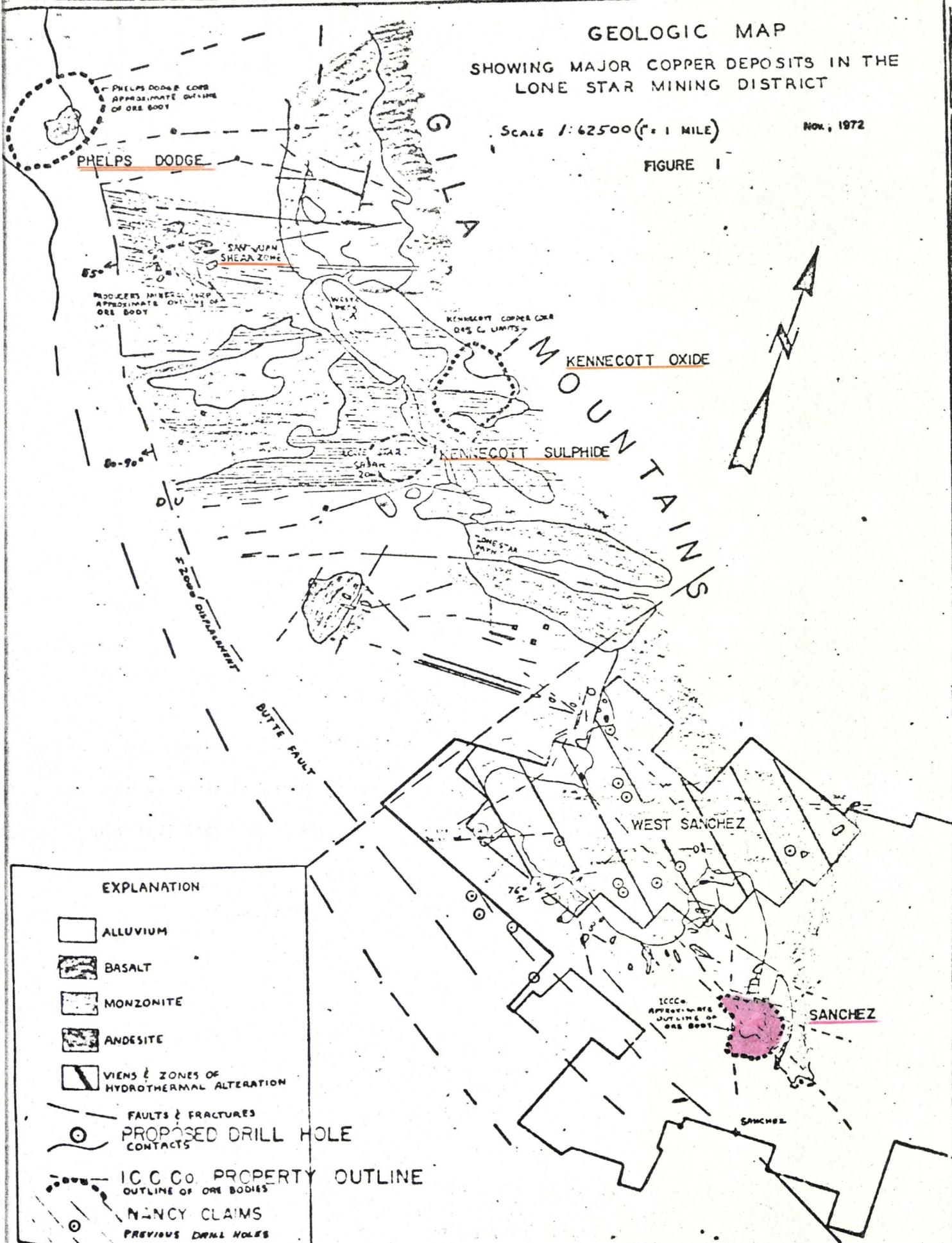
GEOLOGIC MAP

SHOWING MAJOR COPPER DEPOSITS IN THE LONE STAR MINING DISTRICT

SCALE 1:62500 (1" = 1 MILE)

Nov., 1972

FIGURE 1



EXPLANATION

ALLUVIUM

BASALT

MONZONITE

ANDESITE

VIENS & ZONES OF HYDROTHERMAL ALTERATION

FAULTS & FRACTURES
PROPOSED DRILL HOLE
CONTACTS

I.C.C. Co. PROPERTY OUTLINE
OUTLINE OF ORE BODIES

NANCY CLAIMS
PREVIOUS DRILL HOLES



Inspiration Consolidated Copper Company

INSPIRATION, ARIZONA 85537

6/2/75

May 30, 1975

Mr. Roland B. Mulchay
2732 Wren Road
Salt Lake City, Utah 84117

Dear Roland:

I've been intending to write you for some time, but it seems that my best intentions were always sidetracked. First, I wish to thank you for your hospitality during your visit and, secondly, for the copy of "comments on breccias."

We (Millie, Mary Ann and myself) are leaving on vacation tomorrow and will be gone through the 15th. We plan to drive first to Sidney, Montana via Santa Fe and Denver, and will return down the coast through Oregon and California. Hopefully one of these times we'll make it through Salt Lake. The primary purpose of this trip is to attend my 25th year reunion at Montana "Tech". Otherwise, we would probably be working on our cabin in the White Mountains.

Paul Pichard is here today looking over the Sanchez data. As I understand, you have submitted the property to his attention. We have started a drilling program there for the annual assessment work, and will do "back-to-back labor" for this year and next. This will amount to about \$80,000 worth of drilling so we should get some worthwhile information, particularly on the strong secondary biotite zone to the south.

Mary Ann is still job hunting without much success, but she has had several inquiries from various universities. At the present, it appears that she has a good chance for a job at the University of Kentucky. At least she has an interview lined up right after she returns from vacation so we're hoping.

Give our regards to Alice. We're sorry that we won't be through Salt Lake, but we will take a "raincheck" on your kind offer.

Sincerely yours,

John T. Eastlick

JTE:cs

April 11, 1975

Dear Jack:

I managed to get the Sanchez report into the mail late Tuesday afternoon and it should have been in New York the following day. However, to date there has been no reaction, and I have no clue as to the thinking at National Bulk.

I want to send my best thanks to you for all your help while I was at Inspiration, both professional and personal; please tell Millie that I greatly appreciate all the nice things you did for me during my visit. And tell Mary Ann we'll be very happy to have her stay with us until she gets settled, should she decide on Salt Lake City as a place to pursue her career.

The weather has continued to be miserable up here with snow showers almost every day. I am encouraged today, as the sun is out this morning, after a heavy frost, and we just might get to play golf tomorrow. How well, is another question!

I'll probably go to Hermosillo and La Dura the end of next week to map some core on the Cuatro Hermanos prospect, and discover at first hand just what Amoco is doing down there. The last hole is reported to have 165 ft. of 0.52% copper with a little moly, but we have no report on the geology.

I am enclosing a copy of the paper of comments on breccias. A high level conference by Econ Geology, or similar body, might help to clarify breccia terminology - if anyone would be patient enough to review his or her observations on the various breccia types. At least the differences between rocks and post - rock features might be emphasized.

With best regards from Alice and myself, and hopes that you'll stop over with us should you come North,

Sincerely,

Roland B. Mulchay



Inspiration Consolidated Copper Company

INSPIRATION, ARIZONA 85537

TEL.

602-473-2411

3/22/75

252

March 19, 1975

Mr. Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah 84117

Dear Roland:

I have consulted with our management in regard to your request for information on the Ash Peak Mine, and they are agreeable that the records can be made available for review. We don't have too much data on file, but some of it may be useful.

(With reference to the Sanchez property,) we are definitely interested in moving the property, either through an option arrangement with a retained interest or possibly through a joint venture. There are several other companies interested in the property, and, of course, we will be interested in the best deal offered which would be to our benefit. (All of the Sanchez data is here at Inspiration and) you are welcome to look at it at your convenience. However, it should be done soon, for as mentioned above, there are several other interested parties.

I am sorry that we couldn't get together last week, but to put it mildly I was somewhat indisposed. I am back to work now and should be fully recovered by the end of this week. Am looking forward to seeing you soon.

Sincerely yours,

John T. Eastlick

JTE:ct

cc: Mr. J. G. Kuhn

Home Tel.

602-

425-7388 ✓

4/3/75

GR

Like UP

JV 60% of capital invest. for 49% of Sanchez.

Make expenditures necessary for preparation of operations.

Date?

Insp. to receive credit for investment to date

± 5.5 million

Expect to start on 29,000,000 T @ 0.5% side. - JC says
new case, will expand this to 55 million. (Early had asked for 10 million)

MEMO

To Eastlick Globe Date 3/23/75 Time 9:30 PM.
 Phone from RBM SLC. To _____
 Place _____ Subject _____
 Present _____

Exxon, PD, Kenn, Rosario Girner
 Homestake no Am no?

150-175 mil of low gr. oxide [0.35?? RBM]
 55 million 0.45% sulphide.

9 PM Called Barber. He says A. Sully informed of Inspiration situation. Feels RBM would be free to suggest opportunities to others. Suggested RBM call Bob Weed; RBM feels no necessity for this, as Barber's group already informed, and RBM could add nothing to their information.

150 x 7 = 1,050 lbs.
 55 x 9 495

 1,545
 1,000,000,000 @ 100

150,000,000

 1,050,000,000 lbs.
 55,000,000

 495,000,000

 1,545,000,000 lbs.

Joint venture, or continued retained interest.

Payments this year \$100,000 ±, + assessment work expense.

RBM reviews data 10 days at their expense, his time

If he recommends, and they go ahead, carried small interest or substantial finder's fee spread over 10 years.

\$250,000

MEMO

Talked to Bert Reed.
 To Carroll Ward Date 7/12/65 Time 2:30
 Phone from RBM To _____
 Place _____ Subject Prospect at Safford
 Present United Nuclear asked United Nuclear

800,000 cash + 50,000 ft. of drilling.
 70% interest, 30% to U. Nuclear. They do not have option
 to purchase from owners,
 Return capital into only lease.

5,000,000 T oxide — 0.5-0.7% Cu — 11,000,000 tons
 waste in
 pit

Scattered sulphide min, very erratic
 Boleyn is one man show — very positive — has had
 heat attack. was dickering with AS&K, PD and Rival Brass
 at time of negotiations with Inspiration.
 Has information from DDH 26 — will set

no review if we wish.

Says gossip state PD work at Safford
 done by mining department, not by Exploration, who
 refused to recommend carrying out option to
 purchase. No other information available.

had to retire July 1, 1966.

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

April 8, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

Enclosed is a copy of a reconnaissance report on the Sanchez copper property near Safford, Arizona, prepared from data obtained from the Inspiration Consolidated Copper Company, the owners, at the Inspiration offices, and on a quick visit to the claims on April 4th.

As expected, there is a substantial tonnage of low grade copper bearing material, both in oxide (0.36% Cu) and sulphide (0.45% Cu) form, indicated by drilling done to date. There has been extensive exploration since my visit to the property several years ago, and development of large tonnages of 1.0% copper sulphide ores, which could have been projected at that time, are not now to be expected in the areas tested. The sulphide ore possibilities have not yet been fully explored, and there are very long chances for good grade sulphide ores related to a small breccia pipe structure exposed at surface northwest of the Carpenter Shaft.

I am impressed with the indicated reserve tonnages, good possibilities for additional sulphide mineral development, and projections of future, very profitable operations at increased copper prices. If the Mining Department of National Bulk Carriers is similarly impressed, negotiations for an option arrangement could be started with Inspiration officials at the corporate headquarters at Morristown, New Jersey. Mr. Richard H. Hyde is president of the company, and Mr. H. Myles Jacob is board chairman.

I was told at Inspiration on April 2nd, by one of the local officials of the company, that W. R. Grace & Co. had just made an offer on the Sanchez property. Later, I learned informally that the offer was for a joint venture agreement, similar to that made with Union Pacific Mining Company in 1973-74.

As outlined in a Union Pacific report, on file at Inspiration, the agreement provided that Union Pacific would provide 60% of the first \$19.1 million in capital costs in order to reimburse Inspiration for the after tax effects of their investment of \$5,231,000 to that date. Additional capital costs would be supplied at 49% by Union Pacific; Inspiration would retain control, act as the operator, and pay 51% of further costs.

From the Union Pacific figures, it can be estimated that Inspiration now has about \$5,650,000 in the property, and is obligated for the 1975 expenditures of about \$129,456 for property payments and \$36,800 for assessment work. The Union Pacific letter-of-intent agreement provided

for an extended examination period and an opportunity to check earlier drill hole results by drilling. Six holes were drilled; comparisons satisfied Union Pacific engineers that the Inspiration work had been accurately done. All Union Pacific projections were based upon copper at 56¢ per pound, and calculations showed profitable operations with a reasonable payout period. The agreement is reported to have been terminated when Union Pacific proposed changes in the terms, and Inspiration refused.

Off the record, Inspiration is now badly in need of cash, and is threatened with an active takeover attempt by the Crane Company. Inspiration has been seeking cash through sale of treasury stock in an amount equal to about 10% of the 2,439,059 shares issued; 22,200 shares are held in the treasury. Several organizations have been invited to make an overall review of the Inspiration ore reserve position and future prospects for consideration of such a purchase. Homestake engineers have recently conducted a review at Inspiration. At first glance, a stock purchase might be attractive, as the Inspiration ore reserves are reported very large and the Christmas property should eventually be a large low grade copper operation. Anaconda holds about 28% of Inspiration stock, and the Inspiration management undoubtedly feels that with another 10% in friendly hands, a takeover attempt would not be successful.

Inspiration has had, in recent years, more than its share of technical operating difficulties. The necessity for elimination of air pollutants at the old smelter caused the erection of a largely untested, new electric smelting furnace which has been plagued by many breakdowns. The great expenditure at the new smelter plus the lower production caused by the delays and decreased copper prices have brought on a very difficult period for the Company. It is my belief that all available competent staff will be needed to manage Inspiration and future Christmas operations. For that reason, it is suggested that any agreement reached on the Sanchez should vest control with National Bulk, and operations be divorced from Inspiration supervision.

As the total pounds of copper indicated at Sanchez are substantial, a type of joint venture agreement might be the only feasible approach. Possibly the offer of a loan to Inspiration of an amount approaching its investment in the Sanchez property might be sufficient to influence an advantageous agreement, at this time, for future exploitation of the Sanchez reserve. Such an agreement might provide that, if a third party entered as the operator, such as a well financed Canadian or international group, both National Bulk and Inspiration would sell equivalent percentages of their interests to the proposed third party.

The local Inspiration management was most cooperative, and made the very comfortable guest house available during my visit. Mr. Jack Eastlick, resident geologist at Inspiration, supplied all of the information in reports and maps, and accompanied me to the property on April 4th.

Yours very truly,

RBM/lh
Encl.

Roland B. Mulchay

Report on
RECONNAISSANCE EXAMINATION

SANCHEZ COPPER PROPERTY

Graham County, Arizona

Owned by

Inspiration Cons. Copper Company

INTRODUCTION

The information contained in the following report was obtained from incomplete examination of reports, drill records and maps at the offices of the Inspiration Consolidated Copper Company at Inspiration, Arizona from March 31 to April 5, 1975, and during a brief visit to the Sanchez property on April 4th. About ten years ago the prospect was visited by the writer, and then available drilling data were reviewed.

LOCATION AND PHYSICAL FEATURES

The Sanchez copper property is located in the Lone Star Mining District, Graham County, Arizona, about eleven miles by road northeast of Safford. The claims are situated in Sections 25, 26, 35 and 36, Township 6 South, Range 27 East, Salt River Base Line.

Safford is a thriving agricultural community of about 6000 people in the Gila River valley. The town is on Highway 60 - 70, and is served by the Bowie - Globe branch of the Southern Pacific Railroad. A siding at Solomonville, east of Safford, and about nine miles from the property, would be available for freight shipments.

The claims are located near the southerly end of the Gila Mountains in rolling topography with higher basalt covered hills to the east and north. The present surface at about the 3200 ft. elevation is some 150 ft. above the Gila River valley elevation, and about one mile north of the valley boundary.

Climate may be classed as temperate although high temperatures are common in summer; there would be no ordinary interruption of year round operations. Rainfall is about 8.5 inches per year; there is sparse desert type vegetation. Adequate water supply is reported available from wells in the valley at the Grijalva farm and the state lease. A power line reaches the property, and a power supply for a large operation is reported available. There is no nearby source of timber. Supplies for mining operations would come from Tucson, Arizona and El Paso, Texas. Safford would be the residence for employees, though housing is reported scarce.

The road from Safford passes the hard surface Safford airfield where air - radio communications are installed. A gravelled airstrip has also been established at the property.

There is no equipment in the mine area, and only limited material at the test leaching site. An adequate office building for exploratory work

is located near the river. Good graded roads reach all parts of the property. Core from the drill holes is stored in two old buildings near the river.

HISTORY AND RECENT DEVELOPMENTS

Prospecting and very small scale copper ore production have been in progress at the Sanchez property since 1899. In 1964, Harpoon, Inc., a subsidiary of United Nuclear, started active exploration of the area, and in 1969 the property was acquired by Inspiration Consolidated Copper Company, which has corporate headquarters at Morristown, N. J., and mining operations at Inspiration and Christmas, Arizona. Except for continuing advance royalty payments on the Carpenter lease, by the end of 1975 almost all property payments will have been completed by Inspiration.

The Lone Star district will be the next large scale mining center in Arizona. In the late 1950's Phelps Dodge Corporation started exploration in an area about nine miles northwest of the Sanchez, and has had outstanding success. Two deep shafts and connecting crosscuts are now being driven to test drilling results, and to prepare a large underground mining project for production. Reserves are reported by that company to be 400 million tons of 0.72% copper; it is stated informally that a substantial part of this reserve will average 1.0% copper.

About five miles northeast of the Sanchez, since 1955 Kennecott Copper has explored and partly developed a very large, mixed oxide - sulphide copper deposit. It is reported that Kennecott will re-evaluate this deposit since the success by Phelps Dodge in deeper exploration.

Essex International and Towne Mining are also now conducting drilling exploration projects in the district.

In 1973-74 Union Pacific Mining Company by letter of intent arranged an option period on the Sanchez ground which would have developed into a joint venture agreement with Inspiration. Six holes were drilled to check Inspiration results, and the project was recommended by Union Pacific geologists. Modifications of the original agreement were sought by Union Pacific; rejection by Inspiration brought abandonment of the agreement.

Data on the Sanchez has recently been reviewed by Kennecott, Homestake, Phelps Dodge and W. R. Grace. The Homestake review was perfunctory as regards Sanchez; principal emphasis was upon investment in Inspiration itself. W. R. Grace is reported to have made an offer for a joint venture agreement on April 2nd.

PROPERTY

By purchase and location, Inspiration holds 368 unpatented claims, of which 16 are being presented for patent. There are also 200 millsite claims which cover some lode locations; these locations will be dropped when the millsites are patented. Eighty nine acres of valley land are being purchased from Mr. P. Grijalva on small yearly payments (\$12,000 plus interest to be

paid after 1975), and 240 acres are held on a state commercial lease in the valley. Ten acres are leased from Mr. M. Sanchez.

Assessment work aggregating \$36,800 must be done in 1975; that under the provisions of the Carpenter lease should be accomplished by June 30, 1975 and the remainder by September 30th. Property payments, including the Carpenter lease advance royalty, amount to \$129,456 for 1975.

The Carpenter lease provides for a royalty of \$0.007 per pound of copper produced, or a minimum advance of \$100,000 per year. The Grijalva payments are at the rate of \$3,000 per year.

GENERAL GEOLOGY

In the Lone Star district an older series of volcanic rocks, largely andesitic tuffs and agglomerates, are overlain by recent basalts and associated late volcanics. Quartz monzonite intrusive stocks and dikes, and closely related, slightly younger, fine grained acid intrusive rocks cut irregularly through the older volcanic series. The ore deposits appear to be closely related to the quartz monzonite and later intrusives.

SANCHEZ PROPERTY

At Sanchez, dikes and stock--like masses of coarse, biotite-rich quartz monzonite porphyry cut steeply through the andesites. Late, narrow dike-like acid intrusives, probably rhyolitic, cut both quartz monzonite and andesites, and appear related to irregular pebble-dike type breccias which cut monzonite and andesites, often near the contacts. Although the geologic notes on the drill holes are not specific, stronger mineralization may have occurred near these breccias.

About 250 ft. northwest of the Carpenter shaft at surface, there is a poorly exposed breccia, possibly part of a breccia pipe structure, about 75 by 100 ft. in area; the southern extension is covered by recent alluvium. Three drill holes, E-1, 401 and 403 in the immediate area of this breccia, contain much stronger copper values than generally cut in the other drill holes. The breccia has been cut on the Carpenter shaft 200 level, and large boulders of it can be seen in the stockpile at the leach test area. Fragments of coarse quartz monzonite are engulfed in fine grained, dense, gray, probably rhyolitic rock with fine quartz phenocrysts. Both rock types are weakly brecciated, and sealed with irregular iron oxides, some quartz, and erratic copper oxide minerals. The fine grained rocks are cut locally by six inch stringers of glassy quartz with prominent lacing of oxide copper seams. The downward extension of this possible breccia pipe structure has not been delimited.

As indicated by steep drill holes at Sanchez, thick, but highly variable, zones of oxide copper minerals with prominent iron oxides are cut near surface and extend to depths of more than 1200 ft. The principal copper oxide minerals reported are chrysocolla ($\text{CuSiO}_3 \cdot 2 \text{H}_2\text{O}$) with considerable tenorite (CuO), and some malachite, cuprite and chalcantinite. A zone of

strong native copper often occurs near the base of the oxide section, and suggests there may have been late oxidation of a previously secondarily enriched chalcocite (Cu_2S) zone.

Recent faulting, probably of relatively small displacement, appears to have influenced near surface oxidation, and may offset both oxide and underlying sulphide mineral zones.

Below the oxide copper sections there are localized strong sulphide copper minerals in seams and disseminations associated with pyrite. The sulphides are generally of primary origin and include chalcopyrite, prominent bornite, and little molybdenite. Quartz occurs in seams with the sulphides, and there are numerous late calcite seams. A few drill holes show some chalcocite enrichment below the oxide zone. Additional exploration may disclose more of this type of mineral than indicated to date.

There is a small, but possibly important, gold and silver content indicated by incomplete assay data, but mineral relationships have not been determined.

Distribution of alteration zones is masked by the intense oxidation features, and has not been clearly developed. There is some evidence of an outer chlorite zone with pyrite; clay alteration and sericite are noted, but the limits are not defined. Strong, second stage fine biotite is widely distributed but, again, the limits are not determined. Although late biotite alteration has not been widely described in the geologic literature on copper deposits, it is an important and prominent alteration feature at El Teniente in Chile; at Pachon, Argentina; at Cananea and Nacozari in Mexico, and at Ray in Arizona. It is not unlikely that much of the intense sericite alteration described at various large copper districts is the result of breakdown of second stage biotite.

Much of the Sanchez surface, and partly over the presently recognized copper metallization, is covered by recent alluvium to the south and west and by basalt on the higher hills to the east. There are thus possibilities that separate areas of intrusive activity, mineralization and brecciation may be concealed in the vicinity.

DRILLING AND DEVELOPMENT

At Sanchez, exploration and development have been by the Carpenter shaft and a short underground level at 200 ft. below surface, which could be easily made accessible, and by steep diamond drill holes. To date 133 holes have been drilled, some to depths of more than 2000 ft. The deeper holes have been surveyed, and some show wide variations from the vertical. Many holes have not been surveyed; geologic and assay data are very difficult to interpret in these sections.

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11:29

6 PM 3/17/75

Case to Chatfield
Eureka

A. Cook
Sufford

Tittley - 251

N M Mosalem
Kin

METALLURGY

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CONCLUSIONS AND RECOMMENDATIONS

The impressive indicated low grade copper reserve at the Sanchez property, much of which would be available for low cost, open pit mining operations, deserves close consideration as a future economic resource. In the expectation that the price of copper, during the projected twenty year life of the enterprise at 20,000 tons per day and a start-up date some years in the future, will be at least from 20 to 30% higher than the present 63¢ price, the exploitation of the Sanchez deposit could be a very profitable venture.

Present exploration has not eliminated chances for substantial increases in low grade sulphide reserves. There are very long chance possibilities for discovery of higher grade primary ores related to the small breccia exposed at surface and partly explored by three drill holes. This area could be further explored by deep, inclined holes from surface.

If satisfactory business arrangements can be made with the Inspiration Company, it is recommended that a joint venture agreement be made with provision for an option period for a geological examination of drill records and cores, and additional drilling. If these investigations have favorable results, further metallurgical testing would be in order.

4/4/75

SANCHEZ

265 E 1200-350

75' lower

to top of breccia ?

DDH 441 W
bore N70W
E 270' from
Sh.



BRECCIA

501

10:30 AM.

date JV.

12:46

37 $\frac{5}{8}$

36 $\frac{1}{8}$

Call Mr. Brownell

212 - 765 - 3000

11:30 A.M.

Call to Ned Finkler 5/10/75

613-790 - 0178

MM EXP

54945

90054

Work at Campo Morada —

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

April 8, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

Enclosed is a copy of a reconnaissance report on the Sanchez copper property near Safford, Arizona, prepared from data obtained from the Inspiration Consolidated Copper Company, the owners, at the Inspiration offices, and on a quick visit to the claims on April 4th.

As expected, there is a substantial tonnage of low grade copper bearing material, both in oxide (0.36% Cu) and sulphide (0.45% Cu) form, indicated by drilling done to date. There has been extensive exploration since my visit to the property several years ago, and development of large tonnages of 1.0% copper sulphide ores, which could have been projected at that time, are not now to be expected in the areas tested. The sulphide ore possibilities have not yet been fully explored, and there are very long chances for good grade sulphide ores related to a small breccia pipe structure exposed at surface northwest of the Carpenter Shaft.

I am impressed with the indicated reserve tonnages, good possibilities for additional sulphide mineral development, and projections of future, very profitable operations at increased copper prices. If the Mining Department of National Bulk Carriers is similarly impressed, negotiations for an option arrangement could be started with Inspiration officials at the corporate headquarters at Morristown, New Jersey. Mr. Richard H. Hyde is president of the company, and Mr. H. Myles Jacob is board chairman.

I was told at Inspiration on April 2nd, by one of the local officials of the company, that W. R. Grace & Co. had just made an offer on the Sanchez property. Later, I learned informally that the offer was for a joint venture agreement, similar to that made with Union Pacific Mining Company in 1973-74.

As outlined in a Union Pacific report, on file at Inspiration, the agreement provided that Union Pacific would provide 60% of the first \$19.1 million in capital costs in order to reimburse Inspiration for the after tax effects of their investment of \$5,231,000 to that date. Additional capital costs would be supplied at 49% by Union Pacific; Inspiration would retain control, act as the operator, and pay 51% of further costs.

From the Union Pacific figures, it can be estimated that Inspiration now has about \$5,650,000 in the property, and is obligated for the 1975 expenditures of about \$129,456 for property payments and \$36,800 for assessment work. The Union Pacific letter-of-intent agreement provided

April 8, 1975

for an extended examination period and an opportunity to check earlier drill hole results by drilling. Six holes were drilled; comparisons satisfied Union Pacific engineers that the Inspiration work had been accurately done. All Union Pacific projections were based upon copper at 56¢ per pound, and calculations showed profitable operations with a reasonable payout period. The agreement is reported to have been terminated when Union Pacific proposed changes in the terms, and Inspiration refused.

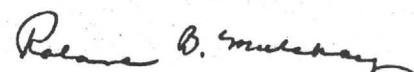
Off the record, Inspiration is now badly in need of cash, and is threatened with an active takeover attempt by the Crane Company. Inspiration has been seeking cash through sale of treasury stock in an amount equal to about 10% of the 2,439,059 shares issued; 22,200 shares are held in the treasury. Several organizations have been invited to make an overall review of the Inspiration ore reserve position and future prospects for consideration of such a purchase. Homestake engineers have recently conducted a review at Inspiration. At first glance, a stock purchase might be attractive, as the Inspiration ore reserves are reported very large and the Christmas property should eventually be a large low grade copper operation. Anaconda holds about 28% of Inspiration stock, and the Inspiration management undoubtedly feels that with another 10% in friendly hands, a takeover attempt would not be successful.

Inspiration has had, in recent years, more than its share of technical operating difficulties. The necessity for elimination of air pollutants at the old smelter caused the erection of a largely untested, new electric smelting furnace which has been plagued by many breakdowns. The great expenditure at the new smelter plus the lower production caused by the delays and decreased copper prices have brought on a very difficult period for the Company. It is my belief that all available competent staff will be needed to manage Inspiration and future Christmas operations. For that reason, it is suggested that any agreement reached on the Sanchez should vest control with National Bulk, and operations be divorced from Inspiration supervision.

As the total pounds of copper indicated at Sanchez are substantial, a type of joint venture agreement might be the only feasible approach. Possibly the offer of a loan to Inspiration of an amount approaching its investment in the Sanchez property might be sufficient to influence an advantageous agreement, at this time, for future exploitation of the Sanchez reserve. Such an agreement might provide that, if a third party entered as the operator, such as a well financed Canadian or international group, both National Bulk and Inspiration would sell equivalent percentages of their interests to the proposed third party.

The local Inspiration management was most cooperative, and made the very comfortable guest house available during my visit. Mr. Jack Eastlick, resident geologist at Inspiration, supplied all of the information in reports and maps, and accompanied me to the property on April 4th.

Yours very truly,


Roland B. Mulchay

RBM/lh
Encl.

MEMO

To Brownell - 44 Date 5/8/75 Time 1:50 PM.
 Phone from return his call To _____
 Place 11:30 AM Subject Sanchez Prospect, Ariz.
 Present _____

Too much money going into Brazil to
 take on another large investment. Hallett and
 Patrick has great interest, but ^{Dick} decided against;
 on basis of Brazil commitments, and present
 shipping conditions. No.

5/9/75

10:15 AM. Called Middleton, Inspiration - dirt line
 - told him NBC decision against, though
 Min. Dept. favored. He says Insp. meeting went
 well - smelter performed well during visit
 of directors

Then talked to Jack Kuhn. Told him same -

He says ~~at~~ she knew of Sanchez, - were approached
 on stock purchase deal. Does not believe

Union Oil was - RBU will contact Eckhard.

Thanked them for treatment at Inspiration.

Inspiration Consolidated Copper Company
Annual Report 1974



Inspiration Consolidated Copper Company
55 Madison Avenue, Morristown, N.J. 07960

Inspiration Consolidated Copper Company Annual Report 1974

Mines and Plants

Inspiration and Christmas, Ariz.,
Philipsburg, Mont.

Executive Office

55 Madison Avenue, Morristown, N.J. 07960

Phoenix Office

100 West Washington Street, Phoenix, Ariz. 85003

On the cover:

Photo of a particularly pure mass of chryso-colla, one of Arizona's major copper ores, extracted from Inspiration's Live Oak open-pit mine.

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THE YEAR IN BRIEF

	1974	1973
Deliveries of Copper:		
Pounds	111,568,000	129,732,000
Price per pound	74.50¢	59.18¢
Proceeds	\$83,123,000	\$76,774,000
Gross Revenue	98,447,000	90,199,000
Net Income	9,469,000	14,601,000
Net Income Per Share	\$3.92	\$6.05
Dividends	6,283,000	4,829,000
Dividends Per Share	\$2.60	\$2.00
Taxes	8,344,000	6,437,000
Capital Expenditures	18,751,000	40,781,000
Depreciation	9,836,000	5,800,000
Depletion	167,000	221,000
At December 31:		
Stockholders' Equity	\$91,208,000	\$87,948,000
Stockholders' Equity Per Share	\$37.74	\$36.42
Number of Employees:		
Active	2,307	2,309
On retirement under pension plans	313	272
Number of Stockholders	8,999	9,147
Number of Shares Outstanding	2,416,859	2,414,909



Inspiration's New Silver Mine in Montana is part of a broad program of diversification, both geographically and among natural resources in addition to copper. Here, H. Myles Jacob, Inspiration chairman (right), and Richard R. Hyde, president, inspect sample of ore at the Black Pine silver mine, which began production early in 1975. Development of a new coal mine in Utah is planned to start this spring. Also under current investigation are mineral deposits of copper, nickel, gold, barite, coal, lead, zinc and uranium. Exploration and development activities are being carried out in 12 of the Western states, including Alaska.

DIRECTORS

Sherman Hazeltine, Chairman of the Board of First National Bank of Arizona

Richard R. Hobbins, Consultant to the Company; Counsel to Chadbourne, Parke, Whiteside and Wolff, Attorneys; Director and Consultant to General Energy Corporation

Richard R. Hyde, President of the Company

H. Myles Jacob, Chairman of the Board

George E. Kruger, Vice President and Technical Services Division Executive of The Chase Manhattan Bank

John H. Mathis, Director of Westvaco Corporation; Trustee of South Brooklyn Savings Bank

Walter H. Sykes, Vice President-Finance of Allied Chemical Corporation

OFFICERS

H. Myles Jacob, Chairman and Chief Executive Officer

Richard R. Hyde, President and Chief Operating Officer

Richard C. Cole, Vice President

Douglas W. Middleton, Vice President

Edward F. Wendt, Secretary and Assistant Treasurer

Robert F. Morison, Treasurer and Assistant Secretary

SALES

Thomas A. Campbell, Jr., Sales Manager

OPERATING STAFF

At Inspiration, Arizona

Douglas W. Middleton, Vice President and General Manager

James B. Holman, General Superintendent of Operations

Donald S. Skufca, Assistant General Superintendent

John G. Kuhn, New Projects Director

Duncan MacDonald, Director of Industrial Relations

Thomas M. Anderson, Mine Superintendent

James H. Lundy, Open-Pit Superintendent

Herbert H. Mellus, Superintendent, Mine Engineering

Richard V. Trusty, Mine Maintenance Superintendent

Sherman P. Quayle, Crushing Plant Superintendent

Gerald F. Fountain, Superintendent-Leaching and Refining

Terry L. Downing, Concentrator Superintendent

Roger E. Martin, Senior Power Engineer

M. Rex Henderson, Smelter Superintendent

John T. Eastlick, Chief Resident Geologist

Hugh W. Olmstead, Chief Exploration Geologist

Thomas J. Montgomery, Property Superintendent

Joseph T. Heatherly, Controller

John C. Lorenzen, Maintenance Superintendent

Carter E. Nelms, Utilities Superintendent

William E. Pattullo, Director of Environmental Controls

Johnny Gregovich, Manager of Community Relations

Joseph M. Fentress, Purchasing Agent

Ralph V. Bamerio, Director of Industrial Hygiene

Magnus Gerszewski, Director of Safety

Stephen D. Jarman, Chief Industrial Engineer

Leonard D. Vanell, Chief Chemist

At Christmas, Arizona

Theodore A. Dodge, Manager

Peter W. Richardson, General Superintendent

Guy Vaillancourt, Mine Superintendent

Richard C. Laird, Concentrator Superintendent

Harold B. Benjamin, General Maintenance Superintendent

At Ox Hide Mine, Inspiration, Arizona

Vernon E. Jones, Superintendent

At Black Pine Mine, Philipsburg, Montana

Daniel D. McLaughlin, Superintendent

Annual Meeting of Stockholders—May 5, 1975

General Counsel: Chadbourne, Parke, Whiteside and Wolff, New York, N.Y.

Western Counsel: G. Henry Ladendorff, Phoenix, Ariz.

Transfer Agent and Registrar: First National City Bank, 55 Wall Street, New York, N.Y. 10015

Common Stock Listed on New York Stock Exchange



Richard R. Hyde, President



H. Myles Jacob, Chairman

TO OUR STOCKHOLDERS

In last year's Annual Report, we expressed the opinion that, "1974 will present numerous challenges for the copper industry: inflation, a clouded economic outlook, shortages of fuel, materials and equipment, and expiration of labor contracts at the end of June." If anything, this was an understatement of the problems the industry and Inspiration faced during the year.

But with all this, Inspiration's net earnings for the year were higher than in six of the previous ten years; and we were able to pay cash dividends higher than in eight of the same ten years. In addition, significant steps were taken to broaden our mining activities both as to natural resources and geographically and to improve production facilities.

This letter and the review of operations that follows seek to give you an objective—if somewhat somber—picture of what has happened during the past year as well as the situation as of today. In this connection, it should be recognized that our company's success in any given period is closely related to the state of the economy and the price of copper. When these improve, Inspiration should be well positioned to benefit from the more favorable market conditions.

Inspiration's net earnings for 1974 were \$9,469,000, or \$3.92 per share, including \$0.37 per share in investment tax credits. This compares with 1973 net income of \$14,601,000, or \$6.05 per share, which included \$1.64 per share in investment tax credits on plant and equipment acquisitions. Before tax credits, 1974 income was equal to \$3.55 per share, compared with \$4.41 per share in the prior year.

As noted above, these results must be evaluated in the total economic picture. Inflation and skyrocketing costs, especially for materials in short supply, added greatly to our 1974 operating expenses. A strike in the third quarter, which affected most of the copper industry, cost Inspiration approximately 15 million pounds in lost copper production. Sporadic problems in bringing our new air pollution control facilities into operation also contributed to the decline in production. Upon resumption of operations after the strike, which was settled at Inspiration on August 23, we had to meet the increased labor costs included in the new collective bargaining agreements.

At the beginning of 1974, Inspiration's base price for copper cathodes was 68 cents per pound—the maximum allowed by the Cost of Living Council. It is a sad commentary on the political environment in which we must do business that, during a time of rapidly rising international copper prices—spot copper wirebar hit a high of \$1.52 per pound on the London Metal Exchange on April 1—we were forced by government controls to sell at artificially low ceiling prices. At the same time, the U.S. Government's General Services Administration, exempt from price controls, was selling copper from its stockpile at prices far in excess of the ceiling price.

Our price remained at 68 cents until May 1 when, following the expiration of price controls, it rose to 80 cents per pound. A further increase to 85 cents, effective on June 5, held through the strike and until September 17.

Then began a severe economic downturn, here and abroad, sparked by decreasing demand and heavy liquidation of Japanese metal holdings on a market which had just absorbed the U.S. stockpile disposal.

Inspiration posted successive decreases of six cents per pound on September 17, four cents on October 16, and three cents on November 25. As the year closed, our price was 72 cents. Further drops of four and five cents on January 2 and January 30, this year, brought it down to our present price of 63 cents per pound.

Copper on the London Metal Exchange and in dealer markets here is currently selling at about 59 cents per pound. These markets have recently shown signs of bottoming out.

Weakness in copper demand has stemmed from particular segments of the economy—automotive production is sharply off; housing starts are at a low ebb; and many utility construction projects have been deferred or cancelled.

While deflation has held sway in the copper market, inflation still rules in the cost side of the business. Labor, machinery, supplies, fuel and taxes are at historic highs. Consequently, we are tightening the corporate belt and practicing stringent economy wherever possible. A production cut of 25 per cent at our Arizona operations, effective February 17, resulted in the layoff of approximately 175 employees.

The year 1974 was not without substantial accomplishments:

- The new smelting facilities are now beginning to generate good revenues through charges to toll customers with whom we have long-term contracts extending up to ten years.

- Inspiration has leased several non-operating properties for possible development by others, with retained interest by Inspiration—a source of possible future income.

- At the end of 1974, the Black Pine silver mine in Montana passed from development status to that of regular operations, and is contributing to revenues sooner than expected.

- Development drilling of our underground coal property in Utah has been completed, and mine development and construction plans have been submitted to government agencies involved for approval, and to obtain easements for access to the property.

- Cash flow from our limited partnership interests in Hamilton Brothers Oil Company began in 1974 and is expected to continue in future years.

- Three-year labor pacts signed with the unions representing our hourly-rated employees should provide strike-free operations until mid-1977.

- Early in 1974, we were successful in bringing to an end the time-consuming and costly litigation instituted in 1968 to recover losses sustained as a result of the collapse of a new excavator bridge at the leaching plant in 1966. Through an agreement reached with our insurer and others, we received \$1,470,000, which, less related expenses and taxes of \$722,000, amounted to 31 cents per share. As noted in the financial statements,

this sum was treated as an addition to retained earnings for 1966 and 1967.

- The new smelter facilities were financed in part by issuance of \$38 million in tax-free pollution control bonds. These bonds, held by five banks, were to be paid off in 23 quarterly installments of \$1.6 million, with final payment of \$1.2 million on February 15, 1980. The banks have agreed to an extension of the maturity date, and payment of the remaining balance by 36 quarterly installments of \$900,000, with a final \$800,000 payment on February 15, 1984. The Internal Revenue Service has been asked to rule that the extension does not affect the tax-free character of the bonds.

- The first shopping center in the Globe-Miami district of Arizona is being constructed on land leased from Inspiration. Our decision to lease this ground was in keeping with our aim to realize the maximum return on our land that is not directly needed for production activities.

As shareholders have already been informed, on February 19, 1975, Thomas M. Evans, chairman of Crane Co., revealed that a Crane subsidiary, CF&I Steel Corporation, had acquired 5.5 per cent of Inspiration's common stock. At the same time it was announced that Crane was contemplating an offer to Inspiration's shareholders, to be filed with the Securities and Exchange Commission on or about March 15, 1975, seeking to acquire any and all of the company's remaining shares. We will, of course, keep you advised of developments.

The strict economies which we are now imposing do not imply that we believe the drop in demand for minerals reflects the future. Our objective continues to be diversification both geographically and among natural resources. Long-term, the need for minerals must grow tremendously. Short-term, we must nevertheless limit our investment in tomorrow to what we can pay for today. This will make your company stronger in the future.

While 1974 has been a trying year, our people have responded well to its multiple challenges. We have every confidence that they can cope with the new and different problems of 1975.



H. Myles Jacob
Chairman



Richard R. Hyde
President

February 28, 1975

	1970	1969	1968	1967	1966	1965
	Copper price rises; peaks at 60¢. Demand recedes in 4th quarter. Year-end price 53¢.	Copper price and deliveries at record high. Price rises from 42¢ to 52¢.	Strike over late in March. Price increased to 42¢. Rod plant completed in December.	Industry-wide strike in mid-July closes all operations through end of year.	Heavy demand; continued Government pressure on price. Three-week strike. Christmas open-pit supplants underground operation.	Price rises, shortages worsen. Copper released from U.S. stockpile. Government intervention keeps U.S. price below world markets.
	134,110	127,216	88,017	66,044	114,224	124,238
	58.12	47.49	42.00	39.25	36.75	35.46
	77,943	60,415	36,967	25,922	41,978	44,052
	10,885	9,111	6,932	5,213*	5,540*	4,172
	511	348	394	880	709	486
	<u>89,339</u>	<u>69,874</u>	<u>44,293</u>	<u>32,015</u>	<u>48,227</u>	<u>48,710</u>
	49,381	40,094	31,170	22,038	30,219	31,771
	5,240	4,263	2,991	2,654	2,977	2,362
	2,516	1,785	438	665	217	443
	1,175	872	650	562	632	590
	—	—	—	—	—	—
	3,995	3,435	2,198	1,819	2,680	2,558
	322	321	256	200	340	370
	<u>62,629</u>	<u>50,770</u>	<u>37,703</u>	<u>27,938</u>	<u>37,065</u>	<u>38,094</u>
	26,710	19,104	6,590	4,077	11,162	10,616
	8,867	5,672	899	791*	3,342*	2,686
	<u>17,843</u>	<u>13,432</u>	<u>5,691</u>	<u>3,286*</u>	<u>7,820*</u>	<u>7,930</u>
	7.41	5.60	2.37	1.37*	3.24*	3.30
	2,407	2,400	2,403	2,408	2,407	2,402
	7,823	7,676	5,046	4,815	6,018	5,407
	3.25	3.20	2.10	2.00	2.50	2.25
	9,736	9,368	9,025	6,252	1,948	3,387
	66,582*	56,516*	50,025*	50,205*	51,734*	49,907
	27.66*	23.49*	20.96*	20.85*	21.49*	20.74

TEN-YEAR REVIEW 1965-1974
(Amounts expressed in thousands, except price and per share figures)

Year	1974**	1973**	1972**	1971
Highlights	Price controls end April 30; price rises to 85¢ by June 5. 40-day strike in 3rd quarter; market weakens with downturn in U.S. and foreign economies. Price drops to 72¢ by year end.	Rapidly increasing demand world-wide. U.S. prices move back to 60¢ ceiling in first quarter. U.S. government allows increase to 68¢ in December. Pollution control facilities ready for start-up at year end.	Copper supply ample; demand modest until year-end upturn. Smelter pollution control facilities and acid plant under construction.	Strike closes operations for two months. Copper price falls to 50.25¢ in November.
Deliveries of copper:				
Pounds	111,568	129,732	145,519	108,679
Price per pound***	74.50¢	59.18	50.80	51.98
Proceeds	\$83,123	76,774	73,922	56,492
Other operating revenue	14,190	12,605	11,239	9,253
Interest and other income	1,134	820	388	441
	<u>98,447</u>	<u>90,199</u>	<u>85,549</u>	<u>66,186</u>
Costs, other than those shown separately below	62,330	58,878	54,564	41,429
Taxes, other than income taxes	6,768	5,793	5,399	4,543
Exploration and metallurgical research	3,697	2,770	2,241	1,679
Selling and general administrative expense	1,521	1,492	1,227	1,165
Interest expense	3,083	—	—	—
Depreciation	9,836	5,800	5,096	5,036
Depletion	167	221	250	254
	<u>87,402</u>	<u>74,954</u>	<u>68,777</u>	<u>54,106</u>
Income before income taxes	11,045	15,245	16,772	12,080
Income taxes	1,576	644	4,592	3,352
Net income	<u>\$ 9,469</u>	<u>14,601</u>	<u>12,180</u>	<u>8,728</u>
Net income per share	\$ 3.92	6.05	5.06	3.63
Average number of shares outstanding	2,416	2,414	2,407	2,407
Dividends	\$ 6,283	4,829	4,815	4,814
Dividends per share	\$ 2.60	2.00	2.00	2.00
Capital expenditures	\$18,751	40,781	27,746	9,809
Stockholders' equity at year end	\$91,208	87,948*	77,882*	70,496*
Stockholders' equity per share	\$ 37.74	36.42*	32.35*	29.29*

*Restated to reflect adjustment related to settlement of excavator-collapse litigation.

**See Management's Discussion and Analysis of Earnings on page 8.

***1972 and subsequent deliveries are shown at cathode price, whereas 1971 and prior deliveries are on a wirebar basis.

REVIEW OF OPERATIONS
PRODUCTION AND DELIVERIES (in pounds of copper)

	1974	1973
INSPIRATION AREA MINES		
Ores processed in-plant	81,514,000	86,268,000
Waste dump leaching	17,887,000	16,395,000
	<u>99,401,000</u>	<u>102,663,000</u>
OX HIDE MINE	9,679,000	8,713,000
CHRISTMAS MINE	13,397,000	19,017,000
Total mine production	122,477,000	130,393,000
Change in inventories in process	(9,805,000)	(984,000)
Finished production	<u>112,672,000</u>	<u>129,409,000</u>
Deliveries (sales)	<u>111,568,000</u>	<u>129,732,000</u>

BY-PRODUCTS

Silver—ounces produced	153,000	192,000
Gold—ounces produced	2,700	3,900
Molybdenum—pounds produced	—	105,000
Selenium—pounds delivered	27,000	22,000

SUMMARY OF MINING (in tons)

	1974		1973	
	Ore	Waste	Ore	Waste
INSPIRATION AREA MINES				
Thornton	4,149,000	1,823,000	3,862,000	1,280,000
Live Oak	768,000	3,685,000	1,512,000	2,480,000
Red Hill	3,536,000	13,020,000	3,348,000	13,149,000
	<u>8,453,000</u>	<u>18,528,000</u>	<u>8,722,000</u>	<u>16,909,000</u>
OX HIDE MINE	3,382,000	1,083,000	4,092,000	115,000
CHRISTMAS MINE	1,677,000	8,470,000	1,632,000	9,420,000
Total	<u>13,512,000</u>	<u>28,081,000</u>	<u>14,446,000</u>	<u>26,444,000</u>

ORE RESERVES (in pounds of copper)

Production statistics, and ore reserves as estimated by company engineers at December 31:

	1974		1973	
	Finished Production to Date	Estimated Recoverable Content of Ore Reserves	Finished Production to Date	Estimated Recoverable Content of Ore Reserves
INSPIRATION AREA MINES	4,599,920,000	2,063,159,000	4,499,953,000	2,192,932,000
CHRISTMAS MINES:				
Underground (operations suspended)	75,327,000	567,605,000	75,327,000	567,605,000
Open-pit	134,046,000	263,443,000	121,341,000	219,632,000
SANCHEZ MINE	—	285,703,000	—	285,703,000
	<u>4,809,293,000</u>	<u>3,179,910,000</u>	<u>4,696,621,000</u>	<u>3,265,872,000</u>

Ore reserve estimates are limited to proven tonnages, excluding probable ores, with the exception of the Christmas underground mine which includes 195,000,000 pounds of recoverable copper in probable reserves. Probable ore reserves are those which are reasonably assured but not absolutely certain. Ore reserve estimates may vary as development and mining progress. Changes may also result from major changes in cost-price relationship or by development of new mining and metallurgical techniques.

Inspiration Consolidated Copper Company is an integrated natural resources company. Its principal line of business is the production and sale of copper from its Arizona operations, which include mines, smelter, refinery and rod fabricating plant. In 1974, the company began the production of sulfuric acid at its recently completed acid plant. Inspiration also smelts copper-bearing materials for other producers.

Inspiration's goal is to seek, find, develop and extract natural resource products which society needs and which the company can provide at a profit. Its exploration activities, which cover most of the Western states, are aimed at diversification both geographically and among natural resources. In recent years, it has acquired a silver mine in Montana, which is in production, and a coal property in Utah, now in the development stage. It also has leased some non-operating properties for possible development by others.

INSPIRATION DIVISION

Open-Pit Mines

Ore production from the Thornton, Live Oak and Red Hill mines was 8,722,000 tons in 1973 and 8,453,000 tons in 1974. This decrease was attributable for the most part to the 40-day strike in the third quarter. However, the rate of ore production per operating day rose from 24,094 tons in 1973 to 26,582 tons in 1974, the highest in Inspiration's history.

Ore from these three mines consists of varying degrees of sulfide and oxide minerals and requires different sequences of processing. Predominantly sulfide ore is moved directly to the concentrator where the copper is recovered by flotation. Oxide ore, consisting mostly of acid-soluble minerals, is treated in leaching vats. Ore containing more balanced amounts of sulfide and oxide minerals is first vat-leached with sulfuric acid solutions for extraction of the oxide copper, then sent to the concentrator where the copper sulfide values are recovered by flotation.

Material too low in copper content for in-plant treatment is removed as waste and either discarded or, if copper values warrant, placed on dumps for subsequent leaching. The ratio of waste removed per ton of ore mined rose from 1.94 in 1973 to 2.19 in 1974. A new daily high for total tonnage—124,000 tons—was set on October 21.

To improve the efficiency of our mining equipment, we purchased a new 10-cubic-yard electric shovel and nine new 85-ton diesel-powered haulage trucks in 1974. These replaced some older and smaller units.

Under our agreement with Cities Service Company, we will mine and treat, on a royalty basis, ore on Cities Service property adjacent to our Joe Bush claims. The agreement also will make it possible for us to mine a

substantial tonnage of our own material which could not have been moved without disturbing the common boundary. Removal of waste from this Joe Bush mine is scheduled to begin in the second quarter of 1975, with ore production to start a year later.

The new primary and tertiary crushing facilities operated satisfactorily during 1974. After our metallurgical research engineers helped to solve dust control problems, the crushers demonstrated their ability to process an additional 2,500 tons of ore per day.

Waste Dump Leaching

Leaching of mineralized waste dumps and some leaching-in-place produced 17,887,000 pounds of copper in 1974. This amount includes 2,402,000 pounds from the Willow Springs project which came on stream in the second quarter. The increase over the 16,395,000 pounds similarly produced in 1973 is due to the Willow Springs production, which more than offset the decrease in other such production during the strike. Shortages of sulfuric acid needed for leaching, which plagued us in 1973 and most of 1974, will no longer be a problem as our acid plant comes into full production.

In-Plant Leaching, Electrowinning Plant and Refinery

In-plant leaching involves the bedding of ore in one of thirteen 10,000-ton-capacity vats. Sulfuric acid leaching solutions increase in copper content as they advance from vat to vat. At the electrowinning plant, copper is electrolytically plated out of high-grade solutions in the form of cathodes, ready for shipment to customers. The copper content of low-grade solutions is recovered by precipitation on scrap iron. The resulting product, cement copper, contains approximately 75 per cent

Note J—Settlement of Excavator-Collapse Litigation

In May 1974, agreement was reached with the company's insurer and others to settle litigation instituted by Inspiration to recover loss of profits, extra expenses, and costs of physical damage suffered as a result of the collapse of a new excavator bridge in March 1966. The settlement of the litigation in the amount of \$1,470,000, less related expenses and income taxes of \$722,000, has been recorded as an adjustment to prior periods. Accordingly, income retained at December 31, 1973, has been restated from amounts previously reported to reflect a retroactive credit of \$748,000 applicable to the years 1966 and 1967. This retroactive adjustment increased net income for such years by \$421,000, or \$0.17 per share, and \$327,000, or \$0.14 per share, respectively.

Note K—Contingencies

An action by the United States of America against the company and various labor unions representing its employees, charging the violation of Title VII of the Civil Rights Act of 1964 in connection with alleged discrimination against Mexican-American and American-Indian employees, was tried in the U.S. District Court for the District of Arizona. An adverse decision has been rendered. In 1974, pursuant to statute, the Equal Employment Opportunity Commission was substituted for the United States as plaintiff. In the opinion of management and legal counsel, the implementation of this court decision and any back pay claims allowed thereunder should not have a material adverse effect upon the financial position of the company.

In the class action against the company and other smelter operators in Arizona for damages to the plaintiffs and other residents of Maricopa County allegedly resulting from air pollution and for an injunction against smelting operations, the Superior Court of Arizona ruled that such action may not be maintained as a class action. As the result of appeals, the Supreme Court of Arizona upheld the Superior Court ruling that the action may not be maintained as a class action. Plaintiffs may petition the U.S. Supreme Court to review alleged constitutional questions. Counsel for the company continues of the opinion that the action can be successfully defended.

The company, along with the other primary copper producers in the country, was served with subpoenas by the Antitrust Division of the U.S. Department of Justice which required it to produce documents and information relating to copper prices starting with the year 1951, and exploration, development, smelting and refining activities and operations starting with the year 1955, for use by a Grand Jury empanelled in the U.S. District Court for the Eastern District of New York. In 1974, the jurisdiction of this investigation was transferred to the Southern District of New York. The company has produced all or substantially all of the documents required.

REPORT OF INDEPENDENT ACCOUNTANTS

February 17, 1975

To the Board of Directors and Stockholders of
Inspiration Consolidated Copper Company

In our opinion, the accompanying balance sheet, the related statements of income and income retained and the statement of changes in financial position present fairly the financial position of Inspiration Consolidated Copper Company at December 31, 1974, and 1973, the results of its operations and the changes in financial position for the years then ended, in conformity with generally accepted accounting principles consistently applied. Our examinations of these statements were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Morristown, N.J. 07960

PRICE WATERHOUSE & CO.

Note H—Long-Term Liabilities

	<u>1974</u>	<u>1973</u>
Loan from The Industrial Development Authority of Gila County, Arizona, used to finance construction of pollution control facilities. The Industrial Development Authority obtained funds for this loan from the sale of tax-free Pollution Control Revenue Bonds to five banks in New York and Arizona. The company has guaranteed the Authority's payment of principal and interest on these Bonds. Interest is at 75 per cent of the prime rate charged by The Chase Manhattan Bank, N.A.(a)	\$33,200,000	\$38,000,000
Advances from a smelter customer repayable in 120 equal monthly payments, without interest, beginning October 1, 1974. Repayments are deducted from amounts due from the customer for treatment of its concentrates. Limit on advances was \$13,200,000	12,870,000	13,200,000
Advances from a smelter customer repayable in 20 equal semi-annual installments beginning December 31, 1974, without interest. Limit on advances was \$3,677,080	3,493,000	3,393,000
6% note payable in annual installments of \$304,000 through 1978	1,216,000	—
4% note payable in varying annual installments through 1978	483,000	—
Advances from a smelter customer repayable in equal semi-annual installments of \$53,500 to June 1979, with interest at prime rate	482,000	589,000
7½% twenty-year mortgage repayable in annual installments of \$47,000, including principal and interest, ending 1989	411,000	426,000
	<u>52,155,000</u>	<u>55,608,000</u>
Less current installments	5,854,000(a)	5,811,000
	<u>\$46,301,000</u>	<u>\$49,797,000</u>

(a) The loan from The Industrial Development Authority of Gila County provides for repayment in 23 quarterly installments of \$1,600,000, beginning May 15, 1974, and a final payment of \$1,200,000 on February 15, 1980. Pending Internal Revenue Service approval, the banks holding the Authority's Bonds have agreed to an extension of the maturity date, and the repayment of the December 31, 1974, balance in 36 quarterly installments of \$900,000 and a final payment of \$800,000 on February 15, 1984. If the Internal Revenue Service does not rule by August 15, 1975, that the extension does not affect the tax-free character of the Bonds, the company will revert to the original repayment schedule and make up the differences due on the February and May 1975 payments. The current portion of this long-term liability is included in the statements at \$3,600,000.

The agreement relating to the loan from The Industrial Development Authority places certain restrictions on the company including certain requirements as to working capital and restrictions on cash dividends. The amount of retained earnings free from restriction at December 31, 1974, was \$7,823,000.

Note I—Capitalized Interest Expense and Deferred Start-up Cost

During the construction period of the new pollution control facilities, the company capitalized interest on funds borrowed to construct these facilities. Interest of \$2,524,000 (\$2,118,000 incurred in 1973) was capitalized through December 31, 1973. Beginning in 1974, the capitalized interest amount is being amortized on a straight-line basis over the useful lives (ranging from 10 to 30 years) of the pollution control facilities. Amortization of capitalized interest expense in 1974 totaled \$140,000.

Start-up costs totaling \$1,904,000 incurred in 1974 in connection with the new pollution control facilities were deferred and are being amortized over a period ending December 1975. Amortization of these costs in 1974 totaled \$225,000. The remaining deferred start-up costs of \$1,679,000 are included in prepaid expenses at December 31, 1974, and will be amortized in 1975.

copper. Inspiration has a patented process by which this copper can be upgraded to 98 per cent pure copper for direct sale to customers for use in powder metallurgy and chemical applications. Sales of this processed cement copper under Inspiration's trade name "CuPels"® totaled 3,642,000 pounds in 1974 and 3,596,000 pounds in 1973. If not upgraded by this process, cement copper is further treated at the smelter and refinery.

During 1974, the leaching plant treated 3,975,000 tons of ore and produced 8,824,000 pounds of electrolytic copper and 22,633,000 pounds of cement copper. From the treatment of 4,662,000 tons of ore in 1973, 10,006,000 pounds of electrolytic copper and 24,792,000 pounds of cement copper were produced.

The electrolytic refinery, using anodes cast at the smelter, produced 109,494,000 pounds of cathode copper in 1974 and 138,495,000 pounds in 1973. The 1974 production suffered from the strike and shortages of anode copper, which stemmed from start-up problems at the new smelting facilities.

Copper Concentrator and Molybdenum Plant

At the concentrator, copper is recovered by flotation, a process in which the minerals are treated in cells with reagents which cause them to attach to air bubbles and float to the surface. The product of flotation, called concentrate, is sent to the smelter.

During 1974, the concentrator produced 49,051,000 pounds of copper from the treatment of 6,174,000 tons of ore. In the previous year, 45,978,000 pounds were produced from 6,710,000 tons of ore. On a per-operating-day basis, treatment rose from 18,536 tons in 1973 to 19,415 tons in 1974.

The by-product molybdenum recovery plant, which had been put on standby in September 1973, was not operated in 1974. Metallurgical test work, directed toward improvements in recovery, has produced promising results in the laboratory. If pilot-plant tests now being run at the concentrator produce similar results, the recovery plant will be put back in operation.

Smelter

New copper-bearing material treated at the smelter during the year totaled 248,000 tons, a decrease from 1973's total of 321,000 tons. Toll and custom material from other producers' mines accounted for 45 per cent of the tonnage treated in 1974, and 52 per cent in the prior year.

Start-up of the acid plant and new pollution control facilities at the smelter took much longer and presented more problems than expected. Repairs, necessitated by a leak which developed in one wall of the new electric furnace on June 4, caused a suspension of operations

until July 6. The strike caused another 40-day delay. By year end, production at both the smelter and acid plant, though improving, was not yet at capacity. Recognizing these problems and our continued efforts to operate a virtually smoke-free smelter in compliance with air quality standards, the Arizona authorities have extended our conditional operating permit to June 30, 1975. Barring unforeseen setbacks, we expect to meet that deadline.

OX HIDE MINE

Copper production from this open-pit mine and heap-leaching operation rose from 8,713,000 pounds in 1973 to 9,679,000 pounds in 1974. With an increased supply of sulfuric acid from our own plant and declining prices for scrap iron used in precipitation, improvements in both costs and production are expected in 1975. Our equipment replacement program was continued at Ox Hide in 1974, at a cost of \$696,000.

FABRICATING DIVISION—Rod Plant

Most rod plant employees were covered by a labor contract which was effective to August 31. However, they did not cross picket lines set up on July 15 by a union representing a few clerical and laboratory employees. The plant's operations were thus suspended throughout the strike. During that time, extensive repairs were made by our salaried employees.

As a result of additional toll conversion of copper furnished by customers, production of INSPIROD®, our continuous-cast copper rod, increased from 78,582,000 pounds in 1973 to 82,255,000 pounds in 1974.

New equipment, installed in 1974, was aimed at achieving a more efficient operation, improving the already high quality of our rod, and enhancing customer satisfaction.

CHRISTMAS DIVISION

As at our other Arizona operations, production of copper at the Christmas mine was halted during the strike, although some waste material was removed by supervisory personnel. Production was 13,397,000 pounds in 1974, as compared with 19,017,000 pounds in 1973. The ratio of waste removed per ton of ore mined was 5.05 in 1974 and 5.77 in the previous year.

Ore at Christmas, after being crushed and ground, is treated by flotation and the concentrates are trucked to the smelter at Inspiration. Although the flotation process is primarily effective in the recovery of sulfide minerals, the combined efforts of our research and operating staff have resulted in the recovery of a significant portion of the oxide minerals in the Christmas ore.

The installation of a new \$632,000 primary crusher was begun during 1974. Completion is expected in

April of this year. Other capital expenditures at Christmas included the purchase of three 35-ton haulage trucks and five front-end loaders.

Close to the present Christmas open-pit mine is a large low-grade ore body whose near-surface ores do not yield adequate recovery when treated by flotation. In November, we began to leach a test dump of 10,000 tons of this ore to determine its susceptibility to this method of recovery. Results to date are encouraging. Plans for an oxide ore mining operation with dump leaching, liquid-ion exchange and electrowinning are being formulated for use in further economic studies. Liquid-ion exchange, also referred to as solvent extraction, raises the copper concentration of leach solutions to the point where the copper may be recovered from the solution by electrowinning to produce a marketable cathode. This method replaces precipitation of copper on scrap iron, followed by smelting and refining to produce a similar cathode.

METALLURGICAL RESEARCH

Our metallurgical research program is directed to three areas—improvement in current plant operations, development of new processes, and testing methods of extraction for new mining prospects.

Of primary importance this year were the development of additional applications of our patented dichromate leaching process, the evaluation of the use of titanium as a plate for the electro-deposition of cathodes in the refinery, and the investigation of solvent extraction followed by electrowinning. During the strike, our research engineers applied a new process to the gold and silver-bearing anode slimes which accumulate in electrolytic refining tanks. The process, which works more rapidly and effectively than conventional acid leaching, made possible the sale of a large quantity of these slimes at a time when their values were near peak levels.

EXPLORATION AND DEVELOPMENT

In accordance with our policy of aggressive exploration to provide for the continuing growth of the company, exploration activities were conducted in most of the Western states in 1974. Concern for the environment in which we operate is an integral part of these activities.

Mineral deposits of copper, coal, nickel, gold, silver, cobalt, chromite, lead, zinc and uranium were investigated. Fourteen major prospects are currently under review. Work on a copper-nickel deposit in Alaska and a lateritic-nickel deposit in Oregon continues to be encouraging. Five of our properties have been leased for possible development by other companies, with retained interest by Inspiration—a source of possible

future income.

Options to purchase have been exercised for the Black Pine silver property in Montana and the Ferron Canyon coal property in Utah. We organized new wholly owned subsidiary corporations—the Black Pine Mining Company and Canyon Fuel Company—to develop and operate these mines.

Development of the Black Pine mine was completed at year end. Production in 1975 from this small silver, underground vein mine is expected to be between 5,500 and 6,000 tons of ore per month, averaging five to six ounces of silver per ton. The ore will be sold to a nearby smelter.

This spring, when weather permits, development of the Ferron Canyon mine will begin. This property has a reserve of approximately 18 million tons of low-sulfur bituminous coal, which will be mined underground in seams from five to twelve feet thick. Access will be from U.S. Forest Service land via underground haulage. Applications for a use permit and underground right-of-way have been filed with the Service.

PROJECTS

As expected in a time of economic recession and weak markets such as we are now experiencing, many planned projects are being held in abeyance.

The operation of the Sanchez mine as a joint venture is still under consideration. Expansion plans for the Inspiration concentrator and the Ox Hide mine treatment plant, as well as plans for construction of a plant for retreating old mill tailings, await more favorable market conditions.

Expansion of the water supply at Inspiration is in progress; completion is scheduled for 1976.

During 1974, we began investigating the feasibility of again utilizing the ferric sulfate leaching process in the leaching plant. This could provide increased recovery of sulfide minerals and permit the treatment of greater tonnages in the leaching plant and concentrator with a minimum of capital outlay. Because the use of this process in combination with solvent extraction and electrowinning appears to have even greater potential, it will continue to receive our close attention in 1975.

EMPLOYEE RELATIONS

Following the strike, which involved most of the domestic copper industry and ended at Inspiration on August 23, new three-year contracts were signed with all unions representing our employees. The terms of the settlements generally followed those of other producers. During the strike, our salaried employees accomplished considerable maintenance and repair work and, as a result, the start-up following the strike was rapid and smooth.

	Number of Shares Optioned	Option Price		Number of Shares Available For Grant
		Per Share Range	Total	
Outstanding at December 31, 1972				
Granted in 1969-1971	41,675	\$37.69—\$50.00	\$1,828,000	26,375
Exercised in 1973	(7,225)	37.69— 45.38	(294,000)	—
Lapsed in 1973	<u>(2,425)</u>	37.69— 50.00	<u>(107,000)</u>	<u>2,425</u>
Outstanding at December 31, 1973				
Granted in 1969-1971	32,025	37.69— 50.00	1,427,000	28,800
Increase in 1974 in shares available for grant	—	—	—	70,000
Granted in 1974	56,875	26.88— 45.88	1,557,000	(56,875)
Exercised in 1974	(1,950)	37.69	(74,000)	—
Lapsed in 1974	<u>(10,825)</u>	37.69— 50.00	<u>(493,000)</u>	<u>10,825</u>
Outstanding at December 31, 1974				
Qualified—granted in 1970-1974	35,250	26.88— 50.00	1,204,000	
Non-qualified—granted in 1971-1974	40,875	26.88— 45.88	1,213,000	
Total	<u>76,125</u>	\$26.88—\$50.00	<u>\$2,417,000</u>	<u>52,750</u>

The approximate market values, at date of exercise, of options exercised in 1973 and 1974 were \$357,000, or \$49.41 per share, and \$91,000, or \$46.86 per share, respectively.

Note F—Pension Plans

The company has pension plans covering all of its full-time employees. Contributions were \$1,472,000 in 1974 and \$1,468,000 in 1973. Changes during 1974 in the actuarial cost method and actuarial assumptions used in computing pension costs for the company's Pension Plan for Day's Pay Employees and in benefits payable under the company's Retirement Plan for Salaried Employees did not have a significant impact on pension expense for the year. The actuarially computed value of vested benefits exceeded the total pension fund assets by approximately \$8,500,000 at December 31, 1974. The unfunded past service liability as of December 31, 1974, was estimated at approximately \$7,300,000.

Labor settlements reached in 1974 with unions representing hourly employees of the company call for substantial increases in pension benefits commencing July 1, 1975, and will result in an increase in annual pension expense of approximately \$1,000,000, with the increase in 1975 estimated to be approximately \$500,000. With regard to the application of the requirements of the Employee Retirement Income Security Act of 1974, which becomes effective as of January 1, 1976, the company does not anticipate a material increase in the cost of its pension plans.

Note G—Income Taxes

Examination of the company's federal income tax returns has been completed by the Internal Revenue Service through 1969. The Service has proposed adjustments for 1969 which would result in additional tax liability of approximately \$4,483,000, \$3,810,000 of which relates to the company's deduction for percentage depletion. The proposed adjustments are being contested and management, on the basis of advice of counsel, believes that the final determination will not have a material adverse effect upon the company's financial position. If upheld, the proposed adjustments also would have a continuing impact on the company's federal income tax liability for subsequent years, the precise effect of which cannot now be determined.

The company's effective tax rate is favorably affected by statutory depletion and investment tax credits. Income tax expense is summarized on page 12.

Note C—Plant and Equipment

	1974	1973
Plant and equipment:		
Balance at beginning of year	\$159,608,000	\$120,909,000
Additions (see page 12)	16,190,000	40,522,000
Retirements and sales	(1,446,000)	(1,823,000)
Balance at end of year	<u>174,352,000</u>	<u>159,608,000</u>
Analysis of balance:		
Fabricating	4,661,000	4,614,000
Smelting including acid plant	69,229,000	62,152,000
Mining and other	100,462,000	92,842,000
Total, as above	<u>174,352,000</u>	<u>159,608,000</u>
Accumulated depreciation:		
Balance at beginning of year	59,974,000	55,358,000
Depreciation charged operations	9,836,000	5,800,000
Depreciation charged pre-operating exploration and development	—	27,000
Retirements and sales	(810,000)	(1,211,000)
Balance at end of year	<u>69,000,000</u>	<u>59,974,000</u>
Analysis of balance:		
Fabricating	1,832,000	1,528,000
Smelting including acid plant	8,351,000	4,315,000
Mining and other	58,817,000	54,131,000
Total, as above	<u>69,000,000</u>	<u>59,974,000</u>
Plant and equipment, net	<u>\$105,352,000</u>	<u>\$ 99,634,000</u>

Note D—Mines, Mining Claims and Lands

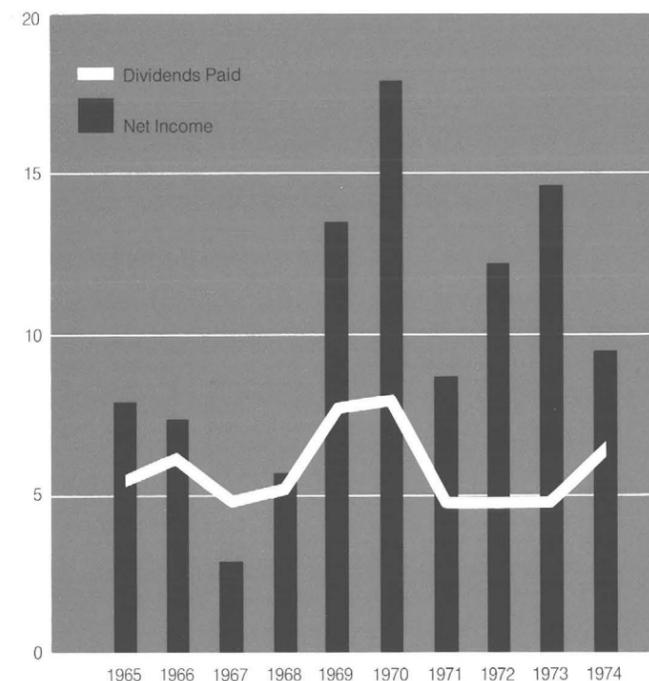
Mines, mining claims and lands:		
Balance at beginning of year	\$ 22,066,000	\$ 21,812,000
Additions	2,561,000	259,000
Deductions	(6,000)	(5,000)
Balance at end of year	<u>24,621,000</u>	<u>22,066,000</u>
Accumulated depletion:		
Balance at beginning of year	14,594,000	14,373,000
Depletion charged income	167,000	221,000
Balance at end of year	<u>14,761,000</u>	<u>14,594,000</u>
Mines, mining claims and lands, net	<u>\$ 9,860,000</u>	<u>\$ 7,472,000</u>

Note E—Stock Option Plan

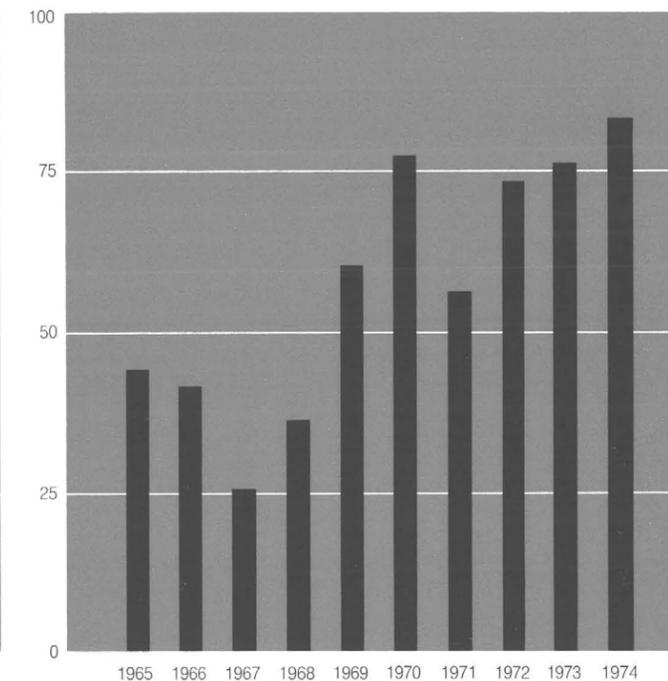
Options have been granted to officers and key employees to purchase common stock of the company under the 1969 Stock Option Plan. At the 1974 Annual Meeting, the stockholders of the company voted to amend the Plan extending its termination date from May 1, 1974, to May 1, 1979, and increasing the maximum number of shares that may be granted under the Plan from 70,000 to 140,000. Options may not be granted for less than 100 per cent of the market value of the shares on the date of the grant and are exercisable as to 50 per cent of the shares subject to option immediately after grant and are exercisable as to the remaining shares one year thereafter. The maximum term of qualified stock options and non-qualified stock options under the Plan is five years and ten years, respectively, from the date of grant. Details of transactions under the Plan for the last two years are as follows:

FINANCIAL REVIEW

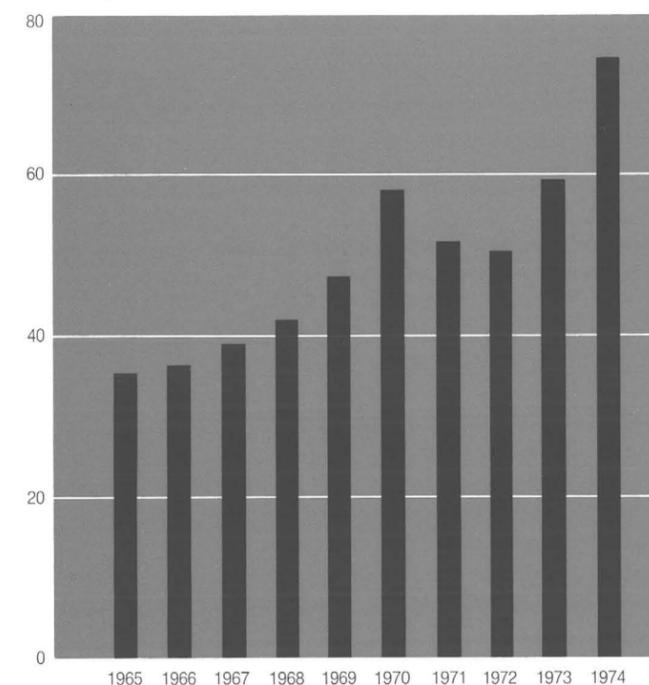
Net Income and Dividends Paid
Millions of Dollars



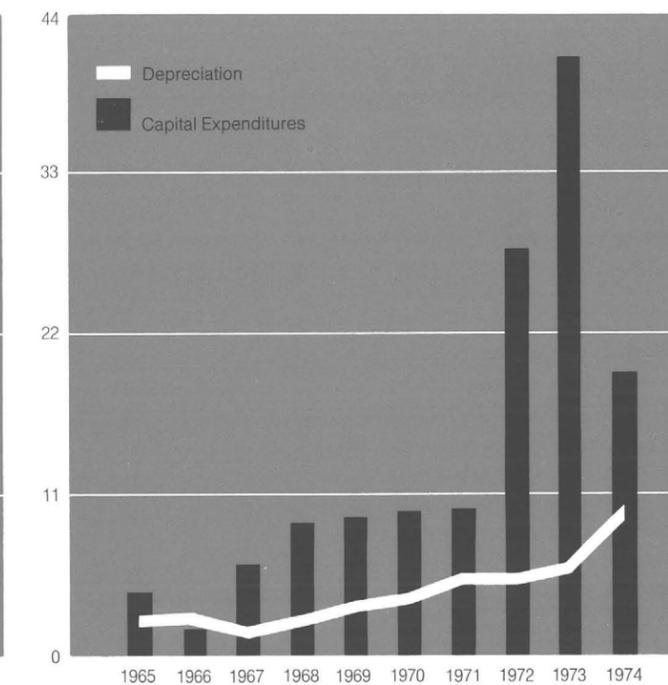
Proceeds from Deliveries of Copper
Millions of Dollars



Average Price per Pound
Cents per Pound



Capital Expenditures and Depreciation
Millions of Dollars



NOTES TO FINANCIAL STATEMENTS

Note A—Accounting PoliciesInventories of Metals and Supplies

Finished copper produced from company mines and certain supplies are carried on the last-in, first-out basis. By-products are carried at market. All other inventories are valued at average cost, not in excess of market.

Plant and Equipment

Plant and equipment are stated at cost. The company uses various depreciation methods, including unit-of-production and straight-line, in amounts sufficient to absorb the cost of assets over their estimated useful lives of from 5 to 30 years. Cost of property disposed of is deducted from the appropriate asset account. In the case of long-lived assets depreciated on a unit-of-production basis, the reserve for depreciation is reduced by such cost less proceeds of salvage; in all other cases net gain or loss on disposition is currently taken into income.

Expenditures for maintenance and repairs are expensed as incurred. Renewals or betterments which increase the value of the property are capitalized.

Mines, Mining Claims and Lands

Properties are stated at cost, a portion of which arose from issuance of capital stock at original par value. Depletion is computed separately for Inspiration area including the Ox Hide mine and for the Christmas mines at rates based on amortized cost of properties and ore reserves as estimated by company engineers.

The company makes no representation that the cost of mining properties indicates current values; that the allowance for depletion represents the depletion actually sustained to date; that the current year's deduction represents the decline, if any, in mine values attributable to the year's operations; or that depletion charges represent anything other than a general provision for amortization of cost of mines based on estimated recoverable content of ore reserves.

Income Recognition

Sales of copper are billed and taken into income on a physical delivery basis. Smelting and refining tolls which account for a significant portion of other operating revenue are taken into income when the related material is treated.

Mining Expenses

Mine exploration and development costs are expensed as incurred.

Pension Plan Costs

Annual pension costs include current cost and amortization of unfunded prior service costs over a 40-year period which started January 1, 1967. It is the company's policy to fund pension costs accrued.

Income Taxes

In addition to charging income for taxes estimated to be payable, the company provides for deferred income taxes resulting from timing differences between financial and taxable income. Depreciation on certain assets is computed using the straight-line method for financial reporting purposes and the double-declining-balance method for income tax purposes. Interest expense on funds borrowed for construction of pollution control facilities was capitalized during the construction period for financial reporting purposes and deducted currently for income tax purposes. No provision is made for differences resulting from statutory depletion. Tax credits realized on plant and equipment acquisitions are used currently to reduce the provision for federal income taxes (flow-through method).

Note B—Inventories

Inventories carried on the last-in, first-out basis aggregated \$1,398,000 at December 31, 1974, and \$939,000 at December 31, 1973. Replacement costs of such inventories would have been \$3,967,000 and \$2,611,000 respectively. Opening and closing inventories used in determining cost of copper delivered for the two years ended December 31, 1973 and 1974, were \$3,970,000, \$5,265,000 and \$11,785,000, respectively. Inventories of metals are summarized on page 12.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF THE SUMMARY OF EARNINGS

Comments on deliveries and costs are included in other segments of this report. Please refer to the Income Statement presentation in the Ten-Year Review (pages 18 and 19) in connection with the following comments on changes in income.

1973 vs. 1972

Other operating revenue increased \$1,366,000 due primarily to higher silver and gold prices and greater revenue from the sale of copper recovered from concentrates purchased from other producers.

Interest and other income rose \$432,000 as a result of increased investments in short-term marketable securities.

Exploration and metallurgical research expenditures were higher by \$529,000 due to expanded exploration in Alaska.

Selling and general administrative expense increased \$265,000, primarily due to higher salaries.

Depreciation was \$704,000 higher, resulting from increased capital investment in mining equipment and crushing facilities.

Income taxes included investment tax credits of \$698,000 in 1972 and \$3,952,000 in 1973. Before these credits, income taxes were lower in 1973, reflecting decreased income before such taxes.

1974 vs. 1973

Other operating revenue increased \$1,585,000 because of higher silver and gold prices and greater revenues from toll smelting for other producers.

Interest and other income increased \$314,000, reflecting higher short-term interest rates.

Taxes, other than income taxes increased \$975,000 because of higher Arizona severance and property taxes.

Exploration and metallurgical research expenses increased \$927,000, reflecting expanded exploration activities in the western United States.

Interest expense on funds borrowed for construction of pollution control facilities was first charged to expense in 1974. During the construction period which ended December 31, 1973, interest of \$2,524,000 was capitalized as part of the pollution control facilities and is being amortized over the useful lives of these facilities.

Depreciation was \$4,036,000 higher, of which \$3,440,000 was applicable to new pollution control facilities which the company began depreciating in 1974.

Income taxes included investment tax credits of \$3,952,000 in 1973 and \$896,000 in 1974. Before these credits, income taxes were lower in 1974, reflecting decreased income before such taxes.

SALES PRICES OF COMMON STOCK

	1973				1974			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
High	52½	51½	45⅝	44⅞	49¼	49	40½	31⅞
Low	45½	38	34½	35½	40⅞	38½	25¼	25¼

December 31

INVENTORIES OF METALS

	1974	1973
Copper:		
Finished	\$ 1,105,000	\$ 540,000
In-process	5,649,000	2,115,000
Purchased materials	4,724,000	1,804,000
By-products	307,000	806,000
	<u>\$11,785,000</u>	<u>\$ 5,265,000</u>

CAPITAL EXPENDITURES

	1974	1973
Plant and Equipment:		
Smelter: Pollution control facilities including acid plant	\$ 6,879,000	\$32,995,000
Other facilities	219,000	124,000
Mines	5,376,000	5,274,000
Willow Springs leaching project	1,447,000	692,000
Water supply systems	691,000	58,000
Crushers and conveyors	438,000	290,000
Leaching plant and refinery	170,000	86,000
Rod plant	128,000	37,000
Tailings lines and dams	25,000	251,000
Concentrator	21,000	232,000
Other	796,000	483,000
	<u>16,190,000</u>	<u>40,522,000</u>
Mines, Mining Claims and Lands	2,561,000	259,000
Total Capital Expenditures	<u>\$18,751,000</u>	<u>\$40,781,000</u>

TAXES

	1974	1973
Income Taxes:		
Current—Federal	\$ 2,747,000	\$ 2,512,000
Less investment tax credit	(526,000)	(3,952,000)
—State	899,000	773,000
Deferred (including 1974 investment tax credit of \$370,000)	(1,544,000)	1,311,000
	<u>1,576,000</u>	<u>644,000</u>
Other Taxes:		
Property	2,450,000	2,201,000
Sales and severance	2,759,000	2,209,000
Social security and unemployment	1,541,000	1,369,000
Miscellaneous	18,000	14,000
	<u>6,768,000</u>	<u>5,793,000</u>
Total Taxes	<u>\$ 8,344,000</u>	<u>\$ 6,437,000</u>

STATEMENT OF INCOME

	1974	1973
Deliveries of copper	\$83,123,000	\$76,774,000
Other operating revenue	14,190,000	12,605,000
Interest and other income	1,134,000	820,000
	<u>98,447,000</u>	<u>90,199,000</u>
Costs, other than those shown separately below—note B	62,330,000	58,878,000
Taxes, other than income taxes	6,768,000	5,793,000
Exploration and metallurgical research	3,697,000	2,770,000
Selling and general administrative expense	1,521,000	1,492,000
Interest expense—note I	3,083,000	—
Depreciation—note C	9,836,000	5,800,000
Depletion—note D	167,000	221,000
	<u>87,402,000</u>	<u>74,954,000</u>
Income before income taxes	11,045,000	15,245,000
Income taxes—note G	1,576,000	644,000
Net income	<u>\$ 9,469,000</u>	<u>\$14,601,000</u>
Net income per share*	<u>\$3.92</u>	<u>\$6.05</u>

*Based on weighted average number of shares outstanding, exclusive of stock held in treasury.

STATEMENT OF INCOME RETAINED

	1974	1973
Income retained—at beginning of year, as previously reported	\$60,402,000	\$50,630,000
Prior period adjustment related to settlement of excavator-collapse litigation—note J	748,000	748,000
Income retained—at beginning of year, as restated	61,150,000	51,378,000
Net income	9,469,000	14,601,000
	<u>70,619,000</u>	<u>65,979,000</u>
	Per Share	
	1974	1973
Dividends paid		
March	\$0.65	\$0.50
June65	.50
September65	.50
December65	.50
Total	<u>\$2.60</u>	<u>\$2.00</u>
Income retained at end of year—note H	<u>\$64,336,000</u>	<u>\$61,150,000</u>

See notes to financial statements.

BALANCE SHEET	December 31	
	1974	1973*
ASSETS		
Current Assets:		
Cash	\$ 3,322,000	\$ 3,305,000
Time deposits	—	2,000,000
Marketable securities, at cost approximating market	3,550,000	17,844,000
Accounts receivable	9,119,000	12,999,000
Inventories of metals—note B	11,785,000	5,265,000
Supplies—note B	9,481,000	5,927,000
Prepaid expenses—note I	1,941,000	135,000
	<u>39,198,000</u>	<u>47,475,000</u>
Investments and advances, at cost or less	1,586,000	1,403,000
Patents and licenses, less amortization	5,000	87,000
Plant and equipment, net—note C	105,352,000	99,634,000
Mines, mining claims and lands, net—note D	9,860,000	7,472,000
	<u>\$156,001,000</u>	<u>\$156,071,000</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities:		
Current portion of long-term liabilities—note H	\$ 5,854,000	\$ 5,811,000
Accounts payable	5,734,000	4,268,000
Accrued taxes—note G	4,317,000	3,140,000
Other accrued liabilities	1,040,000	2,016,000
	<u>16,945,000</u>	<u>15,235,000</u>
Long-term liabilities—note H	46,301,000	49,797,000
Deferred taxes—note G	1,547,000	3,091,000
Total Liabilities	<u>64,793,000</u>	<u>68,123,000</u>
Stockholders' Equity:		
Preferred stock without par value		
Authorized 1,000,000 shares; none issued		
Common stock—note E		
Authorized 7,500,000 shares of \$1 par value		
Issued 2,439,059 shares (1974); 2,437,109 shares (1973)	2,439,000	2,437,000
Capital in excess of par value	25,277,000	25,205,000
Income retained—note H	64,336,000	61,150,000
	<u>92,052,000</u>	<u>88,792,000</u>
Less: cost of 22,200 shares of common stock held in treasury	844,000	844,000
Total Stockholders' Equity	<u>91,208,000</u>	<u>87,948,000</u>
	<u>\$156,001,000</u>	<u>\$156,071,000</u>

*Restated to reflect prior years' adjustment of retained earnings related to settlement of excavator-collapse litigation.

See notes to financial statements.

STATEMENT OF CHANGES IN FINANCIAL POSITION	1974	1973
NET CURRENT ASSETS—AT BEGINNING OF YEAR	\$32,240,000*	\$24,083,000*
Source of working capital:		
Net income	9,469,000	14,601,000
Add—Charges not affecting working capital in the current period:		
Depreciation—note C	9,836,000	5,827,000
Depletion—note D	167,000	221,000
Deferred taxes—note G	(1,544,000)	1,311,000
Working capital provided from operations	17,928,000	21,960,000
Proceeds from sale of common stock	74,000	294,000
Proceeds from sale of equipment	635,000	476,000
Loans for pollution control facilities—note H	—	26,000,000
Advances from toll customers for pollution control facilities—note H	284,000	10,545,000
Other additions to long-term liabilities—note H	1,396,000	—
Other	87,000	303,000
Total	<u>20,404,000</u>	<u>59,578,000</u>
Application of working capital:		
Dividends paid	6,283,000	4,829,000
Capital expenditures	18,751,000	40,781,000
Reduction of long-term liabilities	5,174,000	5,811,000
Investments—net	183,000	—
Total	<u>30,391,000</u>	<u>51,421,000</u>
Increase (decrease) in working capital	<u>(9,987,000)</u>	<u>8,157,000</u>
NET CURRENT ASSETS—AT END OF YEAR	<u>\$22,253,000</u>	<u>\$32,240,000</u>
ANALYSIS OF CHANGES IN WORKING CAPITAL		
Increase (decrease) in current assets:		
Cash and time deposits	\$(1,983,000)	\$(1,773,000)
Marketable securities, at cost approximating market	(14,294,000)	7,291,000
Accounts receivable	(3,880,000)	5,968,000
Inventories of metals—note B	6,520,000	1,295,000
Supplies—note B	3,554,000	1,475,000
Prepaid expenses—note I	1,806,000	(104,000)
	<u>(8,277,000)</u>	<u>14,152,000</u>
(Increase) decrease in current liabilities:		
Current portion of long-term liabilities—note H	(43,000)	(5,690,000)
Accounts payable	(1,466,000)	(568,000)
Accrued taxes—note G	(1,177,000)	932,000
Other accrued liabilities	976,000	(669,000)
	<u>(1,710,000)</u>	<u>(5,995,000)</u>
Increase (decrease) in working capital	<u>\$(9,987,000)</u>	<u>\$ 8,157,000</u>

*Restated to reflect prior years' adjustment of retained earnings related to settlement of excavator-collapse litigation.

See notes to financial statements.

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

April 8, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

Enclosed is a copy of a reconnaissance report on the Sanchez copper property near Safford, Arizona, prepared from data obtained from the Inspiration Consolidated Copper Company, the owners, at the Inspiration offices, and on a quick visit to the claims on April 4th.

As expected, there is a substantial tonnage of low grade copper bearing material, both in oxide (0.36% Cu) and sulphide (0.45% Cu) form, indicated by drilling done to date. There has been extensive exploration since my visit to the property several years ago, and development of large tonnages of 1.0% copper sulphide ores, which could have been projected at that time, are not now to be expected in the areas tested. The sulphide ore possibilities have not yet been fully explored, and there are very long chances for good grade sulphide ores related to a small breccia pipe structure exposed at surface northwest of the Carpenter Shaft.

I am impressed with the indicated reserve tonnages, good possibilities for additional sulphide mineral development, and projections of future, very profitable operations at increased copper prices. If the Mining Department of National Bulk Carriers is similarly impressed, negotiations for an option arrangement could be started with Inspiration officials at the corporate headquarters at Morristown, New Jersey. Mr. Richard H. Hyde is president of the company, and Mr. H. Myles Jacob is board chairman.

I was told at Inspiration on April 2nd, by one of the local officials of the company, that W. R. Grace & Co. had just made an offer on the Sanchez property. Later, I learned informally that the offer was for a joint venture agreement, similar to that made with Union Pacific Mining Company in 1973-74.

As outlined in a Union Pacific report, on file at Inspiration, the agreement provided that Union Pacific would provide 60% of the first \$19.1 million in capital costs in order to reimburse Inspiration for the after tax effects of their investment of \$5,231,000 to that date. Additional capital costs would be supplied at 49% by Union Pacific; Inspiration would retain control, act as the operator, and pay 51% of further costs.

From the Union Pacific figures, it can be estimated that Inspiration now has about \$5,650,000 in the property, and is obligated for the 1975 expenditures of about \$129,456 for property payments and \$36,800 for assessment work. The Union Pacific letter-of-intent agreement provided

for an extended examination period and an opportunity to check earlier drill hole results by drilling. Six holes were drilled; comparisons satisfied Union Pacific engineers that the Inspiration work had been accurately done. All Union Pacific projections were based upon copper at 56¢ per pound, and calculations showed profitable operations with a reasonable payout period. The agreement is reported to have been terminated when Union Pacific proposed changes in the terms, and Inspiration refused.

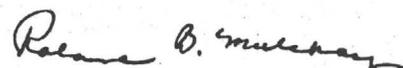
Off the record, Inspiration is now badly in need of cash, and is threatened with an active takeover attempt by the Crane Company. Inspiration has been seeking cash through sale of treasury stock in an amount equal to about 10% of the 2,439,059 shares issued; 22,200 shares are held in the treasury. Several organizations have been invited to make an overall review of the Inspiration ore reserve position and future prospects for consideration of such a purchase. Homestake engineers have recently conducted a review at Inspiration. At first glance, a stock purchase might be attractive, as the Inspiration ore reserves are reported very large and the Christmas property should eventually be a large low grade copper operation. Anaconda holds about 28% of Inspiration stock, and the Inspiration management undoubtedly feels that with another 10% in friendly hands, a takeover attempt would not be successful.

Inspiration has had, in recent years, more than its share of technical operating difficulties. The necessity for elimination of air pollutants at the old smelter caused the erection of a largely untested, new electric smelting furnace which has been plagued by many breakdowns. The great expenditure at the new smelter plus the lower production caused by the delays and decreased copper prices have brought on a very difficult period for the Company. It is my belief that all available competent staff will be needed to manage Inspiration and future Christmas operations. For that reason, it is suggested that any agreement reached on the Sanchez should vest control with National Bulk, and operations be divorced from Inspiration supervision.

As the total pounds of copper indicated at Sanchez are substantial, a type of joint venture agreement might be the only feasible approach. Possibly the offer of a loan to Inspiration of an amount approaching its investment in the Sanchez property might be sufficient to influence an advantageous agreement, at this time, for future exploitation of the Sanchez reserve. Such an agreement might provide that, if a third party entered as the operator, such as a well financed Canadian or international group, both National Bulk and Inspiration would sell equivalent percentages of their interests to the proposed third party.

The local Inspiration management was most cooperative, and made the very comfortable guest house available during my visit. Mr. Jack Eastlick, resident geologist at Inspiration, supplied all of the information in reports and maps, and accompanied me to the property on April 4th.

Yours very truly,


Roland B. Mulchay

Report on
RECONNAISSANCE EXAMINATION

SANCHEZ COPPER PROPERTY

Graham County, Arizona

Owned by

Inspiration Cons. Copper Company

INTRODUCTION

The information contained in the following report was obtained from incomplete examination of reports, drill records and maps at the offices of the Inspiration Consolidated Copper Company at Inspiration, Arizona from March 31 to April 5, 1975, and during a brief visit to the Sanchez property on April 4th. About ten years ago the prospect was visited by the writer, and then available drilling data were reviewed.

LOCATION AND PHYSICAL FEATURES

The Sanchez copper property is located in the Lone Star Mining District, Graham County, Arizona, about eleven miles by road northeast of Safford. The claims are situated in Sections 25, 26, 35 and 36, Township 6 South, Range 27 East, Salt River Base Line.

Safford is a thriving agricultural community of about 6000 people in the Gila River valley. The town is on Highway 60 - 70, and is served by the Bowie - Globe branch of the Southern Pacific Railroad. A siding at Solomonville, east of Safford, and about nine miles from the property, would be available for freight shipments.

The claims are located near the southerly end of the Gila Mountains in rolling topography with higher basalt covered hills to the east and north. The present surface at about the 3200 ft. elevation is some 150 ft. above the Gila River valley elevation, and about one mile north of the valley boundary.

Climate may be classed as temperate although high temperatures are common in summer; there would be no ordinary interruption of year round operations. Rainfall is about 8.5 inches per year; there is sparse desert type vegetation. Adequate water supply is reported available from wells in the valley at the Grijalva farm and the state lease. A power line reaches the property, and a power supply for a large operation is reported available. There is no nearby source of timber. Supplies for mining operations would come from Tucson, Arizona and El Paso, Texas. Safford would be the residence for employees, though housing is reported scarce.

The road from Safford passes the hard surface Safford airfield where air - radio communications are installed. A gravelled airstrip has also been established at the property.

There is no equipment in the mine area, and only limited material at the test leaching site. An adequate office building for exploratory work

is located near the river. Good graded roads reach all parts of the property. Core from the drill holes is stored in two old buildings near the river.

HISTORY AND RECENT DEVELOPMENTS

Prospecting and very small scale copper ore production have been in progress at the Sanchez property since 1899. In 1964, Harpoon, Inc., a subsidiary of United Nuclear, started active exploration of the area, and in 1969 the property was acquired by Inspiration Consolidated Copper Company, which has corporate headquarters at Morristown, N. J., and mining operations at Inspiration and Christmas, Arizona. Except for continuing advance royalty payments on the Carpenter lease, by the end of 1975 almost all property payments will have been completed by Inspiration.

The Lone Star district will be the next large scale mining center in Arizona. In the late 1950's Phelps Dodge Corporation started exploration in an area about nine miles northwest of the Sanchez, and has had outstanding success. Two deep shafts and connecting crosscuts are now being driven to test drilling results, and to prepare a large underground mining project for production. Reserves are reported by that company to be 400 million tons of 0.72% copper; it is stated informally that a substantial part of this reserve will average 1.0% copper.

About five miles northeast of the Sanchez, since 1955 Kennecott Copper has explored and partly developed a very large, mixed oxide - sulphide copper deposit. It is reported that Kennecott will re-evaluate this deposit since the success by Phelps Dodge in deeper exploration.

Essex International and Towne Mining are also now conducting drilling exploration projects in the district.

In 1973-74 Union Pacific Mining Company by letter of intent arranged an option period on the Sanchez ground which would have developed into a joint venture agreement with Inspiration. Six holes were drilled to check Inspiration results, and the project was recommended by Union Pacific geologists. Modifications of the original agreement were sought by Union Pacific; rejection by Inspiration brought abandonment of the agreement.

Data on the Sanchez has recently been reviewed by Kennecott, Homestake, Phelps Dodge and W. R. Grace. The Homestake review was perfunctory as regards Sanchez; principal emphasis was upon investment in Inspiration itself. W. R. Grace is reported to have made an offer for a joint venture agreement on April 2nd.

PROPERTY

By purchase and location, Inspiration holds 368 unpatented claims, of which 16 are being presented for patent. There are also 200 millsite claims which cover some lode locations; these locations will be dropped when the millsites are patented. Eighty nine acres of valley land are being purchased from Mr. P. Grijalva on small yearly payments (\$12,000 plus interest to be

paid after 1975), and 240 acres are held on a state commercial lease in the valley. Ten acres are leased from Mr. M. Sanchez.

Assessment work aggregating \$36,800 must be done in 1975; that under the provisions of the Carpenter lease should be accomplished by June 30, 1975 and the remainder by September 30th. Property payments, including the Carpenter lease advance royalty, amount to \$129,456 for 1975.

The Carpenter lease provides for a royalty of \$0.007 per pound of copper produced, or a minimum advance of \$100,000 per year. The Grijalva payments are at the rate of \$3,000 per year.

GENERAL GEOLOGY

In the Lone Star district an older series of volcanic rocks, largely andesitic tuffs and agglomerates, are overlain by recent basalts and associated late volcanics. Quartz monzonite intrusive stocks and dikes, and closely related, slightly younger, fine grained acid intrusive rocks cut irregularly through the older volcanic series. The ore deposits appear to be closely related to the quartz monzonite and later intrusives.

SANCHEZ PROPERTY

At Sanchez, dikes and stock--like masses of coarse, biotite-rich quartz monzonite porphyry cut steeply through the andesites. Late, narrow dike-like acid intrusives, probably rhyolitic, cut both quartz monzonite and andesites, and appear related to irregular pebble-dike type breccias which cut monzonite and andesites, often near the contacts. Although the geologic notes on the drill holes are not specific, stronger mineralization may have occurred near these breccias.

About 250 ft. northwest of the Carpenter shaft at surface, there is a poorly exposed breccia, possibly part of a breccia pipe structure, about 75 by 100 ft. in area; the southern extension is covered by recent alluvium. Three drill holes, E-1, 401 and 403 in the immediate area of this breccia, contain much stronger copper values than generally cut in the other drill holes. The breccia has been cut on the Carpenter shaft 200 level, and large boulders of it can be seen in the stockpile at the leach test area. Fragments of coarse quartz monzonite are engulfed in fine grained, dense, gray, probably rhyolitic rock with fine quartz phenocrysts. Both rock types are weakly brecciated, and sealed with irregular iron oxides, some quartz, and erratic copper oxide minerals. The fine grained rocks are cut locally by six inch stringers of glassy quartz with prominent lacing of oxide copper seams. The downward extension of this possible breccia pipe structure has not been delimited.

As indicated by steep drill holes at Sanchez, thick, but highly variable, zones of oxide copper minerals with prominent iron oxides are cut near surface and extend to depths of more than 1200 ft. The principal copper oxide minerals reported are chrysocolla ($\text{CuSiO}_3 \cdot 2 \text{H}_2\text{O}$) with considerable tenorite (CuO), and some malachite, cuprite and chalcantinite. A zone of

strong native copper often occurs near the base of the oxide section, and suggests there may have been late oxidation of a previously secondarily enriched chalcocite (Cu_2S) zone.

Recent faulting, probably of relatively small displacement, appears to have influenced near surface oxidation, and may offset both oxide and underlying sulphide mineral zones.

Below the oxide copper sections there are localized strong sulphide copper minerals in seams and disseminations associated with pyrite. The sulphides are generally of primary origin and include chalcopyrite, prominent bornite, and little molybdenite. Quartz occurs in seams with the sulphides, and there are numerous late calcite seams. A few drill holes show some chalcocite enrichment below the oxide zone. Additional exploration may disclose more of this type of mineral than indicated to date.

There is a small, but possibly important, gold and silver content indicated by incomplete assay data, but mineral relationships have not been determined.

Distribution of alteration zones is masked by the intense oxidation features, and has not been clearly developed. There is some evidence of an outer chlorite zone with pyrite; clay alteration and sericite are noted, but the limits are not defined. Strong, second stage fine biotite is widely distributed but, again, the limits are not determined. Although late biotite alteration has not been widely described in the geologic literature on copper deposits, it is an important and prominent alteration feature at El Teniente in Chile; at Pachon, Argentina; at Cananea and Nacozari in Mexico, and at Ray in Arizona. It is not unlikely that much of the intense sericite alteration described at various large copper districts is the result of breakdown of second stage biotite.

Much of the Sanchez surface, and partly over the presently recognized copper metallization, is covered by recent alluvium to the south and west and by basalt on the higher hills to the east. There are thus possibilities that separate areas of intrusive activity, mineralization and brecciation may be concealed in the vicinity.

DRILLING AND DEVELOPMENT

At Sanchez, exploration and development have been by the Carpenter shaft and a short underground level at 200 ft. below surface, which could be easily made accessible, and by steep diamond drill holes. To date 133 holes have been drilled, some to depths of more than 2000 ft. The deeper holes have been surveyed, and some show wide variations from the vertical. Many holes have not been surveyed; geologic and assay data are very difficult to interpret in these sections.

The holes total more than 200,000 ft. in length. Core recovery has been very good, and checks made by Union Pacific geologists indicated assaying and sample preparation had been done competently. Most of the core is reported

to be available for review.

In the early drilling programs emphasis was placed on oxide copper development. More recently, increased attention has been given to underlying sulphide copper possibilities. Several old holes have been deepened and others drilled into the sulphide zone. It does not appear that the sulphide possibilities have yet been fully explored, laterally or at depth.

INDICATED RESERVE TONNAGES

OXIDE COPPER

Computer designed open pit models prepared by Inspiration indicate 79,363,000 tons @ 0.36% oxide copper could be mined from an open pit with a 1.49:1 waste to ore stripping ratio; 0.2% copper was used as a cutoff grade.

A careful check of these calculations was made by Union Pacific geologists and their outside consultants. Three particular benches were selected and reserve blocks were individually calculated. Using the Union Pacific figures for the benches, extrapolation to the Inspiration design would have shown a total of 86,000,000 tons at 0.35% copper.

A later independent estimate by Union Pacific and consultants developed a new oxide pit design which showed a total of 116,000,000 tons at 0.368% oxide copper, and a stripping ratio of 1.8:1; a 0.2% copper cutoff was also used.

A recent computer study of better grade oxide reserves, directed to estimate a tonnage of better grade material, showed a total of 30,520,000 tons at 0.50% oxide copper between the 3200 and 2700 elevation benches. Most of this reserve would fall within the limits of the designed pit. Thus, an operation could be started on better grade material to amortize plant and stripping costs more rapidly than by use of calculated average grade reserves.

SULPHIDE COPPER

The Inspiration geological department, using available sulphide data, has calculated a sulphide reserve on benches from 2600 to 900 ft. elevation, without regard to open pit design, which showed a total of 52,737,000 tons at 0.45% copper, using a 0.3% copper cutoff. They believe that this indicated reserve might be greatly increased by further exploration. Probably much of this tonnage would not be available for open pit extraction.

There is an appreciable low grade gold and silver content shown by scattered analysis of copper samples. Statistical analysis by Inspiration indicates that this may average 0.007 oz. gold per ton, and 0.085 oz. silver per ton. The assay data is incomplete, and the mineral relationships are unknown. However, it appears that an important credit in precious metals might be recovered from the sulphide ores. It is unlikely that such credit would be obtained in a leaching operation. Data on the molybdenum content is inconclusive, and the possible molybdenum recovery may not be sufficient to deserve consideration.

METALLURGY

Inspiration has conducted bulk sulphuric acid leaching tests at the property on the oxide materials. A start was made with straight heap leaching; this was modified by tests of leaching techniques developed at Mangula, Rhodesia, which were considered successful.

In the leaching tests, material obtained from the Carpenter 200 level, with some surface material, was blended to obtain a grade of 0.36% oxide copper, and crushed to $\frac{1}{2}$ mesh. Fines were removed. Tests were initially on small lots, but finally a 5000 ton lot was leached on a specially constructed concrete pad with asphalt facing. After a 21 day leach period, a 61% recovery was obtained. In this process, copper would be removed from the leach solutions by solvent extraction, as determined by tests by General Mills, followed by electro-winning to cathode copper. The abundant sulphuric acid now being made by copper smelters in the Southwest should insure supply of this reagent at reasonable cost in the future.

The writer believes that additional testing, with probably indicated increased plant investment, would show substantially better recoveries at costs which would be economic. The Union Pacific investigation in 1973-74 indicated the Inspiration test leaching operation would be economic at 56¢ copper.

CONCLUSIONS AND RECOMMENDATIONS

The impressive indicated low grade copper reserve at the Sanchez property, much of which would be available for low cost, open pit mining operations, deserves close consideration as a future economic resource. In the expectation that the price of copper, during the projected twenty year life of the enterprise at 20,000 tons per day and a start-up date some years in the future, will be at least from 20 to 30% higher than the present 63¢ price, the exploitation of the Sanchez deposit could be a very profitable venture.

Present exploration has not eliminated chances for substantial increases in low grade sulphide reserves. There are very long chance possibilities for discovery of higher grade primary ores related to the small breccia exposed at surface and partly explored by three drill holes. This area could be further explored by deep, inclined holes from surface.

If satisfactory business arrangements can be made with the Inspiration Company, it is recommended that a joint venture agreement be made with provision for an option period for a geological examination of drill records and cores, and additional drilling. If these investigations have favorable results, further metallurgical testing would be in order.

Palmer O. Mulhany

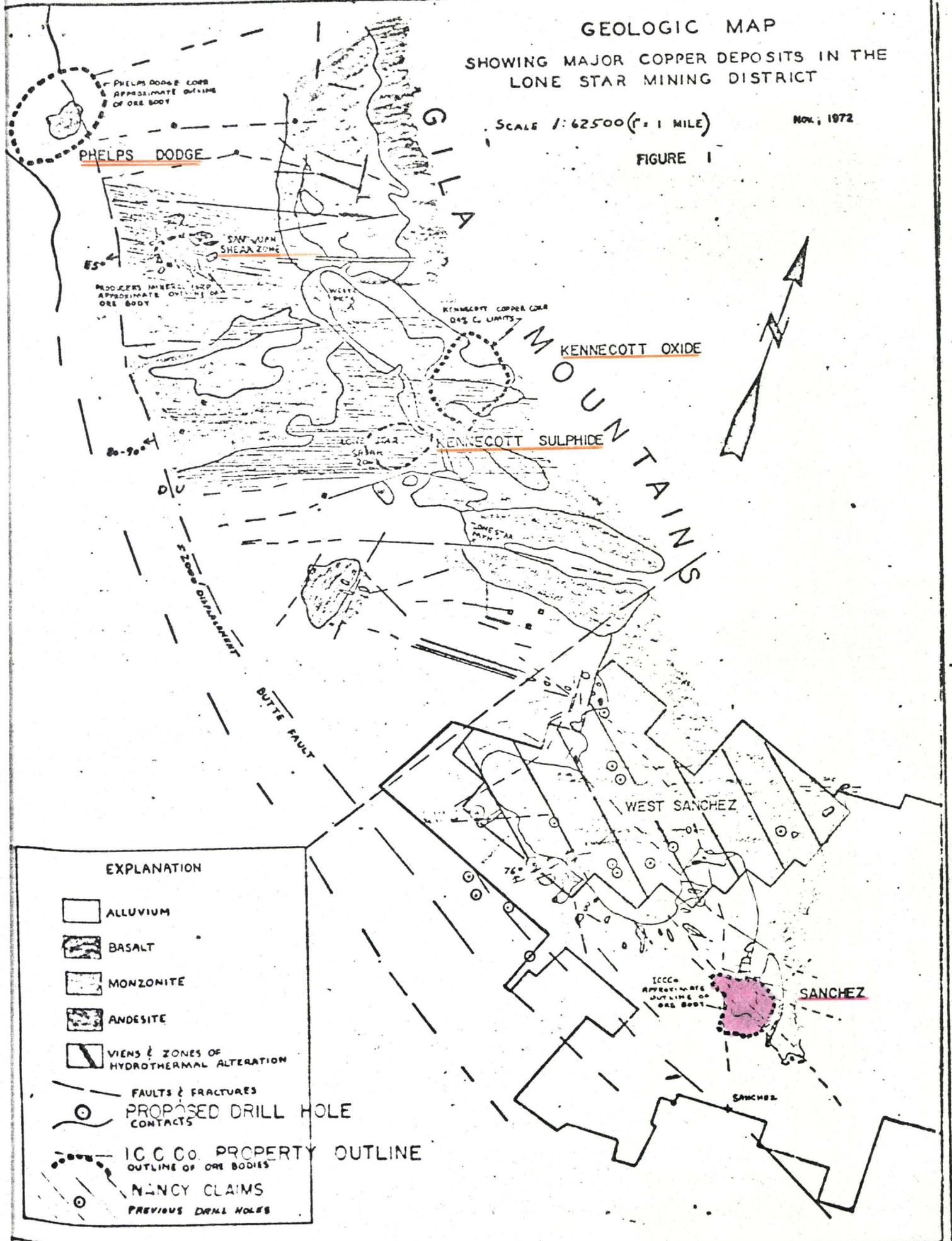
GEOLOGIC MAP

SHOWING MAJOR COPPER DEPOSITS IN THE LONE STAR MINING DISTRICT

SCALE 1:62500 (1" = 1 MILE)

Nov., 1972

FIGURE 1



EXPLANATION

-  ALLUVIUM
-  BASALT
-  MONZONITE
-  ANDESITE
-  VEINS & ZONES OF HYDROTHERMAL ALTERATION

FAULTS & FRACTURES
 PROPOSED DRILL HOLE
 CONTACTS

ICCC Co. PROPERTY OUTLINE

NANCY CLAIMS
 PREVIOUS DRILL HOLES

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

April 8, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

Enclosed is a copy of a reconnaissance report on the Sanchez copper property near Safford, Arizona, prepared from data obtained from the Inspiration Consolidated Copper Company, the owners, at the Inspiration offices, and on a quick visit to the claims on April 4th.

As expected, there is a substantial tonnage of low grade copper bearing material, both in oxide (0.36% Cu) and sulphide (0.45% Cu) form, indicated by drilling done to date. There has been extensive exploration since my visit to the property several years ago, and development of large tonnages of 1.0% copper sulphide ores, which could have been projected at that time, are not now to be expected in the areas explored. The sulphide ore possibilities have not yet been fully explored, and there are very long chances for good grade sulphide ores related to a small breccia pipe structure exposed at surface northwest of the Carpenter Shaft.

I am impressed with the indicated reserve tonnages, good possibilities for additional sulphide mineral development, and future-projections of future, very profitable operations at increased copper prices. If the Mining Department of National Bulk Carriers is similarly impressed, negotiations for an option arrangement could be started with Inspiration officials at the corporate headquarters at Morristown, New Jersey. Mr. Richard H. Hyde is ~~chairm-~~ president of the company, and Mr. H. Myles Jacob is board chairman.

at Inspiration
I was told on April 2nd, by one of the local officials of the company that W. R. Grace & Co. had just made an offer on the Sanchez property. Later, I learned informally that the offer was for

a joint venture agreement, similar to that made with Union Pacific Mining Company in 1973-74.

As outlined in a Union Pacific report, on file at Inspiration, the agreement provided that Union Pacific would provide 60% of the first \$19.1 million in capital costs in order to reimburse Inspiration for the after tax effects of their investment of \$5,231,000 to that date. Additional capital costs would be supplied at 49% by Union Pacific; Inspiration would retain control, act as the operator, and pay 51% of further costs.

From the Union Pacific figures, it can be estimated that Inspiration now has about \$5,650,000 in the property, and is obligated for the 1975 expenditures of about \$129,456 for property payments and \$36,800 for assessment work. The Union Pacific letter-of-intent agreement ^{provided} for an extended examination period and an opportunity to check earlier drill hole results by drilling. Six holes were drilled; comparisons satisfied Union Pacific engineers that the Inspiration work had been accurately done. All Union Pacific projections were based upon copper at 56¢ per pound, and calculations showed profitable operations with a reasonable payout period. The agreement is reported to have been terminated when Union Pacific proposed changes in the terms ~~of the agreement~~, and Inspiration refused.

Off the record, Inspiration is now badly in need of cash, and is threatened with an active takeover attempt by the Crane Company. Inspiration has been seeking cash through sale of treasury stock in an amount equal to about 10% of ~~that-outstanding-~~ issued; 22,200 shares are held in the treasury. Several organizations have been invited to make an overall ^{review} of the Inspiration ore reserve position and future prospects for consideration of such a purchase. Homestake ^{engineers} have recently conducted a review at Inspiration. At first glance, a stock purchase might be attractive, as the Inspiration ore reserves are reported very large, and

the Christmas property should eventually be a large low grade copper operation. Anaconda holds about 28% of Inspiration stock, and the Inspiration management undoubtedly feels that with another 10% in friendly hands, a takeover attempt would not be successful.

Inspiration has had, in recent years, more than its share of technical operating difficulties. The necessity for elimination of air pollutants at the old smelter caused the erection of a largely ^{new} untested electric smelting furnace which has been plagued by many breakdowns. The great expenditure at the new smelter plus the lower production caused by the ^{delays} ~~breakdowns~~ and decreased copper prices have ~~brought on~~ ^{caused} a very difficult period for the Company. It is my belief that all available competent staff will be needed to manage Inspiration and future Christmas operations. For that reason, it is suggested that any agreement reached on the Sanchez should vest control with National Bulk, and operations be divorced from Inspiration supervision.

As the total pounds of copper indicated at Sanchez are substantial, a type of joint venture agreement might be the only feasible approach. Possibly the offer of a loan to Inspiration of an amount approaching its investment in the Sanchez property might be sufficient to influence an advantageous agreement, at this time, for future exploitation of the Sanchez reserve. Such an agreement might provide that, if a third party were entered as the operator, such as a well financed Canadian or international group, both National Bulk and Inspiration would sell equivalent percentages of their interests to the proposed ~~third~~ party.

The local Inspiration management was most cooperative, and made the very comfortable guest house available during my visit. Mr. Jack Eastlick, resident geologist at Inspiration, supplied all of the information in reports and maps, and accompanied me to the property on April 4th.

Yours very truly

Roland B. Mulchay

REPORT ON
RECONNAISSANCE EXAMINATION
SANCHEZ COPPER PROPERTY
GRAHAM COUNTY, ARIZONA
OWNED BY
~~OF~~ INSPIRATION CONS. COPPER COMPANY

INTRODUCTION

The information contained in the following report was obtained from incomplete examination of reports, drill records and maps at the offices of the Inspiration Consolidated Copper Company at Inspiration, Arizona from March 31 to April ⁵ 6, 1975, and during a brief visit to the Sanchez property on April ⁴ 5th. About ten years ago the prospect was visited by the writer, and then available drilling data was reviewed.

LOCATION AND PHYSICAL FEATURES

The Sanchez copper property is located in the Lone Star Mining District, Graham County, Arizona, about eleven miles by road northeast of Safford. The claims are situated in Sections 25, 26, 35 and 36, Township 6 South, Range 27 East, Salt River Base Line.

Safford is a thriving agricultural community of about 6000 people in the Gila River valley. The town is on Highway 60 - 70, and is served by the Bowie - Globe branch of the Southern Pacific Railroad. A siding at Solomonville, east of Safford, and about nine miles from the property, would be available for freight shipments.

The claims are located near the southerly end of the Gila Mountains in rolling topography with higher ^{basalt covered} hills to the east and north. The present surface at about the 3200 ft.

There is no equipment in the mine area, and only limited material at the test leaching site. An adequate office building for exploratory work is located near the river. Good graded gravel roads reach all parts of the property. Core from the drill holes is stored in two old buildings near the river.

11

elevation is some 150 ft. above the Gila River valley elevation, and about one mile north of the valley boundary.

Climate may be classed as temperate although high temperatures are common in summer; there would be no ordinary interruption of year round operations. Rainfall is about 8.5 inches per year; there is sparse desert type vegetation. Adequate water supply is reported available from wells in the valley at the Grijalva farm and the state lease. A power line reaches the property, and a power supply for a large operation is reported available. There is no nearby source of timber. Supplies for mining operations would come from Tucson, Arizona and El Paso, Texas. Safford would be the residence for employees, though housing is reported scarce.

The road from Safford passes the hard surface Safford airfield where air - radio communications are installed. A gravelled airstrip has also been established at the property.

→ Insert

HISTORY AND RECENT DEVELOPMENTS

Prospecting and very small scale copper ore production have been in progress at the Sanchez property since 1899. In 1964, Harpoon, Inc., a subsidiary of United Nuclear, started active exploration of the area, and in 1969 the property was acquired by Inspiration Consolidated Copper Company, ^{which has} ~~with~~ corporate headquarters at Morristown, N. J., and mining operations at Inspiration and Christmas, Arizona. Except for continuing advance royalty payments on the Carpenter lease, by the end of 1975 almost all property payments will have been completed by Inspiration. ~~The Lone Star district will~~

The Lone Star district will be the next large scale

mining center in Arizona. In the late 1950's Phelps Dodge Corporation started exploration in an area about nine miles northwest of the Sanchez, and ^{has} ~~have~~ had outstanding success. Two deep shafts and connecting crosscuts are now being driven to test drilling results, and to prepare ~~fer-mini~~ a large underground mining project for production. Reserves are reported by that company to be 400 million tons of 0,72% copper; it is stated informally that a substantial part of this reserve will average 1.0% copper.

About five miles northeast of the Sanchez, since 1955 Kennecott Copper has explored and partly developed a very large, mixed oxide - sulphide copper deposit. It is reported that Kennecott will re-evaluate this deposit since the success by Phelps Dodge in deeper exploration.

Essex International and Towne Mining are also now conducting drilling exploration projects in the district.

In 1973-74 Union Pacific Mining Company, ^{by letter of intent} arranged an option period on the Sanchez ground which would have developed into a joint venture agreement with Inspiration. Six holes were drilled to check Inspiration results, and the project was recommended by Union Pacific geologists. Modifications of the original agreement were sought by Union Pacific; rejection by Inspiration brought abandonment of the agreement.

Data on the Sanchez has recently been reviewed by Kennecott, Homestake, Phelps Dodge and W. R. Grace. The Homestake review was perfunctory as regards Sanchez; principal emphasis was upon investment in Inspiration itself. W. R. Grace is reported to have made an offer for a joint venture agreement on April ²⁴ 4th.

PROPERTY

By purchase and location, Inspiration holds 368 unpatented claims, of which 16 are being presented for patent. There are also 200 millsite claims which cover some lode locations; these locations will be dropped when the millsits are patented. 89 acres of valley land are being purchased from Mr. P. Grijalva on small yearly payments (\$12,000 plus interest to be paid after 1975), and 240 acres are held on a state commercial lease in the valley. Ten acres are leased from Mr, M. Sanchez.

Assessment work aggregating \$36,800 must be done in 1975; that under the provisions of the Carpenter lease should be accomplished by June 30, 1975 and the remainder by September 30th. Property payments, including the Carpenter lease advance royalty, amount to \$129,456 for 1975.

The Carpenter lease provides for a royalty of \$0.007 per pound of copper produced, or a minimum advance of \$100,000 per year. The Grijalva payments are at the rate of \$3,000 per year.

GENERAL GEOLOGY

In the Lone Star district an older series of volcanic rocks, largely andesitic tuffs and agglomerates, are overlain by recent basalts and associated late volcanics. Quartz monzonite intrusive stocks, ^{and dikes,} and closely related, slightly ^{younger,} ~~later~~ fine-grained acid intrusive rocks cut irregularly through the older volcanic series. The ore deposits appear to be closely related to the quartz monzonite and later intrusive ~~rocks.~~

SANCHEZ PROPERTY

At Sanchez, dikes and stock - like masses of coarse,

biotite-rich quartz monzonite porphyry cut steeply through the andesites. Late, narrow dike-like acid intrusives, probably rhyolitic, cut both quartz monzonite and andesites, and ~~are~~ ^{apparently} ~~probably~~ related to irregular pebble-dike type breccias which cut monzonite and andesites, often near the contacts. Although the geologic notes on the drill holes are not specific, stronger mineralization may have occurred near these breccias.

About 250 ft. northwest of the Carpenter shaft at surface, there is a poorly exposed breccia, possibly part of a breccia pipe structure, about 75 by 100 ft. in area; the southern extension is covered by recent alluvium. Three drill holes, ^{E-1, 401 and 403} in the immediate area of this breccia, contain much stronger copper values than generally cut in the other drill holes. The breccia has been cut on the Carpenter shaft 200 level, and large boulders of it can be seen in the ^{stockpile at the} leach test area, ~~stockpile~~.

Fragments of coarse quartz monzonite are engulfed in fine grained, dense, gray, probably rhyolitic rock with fine quartz phenocrysts. Both rock types are weakly brecciated, and sealed with irregular iron oxides, some quartz, and erratic copper oxide minerals. The fine grained rocks are cut locally ^{six inch} by ^{stringers} of ^{glassy} quartz with prominent lacing ^{of} oxide copper seams. The downward extension of this possible breccia pipe structure has not been delimited.

As indicated by steep drill holes at Sanchez, thick, but highly variable, zones of oxide copper minerals with prominent iron oxides are cut near surface and extend to depths of more than ¹²⁰⁰ ~~2000~~ ft. The principal copper oxide minerals reported are chrysocolla ($\text{CuSiO}_3 \cdot 2 \text{H}_2\text{O}$) with considerable tenorite (CuO), and some malachite, cuprite and chalcantite. A zone of strong native copper often occurs near the base of the oxide section,

and suggests there may have been late oxidation of a previously secondarily enriched chalcocite (Cu_2S) zone.

Recent faulting, probably of relatively small displacement, appears to have influenced near surface oxidation, and may offset ~~but~~^{both} oxide and underlying sulphide mineral zones.

Below the oxide copper sections there are localized strong sulphide copper minerals, [←] in seams and disseminations, associated with pyrite. The sulphides are generally of primary origin and include pyrite-little chalcopyrite, and prominent bornite, and some molybdenite. Quartz occurs in seams with the sulphides, and there are numerous late calcite seams. A few drill holes show some chalcocite enrichment below the oxide zone. Additional exploration may disclose more of this type of mineral than ~~so far~~ indicated, ^{to date.}

There is a small, but possibly important, gold and silver content indicated by incomplete assay data, but mineral relationships have not been determined.

Distribution of alteration zones is masked by the intense oxidation features, and has not been clearly developed. There is some evidence of an outer chlorite zone with pyrite; clay alteration and sericite are noted, but the limits are not defined. Strong, second stage fine biotite is widely distributed but, again, the limits are not ~~clearly~~ determined. Although late biotite alteration has not been widely described in the geologic literature on copper deposits, it is an important and prominent alteration feature at El Teniente in Chile; at Pachon, Argentina; at Cananea and Nacozari in Mexico, and at Ray in Arizona. It is not unlikely that much of the intense sericite alteration described at various large copper districts is the result of breakdown of second stage biotite.

Much of the Sanchez surface, and partly ^{over} covering the presently recognized copper metallization, is covered by recent alluvium to the south and west and by basalt on the higher hills to the east. There are thus possibilities that separate areas of intrusive activity, ^{mineralization and} and brecciation may be concealed in the vicinity.

DRILLING AND DEVELOPMENT

At Sanchez, exploration and development have been by the Carpenter shaft and a short underground level at 200 ft. below surface, which could be easily made accessible, and by steep diamond drill holes. To date 133 holes have been drilled, some to depths of more than 2000 ft. The deeper holes have been surveyed, and some show wide variations from the vertical. Many holes have not been surveyed; geologic and assay data are very difficult to interpret in these sections.

The holes total more than 200,000 ft. in length. Core recovery has been very good, and checks made by Union Pacific geologists indicated assaying and sample preparation had been done competently. Most of the core is reported to be available for review.

In the early drilling programs emphasis was placed on oxide copper development. More recently, increased attention has been given to underlying sulphide copper possibilities. Several old holes have been deepened and others drilled into the sulphide zone. It does not appear that the sulphide possibilities have yet been fully explored, laterally or at depth.

INDICATED RESERVE TONNAGES

OXIDE COPPER

Computer designed open pit models prepared by

A recent computer study of better grade oxide reserves, directed to estimate a tonnage of better grade material, showed a total of 30,520,000 tons at 0.50% oxide copper between the 3200 and 2700 elevation benches. Most of this reserve would fall within the limits of the designed pit. Thus, an operation could be started on better grade material to amortize plant and stripping costs more rapidly than by use of calculated average grade reserves.

1705621

Inspiration indicate 79,363,000 tons @ 0.36% oxide copper waste to ore could be mined from an open pit with a 1.49 : 1 stripping ratio; a 0.2% copper was used as a cutoff grade.

A careful check of these calculations was made by Union Pacific geologists and their outside consultants. Three particular benches were selected and reserve blocks were individually calculated. Using the Union Pacific figures for the benches, extrapolation to the Inspiration design would have shown a total of 86,000,000 tons at 0.35% copper.

A later independent estimate by Union Pacific and consultants, developed a new oxide pit design which showed a total of 116,000,000 tons at 0.368% oxide copper, and a stripping ratio of 1.8 : 1; a 0.2% copper cutoff was also used.

INSERT →
COPPER
SULPHIDE RESERVES

The INspiration geological department, using available sulphide data, has calculated a sulphide reserve on benches from 2600 to 900 ft. elevation, without regard to open pit design, which showed a total of 52,737,000 tons at 0.45% copper, using a 0.3% copper cutoff. They believe that this indicated reserve might be greatly increased by further exploration. Probably not much of this tonnage would be available for open pit extraction.

A-more-recent-computer-study-of-better-grade-

There is an appreciable low grade gold and silver content shown by scattered analysis of copper samples. Statistical analysis by Inspiration indicates that ^{this} ~~this~~ may average 0.007 oz. gold per ton, and 0.085 oz. silver per ton. The assay data is incomplete, and the mineral relationships are unknown. However, it appears that an important credit in precious metals might be recovered from the sulphide ores. It is unlikely that such credit would ^{be obtained} occur in a leaching operation. Data on the molybdenum content

^{inconclusive} ^{the possible molybdenum recovery}
 is fragmentary, and may not be sufficient to deserve consideration.

METALLURGY

Inspiration has conducted bulk sulphuric acid leaching tests on the oxide materials at the property. A start was made with straight heap leaching; this was modified by tests of leaching techniques developed at Mangula, Rhodesia, which were considered successful.

In the leaching tests, material obtained from the Carpenter 200 level, with some surface material, was blended to obtain a grade of 0.36% oxide copper, and crushed to $-\frac{1}{2}$ mesh. Fines were removed. Tests were initially on small lots, but finally a 5000 ton lot was leached on a specially constructed concrete pad with asphalt facing. After a 21 day leach period, a 61% recovery was obtained. In ^{this} ~~this~~ process, copper would be removed from the leach solutions by solvent extraction, as determined by tests by General Mills, followed by electro-winning to cathode copper. The abundant sulphuric acid now being made by copper smelters in the Southwest should insure supply of this reagent at reasonable cost in the future.

The writer believes that additional testing, with probable indicated increased plant investment, would show substantially ^{better} increased recoveries at costs which would be economic. The Union Pacific investigation in 1973 -74 ^{indicated the Inspiration} ~~shewed-such-a-~~ operation would be economic at 56¢ copper.

test
leaching

CONCLUSIONS AND RECOMMENDATIONS

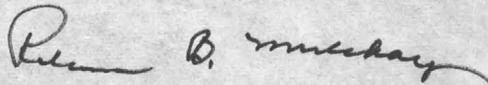
The impressive indicated low grade copper reserves at the Sanchez property, much of which would be available for low cost, open pit mining operations, deserves close consideration as a future economic resource. In the expectation that the price

of copper, during the projected twenty year life of the enterprise at 20,000 tons per day and a start-up date some years in the future, will be ^{at least} from 20 to 30% higher than the present 63¢ price, the exploitation of the Sanchez deposit could be a very profitable venture.

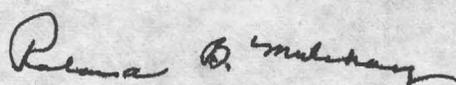
Present exploration has not eliminated chances for substantial increases in low grade sulphide reserves. There are very long chance possibilities for discovery of higher grade primary ores related to the small breccia exposed at surface and partly explored by three drill holes. This area could be ^{further} ~~also~~ explored by inclined ^{deep,} ~~deep~~ holes from surface.

If satisfactory business arrangements can be made with the Inspiration Company, it is recommended that a joint ^{an option period for} venture agreement be made with provision for a geological examination ^{of drill records and cores,} and additional drilling. If these investigations ^{have} ~~had~~ favorable results, ^{further} metallurgical testing would be in order.

~~Yours very truly,~~


Roland B. Mulchay

April 7, 1975

LOCATION.

LONE STAR MINING DISTRICT GRAHAM COUNTY, ARIZONA ABOUT 11 MI.
NORTHWEST OF SAFFORD, ^{BY ROAD,} PROPERTY IS SITUATED IN
SECTIONS 25, 26, 35, AND 36, T6S, R27E, SALT RIVER BASE LINE.
SAFFORD IS IN THE GILA RIVER VALLEY, ^{A THRIVING} AN AGRICULTURAL
COMMUNITY, ON HIGHWAY 60-70, AND IS SERVED BY THE
DAWIE - GLOBE BRANCH OF THE SOUTHERN PACIFIC RAILROAD.

Rel. of
Subsidence
study in 1974

ELEVATION AT THE CLAIMS IS ABOUT 3200 FT.
TEMPERATURES ARE HIGH IN SUMMER, ^{CLIMATE} BUT MAY BE CLASSIFIED
AS ^A TEMPERATE CLIMATE WITH NO SEVERE ~~CLIMATIC~~ CONDITIONS
TO PREVENT YEAR-ROUND OPERATIONS.
RAINFALL ABOUT 8.5 IN PER YEAR, ~~AND~~ THERE IS SPARSE
DESERT TYPE VEGETATION.

CLAIMS ARE NEAR SOUTHERLY END OF THE GILA MOUNTAINS IN
AREA OF MODERATE RELIEF. PROPOSED ^{MINE} PLANT SITE WOULD
BE ABOUT 150 FT. ABOVE THE GILA RIVER FLOOD PLAIN,
AT THE 3200 CONTOUR, AND ABOUT ONE MILE TO THE NORTH.
AIRSTRIP AT PROPERTY; ONLY 6 MI ± TO SAFFORD HARD SURFACE AIRPORT.

HISTORY

PROPERTY

THE PROPERTY CONTAINS 368 UNPATENTED LODE CLAIMS, OF
WHICH 16 ARE BEING PREPARED FOR PATENT, ^{AND 200 MILLISITE CLAIMS.} 89 ACRES
OF VALLEY LAND IS BEING PURCHASED FROM P. GRIJALVA
ON YEARLY PAYMENTS (12,000 PWS ^{INTEREST} TO BE PAID AFTER 1975), AND
240 ACRES ARE HELD ON A STATE COMMERCIAL LEASE,
10 ACRES ARE LEASED FROM M. SANCHEZ. ASSESSMENT
WORK MUST BE DONE YEARLY ON THE UNPATENTED CLAIMS
AMOUNTING TO \$36,800 FOR 1975; PART OF THIS UNDER
THE CARPENTER LEASE SHOULD BE ACCOMPLISHED BY JUNE 30TH;
~~AND~~ THE REMAINDER BE SEPT. 1ST ^{PROPERTY} PAYMENTS FOR
1975 AGGREGATE \$129,456.

THE CARPENTER LEASE PROVIDES FOR A ROYALTY
OF \$0.07 PER POUND OF COPPER, OR \$100,000 PER YEAR, ^{MINIMUM,}
INCLUDED IN FIGURE ABOVE. NEGOTIATIONS WITH
THE BUREAU OF LAND MANAGEMENT HAVE BEEN STARTED TO
EXCHANGE SOME 1265 ACRES FOR LAND TO BE USED
FOR PLANT AND DUMP SITES.?

WATER, POWER, SUPPLIES, NEARBY ACTIVITY.

THE LONE STAR DISTRICT WILL BE THE NEXT LARGE
COPPER PRODUCING AREA IN ARIZONA, ABOUT ^{MINE} 3 MI. NORTHWEST
OF THE SANCHEZ PROPERTY, PHELPS-DODGE CORPORATION IS
SINKING TWO SHAFTS AND CONDUCTING LATERAL DEVELOPMENT
SOME 2000 FT. BELOW SURFACE TO CHECK DRILLING
RESULTS AND PREPARE FOR ^{UNDERGROUND} MINING OF A VERY LARGE BODY
OF SULPHIDE ORE, REPORTED ^{by P-D} TO CONTAIN MORE THAN
400,000,000 TONS OF 0.72% Cu.

ABOUT FIVE MILES NORTH OF ^{THE} SANCHEZ GROUP,
KENNECOTT IS REPORTED TO HAVE FOUR DRILLS IN
OPERATION TO RE-EVALUATE A ^{LARGE} MIXED OXIDE-SULPHIDE
COPPER OREBODY PREVIOUSLY DEVELOPED, BUT WHICH
HAD NOT BEEN PLACED IN OPERATION.

Look up
A. Cook
report

HISTORY

and very little production of copper ore.
Some mining at Sander date from 1899. In 1964
Harper, Inc. (United Nuclear) started active exploration at
the property, and in 1969 the property was acquired by
Inspiration. Property payments made since then, except for
advance royalty payments on the Carpenter lease, have largely
been satisfied.

There is no equipment at the proposed mine site itself
and only limited equipment at the test leaching area.
A good office has been established near the mine. A gravelled
airstrip has also been constructed between the office and the
mine. Gravel roads reach all parts of the area.

In 1955 Kamb started additional exploration on the de Long
Ston property, and have developed a mixed ore-sulphide orebody
which has not been brought into production; metallurgy has been reported to
be difficult. In the late 1950's PD started drilling of their present
Safford project with outstanding success and present activity to
refine the property for eventual mining operations.
Retallenging.

To minimize plant costs, Inspiration has conducted
modified heap leaching techniques, based upon procedures
developed at Marquise, ~~S. Africa~~ Rhodesia.

Material largely obtained from underground workings
at the 200 level of the Carpenter shaft, and containing
considerable material from ^{extension of} the breccia zone exposed at
surface, were blended to a .36 Cu grade, and
subjected to leaching in small lots at first and then
on a specially constructed asphalt covered cement pad
for a 5000 ton test on $1\frac{1}{2}$ " crushed material from which
Siner had been removed. On a leaching period
of 21 days, it is reported that a 61% recovery of
copper values was made. Copper could be recovered
from leach solutions by solvent extraction ^{taken by General Mills Corp.} and normal
electro-winning. The abundant sulphuric acid now and
to be available ^{four meters} in the Southwest should insure supply of the
reagent at reasonable cost.

The writer believes that additional testing, with
possible probable increased plant investment, would indicate
substantially increased recoveries at costs which would
be economic.

TWO OTHER GROUPS ARE REPORTED TO BE DRILLING IN THE DISTRICT, ESSEX INTEL, AND TOWNE CORP. WATER SUPPLY ^{IS REPORTED ASSURED} FROM WELLS IN THE GILA VALLEY ON THE GRIJALVA PROPERTY AND THE STATE ^{LEASE.} ~~ASSURED.~~ ^{ELECTRIC} POWER IS AVAILABLE, AND A SMALL POWER LINE REACHED THE PROPERTY, THREE MILES OF GRAVEL ROAD CONNECT THE PROSPECT TO AN OILED ROAD IN THE GILA VALLEY, WHICH REACHES SAFFORD, VIA THE AIRPORT, ~~ABOUT 8 MI. FROM THE PROSPECT.~~ ^{Iron supplies will come from Safford, but major iron used in supplies from Tucson or El Paso.}

GENERAL GEOLOGY

LONE STAR DISTRICT

IN THE LONE STAR DISTRICT, AN OLDER ANDESITIC VOLCANIC SERIES IS OVERLAIN BY RECENT BASALTS AND ASSOCIATED LATE VOLCANICS. QUARTZ MONZONITE TYPE INTRUSIVES CUT IRREGULARLY THROUGH THE OLDER VOLCANICS, AND GRC DEPOSITS, WHERE THEY HAVE BEEN DESCRIBED, ARE CLOSELY RELATED TO THESE INTRUSIVES.

SANCHEZ PROSPECT

AT SANCHEZ, DIKES AND STOCK-LIKE MASSES OF QUARTZ MONZONITE CUT STEEPLY THROUGH THE ANDESITES, AND STRONG COPPER MINERALIZATION IS LOCALIZED IN THE SURROUNDING AREAS. AS MUCH OF THE SANCHEZ SURFACE IS COVERED BY RECENT ALLUVIUM, OTHER POSSIBLE INTRUSIVE BODIES MAY BE HIDDEN

AT PRESENT LOCAL FAULTS OFFSET MINERAL ZONES AND ROCK STRUCTURES, AND AFFECT OXIDATION DEPTHS. AS DEVELOPED BY STEEP DRILL HOLES,

AT SANCHEZ, ^{A THICKER BUT VARIABLE ZONES AND STRONG IRON OXIDES} OF OXIDE COPPER MINERALS ARE EXPOSED ~~AT~~ NEAR SURFACE, AND CONTINUE LOCALLY TO DEPTHS OF

more than 1200 FT. THE PRINCIPAL OXIDE MINERAL IS CHRYSOCOLLA ($CuSiO_3 \cdot 2H_2O$), WITH CONSIDERABLE TENORITE (CuO), AND SOME MALACHITE ($CuCO_3$), CUPRITE (Cu_2O) AND CHALCANTHITE ($CuSO_4 \cdot 5H_2O$). A ZONE OF STRONG

NATIVE COPPER OFTEN OCCURS NEAR THE BASE OF THE OXIDE SECTION, AND SUGGESTS RECENT OXIDATION OF A PREVIOUSLY ENRICHED ~~CHALCOCITE~~ ^{CHALCOCITE} SECONDARY ZONE.

BELOW THE OXIDE ZONE THERE ARE LOCAL STRONG ^{AS SEAMS, DISSEMINATIONS, AND AS BRECCIA CEMENT} SULPHIDE MINERALS. THESE MINERALS ARE GENERALLY PRIMARY AND CONSIST OF CHALCOPYRITE, PYRITE, ~~AND~~ PROMINENT BORNITE, AND LITTLE MOLDENITE.

A FEW HOLES SHOW SOME CHALCOCITE BELOW THE OXIDE ZONE, AND FUTURE EXPLORATION COULD SHOW GREATER EXTENT OF THIS SECONDARY MINERAL THAN INDICATED TO DATE. THE SULPHIDES ARE OFTEN ASSOCIATED WITH QUARTZ VEINLETS,

AND THERE ARE NUMEROUS LATE CALCITE SEAMS. THERE IS A SMALL GOLD AND SILVER CONTENT INDICATED BY ASSAYS, BUT MINERAL RELATIONSHIPS ^{ARE UNKNOWN.}

ALTERATION PATTERNS ARE MARKED BY THE INTENSE OXIDATION FEATURES, AND HAVE NOT BEEN CLEARLY EXPOSED. THERE IS SOME EVIDENCE OF AN OUTER CHLORITIC ZONE WITH PYRITE; CLAY AND SERICITE ARE BOTH PRESENT THOUGH THE LIMITS ARE NOT DEFINED. INTENSE SECONDARY BIOTITE IS WIDELY DISTRIBUTED

*Sanchez
mineral
+ type
Lead
various
from
the
mineral
is
in
the
deposit.
late
fig. 3
intrusive
to
is
related
to
strong
oxidation
at
depth.*

ALTHOUGH ITS BOUNDARIES AND CONTROLS ARE NOT EVIDENT. ALTHOUGH SECONDARY BIOTITE HAS NOT BEEN WIDELY DESCRIBED IN COPPER DEPOSIT LITERATURE, IT IS AN IMPORTANT ALTERATION FEATURE ^{THE IMPORTANT EL TEXIENTE,} AT A BRADEN, PACHON, CANANEA, NACOTARI, AND RAY COPPER DISTRICTS.

DRILLING AND DEVELOPMENTS

TO DATE, 133 ^{STEP} DIAMOND DRILL HOLES HAVE BEEN DRILLED. SOME HOLES REACH DEPTHS OF MORE THAN 2000 FT, BUT MOST ARE LESS THAN 1200 FT. ~~THE DEEPER~~ HOLES HAVE BEEN SURVEYED, AND SOME HAVE WIDE DEVIATIONS FROM VERTICAL; MANY HOLES ARE UNSURVEYED, AND MAKE ASSAY AND GEOLOGIC CORRELATIONS DIFFICULT OR VERY UNCERTAIN.

A TOTAL OF ^{about over 200,000 ft.} FEET OF DRILLING HAS BEEN DONE. CORE RECOVERY HAS BEEN EXCELLENT, AND CHECKS MADE BY U.P. MINING CO. INDICATED ASSAYING AND SAMPLE PREPARATION HAD BEEN DONE COMPETENTLY

A ^{SHORT} LEVEL HAS BEEN RUN FROM THE CARPENTER SHAFT AT 700 FT. BELOW SURFACE (~~FEET~~). THIS WORK WOULD BE AVAILABLE FOR UNDERGROUND EXAMINATION OF ROCK TYPES AND ORE MINERALS. A SMALL SURFACE PIT WAS ALSO EXCAVATED TO PROVIDE MATERIAL FOR METALLURGICAL TESTING AT THE PROPERTY,

EMPHASIS WAS PLACED ON OXIDE MINERAL DEVELOPMENT IN THE EARLY DRILLING PROGRAMS. MORE RECENTLY, ATTENTION HAS BEEN GIVEN TO EXPLORATION OF SULPHIDE POSSIBILITIES, AND ^{SEVERAL} OLD HOLES HAVE BEEN DEEPENED, AND OTHERS DRILLED. THE SULPHIDE POSSIBILITIES HAVE NOT BEEN FULLY EXPLORED Laterally OR AT DEPTH.

INDICATED RESERVE TONNAGES.

COMPUTER DESIGNED OPEN PIT MODELS HAVE INDICATED 79,263,000 TONS @ 0.36% OXIDE Cu WITH A WASTE TO ORE RATIO OF 1.49:1.

A CHECK OF THESE CALCULATIONS BY U.P. MIN. CO., BY TRIANGULAR BLOCK CALCULATIONS ON THREE BENCHES, SHOWED THE ABOVE TOTAL TO BE PROBABLY CONSERVATIVE. THE UPMC FIGURE TOTALLED 86, MILLION TONS AT 0.35% COPPER,

DESIGN,
OPEN PIT

THAT ANY
IMPORTANT
AMOUNT
WOULD BE
RECOVERED
FROM LEACHING
OPERATIONS.

oxide
section

THE INSPIRATION GEOLOGICAL DEPARTMENT, USING AVAILABLE DATA ON THE SULPHIDE BODY AND FIGURING BENCHES FROM THE 2600 TO THE 900 LEVEL ELEVATION, WITHOUT USING A 0.30% CU CUTOFF, SHOWED 52,737,000 TONS @ 0.448% CU. THEY BELIEVE ADDITIONAL EXPLORATION MAY DOUBLE THIS INDICATED RESERVE. PROBABLY MUCH OF THIS RESERVE WOULD NOT BE AVAILABLE FOR OPEN PIT OPERATIONS.

THERE IS AN APPRECIABLE GOLD AND SILVER CONTENT IN THE ORE, WHICH IS BELIEVED, FROM SCATTERED ANALYSES, WOULD AVERAGE FOR OXIDE AND SULPHIDE ZONE ABOUT 0.007 OZ AV AND 0.085 OZ Ag PER TON. THE ASSAY DATA ARE INCOMPLETE, BUT IT APPEARS LIKELY A SUBSTANTIAL PRECIOUS METAL CREDIT MAY BE RECOVERED FROM THE SULPHIDE ORES. IT IS UNLIKELY TOTAL RESERVES OF OXIDE LOW GRADE MATERIAL WOULD GREATLY EXCEED THE PIT DESIGN ESTIMATES, ALTHOUGH THE GRADE WOULD BE CLOSE TO 0.3% CU. SIMILARLY, THE SULPHIDE POTENTIAL MAY BE MUCH GREATER THAN THAT INDICATED BY PRESENT EXPLORATION.

A VERY RECENT COMPUTER STUDY OF OXIDE RESERVES, DIRECTED TO OUTLINE BETTER GRADE MATERIAL, MOST OF WHICH WOULD FALL WITHIN ~~PLANNED~~ PLANNED PIT LIMITS, SHOWED 30,520,000 TONS @ 0.50% CU BETWEEN THE 3200 AND 2700 ~~LEVEL~~ ELEVATIONS, THUS AN ~~OP~~ OPERATION COULD BE STARTED ON BETTER GRADE MATERIAL TO AMORTIZE PLANT AND STRIPPING COSTS MORE QUICKLY THAN BY USE OF MATERIAL OF AVERAGE GRADE.

Metallurgy

CONCLUSIONS AND RECOMMENDATIONS

MUCH OF IT AVAILABLE IN
OPEN PIT OPERATIONS

THE IMPRESSIVE LOW GRADE RESERVES, AT THE SANCHEZ PROSPECT DESERVE CLOSE CONSIDERATION IN THE EXPECTATION THAT THE PRICE OF COPPER WILL BE FROM 20 TO 20% HIGHER THAN AT PRESENT (63¢/lb) AND DURING THE LIFE OF A PROJECTED OPERATION AT ± 20,000 T/day, over the 20 years following start of operations.

EXPLORATION HAS NOT ELIMINATED CHANCES FOR SUBSTANTIAL INCREASES IN SULPHIDE RESERVES. THE POSSIBILITIES FOR BETTER GRADE ORES RELATED TO THE SMALL BRECCIA EXPOSED AT SURFACE, AND POSSIBLY PARTLY EXPLORED BY DDHS 401 AND 403 AND E-1, WHILE LONG RANGE, PRESENT INTRIGUING CHANCES WHICH COULD BE TESTED BY LIMITED ADDITIONAL DEEP DRILLING,

IF SATISFACTORY BUSINESS ARRANGEMENTS CAN BE MADE, WHICH WOULD PROVIDE FOR GEOLOGICAL EXAMINATION AND ADDITIONAL EXPLORATION, IT IS RECOMMENDED THAT SUCH WORK BE DONE IMMEDIATELY, BASED ON RESULTS OF THE EXAMINATION.

Call to Brownell, N.Y.
PROPERTY IN ARIZONA

PRELIMINARY EXAM. BY RBH PRIOR
TO 1966. FAVORABLE GEOLOGIC FEATURES.
BUSINESS BAD, COULD NOT OPTION FOR
ANA.

EXTENSIVE EXPLORATION AND DEVELOPMENT
SINCE; ATTEMPTED OPERATIONS NOT
SUCCESSFUL. REPORTED SUBSTANTIAL
LOW GRADE TONNAGE NOW DEVELOPED
BY DRILLING. (NOW LOW COST ACID
(COMMERCIAL AT 75¢ COPPER?)
FOR LEACHING.) RBH BELIEVES OTHER
GEOLOGIC POSSIBILITIES AT DEPTH
NOT TESTED. ROCKS AND ALTERATION
FEATURES FAVORABLE.

BELIEVED POSSIBLE 2-3 BILLION LBS. CU
MIGHT BE FOUND.

UNFAVORABLE

THREE MIN. COS, ONE ENERGY CO AND
ONE CONGLOM. EXPRESSING ACTIVE INTEREST

PAYMENTS DUE ± 110,000 THIS YR. PLUS
ASSESSMENT WORK; NEED TO WORK OUT
DEAL. - ST. VENTURE OR RETAINED INTEREST.
POSSIBLE WATER SUPPLY AND POWER
SUPPLY PROBLEMS.

RBH TO REEXAMINE AT THEIR
EXPENSE. IF RECOMMENDS, AND DEAL IS
MADE, WANTS CARRIED SMALL INTEREST
OR \$25,000 FOR 10 YEARS - PRESENT
TO OTHERS IF DEAL DOES NOT PROCEED

collect
5/5 9:45 Called Brownell - left
word no return call

5/7 Called Brownell 9:40 AM
No return call.

SANCHEZ
Geological Reserves.
Oxide Only

1-3

not confined to
planned pit area

4/5/75

<u>Bench</u>	<u>Elevation</u> (above sea level)	<u>Assay Range</u>	<u>Tonnage</u>	<u>Grade</u>
1	3350	0.30 - 0.39		
		0.40 - 0.49		
		0.50 +		
		0.30 - 0.50 +		
		0.40 - 0.50 +		
2	3300	0.30 - 0.39		
		0.40 - 0.49		
		0.50 +		
		0.30 - 0.50 +		
		0.40 - 0.50 +		
3	3250	0.30 - 0.39		
		0.40 - 0.49		
		0.50 +		
		0.30 - 0.50 +		
		0.40 - 0.50 +		
4	3200	0.30 - 0.39	1,200,000	0.33
		0.40 - 0.49	450,000	0.44
		0.50 +	1,120,000	0.64
		0.30 - 0.50 +	2,770,000	0.47
		0.40 - 0.50 +	1,570,000	0.59
5	3150	0.30 - 0.39	2,110,000	0.34
		0.40 - 0.49	1,310,000	0.44
		0.50 +	700,000	0.56
		0.30 - 0.50 +	4,120,000	0.41
		0.40 - 0.50 +	2,010,000	0.48
6	3100	0.30 - 0.39	4,330,000	0.35
		0.40 - 0.49	2,390,000	0.44
		0.50 +	1,140,000	0.61
		0.30 - 0.50 +	7,860,000	0.42
		0.40 - 0.50 +	3,530,000	0.50

<u>Bench</u>	<u>Elevation</u> (above sea level)	<u>Assay Range</u>	<u>Tonnage</u>	<u>Grade</u>
7	3050	0.30 - 0.39	3,560,000	0.34
		0.40 - 0.49	1,350,000	0.44
		0.50 +	1,090,000	0.59
		0.30 - 0.50 +	6,000,000	0.41
		0.40 - 0.50 +	2,440,000	0.51
8	3000	0.30 - 0.39	5,870,000	0.34
		0.40 - 0.49	2,280,000	0.43
		0.50 +	1,090,000	0.67
		0.30 - 0.50 +	9,240,000	0.40
		0.40 - 0.50 +	3,370,000	0.51
9	2950	0.30 - 0.39	5,540,000	0.35
		0.40 - 0.49	2,730,000	0.43
		0.50 +	1,430,000	0.60
		0.30 - 0.50 +	9,700,000	0.41
		0.40 - 0.50 +	4,160,000	0.49
10	2900	0.30 - 0.39	3,070,000	0.34
		0.40 - 0.49	2,140,000	0.43
		0.50 +	740,000	0.63
		0.30 - 0.50 +	5,950,000	0.41
		0.40 - 0.50 +	2,880,000	0.48
11	2850	0.30 - 0.39	4,390,000	0.33
		0.40 - 0.49	2,190,000	0.43
		0.50 +	260,000	0.79
		0.30 - 0.50 +	6,840,000	0.38
		0.40 - 0.50 +	2,450,000	0.47
12	2800	0.30 - 0.39	4,520,000	0.34
		0.40 - 0.49	1,790,000	0.44
		0.50 +	1,110,000	0.62
		0.30 - 0.50 +	7,420,000	0.41
		0.40 - 0.50 +	2,900,000	0.51

<u>Bench</u>	<u>Elevation</u> (above sea level)	<u>Assay Range</u>	<u>Tonnage</u>	<u>Grade</u>
13	2750	0.30 - 0.39	4,050,000	0.35
		0.40 - 0.49	2,520,000	0.44
		0.50 +	1,740,000	0.64
		0.30 - 0.50 +	8,310,000	0.44
		0.40 - 0.50 +	4,260,000	0.52
14	2700	0.30 - 0.39	4,480,000	0.35
		0.40 - 0.49	730,000	0.42
		0.50 +	140,000	0.59
		0.30 - 0.50 +	5,350,000	0.37
		0.40 - 0.50 +	870,000	0.45
4-14	3200-2700	0.30 - 0.39	43,120,000	0.34
		0.40 - 0.49	19,880,000	0.44
		0.50 +	10,640,000	0.62
		0.30 - 0.50 +	73,640,000	0.41
		0.40 - 0.50 +	30,520,000	0.50
		0.30 - 0.39		
		0.40 - 0.49		
		0.50 +		
		0.30 - 0.50 +		
		0.40 - 0.50 +		
		0.30 - 0.39		
		0.40 - 0.49		
		0.50 +		
		0.30 - 0.50 +		
		0.40 - 0.50 +		
		0.30 - 0.39		
		0.40 - 0.49		
		0.50 +		
		0.30 - 0.50 +		
		0.40 - 0.50 +		

TABLE 1
MINE & MOBILE PLANT EQUIPMENT
INVESTMENT SCHEDULE - \$M

Year	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<u>Mine Equipment</u>																			
Haul Truck	2681		1192		2681			744	1072		804	267		1220					10,661
Loader	1541	278	801	277	586	554	(31)	832	277	555	554		554	247		277			7,302
Rotary Drill	959			288	575				575					575					2,972
D-9 Tractor	352		264			132	158		132		158	132		132	132				1,592
AN/FO Truck	28								25										53
Road Grader	116	116		105				105			105		105			105			757
Water Truck	246										111	111							468
Cat 824B Dozer	235			221				221				221				221			1,119
Compressor	58								52										110
Rock Drill	31					28						28							87
Man Truck	10						10							10					30
Cat 980 Loader	89			80				80				80				80			409
Light Plant	35		32			32			32			32			32				195
AN/FO Silo	10																		10
Mine - Total	6391	394	2289	971	3842	746	137	1982	2165	555	1732	871	659	2184	164	683	0	0	25,765
<u>Leach Plant Equipment</u>																			
Loader	311			280			280			280			280			280			1,711
Dozer	118			106			106			106			106			106			648
Total Plant and Mine	6820	394	2289	1357	3842	746	523	1982	2165	941	1732	871	1045	2184	164	1069	0	0	28,124

All Capital Includes 15% Contingency

INTRODUCTION

Sanchez is a porphyry-type oxide copper deposit located in the Lone Star Mining District in southeastern Arizona, (see Figure 1) approximately ten miles northeast of Safford in Graham County.

Mining at Sanchez dates from 1899, but it was 1964 when Harpoon, Inc. discovered the existence of a large, low-grade copper deposit. Since optioning the property in 1969, Inspiration Consolidated Copper Company has developed approximately 79 million tons of ore, averaging about 0.36% copper, which is amenable to a modified sulfuric acid heap leach. Such a process minimizes capital investment and avoids environmental problems associated with conventional smelters.

Based on a feasibility study by Inspiration in December of 1972, UPMC proposed, subject to confirmation of Inspiration's study, to provide 60% of pre-production investment and that Inspiration would retain 51% interest in the project and be designated as operator.

The constant dollar economics shown below were the basis for the deal. They assume a constant copper price of 56¢/lb.

ECONOMICS

	<u>UPMC</u>	<u>Project</u>
Reserves		79 million tons
Grade		0.36% Cu
Life		13 Years
Investment	\$11.5 million	\$19.1 million
Rate of Return	12.4%	16.7%
NPV at 10%	\$1.5 million	\$7.1 million
Income A/Tax	\$1.2 million/yr.	\$2.5 million/yr.
Payback	9 years	5 years

Following approval of the proposed deal by both corporate managements in early April of 1973, a letter of intent was signed which outlines the business arrangement and provides for a confirmatory feasibility study by UPMC.

This report presents the results of this study as well as summarizing prior development work by Inspiration.

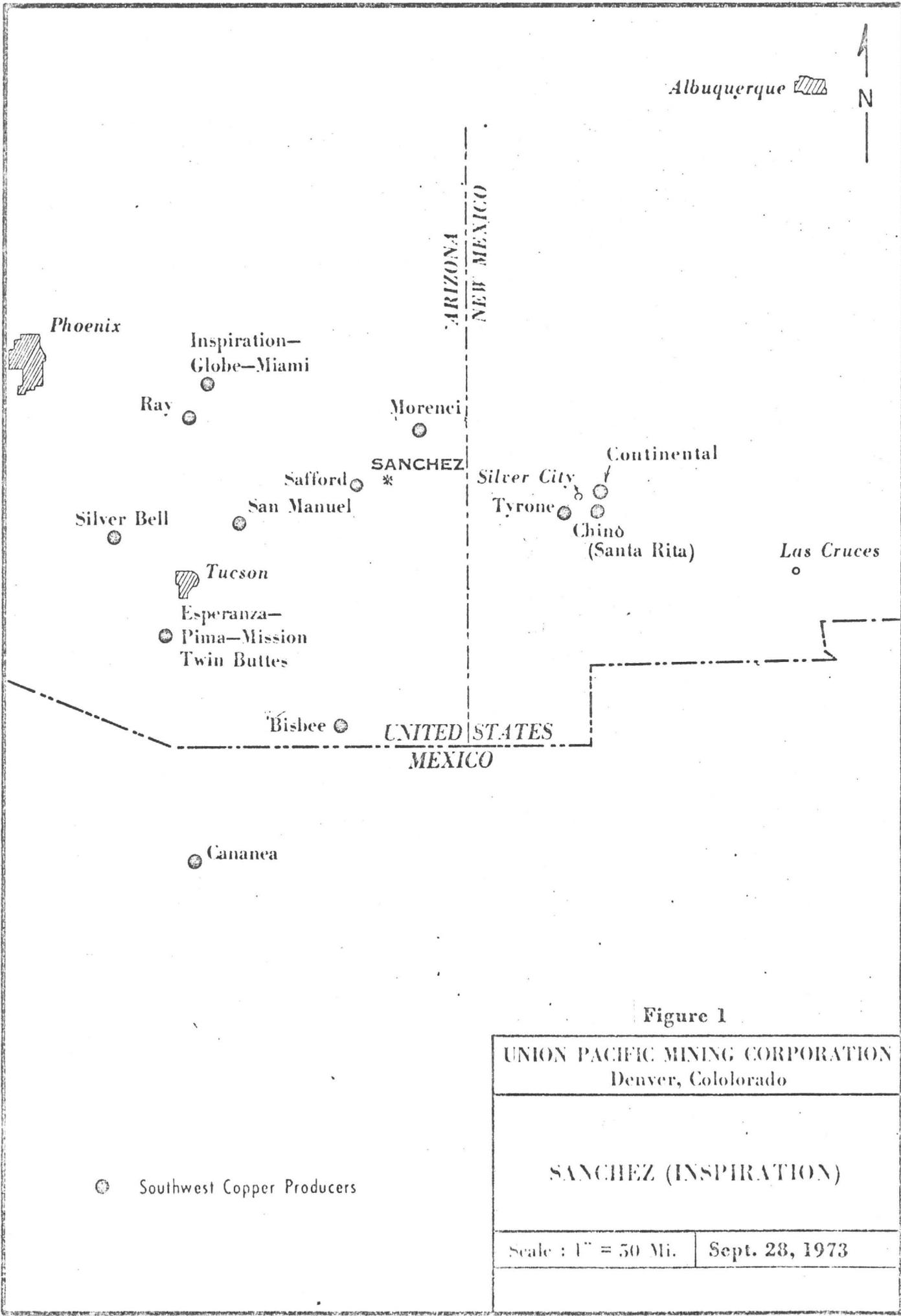


Figure 1

UNION PACIFIC MINING CORPORATION Denver, Colorado	
SANCHEZ (INSPIRATION)	
Scale : 1" = 50 Mi.	Sept. 28, 1973

⊙ Southwest Copper Producers

SUMMARY

The Sanchez Project as presently planned would produce 75,000 pounds of high quality cathode copper per day (27.4 million pounds per year). This would require mining an average of 17,500 tons of open pit ore per day at a grade of 0.36% copper and an additional 26,200 tons of waste. The extraction of copper from the ore is assumed to be 61%.

a. Reserve Audit

The deposit outcrops beneath the basalt rim of the Gila Mountains; has a generally conical shape measuring approximately 2,000 feet in diameter at the surface and 2,500 feet deep; and can be divided into three mineralogical zones, oxide, mixed and sulfide. The upper oxide ore is of current economic importance.

A total of 126 holes have been drilled on the property; 69 by Inspiration. Data from previous holes was used by Inspiration as a basis for its reserve estimates.

UPMC has made spot checks of Inspiration reserve calculations, for various mine benches, representing about 16% of the pit reserve. The following Table compares the hand calculated results by UPMC with the computer output compiled by Computech of Tucson, Arizona for Inspiration.

RESERVE AUDIT 0.2% Cu Cut Off

5 Benches = 16% of Reserves

	<u>TONS</u>	<u>GRADE</u>
ICCC (Computer)	10,330,700	.336
UPMC (Hand)	11,271,800	.325
PROJECTED TO MINABLE RESERVES		
ICCC	79 Million	.360
UPMC	86 Million	.350

The findings are well within reasonable limits, and therefore verify the reserve tonnage estimate as presented by ICCC.

In addition to the above calculations, comparison has been made between computer print-outs and drill hole data for rock and ore type, which has given us confidence in the computer program. There are minor differences between the computer and hand-drawn interpretation of rock and mineral-type locations which are insignificant to the overall picture.

Various parameters were studied for reliability of data; these included check assays, composite assays, statistical analysis of data, individual drill logs, drill hole location, core recovery and assays from the level of the Carpenter shaft.

b. Mining Audit

The mining method, i. e., open-pit, three-shift operation, with rubber tired loaders feeding large haulage trucks, selected by Inspiration appears to be the proper approach for the property.

Hand checks of the ore reserve and waste tonnages in the Inspiration "pit" indicate some discrepancy in determining waste and alluvium tonnage for benches above the 3200 foot level; however, the difference would not be significant.

Initial mine capital was increased by the need for an extra truck and additional drilling capacity. Operating costs are estimated to be higher than developed by Inspiration due to several factors, including higher fuel costs and higher operating costs quoted by vendors.

c. Process Audit

Inspiration has developed a refinement of the normal heap leaching process for copper ore based on the operations at Mangula, Rhodesia. The so-called Mangula leach treats ore crushed to minus 1/2" with the fines removed or agglomerated by water sprays. The sized ore is stacked in twenty foot lifts on a prepared pad and acid solution is percolated through the heaped ore for about 3 weeks. The leached ore is then washed with water and discarded. The dissolved copper is recovered by conventional solvent extraction and electrowinning process to produce copper cathode for market. See Figure 2 for an artists conception of the plant layout.

This process was tested on a 7,000 ton sample of Sanchez ore and is the basis for the recovery and costs used in the study. Process parameters such as leach time, acid strength and percolation rates are not considered to be the optimum.

The capital estimates for the process plant prepared by Inspiration

made certain assumptions that were not included in the UPMC estimate. This has resulted in using a higher initial investment in the UPMC analysis.

d. Marketing

Inspiration is amenable to marketing our share of the cathode copper from Sanchez at a fee to be negotiated. ICCC is established in the cathode copper market and has developed outlets which are best suited to this product.

e. Economics

The following Table summarizes the UPMC estimate of the Sanchez economics at this point for both a total project view and UPMC's share, based on the deal as presently structured and assuming a 56¢/lb. copper price over the life of the project.

	<u>UPMC ESTIMATE</u>	
	<u>Project</u>	<u>UPMC</u>
Initial Investment - \$MM	24.9	14.4
Average Operating Costs - ¢/lb.	37.6	34.5
Earnings - \$MM/Yrs.	1.3	0.6
Rate of Return - %	8.9	5.6

Because of our higher estimates, for both capital and operating costs, the economics are not as attractive as those which were the basis for UPMC's interest; however, there appear to be sufficient areas for improvement in the project to pursue it further. There is considerable work to be done in refining estimates for the project, and it appears that optimization of important process parameters could provide very significant improvement in project economics.

If further refinement indicates that the total project economics are acceptable but UPMC's are not, revision of the "deal" would be in order.

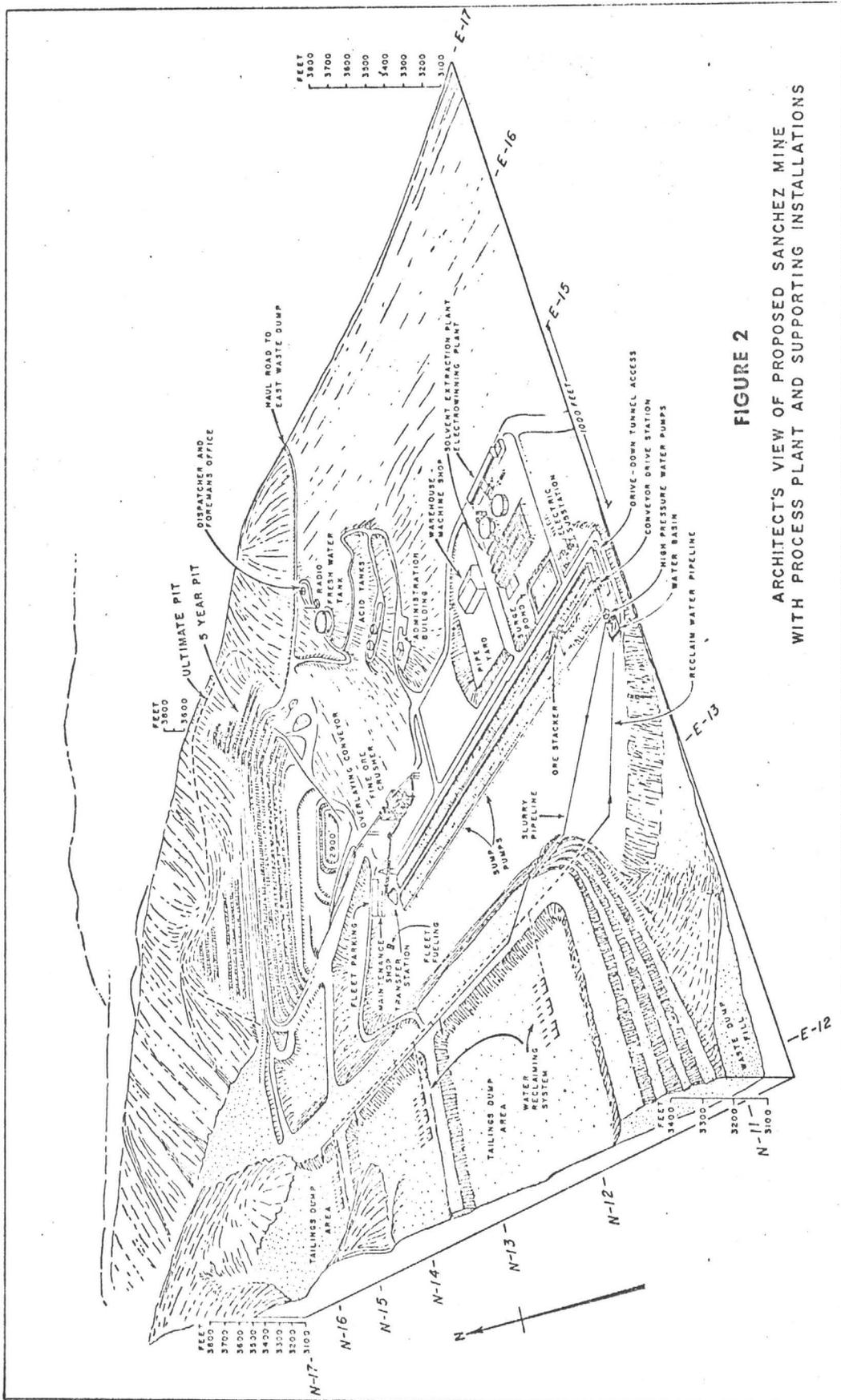


FIGURE 2
 ARCHITECT'S VIEW OF PROPOSED SANCHEZ MINE
 WITH PROCESS PLANT AND SUPPORTING INSTALLATIONS

RECOMMENDATIONS

The relatively low grade of the deposit dictated that the analysis be conservatively cast and represents a part of the reason estimated capital costs are somewhat higher than those developed by Inspiration. In that same spirit of conservatism, a program of additional metallurgical testing and "fill-in" drilling is recommended to verify certain assumptions used both by Inspiration and UPMC in the project analysis.

DRILLING

Approximately 40% of the reserves as computed by Inspiration and audited by UPMC, are based on "uncheckable" data, uncheckable in that data from these areas of the reserves cannot be verified because the original core, reject material, or assay pulps are not available for further study. As noted on the attached sketch, (Figure 3) a drilling program totaling 7 holes at an estimated cost of \$75,000 is recommended in those areas where the data is missing.

METALLURGY

The copper extraction used as a basis of both the ICCC and UPMC studies is based on the results of leaching some 7,000 tons of ore made up of a composite from the outcrop and underground workings. While the ore was blended to produce a reasonable representation of ore types and rock types, and did correspond to the average grade of the ore body, there is still some concern that recovery could vary through the life of the property as the depth of the pit advances. It is proposed therefore, that a leaching program using existing core or reject material be conducted on composite samples that will correspond to the various bench levels as the mine progresses. These leach tests would be conducted in columns using ore sized to the Mangula specifications and will test in addition to recovery, other variables that could have an impact on capital and operating costs.

The metallurgical test program proposed would be conducted in two phases as illustrated by Figure 4 and would cost an estimated \$80,000.

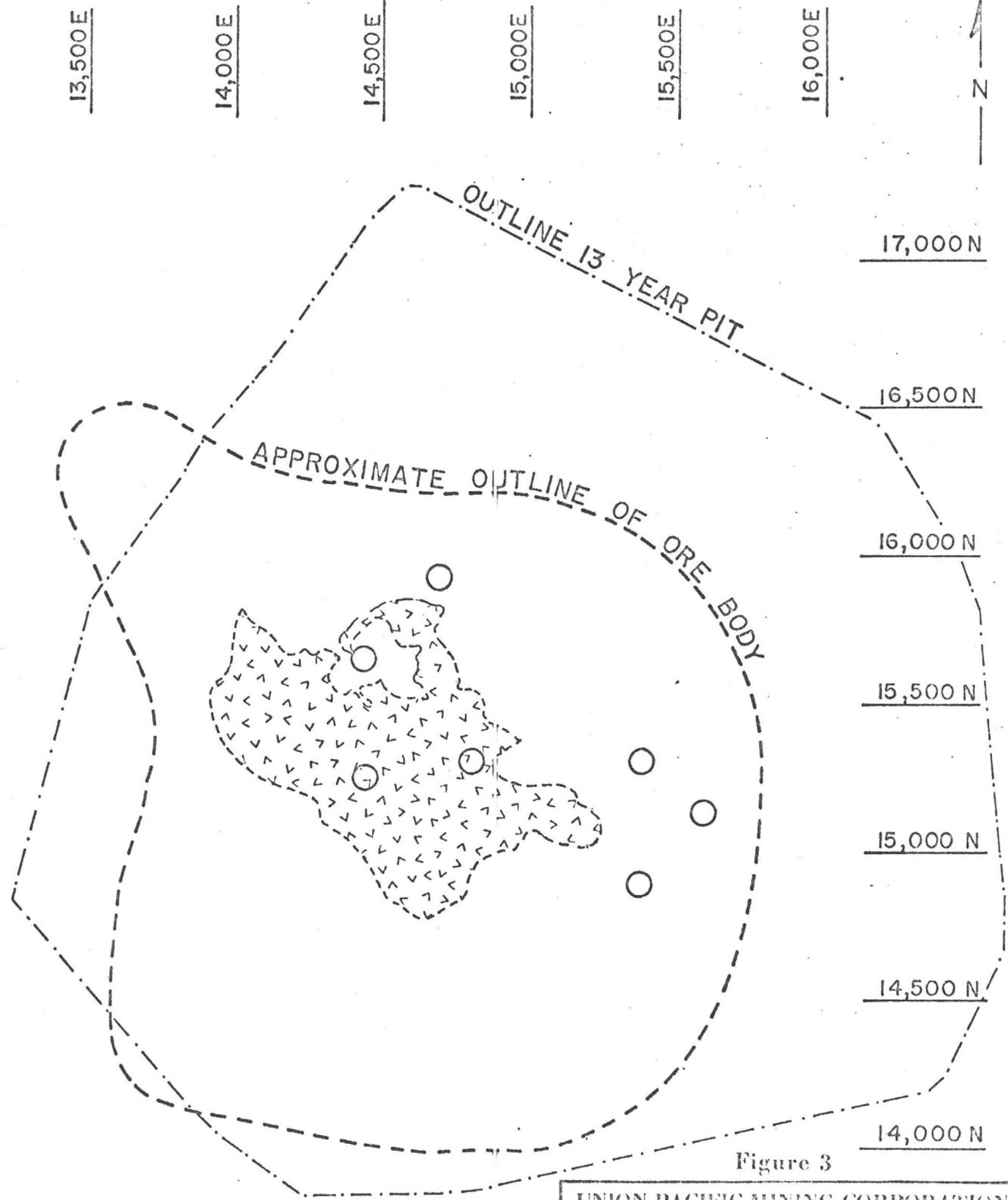


Figure 3

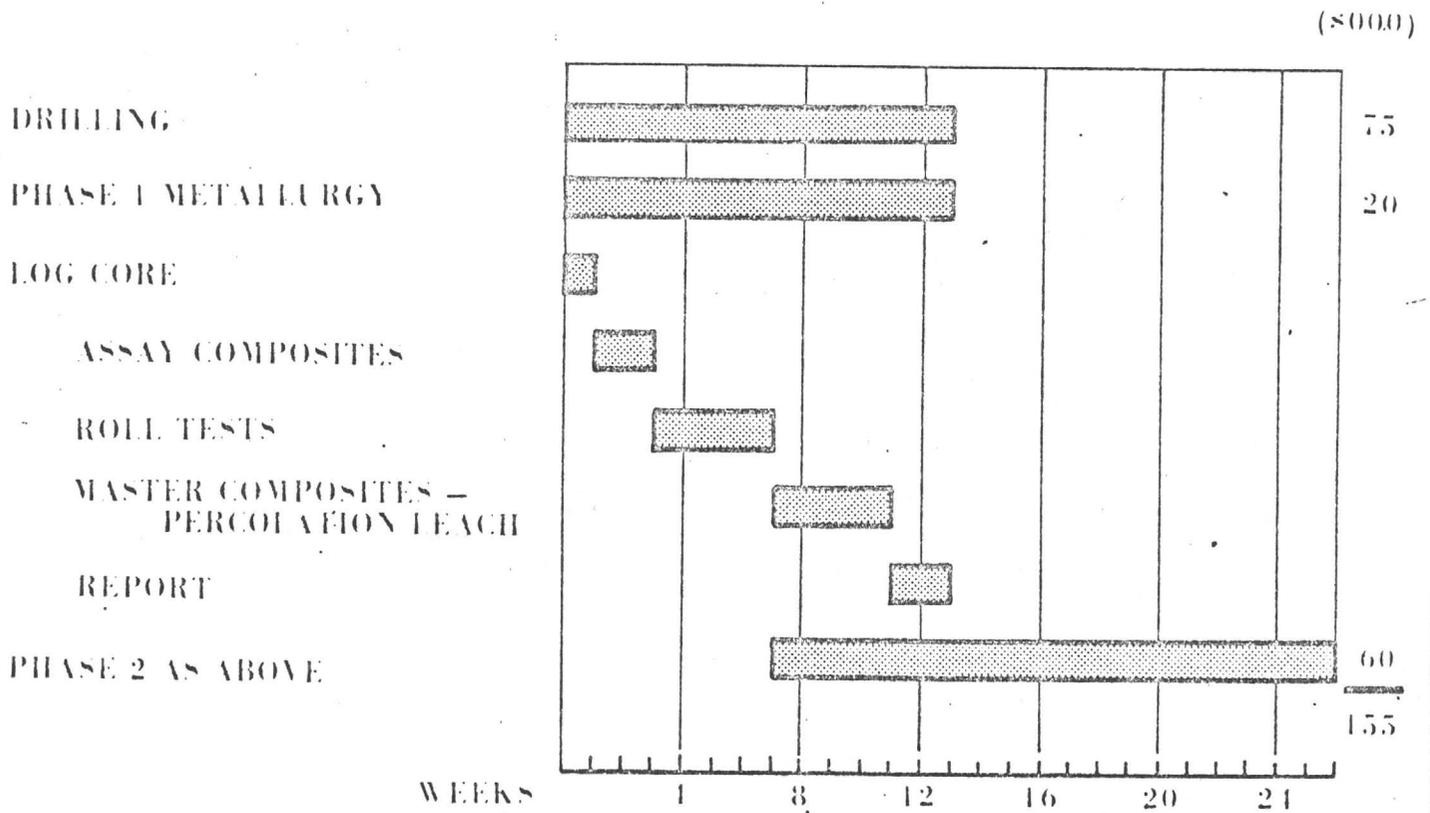
EXPLANATION

- PROPOSED DRILL HOLES
- ▤ MONZONITE PORPHYRY

UNION PACIFIC MINING CORPORATION Denver, Colorado	
SUMMARY MAP SANCHEZ AREA GRAHAM COUNTY, ARIZONA	
Scale: 1" = ±500'	Sept. 4th, 1973
TO ACCOMPANY U.P.M.C. FEASIBILITY REPORT	

Figure 1

PROPOSED CONFIRMATION PROGRAM



GEOLOGY

Regional

The Sanchez deposit is located on the south end of the Gila Mountains, one of the northwest trending ranges of the Basin and Range Province. The mountain range is composed of volcanics of three different series--older, intermediate and younger. These older Cretaceous volcanics are intruded by Tertiary acid rocks classed as monzonite and quartz-monzonite porphyries. Copper mineralization is associated with the intrusives not only in the Sanchez deposit but also in two major discoveries that are owned by Kennecott and Phelps-Dodge (see Figure 5). The older volcanics are composed of andesites, the intermediate of latite, and the younger series are thick basalt flows that cap the Gila Mountain Range.

Detail

The deposit is a porphyry copper type as the mineralization is centered around and within a monzonite stock (Figure 6). The northwest and eastward trending structures are responsible for localizing the intrusives and the copper mineralization. The monzonite intrusive is a "pipe-like" mass intruding the andesite host rock (Figures 7 and 8). Many dikes have formed in the broken masses of andesite and several blocks of andesite have been surrounded by the intrusive. Mineralization is found in the upper zone as oxide and grades into native copper, then into sulfide at approximately 1,000 to 1,200 feet in depth. There is no enriched blanket of chalcocite in this particular deposit and the upper area of oxide mineralization is of prime importance as it is considered the mineralized zone that has the potential for being open pit mined economically.

The oxide zone consists mainly of chrysocolla and copper pitch (tenorite) with minor malachite, cuprite and chalcocite. Native copper is found in all zones but is most plentiful near the oxide sulfide contact. This mixed zone contains both sulfide and oxide minerals.

In the sulfide zone, that extends to 3,300 feet in depth, chalcopyrite and bornite predominate but chalcocite, pyrite, covelite and molybdenite are present. Both the older andesite and younger monzonite are favorable host rocks. There is a close association of higher grade mineralization with the contact area of the monzonite and andesite along and with zones where crackling is present from the fault zones passing through this deposit.

Although we have not made a thorough study of the alteration of the deposit, ICCG geologists liken the deposit to a typical alteration pattern of porphyry coppers. According to them, the deposit exhibits phyllic and minor

potassic alteration which grades laterally to a secondary biotite zone, then to a biotite chlorite zone and finally to a propylitic zone which contains epidote. There is a definite preferential trend of the higher grade mineralization in a northwest-southeast direction through the main mineralized zone.

Ore Reserves

The reserves established for the Sanchez deposit by ICCC, the fourth operating company on the deposit, were obtained through a computer program generated by Computech of Tucson, Arizona. Their reserves were calculated as follows: assay and survey data from drill holes were used to derive 50 x 50 x 25 blocks, the grades of which were determined by interpolating drill hole assay data over a 300 foot distance from each hole. The blocks are then summed at various cutoffs to derive geologic reserves for these cutoffs. Rock and mineral type data were coded for each block but not used in the calculations; however, these were used to determine plans and sections of the rock type and mineral type.

A bottom bench was then drawn by the Inspiration Mine Engineer and a pit slope angle specified. The computer program then "exploded" the pit from the bottom up and counted the blocks mined to obtain minable reserves. Much of Inspiration's feasibility study for the proposed mine was based on the computer output.

An audit of Inspiration's computer prepared ore reserves was made for two purposes: 1) to attempt to confirm the tons and grade of the Sanchez deposit as represented by Inspiration Consolidated Copper Company; and 2) to obtain confidence in the computer program with regard to tons, grade, rock type and ore type. A total of five 25 foot benches out of a total of forty (Appendix I) for the entire pit as designed by Inspiration was selected for audit, these five benches contain 16% of the ore reserve. A comparison of the UPMC audit with the ICCC computer reserve figures follows:

RESERVES AT .2% CU CUTOFF

	<u>Tons</u>	<u>% Var.</u>	<u>% Cu</u>	<u>% Var</u>	<u># Cu</u>	<u>% Var</u>
2600-2625 (Gunn)	1,016,600		.458		9,312,056	102.4
		99.5		102.9		
2600-2625 Computer Phase A (No pit 10.5 of this level)	1,021,300		.445		9,089,570	
3100-3150 (Meyer)	6,042,500		.327		39,517,950	
		107.3		95.9		103.0
3100-3150 Computer	5,631,200		.341		38,404,784	
3150-3200 (Bond)	4,212,700		.291		24,517,914	
		114.5		97.3		111.5
3150-3200 Computer Phase A + 10.5	3,678,200		.299		21,995,636	
Weighted Average		109.1		97.1		105.6

NOTE: %Var. = Hand calculated results divided by computer derived figures.

As shown above, agreement is within +9.1% on tons, -2.9% on grade, and +5.6% on pounds of copper which is acceptable.

Extending this variance over the total ore body, the reserve comparison is as follows:

	<u>Tons</u>	<u>Grade % Cu</u>
ICCC	79 Million	0.36
UPMC	86 Million	0.35

Method of Evaluation

A method employing triangles was selected as a suitable approach to test the ore reserve estimates as calculated by the Computech computer program. The mineralized zone is a large disseminated volume of rock of variable grades with a higher grade center, probably associated with fracturing. Because of this variation, size and anticipated mining method, it was decided than an approach involving a large amount of averaging would produce the correct results. After a trip to the property to obtain data and to log two holes, the following steps were taken to determine the audit:

- 1) Individual drill hole logs were checked and assay intervals calculated for the 50-foot benches of the 3100 and 3150 bench checks and 25-foot intervals were calculated for the 2600 bench check.

Fifty-foot intervals were analyzed on the 3100 and 3150 benches since three previous computations were available for these benches. There are the early Pit A computer results, the hand calculated results of Rene von Beck, and the computer results by Computech. It was necessary to combine Computech reserves for the 3100 and 3125 benches and the 3150 and 3175 benches to compare with the earlier work that was done on 50-foot benches.

Assay logs are available on the 100, 300 and 400 series holes; however, the 200 series holes (all rotary) drilled by Ranchers are not available. All of the core was not assayed for the 100 series holes. United Nuclear only assayed short intervals where visible green oxide copper was noticed. They did not recognize copper pitch (tenorite). Where assays were incomplete on the 100 series holes, peripheral holes were averaged to obtain a value for the incomplete interval. This number was then used with the other data points of the triangle for an average of the triangle. Logs were not available on the 200 series holes; therefore, it was necessary to use data furnished on the level maps.

- 2) After drill hole interval assays had been determined on the entire bench, triangles were made by connecting data points (drill hole). Average grades for the triangle were calculated by averaging the grades of the three apexes of the triangle.
- 3) The area of the triangle was then planimetered and calculated tonnage derived from the cubic feet involved by dividing by a tonnage factor of 12.5 cubic feet per ton.

4) Triangles were then grouped into classes from 0.15% Cu to +0.40% Cu at .05 increments. Reserves were calculated for each class and an accumulated reserve determined at each .05% Cu increment by weighted averages of the triangles. Reserves for each of the three benches have been reported in individual memos by C. Gunn (6/26/73), E. Bond (7/5/73), and P. Meyer (6/22/73), attached as Appendices II, III, and IV.

Mr. Gunn is a representative of the consulting firm of Derry, Michener & Booth. He was asked to assist in this audit by giving his suggestions as well as completing the audit for one bench which insured a larger sampling audit of the reserve zone.

Reliability of Data

Many parameters were used in the evaluation of the Sanchez data, and these are discussed individually below.

Assay Checks

A check assay program of 140 samples shows the copper values posted on the 400 series diamond drill logs are reliable. The first check program was composed of 11 samples of split core and 10 samples of crushed rejects. Assay pulps were prepared by Hazen Research of Golden, Colorado. Both Hazen and Loring Laboratories of Calgary assayed the pulps by atomic absorption. At this point it appeared there was about a 10% reduction in grade between the check samples and the values on the drill logs. Another group of 119 samples were obtained. These consisted of 60 samples of split core, 40 samples of crushed reject, and 19 previously prepared assay pulps. Hazen prepared assay pulps from the core and rejects. All samples were assayed by Hazen, Loring and Talco (an ICCC Lab. in Safford, Arizona) and Southwestern Assayers and Chemists in Tucson, Arizona. Talco and Southwestern also assayed the first 21 samples. Talco used a short iodide method, the others atomic absorption. A study by our Technical Systems Analyst shows that the agreement between the posted assays, Talco, Loring and Southwestern is excellent. There appears to be a low bias in the Hazen assays.

It is felt that check samples establish the reliability of ICCC's core splitting, sample preparation procedure and assaying. It must be remembered that this work checks only the data for the 400 series holes. At this time there is no way that assay data for the 100, 200 or 300 series holes can be checked.

Breakdown of the assay data is in Appendix V.

Composite Assays

One hundred and thirty-three composite assays prepared by ICCC have been tabulated and a statistical analysis was made by our Systems Department (Appendices VI and VII). Correlation coefficients of the composites compared with initial samples are in the range of .967 and .987 which gives us confidence on the preparation and check assaying of the composite samples.

Statistical Analysis of Data

The statistical folder prepared on the analysis of the computer generated blocks by Inspiration has been reviewed by Systems. Frequency distribution curves of the individual computer generated blocks show the deposit to have a normal distribution on the two dimensional analysis which is the basis of the computer calculation of ore reserves.

Individual Drill Log Data

A total of 126 holes has been drilled on the property. The 100 series drilled by United Nuclear total 31, the 200 series drilled by Ranchers total 15, the 300 series drilled by Bear Creek (Kennecott) total 7, and the 400 series drilled by Inspiration total 69. The 900 series drilled by Harpoon total 4 and are not within the area of our ore reserve calculation.

100 Series Holes (Diamond Drill)

Assays on the United Nuclear logs are not complete. They did not recognize tenorite in the mineralized zone and only assayed areas where vivid green color of malachite or chrysocolla were evident. Consequently, many of the assay intervals for the upper benches are incomplete. No core or samples are available for additional checking.

200 Series Holes (Rotary)

There are no logs available on the 200 series holes drilled by Ranchers. Assay data posted on maps were used at face value. In addition, there are no cuttings, rejects or pulp samples for additional check assays. These are important factors as data from the 200 series holes were used for a significant part of the ore reserve calculation by both ICCC and our own audit.

300 Series Holes

There are logs complete with assay data for the 300 series. However,

core, rejects, or pulp samples are not available for any check assaying.

400 Series Holes

Complete assay data is available on the logs for the 400 series. Pulps, split core and reject samples were available for checking. About half of the pulps and rejects are cataloged and filed for ready retrieval. All of the above mentioned check samples have been taken from the 400 series holes.

ICCC's ore reserve estimate and UPMC's audit required the use of data from the 100, 200, 300 and 400 series holes. The 900 series holes did not enter into ore reserve calculations. On the 3100 and 3150 benches 49% of the holes used for ore reserve calculations are in the 100, 200 and 300 series; 19% of the holes are the 200 series. On the 2600 to 2625 bench, 35% were in the 100 and 200 series. Approximately 25% of the total tons calculated for the 3100 and 3150 benches is dependent upon the 100 and 200 series holes (See Figure 9).

Approximately 40% of the information used in the reserves and audit is from the uncheckable 100, 200 and 300 series holes. All check assays by UPMC are from the 400 series holes of ICCC, no check assays are available from the United Nuclear, Ranchers and Bear Creek work. Their data is probably reliable, but can not be checked. Because of the low grade nature of this deposit and the marginal economics, about the only check possible is a limited diamond drill program.

Core Recovery

Analysis of the core recovery was made by computing the core recovery for approximately 80 holes in the pit area. This was done on the 100 and 400 series drill holes. The study was made to a depth of 500 feet on all holes except for the central area where approximately 16 holes were carried down to a depth of 800 feet. Core recovery for individual drill holes varied between 80 and 100 percent. The majority of holes are above 90 percent and the overall average of recovery within the pit area is 96 percent.

United Nuclear holes (100 series) were actually measured as core recovered and was given in tenths of feet. The Inspiration holes apparently were estimated and core reported to the nearest one-half foot in some areas and to the nearest one foot in the majority of holes.

Internal Drill Hole Surveys

Many of the drill hole logs do not have the hole survey data listed.

Surveys for six holes were calculated and plotted on various bench maps as a check for hole location. One hole had a "bust" in the calculation. The correct location varied from 9 to 17 feet on the 3150 bench to 45 feet on the bottom bench. The other five holes all checked within 5 feet except for the bottom of the pit at 2400 where the greatest error was 29 feet.

We conclude that the holes are more than reasonably plotted and are generally plotted within 20 feet of where they actually occur. On this type of ore body which will be mined by large scale, open pit method, a 20 to 40 foot variance would not be significant since grade control will be guided by the assays from blast hole drilling.

Carpenter Mine Workings

The Carpenter Shaft is very near the center of the pit area. At about 200 feet below the surface limited drilling has been done. This underground work was the source of much of the material used in the Mangula leach tests. Assay data and geologic data shown on underground maps agrees in general with the computer print-outs of the same area.

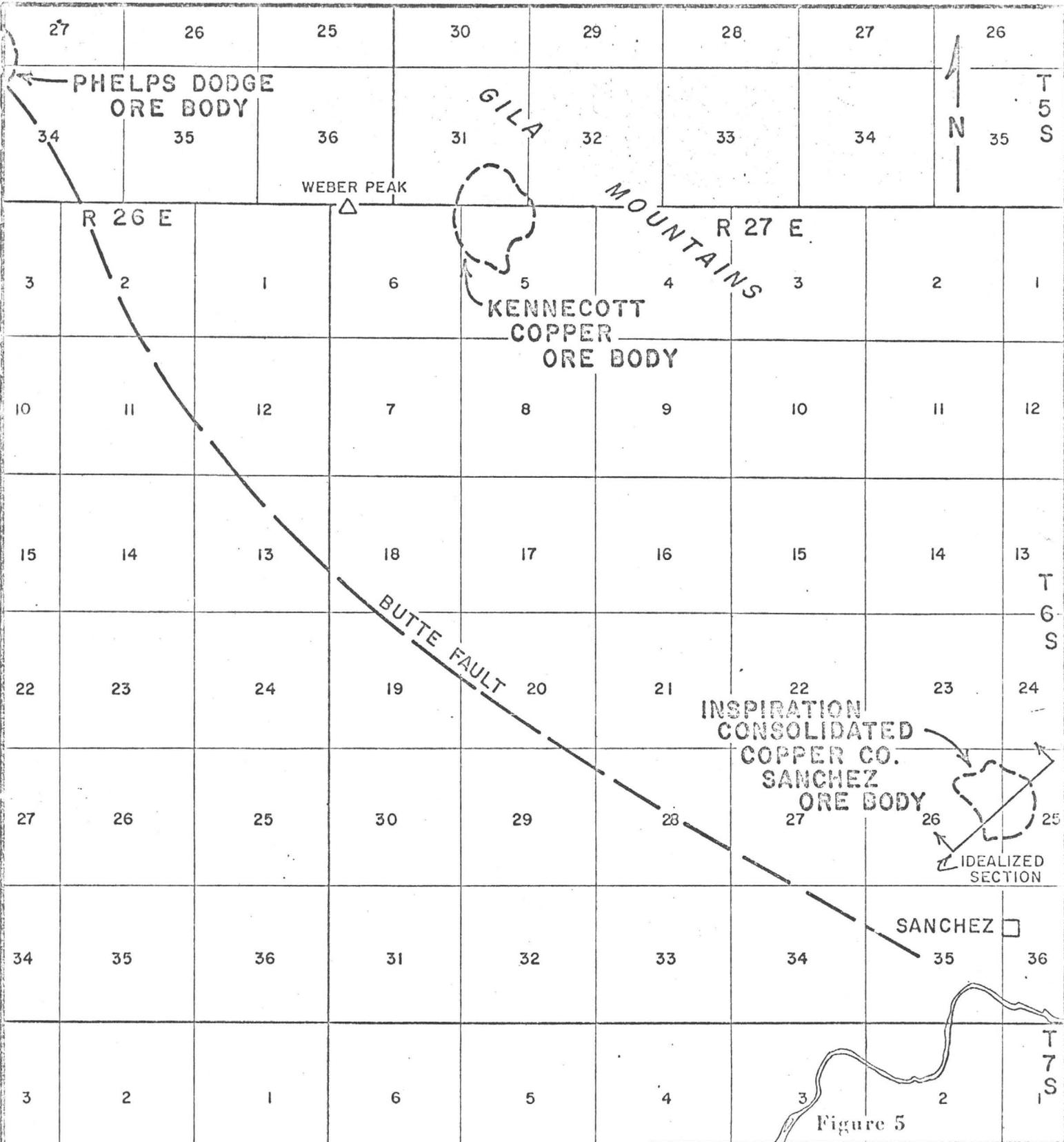
POTENTIAL OF SANCHEZ AREA

In addition to the evaluation of the pit area as outlined by ICCC, a study has been made of the extension of potential outside the perimeter of the pit area as well as evaluation of all the claims on the Sanchez property.

There is a possibility to expand the known reserves to the northwest, peripheral to the present pit outline and at some future date, this area should be drilled before too much pit and dump planning is designed for the northwest.

The ICCC exploration staff has completed a recent induced polarization survey of the northwest and west side of the Sanchez holdings. A report on this work dated May, 1973 suggests some deep drilling targets exist to the northwest of the pit area from a mile to several miles distant.

A third potential for added life exists and is the most concrete at the present time. Below the 13 year pit exists a reserve of sulfide mineralization ranging from .4 to .5% Cu. This grade coupled with the lower grade material totals a geologic reserve of oxide at 250 million tons averaging 0.25% Cu which overlies 130 million tons of mixed oxide and sulfide rock averaging 0.3% Cu.



UNION PACIFIC MINING CORPORATION
 Denver, Colorado

LOCATION MAP
 SANCHEZ DEPOSIT

GRAHAM COUNTY, ARIZONA

Scale : 1" = 1 Mile Date : April 6th, 1973

TO ACCOMPANY U.P.M.C. FEASIBILITY REPORT

EXPLANATION

 Mineralized Zone



EXPLANATION

- | | | | |
|---|--------------------|---|------------------|
|  | BASALT |  | FAULTS |
|  | MONZONITE PORPHYRY |  | VISIBLE CONTACTS |
|  | ANDESITE PORPHYRY |  | INFERRED CONTACT |
|  | ANDESITE | | |
|  | BRECCIA ZONE | | |

UNION PACIFIC MINING CORPORATION
Denver, Colorado

GEOLOGIC MAP
SANCHEZ AREA
GRAHAM COUNTY, ARIZONA

Scale 1" = ±500'

Date: July 9, 1973

TO ACCOMPANY U.P.M.C. FEASIBILITY
REPORT



EXPLANATION

[Stippled Box]	Andesite	[Wavy Box]	+ .4 %Cu
[Cross-hatched Box]	Andesite Porphyry	[Checkered Box]	+ .2 %Cu
[Checkered Box]	Monzonite	[W]	Waste
[Wavy Box]	Monzonite Porphyry		
[Cross-hatched Box]	Breccia		
[Dashed Box]	Qal - Alluvium		

Figure 8
UNION PACIFIC MINING CORPORATION
DENVER, COLORADO
SANCHEZ PROJECT
SECTION 15,500 N
GRAHAM COUNTY, ARIZONA
BY: P.A.M. | AUGUST 1, 1973
TO ACCOMPANY UPMC FEASIBILITY REPORT.

ECONOMICS

UPMC capital and operating cost estimates detailed in preceding discussions are summarized in Tables 9 and 10. These Tables also compare the UPMC estimate to Inspiration's estimate of December 1972. These comparisons indicate that UPMC's estimate of both capital and operating costs are higher than Inspiration's for the various reasons discussed previously.

The project economics, (detailed in Appendix XV) based on our estimate of capital and operating costs, and Inspiration reserve estimates and metallurgical assumptions are summarized in Table 11.

The business arrangement, as currently structured, provides that UPMC will put up 60% of the first \$19.1 million in capital costs, in order to reimburse Inspiration for the after-tax affect of their sunk costs through October 1972. We have verified by audit (see Appendix XVI) that their sunk costs are substantially as represented, approximately \$5 million. Capital in excess of \$19.1 million will be provided, 51% by ICCC and 49% by UPMC, with Inspiration retaining a 51% interest in the property. Thus the base case economics for 56¢ copper provide the following:

	<u>UPMC Estimate</u>	
	<u>Project</u>	<u>UPMC</u>
Initial Investment \$ MM	24.9	14.4
Average Earnings \$MM/Yr	1.3	0.6
Rate of Return - %	8.9	5.6

While these returns are discouraging, there is considerable upside potential to be explored.

There are two areas of the project which we can look to in attempting to improve the economics:

- 1) Optimization of design
- 2) Revision of the business arrangement

Optimization of Design

There appears to be considerable potential to be gained by optimizing costs and processes and, of course, Inspiration never considered the project to be optimized.

A program to further define the ore grade and tonnage, and to optimize the copper recovery has been proposed. The affect of changes in either parameter is represented by the revenue line in Figure 16. Of course, a change in copper prices can also be represented on the revenue line. This graph shows that a 10% increase in revenue for whatever reason would result in a numerical increase of 5% in rate of return.

Previous discussion has indicated that this is by no means a definitive estimate; there is much refinement needed. Figure 16 also shows the sensitivity of rate of return to changes in capital and operating costs.

The following Table summarizes the affect of changes in these variables on the project rate of return.

	<u>Change</u>	<u>Change Project ROR - %</u>
Operating Cost	- 10%	+ 4
Capital	- 10%	+ 2

The differences indicated by comparison of capital and operating costs in Tables 9 and 10 emphasize the need for better definition and the potential for improved economics.

Inspiration's total operating cost estimate is only 8% lower than UPMC's; however, ICCC's estimate for mine operating costs is about 4.2¢/lb (11% of the total) lower than ours. If Inspiration's estimate is borne out, the project could well provide a rate of return 4 percentage points higher than our estimates indicate. Previous discussion indicated that acid costs (a function of both price and consumption) are not well defined. These account for about 10% of the total costs, thus there is considerable room for improvement in this area, also.

Similarly, the capital comparison in Table 9 shows that Inspiration's estimate for initial capital is about 25% lower than that of UPMC. A particular area of contention is the leaching circuit, the least defined portion of the plant at this time. The difference in leach plant estimates is 11% of UPMC's total initial capital; if a definitive estimate confirms ICCC's estimate for this section, the project would benefit from a 2 percentage point increase in ROR as shown above.

There are several other areas of the estimate where brief investigation has indicated considerable potential. These are summarized below.

	<u>Variable Change</u>	<u>Change in ROR-%</u>
Working Capital	-50%	+ 1
Project Life	+ 5 years	+ 2.2
Plant Capacity	+14%	+ 4

These are some of the changes which have been considered and are indicative of the improvements which further refinements to the project may bring.

The base case economics contain four months' working capital on verbal advice from Inspiration; however, study of Inspiration's financial statements indicates that Inspiration needs approximately 45 days working capital. It would seem that Sanchez would need no more working capital than Inspiration since the smelter inventories should be a significant factor in Inspiration's requirements. Reducing the working capital for Sanchez from \$3 million (4 months) to \$1.5 million (2 months) would increase the rate of return by 1 percentage point.

The above Table also shows the effect of increased project life, which the geologic investigation, previously discussed, indicates will likely occur.

The last item in the Table shows the result of estimating the economics for a 20,000 TPD plant, factored from the 17,500 TPD estimate by scaling up all capital costs by the 0.6 power except for mine capital which was scaled up linearly. Unit operating costs were assumed to remain constant and the reserves were held constant so that project life was reduced from 13 years to 11 years. 20,000 TPD is not intended to be an optimum size; that has yet to be determined. Obviously, there is much work remaining in order to optimize this project.

Revision of the Business Arrangement

Should better definition of the project result in an acceptable return to Inspiration but an unacceptable return to UPMC, we would obviously negotiate for a more favorable arrangement as anticipated in the letter of intent.

TABLE 9

SANCHEZ

CAPITAL SUMMARY

Capital Estimates - \$(000)

	<u>UPMC</u>	<u>ICCC Dec. '72</u>
Initial Capital		
Mine	4,908	4,271
Crushing	2,600	2,068
Leaching	7,738	5,036
Solvent Extraction	1,700	1,034
Electrowinning	3,750	3,160
Miscellaneous	3,000	2,774
Site Preparation	200	(inc)
	<hr/>	<hr/>
Total Plant & Equipment	23,896	18,343
Organic Supply	<u>700</u>	<u>225</u>
Total Depreciable	24,596	18,568
Property	<u>300</u>	<u>537</u>
	24,896	19,105
Replacement Capital	<u>10,473</u>	<u>6,308</u>
Total	35,369	25,413

TABLE 10

SANCHEZ

OPERATING COST SUMMARY

Operating Costs Estimates - ¢/lb

	<u>UPMC</u>	<u>ICCC Dec. '72</u>
Mining	15.68	11.51
Crushing	1.47	2.25
Leaching	8.76	8.50
S - X	1.33	1.22
E - W	3.65	1.86
Supervision	1.94)
Support	<u>1.70</u>) <u>3.86</u>
Total Direct	34.53	29.20
Tax & Insurance	1.79	1.25
Freight	.50	1.74
Marketing	.25	.50
Melt & Casting	--	1.25
Royalties	<u>.52</u>	<u>.58</u>
Total External	3.06	5.32
Total	37.59	34.52

The function of Still, Lowell and Still was for geologic interpretation and mine cost analysis. Pincock, Allen and Holt, working with UPMC personnel, developed a new pit design taking maximum advantage of slope stability based on a detailed rock fracture study. The revised pit took into account cutoffs based on recovery as a function of grade and rock type factors not recognized by ICCC.

The new pit design delineates the mineable reserve of 116 million tons at an average grade of 0.368% copper, an increase of 46% over the original design. The modified design did increase stripping ratio from 1.5:1 to 1.8:1.

The revised mine operating costs are summarized in two charts as follows:

<u>Year</u>	<u>Stripping Ratio (Waste/Ore)</u>	<u>Mining Cost Per Dry Ton Of Material</u>	<u>Mining Cost Per Dry Ton Of Ore</u>
0 - 2	2.48/1	.294	\$ 1.025
2 - 4	2.19/1	.345	1.100
4 - 6	2.19/1	.423	1.347
6 - 9 $\frac{1}{2}$	2.03/1	.414	1.256
9 $\frac{1}{2}$ -12 $\frac{1}{2}$	1.49/1	.466	1.160
12 $\frac{1}{2}$ -17	.80/1	.506	.911
Average	1.778/1	.407	\$ 1.122

<u>Element</u>	<u>Overall Ave. Cost Per Dry Ton of Ore</u>
Drilling	\$.152
Blasting	.128
Secondary Blasting	.025
Alluvium Dozing	.013
Truck Loading	.139
Truck Hauling	.411
Road Maintenance	.061
Coarse Ore Stockpiling	.012
Waste Dump Maintenance	.026
Repair Crew	.114
Pit Department	.041
	<hr/>
Total	\$1.122

The mine capital requirements were determined for each period in the life of the mine, as shown in Table I. It may be noted that the cost of the equipment needed increases during the first several years as the size of the truck fleet increases. Replacement costs are included, based on operating lives appropriate to each piece of equipment, as recommended by the equipment manufacturers and adjusted by the operating experience of those using similar equipment.

LAND STATUS AUDIT

An effort has been made to verify the figures appearing in the "Outline of Costs of Lease Option Agreements for the Sanchez Project" which was attached as an exhibit to Inspiration's feasibility study and is reproduced in the attached table.

The payment relating to claims covered by the Carrasco lease for 1974 and, consequently, the total are supported by the document furnished by Inspiration.

The payments for 1974, 1975 and 1976 and the total for the two claims covered by the agreement with Collopy are supported by the instrument furnished us, except that a 3% production royalty on net smelter returns is provided for. For purposed of the outline, Inspiration apparently assumed production would not begin until 1977, at which time total payments due Collopy would have been reached.

The outline was evidently prepared prior to June 1, 1973, which is the date of an amended lease entered into by Inspiration and the Knox interests. Accordingly, the revised payment due under the lease in 1975 was not available. It is \$21,605 in lieu of the \$95,000 as shown. This also changes the total.

The payments for 1974, 1975 and 1976 and the total shown for the so-called Carpenter claims are also supported by documentation, except that it must be understood that the total is only for payments made by Inspiration. As the note to the outline indicates, an additional \$150,000 was paid by Harpoon. This becomes important when the figure of \$2,035,000, which is included in the total as production royalties, is considered. Some error in computation has occurred in the outline, since \$189,000 per year for 12 years equals \$2,268,000; but the more important point is that no production royalties paid, which, accepting Inspiration's assumption that production royalties will begin in 1977, will be \$800,000.

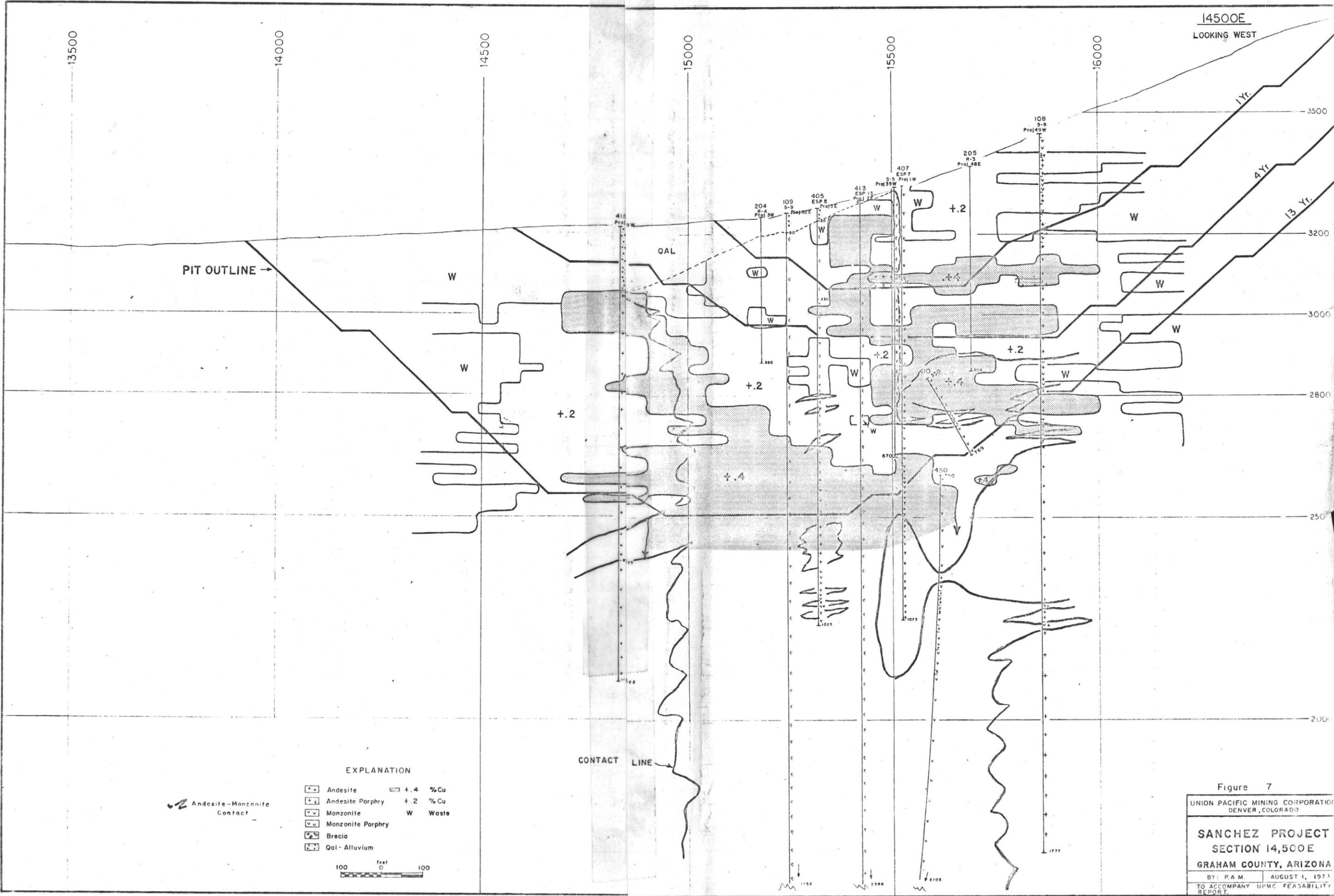
The mining lease now assigned to Inspiration covering the Carpenter claims provides for payment of 7/10 of a cent for each net pound of copper produced from the leased claims. It also provides that if the lessee obtains additional mining claims in Sections 23, 24, 25 and 26, T6S, R27E contiguous to the Carpenter claims "other than those now or hereafter acquired or staked in connection with the Nancy claims located in Sections 23 and 26, "such claims will be subject to the lease". The Gila claims numbers 43, 45, 47 and 49 are clearly contiguous to the Carpenter claims, so that others of the Gila group may be included under this provision. It might be presumed that the parties contemplated payment of a production

royalty to the lessors on these additional claims; however, Inspiration contends that they were located in connection with the Nancy claims.

Apparently, the only other payments relate to purchase of the Grijalva farm. Payments remain under a promissory note entered into by an agent of Inspiration, in the amount of \$21,850 plus 6¢ interest per year on the unpaid balance.

Inspiration has furnished copies of documents to support its claim of ownership in the Sanchez area. In addition, a selective search of the County records for filing of claim location certificates and annual assessment work affidavits has been made. A detailed check of the 16 claims which Inspiration is taking to patent was made. Both the selective and the detailed check indicate that assessment requirements have been met.

It is felt that the aforementioned title search is adequate at this stage of the project evaluation; and we feel reasonably sure that Inspiration's title to the properties is as presented by them. In the event of additional commitments, an expenditure for a detailed title opinion on at least the part of the properties involved in initial development plans may be desirable.



EXPLANATION

- Andesite +.4 %Cu
- Andesite Porphyry +.2 %Cu
- Monzonite W Waste
- Monzonite Porphyry
- Breccia
- Qal - Alluvium



Andesite-Monzonite Contact

Figure 7
UNION PACIFIC MINING CORPORATION
DENVER, COLORADO
SANCHEZ PROJECT
SECTION 14,500E
GRAHAM COUNTY, ARIZONA
BY: P.A.M. AUGUST 1, 1973
TO ACCOMPANY UPMC FEASIBILITY REPORT.

418 14500 E 14835N.

0-165 alluv.
 165-181 monz. 165-265 0.59 ok
 181-748 and 265-615 ± 0.35
 748-825 monz., 615-815 0.35
 825-1122 and, 815-1015 0.41
 1015-1122 0.31 ok should be deepened.
 to top of 3. zone.

419 all andesite

14823 N 14300 E

0-181 alluvium 181-525 0.30 ok.
 181-1255 all andesite 525-630 0.21 "
 630-980 0.48 "
 980-1080 0.25
 1080-1230 0.53 mixed and sub.
 1230-1255 0.34 Sul.

108 220 E of 129 15861N 14549 E 3462 E1.

10-270 And. + monz. 10-763 only scattered assays
 270-1777 all andesite 763-1314 - 0.30 ok.
 1314-1400 0.37 mixed and sub.
 1400-1456 0.30 Sul.
 1456-1572 0.29 mixed
 1572-1777 0.34 Sul.

103 280' W of 129.

0-12 mixed No assay 0-88
 12-1137 Andesite 88-± 802.5 scattered assay 0.1-0.4 mixed ± .15
 1137-1472 And + monz. 802.5-849.2 0.41 ok
 1472-1752 And. 849.2-996.8 scattered assays ± 0.15
 1752-1797 And + monz. 996.8-1797 0.24 (sulph. 1010-1797.)

304 16,136 N 14392 E

0-42 no samples. 42-1495 all andesite - all acid. - 0.15-0.27% Cu.

S1 (101) 7-301 monz. } few assays above 0.2
 301-369 And + monz. }
 369-1500 monz. 0.15 in lower part of hole

S2 (102) 16669N-13959 E
 All andesite. avg 0.15-0.20

Look up underground notes, assays.

368 Unpatented claims - no patent, 1 state lease, 1 fee 80 A. Cuijiva
 #36,800 Computer group by 30 June, ^{contract} rest by Sept. 1. —

to Oct 11, 1972
~~to 1973~~
 Insp. investment ~~to 5,000,000 to 9/72~~ 5,231,430

UP to put up 60% of first 19.5 million (11.5 million) less 4% int. - Insp. SI, operators -

Then put up approx equal amount for plant 11.6 + 2.8 = 14.4 Insp. (10.5?)

Develop - 2,577,822
 Expl 222,991
 Royalty 298,250
 Capital 2,132,367

+ additional since 10/11/72 - principally property payments.

5,231,430
 1973 158,851
 4 183,471
 To Jan. 1, 75 # 5,572,752
 73,600 assays.
 5,646,352

36800
 73600

3650 (11 years)
~~20,000~~ 73,000
 2650 (8 years)
~~20,000~~ 53,000

15568A 14300B

441 (W edge of Kucina)	120 - 120	0.03
12 - 254 alt monz.	120 - 160	0.42
	160 - 240	0.058
254 - 336 in analysis - wash Feox, talc matrix	240 - 310	0.44
336 - 361 monz.	310 - 410	1.03
361 - 397 Bx - Frag. and. engulfed in f. gray groundmass - Feox	410 - 560	0.17
	560 - 960	0.54
397 - 599 monz.	960 - 1110	0.26
599 - 654 and.	1110 - 1295	0.54 - stopped w 0.8-1.0% Cu,
654 - 902 monz.		
902 - 911 and.		
911 - 1129 andesite - little Bx at 1001-02		
1129 - 1295 and monz.	1118 - 1190 mt Cu. 1190 - 1295 sulph. except at start	

2833
 1999
 8332
 545

793
 262

2126
 516

3. Develop time schedule for project.

LOCATION AND ACCESS

The Sanchez project is located in the Lone Star mining district, Graham County, Arizona about ten miles northeast of Safford, Ariz. (Fig. 1). The mine and plant site is situated in Section 25, 26, 35, and 36; T.6S., Salt River Baseline & Meridian. R27E.,

The property is accessible via dirt road north from Highway 60-70 at Solomon, Arizona which goes across the Gila River on a bridge and east to the project site. It is about eight miles from the highway junction. An alternate route is via San Jose road which leaves Highway 60-70 approximately two miles east of Solomon and goes northeast to the river where there is a ford. This road is impassable across the stream when the water is high.

GEOGRAPHY & TOPOGRAPHY

The Sanchez deposit is located in a valley depression tributary to the Gila River which is about one mile south of the property. The average elevation is about 3,200 feet above sea - level.

Rainfall averages 3.5 inches per year and vegetation is sparse mesquite-greasewood type. Temperatures range from 7° to 114°, the average being 82°F.

The area of the proposed mine and plant site is rather gentle in relief, although the slope out of the pit will encounter the steep hill slopes surrounding the area to the north and east.

LAND STATUS

The Sanchez property includes 551 unpatented lode mining claims, 39 acres of farm land purchased from P. Grijalva, ten acres of valley border leased from M. Sanchez and 240 acres of state land covered by a prospecting permit. (Fig. 2)

The principal lease with Harpoon, Inc. (a subsidiary of United Nuclear Corp.) has been paid off. This lease covers Harpoon's interest in 31 claims in the Carpenter group, 124 claims in the Basalt group and the State prospecting permit. (See App. A for other claims.)

By 1976 all the claims under option will have been acquired by Inspiration except the Carpenter group. Inspiration will pay a production royalty or minimum royalty as long as the Carpenter agree-

ment is in effect since there is no provision for purchase of this interest.

Table 1 outlines the Lease Option agreements in effect.

Steps have been taken to initiate patent proceedings for sixteen contiguous lode claims and negotiations with the Bureau of Land Management for a land exchange of 1,265 or more acres have been started. This land exchange area will be utilized for dump sites and plant site. (Fig. 3)

A full discussion of the status of the land situations is included in Appendix A.

HISTORY

Kennecott Copper Corporation which started operations in the district in 1955 and is developing a large, low grade copper deposit four and a half miles northwest of Sanchez. Presently a number of concerns are active in the area; including Kennecott Copper Corp., Phelps Dodge Corporation, and Producers Minerals Corp. who have active projects in the district; plus Essex International and Amax Exploration who have located claims nearby.

Mining at Sanchez on a small scale dates back to 1899, but it was not until 1964 that Harpoon, Inc. discovered the existence of a large low grade copper ore body. Prior to Harpoon's interest Bear Creek Mining Co. drilled four holes and relinquished the property. After Harpoon came on the scene Sanchez's Exploration & Development Co. drilled several holes under a lease & option agreement with Harpoon and subsequently vacated their option. Also Harpoon drilled several holes. Information from all the drilling done by previous parties was evaluated and used in this analysis.

Inspiration optioned the property in 1969 and started an extensive drilling program coupled with metallurgical testing and feasibility study.

CULTURE & SERVICES

The town of Safford, county seat of Graham County, Arizona is approximately ten miles southwest of the Sanchez property. Safford is an agricultural community on the Gila River with a population of 5,317 persons (1970 census). The town is of adequate size to support the required work force, although housing is tight.

The project area is accessible to on-highway freight trucks via an eight mile gravel county road. Safford is served by the Southern

Pacific railroad and a siding approximately nine miles from Sanchez could be reestablished and used if needed.

Ample power is available for less than a cent per kilowatt hour, although a powerline and substation would have to be built to the property.

Water potential from wells on our property is excellent. In addition, owned and leased farmlands in the Gila valley have water potential.

GEOLOGY - by E. Ross

Known copper deposits in the district are confined to the South flank of the Gila Mountains and can be traced to igneous activity along the Butte fault (Fig. 4). Copper metallization accompanied the intrusive rocks and the related phyllic hydrothermal alteration.

The Sanchez deposit is a porphyry-copper type and is centered around monzonite porphyry stocks (Fig. 5). The northwest and eastward trending structures were responsible for localizing the intrusives and the copper mineralization. The deposit can be divided into three mineralogical zones: an oxide zone, a mixed zone, and a sulfide zone (Fig. 6). The oxide zone consists mainly of chrysocolla and copper pitch (tenorite), with minor amounts of malachite, cuprite, and chalcantite. Native copper is found in all zones but is most plentiful near the oxide-sulfide contact. The mixed zone contains both sulfide and oxide minerals. In the sulfide zone chalcopyrite and bornite predominate, but chalcocite, pyrite, covellite, and molybdenite are present.

The core of the deposit exhibits phyllic and minor potassic hydrothermal alteration which grades laterally to a secondary biotite zone, then to a biotite-chlorite zone, and finally to a propylitic zone.

The highest grade portion of the ore body is contained almost entirely within the main stock, but the bulk of the copper mineralization is found in the host rock surrounding it (Figs. 5, 6, & 7). One theory for the formation of the deposit is that the intersection of the major faults created a conduit for an older intrusive, which further prepared the ground for the main intrusive. Sometime later a younger, barren intrusive penetrated the area (Fig. 7). The west end of the main stock is relatively unexplored and could produce additional reserves.

ORE RESERVES

The ore reserves in the largest designed pit total 79,362,000

tons averaging .36% total copper. Within the pit limits totals 118,106,000 tons including 39,050,000 tons of basalt.

There are 571,406,000 pounds of contained copper of which 343,553,000 are recoverable at 60% recovery. The waste to ore ratio is 1.49: 1.00. These results are based on interpretation of the drilling data by computer analysis.

Basic parameters for the pit design were:

1. Cutoff grade: .20% Cu.
2. Pit slopes at 45° which are reduced to 38° by safety benches and access roads.
3. Weight of rock in place: 12.5 cu. ft. per ton.
4. Haul roads at ± 3% and 60 feet wide.
5. Three intermediate pits and final expansion have been designed. The ore and waste tonnages for each of these designs are summarized in table 2.
6. Bench height is designed at 5 ft.

Table 2: ACCEPTED ORE RESERVES, MICHEZ PROJECT

<u>Pit</u>	<u>Tons Ore</u>	<u>Tons waste</u>	<u>Tons Alluv.</u>	<u>Total Tons</u>
1-2	12,500,000	11,700,000	9,925,000	34,125,000
3-5	13,750,000	22,034,000	8,291,000	49,125,000
6-10	31,250,000	33,906,000	12,656,000	77,312,000
11-13	<u>16,362,000</u>	<u>10,511,000</u>	<u>9,033,000</u>	<u>36,406,000</u>
	79,362,000	78,201,000	39,905,000	197,468,000

Geologic reserves in the vicinity of the pit design down to the lowest pit elevation total 208 million tons averaging .23% copper of which 166 million tons average .33% copper. There is some indication further extension to the west is possible (Fig. 5), based on sparse drilling information.

Gross oxide reserves are estimated at 250 million tons averaging .25% copper. Underlying the oxide zone there are an estimated 130 million tons of mixed and sulfide ore with an average grade approaching .30% copper. This zone is only partially explored.

METALLURGY

A system of heap leaching, patterned after an installation at the Mangula operation of Messing Transvaal Development Co. in Rhodesia was adapted to test the Sanchez ores, after a series of conventional dump and vat leaching tests were not very successful.

This adaptation, termed the Mangula-Sanchez system by us, showed favorable results as a practical plant process for Sanchez ores and is the basis for this evaluation.

Results from five small pad tests and one 5,000 ton pad test indicate that metallurgically the following system is feasible for the Sanchez ore:

1. Crash to minus 5/16 inch closed side of crusher in open circuit to produce a minus 1/2 inch specification product.
2. Stack twenty feet high on a permanent base; water sprays in the bedding system will provide agglomeration of fines.
3. Leach with fifteen to twenty grams per liter sulfuric acid in water for twenty to twenty-one days at percolation rates of 450-500 gallons per minute per 10,000 square feet of surface area.
4. Wash leached ore heap for one to two days to recover acid and residual copper solution.
5. Reclaim and discard the residue in a tailings area.

This plan, according to the test results, will recover approximately 61% of the copper in the ore with an acid consumption of eleven pounds per pound of copper recovered or about forty-eight pounds per ton of ore.

The Mangula system was developed in Africa at the Mangula mine of Messing Transvaal Development Co. in Rhodesia.

The Mangula plant in Africa washes mine run ore before crushing to minus 1/2 inch. The washing removes most of the fines which hinder percolation. The crushed ore is bedded in twenty foot lifts by a combination loading and excavation bridge on an asphalt pad which allows control of solution flow. The leach solution contains thirteen grams per liter sulfuric acid and ten grams per liter copper and is applied at two hundred gpm per 10,000 square feet of pad area. The time required is twenty-five to thirty days to recover eighty per cent of the copper. The pregnant off solution contains thirteen grams per liter copper and has a pH of 2.0

PAY DIRT

No. 322, December 17, 1965

**UNITED NUCLEAR PLANS FOR
PRODUCTION AT THREE MINES**

Richard D. Bokum II, president of United Nuclear Corporation, has announced his company's plans to begin production at three properties, two of which are in Arizona, the third in Montana.

Copper operations will start on the company's holding about 10 miles northwest of Safford, Arizona, where exploratory work has been in progress for about two years. The plan calls for sinking an 800-foot shaft at a cost estimated at about \$300,000. Last spring the company reported the discovery by diamond drilling of a large reserve of low-grade copper-bearing rock, but the present program calls for mining ore of a grade said to justify shipping directly to the smelter. United Nuclear's holdings include 50 claims in the Lone Star group and 40 claims in the Esperanza group held under option, and an additional 20 claims located by the company.

The other Arizona project covers mining and production from the Pine Mountain mercury mine, south of Payson, near the Gila-Maricopa county boundary. Initially, ore production will be about 50 tons per day.

The third project is a lead-silver-zinc property near White Sulphur Springs, Montana, which will be mined by open-pit methods and the ore concentrated on the property in new facilities to cost approximately one-half million dollars. United Nuclear has a 50 per cent interest in this project.

United Nuclear is a major producer of uranium from its mines in New Mexico and a fabricator of nuclear fuel and reactor cores at plants in Missouri, Connecticut and Rhode Island. Western offices are maintained in Santa Fe, New Mexico. The current expansion program is said to be an effort to broaden the concern's natural resources base.

Wm. G. Hoskins, project geologist, directed United Nuclear's exploration at Safford, Arizona.

THIS IS COPPER COUNTRY



Arizona Mining Association

- 1950 First significant copper ore body to be discovered by geophysical methods, south of Tucson.
- 1954 Cyprus Mines Corporation buys Bruce Mine west of Prescott near Bagdad.
- 1956 Tucson copper district reopened.
- 1957 Duval Corporation builds concentrator at its Esperanza mine, south of Tucson. Duval had acquired the mine a few years prior to this time.
- 1958 Arizona supplies over half the nation's newly mined copper, a position which it still holds today.
- 1963 Cities Service Company acquires the Tennessee Corporation mine near Miami, which originally was owned by the Miami Copper Company.
- 1964 Ranchers Exploration and Development Corporation buys the Bluebird Mine near Miami from the Stovall Copper Company.
- 1965 The Anaconda Company begins massive stripping operations at Twin Buttes Mine, south of Tucson.
McAlester Fuel Company explores the Zonia Mine at Kirkland, southwest of Prescott, starts ore leaching production a year later.
First acid plant as part of a smelter is installed by Phelps Dodge at Morenci.
- 1968 At the Bluebird Mine, near Miami, Ranchers Exploration and Development initiates the industry's, and the world's,

first method of copper recovery from cementation to solvent extraction-electrowinning. Other Arizona mines have since begun similar operations.

- 1969 Continental Oil Company begins exploration near Florence, a year later makes copper ore discovery. Hecla Mining Company starts new underground development at Lakeshore Mine, south of Casa Grande. Arizona's first rod plant, built by Inspiration near Miami, starts supplying copper rod to a telephone cable factory in Phoenix. For the first time, the industry manufactures a finished product within the State.
- 1970 Value of copper produced in Arizona exceeds \$1 billion.
- 1972 Magma's underground mine near San Manuel becomes the State's largest copper producer.
- 1973 Anamax Mining Company is formed by a partnership of the Anaconda Company and Amax Arizona, Inc., to operate the Twin Buttes Mine.
- 1974 Inspiration builds the State's first electric smelter, near Miami.

Much has been written about the history of copper mining in Arizona. Many books on the subject are available at public libraries. You will find them interesting, rewarding reading.

An invitation.

Visit an Arizona copper mine. Many copper mining companies offer public tours of their operations. The Arizona Mining Association has a free tour brochure listing the times and dates of tours, safety rules for visitors and whom to contact at the various companies. Just write or call us for it.

Arizona Mining Association

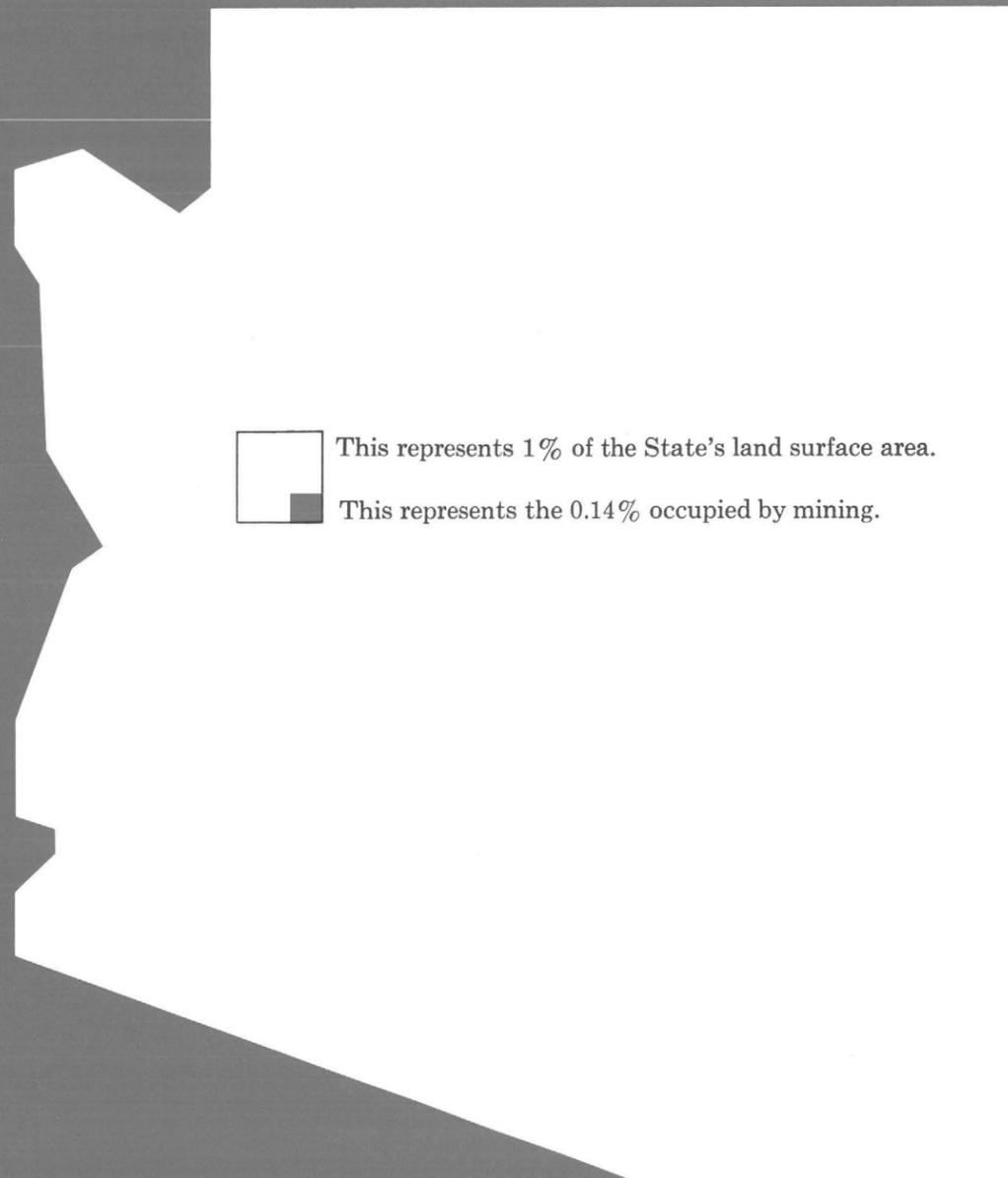
Suite 1222, Arizona Title Building
111 West Monroe
Phoenix, Arizona 85003
Telephone: 602-258-3476

- 1857 Prospectors begin entering Arizona in numbers. Gold ore found in Mohave County near Colorado River.
- 1863 Castle Dome district near Yuma becomes known. Many placer and lode deposits discovered in Prescott region. Moss Mine, Oatman district, Vulture Mine near Wickenburg, and Planet Mine near Williams River are discovered. Moss and Vulture are lode gold mines; Planet is copper. Many lode deposits discovered in Mohave County. Arizona is made a Territory, chiefly because of gold discoveries, with Prescott as the capital.
- 1874 Globe becomes a booming silver camp. Railroad built from Clifton to Metcalf, the first in Arizona.
- 1875 Arizona's first smelter, one-ton capacity, is built at Clifton by the Leszinsky brothers.
- 1876 Southern Pacific Railway reaches Gila Bend from California. United Verde ore body is discovered at Jerome.
- 1877 Rich mineralized ledges discovered at Bisbee; silver bonanza makes Tombstone famous boom town.
- 1878 "Little Emma," a narrow gauge locomotive, is hauled 600 miles by oxen from La Junta, Colorado, to Clifton. Its bell may be seen today in Clifton's Town Hall.
- 1880 Phelps Dodge Corporation buys half interest in Detroit Copper and builds small smelter at Morenci. Silver-copper ore is mined from Silver Queen at Superior (now the Magma). Leszinsky sells out Clifton smelter operation to Arizona Copper Company, after making \$2,000,000.
- 1881 Railroad reaches Lordsburg. Old Dominion Copper and Smelting Company starts operations at Globe. Phelps Dodge acquires Atlanta claim at Bisbee. Mammoth district opened. A small copper furnace is in operation at the present site of Miami.
- 1883 Some copper mining is undertaken at Ray. A small smelter is built at Jerome.
- 1886 Bonanza ores exhausted at Morenci; concentrator built to treat oxidized ore averaging 6.5% copper. Six furnaces in operation at Globe.
- 1888 Copper replaces gold and silver in economic importance to Arizona.
- 1898 Twelve-mule teams haul ore from Globe to Bowie before the railroad reached Globe. The 260-mile round trip takes several weeks.
- 1900 A smelter is built at Douglas by Phelps Dodge. Rich gold ore is found in Oatman and Katherine districts. Cornelia Copper Company is organized to work the Ajo deposit.
- 1907 Arizona passes Montana in copper production; becomes the No. 1 copper producer in the U.S. Loses its No. 1 position in 1909; regains it in 1910 and retains it thereafter.
- 1908 Inspiration Copper Company is organized, begins active development work near Miami in 1909.
- 1910 Magma Copper Company at Superior is formed to work the Silver Queen property.
- 1911 American Smelting and Refining Company builds smelter at Hayden. Production starts at Miami Copper Company. Ray production starts on large scale. New Cornelia property is drilled. Production starts at Magma.
- 1915 Metal prices start to boom. Inspiration Consolidated Copper Company introduces the country's first large-scale copper flotation plant.
- 1921 Postwar depression and shut down of copper properties.
- 1925 End of high grade ore at Miami in sight; producer plans for working of low grade ores.
- 1929 Climax of boom and start of the great depression; copper price collapses from 18¢ to under 10¢ a pound, and declines to under 5¢ a pound in 1932.
- 1933 Kennecott Copper Corporation acquires the Ray Mine property.
- 1939 World War II begins; mineral industries gear to high production. Copper, lead and zinc prices begin long climb upward.
- 1943 Arizona's metal output greatest since 1929.
- 1948 Output of copper ore and zinc-lead ore is the highest of any year in the history of the State.

THIS IS COPPER COUNTRY

Facts about Arizona's copper mining industry.

Prepared by
the Arizona Mining Association
Phoenix, Arizona



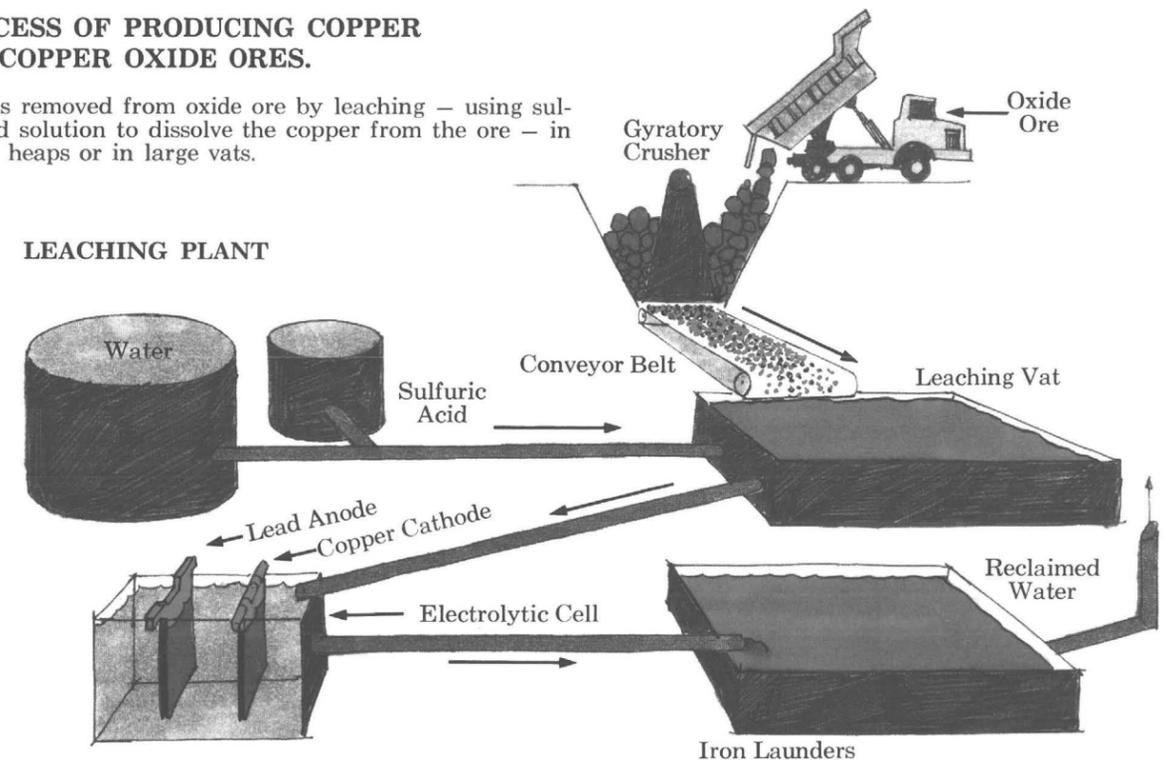
	Acres
Arizona total land area	72,688,000
Total devoted to mining (1930-1971)	102,000*

Source: U.S. Bureau of Mines

* Approximately 0.14% (one-seventh of one per cent) of Arizona's land surface is occupied by mines, mills, smelters, waste disposal areas, roads, etc.

A PROCESS OF PRODUCING COPPER FROM COPPER OXIDE ORES.

Copper is removed from oxide ore by leaching — using sulfuric acid solution to dissolve the copper from the ore — in place, in heaps or in large vats.



In the electrolytic winning plant, the copper from the copper sulfate (leach) solution is electroplated onto a cathode and is ready for market. The remaining, weak copper-bearing solution is washed over scrap iron which removes the last bit of copper. The resulting red-brown "cement" copper (85% copper) is usually sent to a smelter.

The way it all began.

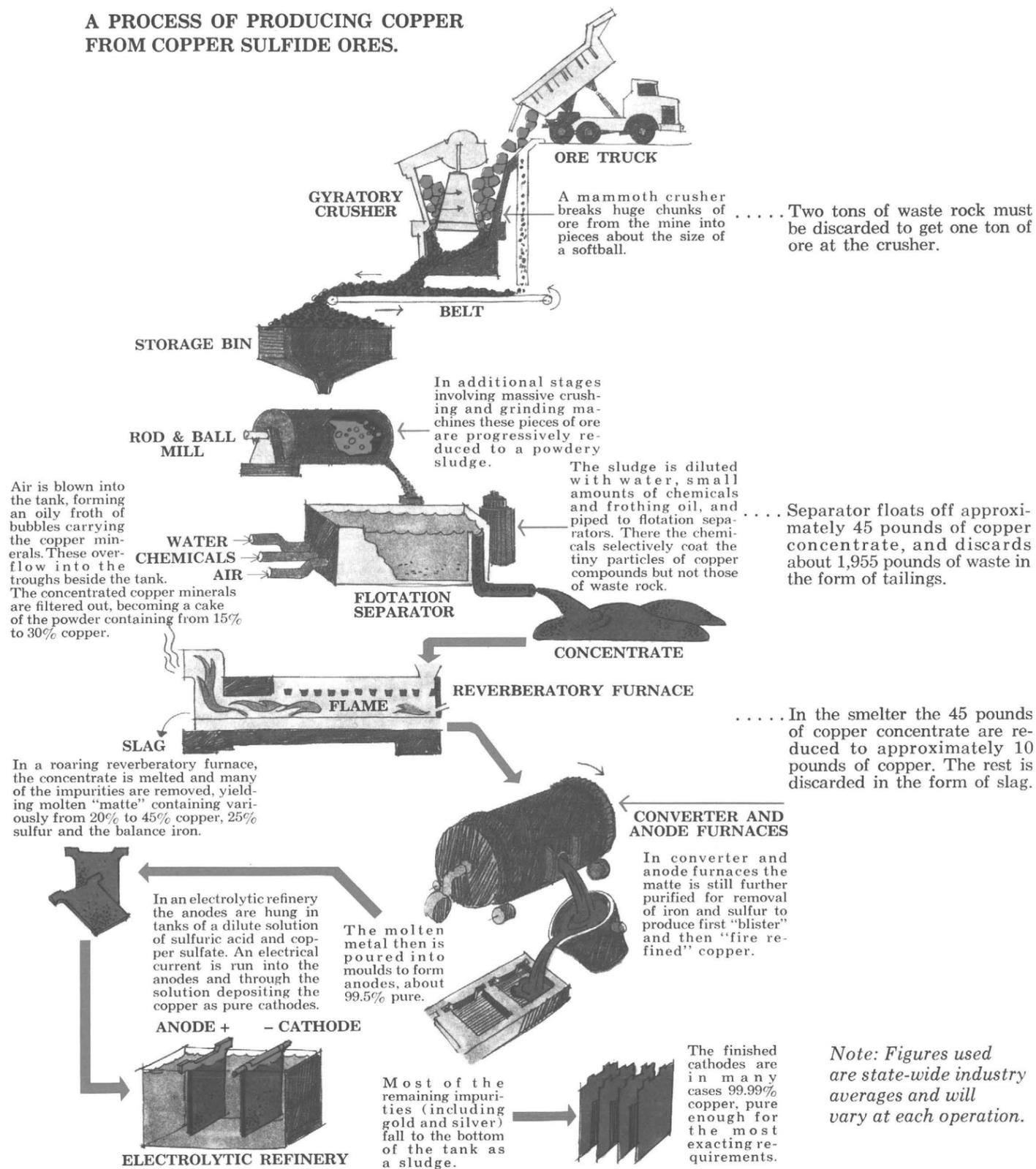
Much of Arizona's history is linked to the search for and development of minerals. Without attempting to document every significant event, here are some historical highlights on the early beginnings of mining in Arizona, down to modern times.

- 1540 First mineral exploration by Coronado searching for the Seven Cities of Cibola.
- 1583 Earliest mineral discovery, by Don Antonio de Espejo, an outcrop of silver south of the San Francisco Peaks, probably at the site of what later became the great copper camp of Jerome.
- 1604 Juan de Onate explores what is now northern and western Arizona but discovers no minerals.

- 1691 For 25 years Padre Kino explores the Papago country, and mentions the mining of rich silver ores.
- 1736 Famous Bolas de Plata silver deposit is discovered at Arizonac in northern Sonora.
- 1750 Some copper is mined at Ajo.
- 1853 Gadsden Purchase from Mexico acquires that part of Arizona and New Mexico south of the Gila River.
- 1854 First mining of copper by Americans in Arizona at a site named Ajo. The high-grade ore is packed by mule train across the desert to the Colorado River, then by sea around the Horn to Swansea, Wales for smelting.

Processing 0.6% low grade ore into 99.99% pure copper.

A PROCESS OF PRODUCING COPPER FROM COPPER SULFIDE ORES.



Introduction.

We hope, in this booklet, to give you some highlights of the copper industry of Arizona. We want you to have more factual information, as well as pride, in our State's role in supplying over half this nation's newly mined copper. The significance of mineral shortages upon the American "way of life" is seldom appreciated until we face a crisis such as we are experiencing in fuels.

Our national leadership is becoming increasingly concerned with shortages of metals, fuels and industrial minerals. Thanks to Arizona, one of the most critical of these, copper, is not now as serious a problem.

As you read this booklet and appraise copper's impact upon Arizona, we hope you will make your personal evaluation upon facts rather than emotion. Certainly this industry has environmental, economic and social impacts! It has become increasingly controversial as population pressures have grown. A perfect balancing of all these factors is probably impossible, but objective compromise following a thoughtful weighing of facts can afford workable solutions.

We have assembled the information in this booklet from what we believe to be competent sources. Should you have a question or need more specific information, please feel free to write or telephone our office.

Sincerely,

James K. Richardson, President
Arizona Mining Association
Suite 1222, Arizona Title Building
111 West Monroe, Phoenix, Arizona 85003
Telephone: 602-258-3476

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These are Arizona's major copper producers.

These member companies of the Arizona Mining Association and the properties they operate are keyed to the adjacent map.

AMAX ARIZONA, INC.

Partner in Anamax Mining Co., operating Twin Buttes Mine

AMERICAN SMELTING AND REFINING COMPANY

1. Smelter at Hayden
2. Silver Bell Unit, open pit mine northwest of Tucson
3. Sacaton Unit, open pit mine north of Casa Grande
4. Mission Unit, open pit mine south of Tucson
5. San Xavier Unit, open pit mine south of Tucson

THE ANACONDA COMPANY

Partner in Anamax Mining Co., operating Twin Buttes Mine

ANAMAX MINING CO.

6. Twin Buttes Mine, open pit south of Tucson

CITIES SERVICE COMPANY

7. Pinto Valley Mine, open pit west of Miami
8. Miami East, underground mine development
9. Copper Cities Mine, open pit north of Miami

CONTINENTAL OIL COMPANY

10. Mine development project, north of Florence

CYPRUS MINES CORPORATION

11. Bagdad Copper Company Division, open pit mine
12. Bagdad Copper Company Division, electrowinning plant
13. Bruce Mine, underground mine west of Bagdad
14. Cyprus Pima Mining Company, open pit mine south of Tucson

DUVAL CORPORATION

15. Mineral Park Mine, open pit north of Kingman
16. Esperanza Mine, open pit south of Tucson
17. Sierrita Mine, open pit south of Tucson

HECLA MINING COMPANY

18. Lakeshore Mine, underground development south of Casa Grande

INSPIRATION CONSOLIDATED COPPER COMPANY

19. Ox Hide Mine, open pit west of Miami
20. Electrolytic refinery and electrowinning plant
21. Thornton & Live Oak open pit mines, north of Miami
22. Smelter, east of Miami
23. Rod Plant, east of Miami
24. Christmas Mine, open pit south of Miami

KENNECOTT COPPER CORPORATION

25. Ray Mine, open pit north of Hayden
26. Electrowinning plant at Ray
27. Smelter at Hayden

MAGMA COPPER COMPANY

28. Superior Mine, underground
29. San Manuel Mine, underground blockcaving
30. Smelter at San Manuel
31. Electrolytic refinery at San Manuel
32. Rod Plant at San Manuel

McALESTER FUEL COMPANY

33. Zonia Mine, in-place leaching at Kirkland, southwest of Prescott

PHELPS DODGE CORPORATION

34. New Cornelia Mine, open pit at Ajo
35. Smelter at Ajo
36. Copper Queen Mine, underground at Bisbee
37. Smelter at Douglas
38. Morenci Mine, open pit
39. Metcalf Mine, open pit development near Morenci
40. Smelter at Morenci
41. Safford Project, underground development north of Safford

RANCHERS EXPLORATION & DEVELOPMENT CORPORATION

42. Bluebird Mine, open pit west of Miami
43. Electrowinning plant, at Bluebird Mine
44. Old Reliable Mine, in-place leaching northeast of San Manuel

Producing over half of the nation's newly mined copper.

prospecting — The process of searching for new mineral deposits.

reverberatory furnace — In the smelter, the furnace in which copper concentrates are melted, slag drawn off, and molten copper-bearing matte tapped for further processing.

rod mill — A rotating horizontal steel cylinder in which steel rods initially grind the crushed ore.

slag — Waste rock from the smelter. The black lava-like material is primarily iron and silica.

smelter — The plant in which fire refining takes place.

sulfide ore — Ore composed of copper, sulfur and usually iron along with the various other minerals making up the host rock.

tailings — The finely-ground residue or waste materials contained in the ore remaining after floating off the copper-bearing concentrate.

underground mining — Extraction of ore through vertical shafts from the surface, or horizontal tunnels, drifts or crosscuts driven into the ore body.

Arizona is copper country. There are 23 open pit mines and seven underground mines being operated or developed by members of the Arizona Mining Association.

From these operations in 1974 came 842,300 tons or 53% of the nation's newly mined copper, more than all other states in the U.S. combined, and more than any other country in the free world.

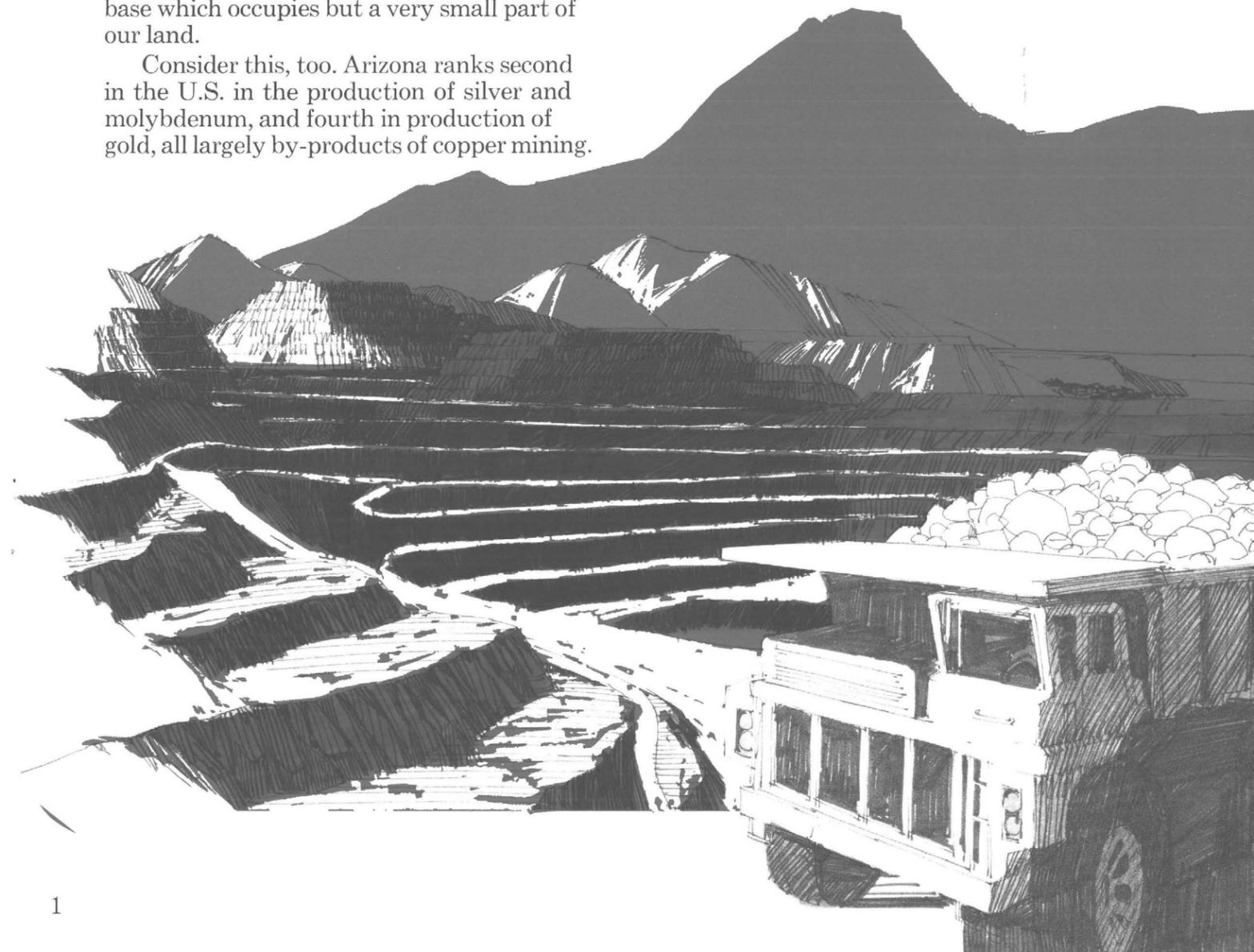
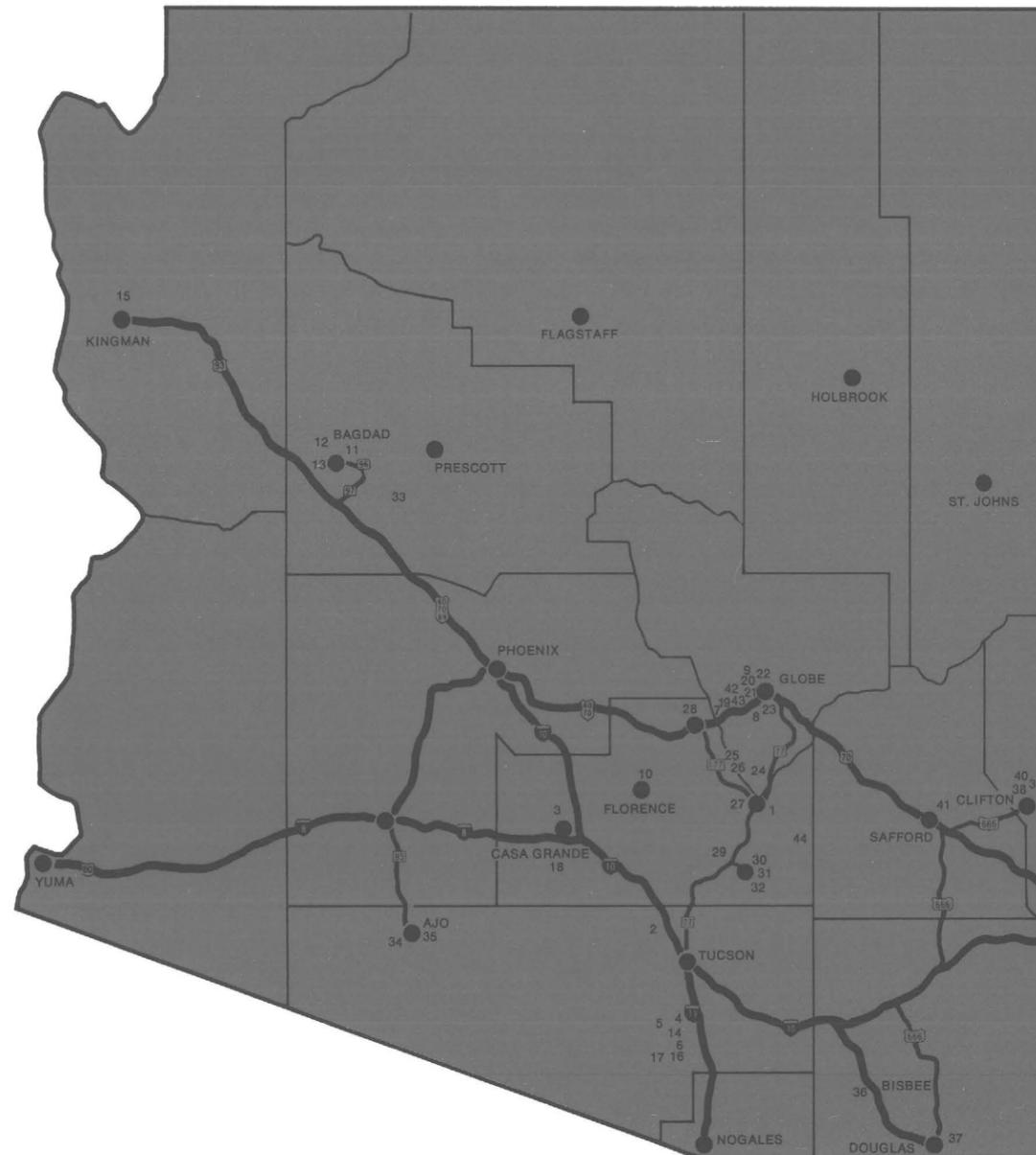
And it all comes from the use of less than 102,000 acres, or about one-seventh of one per cent of Arizona's land surface. What this means to every Arizonan is that much of our whole economy rests upon a small mineral base which occupies but a very small part of our land.

Consider this, too. Arizona ranks second in the U.S. in the production of silver and molybdenum, and fourth in production of gold, all largely by-products of copper mining.

A man-made wonder.

Today's typical large copper mine in Arizona is just as much an engineering marvel as the Golden Gate Bridge, the towering World Trade Center building, a nuclear submarine, or any other man-made wonder.

Developing a modern mine requires the highest degree of technological and engineering skills, vast amounts of manpower and capital — and something else. It takes plain old-fashioned ingenuity to win over half the nation's newly mined copper from Arizona's low grade ores. This is an achievement of which all Arizonans may well be proud.



Moving two tons of rock to get one ton of ore.

Arizona copper mining has come a long way since the early years of this century, when ores containing 5% to 10% copper were not uncommon. Currently, the grade of ore being worked in all Arizona mines averages approximately 0.6% copper.

Mining today in Arizona is a high volume operation in terms of tonnages handled, with a low yield in terms of copper content. The average ratio is two tons of waste rock for every ton of ore. This means moving some 6,000 pounds of material to get 10 pounds of copper out of the 12 pounds contained. (100% recovery is not possible.)

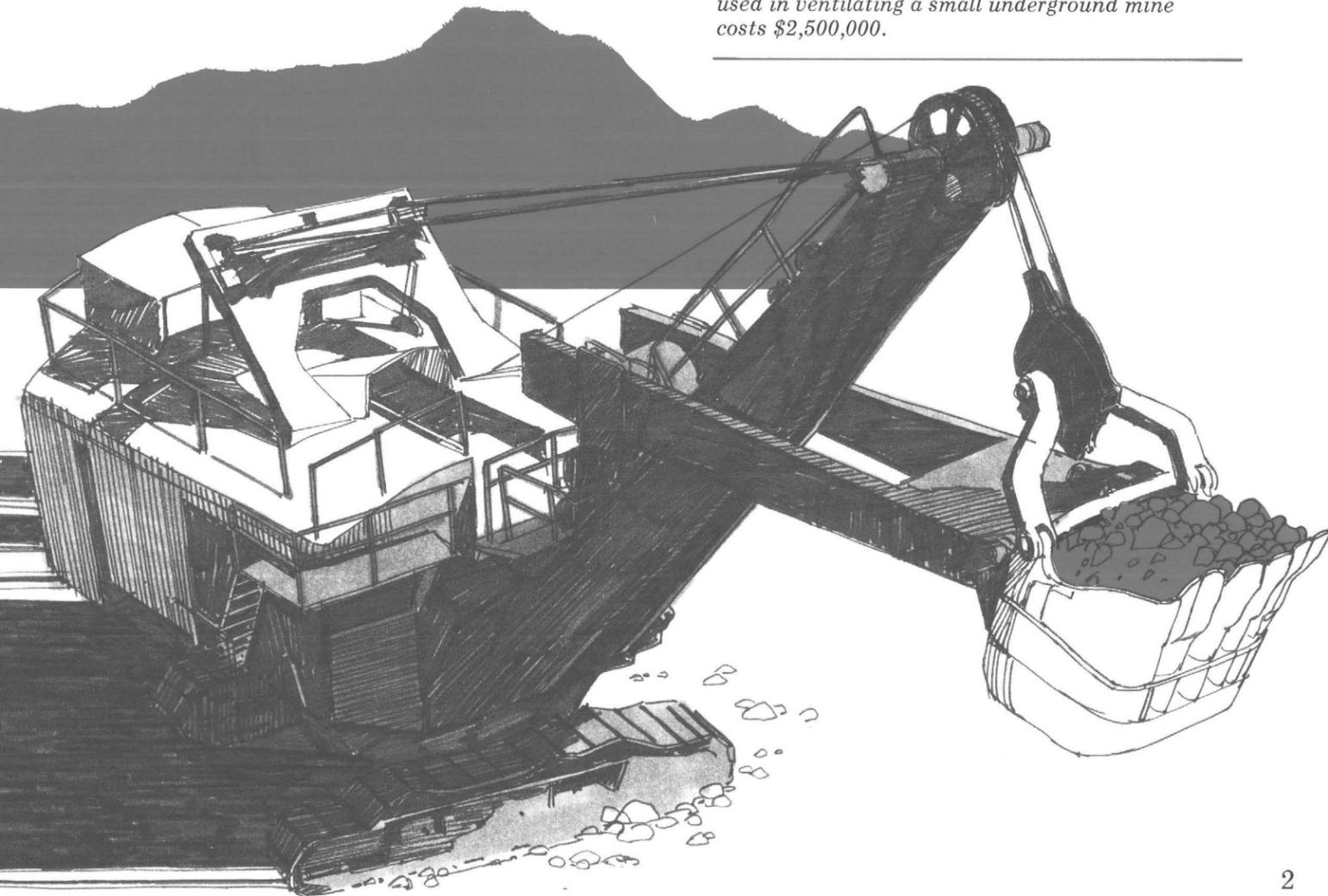
Modern technology and equipment make the mining of these lower grade ores feasible.

Underground mining is ordinarily a

costlier method. To successfully compete with open pit copper mines, the amount of mineable copper mineral must be significantly greater or the ore body must be of such size and nature to permit block caving, a more economical underground mining method.

Modern equipment carries modern price tags.

Just one huge 20-cubic-yard capacity electric shovel used in an Arizona open pit mine carries a price tag of \$1,000,000. A 150-ton capacity ore haulage truck costs about \$400,000. A set of tires on these trucks costs around \$36,000 and lasts about three months. A 6,000-ton refrigeration unit used in ventilating a small underground mine costs \$2,500,000.



Glossary of mining terms.

acid plant — The plant at the smelter site that recovers sulfur dioxide and manufactures from it sulfuric acid.

anode — Fire-refined copper cast at the smelter into slabs weighing 600 to 1200 pounds of about 99.5% purity; shipped to an electrolytic refinery for final purification process.

ball mill — A rotating horizontal steel cylinder loaded with steel balls which grind the ore to a fine powder consistency.

beneficiation — Concentrating the copper content of the ore; the crushing, screening and grinding of ore and removal of copper-bearing minerals by a flotation process prior to smelting the copper concentrates.

blister copper — Copper 96% to 99% pure, having a blistered surface after casting due to gases generated during solidification; normally is further refined at the smelter into a fire-refined copper and cast into anodes.

block caving — A form of underground mining wherein a block of ore is removed by undercutting it, causing it to fall by gravity through previously driven raises and is loaded through chutes into mine cars, hauled to the shaft and lifted to the surface.

cathode — Refined from anodes in the electrolytic refinery into plates of 99.99% pure copper; these are shipped to factories to be melted and cast into shapes ready for rolling, drawing or extruding into finished products.

concentrate — Copper-bearing material from the flotation process; contains 15% to 30% copper plus various quantities of sulfur, iron and other impurities.

converter — A brick-lined cylindrical vessel in the smelter for processing molten copper matte from the reverberatory furnace; the impurities, principally iron and sulfur, are removed by blowing air through the molten bath; the result is blister copper, about 99% pure.

crusher — Apparatus in which ore is broken into progressively smaller pieces.

development — The process of preparing an ore body for mining; sinking a shaft and driving haulage tunnels for an underground mine, or removing the overburden for an open pit mine; installing crushers, concentrators, transportation, power and water lines, offices, shops, warehouses, etc.

dump — The site for disposal of waste rock from the mine, or slag from the smelter; may be extremely low grade or where dump leaching takes place.

electrolytic refinery — The process in which fire-refined copper anodes are immersed in an acid solution with pure copper cathode starter sheets. An electric current passed between them deposits 99.99% pure copper on the cathodes.

electrowinning — Electrolytic winning process, wherein copper from copper sulfate (leach) solution is electroplated onto cathodes, ready for market.

exploration — The process of locating and proving that a mineral occurrence is indeed an ore body; that is, determining that it is large enough, contains enough copper to be mined profitably.

fire refining — Last step in a smelter wherein molten blister copper from the converter is deposited in the refining (or casting) furnace and gas blown through it to remove more of the impurities, principally oxygen. Also, general term for pyrometallurgical refining or smelting.

flotation — The process of mixing powdered ore with water and chemical reagents to separate the metallic particles from the waste rock; the metallic particles are collected and dried and this concentrate is sent to the smelter for fire refining.

gangue — Undesired minerals associated with ore; that portion of the ore rejected as tailing in the flotation process.

leaching — A process of using a weak sulfuric acid solution to dissolve copper from low-grade oxide ores; may take place in vats, heaps, dumps or in situ (in place).

matte — A mixture of sulfur, iron and copper, containing approximately 20% to 45% copper, tapped from reverberatory furnace in the smelter.

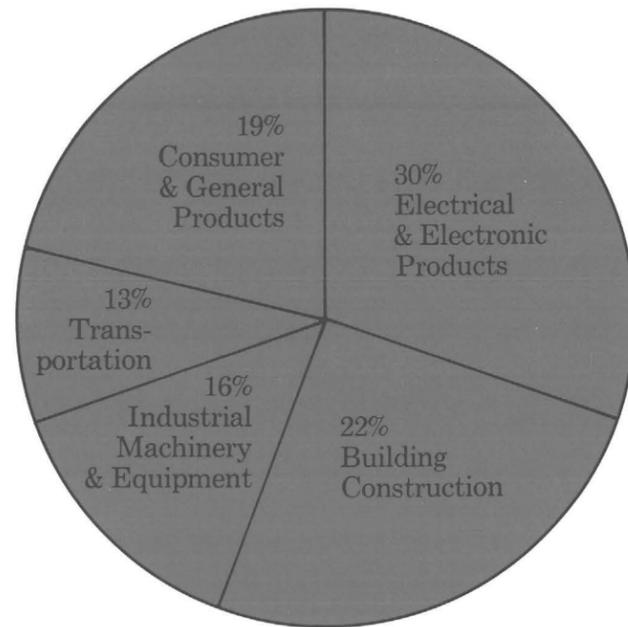
mill — The facility containing rod mills (if used), ball mills and flotation cells where the ore is ground and copper concentrate extracted. Also called the concentrator.

open pit mining — A surface mining method in which overlying rock and soil are removed to expose the ore body, which is then drilled, blasted and loaded into trucks or railroad cars for haulage from the pit.

ore — Rock containing enough mineral value to warrant the expense of mining it.

oxide ore — Ore containing copper minerals which have been altered by oxidation or weathering process.

Where copper is used.



Source: Copper Development Association, Inc.

People use copper. Every man, woman and child in the U.S. uses around 25 pounds of copper every year in essential products, conveniences and services. For instance —

Electrical and electronics industries use the most, turning copper into motors, rectifiers, control panels, solenoids. In areas of high technology, the space age industries, copper is essential to miniaturization of electronic testers, controls, printed circuits, computer components. It is the basic “energy” metal used in electric generators, transmission and distribution lines, and in all forms of communications — telephone, telegraph, radio, TV.

Next biggest user is building construction where copper fills a multitude of needs — in electrical wiring, heating and cooling systems, plumbing, roofing. Building hardware is made of bronze (copper combined with tin) and brass (copper combined with zinc).

Consumer and general products make up the third biggest copper market. Just look around. Copper is an essential part of the electric lamp you may be reading by; your clock on the wall; your refrigerator, freezer, range, automatic washer, dryer, dishwasher and other household appliances.

Industrial machinery and equipment is the next largest market, using copper sheet, tube, rod and wire in ever increasing quantities. The fifth major user is transportation, where automobiles, trucks, buses, planes, trains, ships — and outer space vehicles — all rely on copper.

It's re-used time after time.

About two-thirds of all copper used by industry comes back time after time to be melted and used again. It is practically indestructible and is one of the most recyclable of all metals. In fact, while 49% of the nation's total supply in 1973 came from U.S. newly mined copper, 46% came from recycled domestic scrap. The remaining 5% was imported.

Did you know that:

Over 50 pounds of copper and copper alloys are used in your automobile. Some 2,500 individual insulated copper wires make up a typical large telephone cable, with each wire capable of carrying hundreds of conversations. Wire finer than a human hair is drawn from copper for the electrical industry, which also uses copper bars as thick as a railroad tie. U.S. coins, mostly copper sandwiched between layers of nickel or silver, require some 50,000 tons of copper a year — equalling the total annual output of one medium-sized Arizona mine.

The industry's most valuable asset — human resources.

The Arizona copper industry's greatest single asset is its people, the men and women who make it all happen. The truck drivers, stenographers, timbermen. The drill operators, matte tappers, bank spray attendants. The shovel operators, hoistmen, accountants. The converter punchers, slag skimmers, scalers. The geologists, engineers, metallurgists and agronomists.

Safeguarding their health, safety and security is an overriding obligation. Arizona's copper mining firms are successfully meeting that obligation with investments in programs, equipment and benefits beyond wages and salaries paid.

Benefits: Nearly \$1,700 a year per employee.

Employee fringe benefits in 1973 amounted to \$44,020,043, averaging slightly over \$1,667 for every man and woman in Arizona's copper mining industry. This includes group insurance, retirement plan contributions, profit sharing and various other benefits.

Community hospitals in mining areas received over \$7,000,000 in 1973 from Arizona copper companies to hold down costs to individual patients — company employees as well as non-mining residents. In most mining communities, recreational facilities also are provided for the benefit of all its residents.

Health and safety go hand in hand. And Arizona's copper mining industry works constantly toward improved working conditions.

Work habits are thoroughly analyzed and evaluated. Measures and methods designed to minimize hazards are adopted. Safety programs emphasize the necessity of rigid adherence to safety rules on the job. Today, every mine worker receives safety training each month and results are encouraging.

For instance, one large Arizona copper mining company reports that its frequency of lost-time accidents has dropped from 40.94 per million man-hours of work in 1952 to an average of only 2.49 in 1973. The national frequency rate at open pit mines averages around 9.24 per million man-hours of work, according to a 1971 National Safety Council report.

Obviously, where safety is concerned, “good” is never good enough. There is always room for improvement. And Arizona's copper producers are dedicated to improving the record through intensified safety programs.

What's being done to protect the environment.

Arizona's copper producers have a responsibility to minimize the effects of their operations on the environment.

They accept that responsibility and are putting environmental protection measures into practice at mine sites all over the State as rapidly as time, money and technology permit.

Commitment to meeting air quality standards.

Long before any laws or regulations were passed in regard to controlling smelter smoke, Arizona's copper producers were working individually and together, trying to develop the missing technology. There still are some gaps. No two smelters are alike and, for some, there just isn't any way known today to solve the whole problem of smoke control.

Today, time limitations of increasingly stringent Federal and State clean air standards are, in some cases, forcing large capital commitments in systems which have not been fully proven.

However, much progress has been made. From 1964 to 1974, Arizona copper producers have spent about \$400 million on smelter

emission controls to meet Federal and State regulations. The copper industry in the past three years has given the University of Arizona over a half million dollars to establish an Atmospheric Analysis Laboratory to study air quality in the State — and another hundred thousand in 1974 to keep the program going. The industry also is contributing to the University of Arizona's College of Agriculture to study possible beneficial uses of sulfuric acid in agriculture.

Overall, a reasonable balance between environmental goals, technical capabilities and economic realities is essential to preserve and improve the quality of air in Arizona. And the copper industry is working to do its full share to achieve that balance.

Water reused; land reclaimed.

Water is essential in the production of copper. It takes about a ton of water to process a ton of ore. And the industry makes the most of that water. Arizona's copper producers reclaim and recycle the water used in their mills. What is meant by recycling? The same water is reused as many as eight and a half times before it finally evaporates!

Of the 102,000 acres used by the minerals industry in Arizona from 1930 to 1971, approximately 6,850 of those acres or 6.7%

land use planning. Although only one-seventh of one per cent of Arizona's land surface is used for mining, the search for new ore bodies has to take place over most of the State.

A mine producing 40,000 tons of copper per year will, today, cost approximately \$200 million, or about \$5,000 per ton of annual copper capacity. This is money that must be spent before a penny's worth of copper is sent to market.

A typical Arizona copper mine has an investment in equipment and facilities of approximately \$70,000 per employee.

Depletion allowance — a key factor.

The object of the depletion allowance is to permit a mining company to stay in business. A manufacturing company, for example, may depreciate a factory, a truck or other equipment to replace it when it wears out. But a mine cannot be replaced once the ore body has been exhausted.

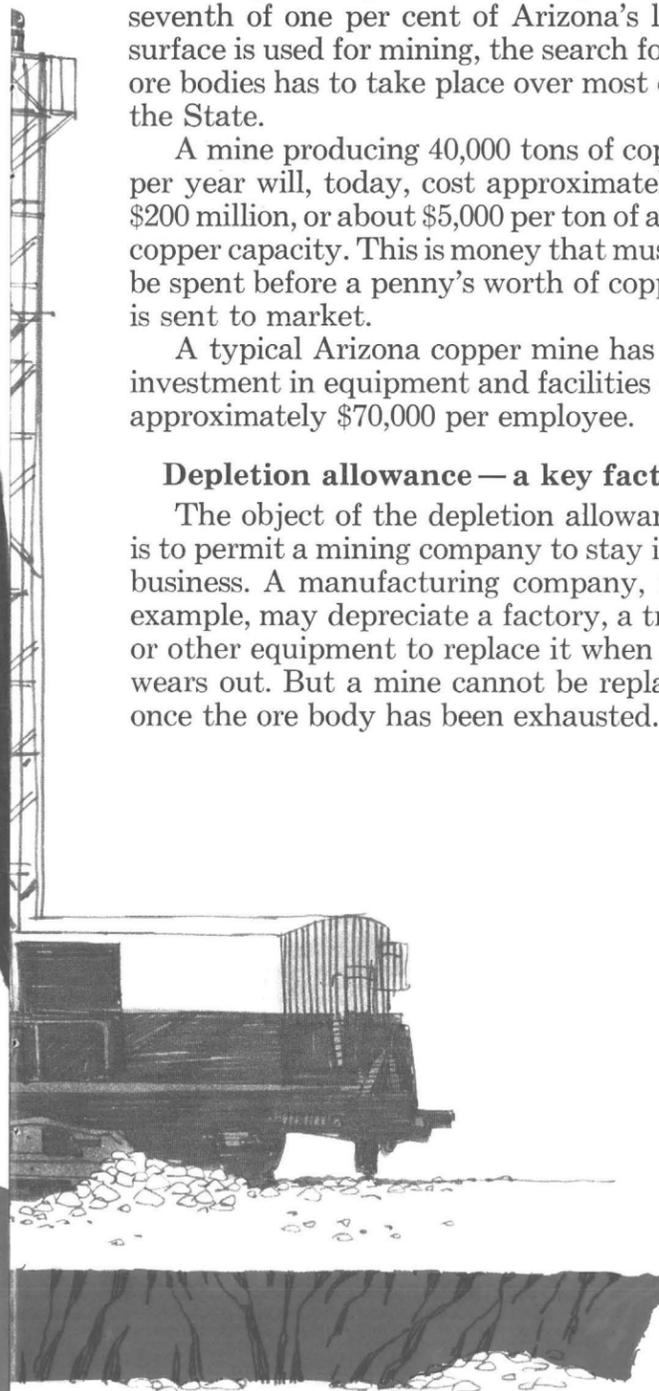
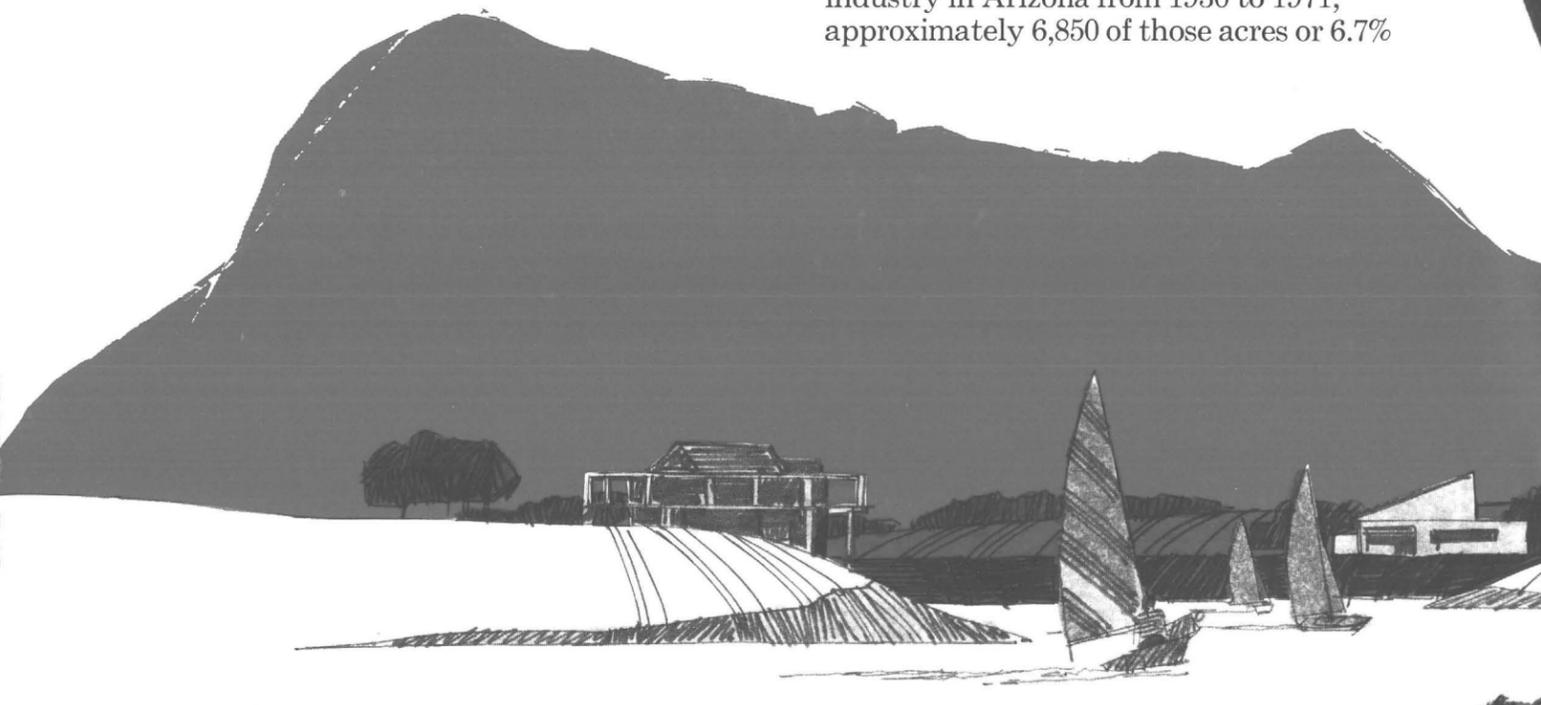
Therefore, the law allows a certain percentage of the value of that mine's production to be set aside to find a new ore body. In this way, a mining company hopefully finds and develops a new ore body as the old one is being mined, so that it may stay in business.

"Present depletion rates provide a proper balance."

The Report of the House Committee on Ways and Means accompanying the Tax Reform Bill of 1969 noted that:

"(Y)our committee's bill provides for substantial reductions in percentage depletion rates for most items. However, some items — namely, gold, silver, oil shale, copper and iron ore — are to remain at the present 15 per cent rate in case of deposits in the United States. For these items, present depletion rates appear to provide a proper balance between the need to encourage exploration and the discovery of new reserves on the one hand and the revenue cost involved on the other hand."

Present and indicated future copper requirements make clear that this conclusion remains sound today.



Copper supply and demand: A critical need to find more.

There are two sides to our nation's copper supply and demand situation.

On the brighter side, the U.S. approaches self sufficiency insofar as copper requirements are concerned — a position which, given copper's importance to the economy as an essential raw material, warrants maintaining. However, it has been necessary during the past 10 years to import an average of about 9% of our copper to meet national needs.

Looking into the future, projections of increased domestic copper requirements indicate that, if our country is to maintain a high degree of self sufficiency, domestic mine production must increase on the order of 85% by 1985, and nearly 200% by the year 2000. This means our nation should be putting into production one fair to medium size copper mine every year just to keep up with growing needs. It is not being done. One reason it's not being done is the increasing denial of access to public lands which must be prospected to find the ore bodies of tomorrow.

The energy crisis pales by comparison.

Our country is suffering the consequences of its failure to maintain adequate domestic fuel production. Yet, a metals shortage, if permitted to develop, could make the energy crisis seem mild by comparison.

In a 1972 report, the U.S. Secretary of the Interior flatly predicts that our nation will need to import 34% of its domestic copper requirements by 1984 and 56% by the year 2000.

Unless new mine development narrows the gap between domestic copper supply and demand, the long-range effects of such a metals shortage on the economy and national security of a metals-based culture such as ours could be staggering.

There are no quick, easy solutions.

In supplying over half of the nation's newly mined copper, Arizona has a major responsibility in meeting national needs. But bringing in a new copper mine takes mineable ore bodies, money and time.

Prior to bringing a mine into production, normally five to 10 years are spent in prospecting, exploration and development. So it is imperative that the mineral potential of all Arizona land be appraised as early as possible; not necessarily for mining next year or in the next decade — but, perhaps, for mining in the next century.

Selecting a mine site is not a matter of "alternate" choices. The minerals are where nature put them. Access to all land areas must be considered in all

of the land has been reclaimed according to U.S. Bureau of Mines statistics. The Bureau also reports that rate of reclamation

increased to 10% in 1971 as new practices for reclaimed waste piles have been put in use.

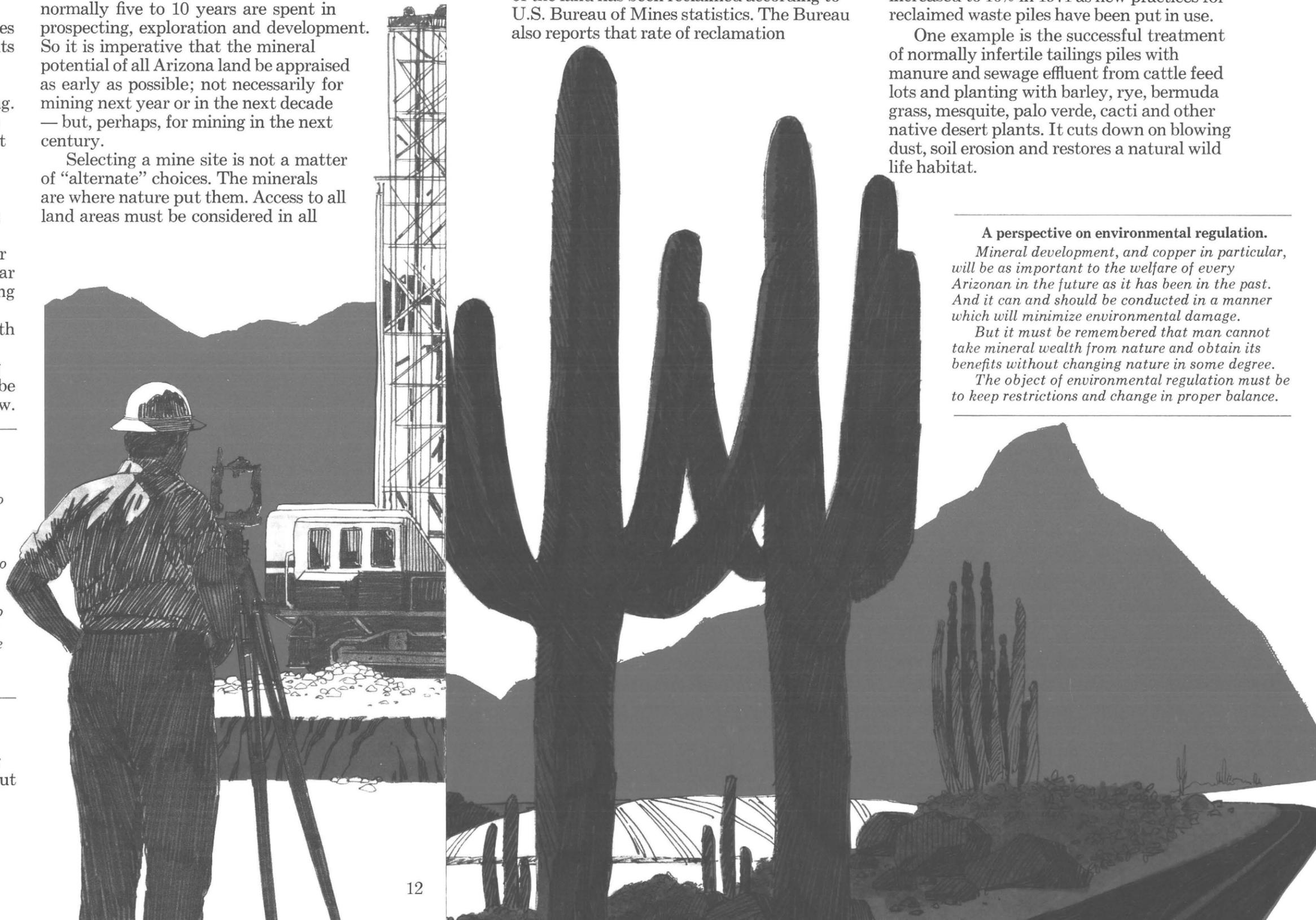
One example is the successful treatment of normally infertile tailings piles with manure and sewage effluent from cattle feed lots and planting with barley, rye, bermuda grass, mesquite, palo verde, cacti and other native desert plants. It cuts down on blowing dust, soil erosion and restores a natural wild life habitat.

A perspective on environmental regulation.

Mineral development, and copper in particular, will be as important to the welfare of every Arizonan in the future as it has been in the past. And it can and should be conducted in a manner which will minimize environmental damage.

But it must be remembered that man cannot take mineral wealth from nature and obtain its benefits without changing nature in some degree.

The object of environmental regulation must be to keep restrictions and change in proper balance.



Why copper is important to every Arizonan.

The earth is the only source of new wealth. It provides those raw materials — minerals, food, fiber — that are the basis for all industry.

Directly and indirectly, the combined impact of Arizona's copper mining industry on the State's economy averaged more than \$3.1 billion annually from 1970 to 1972, in the form of personal, business and government income.*

The basic industries making the major contributions to Arizona income are manufacturing, mining, agriculture, tourism and travel.

Major Sources of Arizona Income (Basic Industries) — 1973

Manufacturing Output (value added)	\$2,160,000,000
Mining Output	1,304,988,000
Agricultural Income (crops and livestock)	1,097,793,000
Tourism and Travel	690,000,000

Source: Valley National Bank

Statewide: One out of every eight jobs.*

There were more than 26,400 workers employed directly in the search for and production of copper in Arizona in 1973. They comprised about 3% of Arizona's average total employment — and approximately 12% of the State's basic employment. Many thousands of people in other Arizona industries also have their jobs because of copper.

The copper industry thereby accounts directly and indirectly for approximately one out of every eight jobs in the State. About one-third of the State's copper workers live in the Tucson metropolitan area, where approximately one out of every four jobs is directly or indirectly linked to copper.

Personal income: One out of every eight dollars.*

From 1970 to 1972, the copper industry was directly responsible for an annual

average of \$227.6 million in personal income to Arizonans — and over \$301 million in 1973. The more than \$300 million represented a 25% increase over 1972.

These payments were in the form of wages, salaries, pensions, other benefits and dividends. And they represented approximately 12%, or one out of every eight dollars, of basic personal income in the State.

In the Tucson area, copper production accounted for one out of every six dollars of personal income.

As those dollars recirculate through the State's economy, the combined direct and indirect impact in personal income is estimated at over \$852 million annually to Arizona residents.

Impact on other Arizona businesses.*

Arizona's copper industry purchases more than 70% of all goods and services from business firms within the State. This meant nearly \$687 million in income to other Arizona businesses over a three-year period from 1970 to 1972, averaging over \$228.9 million annually.

About \$88 million a year went to wholesale firms supplying automotive and other equipment and parts. Arizona's manufacturing firms received nearly \$34 million a year. Contract construction firms gained more than \$44 million yearly, while the State's electric, gas and telephone utilities sold upwards of \$41 million worth of energy and service a year to copper producers.

The State's transportation industry received around \$14 million annually; retailers picked up around \$4 million a year; and service industries benefited by nearly \$3 million a year from Arizona's copper mining industry.

Overall, about \$85 million annually in purchases went to Pima County businesses, around \$82 million a year to firms in Maricopa County, with remaining substantial amounts spread across other

School district revenues provided by the Arizona copper industry, 1970-1973.

School District	Amount of Revenue ^a	
	1970-1972 Annual Average	1973
Sahuarita Combined ^b	\$ 2,092,755	\$ 2,455,077
Tucson No. 1 Combined	1,603,333	2,052,188
Morenci Combined	1,240,577	1,273,037
Miami Combined	1,233,991	1,510,189
Mammoth Combined	1,084,185	1,838,539
Ray Combined	934,255	1,100,783
Scottsdale Combined	747,523	957,603
Marana Combined	727,024	881,186
Phoenix Union High School	710,264	885,055
Ajo Combined	621,445	873,261
Bisbee Combined	597,168	753,974
Mesa Combined	576,362	879,486
Washington Elementary	543,749	818,552
Hayden-Winkelman Combined	442,334	762,422
Tempe Combined	401,707	578,316
Bagdad Combined	339,409	468,432
Cartwright Elementary	306,228	417,947
Glendale Union High School	306,198	452,471
Douglas Combined	296,502	266,139
All other school districts	6,618,689	9,844,383
Total	\$21,423,698	\$29,069,040

^a Provided directly through the property tax and indirectly through the apportionment of educational excise taxes.

^b Combined high school and elementary school districts.

Source: Arizona Economic Information Center

Municipal government revenues provided by the Arizona copper industry, 1970-1973.

<u>Municipality</u>	<u>Amount of Revenue^a</u>	
	<u>1970-1972 Annual Average</u>	<u>1973</u>
Phoenix	\$1,070,598	\$1,741,048
Tucson	501,174	815,027
Mesa	143,615	196,808
Scottsdale	123,454	201,851
Tempe	117,162	190,535
Glendale	66,309	107,834
Yuma	53,072	86,309
Flagstaff	47,803	77,740
Prescott	24,028	39,074
Paradise Valley	13,085	21,279
South Tucson	11,371	18,492
All others	526,679	721,145
Total	\$2,698,350	\$4,217,142

^aContributed directly through the property tax and the automatic apportionment of privilege excise taxes and corporate income taxes collected by the State.

Source: Arizona Economic Information Center

areas of the State.

Again, by the time recirculation takes place, Arizona's copper industry is directly and indirectly responsible for more than \$2.0 billion in annual business income.

One out of every four tax dollars from copper.*

State and local government revenues generated by Arizona's copper mining industry go a long way in helping lighten the individual's tax burden.

For example, from 1970 to 1972, the Arizona copper industry paid an average of approximately \$65.8 million each year to support State, county, municipal, community college, elementary and high school district, and miscellaneous improvement district governments in the State.

In 1973, the total was in excess of \$82 million, paid through property taxes, severance taxes, the corporate income tax, payroll taxes, sales taxes on Arizona purchases and other taxes, royalties and fees.

The combined recirculation effect of direct and indirect tax revenues generated

is estimated at more than \$254 million annually, or one out of every four dollars in taxes paid to State and local government in Arizona during the period from 1970 to 1972.

Revenues from the copper industry's direct tax payments are applied state-wide. While a major beneficiary is the State government, every county, municipality and school district in the State also benefits from the industry's tax payments.

*Source: Arizona Economic Information Center

Out of every dollar, 62¢ stays in Arizona. **

Arizona is the main beneficiary of its copper mining activities. Out of every dollar's worth of copper mined in Arizona, an estimated 62¢ stays in the State in the form of payrolls, taxes, purchases, dividends and permanent facilities. Historically, dollars from copper have built towns, schools, hospitals, libraries and roads, opening up many areas of the State.

Definitely, copper mining is an Arizona business, of which we can all be proud!

** In addition to the personal, business, State and local government income figures reported here for 1970-72, another \$323.9 million annually went for Federal taxes, out-of-state suppliers of goods and services, out-of-state wages and salaries, debt service and profits.

Total state and local government revenues provided by the Arizona copper industry, 1970-1973.

<u>Type of Revenue</u>	<u>Amount Paid</u>	
	<u>1970-1972 Annual Average</u>	<u>1973</u>
Property Taxes	\$31,746,666	\$34,998,000
Severance Taxes		
Privilege Sales Tax	8,526,666	10,963,000
Education Excise Tax	4,263,333	5,481,500
Special Excise Tax	4,263,333	5,481,500
Corporate Income Tax	4,469,333	5,901,000
Payroll Taxes		
Unemployment Compensation	1,553,333	1,466,000
Workmen's Compensation	3,431,333	5,041,000
Miscellaneous Taxes ^a	4,819,333	7,596,000
Land Rentals and Royalties	2,704,600	5,100,000
Total	\$65,777,930	\$82,028,000

^aIncludes sales taxes paid on Arizona purchases as well as motor vehicle licenses and fees.

Source: Arizona Economic Information Center

Arizona state government revenues provided by the copper industry, 1970-1973.

Source of Revenue	Amount of Revenue	
	1970-1972 Annual Average	1973
State Property Tax	\$ 8,023,104	\$ 4,455,967 ^a
Severance Taxes		
Privilege Sales Tax	3,530,040 ^b	4,538,682 ^b
Education Excise Tax	c	c
Special Excise Tax	c	c
Corporate Income Tax	4,469,333	5,159,925 ^b
Payroll Taxes		
Unemployment Compensation	1,553,333	1,466,000
Workmen's Compensation	3,431,333	5,041,000
Sales Taxes on Purchases		
Privilege Excise Tax	645,150	1,023,960
Education Excise Tax	c	c
Special Excise Tax	c	c
Motor Vehicle Taxes and Fees	144,000	176,000
Land Rentals and Royalties	2,704,600	5,100,000
Total	\$24,500,893	\$26,961,534

^aThe decline in State property tax in 1973 resulted from a decrease in the State property tax rate to 75¢ per \$100 of assessed valuation from the \$1.55 rate levied in 1972. The rate was raised again in 1974 to \$1.50.

^bExcludes amounts shared with county and municipal governments.

^cAlthough paid directly to the State general fund, it is assumed that all educational excise taxes are in fact redistributed to the school districts.

Source: Arizona Economic Information Center

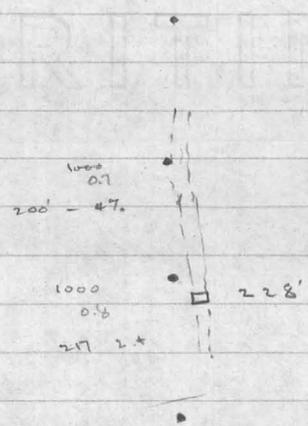
County government revenues provided by the Arizona copper industry, 1970-1973.

County	Amount of Revenue ^a	
	1970-1972 Annual Average	1973
Pima	\$ 7,820,808	\$ 9,818,421
Pinal	2,092,936	2,357,072
Maricopa	1,782,383	2,363,571
Gila	1,512,685	1,933,721
Cochise	481,711	515,694
Mohave	358,257	273,238
Yavapai	263,131	293,843
Coconino	127,241	164,517
Yuma	100,435	125,710
Graham	69,030	38,585
Navajo	66,314	89,849
Santa Cruz	27,109	33,949
Greenlee	24,736	269,536
Apache	24,432	32,225
Total	\$14,751,208	\$18,309,931

^aContributed directly through the property tax and the automatic apportionment of privilege excise taxes collected by the State.

Source: Arizona Economic Information Center

✓ 5 yrs @ # 20,000 Sept?
 5 yrs 50,000



65
 5.25
 1.75

18.26
 16.7340
 1.8244
 0.025 A.

3000 3.00
 2.30
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 600

Esperanza Hill
 July 3, 1964

There were 5 hills to 500' north

the lower 200' N of good well

good well 4-5' 9's low level

level average 1' 10" ± 0.7

compare with good well 0.8

good well with slope down change

was 200' S of good well N. 61.

The depth of the well was
to 100' to 100' - per record.

Now Xc ing sample was

on 218 level toward N. 61

good in section - also drilling

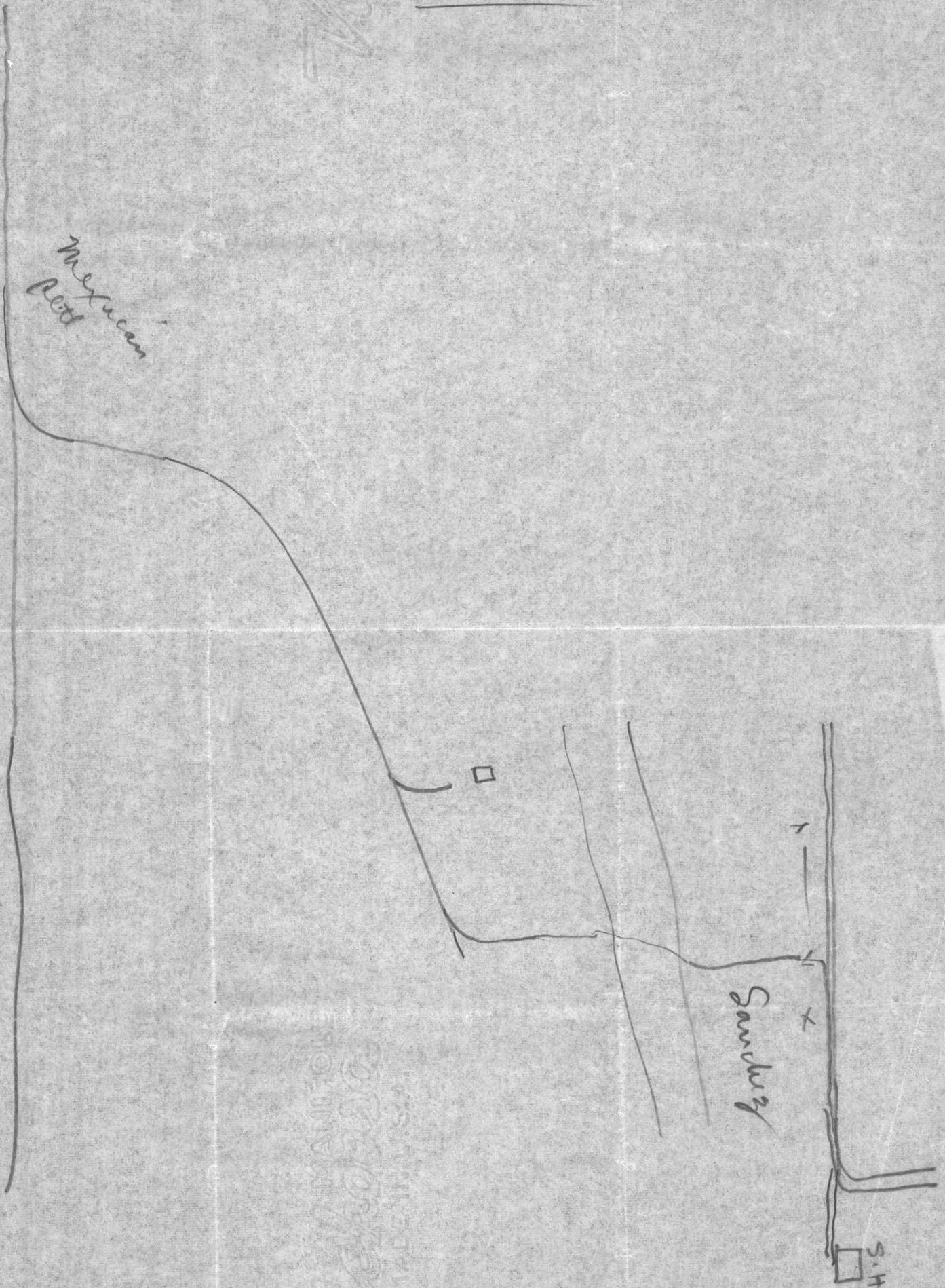
Manly St. Williams So within 100'

FOR INFORMATION
S. B. MARSHALL
1230 W. 12th St.

July, 1964

HAROLD D. MARYOTT & CO.

Mexican
Road



NOV 14 1962

THE ANACONDA COMPANY

151 S. Tucson Blvd. — Room 221

Tucson, Arizona



Barber replaced this letter with one written 11/29/62 and withdrew recommendation made in this letter. ROM.

Geological Department
Southwest Exploration Office

November 13, 1962

Mr. Roland B. Mulchay, Asst. Chief Geologist
The Anaconda Company
809 Kearns Building
Salt Lake City 1, Utah

Dear Mr. Mulchay:

On November 9, 1962, Mr. Jerry Y. Bell, consulting geologist from Newport Beach, California, called our office in regards to the Winkler claim groups, north of Safford, Graham County, Arizona. This is the property that was visited by Gerald E. Rupp and me on June 27 and 28, 1962, and described in my letter to you of July 6, 1962.

Mr. Bell stated that he represented Mr. Navor Proctor, attorney in Globe, Arizona, who has obtained an option on the 236 and 173 claims groups outlined on the U.S.G.S. topographic map accompanying my July 6 letter. Proctor reportedly has reached an agreement with Winkler and the numerous other owners of the property, and he and Bell are offering the following terms:

(1) Proctor will guarantee the legality of all 409 claims, as to proper location monuments, pits, and assessment work to date.

(2) Up to five years will be permitted for an examination of the area, which would include any geophysical and geological surveys, drilling, or other exploration work deemed necessary; during this period, the examining company will only be responsible for performing the annual assessment work on the property.

(3) At the end of the required examination period, the interested company may purchase any of the claims at the rate of \$8000. per claim, or retain the property on payment of 5% royalty of net smelter returns.

(4) Bell, as promoter of the property, would like 1% royalty of net smelter returns, for the life of any mine developed; he commented that he might accept a cash payment instead.

November 13, 1962

No additional development or exploration has been reportedly done on the claims since our visit last June. The San Juan Mine property is still in litigation, and legally not available for consideration.

Bell claims that the Winkler property has a good potential for containing a copper sulfide concentration due to the intersection of a shear zone between the Phelps Dodge-Kennecott properties, and a shear zone entirely on the Winkler claims. He did not explain the basis for this assumption of conditions below a minimum of probably 600 feet of gravel cover.

The terms of the agreement permitting additional exploration on the Winkler property, as described by Bell, are reasonable. If the owners are actually interested in selling the property, a satisfactory option involving a final price should be negotiable. As concluded in my letter of July 6, a geophysical survey of the area would be of interest on the basis of the proximity to the Phelps Dodge and Kennecott properties.

Bell was told that we would inform him of our possible interest in the terms described. He is leaving for the Fiji Islands to study gold placers in the near future, and would appreciate our decision at the earliest convenience.

Yours very truly,



G. A. Barber

GAB:je

Roland B. Mulchay
Consulting Geologist
2732 Wren Road
Salt Lake City, Utah

April 8, 1975

Mr. George R. Brownell
National Bulk Carriers, Inc.
1345 Avenue of the Americas
New York, N. Y. 10019

Dear Mr. Brownell:

Enclosed is a copy of a reconnaissance report on the Sanchez copper property near Safford, Arizona, prepared from data obtained from the Inspiration Consolidated Copper Company, the owners, at the Inspiration offices, and on a quick visit to the claims on April 4th.

As expected, there is a substantial tonnage of low grade copper bearing material, both in oxide (0.36% Cu) and sulphide (0.45% Cu) form, indicated by drilling done to date. There has been extensive exploration since my visit to the property several years ago, and development of large tonnages of 1.0% copper sulphide ores, which could have been projected at that time, are not now to be expected in the areas tested. The sulphide ore possibilities have not yet been fully explored, and there are very long chances for good grade sulphide ores related to a small breccia pipe structure exposed at surface northwest of the Carpenter Shaft.

I am impressed with the indicated reserve tonnages, good possibilities for additional sulphide mineral development, and projections of future, very profitable operations at increased copper prices. If the Mining Department of National Bulk Carriers is similarly impressed, negotiations for an option arrangement could be started with Inspiration officials at the corporate headquarters at Morristown, New Jersey. Mr. Richard H. Hyde is president of the company, and Mr. H. Myles Jacob is board chairman.

I was told at Inspiration on April 2nd, by one of the local officials of the company, that W. R. Grace & Co. had just made an offer on the Sanchez property. Later, I learned informally that the offer was for a joint venture agreement, similar to that made with Union Pacific Mining Company in 1973-74.

As outlined in a Union Pacific report, on file at Inspiration, the agreement provided that Union Pacific would provide 60% of the first \$19.1 million in capital costs in order to reimburse Inspiration for the after tax effects of their investment of \$5,231,000 to that date. Additional capital costs would be supplied at 49% by Union Pacific; Inspiration would retain control, act as the operator, and pay 51% of further costs.

From the Union Pacific figures, it can be estimated that Inspiration now has about \$5,650,000 in the property, and is obligated for the 1975 expenditures of about \$129,456 for property payments and \$36,800 for assessment work. The Union Pacific letter-of-intent agreement provided

April 8, 1975

for an extended examination period and an opportunity to check earlier drill hole results by drilling. Six holes were drilled; comparisons satisfied Union Pacific engineers that the Inspiration work had been accurately done. All Union Pacific projections were based upon copper at 56¢ per pound, and calculations showed profitable operations with a reasonable payout period. The agreement is reported to have been terminated when Union Pacific proposed changes in the terms, and Inspiration refused.

Off the record, Inspiration is now badly in need of cash, and is threatened with an active takeover attempt by the Crane Company. Inspiration has been seeking cash through sale of treasury stock in an amount equal to about 10% of the 2,439,059 shares issued; 22,200 shares are held in the treasury. Several organizations have been invited to make an overall review of the Inspiration ore reserve position and future prospects for consideration of such a purchase. Homestake engineers have recently conducted a review at Inspiration. At first glance, a stock purchase might be attractive, as the Inspiration ore reserves are reported very large and the Christmas property should eventually be a large low grade copper operation. Anaconda holds about 28% of Inspiration stock, and the Inspiration management undoubtedly feels that with another 10% in friendly hands, a takeover attempt would not be successful.

Inspiration has had, in recent years, more than its share of technical operating difficulties. The necessity for elimination of air pollutants at the old smelter caused the erection of a largely untested, new electric smelting furnace which has been plagued by many breakdowns. The great expenditure at the new smelter plus the lower production caused by the delays and decreased copper prices have brought on a very difficult period for the Company. It is my belief that all available competent staff will be needed to manage Inspiration and future Christmas operations. For that reason, it is suggested that any agreement reached on the Sanchez should vest control with National Bulk, and operations be divorced from Inspiration supervision.

As the total pounds of copper indicated at Sanchez are substantial, a type of joint venture agreement might be the only feasible approach. Possibly the offer of a loan to Inspiration of an amount approaching its investment in the Sanchez property might be sufficient to influence an advantageous agreement, at this time, for future exploitation of the Sanchez reserve. Such an agreement might provide that, if a third party entered as the operator, such as a well financed Canadian or international group, both National Bulk and Inspiration would sell equivalent percentages of their interests to the proposed third party.

The local Inspiration management was most cooperative, and made the very comfortable guest house available during my visit. Mr. Jack Eastlick, resident geologist at Inspiration, supplied all of the information in reports and maps, and accompanied me to the property on April 4th.

Yours very truly,

RBM/lh
Encl.

Roland B. Mulchay

Report on
RECONNAISSANCE EXAMINATION

SANCHEZ COPPER PROPERTY
Graham County, Arizona

Owned by
Inspiration Cons. Copper Company

INTRODUCTION

The information contained in the following report was obtained from incomplete examination of reports, drill records and maps at the offices of the Inspiration Consolidated Copper Company at Inspiration, Arizona from March 31 to April 5, 1975, and during a brief visit to the Sanchez property on April 4th. About ten years ago the prospect was visited by the writer, and then available drilling data were reviewed.

LOCATION AND PHYSICAL FEATURES

The Sanchez copper property is located in the Lone Star Mining District, Graham County, Arizona, about eleven miles by road northeast of Safford. The claims are situated in Sections 25, 26, 35 and 36, Township 6 South, Range 27 East, Salt River Base Line.

Safford is a thriving agricultural community of about 6000 people in the Gila River valley. The town is on Highway 60 - 70, and is served by the Bowie - Globe branch of the Southern Pacific Railroad. A siding at Solomonville, east of Safford, and about nine miles from the property, would be available for freight shipments.

The claims are located near the southerly end of the Gila Mountains in rolling topography with higher basalt covered hills to the east and north. The present surface at about the 3200 ft. elevation is some 150 ft. above the Gila River valley elevation, and about one mile north of the valley boundary.

Climate may be classed as temperate although high temperatures are common in summer; there would be no ordinary interruption of year round operations. Rainfall is about 8.5 inches per year; there is sparse desert type vegetation. Adequate water supply is reported available from wells in the valley at the Grijalva farm and the state lease. A power line reaches the property, and a power supply for a large operation is reported available. There is no nearby source of timber. Supplies for mining operations would come from Tucson, Arizona and El Paso, Texas. Safford would be the residence for employees, though housing is reported scarce.

The road from Safford passes the hard surface Safford airfield where air - radio communications are installed. A gravelled airstrip has also been established at the property.

There is no equipment in the mine area, and only limited material at the test leaching site. An adequate office building for exploratory work

is located near the river. Good graded roads reach all parts of the property. Core from the drill holes is stored in two old buildings near the river.

HISTORY AND RECENT DEVELOPMENTS

Prospecting and very small scale copper ore production have been in progress at the Sanchez property since 1899. In 1964, Harpoon, Inc., a subsidiary of United Nuclear, started active exploration of the area, and in 1969 the property was acquired by Inspiration Consolidated Copper Company, which has corporate headquarters at Morristown, N. J., and mining operations at Inspiration and Christmas, Arizona. Except for continuing advance royalty payments on the Carpenter lease, by the end of 1975 almost all property payments will have been completed by Inspiration.

The Lone Star district will be the next large scale mining center in Arizona. In the late 1950's Phelps Dodge Corporation started exploration in an area about nine miles northwest of the Sanchez, and has had outstanding success. Two deep shafts and connecting crosscuts are now being driven to test drilling results, and to prepare a large underground mining project for production. Reserves are reported by that company to be 400 million tons of 0.72% copper; it is stated informally that a substantial part of this reserve will average 1.0% copper.

About five miles northeast of the Sanchez, since 1955 Kennecott Copper has explored and partly developed a very large, mixed oxide - sulphide copper deposit. It is reported that Kennecott will re-evaluate this deposit since the success by Phelps Dodge in deeper exploration.

Essex International and Towne Mining are also now conducting drilling exploration projects in the district.

In 1973-74 Union Pacific Mining Company by letter of intent arranged an option period on the Sanchez ground which would have developed into a joint venture agreement with Inspiration. Six holes were drilled to check Inspiration results, and the project was recommended by Union Pacific geologists. Modifications of the original agreement were sought by Union Pacific; rejection by Inspiration brought abandonment of the agreement.

Data on the Sanchez has recently been reviewed by Kennecott, Homestake, Phelps Dodge and W. R. Grace. The Homestake review was perfunctory as regards Sanchez; principal emphasis was upon investment in Inspiration itself. W. R. Grace is reported to have made an offer for a joint venture agreement on April 2nd.

PROPERTY

By purchase and location, Inspiration holds 368 unpatented claims, of which 16 are being presented for patent. There are also 200 millsite claims which cover some lode locations; these locations will be dropped when the millsites are patented. Eighty nine acres of valley land are being purchased from Mr. P. Grijalva on small yearly payments (\$12,000 plus interest to be

paid after 1975), and 240 acres are held on a state commercial lease in the valley. Ten acres are leased from Mr. M. Sanchez.

Assessment work aggregating \$36,800 must be done in 1975; that under the provisions of the Carpenter lease should be accomplished by June 30, 1975 and the remainder by September 30th. Property payments, including the Carpenter lease advance royalty, amount to \$129,456 for 1975.

The Carpenter lease provides for a royalty of \$0.007 per pound of copper produced, or a minimum advance of \$100,000 per year. The Grijalva payments are at the rate of \$3,000 per year.

GENERAL GEOLOGY

In the Lone Star district an older series of volcanic rocks, largely andesitic tuffs and agglomerates, are overlain by recent basalts and associated late volcanics. Quartz monzonite intrusive stocks and dikes, and closely related, slightly younger, fine grained acid intrusive rocks cut irregularly through the older volcanic series. The ore deposits appear to be closely related to the quartz monzonite and later intrusives.

SANCHEZ PROPERTY

At Sanchez, dikes and stock--like masses of coarse, biotite-rich quartz monzonite porphyry cut steeply through the andesites. Late, narrow dike-like acid intrusives, probably rhyolitic, cut both quartz monzonite and andesites, and appear related to irregular pebble-dike type breccias which cut monzonite and andesites, often near the contacts. Although the geologic notes on the drill holes are not specific, stronger mineralization may have occurred near these breccias.

About 250 ft. northwest of the Carpenter shaft at surface, there is a poorly exposed breccia, possibly part of a breccia pipe structure, about 75 by 100 ft. in area; the southern extension is covered by recent alluvium. Three drill holes, E-1, 401 and 403 in the immediate area of this breccia, contain much stronger copper values than generally cut in the other drill holes. The breccia has been cut on the Carpenter shaft 200 level, and large boulders of it can be seen in the stockpile at the leach test area. Fragments of coarse quartz monzonite are engulfed in fine grained, dense, gray, probably rhyolitic rock with fine quartz phenocrysts. Both rock types are weakly brecciated, and sealed with irregular iron oxides, some quartz, and erratic copper oxide minerals. The fine grained rocks are cut locally by six inch stringers of glassy quartz with prominent lacing of oxide copper seams. The downward extension of this possible breccia pipe structure has not been delimited.

As indicated by steep drill holes at Sanchez, thick, but highly variable, zones of oxide copper minerals with prominent iron oxides are cut near surface and extend to depths of more than 1200 ft. The principal copper oxide minerals reported are chrysocolla ($\text{CuSiO}_3 \cdot 2 \text{H}_2\text{O}$) with considerable tenorite (CuO), and some malachite, cuprite and chalcantinite. A zone of

strong native copper often occurs near the base of the oxide section, and suggests there may have been late oxidation of a previously secondarily enriched chalcocite (Cu_2S) zone.

Recent faulting, probably of relatively small displacement, appears to have influenced near surface oxidation, and may offset both oxide and underlying sulphide mineral zones.

Below the oxide copper sections there are localized strong sulphide copper minerals in seams and disseminations associated with pyrite. The sulphides are generally of primary origin and include chalcopyrite, prominent bornite, and little molybdenite. Quartz occurs in seams with the sulphides, and there are numerous late calcite seams. A few drill holes show some chalcocite enrichment below the oxide zone. Additional exploration may disclose more of this type of mineral than indicated to date.

There is a small, but possibly important, gold and silver content indicated by incomplete assay data, but mineral relationships have not been determined.

Distribution of alteration zones is masked by the intense oxidation features, and has not been clearly developed. There is some evidence of an outer chlorite zone with pyrite; clay alteration and sericite are noted, but the limits are not defined. Strong, second stage fine biotite is widely distributed but, again, the limits are not determined. Although late biotite alteration has not been widely described in the geologic literature on copper deposits, it is an important and prominent alteration feature at El Teniente in Chile; at Pachon, Argentina; at Cananea and Nacozari in Mexico, and at Ray in Arizona. It is not unlikely that much of the intense sericite alteration described at various large copper districts is the result of breakdown of second stage biotite.

Much of the Sanchez surface, and partly over the presently recognized copper metallization, is covered by recent alluvium to the south and west and by basalt on the higher hills to the east. There are thus possibilities that separate areas of intrusive activity, mineralization and brecciation may be concealed in the vicinity.

DRILLING AND DEVELOPMENT

At Sanchez, exploration and development have been by the Carpenter shaft and a short underground level at 200 ft. below surface, which could be easily made accessible, and by steep diamond drill holes. To date 133 holes have been drilled, some to depths of more than 2000 ft. The deeper holes have been surveyed, and some show wide variations from the vertical. Many holes have not been surveyed; geologic and assay data are very difficult to interpret in these sections.

The holes total more than 200,000 ft. in length. Core recovery has been very good, and checks made by Union Pacific geologists indicated assaying and sample preparation had been done competently. Most of the core is reported

to be available for review.

In the early drilling programs emphasis was placed on oxide copper development. More recently, increased attention has been given to underlying sulphide copper possibilities. Several old holes have been deepened and others drilled into the sulphide zone. It does not appear that the sulphide possibilities have yet been fully explored, laterally or at depth.

INDICATED RESERVE TONNAGES

OXIDE COPPER

Computer designed open pit models prepared by Inspiration indicate 79,363,000 tons @ 0.36% oxide copper could be mined from an open pit with a 1.49:1 waste to ore stripping ratio; 0.2% copper was used as a cutoff grade.

A careful check of these calculations was made by Union Pacific geologists and their outside consultants. Three particular benches were selected and reserve blocks were individually calculated. Using the Union Pacific figures for the benches, extrapolation to the Inspiration design would have shown a total of 86,000,000 tons at 0.35% copper.

A later independent estimate by Union Pacific and consultants developed a new oxide pit design which showed a total of 116,000,000 tons at 0.368% oxide copper, and a stripping ratio of 1.8:1; a 0.2% copper cutoff was also used.

A recent computer study of better grade oxide reserves, directed to estimate a tonnage of better grade material, showed a total of 30,520,000 tons at 0.50% oxide copper between the 3200 and 2700 elevation benches. Most of this reserve would fall within the limits of the designed pit. Thus, an operation could be started on better grade material to amortize plant and stripping costs more rapidly than by use of calculated average grade reserves.

SULPHIDE COPPER

The Inspiration geological department, using available sulphide data, has calculated a sulphide reserve on benches from 2600 to 900 ft. elevation, without regard to open pit design, which showed a total of 52,737,000 tons at 0.45% copper, using a 0.3% copper cutoff. They believe that this indicated reserve might be greatly increased by further exploration. Probably much of this tonnage would not be available for open pit extraction.

There is an appreciable low grade gold and silver content shown by scattered analysis of copper samples. Statistical analysis by Inspiration indicates that this may average 0.007 oz. gold per ton, and 0.085 oz. silver per ton. The assay data is incomplete, and the mineral relationships are unknown. However, it appears that an important credit in precious metals might be recovered from the sulphide ores. It is unlikely that such credit would be obtained in a leaching operation. Data on the molybdenum content is inconclusive, and the possible molybdenum recovery may not be sufficient to deserve consideration.

METALLURGY

Inspiration has conducted bulk sulphuric acid leaching tests at the property on the oxide materials. A start was made with straight heap leaching; this was modified by tests of leaching techniques developed at Mangula, Rhodesia, which were considered successful.

In the leaching tests, material obtained from the Carpenter 200 level, with some surface material, was blended to obtain a grade of 0.36% oxide copper, and crushed to $\frac{1}{2}$ mesh. Fines were removed. Tests were initially on small lots, but finally a 5000 ton lot was leached on a specially constructed concrete pad with asphalt facing. After a 21 day leach period, a 61% recovery was obtained. In this process, copper would be removed from the leach solutions by solvent extraction, as determined by tests by General Mills, followed by electro-winning to cathode copper. The abundant sulphuric acid now being made by copper smelters in the Southwest should insure supply of this reagent at reasonable cost in the future.

The writer believes that additional testing, with probably indicated increased plant investment, would show substantially better recoveries at costs which would be economic. The Union Pacific investigation in 1973-74 indicated the Inspiration test leaching operation would be economic at 56¢ copper.

CONCLUSIONS AND RECOMMENDATIONS

The impressive indicated low grade copper reserve at the Sanchez property, much of which would be available for low cost, open pit mining operations, deserves close consideration as a future economic resource. In the expectation that the price of copper, during the projected twenty year life of the enterprise at 20,000 tons per day and a start-up date some years in the future, will be at least from 20 to 30% higher than the present 63¢ price, the exploitation of the Sanchez deposit could be a very profitable venture.

Present exploration has not eliminated chances for substantial increases in low grade sulphide reserves. There are very long chance possibilities for discovery of higher grade primary ores related to the small breccia exposed at surface and partly explored by three drill holes. This area could be further explored by deep, inclined holes from surface.

If satisfactory business arrangements can be made with the Inspiration Company, it is recommended that a joint venture agreement be made with provision for an option period for a geological examination of drill records and cores, and additional drilling. If these investigations have favorable results, further metallurgical testing would be in order.

dup policy of retaining regional shopping centers.

6/27/75

WSTJ