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AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 15, 1962

MEMORANDUM TO K. E. RICHARD:

SACATON
Drilling Performance
September 1962

The following is a summary of drilling performance of Boyles Bros. Drilling Co. and J. O. Barnes Well Drilling during the month of September, 1962.

SHIFTS

	Possible	Worked	Productive	Feet
Boyles non-core	194.0000	177.3125	136.7850	7739.3
Barnes non-core	65.7495	65.7495	58.9995	1962.1
Total, non-core	259.7495	243.0620	195.7845	9701.4
Boyles core	82.375*	82.375	82.375	743.1
Total Shifts	342.1245	325.437	278.155	Total ft-10444.5

OPERATING DOWN TIME (SHIFTS) Non-Core

	Repairs	%	Fishing	%	Total	%
Boyles	18.28	9.42	21.06	10.86	40.5275**	20.89
Barnes	5.125	7.79	1.625	2.47	6.750	10.27
Total	23.405	9.01	22.685	8.73	47.2775	18.20

IDLE DOWN TIME (SHIFTS) Non-Core

Boyles	%	Barnes	%	Total	%
16.6875	8.60	-	-	16.6875	6.42

TOTAL DOWN TIME (SHIFTS) Non-Core

Boyles	%	Barnes	%	Total	%
57.2150	29.49	6.7500	10.27	63.965	24.63

AVERAGE PROGRESS FT/SHIFT

	Non-Core	Core
Boyles	39.89'	9.02'
Barnes	29.84'	-

* Does not include time idled by reason of no location ready.
** Includes miscellaneous delays (water, etc.)

JOSEPH R. WOJCIK

JRW/kw
cc: JHCourtright
JEKinnison

JOY MANUFACTURING COMPANY
900 WOODLAND AVENUE
MICHIGAN CITY, INDIANA

J. H. C.

OCT 3 0 1962

October 15, 1962

Mr. Kenyon Richard
Chief Geologist
American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

Thursday for
JHC, RKK, VEK & Colwell

Dear Mr. Richard:

As per our recent conversation while at Tucson with regard to the drilling that is now in progress near Florence, Arizona, we desire to make a reduction in the per foot prices effective with the third hole that is now being drilled with the 250 rotary drill.

Rock Bit Drilling

From 800 to 950 feet	$4.75 per ft.
From 950 to 1100 feet	$5.00 per ft.
From 1100 to 1250 feet	$5.25 per ft.
From 1250 to 1400 feet	$5.50 per ft.
From 1400 to 1550 feet	$5.75 per ft.
From 1550 to 1700 feet	$6.00 per ft.
From 1700 to 1850 feet	$6.25 per ft.
From 1850 to 2000 feet	$6.50 per ft.

The prices for coring below a depth of 1000 feet with the 75, 250 or 22-HD drills will be as follows:

	NX Wireline or NXM	BX Wireline or BXM
From 1000 to 1500 feet	$7.20 ft.	$6.85 ft.
From 1500 to 2000 feet	8.20 ft.	7.85 ft.

The other prices and conditions will remain the same as at present.

Yours very truly,

JOY MANUFACTURING COMPANY

W. J. Pilarski, Manager
Contract Drill Division

WJP/e t

J. H. C.

K. RICHARD
ROOM 808

OCT 1 1962

JCK 10/8/62

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 25, 1962

K. R. R.K.K. 10/22/62

SEP 28 1962

MEMORANDUM TO MR. R. J. LACY

MR. ~~JHC~~ / RKK - JCK
READ AND RETURN
PREPARE ANSWERS ..... HANDLE
FILE ..... INITIALS

Induced Polarization Surveys
Poston Butte Prospect
Pinal County, Arizona

Induced polarization traverses were made over the E. W. McFarland property and adjoining areas between August 2 and September 6. These traverses were established using an "a" spacing of 1000 ft. to provide as much depth penetration as possible. Reliable data could not be obtained in this area with any larger spacing.

Power line interference was a problem over most of the survey area, causing sub-standard data accuracy. Allowances for errors in the data have been made in my interpretation.

PRESENTATION OF RESULTS

Profiles of the I. P. results are plotted on the map labeled Attachment 1. The data obtained in 1960 and 1961 (both 400 ft. "a" and 1000 ft. "a") are also profiled on Attachment 1.

Attachment 2 shows the interpreted extent of the I. P. anomaly.

INTERPRETATION

The results of the recent survey extend the anomaly westerly to a point 6900 ft. from the mineralized showings at the base of Poston Butte. A fringe area of very weak I. P. response occurs along most of the perifery of the anomaly. I have labeled this fringe area as "questionable weak induced polarization anomaly." Identification of this area of questionable response is made chiefly on the basis of continuity from profile to profile since the magnitude of response approaches background levels.

Anomalous response has been determined on the basis of two criteria -- amplitude of 1000 ft. "a" response and the ratio $\frac{\text{1000 ft. "a" response}}{\text{400 ft. "a" response}}$. This technique was used to discriminate against extraneous response from river gravels and/or conglomerate.

CONCLUSIONS & RECOMMENDATIONS

The current drilling results tend to confirm that sulfides are the source of the I. P. anomaly. The top of sulfides in holes 5 and 8 (478 and 458 ft. respectively) is definitely within our depth of investigation. To the west, in hole 9, the top of sulfides (707 ft.) is near the limit of I. P. detection. Farther to the west, hole 10 is drilling in post-mineral conglomerate at about 1200 ft. If sulfides exist, they will be below detectable depths.

The value of the I. P. survey will depend on the depth to bedrock and the base of oxidation in areas where additional drilling is planned. Where the base of oxidation is no more than 500 to 700 ft., the interpreted limits of the I. P. anomaly should correspond to the limits of significant sulfide

occurrences. Where the base of oxidation is very deep, as in hole 10, the I. P. results will have neither positive nor negative significance.

Only one small area exists within the I. P. anomaly which has not been tested by drilling. This is the area bounded on the east by holes 3 and 7, on the south by hole 2, and on the west by holes 5 and 8. Mr. K. E. Richard may want to consider a hole to fill in this area because of the results of holes 5 and 8 (significant copper in hole 5 and strong alteration in the leached capping in hole 8).

Neither the amplitude nor areal extent of the I. P. anomaly is sufficient to justify geophysical recommendations for additional drilling.

ORIGINAL SIGNED BY
W. E. SAEGART

W. E. SAEGART

WES/kw
Attachments: 1 - 1" = 500' map showing I. P. profiles
2 - 1" = 500' map showing I. P. interpretation

cc: KERichard, w/Attach. 2 only
One copy w/Attach. 2 only
One copy w/Attachs. 1 & 2

ATTACHMENT 2

INDUCED POLARIZATION MAP

COMPOSITE INTERPRETATION OF 1960-61-62 SURVEYS

POSTON BUTTE PROJECT

Pinal County, Arizona

W.E. Saegart

September, 1962

J. H. COURTRIGHT

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 10, 1962

Mr. C. P. Pollock, Exploration Manager
American Smelting and Refining Company
120 Broadway
New York 5, New York

POSTON BUTTE DRILLING
PINAL COUNTY, ARIZONA

Dear Sir:

In planning the 2nd phase of the Poston Butte exploration program it was estimated that at least 7 holes would be required to test the area covered by the McFarland ground and adjoining ASARCO claims (Mr. Richard's letter of May 18, 1962). It is now apparent that the current appropriation will be insufficient to complete the 7 holes. This situation is due principally to encountering greater depths of conglomerate cover than anticipated.

The enclosed map shows the current status of the drilling. Holes 8, 9 and 11 have been completed; No. 10 is temporarily stopped at 1036 ft in conglomerate; and Nos. 11 and 12 are drilling conglomerate. Although none of the three completed holes encountered better than marginal grade copper mineralization (best intercept: 118 ft. @ .56% Cu, hole 11), results show an increase in primary copper mineralization to the west with no definite limits to the zone yet apparent. Hole 8 cut only slightly altered and mineralized rock, but this was beneath a post-ore fault overlain by strongly altered and mineralized leached capping; thus, this does not necessarily represent a limit on the north. The lack of appreciable enrichment in holes 9 and 11, coinciding with moderate to weak alteration, might be interpreted as an indication of nearby limits; however, these two holes are spaced too widely (2000 ft) to be conclusive.

Although the chances of success have been somewhat lessened by the recent drilling, it is our opinion that this porphyry copper prospect still offers a reasonable exploration gamble. It is recommended that sufficient funds be appropriated to drill 6 more holes and to complete current holes, as follows:

3 deep holes	-	5000 ft.
3 shallow holes	-	2000 ft.
complete Nos. 10,12 & 13	-	1500 ft.
		8500 ft. @ $6.00/ft = $51,000.

Should results of this drilling prove favorable, we would need to option privately held land lying immediately north of McFarland's property. The cost of options is estimated at $10,000. As of September 1, there was $10,600 remaining in the current appropriation which will cover the first half of this

month only.

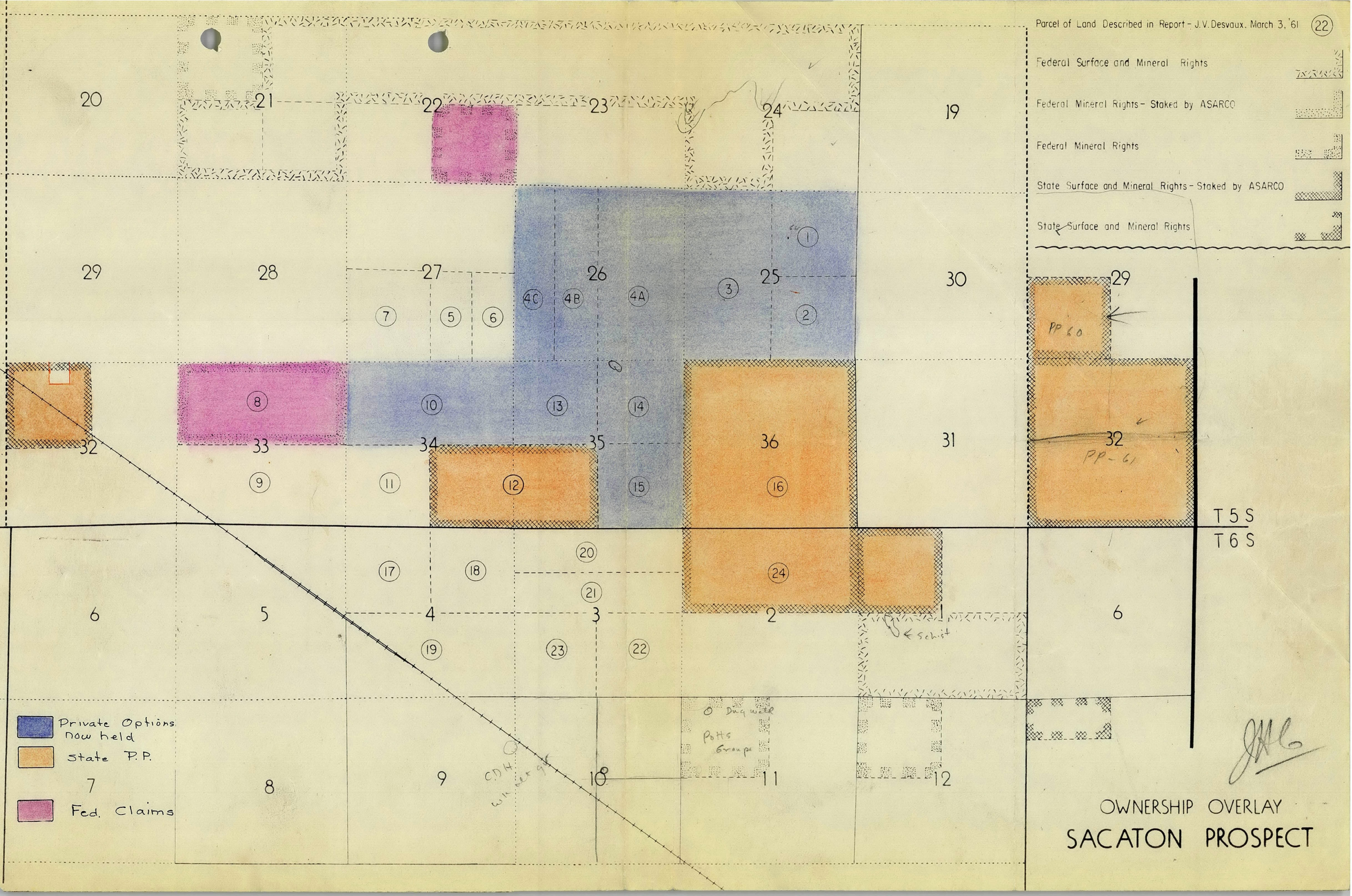
Drilling	$51,000
Options	10,000
	$61,000
Less Estimated Balance	3,000
Total Requirement	$58,000

Proposed hole locations are shown on the accompanying map.

Yours very truly,

J. H. COURTRIGHT

JHC/kw
Attach - map
cc: DJPope
KERichard - All w/map
RJLacy

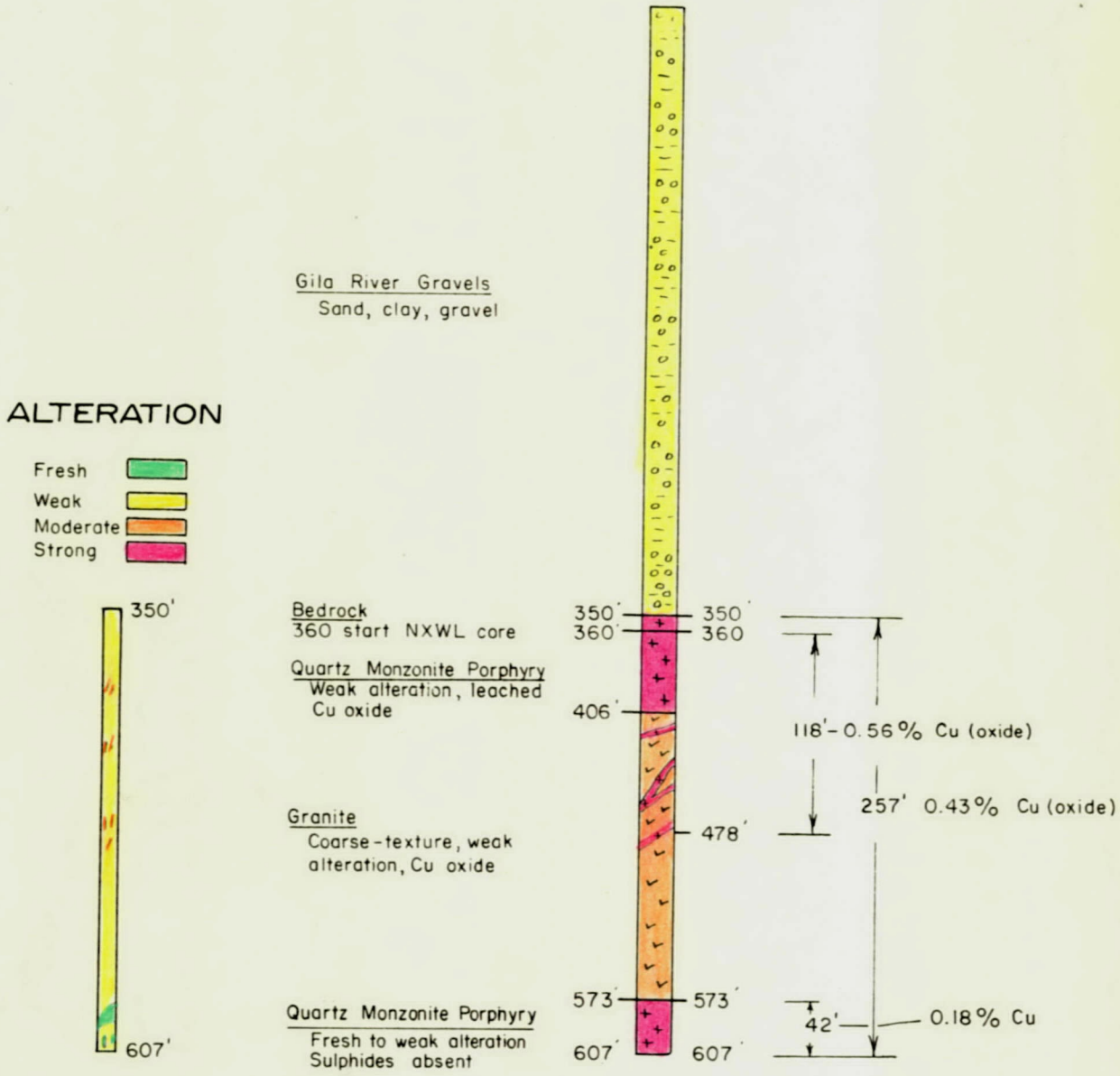

Parcel of Land Described in Report - J.V. Desvaux, March 3, '61
22
Federal Surface and Mineral Rights
Federal Mineral Rights - Staked by ASARCO
Federal Mineral Rights
State Surface and Mineral Rights - Staked by ASARCO
State Surface and Mineral Rights
T 5 S
T 6 S
Private Options Now held
State P.P.
Fed. Claims
OWNERSHIP OVERLAY
SACATON PROSPECT

J.H.C.

POSTEN BUTTE AREA

Hole No. 11

Generalized Log



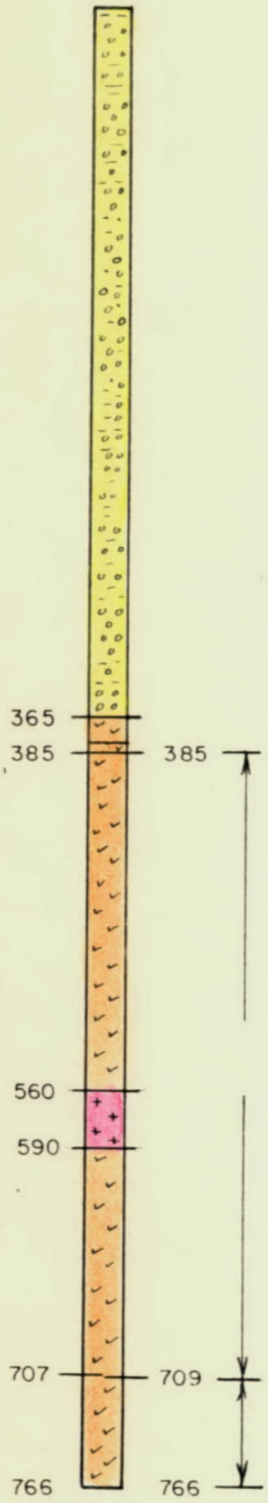
Scale 1" = 100'
Completed Sept. 4, 1962

J.H.C.

POSTEN BUTTE AREA

Hole No. 9

Generalized Log



Gila River gravels
Sand, clay, gravel

Estimated bedrock — 365

380-385 NX core
385 start NXWL core — 385 — 385

Biotite Granite
Coarse texture, alteration weak
Sulphides leached
Cu as CuO, CuSi

324' 0.42 % Cu (Oxide)

560

Monzonite Porphyry
Alteration weak, leached
Cu as in granite — 590

Biotite Granite
Same as above

707 Top sulphide zone
Cc, Cpy, Py
Cc diminishes rapidly
below 707 — 707 — 709

57' 0.40 % Cu (Sulf)

766 — 766

POSTEN BUTTE AREA

Hole No. 8

Generalized Log

Gila River Gravels

Sand, clay, gravel

Estimated bedrock — 334

344-350 NX core — 350

350 start NXWL core — 350

108' 0.026 % Cu

Biotite Granite

Moderate to strong alteration
Leached; limonite, some LLm

Probable Fault Zone — 458 — 458

Sericite, py, cc — 475 — 475 — 17' 0.24 % Cu

Weak alteration, py, tr cpy — 496 — 496 — 21' 0.01 % Cu

Scale 1" = 100'
Completed: Aug. 18, 1962

October 29, 1962

JHC

Seaton Project

Options - Acres and Purchase Price

Owner and Description	Acres	Option Payments: Date Due	Amount	Purchase Price: per Acre	Gross	Net
(14) I Robert Fabricant NE/4 - Sec 35	160	paid	13000	425	68000	55000 11/12/62
(14a) Surety T+T - 2052 E/2 - Sec 26	320	paid	26000	425	136000	111000 12/1/62
(14b) Surety T+T - 2096 2052 E/2 W/2 - Sec 26	160	paid	17000	500	80000	63000 1/1/63
(13) Ariz LT+T - 5993-T NW/4 - Sec 35	160	paid	15000	425	68000	53000 12/1/62
(10) Ariz LT+T - 6020-T N/2 - Sec 34	320	paid	13000	400	128000	115000
		10-31-62	5000	425	136000	119000 6/15/63
(17) Edith S Bruton SW/4 - Sec 27	160	paid	4800	450	72000	67200
		1-10-63	4800	450	72000	62400 12/31/63
Cyril J. Cron SE/4 - Sec 25	160	paid	6500	500	80000	73500
		1-10-63	6500	500	80000	67000 12/31/63
(15) J. Richard Heath SE/4 - Sec 35	160	paid	8000	500	80000	72000
		1-10-63	8000	500	80000	64000 7/1/63
(13) Herbert G. Bloom W/2 + NE/4 - Sec 25	480	paid	26000	625	300000	274000
		1-10-63	20800	650	312000	265200 7/1/63
Total	2080	paid	129300		1012000	882700
		due	174400		1032000	857600
(4c) Asarco Purchase W/2 W/2 - Sec 26	160	paid		525	84000	

6-11-62

Sacaton Project
Options - Acres and Purchase Price

Owner and Description	Acres	Option Payments Date	Option Payments Amount	Purchase Price per acre	Purchase Price Net	Purchase Price Gross
Fabricant		5-12-61	9000 pd	425		
Sec 35 - NE/4	160	5-12-62	4000 pd	425	55000	68000
Ariz LT+T 6020-T	320	3-6-62	13000 pd	400	115000	128000
Sec 24 - N 1/2		10-31-62	5000	425	118000	136000
Surety T+T. 2052		5-17-61	18000 pd	425	118000	136000
Sec 26 - E 1/2	320	4-1-62	8000 pd	425	110000	136000
Ariz LT+T - 5993-T		6-12-61	7500 pd			
Sec 35 - NW 1/4	160	12-1-61	4500 pd			
		5-31-61	3000 pd	425	53000	68000
Rd. & Bruton		6-11-62	4800 pd	450	67200	72000
Sec 27 - SW 1/4	160	1-10-63	4800	450	62400	72000
Cyril J Cron		4-23-62	6500 pd	500	73500	80000
Sec 25 - SE 1/4	160	1-10-63	6500	500	67000	80000
J. Hernard Geo T.		3-8-62	8000 pd	500	72000	80000
Sec 25 - SE 1/4	160	1-10-62	8000	500	64000	80000
Herbert & Bloom		4-13-62	26000 pd	625	274000	300000
Sec 25 - W 1/2 + NE 1/4	480	1-10-63	20000	650	265200	312000
Surety T+T 2096 2082		7-5-61	9000 pd			
Sec 26 - E 1/2 W 1/2	160	3-18-62	8000 pd	500	63000	80000
Total	2080		129300 pd		882700	1012000 min
			174400		857600	1032100 max
Asarco purchase						
Sec 26 - W 1/2 W 1/2	160	2-28-62	8400 pd	525		

ASARCO

Southwestern Exploration Division

JHC

WLK

May 25, 1977

J. H. C.

MAY 27 1977

FILE MEMORANDUM

In-Place Leach Testing
Poston Butte Deposit
Pinal County, Arizona

On May 24, 1977 I met with Mr. George Laflin, Regional Mining Engineer with the Technical Service Dept. of Dowell, and Messrs. D. E. Crowell and T. D. Henderson of ASARCO Incorporated, to discuss possible in-place leach testing at Poston Butte. Asarco had previously met in Nov. 1976 with Mr. D. DeMott of the New Ventures group of Dowell for the same purpose. Their work has been stalled by their insistence that the efficacy of chelates as leach compounds be researched contrary to our clearly stated request that sulfuric acid be used for leaching. The purpose of the meeting with Mr. Laflin was to discuss Dowell's interest to serve as a contractor for pump tests.

Mr. Laflin proposed a program which would involve two wells approximately 100 ft. apart drilled at 9-5/8 in. diameter in the conglomerate and 7 in. diameter in bedrock. These wells would be cased and the area between the casing and the hole would be cemented back to the collar. A 2-in. injection stainless steel or plastic pipe would be placed inside the casing. Acid would be injected directly into the casing ahead of the injection pump to eliminate the need for a stainless steel pump. He indicated that it would require six-month lead time to contract an oil well rig of sufficient size and that a 2000 ft. hole would cost about $50/ft. He thought we might get a water well drill out of Phoenix much sooner and at much less cost. Apparently the design of the injection well and the pump is relatively simple.

The recovery well is not so simple. Although it would be drilled and cased in the same way, the problems involve wear and corrosion on pumps when pumping the pregnant solution to the surface. He suggested that an airlift system would be most suitable and involves pumping air down the outer annulus of the hole to force the pregnant solution up the interior portion of the pipe. The construction cost for the two-well program is roughly estimated by Mr. Laflin at $250,000. To this must be added operating and pilot plant costs. Mr. Laflin emphasized the need to be alert for various environmental problems. The production wells and all existing and future exploration holes should be cemented to the surface to eliminate contamination of the near-surface alluvium.

He pointed out that injection would occur over a vertical height of approximately 10 feet and would be pulled into the bottom of the recovery well at the base of the casing. The maximum width of the flow lines between the two wells at 100 ft. spacing would be approximately 40 ft. and the flow lines would approximate the shape of a football. Geologic information

which would be most critical as far as assisting with the permeability testing would be fracture information. Iron oxide mineralogy might also be important because of the tendency for iron to accumulate in the pregnant solution and then clog the rock pores when the barren solution is pumped back in the hole. Clay mineralogy is not critical because montmorillonites do not swell in an acid solution.

Mr. Laflin has had considerable experience with in-place copper leach testing at Ely, Safford, and currently at Occidental's Van Dyke deposit in Miami. His opinion is that the Poston Butte deposit is the most ideally suited he has seen for in-place leaching.

Mr. Laflin, although currently with Dowell, is planning on taking an early retirement in approximately May 1978. At that time he plans to join the firm of Emery Nielson and Associates, also in Denver, and would be available to us at that time as a consultant. He pointed out that our money might be better spent with a consultant because there are numerous political problems within Dowell involving competition between groups. In addition, the amount of service which would be required from Dowell would be so small as to probably be of no interest to Dowell. Mr. Nielson has informally suggested he make a two to three-week detailed cost estimate of a 2-hole program possibly sometime later this fall. This would be done during his vacation when he would bill us as a consultant at $250 a day plus expenses. Messrs. Crowell, Henderson, and I were generally impressed with Mr. Laflin's knowledge of Poston Butte, his general practical approach to the problems, and his experience with drilling and fluid circulation in other in-place leach programs. We think the approach suggested by Mr. Laflin is reasonable -- that is using a consultant -- and that he could supply the requisite expertise for the pumping tests. It might nevertheless be advisable to consult with another firm such as Core Laboratories before making a detailed cost estimate of the pumping program.

Before a pilot program could be started it would be necessary to confirm the Poston Butte ore reserve by drilling 5 additional exploration holes at an approximate cost of $150,000. If previous reserve estimates are verified I would recommend that an in-place leach test program be initiated.

F. T. Graybeal

F. T. Graybeal

FTG:lb

cc: DECrowell/TDHenderson
WLKurtz

JHC → file

RECEIVED
JUL 26 1976
EXPLORATION DEPARTMENT

W. L. K.
AUG 5 1976

Air Mail

July 23, 1976

Mr. Adolph V. Mitterer
Manager of Mining & Milling
Minerals Department
Continental Oil Company
1755 Glenarm Place
Denver, Colorado 80202

Arizona
Poston Butte Property

Dear Adolph:

We've not received your reply to our counterproposal described in my letter to you of February 13, and I interpret this as indicating that Conoco is not interested in our proposition, at least until copper markets improve and your project is reactivated. However, given the vagaries of mail deliveries, I suppose it is in the realm of possibility that my letter of February 13 never reached its destination, and it would therefore be helpful if you would confirm your lack of interest or otherwise for our records.

I had the good fortune to attend MIT's winter session of the Program for Senior Executives, and I noted your name among those of past attendees. I enjoyed my stay at Endicott House and I expect you did the same. With best regards,

Sincerely yours,
Original Signed By
T. C. Osborne

T. C. Osborne

bcc: WLKurtz
FTGraybeal

ASARCO

Southwestern Exploration Division

December 22, 1975

FILE MEMORANDUM

Posten Butte
Pinal County, Arizona

R. B. Cummings called (19 Dec.) in reference to an underground tour he had at Conoco's Posten Butte deposit.

1. Reconfirmed that with depth pass from potassic/ore to phyllic/py.
2. A N30°W trending fault (60° to W!) bounds ore on east side, at depth (+700'); this fault traces between discovery outcrop and ore zone to west.
3. Ore is also bounded on south by NE-trending, north-dipping fault.
4. Laramide rocks are not "well" mineralized, but are strongly altered; i.e., 2nd biotite, chlorite, minor Kspar.
5. There are no thick sulfide veins or major quartz (vein) introduction.
6. "Ore" rock is busted, especially in oxide zone -- lots of bad ground.
7. Saw a few flat faults.
8. Mining plans: oxide .45% at .16% acid soluble cutoff
   sulfide .4% at .2%

John R. King

JRK:lb

cc: WLKurtz
FTGraybeal

CM: TCO
BC → WLK

FREEPORT

RECEIVED
DEC 3 1975
S. W. U. S. EXPL. DIV.

FREEPORT EXPLORATION COMPANY

SUITE 121 / 655 NORTH ALVERNON WAY
TUCSON, ARIZONA 85711
PHONE: (602) 881-6070

December 2, 1975

Poston Butte

Mr. William L. Kurtz, Manager
ASARCO, Inc.
P. O. Box 5747
Tucson, Arizona 85703

Dear Bill:

This letter is to confirm our telephone conversation of December 1, 1975 concerning the proposed Freeport-ASARCO joint venture arrangement on the ASARCO Poston Butte deposit.

As you are aware for the past six months, I have had approval from Messrs. D. R. Cook and J. G. Hall to enter into a joint venture with you on the Poston Butte deposit following the general terms of trade previously negotiated. However, in view of the lengthly delay, we believe it is prudent to terminate the original proposal. In the event there is a revival of interest by Freeport and ASARCO, then a new proposition can be discussed subject to our management's approval.

Sincerely,

Ken

Kenneth D. Cornelius
District Exploration Manager

KDC/bjm
6070
xc: Douglas R. Cook

ASARCO

EXPLORATION DEPARTMENT

RECEIVED
AUG 8 1975
EXPLORATION DEPT.

AIR MAIL

August 5, 1975

J. H. C.
AUG 8 1975

Mr. Adolph V. Mitterer
Manager of Mining and Milling
Minerals Department
Continental Oil Company
1755 Glenarm Place
Denver, Colorado 80202

Poston Butte, Arizona

Dear Mr. Mitterer:

Further to my letter of July 18 which acknowledged yours of July 16, we have given more thought to the Florence land question.

Since the deeply buried mineralization which we share with Conoco is physically separated from your main deposit and any development of the former is probably some years in the future, it seems to us best to postpone the question of its unitization for future negotiations when need for it arises. We therefore suggest further discussion along the following lines:

1. Conoco to pay Asarco $1.5 million for:

   a. The right to use as much of Asarco's land surface as necessary for prudent development of the Conoco deposit with Conoco undertaking not to locate surface facilities where they might impede future development of the deep mineralization, except with the consent in writing of Asarco.

   b. The right to strip waste rock from Asarco ground as required to provide backslope for Conoco's planned open pit. For convenient definition such right would be limited to a fixed depth below surface, say 1200 feet.

2. Asarco would not oppose Conoco pumping to remove water from the open pit area (your paragraph 11).

3. Conoco would pay all taxes on our 891 acres and indemnify Asarco for any claims against it resulting from Conoco's activities.

4. In recognition that Asarco prefers not to tie up its ground unless Conoco does proceed to develop and strip according to its plans, Conoco would pay Asarco rental of $100,000 for any calendar year after 1976 during which Conoco expenditures on its property total less than $1 million.

5. On all Conoco ore made available for open pit mining by stripping waste from Asarco's property, Conoco would pay Asarco a royalty of 2% on net smelter returns.

6. An Area of Mutual Interest covering the deep mineralization would be designated (your paragraph 5) and either party acting independently, solely for its own account, would be free to perform drilling and other exploration including leaching-in-place experiments. All information, except information related to leaching-in-place experiments, would be shared (your paragraph 6).

7. Asarco would be free to develop a leaching-in-place operation on its property, subject to no unreasonable interference with Conoco's installations and waste stripping requirements.

As a possible alternative to the foregoing, we would also be willing to consider outright sale of our land, including mineral rights. However, our senior officers conclude that the price would have to exceed the previously quoted figure by a substantial amount to compensate Asarco for its mineral reserves.

In accordance with your suggestion, we would be pleased to hear from you after Mr. Koch's return about August 1, and incidentally I expect to be in Denver Friday, August 8, if that date is convenient to you for a meeting.

Very truly yours,

John J. Collins
Vice President

cc: JHCourtright
WLKurtz
NVisnes/TEScartaccini

RECEIVED
JUN 26 1975
EXPLORATION DEPT.

New York, June 23, 1975

J. H. C.
JUN 26 1975

MEMORANDUM FOR: Mr. R. L. Hennebach

Poston Butte, Arizona

At our meeting June 19th in Florence, Conoco's staff gave us maps and cross-sections that Tom Scartaccini interprets as indicating Asarco's property does indeed control the lower 1/5 of Conoco's orebody, under any reasonable pit slope. None of Asarco's mineralized bedrock would be touched as it is in the dropped fault block (a graben). Our Tucson lawyer confirmed that we are within our rights if we withhold permission to strip our ground. Of Conoco's professed 800 million tons of ore, they would still have 600 million tons and therefore ample reserves to support their proposed operation.

Their statements on oxide ore grade (0.46¢ Cu) and leaching recoveries (75-80%) lead us to believe that they may not make an operating profit even at 85¢ copper, on which they base their estimates. Overhanging this problem would be recovery of their pre-production expenditure of $160 million plus generation of profits to finance the construction of a sulphide flotation mill to start production in the 5th year. Unless the price of copper goes much higher, this development could be a fiasco.

This possibility means we should take the $1.5 cash promptly and try to draft an agreement to allow us to take some future advantage of their current optimistic outlook, while it lasts. Should we ask for participation in the 1/5 of the ore reserve that we control? Is there any long-term gas or oil or uranium contract with Conoco that could be important to us?

Of comparatively minor importance, they proposed unitizing (some 30 years hence) the graben block where we have 1/3 of the speculative ore reserve amounting to some 400 million tons at 0.34% Cu. Their current pit outline would strip at least 50 million tons of waste from 40 acres of our property but the main credit as to waste removal over the graben would be the open space resulting from completion of their main pit. Mr. Ludwig Koch raised a new point and pretended he expected to charge us with the cost of stripping on our 40 acres before we could unitize the graben block. I quickly protested this would wreck the deal and they seemed to yield. They admitted that their only major problem is the position of our ground.

The cost of drilling our property on close spacing was a charge claimed by Mr. Koch in New York but the cost is relatively small (± half

a million dollars) and we could afford to do it ourselves at some future date, thereby eliminating a minor point and forcing Conoco to focus on the main issue (1/5 of the main ore reserve). Asarco might be able to add to its copper reserves.

John J. Collins

cc: TASnedden
JHCourtright
WLKurtz
TScartaccini

Courtright

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA
SOUTHWESTERN MINING DEPARTMENT

J. H. C.
JUN 24 1975

June 23, 1975

mining .40 .20
milling total 1.50
Cost - 54-64¢ / lb

Memorandum to R. B. Meen

Subject: Meeting with Continental Oil Company Regarding Asarco's Property Adjoining the Proposed Conoco Operations, Florence, Arizona

Meeting Time: June 19, 1975, 1:40 p.m.

Present: Conoco: Mr. Ludwig W. Koch, General Manager, Exploration and Operations, Minerals Department
Mr. Alex Bisset, Project Manager
Mr. Frank Buchella, Senior Mining Engineer
Mr. Phil Nason, Project Geologist

Asarco: Mr. John J. Collins
Mr. Bill Kurtz
Mr. Harold Courtright
Mr. Tom Scartaccini

Mr. Koch called the meeting in order that the property controlled by Continental Oil Company and Asarco could be viewed in light of Conoco's proposed operations. Mr. Koch stated that Conoco had presented a proposal to Asarco in New York for a total purchase of the Asarco controlled property.

Evidently, this proposal was not viable; therefore, he had presented another option and wanted to go through it again so that it could be viewed at the location as it related to the Conoco proposed operation. This would allow for questions on the operation to be answered.

The second option in principal was a proposed agreement between Conoco and Asarco where the property, both Asarco's and Conoco's, would be developed as a unitized operation. Conoco in time would continue their interspaced drilling program onto the Asarco property and further define the ore body. They would then engineer it for any possible development.

At such time as the Asarco property would be put into production, Asarco would have an option to either join Conoco as a partner in the operation, let Conoco operate the property with Asarco retaining a royalty override, or operate

the property on its own. At the time Asarco exercised one of the various options, the drilling and engineering costs of the Asarco property incurred by Conoco during the interim would then be repaid to Conoco by Asarco.

One point that Mr. Koch interjected that was not brought out in New York previously was the fact that any stripping by Conoco into Asarco property that would benefit the Asarco mineralized area would also have to be repaid by Asarco to Conoco.

With this introduction, Conoco then presented the following information on the project.

1. A view at an overall Conoco and Asarco property map. This map showed the relationship of the Conoco plant facilities, the pit, the dumps (waste and tailing), and the various property leases Conoco has acquired or will acquire.

2. Sections showing the area along the Asarco-Conoco property boundary with the drill holes plotted. The mineralized area as Conoco knows it was also plotted and the mineralization was extended into the Asarco ground (copy given to Asarco).

3. A different plan map showing surface facilities with the final pit outline as now proposed by Conoco (copy given to Asarco).

4. A map showing seven ore polygons defining the ore reserves on Asarco and adjoining Conoco ground outside of the present pit as projected (copy given to Asarco).

5. A tabulation sheet showing the stripping ratios necessary to obtain the reserve in Item 4 at the various cut-off grades.

6. Plan maps of the Conoco pit showing the pre-mine, the oxide, oxide-sulfide and straight sulfide phases and final pit outline. We were told that the pre-mine would take approximately two years, the oxide phase would last four years, the oxide-sulfide phase would last 22 years, and the straight sulfide operation would last 14 years. This schedule assumes the starting of the oxide phase in 1979.

7. Sections showing the mineralization zones corresponding to the phases in Item 6.

In general discussion during the presentation, Conoco revealed the following information:

1. The total ore body carries an approximate stripping ratio of 2:1.

2. The overall reserve is approximately .41 sulfide copper.

3. The cutoff grades used are .26 in oxide and .20 in sulfides.

4. The first few years of oxide-sulfide operation will have a sulfide head of approximately .46 copper.

Oxide - .46 at .26 cutoff

5. Both oxide and sulfide material will be carried to the metal stage on the property.

6. The pit slope planned is 1.2:1. The pit will be an even slope to the bottom, which they hope will be about 2,000 feet.

Conclusions

1. From the discussion of grades, slopes and water problems, the Conoco property appears on the surface to be a very difficult project. The dewatering of the area, which is agricultural, and compensation for such is going to be a problem of major importance. The grades and the stripping ratios involved would appear to make this property a marginal one at best.

2. As can be seen by the attached section of the Conoco plan map, the Asarco property is necessary to Conoco as they have designed their pit.

3. Although Conoco does not intend to strip the Asarco property into the mineralized zone, they will need to advance 1600 feet into Asarco property for dewatering well placements and final pit slopes. They indicate on their sections that there is a north-south fault that defines to the east the majority of their ore body which the pit is designed to mine. This fault was just east of the Asarco-Conoco property line. They have ore indications west of the fault, but it is deeper and they do not include this in their present pit design. If Conoco did not take their pit to the limit that is indicated on the attached section, I would estimate, based on the information seen and from the discussions, that approximately 20 percent of their proposed pit could not be included in their present mining plans.

4. From Asarco's drilling and from projected information acquired from Conoco, the mineralization on the Asarco ground is deep and not conducive to an open pit (Asarco alone) operation. It is not of size or grade to warrant an underground operation.

5. The grades and tonnages shown by Conoco are for a unitized operation in order to recover the maximum amount of the mineralized area west of the Asarco-Conoco property line. This would include operating on Conoco ground both north and west of the Asarco property. However, the stripping ratios and grades involved do not show an economic operation at this time.

6. Mr. Koch was very candid in his statement that the acquisition of control of the Asarco property by Conoco is of prime importance to them at this time. The plans for the surface facilities included using the Asarco property for well dewatering sites, shop facilities, possible gravity tailing disposal, rerouting of the Hunt Highway, and the railroad track. These facilities could be rearranged in different locations; Conoco has the area to do this. However, the present design is the one that will give them their most efficient operation and provide the best initial access to the oxide ore body. If stripping into Asarco property is not in the future, then a major pit redesign will have to take place. This could have ramifications to Conoco. Conoco does not intend to strip into Asarco ground for approximately 15 years. Any potential at incorporating the removal of any potential Asarco ore would not take place for 25-30 years.

7. The overall pit is roughly circular and approximately 6500 feet in diameter.

8. The information Conoco has developed with their interspaced drilling (250 foot grid) has indicated a uniform ore body gradewise. They anticipate no change to the west.

9. Conoco has an exploratory shaft in operation with approximately 1500 feet of heading advanced from the shaft, 1000 feet in the west direction and 500 feet in the east direction. From the west heading several cross cuts have been driven. The ground encountered to date has been adverse. They are standing sets every five feet and have to crib and block everything. They are not able to leave any exposed ground. The sets are being squeezed and the bottom is heaving in places. They have had to come back and stand sets every 2½ feet. The timber being used is 10 inches by 10 inches. The workings are approximately 700 feet deep.

10. Water problems have not been too bad. They are developing about 120 gallons per minute in the shaft. The early test dewatering well indicates they can pull the water down relatively well. However, it is too early to tell much.

11. The amount of stripping that Conoco in time will perform to the benefit of Asarco's mineralized zone is approximately 50 million tons (calculation made by Asarco).

12. The original slope design was 1.3:1. Conoco has since changed to 1.2:1 but are waiting on a slope stability report from Dames and Moore in order to make a final decision.

13. The Conoco design proposed if the Asarco ground was acquired would put the tailing disposal on Asarco ground. This would be gravity, and no pumping costs would be involved. The site would be near the river, and the possibility of water pollution will raise its ugly head.

Looking at the situation, I would define it as the Eisenhower-Palo Verde-Asarco situation in reverse. Both sides can benefit from the unitized operation. It is just a question of what is equitable to both parties. If the operation is not unitized, Conoco will have a portion of their ore reserve locked up. Asarco will not be able to mine its own property as it is. Therefore, possibly some middle ground could be found. For the best operation of their property, Conoco needs control of the Asarco property. This would free a portion of their locked-in ore. Also, operating as a unitized pit could possibly make the Asarco mineralized area economical. Something of an equitable nature could possibly be compensation for the property with a royalty override on the locked-in ore and any possible Asarco ore. To retain an interest in the Conoco operation would possibly also incorporate any liability that may arise from the water problems that they are going to encounter.

Conoco was quite open in their discussion and answered all questions asked. It would appear that they are serious about the project. However, they still have a great many loose ends to pull together before the final decisions are made. The project may not look as attractive for the immediate future based on the various factors involved (pilot plant testing results, water problems and copper price) as they presently view the situation. They could quite possibly be more willing to negotiate at the present time than at a later date.

T. E. Scartaccini

T. E. Scartaccini

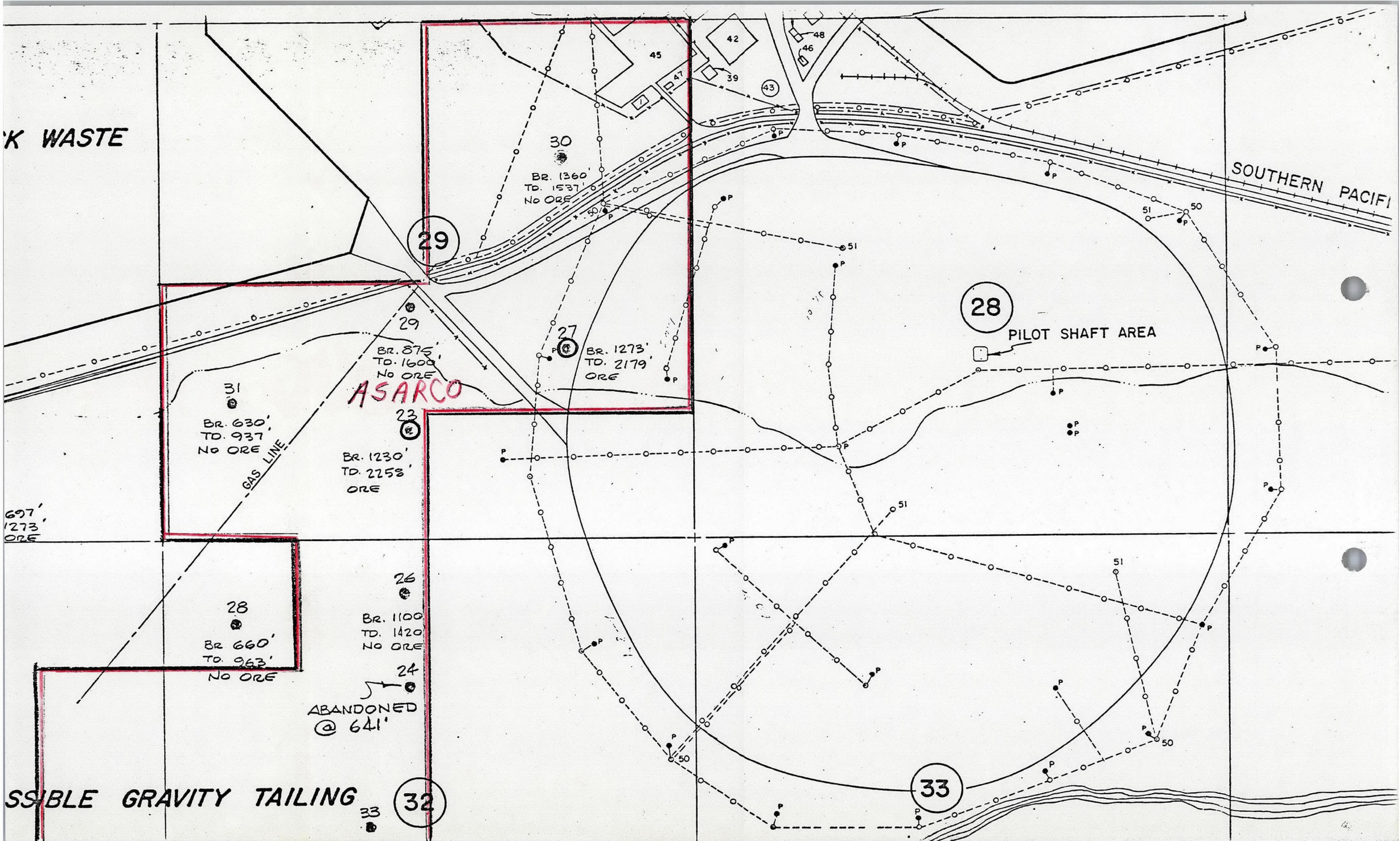
TES:ka
Attachments

cc: TASnedden
NVisnes
JJCollins
WLKurtz
JHCourtright

CUT-OFF COMPARISONS

	.15		.20		.25		.30	
	TONS X 10^6	GRADE	TONS X 10^6	GRADE	TONS X 10^6	GRADE	TONS X 10^6	GRADE
CONOCO OX.	193	.32	156	.36	127	.39	63	.50
ASARCO OX.	84	.36	78	.38	58	.52	40	.63
TOTAL OX.	277	.33	234	.37	185	.43	103	.55
CONOCO SUL.	150	.27	140	.28	65	.32	28	.42
ASARCO SUL.	60	.35	49	.39	42	.42	40	.45
TOTAL SUL.	210	.29	189	.31	107	.36	68	.44
CONOCO TOTAL	343	.30	296	.32	192	.37	91	.47
ASARCO TOTAL	144	.36	127	.38	100	.48	80	.54
TOTAL	487	.32	423	.34	292	.41	171	.50
*STRIPPING RATIO	5.1 TO 4.2 : 1		5.7 TO 4.7 : 1		8.9 TO 7.5 : 1		16.0 TO 13.5 : 1	

* RANGE


K WASTE
SOUTHERN PACIFI
30
BR. 1360'
TD. 1537'
NO ORE
29
29
BR. 875'
TD. 1600'
NO ORE
ASARCO
27
BR. 1273'
TD. 2179'
ORE
28
PILOT SHAFT AREA
31
BR. 630'
TD. 937'
NO ORE
GAS LINE
23
BR. 1230'
TD. 2258'
ORE
697'
1273'
ORE
26
BR. 1100'
TD. 1420'
NO ORE
28
BR 660'
TD. 963'
NO ORE
24
ABANDONED
@ 641'
SSIBLE GRAVITY TAILING
32
33
33

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
MAY 9 1975

May 8, 1975

file

Mr. T. C. Osborne
ASARCO
New York Office

Poston Butte Project
Conoco
Pinal County, Arizona

Enclosed is a letter from Conoco concerning water wells within the area that may be influenced by Conoco's pumping.

Note especially paragraph 3, page 3 (Arizona Law) and page 4 (their offer).

Since our current plans are to continue farming our land, I shall complete and return Conoco's form to them.

W. L. Kurtz/lb
W. L. Kurtz

WLK:lb
Enc.

cc: RBCrist - Note: Please handle.
JHCourtright - w/enc.
NPWhaley - w/enc.

WLR Copy

conoco

T.E.S.

MINING DEPT
MAY 5 1975
TUCSON

Continental Oil Company
P. O. Box 627
Florence, Arizona 85232
(602) 868-5852

MAY 5 1975

May 7, 1975

American Smelting & Refining Co.
P. O. Box 5747
Tucson, Arizona 85703

Dear Sirs:

As you know, Continental Oil Company has discovered a copper deposit near Florence which shows promise for development into a large mine. Exploration drilling, engineering and technical studies have been underway since 1970 to determine if it will be feasible to go ahead.

Work is nearing completion on a small underground pilot mine, where we will dig out limited quantities of ore to evaluate geology and mining conditions, and on a pilot plant, where we will examine processes for treating the ore and recovering copper. Additionally, we have underway a number of environmental studies to predict impact of the new mine on the area. A substantial amount of money has already been invested in developing the project to this point of final feasibility evaluation.

If all our studies show the positive results we expect, it may be possible for Conoco to begin developing the project beginning in 1976. It will take many years to engineer, design and build the mine and processing facilities, and full production rates probably will not be achieved until 1984. At that time the mine will provide permanent jobs for more than 1,600 people in the Florence-Coolidge area, and will become an important asset to the community, state and nation.

When the mine is fully developed, some thirty years from now, it will be an open-pit similar in size to several other large mines now in operation in Arizona.

The deposit lies under the Gila River Valley, concealed beneath about 200 feet of dry gravels and about 125-150 feet of water-bearing conglomerate. Before it can be developed safely, means must be found to prevent groundwater from flooding the mine.

Our ideas are straightforward, and they have been proved workable in other mining areas in the U.S. and elsewhere. We plan to drill a series of closely-spaced wells surrounding the mine. By pumping these wells continuously we will create a kind of pumping fence around the mine which will keep groundwater from flooding the mine. The plan is illustrated and explained in the attached materials.

We expect the number of wells being pumped will increase from five when the initial pumping test program begins in late 1975 to about seventeen wells in the future. The number of wells will increase year by year as the diameter of the mine increases and more wells are needed to maintain the pumping circle.

Part of the water from these wells will be used to process the copper ore, but none of the water will be wasted. That portion of the pumped water belonging to the San Carlos Project will be delivered to their canals to reduce their pumping from other sources.

Conoco's engineers and hydrologists have spent more than five years, drilled many wells, and measured hundreds more to evaluate as carefully as we can what effects might be seen in nearby wells when we begin to pump water for operation and mine drainage.

Our hydrological studies show it is practical and feasible to keep the mine safe, stable and reasonably dry with the pumping procedure outlined above which will create a localized cone of depression in the water table at the mine. As the water table in the mine area is drawn down, the effects will be seen both inside the circle of wells where the mine will be kept dry, and outside the circle, where the water levels in nearby wells will be drawn down by varying amounts, depending on how close they are to the mine.

As the water table declines at the edge of the mine, our dewatering wells will produce less and less water. Over the long term, net volume of mine pumping will be about equal to that of twelve normal irrigation wells, or about 32,000 acre feet per year. Approximately half of this amount will be used to process the ore, and the remainder could be delivered to San Carlos Project irrigation canals. Thus, when viewed with the fact Conoco's operation will result in substantial acreage being taken out of agricultural production, the net effect of our operation will be minimal.

It is acknowledged that Conoco's pumping will cause some decline in the local water table. The amount of that decline is greatest at the mine but diminishes rapidly outward so that it will average less than six inches per year at a distance of about six miles from the edge of the mine over a thirty-year period.

As you know, because of intensive pumping for irrigation, water levels have been declining in local wells for more than forty years. The average rate of that decline has been about five feet every year in the Gila Valley, and about ten feet per year in the Magma area, but has varied for individual wells year by year, depending on rainfall, weather and changes in cropping patterns. That decline will continue regardless of whether Conoco develops its mine.

Under our interpretation of Arizona law, beneficial uses of the land, such as the mine proposed by Conoco, permit the owner to pump groundwater without liability or obligation to owners of nearby water wells for consequent declines in the water table. It is not Conoco's intention to stand on this law without considering the effects on our neighbors. Conoco therefore has established a policy to reimburse owners of existing nearby wells that are measurably affected for the added costs to maintain their present water usage to the extent that such added costs are directly attributable to Conoco's pumping.

As the mine pumping continues without interruption over a period of about thirty years, the effect on the local water table will be a slow and gradual decline which is greatest at the mine and progressively less at increasing distances from the mine. The amount and rate of that decline can be predicted closely from hydrological tests which began in 1970.

To monitor that decline accurately Conoco soon will be drilling a number of observation wells at varying distances and directions from the mine. Our program is being developed in consultation with the United States Geological Survey. Water levels in these wells will be monitored continuously, and the results will be available for public inspection. These measurements will be used to verify Conoco's calculations of water level declines which are the basis for Conoco's offer to reimburse pumping costs. In addition, Conoco will continue its program to frequently check water levels in hundreds of irrigation and domestic wells in the area.

All reimbursement by Conoco will be pursuant to binding written agreements with the individual owners of affected wells, and is in two basic forms:

1. For existing wells, Conoco will pay annually the added lifting costs. This payment will be calculated on the basis of the volume of water assumed to be used or actually being used, the distance of the well from the mine, and the water table decline caused by mine pumping. Naturally, the payment will not cover any added lifting costs resulting from the regional decline, or influences other than Conoco's pumpage.

   For each irrigation well Conoco will pay the dollar cost of the additional power required to lift the actual volume of water produced from the well to a maximum of five-acre feet for each acre now being irrigated from that well. For municipal wells the annual payment will cover the added lifting cost either for metered or estimated annual volume pumped.

2. Because the mine pumping may eventually contribute to declines in some wells very near the mine to the point where resetting the pump or deepening the well may be required to maintain its production, Conoco is willing to make either a single one-time, full-settlement, lump-sum payment for the then-current estimated extra cost of deepening the well, and resetting motors, bowls column, etc. Alternatively we would agree to replace such equipment and/or to deepen the well to the extent needed to maintain present production of declines in water levels as a direct result of the mine pumping.

It must be emphasized that this offer of reimbursement is limited to present volumes and uses from existing wells. If the offer is accepted, its terms and provisions will be incorporated into a written contract agreement between Conoco and the owner(s) of each subject well.

If you own wells which you believe may be affected by Conoco's future mine pumping, please fill out one copy of the attached sheet and return it in the postpaid envelope. Keep the other copy for your records. Conoco's hydrologists will examine the well with you to verify its volume and use, and will ask for copies of any records you may have of pumping operation.

Providing this information to Conoco will assure that we can plan our future operations in a manner which will help assure you of continuing to derive full benefit from your wells.

Thank you for your cooperation.

Yours very truly,

Alex F. Bissett
Project Manager

Enclosures

TABLE 1

PREDICTED AVERAGE ANNUAL INCHES DECLINE OF STATIC WATER LEVELS RESULTING FROM CONOCO MINE PUMPING

Distance From Center of Mine Pumping (Miles)	Average Annual Decline (Inches) During First Five Years	During Second Five Years	During Third Five Years	During Fourth Five Years	During Fifth Five Years	During Sixth Five Years	Average Annual Decline Over 30 Years
2 mi.	68"	31"	12"	10"	9"	6"	23"
2½ mi.	53"	31"	11"	10"	9"	6"	20"
3 mi.	38"	30"	11"	10"	9"	6"	17"
3½ mi.	30"	26"	11"	10"	9"	6"	15"
4 mi.	21"	22"	11"	10"	9"	6"	13"
4½ mi.	16"	19"	11"	10"	8"	6"	12"
5 mi.	11"	16"	11"	10"	6"	6"	10"
5½ mi.	7"	12"	10"	10"	6"	6"	8"
6 mi.	3"	10"	10"	10"	6"	5"	7"
6½ mi.	2"	8"	8"	8"	6"	4"	6"

CONOCO COPPER PROJECT
PROGRAM FOR REIMBURSEMENT, EXTRA COST FOR IRRIGATION WELL PUMPING
DATA SHEET FOR SUBMITTAL BY WELL OWNER

Name of Owner_____

Mailing Address_____

_____

_____

Date Prepared_____Tel. No._____

Irrigated Farming Operations
(Do not include lands within San Carlos Project)

Acres irrigated in 1975 from wells on farm_____

Irrigable acres fallow in 1975_____

Total irrigable acres on farm_____

* *

Irrigation Wells	1	2	3	4	5	6
Your well No.	____	____	____	____	____	____
Total well depth, feet	____	____	____	____	____	____
Casing diameter, inches	____	____	____	____	____	____
Pump bowls:						
Present depth of setting, feet	____	____	____	____	____	____
Date column pipe was added	____	____	____	____	____	____
Feet of column added last time	____	____	____	____	____	____
Type of power (gas, diesel, electric)	____	____	____	____	____	____
Engine or motor horsepower	____	____	____	____	____	____
Depth to static water level:						
Feet	____	____	____	____	____	____
Date measured	____	____	____	____	____	____
Depth to pumping water level:						
Feet	____	____	____	____	____	____
Date measured	____	____	____	____	____	____
Well discharge:						
By whom measured	____	____	____	____	____	____
Method of measurement	____	____	____	____	____	____
Yield in gallons per minute	____	____	____	____	____	____
Date measured	____	____	____	____	____	____

Well Location: On the back of this sheet please draw a sketch of your property, showing Section, Township and Range, and locations of each of your wells.

Authorization

This will authorize CONOCO or its designated consulting hydrologist to examine all wells listed above and to make water-level and/or well-discharge measurements as needed to verify water-well operating conditions.

Signature of Owner_____
or
Aughorized Agent_____

Range ____ E

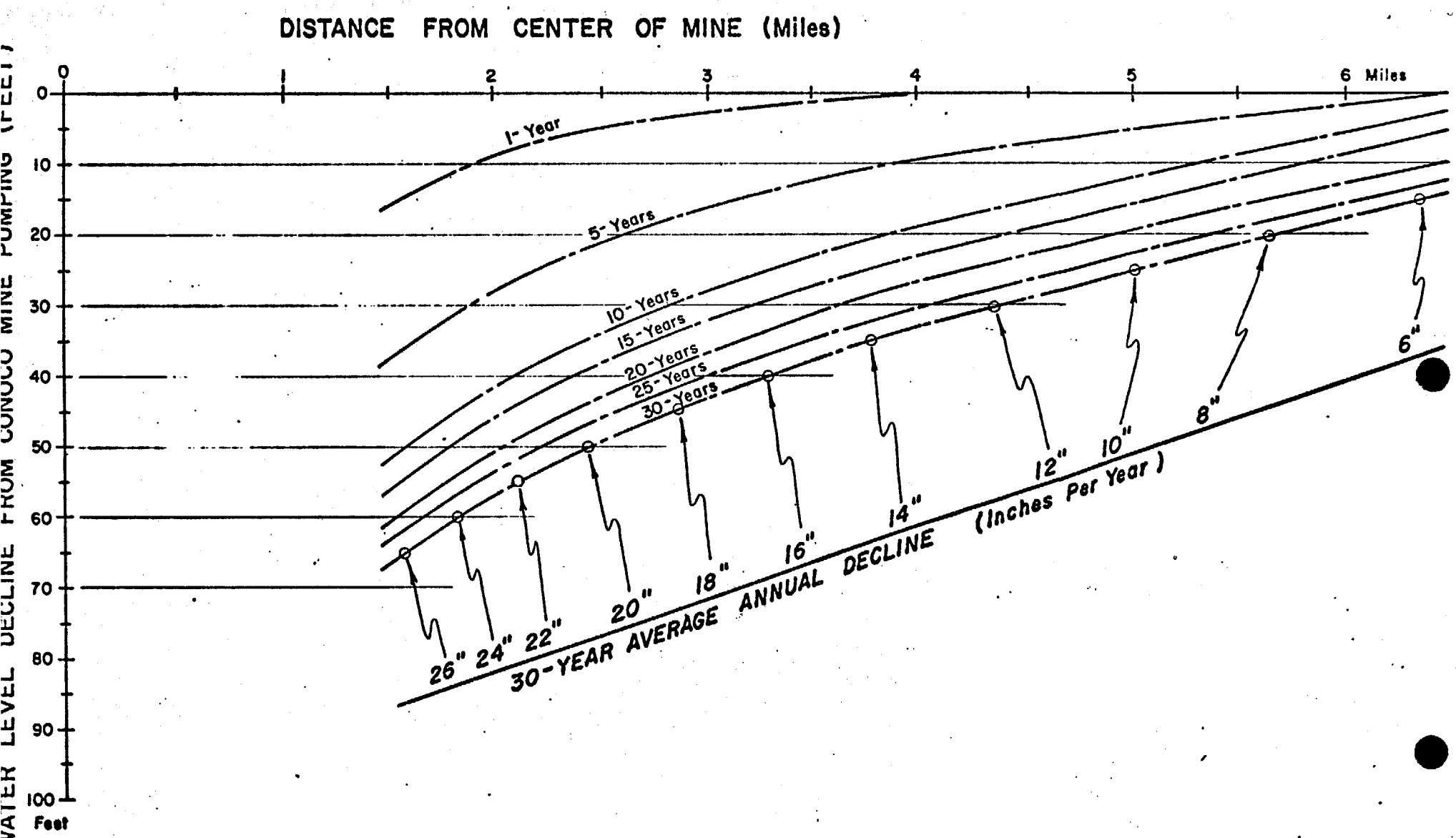
T___S

Section _____

Range _____ E

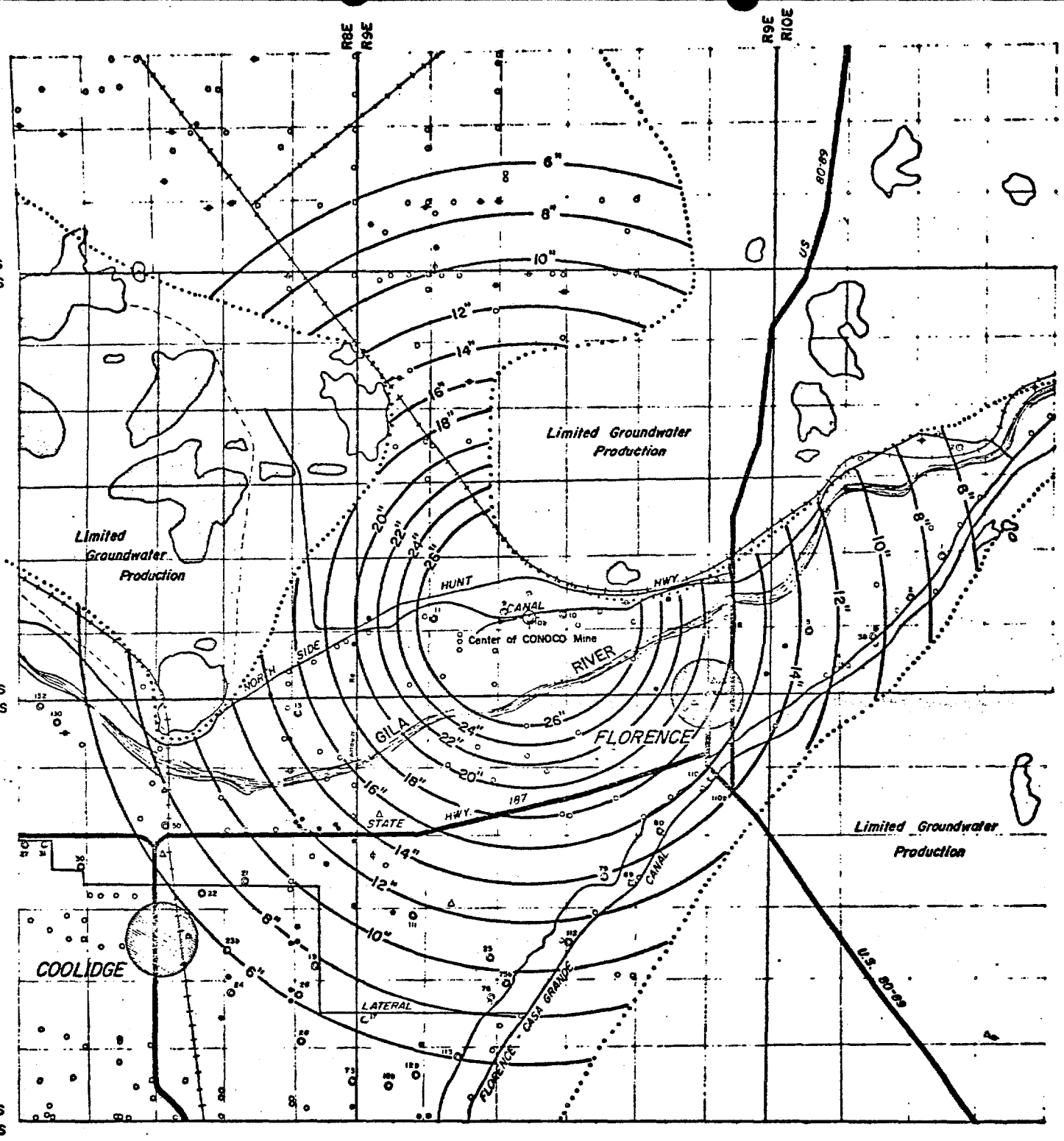
T__S

Section ___



CUMULATIVE TOTAL EFFECT OF CONOCO MINE PUMPING ON STATIC WATER LEVELS AT VARIOUS DISTANCES FROM MINE PUMPING FOR 1 TO 30 YEARS

Data By: Water Development Corporation
Drawn By: R.C. Carter
Date Drawn: 5-1-75



- Abandoned Well
- Domestic Well
- Irrigation (non-project) Well
- B.I.A. (Project) Well
- Stock (windmill) Well
- Industrial Well
- Municipal Well
- Bedrock Exposed at Surface

SCALE

1 0 1 2 3 4 5 miles

N

CONOCO

CONOCO COPPER PROJECT
Florence, Arizona

THIRTY-YEAR PROJECTION

AVERAGE ANNUAL DECLINE OF GROUNDWATER LEVELS FROM PROPOSED MINE PUMPING

Date Drawn : 4-1-75 , Rev. 5-2-75
Drawn By : R. C. Carter
Compiled By : Leonard Halpenny , Water Development Corp.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

April 18, 1975

J. H. C.
APR 21 1975

MEMORANDUM FOR RECORD

Poston Butte
Pinal County, Arizona

Tuesday night, April 15th, Frank Buchella, general manager of Conoco's Florence deposit, stated that they are going to buy or make a sideline agreement with Asarco. He stated that Mr. Royds, a Conoco Vice President, was going to talk to Mr. Barber.

I again emphasize that several more drill holes need to be completed at Poston Butte before any agreement is made with Conoco (we are currently negotiating with Freeport Minerals to complete this drilling).

Further, our anticipated plans call for using our irrigated land at Poston Butte in conjunction with the JI Ranch operation. As shown on attached map, it is the non-irrigated land that Conoco needs to strip so, perhaps, after drilling is completed a sideline agreement can be made.

W. L. Kurtz

WLK:lb
Att.

cc: TCOsborne/JJCollins - w/att.
JHCourtright
RBCrist

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

March 12, 1975

FILE MEMORANDUM

File: Poston Butte

FLORENCE PROJECT
CONTINENTAL OIL COMPANY
MINERALS DIVISION
PINAL COUNTY, ARIZONA

At the February 18, 1975 meeting of the Pinal Mountain Subsection, AIME, Mr. Frank Buchalla, Jr. was the guest speaker.

Some items:

Present estimated reserves at 0.47% copper plus by-products of Ag-Au and Moly is + 1/2 billion tons.

Open-pit methods to be employed
Average 350 feet of alluvial cover
Oxide copper zone 300 feet thick
Sulfide down to 2800 foot depth (i.e., 2150 feet thick) Open pit 2400? deep

Five drill rigs running at present on fill-in holes
Some 450 diamond drill holes completed up to present time

Stripping to commence pre-1976 with 12 shovels. Anticipated pre-mine stripping of 150 million tons completed by mid-1978.
Expect to have an overall 2 to 1 stripping ratio.

Orebody: 1/3 oxide and 2/3 sulfide
Oxide has 23 years life (= 250,000,000 tons)
Sulfide has 42 years life (=~~750~~ 500?,000,000 tons)

Expect to mine 30 thousand tons oxide per day by end of 1978.
Expect to mine 50 thousand tons sulfide per day by 1983.
Ultimate pit diameter of 7,000 feet
Overall pit slope of 1.2 to 1
Operating life to year 2025

Have 2 "drilled" shafts (one 700 feet deep, drilled in 81 days, at cost of $ 3/4 million). 42" escape shaft, 96" production shaft.

Will secure bulk samples for pilot plants of ± 100 tons/day by year end.

Preliminary tests on oxide-solvent extraction-electrowining suggests 70% recovery of oxide in a vat-agitation leach unit.

Florence Project
Continental Oil Company

Twenty-one water wells will ring the ultimate pit area to create cone-of-depression and keep pit area dry.

Water will be given to farmers for draw-down loss.

J.D. Sell

R.B. Crist

JDS:RBC:vmh

cc: J.H. Courtright
W.L. Kurtz

Como co
Ludwig Koch — Frank Buchholz — Sr mm eng.
Alex — mgr insight — proj mgr.

CASE I

Posit. future
in Place Leaching

(98.26 Acres)

CASE I & II TONNAGE ESTIMATE OXIDE & CHALCOCITE only

ASARCO	BLK		400 FACTOR	DEPTH	TONS	GRADE	UNITS
PB-23	1	5.85	160,000	320	23,961,600	.53	12,699,648
PB-23	1	5.85	160,000	80	5,990,400	.36	2,156,544
PB-34 & 27	2	16.99	160,000	152	33,055,744	.67	22,147,348
		16.99	160,000	235	51,105,920	.19	9,710,125
		16.99	160,000	141	30,663,552	.68	20,851,215
		16.99	160,000	34	7,394,048	.24	1,774,572
		16.99	160,000	60	13,048,320	.60	7,828,992
FLOR 51-S	3	3.91	160,000	103	5,154,944	.58	2,989,868
		3.91	160,000	105	5,255,040	.28	1,471,411
67.7%					175,629,568	.465	81,629,729
			lbs. Cu		1,633,354,982		
			Tons Cu		816,677		
					≈105,000,000	≈0.60	

Feb 71 —
77.5 NS at ±

105,884,160 @ 0.63
excl low gr

Conoco

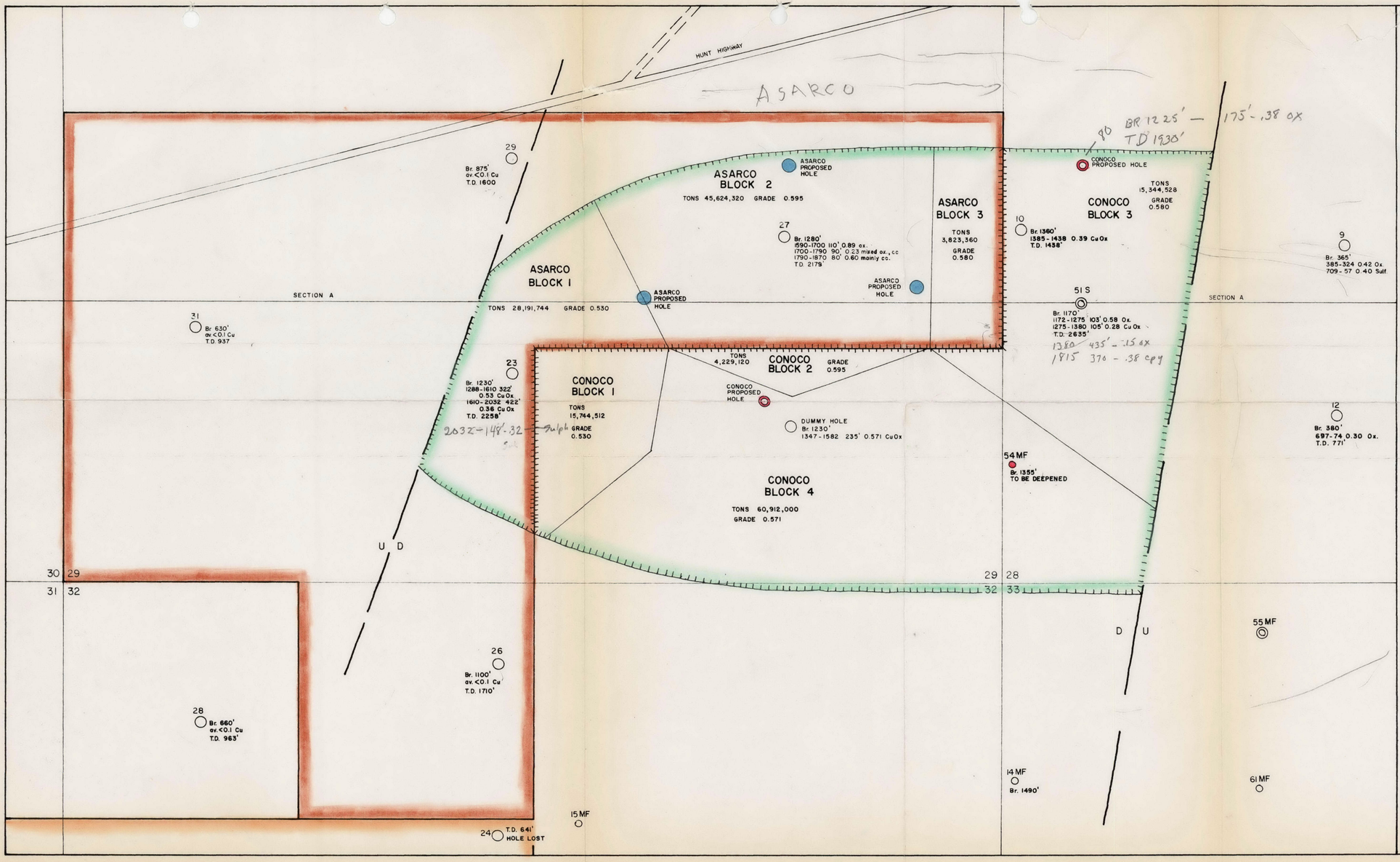
(95.21 Acres)

CONOCO							
PB-23	1	2.29	160,000	320	9,379,840	.53	4,971,315
		2.29	160,000	80	2,344,960	.36	844,186
PB-34 & 27	2	1.28	160,000	152	2,490,368	.67	1,668,547
		1.28	160,000	235	3,850,240	.19	731,546
		1.28	160,000	141	2,310,144	.68	1,570,898
		1.28	160,000	34	557,056	.24	133,693
		1.28	160,000	60	983,040	.60	589,824
FLOR 51-S	3	15.01	160,000	103	19,789,184	.58	11,477,727
		15.01	160,000	105	20,173,440	.28	5,648,563
Composite	4	7.34	160,000	235	22,078,720	.57	12,584,487
32.3%				Conoco	~~83,956,992~~	~~.479~~	40,221,169
					≈55,000,000	≈0.60	
TOTAL BLOCK					259,586,560	.470	

105.9 — .63
57.0 — .58
162.9 — .60
total — block
As + Con

57,031,296 @ 0.58
excl low gr

ATTACHMENT B



ASARCO
BLK 3 3.8 M tons - .58
2 45.6 — .59
1 28.1 — .53
77.5

1275
103
1378

EXPLANATION

ASARCO DRILL HOLES

CONOCO DRILL HOLES
DIAMOND DRILL HOLE
ROTARY DRILL HOLE

ASARCO LAND RECOMMENDED FOR HOLDING

PROBABLE LIMITS OF DEEP "ORE" BODY

FAULT (POSITION INFERRED)

Phase II PROPOSED ASARCO HOLE
SCHEDULED CONOCO HOLE

WEST GRABEN "ORE" BLOCK
POSTON BUTTE
PINAL COUNTY, ARIZONA

W.L.K. SCALE: 1" = 400' FEB. '71

T.R. 2415

EXPLANATION

- + 0.5 Cu Ox
- < 0.5 Cu Ox
- + 0.5 Cu Sulf
- < 0.5 Cu Sulf
- intense fracturing
- weak fracturing
- bedrock surface

SECTION A

(LOOKING NORTH)

POSTON BUTTE PROJECT

PINAL COUNTY, ARIZONA

HORIZONTAL SCALE: 1" = 400'

VERTICAL SCALE: 1" = 200'

W.L.K. FEB. '71'

2414 TR

EXPLORATION SERVICES DIVISION
3422 SOUTH 700 WEST
SALT LAKE CITY, UTAH 84119

RECEIVED
NOV 14 1974
EXPLORATION DEPT.
J. H. C.
NOV 13 1974

November 12, 1974

Mr. W. L. Kurtz
Tucson Office

Postern Butte

FLORENCE GROUNDWATER ANOMALY
ARIZONA

Dear Bill,

Whilst going over our new Mo regression data (my letter November 12th) I was surprised to notice a high positive residual in the vicinity of Florence. Going back to our original data plots and records I found a 1971 drafting error resulted in the omission of an anomalous (13 ppb) Mo value in sample PB-43 (2½ miles N.E. of Florence--center of Section 29, R10E-T4S). This value, which was one of the highest detected in this general area, falls within the most favored portion of the Florence groundwater anomaly (my report 2/22/74). The occurrence of a high positive Mo regression residual suggests the anomalous Mo value is unrelated to evaporite. The anomalous Mo appears to provide additional indication of the potential significance of the Florence groundwater anomaly.

Yours very truly,

L. D. James.

L. D. JAMES

LDJ:db

cc:T.C.Osborne
J.H.Courtright

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.
AUG 19 1974

August 14, 1974

FILE MEMORANDUM

Poston Butte Project
Pinal County, Arizona

Freeport Minerals has expressed interest in conducting further exploration of our Poston Butte Property under the following terms:

> To earn a 50% interest in the property (land and minerals) Freeport would spend $1.5 million including a communication test between two holes. Freeport's minimum committment would be the drilling of 4 exploration holes (±$100,000).

W. L. Kurtz

WLk:lb

cc: TCOsborne
JHCourtright

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

June 17, 1974

J. H. C.

JUN 18 1974

Memorandum for Record

Poston Butte Project
Pinal County, Arizona

On June 10, 1975 I, along with Messrs. Courtright and Crist, met with Messrs. Cook (UP Expl. for Freeport) and Cornelius and Lehner of Freeport's Tucson office to discuss the possibility of Freeport joint venturing our Poston Butte project.

Freeport has expressed a definite interest in Poston Butte. The general terms discussed were for Freeport to spend $1.5 million to earn a 50% interest. Included in this $1.5 million expenditure would be a requirement to test the communication between two drill holes. Freeport has indicated that their first work would be the drilling of an additional 3-6 holes to better define the zone of copper oxide mineralization.

W. L. Kurtz

WLK:lb

cc: TCOsborne
JHCourtright
RBCrist

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DIVISION
P. O. BOX 5747, TUCSON, ARIZONA 85703

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

June 13, 1974

J. H. C.
JUN 17 1974

Mr. Wes Pokluda
Senior Landman, Tucson District
Continental Oil Company
1706 West Grant Road
Tucson, Ari na 85705

Poston Butte
Pinal County, Arizona

Dear Mr. Pokluda:

In reply to your letter of May 17, 1974, please be advised that Asarco is reviewing the possibilities of performing an in-place leaching test at Poston Butte. Should the results of this review be negative, your offer will be seriously considered by our management.

Very truly yours,

W. L. Kurtz
Manager of Exploration

WLK:lb

cc: TCOsborne
JHCourtright
RBCrist

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

J. H. C.

May 24, 1974

MAY 28 1974

Mr. T. C. Osborne
Assistant Director of Exploration
New York Office

Poston Butte Project
Pinal County, Arizona

Dear Sir:

Enclosed is a letter from Conoco indicating they will accept, subject to final approval by their management, my sale offer of March 4, 1974 (purchase price $1.5 million plus 5% NSR, subject to approval by Asarco management).

Recently Freeport Minerals has indicated an interest in an in-situ leaching test at our Poston Butte property. Mr. Courtright and I believe we should refuse the Conoco offer at this time and proceed with negotiations with Freeport.

Very truly yours,

W. L. Kurtz

W. L. Kurtz

WLK:lb
Enc.

cc: JHCourtright - w/enc.
RBCrist - w/enc.

Minerals Department

Continental Oil Company
1706 West Grant Road
Tucson, Arizona 85705
(602) 623-3627

RECEIVED
MAY 20 1974
S. W. U. S. EXPL. DIV.

May 17, 1974

Mr. W. L. Kurtz, Manager of Exploration
American Smelting & Refining Company
1150 North Seventh Avenue
Tucson, Arizona

Dear Mr. Kurtz:

ASARCO Acreage - Our Florence Area - Your Poston Butte Area - Espinosa, Palmer, Odom, and E. Chandler Lands - Being 891 Acres More or Less and State Prospecting Permit No. 22272, Located in Township 4 South Range 9 East - Pinal County, Arizona

Please refer to your letter dated March 4, 1974. Please be advised that we accept the offer as set out in your letter, subject to final management approval.

Upon approval by your management to proceed, I will contact my management for final approval. I feel reasonably sure that our management will approve the terms as outlined in your letter.

I presume the net smelter return royalty would only be on the Espinosa, Chandler, Palmer, and Odom tracts, and also any final sale would be subject to acceptance of titles by CONOCO.

All other offers made by CONOCO are hereby withdrawn.

Yours truly,

Wes Pokluda

Wes Pokluda
Senior Landman
Tucson District

se
cc: A. P. Lorfing

AMERICAN SMELTING AND REFINING COMPANY
EXPLORATION DEPARTMENT
SOUTHWESTERN UNITED STATES DIVISION
P. O. BOX 5747, TUCSON, ARIZONA 85703

J.H.C.

May 17, 1974

R. B. CRIST
PROPERTY MANAGER

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

J. H. C.

MAY 21 1974

Mr. Douglas Cook
Vice President Exploration
Freeport Mining Company
P.O. Box 61520
New Orleans, La. 70161

file

POSTON BUTTE PROJECT
PINAL COUNTY, ARIZONA

Dear Mr. Cook:

As a result of recent conversations between your Mr. Cornelius and ASARCO's Mr. Courtright it was felt that an area of mutual interest could be developed in an "In-Situ" Leach Pilot Plant Test on ASARCO's Poston Butte Property.

Mr. Cornelius felt that as an initial step we should forward to your attention the following data that was the basis of our feasibility studies.

1. Preliminary Report on Hydrogeology of Poston Butte Area, Arizona, and Relationship to Proposed In-Situ Leaching.

2. Project AR - 40.5 Poston Butte Leach Test

3. Outline of Mineralization Features

4. Factors used in feasibility study.
   a. Ore Reserve
   b. Factors
   c. Leach areas & drill holes

5. In-Situ Leach Proposal

6. Cross-section A

7. Drill Core Photos: PB-34 Box 1-62, Flor-515 Box 1-34.

Sincerely yours,

R. B. Crist

R. B. Crist

RBC:vmh
Enc. 7
cc: Ken Cornelius

RECEIVED
MAR 28 1974
EXPLORATION DEPT.
J. H. C.
MAR 29 1974

Air Mail

March 26, 1974

Mr. W. L. Kurtz
Southwestern Division
Tucson Office

Arizona
Florence Area
Groundwater Geochemistry

Dear Mr. Kurtz:

I note from your letter of March 22 that you changed your mind subsequent to our telephone conversation of the 11th, and decided to risk asking for the Conoco drill hole data.

The bedrock information certainly seems negative, but how about the possibility of post-mineral faulting? This is admittedly an unsophisticated idea, but I'm struck by the fact that the two Conoco holes within the eight square mile area of interest are both in the extreme eastern corner. Can you draw fault anywhere on the map which would account for the Conoco information and at the same time preserve the permissibility of the recommended area?

It is not clear from your letter if you have thoroughly discussed this whole thing with Mr. James, which is the proper way to go about it so that the conclusions you present represent your joint opinions. Please follow this procedure in answering the above questions, in order to avoid the excessive formality of triangular correspondence.

Very truly yours,

ORIGINAL SIGNED BY
T. C. OSBORNE

T. C. Osborne

cc: JHCountright
LDJames

J. H. C.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

MAR 27 1974

March 22, 1974

file

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

Groundwater Geochemistry
Poston Butte Area, Arizona

Dear Mr. Osborne:

Reference is made to Mr. James' report of February 22, 1974, in which he recommends work in the area east of Florence. As I have stated previously, we consider the Ray-Red Hills-Poston Butte-Sacaton trend to be a prime area for porphyry copper exploration.

Concerning James' "particularly favorable" area, I have recently obtained data on a number of Conoco drill holes about a mile east of the anomalous water wells. These holes, shown on the attached map with their bottom depths, all contained fresh unmineralized Laramide Grayback quartz monzonite or Precambrian Oracle granite. Conoco has already relinquished their State prospecting permits and plan to allow their claims to revert to Public Domain on 1 September.

With the trend of the mineralized zone at Ray-Red Hills-Poston Butte-Sacaton, I believe that, if any major porphyry copper zone were to exist in the anomalous groundwater area, indications of it would have been present in the area drilled by Conoco. On this basis I do not believe further drilling is warranted at this time.

James' sulphate regression residuals seem to be a refinement of a procedure used by the Russians and Bear Creek. We wonder if sodium should not also be used.

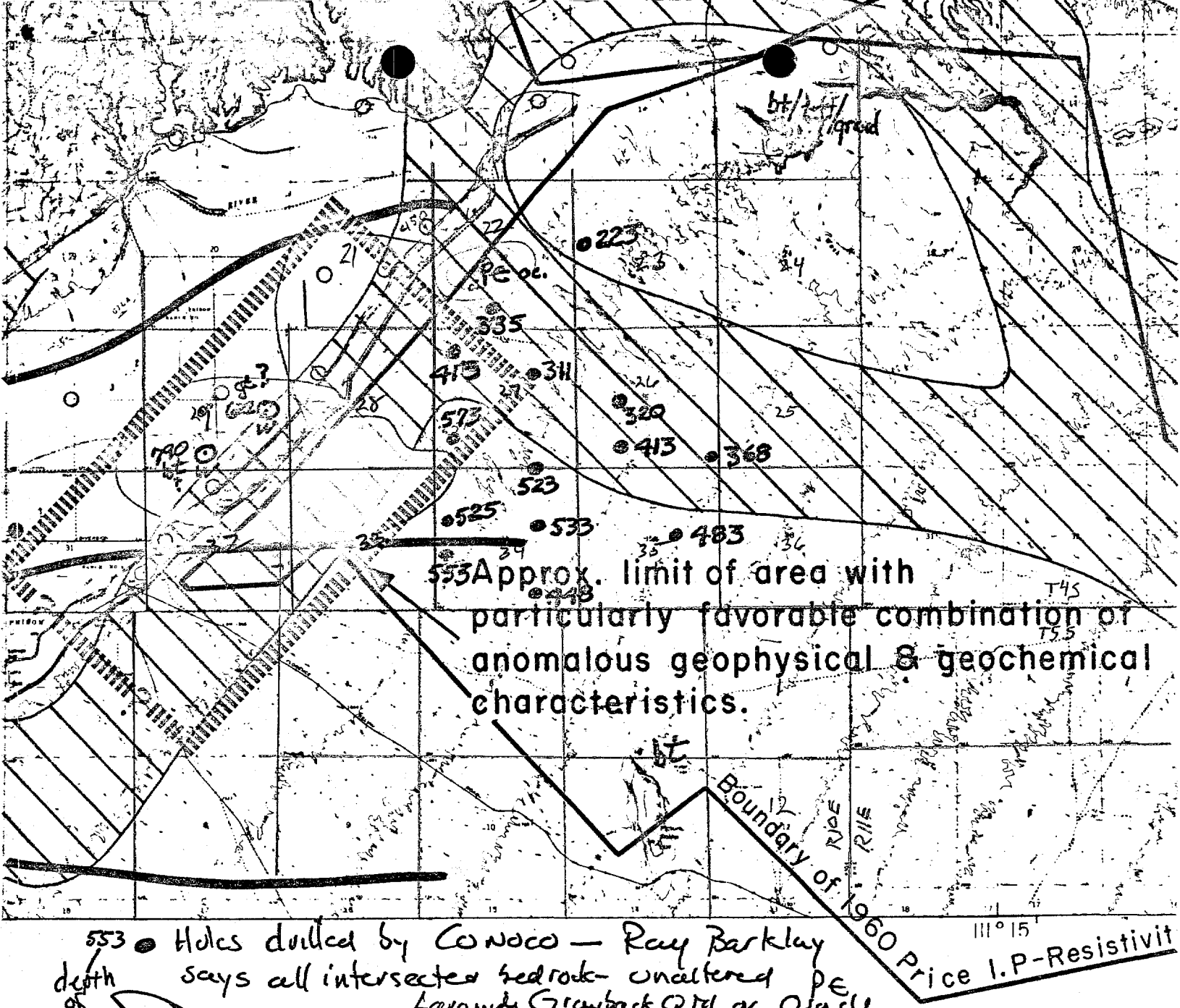
Very truly yours,

W. L. Kurtz

W. L. Kurtz

WLK:lb
Attach.

cc: JHCourtright - w/attach.
LDJames - w/attach.



553 ● Holes drilled by CONOCO — Ray Barkley says all intersected bedrock — unaltered Laramide Granitoid QM or Oracle granite.

depth of hole

MAGNETIC GRADIENT BANDS DELINEATED BY C.K. MOSS.

APPROX. GROUNDWATER FLOW-LINES (BASED ON PUBLISHED U.S.G.S. DATA).

6 MV I.P. ANOMALY DELINEATED BY 1960 ASARCO SURVEY IN VICINITY OF FLORENCE.

Cu –

pH

RATI

?? HI

? PC

J. H. C.

SEP 7 1973

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 6, 1973

Mr. T. C. Osborne
Asst. Director of Exploration
New York Office

Supplement Exploration
Authorization Request
Poston Butte Project
Pinal County, Arizona

Dear Sir:

In my Supplemental Exploration Authorization Request of February 2, 1973, recommending purchase of the fee land at Poston Butte, I pointed out the value of land in that area. This is still true and ASARCO should retain its property position in the Poston Butte area.

$6500 worth of work is due on ASARCO's State Prospecting Permit 22272, sec. 19, T. 4 S., R. 9 E., Pinal County, Arizona. Mr. Crist and I recommend the drilling of a water well to fulfill the work requirements. This water well can be utilized as a monitor well for in-situ leaching tests. If you approve, please request $7,000 to cover the costs of drilling this water well.

Forms 302-EA and 302-EB are attached.

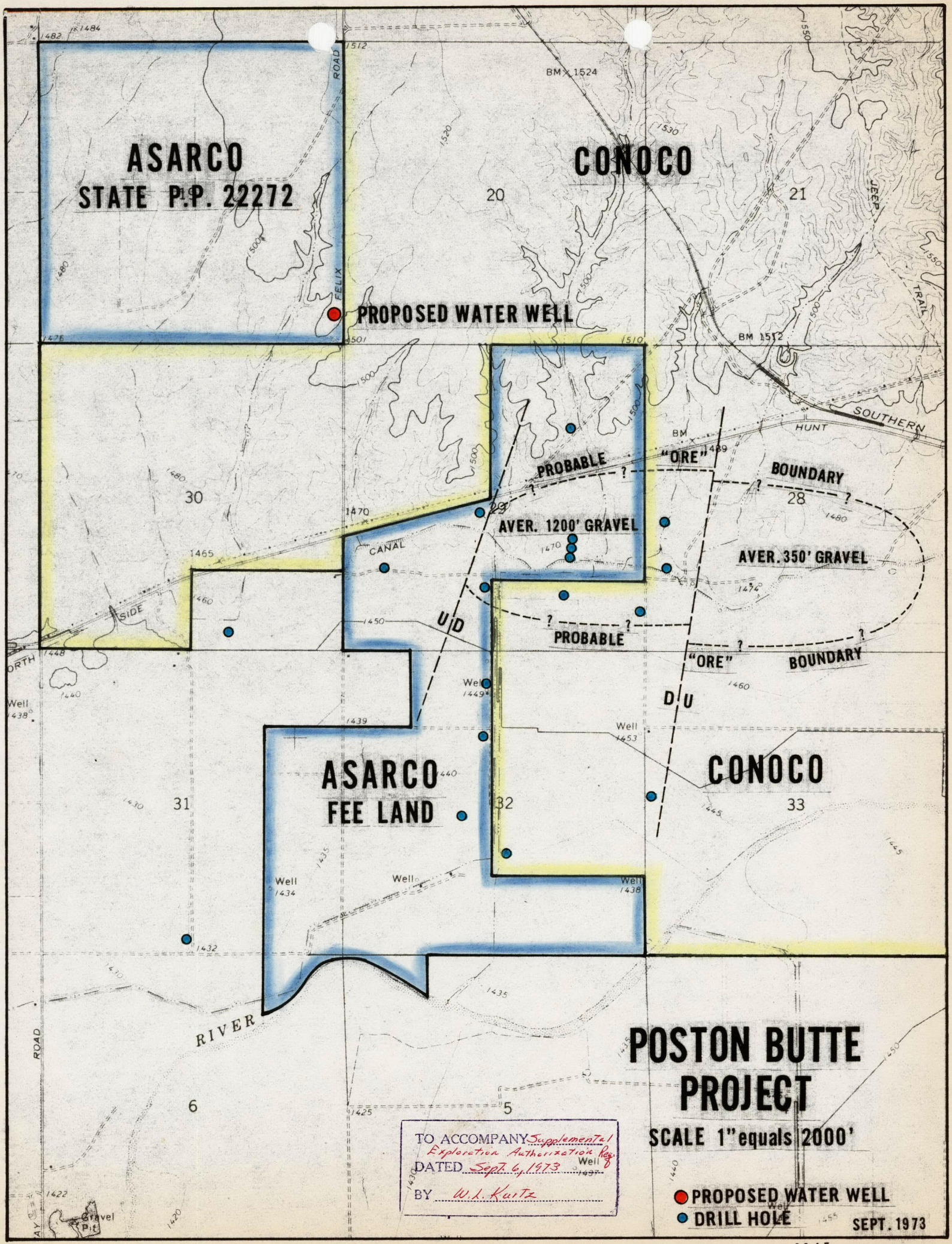
Respectfully submitted,

W. L. Kurtz

W. L. Kurtz

WLK:lb
Attachs.

cc: JHCourtright - w/attachs.
ADCoumides - w/forms only


ASARCO
STATE P.P. 22272
CONOCO
PROPOSED WATER WELL
PROBABLE "ORE" BOUNDARY
AVER. 1200' GRAVEL
AVER. 350' GRAVEL
PROBABLE "ORE" BOUNDARY
U D
D U
ASARCO
FEE LAND
CONOCO
RIVER
SOUTHERN
HUNT
CANAL
FELIX ROAD
JEEP TRAIL
BM 1524
BM 1512
Well
Gravel Pit
20
21
28
29
30
31
32
33
6
5
POSTON BUTTE
PROJECT
SCALE 1" equals 2000'
TO ACCOMPANY Supplemental Exploration Authorization Req.
DATED Sept. 6, 1973
BY W. L. Kurtz
PROPOSED WATER WELL
DRILL HOLE
SEPT. 1973
2645
d.a.melhado

FORM 302-EA

Printed in U.S.A.

COST ESTIMATE, MINERAL EXPLORATION

PROSPECT POSTON BUTTE PROJECT

LOCATION Pinal County, Arizona

OFFICE SWED - Tucson

BY W. L. Kurtz

No.	Type of Work	Salaries/Wages Days	Salaries/Wages Amount	Material	Fees, Rent, Services	Traveling	Taxes	Other	Total Estimate Cost
501	Outright Purchase								
502	Option Payments				891,600			1,000	892,600
503	Bonus Payments				7,200				7,200
504	Minimum Royalties-								
	Deductible from								
	Future Production								
505	Minimum Royalties-Not								
	Deductible from								
	Future Production								
506	Rental Payments				7,800				7,800
507	Staking Claims								
511	Surface Excavating								
512	Underground "								
521	Surface Drilling			25,500	175,900				201,400
522	Underground "								
530	Geologic								
540	Sampling, Assaying, Lab.			21,300	7,300			800	29,400
550	Geophysics								
560	Geochem								
570	Engineering								
580	Construction (temp.)								
590	Construction (perm.)								
610	Administration, Field		16,300		300	3,200		50	19,850
	Offices and Camps								
620	Administration, General		4,000	200	2,700	1,800	1,800	850	11,350
641	Autos and Vehicles			3,100					3,100
642	Aircraft and Boats								
	Legal & Consulting				10,500				10,500
650	Partner's Share								
	ASARCO'S SHARE		20,300	50,100	1,103,300	5,000	1,800	2,700	1,183,200
661	Commission or Fees								
663	Exchange								
	TOTAL		20,300	50,100	1,103,300	5,000	1,800	2,700	1,183,200

PRINTED IN USA 9/69

FORM 302-EB

New York No. .....

APPLICATION FOR SUPPLEMENTAL EXPLORATION AUTHORIZATION

September 6, 1973

Originating Office SWED - Tucson

Application is hereby made for supplemental Authorization to cover cost, in excess of original estimate, of work authorized by New York.

POSTON BUTTE PROJECT
No. Pinal Co., Arizona

0003-00($105,000); 0003-01($14,000); 0003-02($110,000); 0003-03($ 90,000); 0003-04($ 7,200); 0003-05($ 55,000); 0003-06($795,000)

Present total Estimated Cost (Form 302-EA attached)	0003-00	4/29/70	$1,183,200
	0003-01	5/06/70	
Amount previously authorized (date.....)	0003-02	7/29/70	$1,176,200
	0003-03	2/24/71	
Balance for which Authorization is now requested	0003-04	6/23/71	$7,000
	0003-05	2/16/72	
	0003-06	2/21/73	

ADDITIONAL WORK CONTEMPLATED:

Drill one water well to be used as a monitor well for proposed In-Situ Leach Experiment.

EXPLANATION OF INCREASED COST:

Renewal of State Prospecting Permit 22272 requires an expenditure of $10.00 per acre

Reviewed by ..... Acct. Mgr. or Chief Acct.

Approved by ..... Vice President

Recommended by ..... Supervisor

Approved by ..... Comptroller

Account Chargeable to .....
To be designated by Comptroller

Approved by Advisory Committee

.....19.....

Approved by Board of Directors

.....19.....

.....
Secretary

J. H. C.

File Poston Butte

CM to TCO
JHC

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

W.L.K. AUG 12 1973

August 7, 1973

J.H.C. AUG 13 1973

Memorandum to: T. C. Osborne
New York Office

ASARCO/DOW
Poston Butte

Talked to Jake Steward -- Chemical Engineer in Dowell's Denver office.

He reported that his grapevine indicated the "in situ" project was very much alive.

He stated that the late start may prove beneficial in view of recent test work and feels our project should still be forerunner in this particular field.

Dow has reportedly come up with a new cementing process that is to be used experimentally by KCC in their Safford deposit.

The cement (not to be confused with Portland) will handle 30-60% H_2SO_4.

R. E. Hurst is being transferred to their Houston Office. He is still in charge of the project.

RBC

R. B. Crist

RBC:lb

cc: WLKurtz

CPY: ICO
~~JHC~~

W. L. K.
JUN 21 1973

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 19, 1973

J. H. C.
JUN 22 1973

MEMORANDUM FOR: W.L. KURTZ

POSTON BUTTE
U.S.B.M.

Floyd D. Everett - Liaison Officer - Phoenix, Arizona
Parkman T. Brooks - Chemical Engineer

The above Bureau of Mines men were visiting Don Crowell (in regard to tailing pond seepage) and asked if they could talk to someone about the Asarco/DOW Poston Butte in situ leach.

Everett asked immediately if we knew that DOW had propositioned AMAX or vice-versa about an in situ project on their Miami property. He also stated that DOW has worked for the Bureau on a similar project in the northwest.

The Bureau is interested in hydro-fracting at depth (high pressure). Due to time lags (Bureauocracy) the Bureau has lost all of its targets - such as the Old Reliable.

I believe the implication was that if DOW and Asarco parted company at Poston Butte, the Bureau would attempt financing.

I showed him the Press Releases and told him that to my knowledge our purported agreement was not final.

RBC

R.B. CRIST

RBC:kre

J. H. C.

JUN 2 1973

to JHC file

W. L. H.

JUN 2 1973

J. C. Hias

CFB

June 14, 1973

read

JUN 25 1973

Mr. R. L. Hennebach

T. C. O.

JUN 18 1973

JUN 25 1973

J. V. D.

Re: Conoco
- Poston Butte

Mr. Tittmann called again to talk about the above. He said that Conoco is floundering around. He was disappointed that Mr. Royds had not been in touch with us.

He said that Mr. Pennybaker had developed an ore reserve of 539 million tons of .4 sulfide ore with .2 cutoff, stripping ratio 4:1 if oxide ore is counted as waste. In addition, the ore reserve shows 249 million tons of .43% oxide ore, with an estimated 60% recoverable.

Mr. Tittmann states that it would take 60-65¢ copper to produce the required return and that water and Indian problems had not fully been resolved. Also Conoco would have to go to somebody for smelting.

He was disappointed that Royds had not followed up on his suggestion that he inquire if Harry Brindle could be borrowed or retained to check the mining plan. Mr. Tittmann is now considering retaining Harry Brindle himself to review the first 10 years of the mining plan because he suspects that Harry would conclude that Conoco did not have a mine even at the assumed prices for copper.

I told Mr. Tittmann that Harry was now on an urgent assignment for Southern Peru but that I would make another check of his possible availability and be back to him.

Let's discuss in due course.

CFB:mrw

C. F. Barber

cc: Mr. T. A. Snedden

py: TCO
RBC
JHC

June 1973
Published in Phoenix

JHC

Arizona Republic

J. H. C.

FEB 16 1973

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 15, 1973

FILE MEMORANDUM

Poston Butte Project
Pinal County, Arizona

I had a luncheon meeting with the following Conoco personnel:

Adolph Mitterer	Manager Mining & Milling
Robert Anderson	Florence Project Manager
Wes Pokluda	Land Man

Mr. Mitterer stated that most all major copper producers (domestic and Foreign) have contacted Conoco concerning participating in the development of the Florence deposit. Conoco is currently making feasibility studies based on Conoco operating the property and utilizing either flash smelting or Roast-Leach-Electrowinning. These studies should be complete this fall and at that time a decision will be made whether Conoco wants a partner. I assured Mr. Mitterer that Asarco would like to be considered as a potential partner and pointed out our mining experience, acid supply, smelting and marketing capabilities, and our adjoining property position.

Conoco is still definitely interested in either acquiring our property or participating in testing and development of the oxide copper reserves. I informed them that at this point in time I considered it best that Asarco proceed with Dowell. Upon successful completion of the Dowell test, Asarco would be interested in negotiating joint exploration of the deep oxide copper properties with Conoco. I mentioned that the proposed terms of our agreement with Dowell negated or minimized the objections raised by Conoco at the joint Asarco-Conoco-Dowell meeting January 21, 1972.

W. L. Kurtz

WLK:lb

cc: JJCollins
JHCourtright
RBCrist

I. H. C.

OCT 19 1972

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 18, 1972

FILE MEMORANDUM

Poston Butte

Wes Pokluda, Conoco landman, called today to once again offer to purchase any or all land Asarco has under option or State Lease in the Poston Butte area. He tried to convince me that Asarco should sell immediately any land not needed for an in-place leaching operation.

Pokluda offered $1,000 per acre and was somewhat taken aback when I informed him that I considered the land worth more than that.

I informed Pokluda that at the present time Asarco plans to exercise all its options and is not interested in selling any land in the Poston Butte area at this time. I also informed him that an in-place leaching test would be made.

W. L. Kurtz

W. L. Kurtz

WLK:lad

cc: JJCollins
JHCourtright
RBCrist

J. H. C.

OCT 9 1972

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 6, 1972

file

FILE MEMORANDUM

Poston Butte
Dowell

Mr. Hurst, vice president of Dowell, called today:

1. He has approval for Dowell to completely fund the drilling, injection and pumping phases of the Test Project -- if the test fails ASARCO has no obligations to Dowell. ASARCO, as previously agreed, would run the mini solvent extraction/ electrowinning plant.

2. He has accepted the ASARCO suggestion that upon successful conpletion of the pilot test, the capital expenditures be spread over three to six years. Dowell was planning on proceeding directly from pilot test to full scale production (100,000 lb/day) within one year.

3. Hurst promises a proposal during first part of November (after return of personnel from Europe). He stated that Dowell's service.charge will be lower than the 22¢/pound previously proposed.

I am convinced Hurst will steer Dowell into a proposal acceptable to ASARCO. Bob Crist or myself will remain in contact with Hurst.

W. L. Kurtz

WLK:lad

cc: JJCollins
JHCourtright
GWBossard
RBCrist

J. H. C.

APR 28 1972

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 28, 1972

file — Poston Butte

Mr. J. J. Collins
Director of Exploration
New York Office

In accordance with your telephone instructions of today, I submit the following data on Poston Butte Project:

PHASE I:

5 spot in-place leaching test to be conducted by Dowell and completed by 1 Feb. 73. Estimated cost	$250,000-$400,000	
"Mini" solvent extraction/electrowinning plant to be run by Asarco per recommendations of W. Bossard	20,000*	
(Asarco's present investment)	(375,000)	
Total End Phase I: Asarco: $395,000 -- Dowell: $395,000		$790,000

*Additional MA will be needed to cover this expense.

PHASE II: Cost shared equally by Asarco/Dowell after total cost in Phase I equallized. Phase II will require at least 2 years to complete but land and drilling cost will be incurred the first year.

Property payments	$800,000	
20 diamond drill holes to delineate ore body	560,000	
8 rotary holes to complete two additional 5 spot tests	340,000	
Pilot Plant and testing	300,000	
		$2,000,000

PHASE III: Full scale production (cost shared equally Asarco/Dowell)

Wells & distribution	$ 6,500,000	
Plant: Solvent extraction and electro-winning	15,100,000	
Surface shops, etc.	5,400,000	
		$27,000,000
Grand Total Cost:		$29,790,000

Very truly yours,

W. L. Kurtz

W. L. Kurtz

WLK:lad

cc: RBCrist
JHCourtright
GWBossard
MBHecox, Jr.

OFFICE OF THE SECRETARY

New York, N.Y., February 25, 1972

J. H. C.

MAR 1 1972

Mr. J. J. Collins

The following is a corrected extract from the minutes of the Advisory Committee meeting held on February 16, 1972:

RECEIVED

MAR 1 1972

EXPLORATION DEPT.

Mining Authorization #0003-05
Poston Butte Prospect
Pinal County, Arizona

At a meeting of the Advisory Committee held on June 23, 1971, there was approved an expenditure in the amount of $7,200 for property option renewal costs at the Poston Butte Prospect, Arizona, a possible copper prospect.

It was reported by Company Geologists that a Joint Venture agreement is being worked out with Dowell and Continental Oil Company to test the in-place leaching possibilities at Poston Butte. Dowell has submitted a proposal to Asarco for an in-place leaching test and has indicated that the estimated cost is $256,000.

It was reported further that Company Geologists recommend an additional expenditure in the amount of $55,000 at the Poston Butte Prospect for land payments ($35,000), consulting, legal, and overhead fees ($10,000), and overexpenditures to date ($10,000), so that Asarco may maintain its land position and thus be able to participate in the aforesaid joint venture testing at Poston Butte.

There was then approved an additonal expenditure in the amount of $55,000 for additional payments at Poston Butte, necessary to protect Asarco's land interest during the five spot in-place leaching test to be conducted by Dowell and for overexpenditures of previous authorizations.

J. F. Hornbostel, Jr.

JFH:pf
Encl.
FGHamrick w/encl.
HQStringham - 2 w/encl.
JHCourtright
WLKurtz w/encl.
KAvdSteinen
RBCrist

J. H. C.
FEB 11 1972

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 10, 1972

Mr. J. J. Collins
Director of Exploration
New York Office

file

Supplemental Authorization Request
Poston Butte Project
Pinal County, Arizona

Dear Sir:

As I have discussed with you recently, a joint-venture agreement is being worked out with Dowell, a Division of the Dow Chemical Company, and Continental Oil Company to test the in-place leaching possibilities at Poston Butte. The most attractive feature of this agreement is the fact that Dowell alone will fund the in-place leaching test. Dowell has submitted Asarco a proposal for an in-place leaching test and the estimated cost is $256,000.00.

Mr. Crist and I are confident that a satisfactory joint-venture agreement can be consummated between Asarco, Dowell, and Conoco. If for some reason Conoco does not elect to participate in the joint venture, Dowell will joint venture with Asarco on Asarco's ground only. In this case, also, Dowell will fund the in-place leaching test. Our estimate, based on the limited exploration drilling, is that 175 million tons of 0.46 copper (oxide and chalcocite) exist within Asarco's property boundaries at depths greater than 1100 feet below the surface.

Mr. Crist, using preliminary figures for injection rates, pumping rates, capital costs and operating costs estimated by Mr. Bossard of Asarco's Mineral Beneficiation Dept. and Mr. Halpenny of Water Development Corp., has calculated an outcome of 50% before taxes over a 15-year life. The outcome was based on a production of 50 tons of copper per day, a sulphuric acid consumption of 250 tons per day and recovering only 1/3 of the total contained copper. Mr. Halpenny has also concluded that a test can be conducted without contamination of the environment.

I should like to point out that just a 500-foot radius around drill holes PB-27 and 34 contains 39 million tons of 0.46% copper. This in itself presents an attractive in-place leaching target. Mr. Crist has calculated that in-place leaching <u>only</u> this block at a rate of 26,000 pounds of copper per day will give an outcome of 42% before taxes over a 15-year life.

I request the following funds in order that Asarco can maintain its land position and, therefore, participate in the joint venture testing at Poston Butte:

*Land payments	$35,000.00
Consulting, legal, overhead	10,000.00
Overexpenditures	10,000.00
	$55,000.00

* Negotiating for extension of Odom-Staggs agreement (see resume of option payments attached).

Enclosed is an Appendix which reviews the property evaluation, exclusive of minerals, and clearly demonstrates that purchase of agricultural land with mineral potential is a sound practice.

Also enclosed is a resume of the option payments.

I firmly believe that the potential rate of return justifies the additional cost while Dowell is completing the in-place leaching test at their expense. If you agree, please request $55,000.00 for the Poston Butte Project.

Forms 302MA and 302MB are enclosed and, also, a property map.

Very truly yours,

W. L. Kurtz

W. L. Kurtz
Manager of Exploration

WLK:lad
Encs.

cc: JHCourtright - w/o encs.
GWBossard - w/o encs.
KvdSteinen - w/302MA & MB
RBCrist - w/encs.
NPWhaley - w/o encs.

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DIVISION
P. O. BOX 5747, TUCSON, ARIZONA 85703

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

J. H. C.
JAN 11 1972

January 11, 1972

Mr. Earl Davis, Vice President
Dowell
Division of The Dow Chemical Company
909 Americana Building
Houston, Texas 77002

Poston Butte Project
Pinal County, Arizona

Dear Mr. Davis:

This letter confirms that ASARCO is agreeable to entering into a 50-50 joint venture agreement with Dowell on ASARCO's Poston Butte property located near Florence, Arizona.

In order for Dowell to earn a 50% interest in ASARCO's property, Dowell agrees to fund a pilot plant in-place leaching test to be conducted by Dowell. Upon successful completion of this test, additional funds will be advanced by Dowell or ASARCO so that each has an equal investment in the property. At this point in time, each company will advance exploration and development funds equally.

ASARCO agrees that, before finalizing an ASARCO-Dowell joint venture agreement, it is advisable to present CONOCO with the opportunity to participate in the project as a third joint venture partner.

Very truly yours,

W. L. Kurtz
Manager of Exploration

WLK:lad

cc: JJCollins

bc: JHCourtright
RBCrist

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. H. C.
SEP 13 1971

September 10, 1971

Mr. J. J. Collins
Director of Exploration
New York Office

Poston Butte Project
Pinal County, Arizona

Dear Sir:

Enclosed is a Supplemental Request for additional funds ($60,000) to complete the initial testing of the transmissibility of fluids through the bedrock at Poston Butte. This $60,000 will allow the completion of two wells and injection and pumping tests to establish whether communication between the two wells can be established. This type of test will be the best and most definitive at this stage.

There is, however, an alternative to the above testing procedure that I should like to make known to you. This alternative, which would be less expensive but not provide as reliable and complete data, would be to complete well PB-34 (reaming and casing) and use it for both injecting and pumping. This cycling method would give information on whether fluids could be moved into the fractured bedrock and pumped back out. If this were successful, then an additional well, plus an observation hole, would need to be drilled to determine if communication between wells can be established.

Estimated cost to complete this one well (PB-34) cycling test is $35,000.

Yours very truly,

W. L. Kurtz

W. L. Kurtz

WLK:lad
Enc.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 10, 1971

Mr. J. J. Collins
Director of Exploration
New York Office

Supplemental Authorization Request
Poston Butte Project
Pinal County, Arizona

Dear Sir:

Reference is made to Mr. Saegart's Supplemental Authorization Request dated February 19, 1971, in which he requested funds ($66,600) to make an initial test of the in-place-leaching possibilities of the Poston Butte copper prospect. As pointed out, if in-place-leaching can be successfully applied at Poston Butte, copper could be produced at the rate of 30,000 tons the first year and, on a declining basis, produce 370,000 tons over a 15-year period. Production on this basis could yield a discounted rate of return on investment of 47%. Sulfuric acid consumption would be at least 30,000 tons per year.

Some of the procedures and equipment necessary to carry out the initial test have proved to be different and much more expensive than originally proposed. This fact, coupled with losing drill hole PB-35 with a string of acid-resistant stainless steel casing, has led to greatly increased costs to complete the Phase I testing. The Phase I testing requires the completion of two 9-7/8" drill holes 1625 feet deep and located 200 feet apart.

Initial tests of transmissibility will be with fresh water. However, acid resistant casing will be set so that tests may be conducted with sulfuric acid. It is anticipated that, by injecting under pressure in one hole and pumping from the other, communication between the holes can be established.

The additional cost to carry out Phase I (Sept. 71 - Nov. 71) is estimated to be $60,000.00, as itemized below:

PB-27	(old drill hole) needs to be plugged and converted to observation well		$ 5,000
PB-34	(9-7/8" to 1103'; NX core to 1775')		
	reaming to 9-7/8" 522' @ $11/ft.	$5,742	
	casing 7" plastic coated	7,425	
	cementing	2,610	
		$15,777	say 16,000

PB-35 (Hole lost at 1625')			
salvage or redrill new hole	$14,000		
casing	7,425		
cementing	2,610		
	$24,035	say	24,000
Pump rental, water supply, electrical lines, freight			8,500
Core Lab fees			3,000
Contingencies			3,500
Total cost to complete Phase I:			$60,000

If Phase I, using fresh water, is successful the following phases, with estimated costs, will be required:

Phase II (Test Period Dec. 71 - Jan. 72)	
Acid injection in the two holes completed in Phase I; drilling of observation hole	$25,000
Phase III (Test Period Feb. 72 - April 72)	
Property options	$25,400
Additional exploration drilling to further test grade and continuity of the deposit (7200' in 4 holes)	85,000
Total Phase III	$110,400
Phase IV (Test Period May 72 - Feb. 73)	
Property options	$145,600 *
*Will try to renegotiate this option	
In-place-leaching tests, using two existing wells and three new wells	230,000
Total Phase IV	$375,600 *
Phase V (Test Period Feb. 73 -)	
Property options	$637,300
Measurement Drilling estimate 30 additional holes	Costs not Estimated
Additional Pilot in-place-leaching tests	

Resume of Option Payments :

Owner	Date	Amount
E. & W. Chandler	3/1/72	$ 8,900
	3/1/73	270,300 final payment
D. & E. Palmer	3/1/72	$ 8,500
	3/1/73	257,500 final payment
E. Espinosa	4/1/72	$ 8,000
	4/1/73	109,500 final payment
*Odom & Staggs	8/1/72	$145,600 final payment
State Lease	8/4/72	$ 15,695 (probably terminate lease)

*(Will try and renegotiate this option to make final payment 8/1/73.)

The Appendix presents a Property Evaluation exclusive of minerals and clearly demonstrates that purchase of agricultural land with mineral potential is a sound practice.

I firmly believe that, with the potential rate of return, the additional costs necessary to complete Phase I testing are justified. If you agree, please request a Supplemental Mining Authorization in the amount of $60,000. Forms 302 MA and 302 MB are enclosed. A property and drilling map is also attached.

Very truly yours,

W. L. Kurtz

W. L. Kurtz

WLK:lad
Encs. & Attachs.

cc: JHCourtright - w/o encs.
RBCrist - " "
NPWhaley - " "
KvdSteinen - w/encs.-w/o attachs.

APPENDIX

POSTON BUTTE
PINAL COUNTY, ARIZONA
PROPERTY EVALUATION
EXCLUSIVE OF MINERALS

OWNER	ACRES	PURCHASE PRICE	PRESENT MARKET VALUE
Palmer	283 cultivated w/water & mineral rights	$283,000	$212,250 ($750/acre)
Chandler	297 cultivated w/water & mineral rights	$297,000	$222,750
Espinosa	150 unimproved w/mineral rights	$128,000	$ 64,000 ($500/acre)
Odom & Staggs	160 unimproved w/mineral rights	$160,000	$ 80,000
	890	$868,000 ($975/acre)	$579,000 ($650/acre)

Return on Investment
Rental of Cultivated Land - Per Year

	Minimum	Maximum
580 acres	$ 20,300	$ 66,700
Less taxes 890 acres	- 5,000	- 5,000
		- 7,000 (allotment)
NET	$ 15,300	$ 54,700

Future Worth - 20 Years Hence
Equal Payment Factor at 6% Compounded Annually

	Minimum	Maximum
Rental	$562,826	$2,012,194
Resale	852,450	852,450
	$1,415,276	$2,864,644

(Original investment of $868,000 at 6% interest for 20 years - $2,783,762 compounded annually)

The Return on Investment does not reflect the increase of values which will occur with Conoco's adjacent mine operation.

J. H. Courtright

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN EXPLORATION DIVISION
P. O. BOX 5747, TUCSON, ARIZONA 85703

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

March 16, 1971

J. H. C.
MAR 18 1971

file

Mr. B. F. Kern, Geological Supervisor - Metals
Continental Oil Company
Minerals Department
1755 Glenarm Place
Denver, Colorado 08202

Re: FLORENCE - POSTON BUTTE
PINAL COUNTY, ARIZONA

Dear Mr. Kern:

Reference is made to the March 9, 1971 discussion between Messrs. Kern, Barkley and Anderson and Messrs. Saegart and Kurtz concerning the Conoco and Asarco properties in the deep graben deposit at Florence (Poston Butte).

Based on the three drill penetrations in the graben block, reserves of 174 million tons grading 0.57% copper may exist in an area approximately 4000 feet east-west; 2500 feet north-south; and varying from 100 to 300 feet in thickness. Although the three existing drill holes (2 Asarco and 1 Conoco) are not sufficient penetrations to confirm the existance of an ore deposit, they are believed adequate to indicate a reasonable probability of one due to the pervasive habit of porphyry copper type mineralization.

Considering the depth and the indicated grade of the deposit, it is not likely to be economic by conventional mining methods. We believe that the highly fractured condition of the ore deposit may render it amenable to exploitation by In-Place-Leaching.

We propose permeability and transmissibility testing to make a preliminary evaluation of the possibilities of recovering the contained copper by solution mining. Refer to attached proposal of Core Laboratories, Inc., a copy of which was given to you on March 9, 1971.

In-Place-Leaching, if it can be successfully implemented, is a highly desireable method of exploitation due to low capital cost, rapid development of cash flow, and a high rate of return (perhaps as much as 47% before taxes). Further, a large source of inexpensive acid will be available from the copper smelters at nearby Hayden.

Asarco believes it would be mutually advantageous to jointly study the possibilities of exploiting the graben deposit by In-Place-Leaching.

In view of Conoco's experience and expertise in resevoir mechanics gained through petroleum applications, we would appreciate your opinions and recommendations regarding choice of consulting firms or, alternatively, supervision of such tests in the field by Conoco experts.

Before embarking on an In-Place-Leaching test of the graben deposit where-in the expenditures might be shared equally, it is desireable to have some mutual agreement on the type of joint venture format which could be developed following the successful outcome of testing.

Therefore, we propose a joint venture format where the relative equities would be established after the ore deposit has been measured with each company doing its own measurement drilling. Relative equities would be proportional to the relative tons of contained copper developed within the respective Asarco-Conoco properties covering the graben block.

The exploration costs incurred prior to developing the production on a joint venture basis would be credited to each company's proportional share of the capital costs. The division of the capital costs and profits would be on the basis of the relative equities.

We envision recovery of the copper by solvent extraction and electrowinning and believe it advantageous for Asarco to manage this operation because of its established marketing organization. Therefore, we further propose that Asarco be the managing partner even if Conoco's equity is subsequently established to be greater than 50%. This would entitle Asarco to receive a management fee which would be of a magnitude similar to existing joint venture operations elsewhere in the mining industry.

It is our opinion that test work should be carried through Phase I and II as recommended by Core Labs. We would, however, be open to alternative test procedures if your research staff favors another consulting firm or believes such a program could be more effectively established and supervised by Conoco personnel.

If initial test results (such as phases I and II) are encouraging, Asarco would plan to drill a minimum of three additional exploration holes before continuing with more comprehensive in-place leaching tests. Assuming that Conoco also drills an additional 2 or 3 exploration holes, we would then have a conbined total of 8 or 9 exploration holes within the graben ore block. We would consider this sufficient drilling to establish continuity and variability of grade and to indicate order of magnitude of reserve. Further test work, such as described as phases III and IV should then be completed before attempting to measure the deposit by close spaced drilling.

If Conoco and Asarco managements agree - in principle - with the basic terms of the Joint Venture format as proposed herein, we would want to promptly initiate, on a joint basis, the first Phases of permeability and transmissibility testing. Based on the Core Labs proposal, the costs of such initial tests (Phases I and II) would approximate $40,000 for each company.

Perhaps we could proceed with a simple Letter of Intent, signed by both companies, establishing the basic framework of a joint venture which would be formalized only in the event that In-Place-Leaching tests develop favorably.

If these proposals are of interest to Conoco, we would be pleased to initiate discussions with your research staff to determine the best approach to the In-Place-Leaching tests.

W. E. Saegart

W. E. Saegart

WES:sh

cc: JJCollins
JHCourtright
RCBarkley
RBCrist
WLKurtz

BLIND NOTE TO JJC (ASARCO COPIES ONLY)
Would appreciate your comments on Asarco management reaction to joint venture format proposed herein.

RECEIVED
MAR 5 1971
S. W. U. S. EXPL. DIV.

CORE LABORATORIES, INC.
BOX 10185, DALLAS, TX. 75207, CABLE: CORELAB

Engineering & Consulting Department

H. M. SHEARIN
VICE PRESIDENT, MANAGER
JAMES L. MOORE
ASSISTANT MANAGER
C. E. THOMAS
ASSISTANT MANAGER

W. P. SCHULTZ
VICE PRESIDENT, MANAGER
I. F. ROEBUCK, JR.
ASSISTANT MANAGER
W. R. VOWEL
ASSISTANT MANAGER

March 4, 1971

503.02

W.E.S.
MAR 8 1971

Mr. W. E. Saegart
American Smelting & Refining Co.
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona

Dear Mr. Saegart:

In accordance with our discussions of February 23 and 24, 1971, a tentative program has been prepared for the evaluation of the feasibility of in situ leaching of copper ore at your company's Poston Butte Project. This program is divided into phases which should permit a step wise development of the project without excessive expenditures in any one phase.

Attached is a flow diagram of this tentative program along with a brief description of each phase. Also attached is an estimate of the cost of each phase. In view of the relatively short period of time available to prepare the program and determine associated costs, the costs will also be considered tentative since it is believed that with development of the project, many of the costs could be significantly reduced. In estimating costs, no attempt was made to determine what ASARCO's indirect costs, such as personnel and overhead, would be to the project.

Because at least two previously drilled wells would be available for testing, the proposed program has been based on utilizing those wells in the first phase rather than drilling any additional holes.

The cost of Core Laboratories, Inc. Engineering and Consulting Department charges have been estimated, based on the amount of time which could be spent by a senior engineer from our department on the job during each of the first four phases. No

consulting costs have been estimated for the last phase which would be full expansion of the project. These estimated time charges along with expenses are presented on a separate attachment.

As per our conversation, if you obtain management approval for the project, we will be glad to work with you to initiate the proposed program.

If there are any questions relative to the attached program and associated data, please call.

Yours very truly,

CORE LABORATORIES, INC.

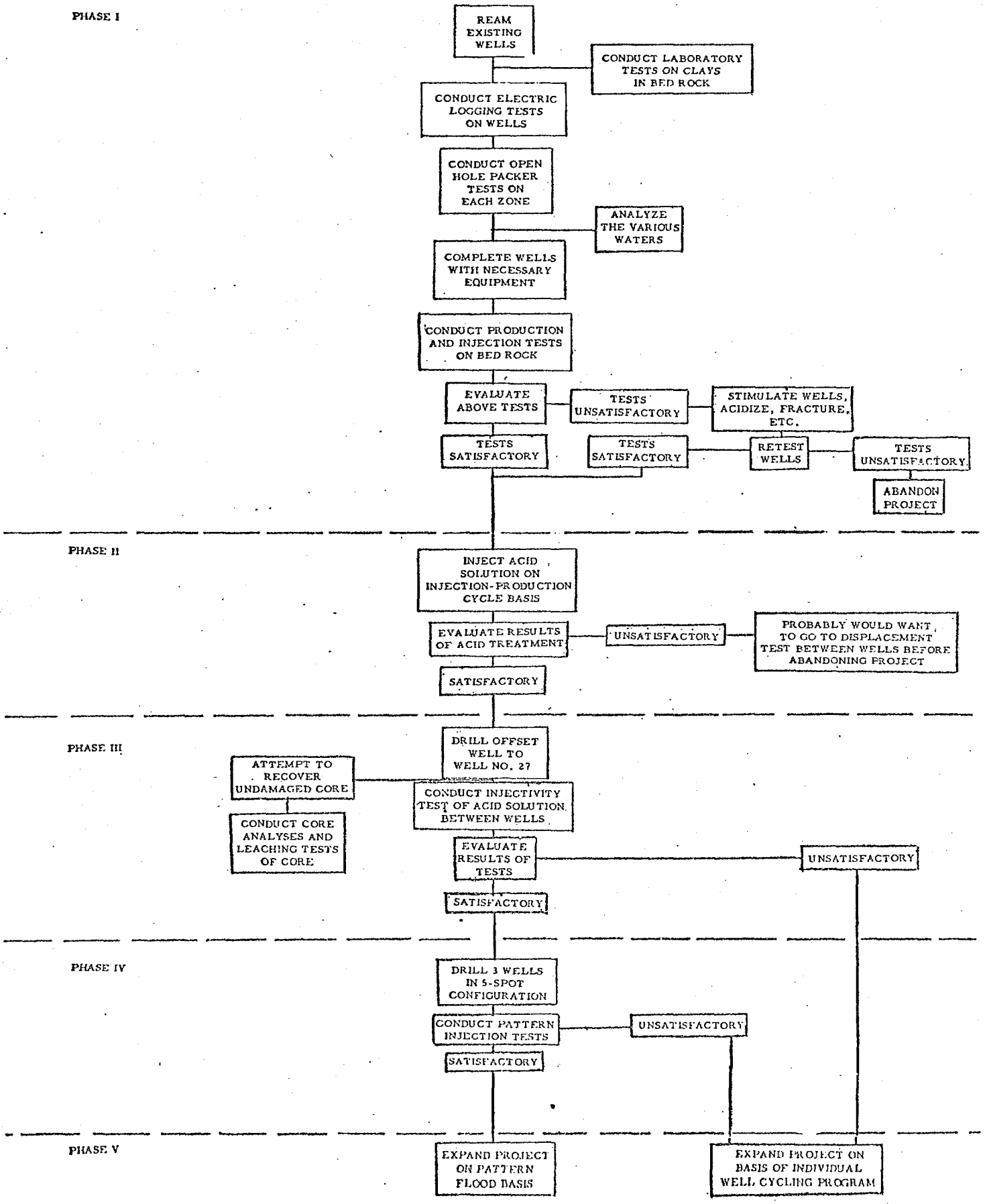
C. F. Lyon

C. F. Lyon

CFL/vr

Attachments

FLOW CHART PROGRAM FOR POSTON BUTTE IN SITU LEACHING PROJECT



AMERICAN SMELTING AND REFINING COMPANY
EVALUATION PROGRAM FOR IN SITU LEACHING
POSTON BUTTE PROJECT, ARIZONA

PHASE I

This phase should consist of testing and completing the two ASARCO wells previously drilled into the ore body. Should CONOCO and ASARCO unitize or joint venture the project, then the CONOCO well already drilled in the grabben area should also be tested and completed for evaluation.

The program in Phase I should include reaming the holes to a diameter sufficiently large to permit the running of 6-5/8-inch or 7-inch casing. Any casing size smaller than the 6-5/8-inch diameter would severely limit the horse power size of any submersible pump used in the test program. Electric logging of the holes with several instruments to determine which will permit detection and correlation of the badly fractured and altered zones, open hole packer production tests of the various zones to determine productivity, analysis of the produced water from each zone, and the selection of the proper type equipment for full scale injection and production tests. Tests should be conducted on the clays present in the bed rock to determine if they can be altered or treated to improve permeability and prevent plugging during the leaching process.

The results obtained from the electric logs should provide the information as to whether or not the zones of alteration and fractures are continuous and correlatable across the ore body. If separate zones are proven to exist, the recommended procedure would be to complete the wells so that the upper zone is the one initially tested and evaluated. At least two different type completions should be made to determine if the drilled holes will stand unsupported or if it will be required to set some type casing through the productive zone. Production and injection tests of adequate duration should be conducted on the bed rock after the wells have been completed. To verify or to determine the path taken by the injected water, either a temperature log should be run or a radioactive tracer material injected which can be detected by radioactive logging. Based on the results of the Phase I tests, a decision can be reached as to whether or not to proceed with the program and go to the next phase or abandon it as unfeasible. Some obvious reasons for failure would be: inability to achieve satisfactory injection or production rates even after stimulation of the formation; inability to control the

path of the injected solution, i.e., loss or movement of the fluid into the conglomerate zone, or excessive channeling down a fracture plane.

PHASE II

Phase II would primarily evaluate the effects of injection of the acid solution. Because the existing well spacing is too great to permit rapid evaluation of pumping the acid solution from one well to another, the injection-production cycling on an individual well basis should be used to evaluate the efficiency of the in situ leaching process. If for some reason the results of injection-production cycling were unsatisfactory, further tests might still be desirable before abandoning the project. Different strength solutions might be used and if the results were still unsatisfactory, it still might be necessary to evaluate the effects of injecting the solution from one well to another.

PHASE III

Phase III would consist primarily of drilling a well to offset one of the existing wells to evaluate the effects of injection of the acid solution from one well to another. The spacing between wells would be based on the results of the tests conducted in Phase I. In drilling this well, a core should be taken across the contact of the overlying conglomerate and the bed rock to see if there is an impermeable barrier present. Since a conventional core barrel only produces rubble from the fractured and altered zone of the bed rock, some special coring device such as the rubber sleeve core barrel will have to be used to insure that a core suitable for testing is obtained. If an undamaged core is recovered, permeability and porosity can be measured and also the effects of acid leaching.

If the displacement test between wells is unsatisfactory, Phase IV could be eliminated insofar as pattern efficiency evaluation and the project developed on an individual well treatment basis.

PHASE IV

This phase would require the drilling of three additional wells to create a five-spot pattern. Using this pattern, sweep efficiency for the reservoir can be evaluated and a decision reached as to whether to develop it on an individual well injection-production cycling basis.

PHASE V

This would be the last phase of the project and would consist of complete development of the project, either on a pattern basis or on an individual well basis.

ESTIMATED PHASE COSTS *
POSTON BUTTE IN SITU LEACHING PROJECT

Phase	Estimated Cost
I	$ 74,500
II	7,000
III	37,000
IV	89,500
V	7,000,000 **

* Exclusive of ASARCO administration and associated overhead costs.

** This assumes 350 wells drilled at a cost of $20,000 per well including all the necessary supporting equipment. Assumed spacing is one well per acre which could be greatly increased depending upon the outcome of the testing program, with direct reduction in total cost.

ESTIMATED TIME COSTS AND EXPENSES
FOR CONSULTING SERVICES PROVIDED BY THE
ENGINEERING AND CONSULTING DEPARTMENT
CORE LABORATORIES, INC.

PHASE I

Time - 20 days @ $180/day	$ 3,600
Expenses @ $40/day - 28 days	1,120
Auto expenses @ $150/week	600
Air travel - round trip	124
TOTAL	$ 5,444

PHASE II

Time - 5 days @ $180/day	$ 900
Expenses @ $40/day - 7 days	280
Auto expense @ $150/week	150
TOTAL	$ 1,330

PHASE III

Time - 10 days @ $180/day	$ 1,800
Expenses @ $40/day - 14 days	640
Auto expense @ $150/week	300
Air travel - round trip	124
TOTAL	$ 2,864

PHASE IV

Time - 20 days @ $180/day	$ 3,600
Expenses @ $40/day - 28 days	1,120
Auto expense @ $150/week	600
Air travel - round trip	124
TOTAL	$ 5,444

TOTAL COST	$ 15,082

ATT. D.

LEACH-PRECIPITATION CEMENT COPPER $.50/LB 02/16/71

CALCULATION ON RETURN OF INVESTMENT

TABLE A

INVESTMENT INVOLVED IN PROJECT

YEAR OF CONSTRUCTION	EXPENDITURES FOR CONSTRUCTION	FACTOR AT 48.3 PCT	VALUE AT COMPLETION DATE
1ST	5000000.	2.68277	13413890.
2ND	6200000.	1.80780	11208372.
3RD	9693000.	1.21819	11807967.
TOTAL	20893000.		36430230.

TABLE B

EARNINGS FROM PROJECT

YEAR	CASH EARNINGS BEFORE TAXES	PRESENT VALUE DISCOUNTED AT 48.3 PCT FACTOR	DISCOUNTED VALUE
1	19077000.	0.673854	12855121.
2	18357000.	0.454079	8335543.
3	17659000.	0.305983	5403366.
4	16981000.	0.206188	3501286.
5	16324000.	0.138941	2268073.
6	15687000.	0.093626	1468711.
7	15068000.	0.063090	950644.
8	14468000.	0.042513	615088.
9	13868000.	0.028648	397291.
10	13322000.	0.019304	257176.
11	12775000.	0.013008	166183.
12	12244000.	0.008765	107328.
13	11729000.	0.005906	69281.
14	11229000.	0.003980	44695.
15	10757000.	0.002682	28852.
TOTAL	219545000.		36468645.

SOLVENT EXTRACTION / ELECTROWINNING $.50/ LB 02/16/71

CALCULATION ON RETURN OF INVESTMENT

TABLE A

INVESTMENT INVOLVED IN PROJECT

YEAR OF CONSTRUCTION	EXPENDITURES FOR CONSTRUCTION	FACTOR AT 47.3 PCT	VALUE AT COMPLETION DATE
1ST	6000000.	2.63781	15826866.
2ND	9941000.	1.78955	17790014.
3RD	14400000.	1.21408	17482809.
TOTAL	30341000.		51099690.

TABLE B

EARNINGS FROM PROJECT

YEAR	CASH EARNINGS BEFORE TAXES	PRESENT VALUE DISCOUNTED AT 47.3 PCT FACTOR	DISCOUNTED VALUE
1	26077000.	0.678426	17691316.
2	25177000.	0.460261	11588014.
3	24304000.	0.312253	7589013.
4	23457000.	0.211841	4969155.
5	22636000.	0.143718	3253211.
6	21839000.	0.097502	2129353.
7	21066000.	0.066148	1393476.
8	20316000.	0.044876	911713.
9	19589000.	0.030445	596396.
10	18884000.	0.020654	390049.
11	18200000.	0.014012	255034.
12	17536000.	0.009506	166709.
13	16892000.	0.006449	108946.
14	16268000.	0.004375	71181.
15	15662000.	0.002968	46492.
TOTAL	307903000.		51160065.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

RECEIVED
FEB 22 1971
EXPLORATION DEPT.

February 19, 1971

J. H. C.
FEB 22 1971

Mr. J. J. Collins
New York Office

Dear Sir:

file

Re: Supplemental Authorization Request
Poston Butte Project
Pinal County, Arizona

Enclosed is a copy of a memorandum from Messrs. Kurtz and Crist dated February 12, 1971, recommending renewal of a portion of our property options and consideration of a possible in-place leaching operation at Poston Butte. I am also enclosing a memo from Mr. G. W. Bossard dated February 10 which outlines the estimated parameters of capital cost, operating cost and production rate for an in-place leaching operation. This assumes that leach solutions can be pressure transmitted through the rock in place and that copper recoveries would be satisfactory.

An exchange of drilling information has been completed with Continental Oil Company covering the ground within the deep graben block (western portion of the Poston Butte copper deposit). A total of three holes (two ASARCO, one Conoco) have been drilled in the ore zone in the graben block. Results of these three holes indicate a possible deposit of 174 million tons averaging 0.57% copper within the combined properties. The average depth to the top of "ore" is 1350 feet. This depth is too great for open pit mining and the grade probably too low to consider block caving. A caving operation would probably also develop a serious water problem since the upper ± 350 feet of alluvium is unconsolidated and water saturated. Local cotton farms obtain most of their irrigation water from this source. The copper occurs primarily as oxides (chrysocolla) and to a lesser extent as chalcocite. In-place leaching appears to be the only means of extracting this copper.

If in-place leaching can be successfully applied, Mr. Bossard estimates a recovery of 3%, on a declining basis, of the total copper per year. This rate would produce 30,000 tons of copper in the first year and a total of 370,000 tons over a 15-year period. Production on this basis would yield a discounted rate of return on investment of 48% producing cement copper, or 47% with the addition of solvent extraction-electrowinning.

The possibility of in-place leaching of this deposit is intriguing and would represent a highly desirable type of operation. Large quantities of sulfuric acid could be consumed on a project located only 50 miles from Hayden. Furthermore, such an operation would not be objectionable to environmentalists since the ground surface would remain undisturbed. No complications with the overlying ground water in near surface gravels is anticipated from in-place leaching.

A preliminary discussion has been held with James L. Moore, assistant manager of Core Laboratories, Inc., Dallas, Texas. This company specializes in petroleum reservoir mechanics. They consider their knowledge and expertise would also be applicable to igneous environments. The host rock of the Poston Butte graben ore zone is intensely fractured (probably more highly fractured than any other porphyry copper deposit we have observed.) Mr. Moore feels this environment may have a high co-efficient of solution transmissibility using pressure injection. He has broadly outlined a test program which could be conducted in stages to determine the effectiveness of fluid transmission and actual leaching in place.

The following is a summary of proposed tests to evaluate in-place leaching possibilities and to further explore the copper deposit, together with estimated costs. These test phases are sequenced so that successive steps would not be conducted unless each phase yielded encouraging results. Itemized cost figures and work descriptions for these summary estimates are tabulated in an attachment hereto.

Phase I - Test Period, 3/1/71 to 6/1/71	
Property options, period 3/1/71-3/1/72	$23,400
In-place fluid transmission tests utilizing one existing well and one new well, and laboratory permeability and leaching tests	60,000
Contingencies	6,600
Total Cost of Phase I	$90,000
Phase II - Test Period, 6/1/71 to 9/1/71	
Additional exploration drilling to further test grade and continuity of the deposit (6,000' in three holes)	$70,000
Phase III - Test Period, 9/1/71 to 9/1/72	
Property options, period 3/1/72-3/1/73	$25,400
In-place leaching tests utilizing two existing wells and three new wells	231,300
Contingencies	28,300
Total Cost of Phase III	$285,000

Phase IV - Test Period, 9/1/72 to --

Measurement Drilling (estimate 38 additional holes)	Costs not Estimated
Additional Pilot In-Place Leach Tests	
Property Acquisition	

Messrs. Kurtz and Crist recommend retention of the two properties on which the deposit occurs. Option payments for these properties (Palmer and Espinosa) totalling $14,500, are due March 1, 1971. I believe we should also retain the Eugene Chandler property for at least one more year. Referring to Attachment A of the Kurtz-Crist memo, one can see that the Eugene Chandler property provides contiguity with the two parcels of the Palmer property. Having a contiguous block of ground might be important for subsequent pumping of water from the south Palmer property to the ore deposit. The Chandler property is also important because, as with the Palmer ground, it carries excellent water rights. The Chandler property might also be a convenient site for surface plant facilities. Option payments to hold the three properties for the next year would total $23,400.

Continental Oil plans to drill three more holes in the graben ore zone. They have agreed to give us the results of this drilling. The three holes proposed as ASARCO's Phase II exploration would then raise the number of holes in this deep block to a total of nine. This number of penetrations should be enough to reasonably estimate the approximate grade and the order of magnitude of tonnage of the deposit. Our first step, however, would be to determine if fluids can be successfully pressure injected and recovered (Phase I). Knowledge of the tonnage and grade will be unimportant unless fluid transmissibility can be demonstrated.

We believe the potential reward of in-place leaching of this deposit is so attractive that the expense of the preliminary tests is justified. The information and experience gained may be useful in the ultimate development of in-place leaching of other deposits. In-place leaching by gravity percolation has not been successful elsewhere in unbroken ground. To our knowledge, however, leaching by pressure injection, in combination with evacuation pumping, has never been investigated.

We envision a joint venture operation (ASARCO-CONOCO) of the Poston Butte graben block if it can be demonstrated that in-place leaching is technically and economically feasible. If you agree, please request a supplemental

authorization in the amount of $90,000 to extend our options on the three properties for another year and to conduct the tests outlined in Phase I.

Very truly yours,

W. E. Saegart

W. E. Saegart

WES:mw
Att.
cc: J. H. Courtright
W. L. Kurtz
R. B. Crist/S. I. Bowditch
A. J. Kroha
G. W. Bossard w/o maps

APPENDIX

Itemization of Sequenced Exploration and In-Place Leach Testing
Poston Butte Graben "Ore"

PHASE I - Work Period, 3/1/71 to 6/1/71

Property Options - Period 3/1/71-3/1/72 (D. Palmer, E. Espinosa and E. Chandler)			$23,400
Lab Tests on Core Samples (Permeability-Leaching)		$ 1,600	
In-Place Pressure Injection and Fluid Transmission Rate Test			
Involves drilling additional hole adjacent to PB-27, installing of submersible production pump and injection pump respectively to measure fluid flow rate (pressure transmissibility) through fractured "ore" host rocks.			
One Additional Hole			
1280' rotary drilling @ $10/ft.	$12,800		
430' coring and reaming @ $20/ft.	8,600		
		21,400	
Preparation of Hole PB-27		6,000	
Submersible pump installed with pipe		15,000	
Surface facilities (injection pump - water storage tank - water distribution lines)		7,000	
Operating Expense, one month		3,000	
Consulting fees, Core Laboratories, Inc.		6,000	
			$60,000
Contingencies			6,600
Total Costs for Phase I			$90,000

PHASE II - Work Period, 6/1/71 to 9/1/71

Additional exploration drilling to further test grade and continuity of the deposit			
3 holes (2,000' average depth)			
3600' rotary drilling @ $10/ft.	$36,000		
2400' diamond drilling @ $14/ft.	33,600		
			$69,600
			Say $70,000

PHASE III - Work Period, 9/1/71 to 9/1/72

Property Options - Period 3/1/72-3/1/73			$25,400
In-Place Leach Test			
Drill 3 additional holes as production wells surrounding PB-27			
4770' rotary drilling @ $10/ft.	$47,700		
330' coring and reaming @ $20/ft.	6,600		
		$54,300	
Install plastic casing liners - 5 holes			
6360' @ $3.00/ft.	19,000		
1590' @ $5.00/ft.	8,000		
		27,000	
Three Submersible Production Well Pumps		45,000	
Surface Facilities			
Water distribution system, precipitation launder, building		75,000	
Operating Costs - 6 months		30,000	
			231,300
Contingencies			28,300
Total Cost for Phase III			$285,000

PHASE IV - Work Period after 3/1/73

Measurement Drilling (estimate 38 additional holes)

Additional Pilot In-Place Leach Tests

Property Acquisition — Costs not estimated

WES:mw
2/18/71

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

RECEIVED
FEB 12 1971
S. W. U. S. EXPL. DIV.

February 12, 1971

W.E.S.
FEB 21 1971

TO: W. E. Saegart

FROM: W. L. Kurtz

Re: Evaluation of the 1970 Poston Butte Prospect
Pinal County, Arizona

At your request, Mr. Crist and I have reviewed and evaluated the 1970 Poston Butte project and conclude that an extremely attractive in-place copper leaching property may exist in part on ASARCO ground and in part on Continental Oil Company ground. We strongly recommend making $14,500 in property payments to retain for one year a reduced land position at Poston Butte. Conoco is scheduled to drill an additional three exploration holes within the favorable in-place leaching block and make this data available to us.

History

ASARCO geologists in 1960 were the first to recognize the Poston Butte area as a porphyry copper prospect. Drilling of 22 holes in 1961-62 indicated a pervasively altered zone in excess of a mile wide and two miles long covered by 160 to 1,360 feet of overburden. At the western margin of this zone, oxidized and primary mineralization with a grade of about 0.4% copper was found.

Early in 1970, ASARCO concluded that additional exploration was warranted. A land position was taken on the southwest extension of the mineralized zone but the MacFarland farm (site of the four drill holes containing 0.4% copper mineralization) was acquired by the Continental Oil Company.

During 1970, ASARCO drilled eleven holes. Of these, six were diamond drilled and five were rotary drilled to bedrock and spot cored. A total of 15,014.5' were rotary drilled, 175.5' were spot cored, and 1,694' were diamond drilled. Two holes intersected significant columns of + 0.5% copper oxide mineralization.

Conoco has actively explored their ground and has publicly announced that their drilling has intersected porphyry copper mineralization averaging slightly above 0.5% copper.

An exchange of data from drill holes in the west Graben block has been made with Conoco.

Property Situation

The ASARCO controlled land is shown on Attachment A. The options on this ground begin expiring March 1, 1971. The necessary land to control for

another year the permissive oxide copper zone requires renewing the Dan Palmer and Ernest Espinoza options at a cost of $8,500 and $6,000 respectively. Next year this amount will be $8,500 and $8,000 respectively. Total purchase price of Chandler ground is $283,000 (due March 1, 1973) and the Espinoza ground is $128,000 (due April 1, 1973).

Geology and Mineralization

An excellent description of the regional and local geology and mineralization is contained within company reports (Blackwater and Poston Butte Prospects, A. G. Blucher, 1960; Poston Butte Drilling Project, A. G. Blucher, June, 1961; Poston Butte Project, R. K. Kirkpatrick, January, 1963) and only those features bearing directly on the current evaluation will be discussed.

Attachment A shows the Poston Butte area and location of all the drill holes. These drill holes have indicated four North to N 30 E faults that define three horsts and two grabens. It is within the western graben block (plan Attachment B and section Attachment C) that we have drilled + 0.5% copper oxide mineralization.

The drill holes in this western graben block have defined a permissive copper oxide block interpreted to have dimensions of 4,000 feet east-west and 2,500 feet north-south. All three of the drill penetrations in this permissive block have intersected significant + 0.5% oxide copper values (see Attachments B and C).

The important features indicated in the three drill holes (PB-23, 27, FLOR 51S) are:

1. Minimum depth to oxidized copper zone of 1,170 feet.

2. Major copper mineral in oxidized zone is chrysocolla, with chalcocite forming an important mineral in part of PB-27.

3. Chrysocolla occurs as fracture coatings and "soaked" in feldspars.

4. Thickness of + 0.5% oxide copper zone varies between 100 and 322 feet.

5. Oxidized copper minerals have resulted from destruction of a thick chalcocite blanket.

6. Large aerial extent of original chalcocite blanket.

7. One per cent copper grade of portions of the original chalcocite blanket.

8. Extremely intense fracturing of rock within the oxide zone that includes the + 0.5% copper zone.

9. Moderate to high iron oxide content.

10. Considerable difference in elevation to top of + 0.5% copper zone.

11. Primary chalcopyrite mineralization grading 0.2 to 0.4% copper is truncated by major flat fault with less than 0.1% copper below the fault.

12. Major rock type cored is Precambrian granite; some Laramide monzonite porphyry also occurs.

Therefore, the three drill holes have indicated the partial destruction of an original chalcocite blanket resulting in an oxidized copper zone 4,000 feet east-west by 2,500 feet north-south by 100-300 feet vertically containing 0.5 to 0.89% copper as chrysocolla and chalcocite in intensely fractured rock.

A feature, recognized from the 1970 drilling program, is the existence of flat faulting (gravity sliding?) at Poston Butte. The full significance of this is not yet known. Additional study will be made.

Continued Exploration

Continental Oil Company plans to drill three additional holes within the western graben oxidized copper block. These are shown on Attachments A and B. Their additional three holes will give a total of six drill penetrations through the copper oxide zone and establish a reasonably good estimate of the tonnage and grade.

Conoco has agreed to supply ASARCO with the data from these three holes and, therefore, no additional drilling by ASARCO is necessary at this time. Of course, the property payment of $14,500 will have to be made to retain a position in the possible orebody.

Potential in West Graben Block and In-Place Leaching

Though considerable drilling is required to confirm tonnage and grade within the permissive 4,000' x 2,500' west graben "ore" block, the three drill penetrations indicate a possible tonnage of 174 million tons grading 0.57% oxide copper (see Attachment B). This represents a large copper reserve (approximately 1,000,000 tons of contained copper) at depths of more than 1,100 feet below the surface. The observed physical characteristics of the mineralization in diamond drill holes PB-27 and 51S, strongly suggests that the copper may be recovered by in-place leaching through a system of pressure injection wells and pumping wells. The severity of the fracturing exhibited in the + 0.5% oxide copper zones indicates that solutions injected under pressure should permeate the rock, effecting a good copper recovery.

To date, no tests of porosity, permeability, or copper recovery have been made. These should be the first steps when favorable results are obtained from the three proposed Conoco drill holes.

The general geological setting in this farming area makes this an ideal locality for in-place leaching. There is an average of 350 feet of loose, water saturated sand, gravel and clay at the surface, underlain by an average of 850 feet of indurated post-mineral conglomerate that contains a thin (20-30 feet) basalt layer near the top. It is difficult to envision the denser acid solutions working their way into the loose, water saturated surface alluvium. The strong faults on the east and west should form an impervious barrier. The bedrock rises to the surface approximately two miles to the north.

Two attractive features of in-place leaching of a copper resource such as that indicated in the west graben block at Poston Butte are:

1. Consumption of large quantities of sulfuric acid.

2. No disturbance of the land surface such as results from open pit and block caving.

Outcome

In order to help in determining whether the type of copper resource indicated in the west graben block at Poston Butte is worthy of continued exploration, an outcome was calculated using "ball park" capital costs and operating expenses determined by G. W. Bossard. Assuming the capital and operating costs listed below, a recovery figure of three per cent per year on a diminishing basis to produce 30,000 tons of copper in the first year, dropping to a low of 19,585 tons in the 15th year, acid consumption of 1 lb/lb copper recovered and pumping volumes of 8,000 gpm, a discounted cash flow rate of return before taxes of 47.3% for solvent extraction/electrowinning and 48.3% for cement copper is indicated (see Attachment D, computer printouts).

A fifteen year operation would consume approximately 37% of the estimated + 0.5% copper reserves in the west graben block.

Estimated Capital Costs

Pre-Mining Development and Advances

Land, mineral and water acquisition	-	$ 751,000.00
Developing leaching field wells (600,000') and pumps	-	13,100,000.00
Precipitation plant	-	769,300.00

Injection plant	- $ 1,000,000.00	
Office, shops, warehouse	- 1,000,000.00	
Water, power and roads	- 1,000,000.00	
Capital contingency (25%)	- 3,444,250.00	
Capital cost for cement copper	- 20,893,125.00	TOTAL
Capital cost for solvent extraction/ electrowinning	- 30,341,250.00	TOTAL

Estimated Operating Costs

Leach Precipitation		Annual Basis
Power	- $0.066/1,000 gpm x 8,000 gpm x 2	= $ 554,800.00
Labor	- 15 men @ $40/day + $5,000/Mo. Supervision	= 279,000.00
Maintenance	- 5% of capital cost of wells, pumps, plant	= 589,000.00
Sulfuric Acid	- 1 lb/lb copper @ $12/ton	= 360,000.00
Precipitating Iron	- 1.5 lb/lb copper @ $60/ton	= 2,700,000.00
Sub-total		$ 4,482,800.00
Contingency @ 10%		440,200.00
		$ 4,923,000.00

Solvent Extraction - Electrowinning		Annual Basis
Power	- $0.066/1,000 gpm x 8,000 gpm x 4	= $ 1,109,600.00
Labor	- 23 men @ $40/day + $5,000/Mo. Supervision	= 395,800.00
Maintenance	- 5% of $16,779,300.00	= 838,965.00
Sulfuric Acid	- 1 lb/lb copper @ $12/ton	= 360,000.00
S.E. and Electrowinning plant and supplies		= 1,218,635.00
		$ 3,923,000.00

Conclusions and Recommendations

We believe an extremely attractive in-place leaching possibility exists at Poston Butte.

We recommend making $14,500 property payments to retain a reduced land position at Poston Butte. This will provide time to evaluate the data from the three proposed Conoco drill holes and, if warranted, make preliminary porosity, permeability, and copper recovery tests along with additional drilling.

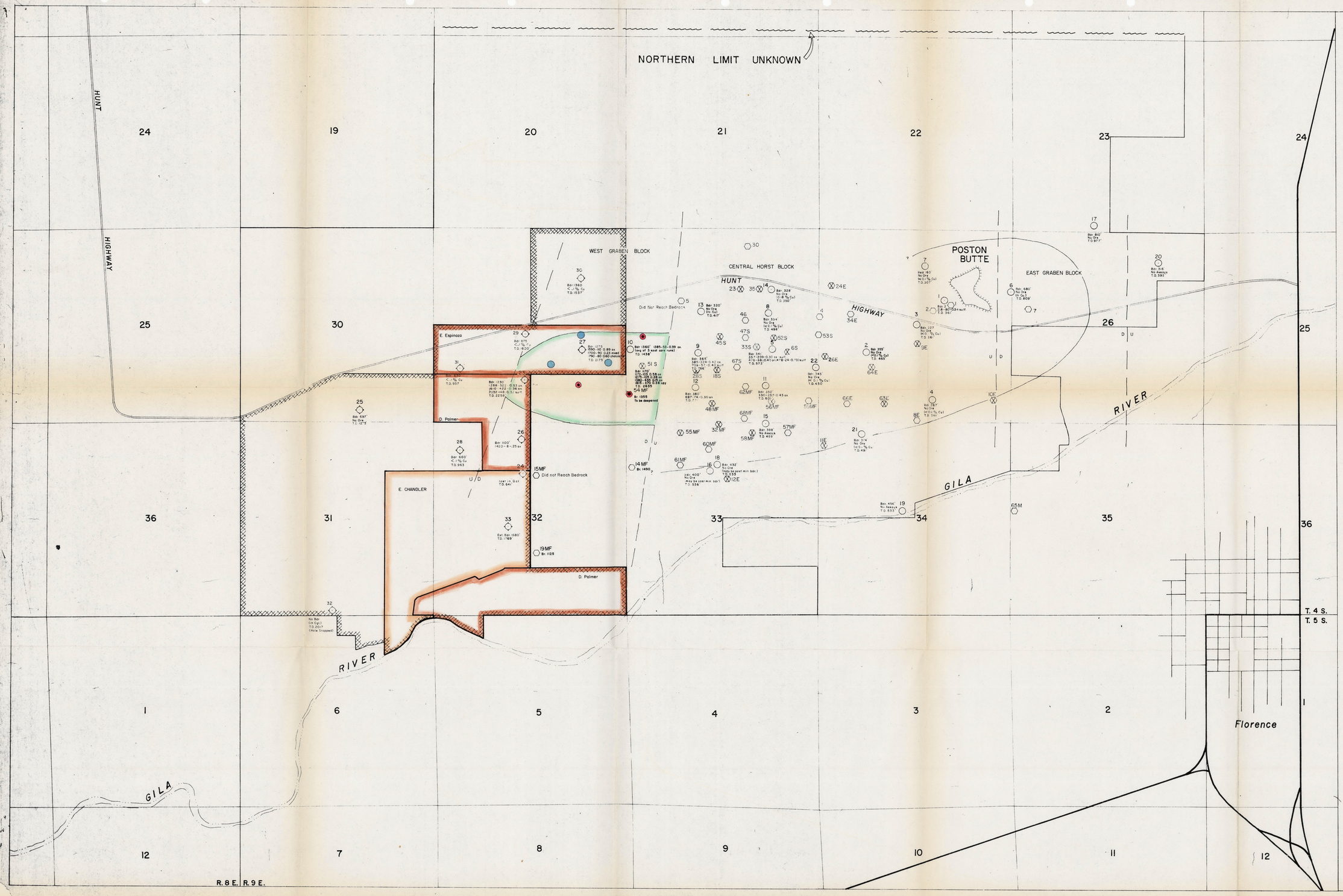
W. L. Kurtz

R. B. Crist

WLK:mw

Attachment A - Drilling Map 1" = 1,000'
Attachment B - West Graben "Ore" Body 1" = 400'
Attachment C - Cross Section
Attachment D - Outcome Calculations

ATTACHMENT A



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EXPLANATION

ASARCO DRILL HOLES

1961-1962 Drill Holes

1970 Drill Holes

Proposed

Rotary drilling in progress

Rotary drilling completed

Diamond drilling in progress

Diamond drilling completed

1971 Proposed holes Phase II

DRILL HOLE ASSAY SUMMARY

350 - 257 - 0.43

% Cu

length of intercept

beginning of intercept

CONTINENTAL OIL HOLES

Rotary Drill Only

Rotary Followed by Diamond Drill

Continental Oil Land

Proposed Holes

ASARCO FEE LAND (OPTIONS)

ASARCO LAND RECOMMENDED FOR HOLDING: PRIMARY INTEREST

ASARCO LAND RECOMMENDED FOR HOLDING: SECONDARY INTEREST

PROBABLE LIMITS OF DEEP "ORE" BODY

LIMIT OF ALTERATION & MINERALIZATION

FAULT (POSITION INFERRED)

Status of Drilling

Month of_____1970

POSTON BUTTE PROJECT

PINAL COUNTY, ARIZONA

Scale: 1" = 1000'

W.E.S.

REVISED FEB. '71 W.L.K.

NVK 2316-A

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

W.E.S.
FEB 10 1971

February 10, 1971

Mr. W. E. Saegart
Building

Poston Butte In-Place Leaching

Per your request of February 9, I have assembled some "ball park" figures for an in-place leaching operation for the oxide orebody at Poston Butte. My estimates and calculations are based on an idealized situation in which it is assumed that the rock has good porosity as inferred by Mr. Kurtz and that solution loss up through the conglomerate capping or to other strata would be minimal. As a guide I have used Mr. Wocjik's report of April, 1964 discussing in-place leaching of the deep Sacaton orebody, and capital and operating cost information on file in this office. In several cases, the electrical allowance for example, it is possible just to allow a lump-sum since we know nothing regarding these requirements.

As a basis for my study I used, per your suggestion, an ore reserve figure of 200,000,000 tons assaying 0.5 percent copper as oxides or equivalent to 1,000,000 tons of copper in place. I assumed a recovery figure of three percent per year on a diminishing basis to produce 30,000 tons of copper in the first year dropping to a low of 19,585 tons in the 15th year. Acid consumption was estimated at 1 lb/lb copper recovered and iron consumption at 1.5 lb/lb copper recovered, both figures based on Silver Bell experience. The pregnant solution assay was assumed to be 2.0 gms/liter and pumping volumes were established at approximately 8,000 gpm. It was also assumed that an equivalent amount of pumping horsepower would be required to inject the solution as needed to pump the pregnant to the surface. Other information used for the calculations are contained in the attachments.

These rough calculations indicate that a capital investment in the magnitude of $15-25,000,000 would be required for the wells, injection plant, production pumps, launder precipitation plant, etc. Based on an inferred plant cost of $17,250,000 and a 50 cent copper price, the return on investment under the conditions discussed above would be in the range of 60 percent on capital.

The order-of-magnitude cost for a solvent extraction/electrowinning plant to produce 60,000,000 lbs per year of copper would be in the range of $10,000,000 as based on work done for North San Xavier. The use of this process would be mandatory since you would not want to pump iron salts

from cementation into the wells, in order to avoid blinding. The advantages obtained would be in the saving of the cost of iron for precipitation and a saleable product which could be sold at full price without deductions for smelting. From previous work it would appear the savings in operating cost due mainly to lower iron consumption would be in the neighborhood of $1,000,000 per year since a portion of the saving in iron is offset by additional costs for chemicals, power and manpower. By increasing the overall capital cost by $10,000,000 for a solvent extraction/electrowinning plant, the indicated additional profit after taxes for the first 15 years would be a total of approximately $50,000,000. However, the return on total investment would be reduced by 10 points to 50 percent. From previous work it appears that the return on investment for a solvent extraction/electrowinning plant is in the neighborhood of 20-25 percent. No consideration has been given in my calculations for accelerated depreciation which could have a bearing on the outcome figures.

I am enclosing for your reference Xerox copies of my work sheets. Please keep in mind that this study is for informational purposes only and in no way should be construed to endorse in-place leaching at Poston Butte, since we are dealing with the problem on the basis of such meager information. The figures I have shown are only rough calculations and ignore such considerations as royalties, operating capital, severance taxes, etc., all of which must be considered. In reality, the most this information should be used for is in discussing parameters.

Yours truly,

G. W. Bossard

G. W. BOSSARD
Director, Mineral Beneficiation Department

GWB/ajf
Attachments

File Poston Butte ? Ha. HC

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. H. C.

AUG 5 - 1970

July 24, 1970

Mr. J.J. Collins
Assistant to the Vice President
New York Office

Supplemental Authorization Request
Poston Butte Project
Pinal County, Arizona

Dear Sir:

This letter is intended as a modification of my Poston Butte authorization request dated July 17, 1970. I am taking this opportunity to elaborate on our objectives and expectations regarding future exploration of the copper zone at Poston Butte.

My authorization request letter unintentionally gave the impression that the proposed drilling would serve to delimit and measure a deep zone of 0.3 to 0.4% Cu. This is not our objective.

As stated in my July 17 letter, the zone of +0.3% Cu has been traced under alluvium for a length of at least 7,000 feet. Actually, the total zone of alteration-mineralization, including the eastern pyritic fringe, extends approximately three miles east to west with the western limit undetermined. Even hole PB-25 may not constitute a western boundary since the zone could pass to the north or south of that location.

The significance of a large zone of disseminated copper mineralization in the Southwest can not be over emphasized. For your reference, I am enclosing a copy of Mr. Courtright's 1963 review of Arizona-New Mexico Porphyry Copper Occurrences. That summary formed a statistical basis for estimating the odds for the occurrence of an economic deposit within a zone of porphyry copper "type" mineralization having a minimum size of 1/2 mile diameter. Mr. Courtright concluded that there is a 50-50 chance that a large zone of disseminated copper mineralization will contain an economic deposit. Incidentally, some of the occurrences included in his "currently under exploration" and "submarginal" categories have since been developed into ore deposits i.e., Sacaton, McGee (Duval-Sierrita), Twin Buttes, Lakeshore, and possibly Copper Creek (Newmont and Phelps Dodge).

The first step toward successful porphyry copper exploration is being able to find a prospect which exhibits the "type" environment. Such a prospect does exist at Poston Butte and exploration odds must be considered unusually attractive. Actually, Poston Butte is the best lead we have at this time in the Southwest.

Monzonite porphyry (probably Laramide) was intersected in 11 of the 22 holes drilled at Poston Butte by ASARCO in 1961-62. The best copper values were found either in porphyry or in granite (pre-Cambrian) in close proximity to the younger intrusive. The four holes penetrating bedrock which we have drilled this year intersected only pre-Cambrian granite. This granite is not the source of the mineralization cut in holes PB-23 and -27. We are exploring for and expect to find better values in or adjacent to a Laramide intrusive in the general vicinity of these two holes. Our objective is to locate a mineable tonnage of ore grade mineralization (+0.7% Cu) within the much larger zone which overall may average ± 0.3% Cu.

We also think the Poston Butte zone should be delimited to the west to have the reasonable assurance that there is no reoccurrence of important mineralization along the same trend.

> For example, an ore deposit may exist in the general area of holes PB-5, -9, -10, -11, -12, -23, and -27 which would be analogous to the Oxide orebody at Silver Bell. If the mineralized zone continues to the west there may be one or more strong centers equivalent to the El Tiro Deposit.

The zone must be delimited to the west to effect a valid exploration test.

The loss of the MacFarland property to Continental Oil was unfortunate. Our present property holdings were acquired assuming we could also conclude an agreement for the MacFarland farm. As a matter of fact, in March, after three months of negotiations, Judge MacFarland verbally accepted our option agreement. Acceptance was subsequently withdrawn and he recently has signed with Continental Oil. We have been actively competing with Continental Oil for property in the district since the first of the year when coincidentally both companies initiated exploration. Because both companies entered the district at the same time, we do not believe there exists any ethical objection to our continued exploration near the mutual property boundaries. A coat-tailing situation does not exist.

An orebody could exist entirely within our present land holdings including proposed additions. There is a good possibility, however, that an ore deposit would cross boundaries between our holdings and those of Continental Oil. In the event of a mutual discovery, I would not expect the future development of frustrating boundary agreements such as have existed at Mission-Pima-Eisenhower. Without mining expertise or facilities, the Oil Company would not be expected to attempt an independent mining operation. They would probably sell their property or joint venture its development with a traditional mining company. If we control any part of an ore deposit, ASARCO would be in a commanding position as the logical partner.

Our exploration of the zone should continue until the chances for discovery are reasonably exhausted. The next phase of exploration can be carried out at a somewhat more modest cost than requested in my letter of July 17.

In reviewing the proposal, I have eliminated two holes and shortened some of the projected drilling depths. A minimum test of our stated objectives is outlined as follows:

1. Deepen holes PB-23 and -27 (total depths 2400 to 2500 feet).

2. Drill three new holes in Section 29 to explore the area north and west of PB-23 and -27 (total depths 2300 to 2400 feet).

3. Drill one hole in Section 31 to extend or partially delimit the Poston Butte zone to the southwest (total depth 800 feet).

Payments for additional property acquisition have also been revised. The probable first year cost for an option on the Odom-Staggs property (160 acres; NE 1/4 Section 29) is $7,200 rather than $4,800 as previously estimated. The upset price will be $1,000 per acre. We are also requesting $1,290 to cover two years rental of State Land in Section 19. Notice was received yesterday from the State Land Department confirming the avialability of this Section.

The total cost of our revised exploration proposal as itemized on enclosed Forms 302-MA and 302-MB is estimated at $110,000. If you approve, please request a supplemental authorization in that amount for the Poston Butte Project.

Very truly yours,

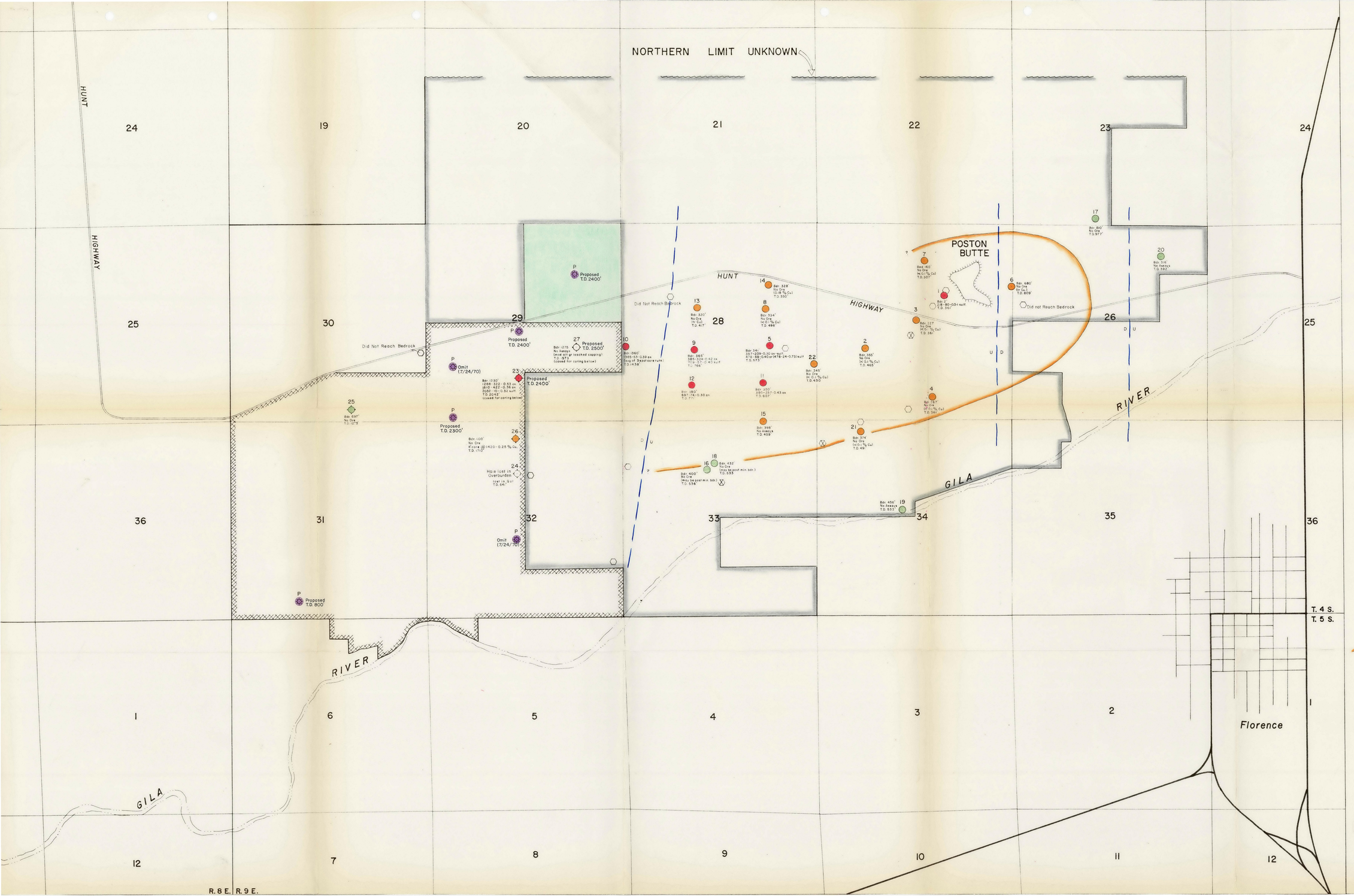
W. E. Saegart

W. E. Saegart

WES:lab

Ecnlosures

cc: J.H.Courtright, w/o encl.
Wm.L.Kurtz, w/encl.
S.I.Bowditch, w/o encl.
K.v.d.Steinen, w/forms 302-MA and 302-MB



N

EXPLANATION

ASARCO DRILL HOLES

PROGRESS

- 1961-62
- 1970
- Proposed

RESULTS

- Significant Intercepts ≥ 0.3 % Cu
- Minor Alteration - Mineralization
- Barren

DRILL HOLE ASSAY SUMMARY

350 - 257 - 0.43
% Cu
length of intercept
beginning of intercept

CONTINENTAL OIL HOLES

- Rotary Drill Only
- Rotary Followed by Diamond Drill

PROPERTY STATUS

- ASARCO
- CONTINENTAL OIL
- ODOM - STAGGS

LIMIT OF ALTERATION & MINERALIZATION

FAULT (POSITION INFERRED)

NOTE: July 24 revisions underlined in red

TO ACCOMPANY Reconnaissance Report
DATED July 17, 1970 Revised July 24, 1970
BY A. E. Sargent

Drilling Progress
&
Proposed Exploration

POSTON BUTTE PROJECT

PINAL COUNTY, ARIZONA

Scale: 1" = 1000'

W.E.S. JULY 1970

MVK 2316

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 17, 1970

Mr.J.J. Collins
Assistant to the Vice President
New York Office

Supplemental Authorization Request
Poston Butte Project
Pinal County, Arizona

Dear Sir:

Five holes have been drilled to date on the Poston Butte Project under Mining Authorization 0003-00. As of this date, the authorization is fully expended. Drilling costs incurred on the first two holes were higher than anticipated and accordingly, one of the proposed holes was omitted.

The holes drilled during the current program were numbered PB-23 through PB-27 and are plotted on the attached Progress Map. Results of this drilling can be summarized as follows:

Description of Mineralization and Assay Summary

Hole No.	Bedrock Depth	Oxide Zone			Sulfide Zone			Total Depth
PB-23	1230 ft	Wk alt pre-Cambrian granite visible Ox Cu from 1230 to 2030			Wk alt pre-Cambrian granite finely divided Cpy - tr cc			2042
		From	Int.	% Cu	From	Int.	% Cu	
		1288	322	0.53	2032	10	0.32	
		1610	422	0.36				
PB-24	Hole lost in Qal							640
PB-25	697	Fresh pre-Cambrian granite. No Cu			Non existent			1273
PB-26	±1100	Wk alt pre-Cambrian granite tr Ox Cu, from 1420 to 1450			Not reached			1710
		From	Int.	% Cu				
		1420	8	0.25				

Description of Mineralization and Assay Summary

Hole No.	Bedrock Depth	Oxide Zone	Sulfide Zone	Total Depth
PB-27	1275	Mod alt pre-Cambrian granite wk-mod lim after cc & Cpy, Assays not available	Not reached	1573

The assay averages reported above for PB-23 include both rock bit and core samples. Rock bit sample assays have been adjusted upward to compensate for impoverishment of copper minerals due to drilling fluid circulation. This manipulation should be legitimate since the core assays are consistently higher than assays of adjacent rock bit samples. The assay averages for PB-23 are marginal to ore grade in the oxide zone — despite the near lack of alteration of the granite. Finely disseminated chalcopyrite (with minor chalcocite films) was encountered at the bottom of PB-23. A spot core taken from the sulfide zone assayed 0.32% Cu.

We are convinced that the copper minerals in the oxide zone are indigenous rather than exotic as initially interpreted. This conclusion is based on the observation that the distribution of chrysocolla is similar to that of the underlying chalcopyrite -- hair line fracture filling and pin point replacement in biotite books.

Hole PB-27 was stopped in moderately altered pre-Cambrian granite leached capping. Core from this hole exhibits much stronger alteration than PB-23 as well as more abundant sulfide boxworks, including some limonite after chalcocite. Only one small interval of green copper minerals was encountered in PB-27. The absence of copper stain in the oxide zone is related to more thorough leaching of the moderately altered rock. We anticipate higher copper values in the sulfide zone of PB-27 than at PB-23.

It now appears that hole PB-10, drilled in 1962, was not deep enough to constitute a valid test and can not be considered as a western limit of the mineralized zone intersected in holes PB-5, -9, -11, and -12. Our new holes PB-23 and -27 are probably within the same zone of significant copper mineralization. As presently understood, the tenor of this deposit is marginal to perhaps low grade ore due to a lack of significant secondary enrichment. The permissible tonnage, however, is very large. Assuming continuity of mineralization, the zone of +0.3 % Cu measures 7000 feet from East to West (hole PB-5 to -23) and a western limit has not been established.

For a summary of the 1961-62 drilling results refer to my Authorization Request, Poston Butte Project, dated April 23, 1970.

A post mineral fault, located between holes PB-9 and -10, vertically offsets the zone of significant mineralization into two blocks. The eastern block, described by holes PB-5, -9, -11, and -12, is covered by ±360 feet of gravels

and has an oxide zone thickness ranging from 140 to 340 feet. The western, down dropped block, intersected in holes PB-23 and -27 is covered by ±1250 feet of gravels. A much thicker oxide zone is indicated in the western block where PB-23 penetrated 800 feet of copper oxides before entering sulfides. The environment is structurally complicated in a manner similar to our Sacaton Deposits.

Holes PB-23 and -27 are cased to bottom and should be deepened. Additional holes are needed to the north and west to determine the extent of copper mineralization and to establish grades of both the oxide and sulfide zones. One hole is needed to test the character of the bedrock in the southwest portion of our property.

12,300 feet of additional drilling is recommended using a rotary drill to bedrock and diamond drilling below. Coring should be continued several hundred feet into the sulfide zone to permit estimates of primary grades. In addition to deepening PB-23 and -27, six holes are proposed, as shown on the attached map. Estimated costs are tabulated below:

Rotary Footage (6 holes)	Diamond Drill Footage (6 holes)	Diamond Drill Footage (Deepen PB-26 & -27)	Estimated Cost
7,000 feet Incl. casing			$ 50,000
	3,800 feet		45,600
		1500 feet	18,000
Total Direct Cost			$113,600
Indirect Cost at $2.00/ft (sampling, assays, supervision, etc)			24,600
Contingencies			7,000
Total Drilling Cost			$145,200
Option Payment on Odom-Staggs Property (see paragraph below)			4,800
Total Supplemental Exploration Costs			$150,000

Negotiations are in progress to option the NE 1/4 of Section 29 to add to our property holding north of PB-27. It appears that favorable terms are available for this parcel owned by Odom and Staggs.

The cost of the proposed supplemental exploration is high due to the thickness of gravel and conglomerate cover and the existence of an unusually thick zone of oxides. These costs are justified in our opinion in view of the large tonnage of low grade mineralization inferred to date.

Continental Oil Company has had two drills working on their property since May and to date have drilled some 14 holes. In June they successfully concluded a two year option to purchase the MacFarland farm. Continental property holdings and drill hole locations are indicated on the attached map. If an ore deposit does exist, it will probably underly both ASARCO's holdings and the property controlled by Continental Oil. A joint venture with ASARCO as the operator might then be developed. This arrangement would seem desireable from Continental's point of view since they do not have the facilities or background to undertake such a project independently.

Consideration of a joint venture is premature at this time. We should first carry out the additional drilling as here proposed to define and evaluate the western portion of the cupriferous zone. If you agree, please request a supplemental authorization in the amount of $150,000 for the Poston Butte Project. Forms 302-MA and 302-MB are attached.

Very truly yours,

W. E. Saegart

W. E. Saegart

WES:lab

Enclosures

cc: J.H.Courtright, w/map
Wm.L.Kurtz, " "
S.I.Bowditch, " "
K.v.d.Steinen, w/Forms 302-MA & -MB

J H

AUG 4 - 1970

New York, N.Y., July 29, 1970

Mr. C. P. Pollock

The following is an extract from the minutes of the meeting of the Advisory Committee held today:

Mining Authorization No. 0003-02
Poston Butte Project
Pinal County, Arizona

At a meeting of the Advisory Committee held on April 29, 1970, there was approved an expenditure in the amount of $105,000 (MA No. 39-70) for drilling costs and property payments at the Poston Butte Project, Pinal County, Arizona.

It was reported that Company Geologists have recommended continuing the examination of the copper mineralization zone at the Poston Butte area and they have further recommended an expenditure in the amount of $110,000 for additional drilling to deepen two holes and drill four new holes. This expenditure would also include the cost of approximately $8,500 to option certain property and to cover two years' rental of state land in the area.

There was approved an expenditure of $110,000, subject to ratification by the Board of Directors, for drilling expenses and property costs at the Poston Butte Project, Pinal County, Arizona.

J. F. Hornbostel, Jr.

FCHamrick
HCStringham - 3
WEHagart
KAvendenSteiner
JHCourtright

copy for WLK
JHC
SIB

J.H.C.
MAY - 6 1970

W.E.S.
MAY - 5 1970

+
ASARCO TUC

ASARCO NYK A

MR W E SAEGART

BOWDITCH EXECUTION CHANDLER OPTION POSTEN BUTTE AREA IS APPROVED AS REQUESTED YOUR TELEX MAY FIFTH STOP GEM PROJECT LYON COUNTY NEVADA APPROVED AS TELEPHONED YESTERDAY WILL CONFER WITH HARRY SMITH TOMORROW REGARDING AGREEMENT

COLLINS

MAY 6, 1970

+
ASARCO TUC

ASARCO NYK A
M

rec'd 11.40 am

J. H. C.
APR - 2 1970

VT+
ASARCO NYK

ASARCO TUC
MR C P POLLOCK
APRIL 1, 1970

REGARDING POSTON BUTTEN MACFARLAND REFUSES TO FURTHER DISCUSS DEAL WITH ASARCO. HE CONFIRMS THAT AN OPTION WILL BE GRANTED TO CONTINENTAL OIL. I SEE NO ALTERNATIVE TO WITHDRAWING FROM DISTRICT AND FORFEITING OTHER OPTIONS ALREADY SECURED. WE WILL KEEP ABREAST OF CONTINENTAL EXPLORATION PROGRESS.

W.E. SAEGART+
ASARCO NYK

ASARCO TUC
OB

3:30 P.M.
Pat

LC: C.P.Pollock
J.H.Courtright
Wm.L.Kurtz
S.I.Bowditch
A.C.Hall

EXPLORATION NOTE FILE - RECONNAISANCE

J. H. C.

18 1969

Location: N.W. of Florence, Pinal County

Property: Posten Butte
Area:
District: Black Water
Mt. Range:
State: Arizona

Field Check by: J.E. Kinnison and R.Cummings

Date 10/11/67

Recommended Company Interest Classification:
- [ ] First Order
- [ ] Second Order
- [ ] Inactive
- [ ] None
- [x] Technical

Conclusion: New information on exploration activity at Posten Butte

Notes on Recconnaissance:

On the east side of Posten Butte, about 1000' NE on the road that goes in from under the railroad track on the south, there is a new location notice, apparently one of a group. This is No Mad # 3, dated March 30, 1967, signed by Steve Karoly. On the ridge some 2000' to the North is a drill rig. Location pits have been dug. The No Mad # 3 runs easterly.

A geologist from Duval Corporation, David L. Stevens, came down to greet us. He says the property was brought to the attention by the prospector who owns the claims. Duval's activities are confined to the relatively unaltered northern outcrops where the granite shows a little copper stain. Mr. Stevens says that all of the land south of the power line running west (and north of Posten Butte, about 800 ft) has been withdrawn, amounting to a quarter of a section south of the power line, because of the historical importance of Posten Butte. We see that they had prepared drill locations next to our old No. 1 hole and also others to the north which are now apparently in the invalid area. The drill according to Stevens, is a Long Year model 44. Contractor is out of State.

Note: A few days after the visit above described, Art Blucher informed me that Quintana had tied up all the farmland south of the county road. Namely, England and McFarland farms.

- [ ] Map Attached

Date 3/31/69 By J.E. Kinnison

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING
PITTSBURGH 22, PENNSYLVANIA

K.Y.D.S. NOV 12 1962

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
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American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

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INVOICE DATE 11-7-62
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ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 516.' Non-Core Drilling at Florence, Arizona for period ending October 31st as per agreement.					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		PB-19	Non-core 0. 150.		150.		$5.50	$ 825.00
			Non-core 150. 350.		200.		3.50	700.00
			Non-core 350. 500.		150.		4.00	600.00
			Non-core 500. 516.		16.		4.25	68.00
								2,193.00
		Cementing						
		PB-19	Oct. 17 1 Hrs.					
			18 1 "					
			19 1 "					
			22 2 "					
			23 1 "					
			24 1 "					
			25 1 "					
			8 Hrs. @$10.00 per hr.					80.00
		Mixing Mud						
		PB-19	Oct. 17 2 Hrs.					
			18 1½ "					
			22 1 "					
			23 1½ "					

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GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

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K.V.S. NOV 12 1969

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Mixing Mud (Cont'd)					
		PB-19	Oct. 25 2 Hrs. 26 1½ " 29 2 " 31 1 "					
			12 1/2 Hrs. @$10.00 per hr.					125.00
			Materials Used Up					
		PB-19	28- Bags Mud @$2.75 ea.					77.00
			8- Bags Portland Cement @$1.50 ea.					12.00
			2- Bags Casting Plaster @$1.85 ea.					3.70
			1- Bag Quebracho					27.00
								$2,517.70

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

K. V. D. S.
NOV 12 1962

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.

CONTRACT	CODE	DATE	AT SHIP POINT
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American Smelting & Refining Co.
813 Valley National Building
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REQUESTED ROUTING

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ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 977.5' Core and Rock Bit Drilling at Florence, Arizona for period ending October 31st as per agreement.							
			Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		PB-17	Non-core	0.	150.		150.		$5.50	$ 825.00
			Non-core	150.	350.		200.		3.50	700.00
			Non-core	350.	500.		150.		4.00	600.00
			Non-core	500.	588.		88.		4.25	374.00
			NX	588.	590.		2.		6.45	12.90
			Non-core	590.	650.		60.		4.25	255.00
			Non-core	650.	800.		150.		4.50	675.00
			Non-core	800.	950.		150.		4.75	712.50
			Non-core	950.	954.		4.		5.00	20.00
			NX	954.	956.		2.		6.45	12.90
			Non-core	956.	972.		16.		5.00	80.00
			NX	972.	977.5		5.5		6.45	35.48
										4,302.78
			Cementing							
		PB-17	Oct. 8	2 Hrs.						
			9	5 "						
			10	4 "						
			11	2 "						
			16	2 "						
			17	2 "						
				17 Hrs.	@$10.00 per hr.					170.00

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GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM #133A.

JOY MANUFACTURING COMPANY

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ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Mixing Mud					
		PB-17	Oct. 8 — 2 Hrs.					
			9 — 1 "					
			10 — 2 "					
			11 — 1 "					
			12 — 1 "					
			13 — 1 "					
			16 — 2 "					
			17 — 1 "					
			18 — 1 "					
			20 — 1 "					
			22 — 1 "					
			25 — 1 "					
			15 Hrs. @$10.00 per hr.					150.00
			Materials Used Up					
		PB-17	23- Bags Portland Cement @$1.50 ea.					34.50
			1- Bag Casing Plaster					1.85
			83- Bags Drilling Mud @$2.75 ea.					228.25
			2- Bags Quebracho @$27.00 ea.					54.00
			100#- Caustic Soda					11.50
			Standby					
		PB-17	Oct. 30 — 4 1/2 Hrs. @$10.00 per hr.					45.00
			Reaming					
		PB-17	588. — 590.		2.			
			954. — 956.		2.			
					4.		3.00	12.00
								$5,009.88

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

K.V.S. NOV 12 1962

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CONTRACT	CODE			DATE	AT SHIP POINT	
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Tucson, Arizona

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ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 426.' Core and Rock Bit Drilling at Florence, Arizona for period ending October 31st as per agreement.					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		PB-15	Non-core 33. 150.		117.		$5.50	$ 643.50
			Non-core 150. 350.		200.		3.50	700.00
			Non-core 350. 451.		101.		4.00	404.00
			NX Core 451. 459.		8.		5.95	47.60
								1,795.10
		Cementing						
		PB-15	Oct. 1 — 1 Hrs.					
			2 — 1 "					
			3 — 1 "					
			15 — 1 "					
			4 Hrs. @$10.00 per hr.					40.00
		Mixing Mud						
		PB-15	Oct. 1 — 1½ Hrs.					
			2 — 1½ "					
			3 — ½ "					
			4 — 1½ "					
			5 — 1½ "					
			6 — 1 "					
			8 — 1½ "					

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

SOLD TO Inv. #97561 ASARCO

PAGE NO. 2

K.V.D.S. NOV 12 1969

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Mixing Mud (Cont'd)				COPY	
		PB-15	Oct. 9 1½ Hrs.					
			12 ½ "					
			15 1½ "					
			12 1/2 Hrs. @$10.00 per hr.					125.00
			Materials Used Up					
		PB-15	25- Bags Mud @$2.75 ea.					68.75
			6- Bags Portland Cement @$1.50 ea.					9.00
			1- Bag Casting plaster					1.85
								$2,039.70

M P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
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K.V.D.S. NOV 12 1962

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

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ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 553.' Core and Rock Bit Drilling at Florence, Arizona for period ending October 31st as per agreement.					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		PB-18	Non-core 0. 150.		150.		$5.50	$ 825.00
			Non-core 150. 350.		200.		3.50	700.00
			Non-core 350. 460.		110.		4.00	440.00
			NX Core 460. 465.		5.		5.95	29.75
			Non-core 465. 500.		35.		4.00	140.00
			Non-core 500. 551.		51.		4.25	216.75
			NX Core 551. 553.		2.		6.45	12.90
								2,364.40
		Cementing						
		PB-18	Oct. 16 6 Hrs.					
			17 2 "					
			8 Hrs. @$10.00 per hr.					80.00
		Mixing Mud						
		PB-18	Oct. 15 1½ Hrs.					
			17 1 "					
			18 1 "					
			19 3 "					
			22 ½ "					
			24 1 "					
			8 Hrs. @$10.00 per hr.					80.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM 8133A.

JOY MANUFACTURING COMPANY

SOLD TO

Inv. #97562
ASARCO

PAGE NO. 2

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Reaming					
		PB-18	460. 465.		5.		3.00	15.00
			Materials Used Up					
		PB-18	1- Bag Casting plaster					1.85
			3- Bags Portland cement @$1.50 ea.					4.50
			22- Bags Mud @$2.75 ea.					60.50
			1- Bag Quebracho					27.00
			100#-Caustic Soda					11.50
								$2,644.75

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

A. V. P. S.
NOV 12 1962

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO
American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

SHIPPED TO
Florence, Ariz.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 97560
INVOICE DATE 11-2-62
Page 1
DATE SHIPPED
SHIPPED VIA

COPY

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 161.' Core Drilling at Florence, Arizona for period ending October 31st as per agreement.					
			Prospect # From To		Total Feet		Unit Cost	Total Cost
		PB-12-A	NX 610. 771.		161.		$6.45	$1,038.45
			Cementing					
		PB-12-A	Oct. 15 1 Hrs.					10.00
			Casing					
		PB-12-A	Oct. 12 12 Hrs. 13 8 " 20 Hrs. @$10.00 per hr.					200.00
			Casing Lost					
		PB-12-A	310'- NX Casing @$2.92 per ft.					905.20
			Mixing Mud					
		PB-12-A	Oct. 1 2½ Hrs. 2 2 " 3 1½ " 4 1 " 5 5 "					

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A-

JOY MANUFACTURING COMPANY

SOLD TO: Inv. #97561 ASARCO

PAGE NO. 2

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

NOV 12 1962

COPY

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Mixing Mud (Cont'd)					
		PB-12-A	Oct. 6 — 2 Hrs. 8 — 2½ " 9 — 2½ " 10 — 5 " 11 — 1½ " 12 — 1 " 26 1/2 Hrs. @$10.00 per hr.					265.00
			Materials Used Up					
		PB-12-A	73- Bags Mud @$2.75 ea. 2- Bags Flo-Flar @$4.50 ea. 1- Bag Portland Cement					200.75 9.00 1.50 $2,629.90

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	

F. I. D. S. NOV 12 1962

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97563
INVOICE DATE 11-2-62
Page 1

SHIPPED TO: Florence, Ariz.

DATE SHIPPED

SHIPPED VIA

COPY

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 497.' Core and Rock Bit Drilling at Florence, Arizona for period ending October 31st as per agreement.							
			Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		PB-16	Non-core	63.	150.		87.		$5.50	$ 478.50
			Non-core	150.	350.		200.		3.50	700.00
			Non-core	350.	500.		150.		4.00	600.00
			Non-core	500.	533.		33.		4.25	140.25
			NX Core	533.	536.		3.		6.45	19.35
			Non-core	536.	560.		24.		4.25	102.00
										2,040.10
			Cementing							
		PB-16	Oct. 1	1 Hrs.						
			2	1 "						
			3	7 "						
			4	2 "						
				11 Hrs. @$10.00 per hr.						110.00
			Mixing Mud							
		PB-16	Oct. 1	2 Hrs.						
			2	1 "						
			4	2 "						
			5	1 "						
				6 Hrs. @$10.00 perhr.						60.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A)

JOY MANUFACTURING COMPANY

SOLD TO

Inv. #97563
ASARCO

PAGE NO. 2

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Materials Used Up					
			9- Bags Portland Cement @$1.50 ea.					13.50
			1- Bag Casting Plaster					1.85
			39- Bags Drilling Mud @$2.75 ea.					107.25
			Reaming					
		PB-16	533. 536.		3.		3.00	9.00
								$2,341.70

COPY

FORM P138A

INVOICE (CONTINUATION)

Posten Butte

OPTION FOR PURCHASE OF REAL PROPERTY

THIS AGREEMENT made and entered into this _____ day of _____, 1960, by and between

CECIL W. ENGLAND and GLORIA M. ENGLAND,
his wife, of Florence, Arizona,

first parties, hereinafter called "Optionors", and

AMERICAN SMELTING AND REFINING COMPANY,
a New Jersey corporation,

second party, hereinafter called "Optionee",

WITNESSETH:

Whereas Optionors are the owners and lessees of the property particularly described as follows:

PATENTED LAND

Southwest quarter of the Southwest quarter of Section 26;

Southwest quarter; South half of the Southeast quarter, and South half of the Northwest quarter of Section 27;

South half of the Northeast quarter of Section 33;

North half of the Southwest quarter and the South half of the Northwest quarter of Section 33, EXCEPT beginning at the quarter section corner common to Sections 32 and 33, Township 4 South, Range 9 East; running thence North 71 degrees 01 minute East a distance of 1824 feet to a point; thence North 49 degrees 58 minutes East to a point on the North line of the South half of the Northwest quarter of said Section 33; thence Westerly along the North line of the South half of the Northwest quarter of Section 33 to the Northwest corner thereof; thence Southerly along the West line of the South half of the Northwest quarter to the point of beginning;

Northwest quarter of Section 34; and

North half of the Northeast quarter and that part of the South half of the Northeast quarter described as: BEGINNING at the Northeast corner of the South half of the Northeast quarter of said Section 34; thence Southwesterly to a point which is 200 feet North of the center

of Section 34; thence Northerly along the mid-section line to the Northwest corner of the South half of the Northeast quarter of said Section 34; thence East to the place of beginning;

Northwest quarter of the Northwest quarter of Section 35, and: part of the Southeast quarter of the Southwest quarter of Section 26 and part of the Northeast quarter of the Northwest quarter of Section 35 described as follows: BEGINNING at a point on the West line of the Northeast quarter of the Northwest quarter of said Section 35, 860 feet South of the Northwest corner of said Northeast quarter of the Northwest quarter of said Section 35; thence East 130 feet to the center line of a drain ditch; thence Northerly along the center line of said drain ditch to the Northwest corner of the Southeast quarter of the Southwest quarter of said Section 26; thence South to the point of beginning.

All in Township 4 South, Range 9 East, G. & S. R. B. & M., Pinal County, Arizona, subject only to the following liens, liabilities, restrictions, exceptions and encumbrances:

1. A part of the lands above described is subject to a mortgage to the Federal Land Bank of Berkeley, to secure the principal sum of $120,000, dated the 16th day of January, 1959, recorded in the office of the County Recorder of Pinal County, Arizona, in Docket 220 at page 597, which mortgage Optionors agree to pay and discharge as the indebtedness secured thereby becomes due and payable, if this option is exercised.

2. A railroad right of way across a part of said lands held by the Southern Pacific Company.

3. Right of way for highway purposes owned by the County of Pinal crossing a part of said lands.

4. Rights of way for canals, laterals and ditches owned by San Carlos Irrigation & Drainage District which cross a part of said lands.

5. Inclusion within the boundaries of Electrical District No. 2, a municipal corporation.

6. Inclusion within the boundaries of San Carlos Irrigation Project, a municipal corporation.

7. Rights of way for electric transmission lines.

8. The effect of Resolution by the Board of Supervisors declaring rights of way for roads 33 feet wide on each side of all section lines, recorded December 30, 1922 in Book 7 of Minutes, page 386.

9. Security and lien for power service dated August 21, 1944, made and executed by Cecil W. England, a single man, to Electrical District Number Two, Pinal County, Arizona, recorded July 28, 1945 in Book 35 of Mortgages, page 489.

10. Security and lien for power service dated February 21, 1950, made and executed by Cecil W. England, a single man, to Electrical District Number Two, Pinal County, Arizona, recorded July 17, 1950 in Docket 30, page 164.

11. Security and lien for power service dated August 8, 1951, made and executed by Tom Rankin and Jessie A. Rankin, husband and wife, to Electrical District Number Two, Pinal County, Arizona, recorded March 5, 1953 in Docket 74, page 543.

12. Excepting an undivided one-half interest in and to all oil, gas, petroleum, naptha and other hydrocarbon substances and minerals of whatsoever kind and nature in the South half of the Northeast quarter of Section 33, Township 4 South, Range 9 East; and the Northwest quarter of Section 34, Township 4 South, Range 9 East.

STATE LEASED LANDS

State of Arizona Grazing Lease No. 1796 dated July 1, 1952, and expiring June 30, 1962, as follows:

North half of the Southeast quarter of Section 27; the North half of the South half of section 28; and the Southwest quarter of the Southwest quarter of Section 33, all in Township 4 South, Range 9 East, Pinal, County, Arizona.

Whereas Optionee desires to obtain an option to purchase all of said property, and

Whereas Optionors have agreed to grant such option,

NOW, THEREFORE, in consideration of the conditions, payments, provisions and terms hereinafter stated, it is mutually agreed between the parties as follows:

1. Optionors give and grant to Optionee the exclusive right and privilege of purchasing all of the property hereinabove described in the recitals of this Option for the total purchase price of $800,000.00 payable in the amounts, at the times and in the manner hereinafter provided. The initial option period herein granted shall be for the period

from the date of this Option to January 1, 1962, in consideration of which Optionee has paid to Optionors the sum of $5,000.00, receipt whereof is hereby acknowledged. If at any time before the expiration of the initial option period herein granted Optionee should desire to renew the exclusive right and privilege of purchasing said property herein granted, Optionee shall have the privilege and right of extending said option, subject to the terms and conditions hereinafter stated, for an additional period from January 1, 1962, to January 1, 1963, upon giving to Optionors at least thirty (30) day's notice in writing before January 1, 1962, of its desire to extend said option period and upon paying to Optionors an additional consideration of $5,000.00 at the time of giving said notice.

2. If Optionee elects to exercise its option to purchase said property at any time during the original term of this option or during the extended term, if the option is extended as hereinabove provided, then Optionee shall deliver to the Surety Title & Trust Company, of Florence, Arizona, as escrow agent, the sum of $200,000 less the amount of any payments theretofore made to Optionors as the consideration for this option, shall execute and deliver to said escrow agent its certain promissory note, payable to Optionors, in the principal sum of $600,000, bearing no interest, payable in annual installments as follows: $40,000 payable one year after the exercise of said option, and a like sum of $40,000 on or before the same date in each year thereafter until the full sum of $600,000 has been paid, and shall deliver to the escrow agent its good and sufficient realty mortgage therein mortgaging to Optionors all of the property described above to secure the full and faithful payment of said note for $600,000, which said mortgage shall be in the form approved by attorneys for Optionors.

3. Upon Optionee making the initial payment of $200,000 and executing, acknowledging and delivering said note and mortgage to said escrow agent, Optionors shall execute and deliver to the escrow agent their good and sufficient deed and assignment of State Grazing Lease No. 1796 therein conveying to Optionee all of the property above described.

4. If said option is exercised by Optionee as above contemplated, Optionors will purchase and have the Surety Title & Trust Company issue and deliver to Optionee an owner's policy of title insurance in the sum of $800,000, therein insuring marketable title to said property in Optionee, free and clear of all liens and encumbrances, save and except those which are specifically set forth above.

5. If and when said option is exercised and Optionors and Optionee have complied with the provisions above stated, thereupon the escrow agent shall deliver said deed, duly recorded in Pinal County, Arizona, to Optionee, and shall deliver said sum of $200,000, less any amounts theretofore received by Optionors as the consideration for said option, and the recorded mortgage to Optionors. The escrow agent shall hold said promissory note so executed by Optionee and shall not deliver the same to Optionors or any third person so long as all payments due upon said note are made by Optionee to the escrow agent for the benefit of Optionors as the same become due and payable; provided, however, that in the event Optionee should default in the payment of any annual installment as provided in said promissory note or should be in default in complying with the terms and conditions of the aforesaid mortgage given to secure said note, then said escrow agent, upon written demand of Optionors, shall deliver the aforesaid promissory note to Optionors.

6. As payments are made upon said note by Optionee the escrow

agent shall be and it is hereby authorized to first deduct and hold for payment from any annual installment so made by Optionee all sums then due or to become due on the next installment on that certain mortgage above described given by Optionors to the Federal Land Bank of Berkeley, which mortgage now constitutes a first lien on part of the property described above, and shall pay the balance of such installment, after paying the amounts so due the Federal Land Bank of Berkeley, to the Optionors.

7. All escrow fees shall be paid equally by the parties.

8. If at any time after it has exercised said option and after the payment of the first annual installment provided for in said promissory note, Optionee desires to pay said note in full and shall deliver the amount so due on its said note to the escrow agent, the escrow agent is hereby authorized and directed to pay from said funds any balance then remaining due on the mortgage held by the Federal Land Bank of Berkeley, which constitutes a first lien upon the above described property, obtain a satisfaction of said mortgage, and thereupon deliver any balance of said purchase price to the Optionors, and redeliver said promissory note for $600,000 to the Optionee, marked "Paid".

9. During said option period or any extension thereof the Optionee shall have the right to enter upon said property above described for the purpose of prospecting for minerals, to drill at any points upon said property, make geophysical examinations, and have ingress and egress to and from any points where such geophysical examinations are being made or said drilling is being performed, provided, however, that the Optionee shall be liable to the Optionors for any and all damage done to any crops growing upon said property, to the improvements thereon, or to the said real property as the result of any exploratory work so done by Optionee.

If the extent or amount of any such damage cannot be mutually agreed upon, then and in such event when the dispute arises the Optionors will appoint an arbiter and give written notice of his appointment to the Optionee, and within ten days thereafter Optionee shall appoint an arbiter and give written notice of his appointment to the Optionors, and the two so selected shall appoint a third. If the two arbiters thus selected cannot agree upon a third arbiter within twenty days, then and in such event the Judge of the Superior Court of Pinal County, Arizona, is authorized to appoint the third arbiter. When a third arbiter has been appointed the arbiters shall conduct a hearing, after giving written notice to the parties of the time and place of such hearing. Upon such hearing being concluded the arbiters shall make their award and the decision of any two of the arbiters shall be final and binding upon the parties. The cost of arbitration shall be borne equally by the parties. Any party feeling himself aggrieved by the decision of the arbiters may within thirty (30) days thereof appeal said decision to the Superior Court of Pinal County, Arizona.

10. If Optionee shall exercise its option and acquire title to said property, then if Optionee desires to lease any of said property Optionors shall have the preferred right to lease, from year to year, so much of said property as Optionee desires to lease at a rental rate to be agreed upon by both parties but not to exceed the prevailing rental rates for like properties in the area.

11. Optionee agrees that if said option is exercised at other than the end of a crop year, then Optionors shall have the right to continue in possession of the property covered by any crops until they can be harvested. Optionee agrees to execute any and all necessary

documents or instruments which Optionors may require for crop financing.

12. This option shall be placed in escrow with the Surety Title Guarantee Company of Florence, Arizona, designated as the escrow agent for the parties hereto, and the parties agree to execute and deliver to said escrow agent all instruments or documents necessary to effect this option, including a quit-claim deed from Optionee to Optionor to be recorded in the event Optionee does not exercise this option.

13. The covenants and conditions herein contained shall extend to and be binding upon the heirs, administrators, executors and assigns of Optionors and Optionee.

IN WITNESS WHEREOF, Optionors have hereunto set their hands, and Optionee has caused its corporate name to be hereunto subscribed and its corporate seal to be hereunto affixed and attested by its duly authorized officers, in duplicate counterparts, as of the day and year first above written.

_____

_____
Optionors

AMERICAN SMELTING AND REFINING COMPANY

By: _____
Vice President
Optionee

Attest:

_____
Secretary

STATE OF ARIZONA)
) ss.
COUNTY OF)

On this the _____ day of _____, 1960, before me, the undersigned officer, personally appeared CECIL W. ENGLAND and GLORIA M. ENGLAND, his wife, known to me to be the persons whose names are subscribed to the within instrument and acknowledged that they executed the same for the purpose therein contained.

In witness whereof I hereunto set my hand and official seal.

My commission expires:

_____
Notary Public

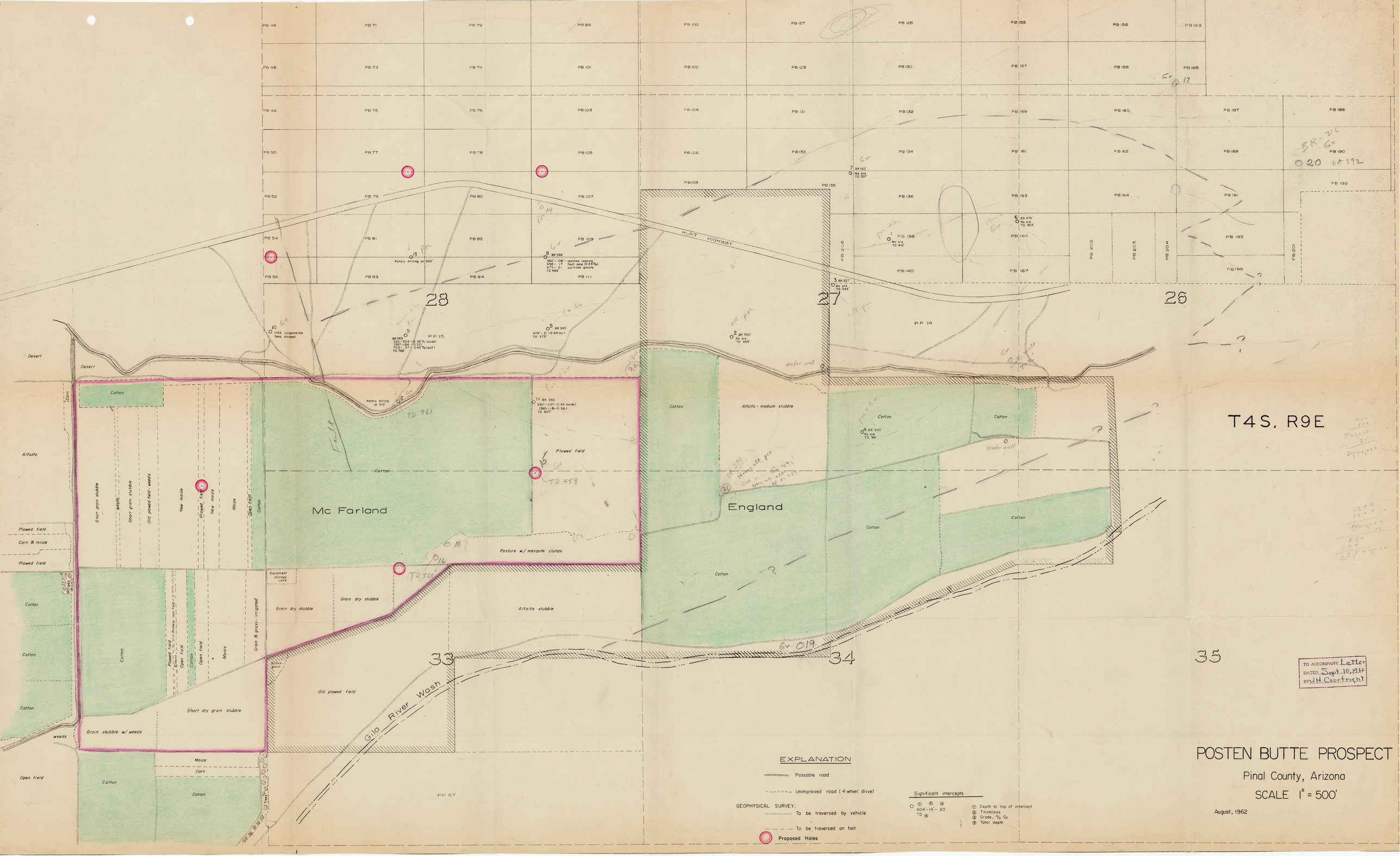
STATE OF NEW YORK)
) ss.
COUNTY OF)

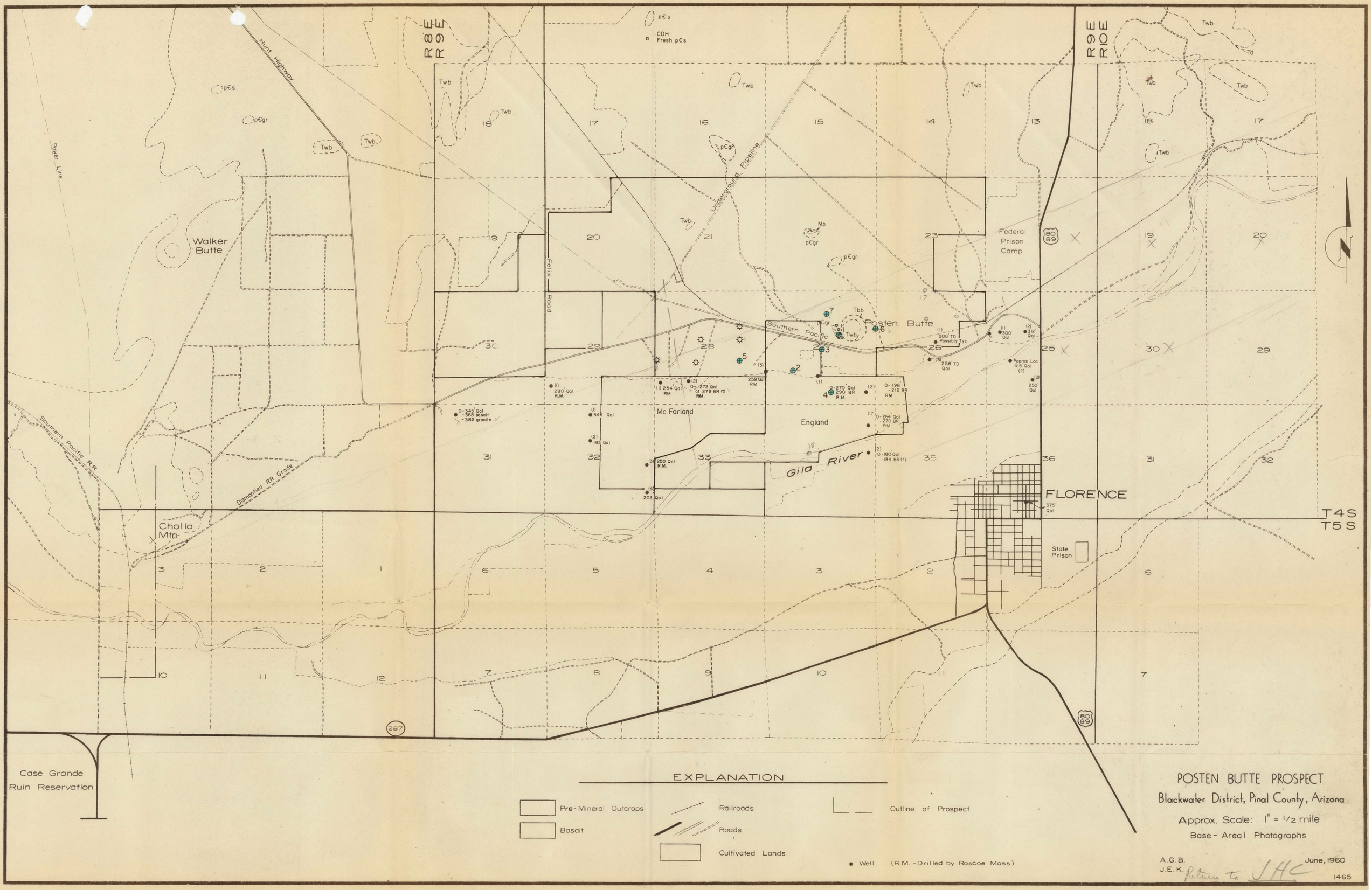
On this the _____ day of _____, 1960, before me, the undersigned officer, personally appeared _____ _____ and _____, who acknowledged themselves to be the _____ and _____, respectively, of AMERICAN SMELTING AND REFINING COMPANY, a New Jersey corporation, and that they, as such officers, being authorized so to do, executed the foregoing instrument for the purposes therein contained.

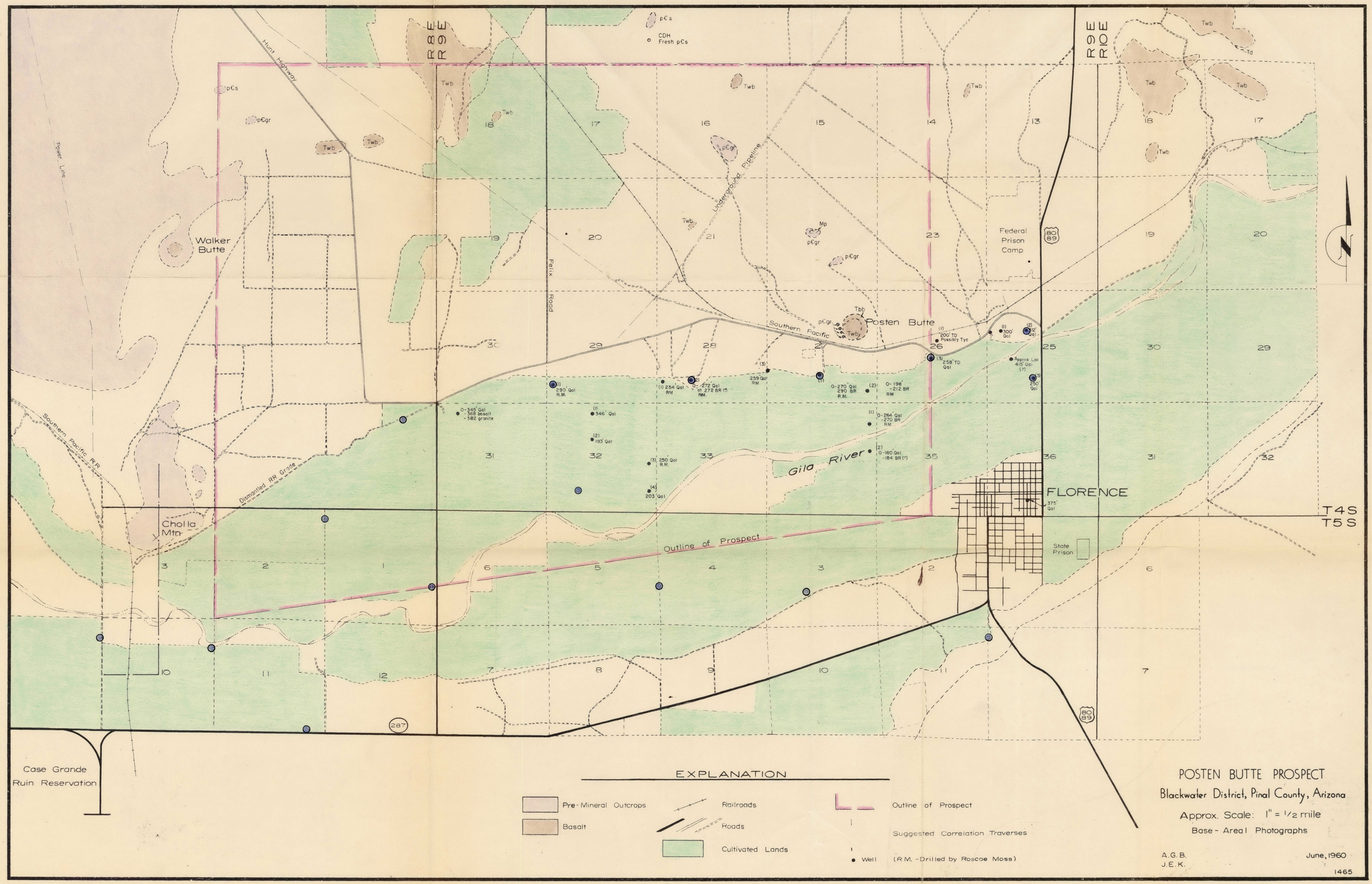
In witness whereof I hereunto set my hand and official seal.

My commission expires:

_____
Notary Public


T4S, R9E
28
27
26
33
34
35
HUNT HIGHWAY
Mc Farland
England
Gila River Wash
Cotton
Alfalfa - medium stubble
Plowed field
Pasture w/ mesquite clumps
Grain dry stubble
Alfalfa stubble
Old plowed field
Short dry grain stubble
Grain stubble w/ weeds
Equipment storage yard
Water well
Desert
Alfalfa
Corn & maize
Open field
Maize
Corn
PP 14
PP 15
PP 67
TO ACCOMPANY Letter
DATED Sept. 10, 1962
BY J.H. Courtright
EXPLANATION
Possable road
Unimproved road (4 wheel drive)
GEOPHYSICAL SURVEY:
To be traversed by vehicle
To be traversed on foot
Proposed Holes
Significant intercepts
① Depth to top of intercept
② Thickness
③ Grade, % Cu
④ Total depth
POSTEN BUTTE PROSPECT
Pinal County, Arizona
SCALE 1" = 500'
August, 1962


R8E
R9E
R10E
T4S
T5S
Hunt Highway
Power Line
Walker Butte
Southern Pacific RR
Dismantled RR Grade
Cholla Mtn
Case Grande Ruin Reservation
Felix Road
Underground Pipeline
Southern Pacific
Posten Butte
Mc Farland
England
Gila River
Federal Prison Camp
FLORENCE
State Prison
CDH Fresh p€s
EXPLANATION
Pre-Mineral Outcrops
Basalt
Railroads
Roads
Cultivated Lands
Outline of Prospect
Well (R.M. - Drilled by Roscoe Moss)
POSTEN BUTTE PROSPECT
Blackwater District, Pinal County, Arizona
Approx. Scale: 1" = 1/2 mile
Base - Areal Photographs
A.G.B.
J.E.K.
June, 1960
1465


R8E
R9E
R9E
R10E
Hunt Highway
Power Line
Walker Butte
Southern Pacific R.R.
Dismantled RR Grade
Cholla Mtn
Case Grande Ruin Reservation
Felix Road
Underground Pipeline
Southern Pacific
Posten Butte
Federal Prison Camp
Gila River
Outline of Prospect
FLORENCE
State Prison
T4S
T5S
EXPLANATION
Pre-Mineral Outcrops
Basalt
Railroads
Roads
Cultivated Lands
Outline of Prospect
Suggested Correlation Traverses
Well (R.M. - Drilled by Roscoe Moss)
POSTEN BUTTE PROSPECT
Blackwater District, Pinal County, Arizona
Approx. Scale: 1" = 1/2 mile
Base - Areal Photographs
A.G.B.
J.E.K.
June, 1960
1465

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

K. R.

August 1, 1962

AUG 2 - 1962

MEMORANDUM FOR MR. KENYON RICHARD

POSTON BUTTE DRILLING
JULY, 1962

Joy Manufacturing Company moved two of their drills, a rotary drill and a 22HD truck-mounted core drill, into the Poston Butte area on July 9. Actual drilling was started on July 11 by both drills.

The following is a summary of the drilling during July:

Hole P.B.-8 Total Drilling - 350 feet

0-344'	Rotary drilling with 4½" rockbit
344-350'	NX core drilling with rotary drill
Casing set to 350'	

The six foot core run yielded approximately one foot of core which was strongly altered granite with some live limonite. Bedrock is estimated at 334 feet.

Hole P.B.-9 Total Drilling - 510 feet

0-380'	Rotary drilling with 4½" rockbit
380-385'	NX core with rotary rods
385-510'	Core with NXWL

Bedrock is estimated at 365 feet.

The rock cored with the wire-line drill, 125' from 385' to 510', is a weakly altered, coarse grained granite containing oxide copper, apparently largely within plagioclase feldspar. Assays on the first 90' range from 0.21% Cu to 0.85% Cu and average about 0.4%.

Hole P.B.-10 Total Drilling - 353'

0-353'	Rotary drilling with 4½" rockbit

The entire footage has been in the Gila River gravels.

Total Drilling

Rockbit	1077'
Coring (NX & NXWL)	136'
Total	1213'

R. K. Kirkpatrick

R. K. KIRKPATRICK

RKK/kw

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 26, 1962

K. R.

JUL 26 1962

MEMORANDUM FOR MR. K. E. RICHARD

POSTON BUTTE PROSPECT

Attached is an estimate of the actual cost to Joy Manufacturing Co. to drill and case the first 2 holes to bedrock on the Poston Butte Prospect. This is a bare cost and does not include any profit margin. As you can see, they came close to a break-even point in spite of the difficulties encountered initially.

Estimated Cost to Joy Mfg.Co. to Drill Holes PB-8 & PB-9 to Bedrock and Set Casing:

PB-8

Rotary Drill:	Est. cost/shift $110	
	13 shifts to drill to 350 & case	$1430.
	3 rockbits @ $45.	135.
	Total est. cost to Joy	$1565.
	Items for which Joy will be paid:	
	0-200 200' @ 3.50/ft.	$ 700.00
	200-344 144' @ 4.25/ft.	610.00
	344-350 6' @ 5.95/ft. (core)	35.75
	344-350 6' @ 3.00/ft. (ream)	18.00
	Mixing mud, casing 11½ hrs.@ $10/hr.	115.00
	Total cost to Asarco	$1478.75

(not included is the cost of mud materials for which Joy Mfg. Co. will be reimbursed at cost of approximately $45.80)

PB-9

Core Drill:	Est. cost/shift $110	
	14 shifts to drill to 385 & case	$1540.
	4 rockbits @ approx. $45.	180.
	Total est. cost to Joy	$1720
	Items for which Joy will be paid:	
	0-200 200' @ 3.50/ft.	$ 700.00
	200-350 150' @ 4.25/ft.	637.50
	350-380 30' @ 5.00/ft.	150.00
	380-385 5' @ 5.95/ft.	29.75
	Mixing mud, cementing, casing 21hrs. @ $10/hr.	210.00
	Total cost to Asarco	$1727.25

(not included is the cost of mud materials & cement for which Joy Mfg. Co. will be reimbursed at cost of approximately $46.05)

Joseph R. Wojcik

JRW/kw
cc: JEKinnison
RKKirkpatrick

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

KR

K. V D. S.

OCT 11 1962

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE 75			DATE	AT SHIP POINT	

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~PERMISSIBLE 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97498
INVOICE DATE 10-4-62
Page 1

SHIPPED TO: Florence, Ariz.

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

COPY

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 350.' Core Drilling at Florence, Arizona for period ending September 30th as per agreement.					
			Prospect # / From / To		Total Feet		Unit Cost	Total Cost
		PB-14	Non-Core 0. 150.		150.		$5.50	$ 825.00
			Non-Core 150. 345.		195.		3.50	682.50
			NX Core 345. 350.		5.		5.95	29.75
								1,537.25
			Mixing Mud					
		PB-14	Sept. 13 1½ Hrs.					
			14 1½ "					
			15 1 "					
			17 2 "					
			18 2 "					
			19 2 "					
			20 1 "					
			21 2 "					
			22 1½ "					
			24 2 "					
			25 ½ "					
			17 Hrs. @$10.00 per hr.					170.00
			Mud Used Up					
		PB-14	36- Bags @$2.75 ea.					99.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A

JOY MANUFACTURING COMPANY

Inv. #97498
Am. Smelting & Refining Co.

PAGE NO. 2

K. V. D. S.
OCT 11 1962

SOLD TO

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		Cementing						
		PB-14	Sept. 14 1 Hrs. 15 2 " 17 1 " 19 1 " 5 Hrs. @$10.00 per hr.					50.00
		Cement Used Up						
		PB-14	7- Bags Portland Cement @$1.50 ea. 4- Bags Casting Plaster @$1.85 ea.					10.50 7.40
								$1,874.15

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING
PITTSBURGH 22, PENNSYLVANIA

K. V. D. S.
OCT 11 1962

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO
American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 97499
INVOICE DATE 10-4-62 Page 1
DATE SHIPPED
SHIPPED VIA

SHIPPED TO
Florence, Ariz.

P. O. ADDRESS

MARKS

COPY

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 513.' Core Drilling at Florence, Arizona for period ending September 30th as per agreement.					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		PB-12A	Non-Core 56. 150.		94.		$5.50	$ 517.00
			Non-Core 150. 350.		200.		3.50	700.00
			Non-Core 350. 500.		150.		4.00	600.00
			Non-Core 500. 530.		30.		4.25	127.50
			NX Core 530. 610.		80.		6.45	516.00
								2,460.50
		Mixing Mud						
		PB-12A	Sept. 17 1½ Hrs.					
			20 2 "					
			24 2 "					
			26 6 "					
			27 4½ "					
			28 3 "					
			25 ½ "					
			21 Hrs. @$10.00 per hr.					210.00
		Casing						
		PB-12A	Sept. 21 3 Hrs. @$10.00 per hr.					30.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS

JOY MANUFACTURING COMPANY

SOLD TO: Inv. #97499
Am. Smelting & Refining Co.

PAGE NO. 2

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

D. S.
OCT 1 1 1962

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Cementing					
		PB-12A	Sept. 27 1 Hrs.					
			28 5 "					
			29 7 "					
			13 Hrs. @$10.00 per hr.					130.00
			Mud and Additives Used Up					
		PB-12A	50- Bags Mud @$2.75 ea.					137.50
			1- Bag Bayrite					2.75
			1- Bag Quebracho					27.00
			100- Lbs. Caustic Soda					11.50
			Cement Used Up					
		PB-12A	4- Bags Portland Cement @$1.50 ea.					6.00
			1- Bag Casting Plaster					1.85
								$3,017.10

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

V. D. S.
OCT 11 1962

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO

American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 97500
INVOICE DATE 10-4-62
Page 1

SHIPPED TO

Florence, Ariz.

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

COPY

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 417.' Core Drilling At Florence, Arizona for period ending September 30th as per agreement.					
			Prospect # / From / To		Total Feet		Unit Cost	Total Cost
		PB-13	Non-Core 0. 150.		150.		$5.50	$ 825.00
			Non-Core 150. 350.		200.		3.50	700.00
			Non-Core 350. 410.		60.		4.00	240.00
			NX Core 410. 417.		7.		5.95	41.65
								1,806.65
		Mixing Mud						
		PB-13	Sept. 5 1½ Hrs.					
			8 2 "					
			3 1/2 Hrs. @$10.00 per hr.					35.00
		Cementing						
		PB-13	Sept. 5 2 Hrs.					
			11 ½ "					
			2 1/2 Hrs. @$10.00 per hr.					25.00
		Casing						
		PB-13	Sept. 8 1½ Hrs.					
			10 5 "					
			11 2 "					
			8 1/2 Hrs. @$10.00 per hr.					85.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A-

JOY MANUFACTURING COMPANY

SOLD TO: Inv. #97500
American Smelting & Refining Co.

PAGE NO. 2

K. V. D. S.
OCT 1 1 1962

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		Mud Used Up						
		PB-13	8 Bags @$2.75 ea.					22.00
		Cement Used Up						
		PB-13	1- Bag Portland Cement					1.50
			1- Bag Casting Plaster					1.85
								$1,977.00

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

K. V. D. S.
OCT 11 1962

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

SHIPPED TO: Florence, Ariz.

~~[illegible]~~ NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97501

INVOICE DATE 10-4-62

DATE SHIPPED

SHIPPED VIA

COPY

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 23.' Core Drilling at Florence, Arizona for period ending September 30th as per agreement.							
			Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		PB-11	NX	584.	607.		23.		$6.45	$148.35
			Cementing							
		PB-11	Sept. 4	1/2 Hr. @$10.00 per hr.						5.00
			Casing							
		PB-11	Sept. 4	4 Hrs. @$10.00 per hr.						40.00
			Cement Used Up							
		PB-11	1 Bag Portland Cement							1.50
										$194.85

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(a)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~[illegible]~~ NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97510

INVOICE DATE 10-16-62

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Florence, Ariz.

COPY

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 33.' Non-Core Drilling at Florence, Arizona for period ending September 30th as per agreement.					
		Prospect #	From To		Total Feet		Unit Cost	Total Cost
		PB-15	Non-Core 0. 33.		33.		$5.50	$181.50
		Mixing Mud						
		PB-15	Sept. 28 3 Hrs. 29 1½ "					
			4 1/2 Hrs. @$10.00 per hr.					45.00
		Mud Used						
		PB-15	13- Bags @$2.75 ea.					35.75
		Cementing						
		PB-15	Sept. 29 1½ Hrs. @$10.00 per hr.					15.00
		Cement Used						
		PB-15	2- Bags Portland Cement @$1.50 ea.					3.00
								$280.25

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO

American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97511

INVOICE DATE 10-15-62

SHIPPED TO

Florence, Ariz.

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

COPY

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 63.' Non-Core Drilling at Florence, Arizona for period ending September 30th as per agreement.					
		Prospect #	From To		Total Feet		Unit Cost	Total Cost
		PB-16	Non-Core 0. 63.		63.		$5.50	$346.50
		Mixing Mud						
		PB-16	Sept. 28 4 Hrs. 29 2 " 6 Hrs. @$10.00 per hr.					60.00
		Cementing						
		PB-16	Sept. 28 3 Hrs. 29 4 " 7 Hrs. @$10.00 per hr.					70.00
		Mud and Additives Used						
		PB-16	36- Bags Mud @$2.75 ea. 1- Bag Quebracho 100#-Caustic Soda					99.00 27.00 11.50
		Cement Used						
		PB-16	5- Bags Portland Cement @$1.50 ea. 1- Bag Casting Plaster					7.50 1.85
								$623.35

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97512
INVOICE DATE 10-15-62
Page 1

SHIPPED TO: Florence, Ariz.

DATE SHIPPED

SHIPPED VIA

COPY

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 372.' Core End Rock Bit Drilling at Florence, Arizona for period ending September 30th as per agreement.							
			Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		PB-10	Non-Core	1066.	1100.		34.		$5.50	$ 187.00
			Non-Core	1100.	1130.		30.		6.00	180.00
			NX Core	1130.	1133.		3.		6.45	19.35
			Non-Core	1133.	1242.		109.		6.00	654.00
			NX Core	1242.	1247.		5.		6.45	32.25
			Non-Core	1247.	1250.		3.		6.00	18.00
			Non-Core	1250.	1385.		135.		6.50	877.50
			NX Core	1385.	1394.		9.		6.45	58.05
			Non-Core	1394.	1400.		6.		6.50	39.00
			Non-Core	1400.	1432.		32.		7.00	224.00
			NX Core	1432.	1438.		6.		6.45	38.70
										2,327.85
		Reaming								
		PB-10	NX	1130.	1133.		3.			
			NX	1242.	1247.		5.			
			NX	1385.	1394.		9.			
							17.		3.00	51.00
		Mixing Mud								
		PB-10	Sept. 13	1½ Hrs.						
			14	½ "						

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A

JOY MANUFACTURING COMPANY

SOLD TO: Inv. 97512
ASARCO

PAGE NO. 2

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			Mixing Mud (Cont'd)					
		PB-10	Sept. 18 1 Hrs. 19 3 " 20 1 " 21 1 " 24 1 " 25 1 " 10 Hrs. @$10.00 per hr.					100.00
			Mud and Additives Used					
		PB-10	52- Bags Mud @$2.75					143.00
			1- Bag Quebracho					27.00
			Mobilization					
			#250 Drill and Equipment					450.00
								$3,098.85

COPY

FORM P138A

INVOICE (CONTINUATION)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	75					

SOLD TO: American Smelting & Refining Co.
813 Valley National Building
Tucson, Arizona

~~TERMS OF DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97459

INVOICE DATE 9-25-62

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Twin Buttes near
Tucson, Ariz.

P. O. ADDRESS

REMARKS

COPY

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 499.' Drilling at Twin Buttes near Tucson, Arizona for period ending September 20th as per agreement.							
			Prospect #	From	To		Total Feet		Unit Cost	Total Cost
			CH-11	Non-core	355.		45.		$3.50	$ 157.50
				Non-core	400.		200.		4.00	800.00
				Non-core	600.		127.		4.75	603.25
				NX Core	727.		8.		6.45	51.60
				Non-core	735.		35.		4.75	166.25
				NX Core	770.		12.		6.45	77.40
				Non-core	782.		18.		4.75	85.50
				Non-core	800.		34.		5.50	187.00
				NX Core	834.		20.		6.45	129.00
										2,257.50
			Reaming							
			CH-11	NX	727.		8.			
				NX	770.		12.			
							20.		3.00	60.00
			Drilling Mud Used Up							
			CH-11	13 Bags @$2.75 ea.						35.75
			Mixing Mud							
			CH-11	8 1/2 hrs. @$10.00 per hr.						85.00
						WORK COMPLETED				$2,438.25

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 13, 1961

MEMORANDUM FOR KENYON RICHARD

McFARLAND CHURN DRILL HOLE
Poston Butte Prospect
Pinal County, Arizona

On the 30th of August Mr. C. W. England called to inform us that cuttings from a well being drilled on the McFarland farm carried abundant "pieces of turquoise" and that we should send a geologist immediately. The McFarland property is just south of the block of state claims in which our drillhole PB 5 is located and its acquisition is the next contemplated step in the exploration of the Poston Butte Prospect. Because of this it was decided that a visit to the well should be delayed a week or so and should be made as casually as possible.

On Friday, September 8th, I accompanied Mr. England to the McFarland well. Following are the pertinent data:

(1) The well is located about one-half mile S 70 W of PB 5 and about 300 feet south of our present property line (south of the westernmost tier of state and federal claims).

(2) According to the driller the well is presently at about 500 feet and is cased 30" to 430 feet. It "hardened up" at 380 feet and became very hard at about 420 feet. When McFarland was told by the driller that they were in bedrock and that he was losing money, McFarland said to continue the hole on a straight hourly pay basis. At present they are making about 8 feet per day.

(3) According to Mr. England, the "turquoise" began to show in the cuttings at about 380 feet. He gathered three samples between 380 and 430 feet which he gave to me along with several large fragments gathered after they drove the casing to 430 feet.

I have examined the cuttings and specimens taken by England and the sample I took while at the well. From these it would appear that an approximate log of this hole is: 0' to 380' - Gila gravels; 380' to 420' - Conglomerate with chrysocolla fragments; 420' to 500' - Altered and mineralized granite, oxidized and leached. A description of these samples follows.

In the samples which according to England came from between 380 and 430 feet most of the fragments are granitic or porphyritic with a few foreign fragments, principally rhyolite of schist. There are a few fragments---about 3 or 4 to the handful---of hard bluish-green chrysocolla. Most of these are subrounded to sub-angular. Many of the granitic fragments show evidence of alteration and mineralization, and a few contain copper-stained feldspars.

Memo for Kenyon Richard
McFarland Churn D.H. - Poston Butte

September 13, 1961

The large fragments which are said to have been bailed after driving the casing to 430 feet are weakly to moderately altered granite. Some of the limonite-filled veinlets may represent weak copper mineralization, but there are no thick veinlets of limonite-after-chalcocite.

In the sample I took there are no foreign fragments and only a few chips of chrysocolla. There were no sulfides in any of the samples or specimens.

The new information gained from this drillhole is important for several reasons. It demonstrates a continuation of alteration and copper mineralization at least one-half mile farther west than our most westerly drillhole, and to within one claim length of our present western boundary. The large fragments of granite from 430 feet---presumably bedrock---and my sample of the cuttings from 500 feet suggest sub-economic mineralization beneath this well. The chrysocolla fragments in the conglomerate are similar to the chrysocolla which occurred in veinlets in the leached capping at our drillhole PB 5 and may have eroded from a zone of stronger copper mineralization to the north. The evidence supporting this thesis is tenuous; however, both the presence of schist fragments and the probable dip of the bedrock surface indicate a southerly movement of conglomerate fragments. A third aspect of immediate importance is the possibility that this "well" might reach sulfides recognizable to England and McFarland and further jeopardize our bargaining position.

During my visit with England, we also discussed the distribution of ground-water beneath his property as it is shown by our drilling and geophysical results. He is cognizant of the fact that his farm is situated on a shallow granite pediment, and that a small drop in the static water table might leave him with dry wells. The same situation exists on the McFarland farm. England made the statement, "If he (McFarland) doesn't get a good well out of this he'll be a lot easier to deal with." Whether or not this drillhole of McFarland's is solely for water, or is intended also to test bedrock for copper, I feel that both England and McFarland are concerned for the value of their property as farms, and that our bargaining position is a favorable one.

ORIGINAL SIGNED BY
ARTHUR G. BLUCHER, JR.

A. G. BLUCHER, JR.

AGB/z

JHC

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

J. H. C.

SEP 9 1961

June 12, 1961

Mr. C. P. Pollock, Exploration Manager
American Smelting and Refining Company
120 Broadway
New York 5, New York

Report on the
Poston Butte Project

Dear Sir:

Mr. Blucher's report and maps on the Poston Butte drilling are not yet complete, but very nearly so. I am writing this now as a transmittal of that report because I will be leaving shortly, and it will be sent to you directly when it is finished within a few days.

All of us here, including Mr. Saegart, have considered these drilling results very carefully. In this connection I have asked Mr. Blucher to report in considerable detail, even to the point of including a certain amount of theorizing. Also, Mr. Saegart will write a portion of Mr. Blucher's text dealing with geophysical considerations. The geophysicists have changed their techniques in certain respects, and this will have a bearing on our recommendations. Mr. Blucher's text and maps will contain some duplication of earlier material. The reason for this is that I would like to have this report represent a "package" which will reduce the need for reference to earlier reports and correspondence.

Although only a few ore grade intercepts were cut, the 7 wide-spaced holes drilled all encountered various altered and mineralized rocks of a typical porphyry copper deposit, and the porphyry body itself is shown to be large. The important point here is that we do not yet know the limits of the mineralized zone. It could be of major proportions as bedrock is concealed for several miles beyond all drill holes. The best hole was PB 5, located at the extreme west end of our drilling area. In addition to chalcocite, it showed stronger values in primary chalcopyrite. This latter feature is important. More drill-holes are needed to determine if this mineralization improves farther to the west or southwest. Mr. Saegart's improved I.P. survey techniques should be extended in that direction as a possible guide to location of additional holes. However, there is a need for additional holes more-or-less regardless of the I.P. results because we may be dealing with primary ore at depths beyond certainty of I.P. response.

This possible extension leads immediately into property held by Mr. MacFarland, as can be noted on the maps accompanying Mr. Blucher's report. We have already determined that we cannot run I.P. surveys on this property without at least some advance negotiation with MacFarland. You may recall that Mr. Wilson made a preliminary approach to MacFarland and found his ideas exhorbitant. We have reason to think that MacFarland's ideas might become more reasonable with time.

Mr. C. P. Pollock
Report on the Poston Butte Project

June 12, 1961

It is my suggestion that this entire project be held in abeyance until later this year, at which time specific authorizations for additional drilling and geophysical work will be requested.

Yours very truly,

Original Signed By
K. Richard

KENYON RICHARD

KR/z
Encl.
cc, w/encl: DJPope
RJLacy
JHCourtright
AGBlucher
WESaegart

File copy routed to:
TASnedden
ACHall

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona
April 4, 1961

K. R.
APR 4 1961

FILE MEMORANDUM

POSTON BUTTE DRILLING
Month of March, 1961

Drilling continued on the Poston Butte prospect with a truck mounted Joy wire line diamond drill rig. A Failings rotary rig was used for the overburden drilling on PB 6.

Advances on 2 holes are summarized below:

PB 5 407' total drilling

Rock bit	166' - 350'	184'	25 sacks mud
Core NX wl	350-500'	150'	2 sacks Cal Seal
Core NX wl	500-573'	73'	2 sacks Portland
9 hours mixing mud			1 sack Lumnite
2 hours Cementing time			10 lbs Quebracho
5 hours Casing time			5 lbs Caustic

PB 6 809' total drilling

Rock bit	0' - 680'	680'	30 sacks mud
Core NX wl	680-809'	129'	2 sacks Cal Seal
9 hours mixing mud			1 sack Portland
2 hours Cementing time			10 lbs Quebracho
30 hours Casing & fishing time			5 lbs Caustic
17 Joints N casing (340')			

ORIGINAL SIGNED BY
ARTHUR G. BLUCHER, JR.
ARTHUR G. BLUCHER, JR.

AGB/ds
cc: WGKellogg

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 2, 1961

T A S
MAR 6 1961

MEMORANDUM FOR KENYON RICHARD

POSTON BUTTE PROJECT
Diamond Drilling
Pinal County, Arizona

A. C. H.
MAR 6 1961

Diamond drill hole PB 2 at Poston Butte has been stopped at a depth of 465 feet. This hole is approximately 2500 feet S 60 W from PB 1 and is in the western end of the southern lobe of the IP anomaly. It was collared in topsoil and was drilled through 327 feet of Gila River gravels and 28 feet of moderately indurated granite conglomerate before encountering altered monzonite porphyry bedrock at 355 feet. The first run with an NX diamond bit, from 370 feet to 374 feet, produced core showing intensely altered porphyry with several thick veinlets of typical limonite-after-chalcocite. Below 374 feet the rock was less altered and most limonites were indicative of pyritic mineralization. At 391 feet a thick fault was penetrated beneath which the porphyry was weakly mineralized by pyrite and some chalcocite replacing pyrite. This zone of secondary enrichment was less than 15 feet thick and the highest assay was 0.18% Cu. Below 410 feet mineralization consisted of pyrite and occasional very weak chalcopyrite in weakly to moderately altered monzonite porphyry. The highest assay in the primary zone was 0.11% Cu and the hole was bottomed in material assaying less than 0.05% Cu.

Although the mineralized porphyry encountered in this drill hole is typical of that found in most porphyry copper occurrences, the degree of alteration and mineralization is quite low. The percentage of total sulphide was less than 3% and, except for the upper portion of the leached capping, alteration consisted of partial sericitization of the feldspars and groundmass and occasional chloritization of the biotite. Neither the alteration nor the mineralization of this rock appears to be equivalent to the leached capping encountered in the first coring run. A composite sample from the sulphide zone assayed 0.005 oz Au, 0.2 oz Ag, and Tr Mo.

A total of 10 drilling shifts were required for this hole -- 6 shifts rockbitting (370 feet) and 4 shifts coring NX (95 feet). Core recovery averaged about 65%. The total direct cost of this hole was about $1850. Indirect costs amounted to about $800.

ORIGINAL SIGNED BY
ARTHUR G. BLUCHER, JR.
A. G. BLUCHER

AGB/ds
cc: CPPollock
DJPope
TASnedden
RJLacy
WESaegart

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 2, 1961

MAR 6 1961

MEMORANDUM FOR KENYON RICHARD

POSTON BUTTE
Diamond Drilling
Pinal County, Arizona

A. C. H.
MAR 6 1961

Diamond drill hole PB 3 at Poston Butte has been stopped at a depth of 343 feet. This hole is approximately 1000 feet southwest of PB 1 and is near the center of the southern lobe of the IP anomaly. It was collared in topsoil and penetrated 228 feet of Gila River gravels and 115 feet of altered and mineralized monzonite porphyry. Sulphides were encountered at 282 feet and consisted of pyrite and very weak chalcopyrite in moderately altered monzonite porphyry. The uppermost sulphide sample, 282 feet to 287 feet, contained chalcocite replacing pyrite and assayed 0.22% Cu. Below 287 feet the protore averaged less than 0.10% Cu with the highest assay being 0.14% Cu.

The porphyry encountered in this hole is similar, both in mineralization and in the general absence of a secondarily enriched chalcocite zone, to that found in PB 2. The slightly higher tenor of the protore probably reflects a slightly higher percentage of total sulphide mineralization. This was determined by mechanical separation of the sulphides to be about 3 1/2%. A composite sample assayed Tr Au, 0.2 oz Ag, and 0.002% Mo.

A total of 10 drilling shifts were required for the hole -- 7 shifts rockbitting (240 feet) and 3 shifts coring NX (103 feet). Core recovery averaged about 60%. The total direct cost of this hole was about $1725. Indirect costs amounted to about $750.

ORIGINAL SIGNED BY
ARTHUR G. BLUCHER, JR.
A. G. BLUCHER

AGB/ds

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 1, 1961

FILE MEMORANDUM

POSTON BUTTE DRILLING
Month of January, 1961

Drilling on the Poston Butte prospect was started on January 11th with a truck mounted Joy wire line diamond drill rig. On January 28th a Portadrill rotary rig was moved onto PB 2 when it became apparent that the Joy drill was too light for rockbit drilling in the alluvium.

Advances on 3 holes are summarized below:

			Cement, Conditioner & Mud
PB 1	410.4' total drilling		
Core NX wl	0 - 410.4	410.4'	30 sacks mud
Bottom			
PB 2	374' total drilling		
Rock bit	0 - 370	370'	20 sacks mud
Core NX wl	370 - 374	4	3 sacks cement
5 hrs cementing and 2 hrs mixing mud			½ sack conditioner
4 hrs casing			10 lbs Caustic Soda
PB 3	30' total drilling		
Rock bit	0 - 30	30'	7 sacks mud
			5 lbs Caustic Soda

A. G. BLUCHER

AGB/ds

Ae-16A.2.0A
JHC

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 1, 1961

MEMORANDUM FOR K. E. RICHARD

POSTON BUTTE PROJECT
Diamond Drilling
Pinal County, Arizona

Diamond drill hole PB 1 at Poston Butte has been stopped at a depth of 410.4 feet. With the exception of a 22 foot section of diabase at about 300 feet and 3½ feet of andesite or diabase at about 400 feet it has been drilled in coarse-grained granite throughout. It encountered about 200 feet of leached capping. Beneath this was about 70 feet of secondarily enriched sulphides with an average grade of about 0.35% Cu. Beneath this zone mineralization consisted of disseminated and veinlet pyrite and occasional very weak chalcopyrite with an average grade of about 0.07% Cu. Below 350 feet partly oxidized ground was again encountered and at about 360 feet a lower chalcocite-pyrite zone was penetrated. This enriched zone was about 30 feet thick and resembled the upper zone in having a tenor of about 0.20% Cu with a few higher grade samples bringing the average grade to about 0.30% Cu. The hole was bottomed in altered diabase or andesite containing less than 0.02% Cu.

Although there were occasional short intercepts of intense alteration, most of the rock above 390 feet shows only slight to moderate alteration; i.e., most orthoclase feldspars are fresh, plagioclase feldspars are partly sericitized, biotite is moderately altered or fresh. Below 390 feet the granitic textures are for the most part obscured by silicification and chloritization and there appears to be a sharp increase in pyrite.

At 50 feet, 250 feet, and 400 feet there were encountered thick, gougy fault zones. These appear to be pre-mineral structures with post-mineral movement and in most cases they mark changes in alteration and mineralization. The higher grade segments of the hole coincide with some of these faults.

The calculated per cent of total sulphide based on Fe, Cu, and S assays of two composite samples was 6.5% and 3.9%. A third composite of all sulphide samples was assayed for gold, silver, and molybdenum and showed Au Tr, Ag 0.1 oz, and 0.002% Mo. The water level in the hole stood at about 150'.

A total of 12 drilling shifts was required for this hole with an average footage drilled per shift of about 30 feet. Wire line drilling with a swivel type core barrel and a conventional NX diamond was used for much of this footage. In poorly coring ground a face discharge bit was substituted for the conventional bit. Core recovery averaged about 70%. The total direct cost of this hole was about $2735.

A. G. BLUCHER

AGB/ds
cc: CPPollock
DJPope
TASnedden
RJLacy
WESaegart

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona
November 18, 1960

MEMORANDUM FOR:

Mr. T. A. Snedden
Mr. K. E. Richard

RIGHTS-OF-WAY
Poston Butte

This will supplement my memoranda of September 29th and October 20th, discussing mining locations which straddle rights of way.

I find that on June 3 of this year the Office of the Solicitor, Department of the Interior, advised the Bureau of Land Management that a right-of-way granted by Congress constitutes either an easement or a "limited fee"; and that a grant of "limited fee" railroad right-of-way "does not include a grant of the minerals in the lands".

The Solicitor's office in its June 3, 1960, opinion goes on to say that it "has long recognized that mining claims may be located over and across easements and, subject to the obligation to support the surface, may take the minerals from beneath it." Particular cases are cited in Lindley on Mines (2, 3rd Ed., sec. 530).

In the case of Poston Butte, the above would indicate that minerals are reserved to the United States where the railroad crossed the public domain on our project in T4S, R5E. But we should recognize that subsequent to the grant of railroad right-of-way, the United States thereafter issued patent to Cecil W. England on the S 1/2 of the NW 1/4 of Section 27 but did not declare a specific reservation of minerals with respect to the railroad right-of-way. It would appear, then, that such minerals were were conveyed in the patent to Cecil W. England.

The railroad right-of-way grant covers 100 feet of surface to each side of the center of the railroad, granted under the Act of Congress March 3, 1875, chapter 152. Two of ASARCO's recent Notices of Mining Location are posted on Southern Pacific's right-of-way. The location of discovery pits for these claims may draw the attention of local railroad men and consequently I believe ASARCO should advise Southern Pacific's San Francisco office of its intentions on their ground, as suggested in my memorandum of October 20.

In the matter of County roads, aside from my comment of September 29, one other procedure we can consider, in the event it becomes necessary to develop an ore deposit, is to petition the Pinal County Board of Supervisors to alter or amend the present dedication of rights-of-way for roads 33 feet wide on each side of "all section lines" (see Book 7, page 366, minutes of December 30, 1922).

Original Signed By
L. K. WILSON

L. K. WILSON

LKW/ds
cc: CFBarber
DJPope
CPPollock
BCThompson, Sr.

Aa-14A.2.0

JHG.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 26, 1960

MEMORANDUM FOR:
Mr. T. A. Breiden
Mr. Kenyon Richard

POSTON BUTTE PROJECT
Pinal County, Arizona

I am handing you herewith for transmittal to New York, two-year option to purchase C. W. England's patented farmlands and State grazing leases near Florence, Arizona, amounting to approximately 1,146 acres.

Terms call for a payment of $5,000 upon signing the agreement for an option period ending January 1, 1962 (about 14 months), with an extension or renewal for one year to January 1, 1963 upon payment of an additional $5,000. There are no other cash commitments or work requirements.

If we elect to exercise the option on or before January 1, 1963, we are to make a down payment of $200,000 followed by 15 equal and annual installments of $40,000 each, for a total purchase price of $800,000 (a reduction of $280,000 from England's earlier asking price).

The agreement includes changes recommended by Mr. England's CPA and attorney Elmer Coker, and it has their approval in its present form.

I should accept any responsibility for the terms and accuracy of these papers. However, I did not compose the text or form of the agreement draft; the draft, as you know, was prepared by Mr. R. C. Thompson, Sr. and this will of course be reviewed further by our attorneys in New York. I have, however, with Mr. Coker's concurrence, inserted the description of the property, liens, restrictions and the like, in the opening recital on Page One instead of attaching these descriptions as the Exhibit A proposed in the earlier Draft. Mr. Coker's additions, which are now included in this agreement, are attached separately to my memorandum herewith to point to his authorship of the provisions quoted.

When approved in final form, the option will be signed by Cecil W. England and Gloria M. England upon receipt of our check for $5,000.

L. K. WILSON

LKW/ds
cc: DJPope - w/enc.
CFPollock - "
CFBarber - "
Encl: Copy of Mr. Coker's provisions
File copy routed to:
ACBall
JHCourtright

Extra

OPTION FOR PURCHASE OF REAL PROPERTY

THIS AGREEMENT made and entered into this _____ day of _____, 1960, by and between

CECIL W. ENGLAND and GLORIA M. ENGLAND,
his wife, of Florence, Arizona,

first parties, hereinafter called "Optionors", and

AMERICAN SMELTING AND REFINING COMPANY,
a New Jersey corporation,

second party, hereinafter called "Optionee",

WITNESSETH:

Whereas Optionors are the owners and lessees of the property particularly described as follows:

PATENTED LAND

Southwest quarter of the Southwest quarter of Section 26;

Southwest quarter; South half of the Southeast quarter, and South half of the Northwest quarter of Section 27;

South half of the Northeast quarter of Section 33;

North half of the Southwest quarter and the South half of the Northwest quarter of Section 33, EXCEPT beginning at the quarter section corner common to Sections 32 and 33, Township 4 South, Range 9 East; running thence North 71 degrees 01 minute East a distance of 1824 feet to a point; thence North 49 degrees 58 minutes East to a point on the North line of the South half of the Northwest quarter of said Section 33; thence Westerly along the North line of the South half of the Northwest quarter of Section 33 to the Northwest corner thereof; thence Southerly along the West line of the South half of the Northwest quarter to the point of beginning;

Northwest quarter of Section 34; and

North half of the Northeast quarter and that part of the South half of the Northeast quarter described as: BEGINNING at the Northeast corner of the South half of the Northeast quarter of said Section 34; thence Southwesterly to a point which is 200 feet North of the center

of Section 34; thence Northerly along the mid-section line to the Northwest corner of the South half of the Northeast quarter of said Section 34; thence East to the place of beginning;

Northwest quarter of the Northwest quarter of Section 35, and: part of the Southeast quarter of the Southwest quarter of Section 26 and part of the Northeast quarter of the Northwest quarter of Section 35 described as follows: BEGINNING at a point on the West line of the Northeast quarter of the Northwest quarter of said Section 35, 860 feet South of the Northwest corner of said Northeast quarter of the Northwest quarter of said Section 35; thence East 130 feet to the center line of a drain ditch; thence Northerly along the center line of said drain ditch to the Northwest corner of the Southeast quarter of the Southwest quarter of said Section 26; thence South to the point of beginning.

All in Township 4 South, Range 9 East, G. & S. R. B. & M., Pinal County, Arizona, subject only to the following liens, liabilities, restrictions, exceptions and encumbrances:

1. A part of the lands above described is subject to a mortgage to the Federal Land Bank of Berkeley, to secure the principal sum of $120,000, dated the 16th day of January, 1959, recorded in the office of the County Recorder of Pinal County, Arizona, in Docket 220 at page 597, which mortgage Optionors agree to pay and discharge as the indebtedness secured thereby becomes due and payable, if this option is exercised.

2. A railroad right of way across a part of said lands held by the Southern Pacific Company.

3. Right of way for highway purposes owned by the County of Pinal crossing a part of said lands.

4. Rights of way for canals, laterals and ditches owned by San Carlos Irrigation & Drainage District which cross a part of said lands.

5. Inclusion within the boundaries of Electrical District No. 2, a municipal corporation.

6. Inclusion within the boundaries of San Carlos Irrigation Project, a municipal corporation.

7. Rights of way for electric transmission lines.

8. The effect of Resolution by the Board of Supervisors declaring rights of way for roads 33 feet wide on each side of all section lines, recorded December 30, 1922 in Book 7 of Minutes, page 386.

9. Security and lien for power service dated August 21, 1944, made and executed by Cecil W. England, a single man, to Electrical District Number Two, Pinal County, Arizona, recorded July 28, 1945 in Book 35 of Mortgages, page 489.

10. Security and lien for power service dated February 21, 1950, made and executed by Cecil W. England, a single man, to Electrical District Number Two, Pinal County, Arizona, recorded July 17, 1950 in Docket 30, page 164.

11. Security and lien for power service dated August 8, 1951, made and executed by Tom Rankin and Jessie A. Rankin, husband and wife, to Electrical District Number Two, Pinal County, Arizona, recorded March 5, 1953 in Docket 74, page 543.

12. Excepting an undivided one-half interest in and to all oil, gas, petroleum, naptha and other hydrocarbon substances and minerals of whatsoever kind and nature in the South half of the Northeast quarter of Section 33, Township 4 South, Range 9 East; and the Northwest quarter of Section 34, Township 4 South, Range 9 East.

STATE LEASED LANDS

State of Arizona Grazing Lease No. 1796 dated July 1, 1952, and expiring June 30, 1962, as follows:

North half of the Southeast quarter of Section 27; the North half of the South half of section 28; and the Southwest quarter of the Southwest quarter of Section 33, all in Township 4 South, Range 9 East, Pinal, County, Arizona.

Whereas Optionee desires to obtain an option to purchase all of said property, and

Whereas Optionors have agreed to grant such option,

NOW, THEREFORE, in consideration of the conditions, payments, provisions and terms hereinafter stated, it is mutually agreed between the parties as follows:

1. Optionors give and grant to Optionee the exclusive right and privilege of purchasing all of the property hereinabove described in the recitals of this Option for the total purchase price of $800,000.00 payable in the amounts, at the times and in the manner hereinafter provided. The initial option period herein granted shall be for the period

from the date of this Option to January 1, 1962, in consideration of which Optionee has paid to Optionors the sum of $5,000.00, receipt whereof is hereby acknowledged. If at any time before the expiration of the initial option period herein granted Optionee should desire to renew the exclusive right and privilege of purchasing said property herein granted, Optionee shall have the privilege and right of extending said option, subject to the terms and conditions hereinafter stated, for an additional period from January 1, 1962, to January 1, 1963, upon giving to Optionors at least thirty (30) day's notice in writing before January 1, 1962, of its desire to extend said option period and upon paying to Optionors an additional consideration of $5,000.00 at the time of giving said notice.

2. If Optionee elects to exercise its option to purchase said property at any time during the original term of this option or during the extended term, if the option is extended as hereinabove provided, then Optionee shall deliver to the Surety Title & Trust Company, of Florence, Arizona, as escrow agent, the sum of $200,000 less the amount of any payments theretofore made to Optionors as the consideration for this option, shall execute and deliver to said escrow agent its certain promissory note, payable to Optionors, in the principal sum of $600,000, bearing no interest, payable in annual installments as follows: $40,000 payable one year after the exercise of said option, and a like sum of $40,000 on or before the same date in each year thereafter until the full sum of $600,000 has been paid, and shall deliver to the escrow agent its good and sufficient realty mortgage therein mortgaging to Optionors all of the property described above to secure the full and faithful payment of said note for $600,000, which said mortgage shall be in the form approved by attorneys for Optionors.

3. Upon Optionee making the initial payment of $200,000 and executing, acknowledging and delivering said note and mortgage to said escrow agent, Optionors shall execute and deliver to the escrow agent their good and sufficient deed and assignment of State Grazing Lease No. 1796 therein conveying to Optionee all of the property above described.

4. If said option is exercised by Optionee as above contemplated, Optionors will purchase and have the Surety Title & Trust Company issue and deliver to Optionee an owner's policy of title insurance in the sum of $800,000, therein insuring marketable title to said property in Optionee, free and clear of all liens and encumbrances, save and except those which are specifically set forth above.

5. If and when said option is exercised and Optionors and Optionee have complied with the provisions above stated, thereupon the escrow agent shall deliver said deed, duly recorded in Pinal County, Arizona, to Optionee, and shall deliver said sum of $200,000, less any amounts theretofore received by Optionors as the consideration for said option, and the recorded mortgage to Optionors. The escrow agent shall hold said promissory note so executed by Optionee and shall not deliver the same to Optionors or any third person so long as all payments due upon said note are made by Optionee to the escrow agent for the benefit of Optionors as the same become due and payable; provided, however, that in the event Optionee should default in the payment of any annual installment as provided in said promissory note or should be in default in complying with the terms and conditions of the aforesaid mortgage given to secure said note, then said escrow agent, upon written demand of Optionors, shall deliver the aforesaid promissory note to Optionors.

6. As payments are made upon said note by Optionee the escrow

agent shall be and it is hereby authorized to first deduct and hold for payment from any annual installment so made by Optionee all sums then due or to become due on the next installment on that certain mortgage above described given by Optionors to the Federal Land Bank of Berkeley, which mortgage now constitutes a first lien on part of the property described above, and shall pay the balance of such installment, after paying the amounts so due the Federal Land Bank of Berkeley, to the Optionors.

7. All escrow fees shall be paid equally by the parties.

8. If at any time after it has exercised said option and after the payment of the first annual installment provided for in said promissory note, Optionee desires to pay said note in full and shall deliver the amount so due on its said note to the escrow agent, the escrow agent is hereby authorized and directed to pay from said funds any balance then remaining due on the mortgage held by the Federal Land Bank of Berkeley, which constitutes a first lien upon the above described property, obtain a satisfaction of said mortgage, and thereupon deliver any balance of said purchase price to the Optionors, and redeliver said promissory note for $600,000 to the Optionee, marked "Paid".

9. During said option period or any extension thereof the Optionee shall have the right to enter upon said property above described for the purpose of prospecting for minerals, to drill at any points upon said property, make geophysical examinations, and have ingress and egress to and from any points where such geophysical examinations are being made or said drilling is being performed, provided, however, that the Optionee shall be liable to the Optionors for any and all damage done to any crops growing upon said property, to the improvements thereon, or to the said real property as the result of any exploratory work so done by Optionee.

If the extent or amount of any such damage cannot be mutually agreed upon, then and in such event when the dispute arises the Optionors will appoint an arbiter and give written notice of his appointment to the Optionee, and within ten days thereafter Optionee shall appoint an arbiter and give written notice of his appointment to the Optionors, and the two so selected shall appoint a third. If the two arbiters thus selected cannot agree upon a third arbiter within twenty days, then and in such event the Judge of the Superior Court of Pinal County, Arizona, is authorized to appoint the third arbiter. When a third arbiter has been appointed the arbiters shall conduct a hearing, after giving written notice to the parties of the time and place of such hearing. Upon such hearing being concluded the arbiters shall make their award and the decision of any two of the arbiters shall be final and binding upon the parties. The cost of arbitration shall be borne equally by the parties. Any party feeling himself aggrieved by the decision of the arbiters may within thirty (30) days thereof appeal said decision to the Superior Court of Pinal County, Arizona.

10. If Optionee shall exercise its option and acquire title to said property, then if Optionee desires to lease any of said property Optionors shall have the preferred right to lease, from year to year, so much of said property as Optionee desires to lease at a rental rate to be agreed upon by both parties but not to exceed the prevailing rental rates for like properties in the area.

11. Optionee agrees that if said option is exercised at other than the end of a crop year, then Optionors shall have the right to continue in possession of the property covered by any crops until they can be harvested. Optionee agrees to execute any and all necessary

documents or instruments which Optionors may require for crop financing.

12. This option shall be placed in escrow with the Surety Title & Trust Company of Florence, Arizona, designated as the escrow agent for the parties hereto, and the parties agree to execute and deliver to said escrow agent all instruments or documents necessary to effect this option, including a quit-claim deed from Optionee to Optionor to be recorded in the event Optionee does not exercise this option.

13. The covenants and conditions herein contained shall extend to and be binding upon the heirs, administrators, executors and assigns of Optionors and Optionee.

IN WITNESS WHEREOF, Optionors have hereunto set their hands, and Optionee has caused its corporate name to be hereunto subscribed and its corporate seal to be hereunto affixed and attested by its duly authorized officers, in duplicate counterparts, as of the day and year first above written.

_____

_____
Optionors

AMERICAN SMELTING AND REFINING COMPANY

By: _____ Vice President
Optionee

Attest:

_____
Secretary

STATE OF ARIZONA)
) ss.
COUNTY OF)

On this the _____ day of _____, 1960, before me, the undersigned officer, personally appeared CECIL W. ENGLAND and GLORIA M. ENGLAND, his wife, known to me to be the persons whose names are subscribed to the within instrument and acknowledged that they executed the same for the purpose therein contained.

In witness whereof I hereunto set my hand and official seal.

My commission expires:

_____
Notary Public

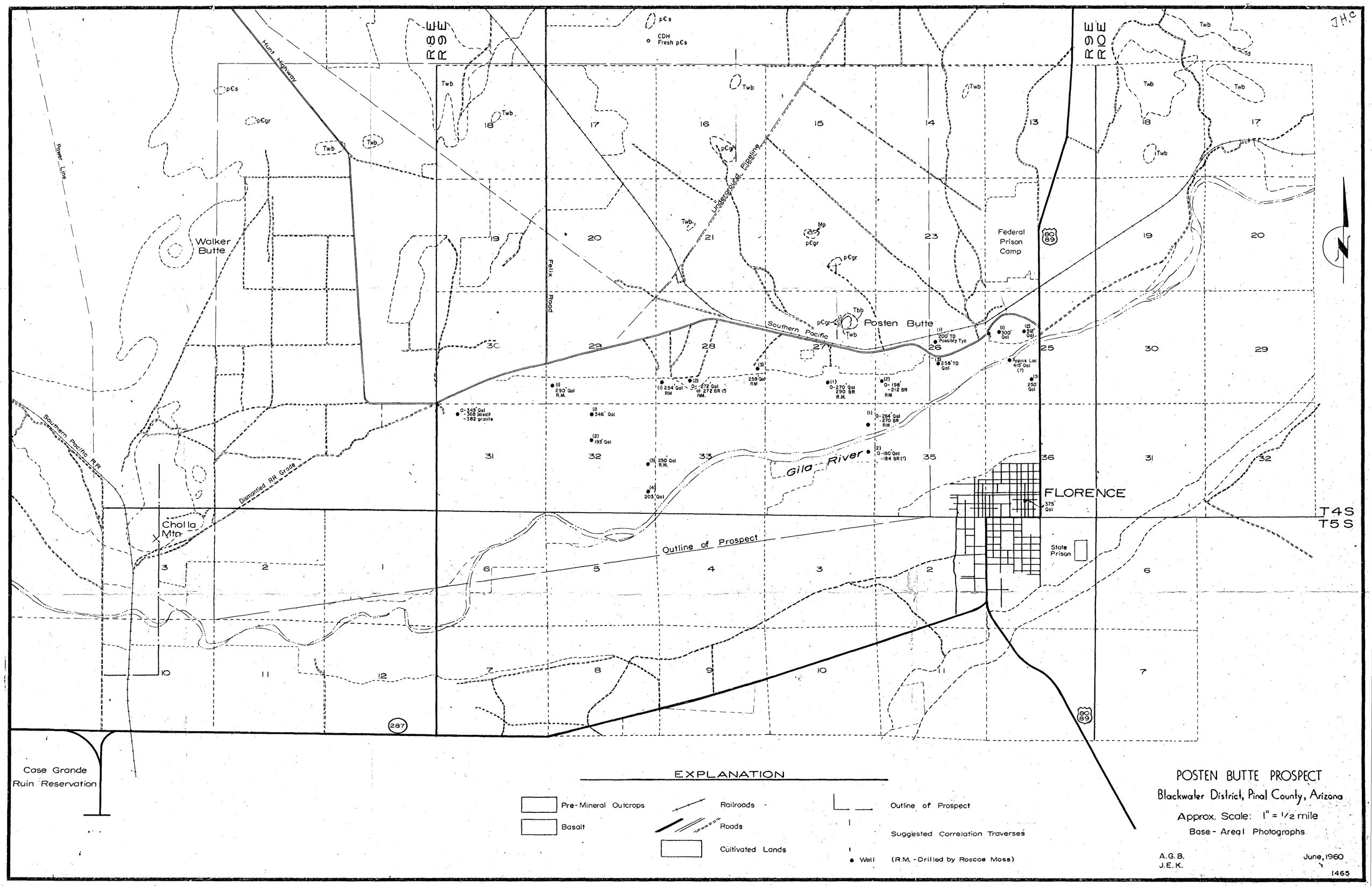
STATE OF NEW YORK)
) ss.
COUNTY OF)

On this the _____ day of _____, 1960, before me, the undersigned officer, personally appeared _____ _____ and _____, who acknowledged themselves to be the _____ and _____, respectively, of AMERICAN SMELTING AND REFINING COMPANY, a New Jersey corporation, and that they, as such officers, being authorized so to do, executed the foregoing instrument for the purposes therein contained.

In witness whereof I hereunto set my hand and official seal.

My commission expires:

_____
Notary Public


T.H.C.
T 4 S
T 5 S
R 9 E
R 10 E
Hunt Highway
Power Line
Walker Butte
Southern Pacific R.R.
Dismantled RR Grade
Cholla Mtn
Case Grande Ruin Reservation
Felix Road
Underground Pipeline
Southern Pacific
Posten Butte
Federal Prison Camp
Gila River
FLORENCE
State Prison
Outline of Prospect
pЄs
pЄgr
Twb
Td
Tbb
Mp
CDH
Fresh pЄs
(1) 200' TD Possibly Tyc
(1) 300' Qal
(2) 316' Qal
(3) 258' TD Qal
Approx. Loc 415' Qal (?)
(3) 250' Qal
(1) 0-198' -212 BR RM
(1) 0-270' Qal 290 BR R.M.
(3) 259' Qal RM
(1) 254' Qal RM
(2) 0-272' Qal at 272 BR (?) RM.
(1) 293' Qal R.M.
0-345' Qal -368 basalt -382 granite
(1) 346' Qal
(2) 193' Qal
(3) 250' Qal R.M.
(4) 203' Qal
(1) 0-264' Qal -270 BR RM.
(2) 0-180' Qal -184 BR (?)
375' Qal
287
80 89
EXPLANATION
Pre-Mineral Outcrops
Basalt
Railroads
Roads
Cultivated Lands
Outline of Prospect
Suggested Correlation Traverses
Well (R.M. - Drilled by Roscoe Moss)
POSTEN BUTTE PROSPECT
Blackwater District, Pinal County, Arizona
Approx. Scale: 1" = 1/2 mile
Base - Areal Photographs
A.G.B.
J.E.K.
June, 1960
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