



CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

The following file is part of the
James Doyle Sell Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

Southwestern Division
Exploration Reports

July 1972 — Oct 1973

plus

few authorization requests
& estimated expenditures budgets.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 1, 1972

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

Exploration Report
Southwestern Division
July 1972

BALD MOUNTAIN PROJECT, Grant County, New Mexico

The rotary drill hole from the surface to a terminal depth of 3597' failed to locate a new center of porphyry copper mineralization along the Tyrone-Chino trend. At 3255' premineral andesite, containing weak propylitic alteration and 1-2% finely disseminated pyrite, was encountered. No further work planned at this time.

Total estimated expenditure during July: \$20,500.00

Estimated unexpended balance of authorization: \$ 1,000.00

HANNA/ASARCO PROJECT, Gila County, Arizona

Agreement with Hanna should be finalized during August and drilling will commence at that time.

Authorized: \$150,000.00

Assessment work will commence during August at the HARDSHELL PROJECT (balance \$18,000.00) and SILVER STATE PROJECT (balance \$29,600.00).

Recommendations for additional drilling at the SUPERIOR EAST PROJECT (balance \$7,000.00) will be submitted in September.

Dowell has received approval of research funds for leaching tests at the POSTON BUTTE PROJECT (balance \$3,700.00). They will make a new proposal to ASARCO this month.

SILVER BELL EAST (balance \$8,400.00) remains inactive.

Very truly yours,


W. L. Kurtz

WLK:lad

cc: JHCourtright
RBCrist
JDSell 

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 5, 1972

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

Exploration Report
Southwestern Division
August 1972

HANNA/ASARCO PROJECT, Gila County, Arizona

Agreement with Hanna was signed and drill site preparation started. Drilling should commence in September or October depending upon drill contractor availability.

Total estimated expenditure during August: \$ 1,000.00

Estimated unexpended balance of authorization: \$149,000.00

SUPERIOR EAST PROJECT, Pinal County, Arizona

A summation report was submitted. Additional drilling was recommended, but will be deferred until later in the year.

Total estimated expenditure during August: \$ 300.00

Estimated unexpended balance of authorization: \$6,700.00

INSPIRATION/ASARCO RAWHIDE PROJECT, Pinal County, Arizona

A letter of intent was signed with Inspiration for Asarco to explore their Rawhide property which lies immediately east of our Superior East Project. Drill roads have been started.

Total estimated expenditure during August: \$ 10,000.00

Estimated unexpended balance of authorization: \$140,000.00

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada

3,130 feet of air hammer drilling was completed in 14 holes at this low-grade disseminated silver deposit, to fulfill 1972 assessment work. Drilling during September will fulfill 1973 assessment work requirements. Assay data not yet available.

Total estimated expenditure during August: \$16,000.00

Estimated unexpended balance of authorization: \$13,600.00

September 5, 1972

HARDSHELL PROJECT, Santa Cruz County, Arizona

1972 assessment work at this silver property consisted of deepening drill hole HDS-49 from 520 feet to 620 feet in chief formation by diamond drilling. No assay data available. Assessment work for 1973 will be fulfilled by deepening drill hole HDS-50.

Total estimated expenditure during August: \$9,000.00

Estimated unexpended balance of authorization: \$9,000.00

POSTON BUTTE PROJECT, Pinal County, Arizona

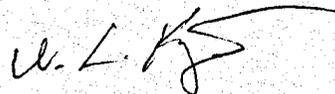
Dowell has not yet submitted their new proposal for the in-place copper leaching test.

Total estimated expenditure during August: \$ None

Estimated unexpended balance of authorization \$3,700.00

SILVER BELL EAST (balance \$8,400.00) and BALD MOUNTAIN (balance \$1,000.00) were inactive.

Very truly yours,



W. L. Kurtz

WLK:lad

cc: JHCourtright
RBCrist
JDSell 

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 28, 1972

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

Exploration Report
Southwestern Division
September 1972

BOHME PROJECT (Hanna), Gila County, Arizona

Three drill sites have been prepared. Drilling should commence during October on this porphyry copper property.

Total estimated expenditure during September: \$ 8,500

Estimated unexpended balance of authorization: \$140,500

HARDSHELL PROJECT, Santa Cruz County, Arizona

1973 assessment work completed during September at this silver property was:

Advancing HDS-49 from 620' to terminal depth of 725';
Advancing HDS-50 from 437' to terminal depth of 542'.

Drill hole HDS-30 will be deepened to fulfill remainder of 1973 assessment work requirements. Core has not yet been assayed.

Total estimated expenditure during September: \$5,000

Estimated unexpended balance of authorization: \$4,000

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona

Currently idle. Drilling will commence after completion of Bohme Project drilling.

Total estimated expenditure during September: \$ 2,200

Estimated unexpended balance of authorization: \$137,800

September 28, 1972

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada

2,800 feet of air hammer drilling was completed in 8 holes at this low-grade disseminated silver deposit. This work fulfills 1973 assessment work requirements. Assays have been received for 16 holes representing 3,945 feet of drilling. The plus 1.0 oz. Ag intercepts have a weighted average of 2.18 oz. Ag and represent 1580' (40% of footage).

Total estimated expenditure during September: \$12,100

Estimated unexpended balance of authorization: \$ 1,500

3R PROJECT (Anaconda), Santa Cruz County, Arizona

Asarco deepened drill hole TR-10 from 1050' to 1680' in highly pyritized breccia with minor enargite. Hole will be continued to test for deep primary copper. Significant assays in upper 300 feet are:

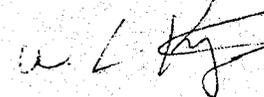
110-160' 50' 0.62% Copper as chalcocite

Total estimated expenditure during September: \$ 7,000

Estimated unexpended balance of authorization: \$38,000

SUPERIOR EAST (balance \$6,700), POSTON BUTTE (balance \$3,700), SILVER BELL EAST (balance \$8,400) and BALD MOUNTAIN (balance (\$1,000)) were inactive.

Very truly yours,



W. L. Kurtz

WLK:lad

cc: JHCourtright
RBCrist
JDSell 

JDS

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 1, 1972

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

Exploration Report
Southwestern Division
October 1972

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona

Air rotary drilling commenced October 25th on this porphyry copper prospect. The drill hole has penetrated 1150 feet of post-mineral dacite and is currently at 1690 feet in post-mineral Whitetail conglomerate. Pre-mineral bedrock is anticipated at 2000 feet.

Monthly estimated expenses thru October 25th: \$ 11,400

Estimated unexpended balance of authorization: \$129,100

HARDSHELL PROJECT, Santa Cruz County, Arizona

1973 assessment work at this silver property was completed by advancing drill hole HDS-30 from 445' to terminal depth of 503'. Assay data for drilling completed for 1972 and 1973 assessment work will be reported next month.

Monthly estimated expenses thru October 25th: \$ 2,100

Estimated unexpended balance of authorization: \$ 1,900

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona

Work during the month was limited to field checking of claim boundaries. Drilling will commence after completion of Bohme Project drilling.

Monthly estimated expenses thru October 25th: \$ 1,000

Estimated unexpended balance of authorization: \$136,800

November 1, 1972

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada

1971-72 and 1972-73 assessment drilling totaling 5940 feet was completed last month at this low-grade potential open pit silver property. The plus 0.5 oz. silver intercepts have a weighted average of 1.43 Ag and represent 3830 feet (64% of footage drilled). An economic appraisal of the property is being made.

Monthly estimated expenses thru October 25th: \$ 1,300*

Estimated unexpended balance of authorization: (\$ 1,000)

3R PROJECT (Anaconda), Santa Cruz County, Arizona

Drill hole TR-10 was deepened from 1680' to 2960' in pyritized silica tuff and intrusive breccia. Enargite content is now negligible; erratic occurrences of molybdenite and sphalerite occur below 1400 feet, suggesting vertical zoning. Hole to be deepened to continue test for primary copper mineralization.

Monthly estimated expenses thru October 25th: \$20,200

Estimated unexpended balance of authorization: \$17,800

THUNDER MOUNTAIN (Kerr-McGee) PROJECT, Santa Cruz County, Arizona

A Mining Authorization was approved to explore this large altered zone for deep primary copper mineralization. The geologic mapping and geochemical sampling accomplished on this property are currently being compiled and evaluated to aid in selection of drill sites.

Monthly estimated expenses thru October 25th: \$ 10,500

Estimated unexpended balance of authorization: \$139,500

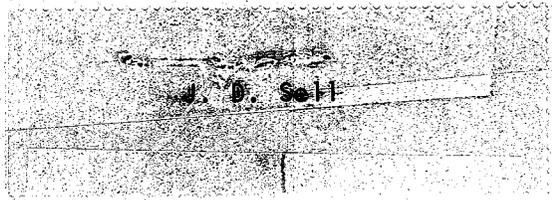
SUPERIOR EAST (balance \$6,700), POSTON BUTTE (balance \$2,400), SILVER BELL EAST (balance \$8,400), and BALD MOUNTAIN (balance (\$1,000)) were inactive.

Very truly yours,


W. L. Kurtz

WLK:lad

cc: JHCourtright
RBCrist
JDSell 



SOUTHWESTERN EXPLORATION DIVISION

Estimated 1973 Expenses

I	General Mining Examination w/o Chief Geologist (Unallocated Expenses) \$30,000 - \$35,000 per month	\$360,000 - 420,000	
II	1973 Continuing Projects	\$1,337,800 *	
	Total I & II		\$1,757,800
III	Proposed Project		96,000
IV	Possible Drill Projects	\$220,000 -	<u>260,000</u>
	GRAND TOTAL		<u>\$2,113,800</u>
V	Personnel		

*Includes \$783,000 Poston Butte property payment.

As of Dec 1, 1972 :

All NYC Correspondence to TCO ; for USA

JIC : Europe

CC: JJCcollins
JHCourtright
RBCrist
JDSell

11 - 1973 CONTINUING PROJECT EXPENSES

<u>PROJECT</u>		<u>ESTIMATED 1973 EXPENDITURES</u>	
BOHME (Hanna)	\$150,000 for 1972-1973, complete the three proposed drill holes. Positive results lead to \$200,000 work committment due May 27, 1975 and notification on May 27, 1975 whether make final Bohme payment \$552,000 on July 27, 1975.	\$ 66,000	<i>Approved</i>
RAWHIDE (Inspiration)	Drill two 4,000' holes 1) offset of A-2 2) test southern margin Schultze	\$137,000	<i>Approved</i>
SUPERIOR EAST	Minimum expenditures to hold property:		
	State	\$ 23,000	
	Claims South Hiway	16,900	
	Claims North Hiway	54,100	
	Add'l. claims-options (?)	7,000	
	Dees Agreement (?)	6,000	
		<u>\$107,000</u> + 10% =	
		\$117,700	say \$120,000
	A. Work if claims not contiguous:		
	1) STATE: road work & start drill hole--sec. 5		
	start drill hole--sec. 4		
		<u>\$23,000</u>	
	2) Claims south hiway:		
	drill road to Rawhide Proj.	10,000	
	drill road south from A-2	6,900	
	Add'l. claims-options-Dees	13,000	
	3) Claims north hiway:		
	deepen A-5 or start new hole	54,100	
		<u>\$107,000</u> + 10% =	
		\$117,700	
	B. Work if claims contiguous:		
	drill road A-2 to Rawhide	\$ 10,000	
	State Leases (same as A)	23,000	
	offset hole to A-2	61,000	
	Add'l. claims-options-Dees	13,000	
		<u>\$107,000</u> + 10% =	
		\$117,700	

3R (Anaconda)	1. Land Payment August	\$16,000	
	Monthly thru Dec. - \$300	<u>1,200</u>	
		\$17,200	
	2. Drill one hole	<u>32,800</u>	\$ 50,000
	(This will make total expenditures equal the second year work committment of \$60,000)		

THUNDER MOUNTAIN (Kerr-McGee)	Drill two holes -- will complete first two years requirements		\$ 90,000
----------------------------------	---	--	-----------

POSTON BUTTE	Land final payments & options	\$783,000	
	SX test - MBD expense ?	(30,000)	
	One man & expenses 1/2 time	8,000	
	State Prospecting (Monitor hole)	<u>6,000</u>	
		\$797,000	
		MBD? <u>(30,000)</u>	
			\$827,000

SILVER STATE	\$12,500 due Silver State 31 Dec. 72		
	<u>2,500</u> overexpenditures		
	\$15,000 <u>Total due before 1973</u>		

25,000 for additional drilling in summer 1973.

negotiated with MBD prior to 25,000 max.

1973 Land Payments:			
Red Top	\$4,800		
Olive	9,600		
Cordero	<u>2,500</u>		
		\$16,900	
	Silver State to be negotiated, say	<u>12,500</u>	
		\$29,400	
	Aerial photography - Topo - Survey	<u>10,000</u>	\$ 39,400

negotiated with MBD prior to 25,000 max. total 80,000 spin in 1975 615 per hole paid negotiable

HARDSHELL	No expenses - assessment work completed thru August 31, 1973		
-----------	--	--	--

SILVER BELL EAST	Geologic - geochemistry		\$ <u>8,400</u>
------------------	-------------------------	--	-----------------

GRAND TOTAL			\$ <u><u>1,337,800</u></u>
-------------	--	--	----------------------------

III - PROPOSED 1973 PROJECT

Geologic Pediment Drill -- 6 months		
Drill contractor	\$10,000 per month	
Supervision	6,000	
Land search		
Land payment		
Geologist		
Crittendon		
Drill Road, Site		
Misc.		
	<u>\$16,000</u>	\$ <u><u>96,000</u></u>

IV - POSSIBLE 1973 DRILLING PROJECTS

RED HILLS	Two 3,000' drill holes	15,000' claim water	\$ 60,000	Study Area + SDI concepts
SANTA CRUZ	Two to four holes plus property	Open at any time	\$100,000	
TYRONE EAST	Two to four holes plus property		<u>\$60-100,000</u>	
			<u>\$220-260,000</u>	

V - PERSONNEL

<u>PERSONNEL</u>		<u>Estimate of Project Time</u>
CRIST	Land, Property, Office Manager	25%
CRITTENDON	Drilling Supervisor - Projects and Geologic Drill	100%
SELL	Bohme, Rawhide, & Superior East Projects	75%
	Supervise:	
	KING - Papago Recon., Rincon Empire Recon.	8%
	FRENCH - Southwest New Mexico Recon.	8%
GRAYBEAL	3R, Thunder Mtn., Silver Bell East Projects	50%
	Supervise:	
	CUMMINGS - Silver Bell District Study	8%
STATHIS	Literature Geologist	
	Supervise:	
	DAVIS - Safford Area Recon., Wickenburg Recon.	8%
WHALEY	Poston Butte project (1/2 time)	66%
	Compile district property maps	
GIESECKE	Regional structural studies	
STONE and BENAVIDEZ	Assist on drilling projects, geologic drilling, geochemical sampling, gravity surveys	75%
KELLOGG and MELHADO	Draftsmen	50%
^{Lois} BORMOLINI	Secretary	
ROBINSON and ROUBOUND	Part-time draftsmen; odd jobs	

Cummins - Sacaton

King - San Xavier Mission

Beverly - Silver Bell

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 9, 1972

J.J. Collins
New York Office

DRAFT OF SOUTHWESTERN EXPLORATION
DIVISION MATERIAL FOR TRIENNIAL
MANAGERS MEETING, 1972

A. SETTING

The porphyry copper metallogenic province of Southwestern United States is part of a continental-scale province that extends along the western Cordillera of North and South America. Within this ~~(continental-scale metallogenic province)~~ Southern Arizona contains a large nucleus of porphyry copper deposits. A northwest-southeast oriented rhombohedron with sides about 160 miles in length contain most of the producing and developing copper mines of the Southwest. Much of our exploration for new porphyry coppers in the Southwest is concentrated within this area.

Radiometric age dating confirms that most of the porphyry copper deposits of the Southwest cluster around the Early Tertiary age boundary ranging in age from 55 to 72 m.y. with a typical age being 65 m.y. A few important deposits notably Bisbee, Arizona, and Yerington and Ely, Nevada, are older, being 100-165 m.y.

Within the overall northwesterly trending metallogenic province important northwesterly and northeasterly lineaments exist along which many of the porphyry copper deposits occur. We believe these lineaments represent fundamental deep seated structures that have been repeatedly active since Precambrian times. It is these lineaments that guided the emplacement of the Early Tertiary quartz monzonite porphyry intrusives common to the mineralized deposits. ~~(The deposits are strongly faulted and fractured and occur within large zones of alteration.)~~ The large alteration zones associated with the porphyry copper deposits greatly increases the chances of porphyry copper discovery beneath the post-mineral cover. *slightly modify*

B. PROJECTS

Two Projects, Superior East and Posten Butte, have made significant copper discoveries.

Superior East Project, Arizona --- This project was designed to test a large covered area between the Miami and Superior Mining Districts. Three types of copper discoveries have been made.

Porphyry copper discovery. Drill Hole A-2(2W) intersected at the 3920-foot depth, leached capping within a gravity slide block that overlies "fringe-type" porphyry copper mineralization grading 0.13 to 0.42% Cu in the primary zone. The intensity of original mineralization in the oxidized gravity slide block coupled with the thickness (+621') of "fringe-type" mineralization penetrated beneath the fault are indicative of a major porphyry copper zone. At least four additional 5,000-foot drill holes will be necessary to assess the true significance of the discovery hole A-2(2W).

Limestone Replacement discovery. Drill Hole A-4 intersected at the 6484-foot depth, 81 feet of limestone thoroughly replaced with specularite, hematite and containing 0.81% copper before passing through a fault and into weakly altered mineralized quartz monzonite. This is interpreted as indicating the replacement units at Newmont's Magma Mine, containing a proven 10 million tons @ 5.7% copper (after dilution), extend eastward beneath the Oak Flat Withdrawal Area and onto ASARCO ground. Attempts are being made to acquire the mineral rights to Oak Flat.

Native Copper discovery. Drill Hole A-4 discovered at the 5083-foot depth, major quantities of native copper with minor cuprite, in the post-mineral Whitetail Conglomerate. The 1256 feet of Whitetail below the Lithic tuff marker bed averages 0.53% copper. Within this thick column are three zones that average above 0.8% copper (248' @ 0.86; 130' @ 0.86; 170' @ 1.12). Structural-isopach studies suggest that ore grade native copper may be restricted to the deepest portion of the Whitetail basin -- an area greater than 1-1/2 square miles. Thus, the potential exists for major tonnages of native copper.

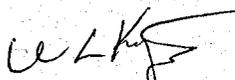
Poston Butte Project, Arizona --- Estimates based on only four drill holes indicate the Poston Butte property may contain more than 100 million tons of 0.6 oxide copper starting at a depth of 1100 feet below the surface. The oxide copper occurs in an extremely broken and fractured quartz monzonite and may be amenable to in-place leaching. Negotiations are being carried forth with Dowell which will require Dowell to make an in-place leaching test at their expense.

Silver State Project, Nevada --- A partially explored low grade disseminated silver property that is estimated to contain 58 million tons of 1.8 ounces silver amenable to open pit mining. Preliminary metallurgical tests indicated greater than 90% recovery by conventional cyanide treatment.

In addition to the above three projects, five additional projects are currently being carried on in search for porphyry copper deposits (3-R, Thunder Mountain, Rawhide, Bohme, Silver Bell East); and one property, Hardshell, is being held for its silver potential.

Hardshell --- Open pit potential of 6.5 to 10 million tons grading 5.0 oz. Ag with a waste/ore ratio of 7/1.

A dry magnetic concentration (4:1) will produce a high Mn product containing 16-18 oz. Ag. Treating this with a sulphurous acid leach will produce a flux containing 73% silica, 35 oz. Ag, and 8% lead. This treatment recovers 68% of the silver in the ore.


W.L. Kurtz

JLS

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 15, 1972

Mr. J. J. Collins
New York Office

Revised Draft of Southwestern
Exploration Division Material for
Triennial Managers Meeting, 1972

A. SETTING

The porphyry copper metallogenic province of Southwestern United States is part of a continental-scale province that extends along the western Cordillera of North and South America. Within this, Southern Arizona contains a large nucleus of porphyry copper deposits. A northwest-southeast oriented rhombohedron with sides about 160 miles in length contains most of the producing and developing copper mines of the Southwest. Much of our exploration for new porphyry coppers in the Southwest is concentrated within this area.

Radiometric age dating confirms that most of the porphyry copper deposits of the Southwest cluster around the Early Tertiary age boundary ranging in age from 55 to 72 m.y. with a typical age being 65 m.y. A few important deposits notably Bisbee, Arizona, and Yerington and Ely, Nevada, are older, being 100-165 m.y.

Within the overall northwesterly trending metallogenic province important northwesterly and northeasterly lineaments exist along which many of the porphyry copper deposits occur. We believe these lineaments represent fundamental deep seated structures that have been repeatedly active since Precambrian times. It is these lineaments that guided the emplacement of the Early Tertiary quartz monzonite porphyry intrusives common to the mineralized deposits. The large zones of alteration which encompass the ore bodies serve to enlarge the target and thus improve the chances of discovery beneath post-mineral cover.

B. PROJECTS

Two projects, Superior East and Poston Butte, have resulted in significant new copper discoveries.

Superior East Project, Arizona --- This project was designed to test a large covered area between the Miami and Superior Mining Districts. Three types of copper mineralization have been encountered.

Porphyry copper discovery. Drill Hole A-2(2W) intersected at the 3920-foot depth, leached capping within a gravity slide block that overlies "fringe-type" porphyry copper mineralization grading 0.13 to 0.42% Cu in the primary zone. The intensity of original mineralization in the oxidized gravity slide block coupled with the thickness (+621') of "fringe-type" mineralization penetrated beneath the

fault are indicative of a major porphyry copper zone. At least four additional 5,000-foot drill holes will be necessary to assess the true significance of the discovery hole A-2(2W). Some of the drilling will be on the adjacent Rawhide Project Area.

Limestone Replacement discovery. Drill Hole A-4 intersected at the 6484-foot depth 81 feet of limestone thoroughly replaced with specularite, hematite and containing 0.81% copper before passing through a fault and into weakly altered and mineralized quartz monzonite. This is interpreted as indicating the replacement units, comparable to those in Newmont's Magma Mine which contain a proven 10 million tons @ 5.7% copper (after dilution), extend eastward beneath the Oak Flat Withdrawal Area and onto ASARCO ground. Attempts are being made to acquire the mineral rights to Oak Flat.

Native Copper discovery. Drill Hole A-4 encountered at the 5083-foot depth significant amounts of native copper with minor cuprite, in the post-mineral Whitetail Conglomerate. The 1256 feet of Whitetail below the Lithic tuff marker bed averages 0.53% copper. Within this column are three zones that average above 0.8% copper (248' @ 0.86; 130' @ 0.86; 170' @ 1.12). Structural-isopach studies suggest that ore grade native copper occupies the deepest portion of the Whitetail basin -- an area greater than 1-1/2 square miles. Thus, the potential exists for major tonnages of native copper.

Poston Butte Project, Arizona --- Estimates based on only four drill holes indicate the Poston Butte property may contain more than 100 million tons of 0.6 oxide copper starting at a depth of 1100 feet below the surface. The oxide copper occurs in an extremely broken and fractured quartz monzonite and may be amenable to in-place leaching. Negotiations are being carried forth with Dowell which will require Dowell to make an in-place leaching test at their expense.

Silver State Project, Nevada --- A partially explored disseminated silver deposit that is estimated to contain 58 million tons of 1.8 ounces silver amenable to open pit mining. Preliminary metallurgical tests indicated greater than 90% recovery by conventional cyanide treatment.

In addition to the above three, four projects are currently being carried on in search for porphyry copper deposits (3-R, Thunder Mountain, Bohme, Silver Bell East); and one property, Hardshell, is being held for its silver potential -- 6.5 to 10 million tons grading 5.0 oz. Ag with a waste/ore ratio of 7/1. A dry magnetic concentration (4:1) of Hardshell ore will produce a high Mn product containing 16-18 oz. Ag. Treating this with a sulphurous acid leach will produce a flux containing 73% silica, 35 oz. Ag, and 8% lead. This treatment recovers 68% of the silver in the ore.

W. L. Kurtz

WLK:lad

J. O. S.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

November 30, 1972

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

Exploration Report
Southwestern Division
November 1972

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona

Rotary drill hole AH-1 has been cased at 1690 feet and diamond drilling will commence shortly at this porphyry copper prospect. Rotary drill hole AH-2 was collared this month and is currently at a depth of 651 feet in post-mineral volcanics.

Monthly estimated expenses thru November 25th: \$ 26,100.00

Estimated unexpended balance of authorization: \$103,000.00

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona

Work at this porphyry copper prospect was limited to location work performed on 17 claims staked by ASARCO to cover open ground adjacent to Inspiration's claims.

Monthly estimated expenses thru November 25th: \$ 4,700.00

Estimated unexpended balance of authorization: \$132,100.00

3R PROJECT (Anaconda), Santa Cruz County, Arizona

Drill hole TR-10 was advanced from 2960' to 4004'. The enargite zone terminated at 2760' and traces of chalcopyrite started at 3190' and persist to bottom of hole. The presence of chalcopyrite, albeit minor, is encouraging and the drill hole will be deepened to continue our test of this vertically zoned porphyry copper prospect.

Monthly estimated expenses thru November 25th: \$15,450.00

Estimated unexpended balance of authorization: \$ 2,350.00

November 30, 1972

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada

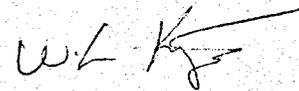
An evaluation of all data developed to date indicates the property has considerable potential at a silver price between \$2.50-\$3.00 per ounce. Additional drilling will be necessary to fully evaluate this open pit silver property.

Monthly estimated expenses thru November 25th: \$ 616.00

Estimated unexpended balance of authorization: (\$1,616.00)

SUPERIOR EAST (balance \$6,500), POSTON BUTTE (balance \$2,400), SILVER BELL EAST (balance \$8,400), BALD MOUNTAIN (balance (\$1,000)), HARDSHELL (balance -0-), and THUNDER MOUNTAIN (balance \$139,000) were inactive.

Very truly yours,



W. L. Kurtz

WLK:lad
Progress maps enclosed.

cc: JHCourtright
RBCrist
JDSell 

J. D. S.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 28, 1972

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

Exploration Report
Southwestern Division
December 1972

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona

Drill hole AH-1 was advanced 423 feet by diamond drilling to a depth of 2113 feet in post-mineral Whitetail conglomerate at this porphyry copper prospect. Hole will be deepened.

Drill hole AH-2 was advanced 1337 feet by rotary drilling to a depth of 1988 feet in post-mineral Whitetail conglomerate. Hole will be deepened by diamond drilling after completion of drill hole AH-1.

Monthly estimated expenses thru December 25th: \$42,700.00

Estimated unexpended balance of authorization: \$60,300.00

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona

Work at this porphyry copper prospect was limited to claim work. Drilling will commence in the spring.

Monthly estimated expenses thru December 25th: \$ 600.00

Estimated unexpended balance of authorization: \$131,500.00

3R PROJECT (Anaconda), Santa Cruz County, Arizona

Drill hole TR-10 was advanced from 4004 feet to a temporary bottom depth of 4105 feet. The bottom 295 feet (3810-4105) contains moderate amounts of very finely disseminated chalcopryrite and assays 0.48% Cu. Because the hole has not yet reached a potassic alteration zone where higher grade copper can be expected, the hole will be reentered and deepened at a later date.

Monthly estimated expenses thru December 25th: \$9,000.00

Estimated unexpended balance of authorization: (\$6,650.00)

T. C. Osborne

- 2 -

December 28, 1972

SILVER STATE (balance \$127,300), SUPERIOR EAST (balance \$6,500), POSTON BUTTE (balance \$2,400), SILVER BELL EAST (balance \$8,400), BALD MOUNTAIN (balance \$1,000), HARDSHELL (balance -0-), and THUNDER MOUNTAIN (balance \$138,750) were inactive.

Very truly yours,


W. L. Kurtz

WLK:lab

Attachs: Bohme & 3R Progress Maps

cc: JHCourtright
RBCrist
JDSell 

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

February 2, 1973

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

Exploration Report
Southwestern Division
January 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona

AH-1 was advanced 1510 feet by diamond drilling to a depth of 3623 feet. At 3539 feet the drill hole passed from post-mineral Whitetail conglomerate into pre-mineral Mississippian limestone that contains minor manganese and sparse pyrite. Hole will be terminated and drill moved to AH-2, cased at 1988 feet in Whitetail conglomerate.

Monthly estimated expenses thru January 25th: ^{26,600}~~26~~ \$47,600

Estimated unexpended balance of authorization: ^{38,700} \$12,700

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona

Work was limited to surveying and claim work. Drill site will be prepared upon final signing of the Inspiration agreement.

Monthly estimated expenses thru January 25th: \$ 6,000

Estimated unexpended balance of authorization: \$125,500

3R PROJECT (Anaconda), Santa Cruz County, Arizona

Work was limited to petrographic work and field mapping to help in selecting drill site on the adjacent Thunder Mountain Project area.

Monthly estimated expenses thru January 25th: \$ 800

Estimated unexpended balance of authorization: (\$ 7,450)

Mr. T. C. Osborne

- 2 -

February 2, 1973

RED HILLS PROJECT, Pinal County, Arizona

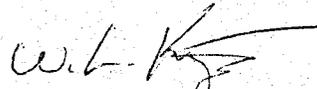
Previously staked ASARCO claims were monumented and additional claims staked to cover fractions. Location work will be performed next month.

Monthly estimated expenses thru January 25th: \$ 2,600

Estimated unexpended balance of authorization: \$17,400

SILVER STATE (balance \$126,800), SUPERIOR EAST (balance \$5,200), POSTON BUTTE (balance \$2,400), SILVER BELL EAST (balance \$8,400), BALD MOUNTAIN (balance (\$1,000)), HARDSHELL (balance -0-), and THUNDER MOUNTAIN (balance \$138,500) were inactive.

Very truly yours,


W. L. Kurtz

WLK:1b

Attach: Bohme Progress Map

cc: JHCourtright
RBCrist
JDSe11 

J. O. S.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 1, 1973

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

Exploration Report
Southwestern Division
February 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

AH-1 was advanced from 3623 to 3863 where the hole was terminated due to twisting off. The premineral intercepts, 3539-3678 Miss. ls.; 3678-3863 Dev. ls., are recrystallized, bleached, weakly iron stained and brecciated with one 8' bed at the base of the Devonian massively replaced with manganese, specularite, and magnetite. The overall characteristics indicate the intercept to be within the fringe zone of a porphyry copper system.

AH-2 was advanced from 1988 to 2489 in postmineral Whitetail conglomerate. Hole will be deepened and should reach premineral bedrock this month.

Monthly estimated expenses thru February 25th: \$21,000

Estimated unexpended balance of authorization: \$32,500

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

A Supplemental Exploration Appropriation has been requested to complete drill roads and start three drill holes for 1973 assessment work requirements.

Monthly estimated expenses thru February 25th: \$ 100.

Estimated unexpended balance of authorization: \$5,100

THUNDER MOUNTAIN (Kerr-McGee) PROJECT, Santa Cruz County, Arizona - Cu:

Detailed mapping and core relogging were continued to help in selecting a drill site. Drill hole will be collared this summer.

Monthly estimated expenses thru February 25th: \$ 650

Estimated unexpended balance of authorization: \$137,650

March 1, 1973

RED HILLS PROJECT, Pinal County, Arizona - Cu:

Location work on the Asarco staked claims was started and should be completed early next month.

Monthly estimated expenses thru February 25th: \$11,000

Estimated unexpended balance of authorization: \$ 6,250

POSTON BUTTE PROJECT, Pinal County, Arizona - Cu:

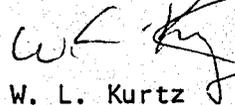
Approval to exercise our purchase options was received. Negotiations with Dowell, whereby they will conduct an in-place leaching test, are continuing.

Monthly estimated expenses thru February 25th: \$1,200

Estimated unexpended balance of authorization: \$1,100

SILVER STATE (balance \$116,500), SILVER BELL EAST (balance \$8,000), BALD MOUNTAIN (balance [\$1,000]), HARDSHELL (balance -0-), 3R (Anaconda) (balance [\$1,300]), and RAWHIDE (balance \$115,300) were inactive.

Very truly yours,



W. L. Kurtz

WLK:lb

Attach: Bohme Progress Map

cc: JHCourtright

RBCrist

JDSell 

JNS

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 30, 1973

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

Exploration Report
Southwestern Division
March 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Drill hole AH-2 was advanced by diamond drilling from 2489 to 3378 feet in post-mineral Whitetail conglomerate. Premineral bedrock is anticipated within a few hundred feet.

Monthly estimated expenses thru March 25th: \$21,300

Estimated unexpended balance of authorization: \$11,200 32,500

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Due to inclement weather, only minor progress was made on drill access roads. Roads and drill sites should be completed in April in preparation for assessment drilling.

Monthly estimated expenses thru March 25th: \$ 19,600

Estimated unexpended balance of authorization: \$109,000

THUNDER MOUNTAIN (Kerr-McGee) PROJECT, Santa Cruz County, Arizona - Cu:

Detailed and reconnaissance geologic mapping was continued to aid in drill site selection. Interestingly, the detailed mapping has strengthened the conclusion that deep-lying silver mineralization (similar in occurrence to the Hardshell mineralization) may lie beneath the Trench area.

Monthly estimated expenses thru March 25th: \$ 2,850

Estimated unexpended balance of authorization: \$134,800

March 30, 1973

3R (Anaconda) PROJECT, Santa Cruz County, Arizona - Cu:

Detailed geologic mapping was continued in the vicinity of the 3R mine to aid in our appraisal of this altered area.

Monthly estimated expenses thru March 25th: \$300

Estimated unexpended balance of authorization: (\$1,600)

RED HILLS PROJECT, Pinal County, Arizona - Cu:

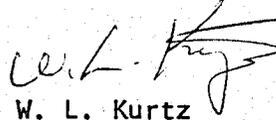
Monumenting and location work was completed on the Asarco staked claims. Negotiations with Bell Western Corp. have begun on their adjoining claims.

Monthly estimated expenses thru March 25th: \$3,000

Estimated unexpended balance of authorization: \$3,250

POSTON BUTTE (balance \$114,000), SILVER STATE (balance \$116,100), SILVER BELL EAST (balance \$8,000), BALD MOUNTAIN (balance [\$1,000]), HARDSHELL (balance -0-), and RAWHIDE (balance \$131,900) were inactive.

Very truly yours,



W. L. Kurtz

WLK:1b

Attach: Bohme Progress Map

cc: JHCourtright
RBCrist
JDSell

J. D. S.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 2, 1973

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

Exploration Report
Southwestern Division
April 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Drill hole AH-2 was advanced from 3378 ft. to a terminal depth of 3781 ft. The interval 3400-3781 ft. was composed of very weakly altered Paleozoic limestones and Precambrian quartzites and effectively forms the eastern limit of the alteration intersected in AH-1. A third hole south of AH-1 will be recommended.

Monthly estimated expenses thru April 25th: \$12,600

Estimated unexpended balance of authorization: \$ 1,400

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Inclement weather prevented completion of access roads and drill sites. These should be completed soon and drilling for assessment will begin during May.

Monthly estimated expenses thru April 25th: \$14,500

Estimated unexpended balance of authorization: \$94,500

THUNDER MOUNTAIN (Kerr-McGee) PROJECT, Santa Cruz County, Arizona - Cu:

Detailed mapping and restudy of drill core was undertaken to help in drill site location.

Monthly estimated expenses thru April 25th: \$ 1,100

Estimated unexpended balance of authorization: \$133,500

T. C. Osborne

- 2 -

May 2, 1973

3R (Anaconda) (balance [\$1,600]), RED HILLS (balance \$250), POSTON BUTTE (balance \$113,500), SILVER STATE (balance \$113,200), SILVER BELL EAST (balance \$7,900), HARDSHELL (balance (-0-), and RAWHIDE (balance \$140,100) were inactive.

Very truly yours,

W. L. Kurtz
W. L. Kurtz *lb*

WLK:lb

Attach: Bohme Progress Map

cc: JHCourtright
RBCrist
JDSell ✓

J.O.B.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 31, 1973

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

Exploration Report
Southwestern Division
May 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Hanna has agreed to participate in the second work commitment period (August 14, 1973-May 27, 1975). A drilling proposal has been submitted.

Monthly estimated expenses thru May 25th: \$ 2,600

Estimated unexpended balance of authorization: \$10,000

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Assessment work drilling has commenced and first drill hole, on State Land section 5, is at a depth of 1,030 feet in post mineral dacite. Assessment work drilling will continue.

Monthly estimated expenses thru May 25th: \$26,500

Estimated unexpended balance of authorization: \$68,000

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada - Ag:

Drill roads and drill sites will be prepared during June and air hammer drilling will commence in July.

Monthly estimated expenses thru May 25th: \$ 800

Estimated unexpended balance of authorization: \$112,400

T. C. Osborne

- 2 -

May 31, 1973

THUNDER MOUNTAIN (Kerr-McGee) (balance \$132,800), 3R (Anaconda) (balance [\$1,600]), RED HILLS (balance -0-), POSTON BUTTE (balance \$113,900), SILVER BELL EAST (balance \$7,700), HARDSHELL (balance -0-), and RAWHIDE (balance \$138,400) were inactive.

Very truly yours,


W. L. Kurtz

WLK:1b

Attachs: Bohme & Superior East Progress Maps

cc: JHCourtright
RBCrist
JDSell 

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 29, 1973

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

Exploration Report
Southwestern Division
June 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Drill hole AH-3 was collared in post-mineral Gila conglomerate, entered post-mineral dacite at 730 feet and was drilling at 1000 feet in dacite at the end of June. The hole will be deepened.

Monthly estimated expenses thru June 25th: \$ 6,000

Estimated unexpended balance of authorization: \$112,500

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Assessment work drilling on State Land was completed with drill hole A-3 ending at 1440' in post-mineral Whitetail conglomerate, and drill hole A-6 ending at 1358' in post-mineral dacite. Both holes will be deepened at a later date. Assessment drilling on A-7 will start in July.

Monthly estimated expenses thru June 25th: \$29,150

Estimated unexpended balance of authorization: \$46,000

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona - Cu:

Drill site AI-1 has been prepared and drilling will commence in July.

Monthly estimated expenses thru June 25th: \$ 5,000

Estimated unexpended balance of authorization: \$121,200

June 29, 1973

THUNDER MOUNTAIN PROJECT (Kerr-McGee), Santa Cruz County, Arizona - Cu:

Drill site preparation will begin in early July and coring will commence in late July or early August.

Monthly estimated expenses thru June 25th: \$ 2,200

Estimated unexpended balance of authorization: \$130,600

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada - Ag:

Drill site preparation has started and drilling is scheduled to commence July 6th.

Monthly estimated expenses thru June 25th: \$ 4,600

Estimated unexpended balance of authorization: \$107,800

3R (Anaconda) (balance [\$1,600]), RED HILLS (balance [\$200]), POSTON BUTTE (balance \$12,900), SILVER BELL EAST (balance \$7,700), and HARDSHELL (balance -0-) were inactive.

Very truly yours,

W. L. Kurtz
W. L. Kurtz

WLK:1b

Attachs: Progress Map - Bohme
" " - Superior East
" " - Rawhide

cc: JHCourtright
RBCrist
JDSeil ✓

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

July 31, 1973

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

Exploration Report
Southwestern Division
July 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Drill hole AH-3 was deepened in post-mineral dacite from 1000 feet to 1173 feet, where casing was set. Diamond drilling will commence in August.

Monthly estimated expenses thru July 25th: \$ 18,000

Estimated unexpended balance of authorization: \$108,000

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Drill site preparation for drill hole A-7 was completed and assessment drilling will commence upon availability of the rig in August. Assessment drilling of hole AA-1 was completed to 120 feet.

Monthly estimated expenses thru July 25th: \$11,000

Estimated unexpended balance of authorization: \$37,000

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona - Cu:

Rotary air-hammer drilling of hole AI-1 commenced during July and progressed to 1287 feet in post-mineral dacite, where casing was set. Rotary drilling will continue to core point during August.

Monthly estimated expenses thru July 25th: \$30,000

Estimated unexpended balance of authorization: \$93,200

July 31, 1973

THUNDER MOUNTAIN PROJECT (Kerr-McGee), Santa Cruz County, Arizona - Cu:

Drill road and site preparation for hole TM-8 has been completed. Diamond drilling should commence in August.

Monthly estimated expenses thru July 25th: \$ 5,000

Estimated unexpended balance of authorization: \$126,000

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada - Ag:

Drill site preparation continues. Six rotary air-hammer holes have been completed for a total footage of 2500 feet. No assay data available.

Monthly estimated expenses thru July 25th: \$17,000

Estimated unexpended balance of authorization: \$91,000

3R (Anaconda) (balance [\$1,800]), RED HILLS (balance [\$1,500]), POSTON BUTTE (balance \$11,900), SILVER BELL EAST (balance \$7,700), and HARDSHELL (balance -0-) were inactive.

Very truly yours,

W. L. Kurtz
W. L. Kurtz

WLK:JDS:1b

Attachs: Progress Map - Bohme
" " - Superior East
" " - Rawhide

cc: JHCourtright
RBCrist
JDSell ✓

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 31, 1973

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

Exploration Report
Southwestern Division
August 1973

Dear Sir:

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Drill hole AH-3 was deepened by diamond drilling from 1173' to 2582' and is presently drilling unmineralized, highly contorted, brecciated, gougy, Precambrian Pinal schist probably representing a gravity slide block. The hole will be deepened to test the rock beneath the brecciated block.

Monthly estimated expenses thru August 25th: \$27,000

Estimated unexpended balance of authorization: \$83,000

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Air hammer drilling commenced on site A-7 and at month's end had reached a depth of 862 feet in postmineral dacite. The hole will be deepened to test for native copper in the Whitetail conglomerate and replacements in the Paleozoic limestones.

Monthly estimated expenses thru August 25th: \$15,500

Estimated unexpended balance of authorization: \$21,500

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona - Cu:

Drill hole AI-1 was advanced from 1287' to 2768' and cased. Coring in the Whitetail conglomerate will start late in September.

Monthly estimated expenses thru August 25th: \$87,200

Estimated unexpended balance of authorization: \$ 6,000

August 31, 1973

THUNDER MOUNTAIN PROJECT (Kerr-McGee), Santa Cruz County, Arizona - Cu:

Diamond drilling was started on hole TM-8 and at month's end was at 902 feet in strongly sericitized and pyritized quartz feldspar porphyry with minor enargite. Drilling will continue to test for deep porphyry copper mineralization.

Monthly estimated expenses thru August 25th: \$ 17,500

Estimated unexpended balance of authorization: \$108,500

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada - Ag:

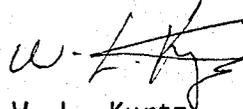
An additional 8,693 feet of air hammer drilling were completed in 20 holes. 26% of the assays received to date average greater than 1.5 ounces silver per ton.

Monthly estimated expenses thru August 25th: \$36,000

Estimated unexpended balance of authorization: \$55,000

3R (Anaconda) (balance [\$1,800]), RED HILLS (balance [\$1,500]), POSTON BUTTE (balance \$11,400), SILVER BELL EAST (balance \$7,700), and HARDSHELL (balance -0-) were inactive.

Very truly yours,



W. L. Kurtz

WLK:lb

Attachs: Progress Maps:
 Bohme
 Superior East
 Rawhide
 Thunder Mtn.

cc: JHCourtright
 RBCrist
 JDSell ✓

f. d. s.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

October 2, 1973

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

Exploration Report
Southwestern Division
September 1973

Dear Sir:

THUNDER MOUNTAIN PROJECT (Kerr-McGee), Santa Cruz County, Arizona - Cu:

Diamond drill hole TM-8 was advanced from 902' to 1826' in strongly sericitized and pyritized quartz feldspar porphyry. Fine-grained disseminated chalcopyrite was encountered at 1350'. The hole will be continued to test this deep porphyry copper target.

Significant assays received: 1370'-1670' -- 300' @ 0.50% Cu.

Monthly estimated expenses thru September 25th: \$11,000

Estimated unexpended balance of authorization: \$101,250

SUPERIOR EAST PROJECT, Gila and Pinal Counties, Arizona - Cu:

Drill hole A-7 was advanced from 862' to 3150' in postmineral dacite, early volcanics and Whitetail conglomerate. The hole is cased and will be continued by diamond drilling to test for native copper in the Whitetail conglomerate and copper replacements in the Paleozoic limestones.

Monthly estimated expenses thru September 25th: \$45,000

Estimated unexpended balance of authorization: \$91,500

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona - Cu:

A diamond drill rig was moved onto hole AI-1, which is cased at 2768'. Coring will begin immediately to test for porphyry copper mineralization.

Monthly estimated expenses thru September 25th: \$2,500

Estimated unexpended balance of authorization: \$29,000

October 2, 1973

BOHME PROJECT (Hanna), Gila County, Arizona - Cu:

Drill hole AH-3 was terminated at 3614' in unmineralized, brecciated Pinal schist. A new drill site will be selected to test this covered area between the Pinto Valley and Copper Cities porphyry copper deposits.

Monthly estimated expenses thru September 25th: \$22,000

Estimated unexpended balance of authorization: \$60,000

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada - Ag:

An additional 7,215 feet of air hammer drilling were completed at this low grade disseminated silver deposit. Drilling will be completed early in October. Significant assay data will be reported in October.

Monthly estimated expenses thru September 25th: \$33,000

Estimated unexpended balance of authorization: \$18,000

POSTON BUTTE PROJECT, Pinal County, Arizona - Cu:

A water well was completed on our State land to fulfill work requirements. Dowell has indicated they will not participate in the in-place leaching test. A new partner will be sought.

Monthly estimated expenses thru September 25th: \$7,600

Estimated unexpended balance of authorization: \$10,300

3R (Anaconda) (balance [\$1,800]), RED HILLS (balance [\$1,500]), SILVER BELL EAST (balance \$7,700), and HARDSHELL (balance -0-) were inactive.

Very truly yours,



W. L. Kurtz

WLK:lb

Attachs: Progress Maps:
Thunder Mountain
Superior East
Rawhide
Bohme

cc: JHCourtright
RBCrist
JDSell ✓

J.B.S.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 12, 1973

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

Charleston Area
Cochise County, Arizona

Dear Sir:

You requested to be informed during the early stages of negotiations for mineral properties in the Southwest.

We have obtained information on seven drill holes up to 3300 feet in depth located in the Charleston Mine area (approximately seven miles southwest of Tombstone, Arizona). Several of these holes contain in excess of 2,000 feet of altered and pyritized, with minor copper, zinc and lead, Cretaceous sediments and volcanics. Mapping by Asarco has demonstrated a permissive zone sufficiently large to house an important copper deposit.

The property, consisting of about six sections, is held by the James Stewart Company and, through their president, Mr. Seth Horne, 3033 N. Central Ave., Phoenix, Arizona 85012, are asking the following terms:

Year	
1	10,000' drilling plus reimbursement of \$15-20,000 of Stewart Company's drilling expenses
2	24,000' drilling
3	\$50,000 Advance Royalty
4	\$75,000 " "
5	\$100,000 " "
6	\$150,000 " "
7	\$200,000 " "
8.	\$250,000 " " continues until production.

Upon production 6% NSR on Federal Land and 3% on State Land (in addition to Royalty due State). After \$25 million has been paid in royalties, the NSR drops to 1% on both Federal and State Land.

T. C. Osborne

- 2 -

September 12, 1973

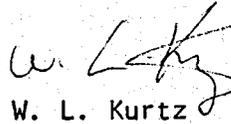
Mr. Courtright and I rate the area a longshot exploration gamble, but worthy of a couple deep, 3-5,000 foot drill holes if terms can be changed along following lines:

Year 2 10-15,000 feet of drilling
After 8, continue minimum advance royalty until after payback
then 5% NSR Federal:3% State until \$25 million paid, then
1% NSR

This would make costs for a four or five hole test of the property in the range of \$170,000 the first year and \$150,000-\$225,000 the second year.

If you approve, I should like to present the above alternative terms, or any others you might suggest, to Mr. Horne next week. A report on this property by Mr. King should be completed next week, and will be submitted with an Exploration Authorization Request if satisfactory business terms can be negotiated.

Very truly yours,



W. L. Kurtz

WLK:1b

cc: JHCourtright
JRKing
JDSell
RBCrist

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

November 1, 1973

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

Exploration Report
Southwestern Division
October 1973

Dear Sir:

THUNDER MOUNTAIN PROJECT (Kerr-McGee), Santa Cruz County, Arizona - Cu:

Diamond drill hole TM-8 was advanced from 1826' to 2869' in strongly sericitized and pyritized quartz feldspar porphyry with an estimated copper tenor of 0.2-0.4%. The hole will be deepened to test this vertically zoned porphyry copper target.

Monthly estimated expenses thru October 25th: \$14,000

Estimated unexpended balance of authorization: \$87,000

RAWHIDE PROJECT (Inspiration), Pinal County, Arizona - Cu:

Diamond drill hole AI-1 was advanced from 2768' to 3073' in Tertiary Whitetail conglomerate; to 3240' in Precambrian schist breccia (gravity slide block); to 3324' in Precambrian schist and Laramide(?) dikes containing minor pyrite and chalcopyrite. The hole will be deepened to test the primary mineralization.

Monthly estimated expenses thru October 25th: \$24,000

Estimated unexpended balance of authorization: \$ 5,000

SILVER STATE PROJECT, Rochester District, Pershing County, Nevada - Ag:

20,820 feet of air hammer drilling in 50 holes were completed during the 1973 drill program at this low grade, disseminated silver property. The assay data indicate that the plus 1.0 ounce silver intercepts average 1.8 oz/T and represent 40% of the footage. Average assay of all samples is approximately 1 oz/T.

Grindability tests, metallurgical tests, and outcome studies are being conducted and will be reported in December.

Monthly estimated expenses thru October 25th: \$11,000

Estimated unexpended balance of authorization: \$ 7,000

T. C. Osborne

- 2 -

November 1, 1973

SUPERIOR EAST (balance \$87,000), BOHME PROJECT (Hanna) (balance \$59,500), POSTON BUTTE (balance \$7,000), 3R (Anaconda) (balance [\$1,800]), RED HILLS (balance [\$1,500]), SILVER BELL EAST (balance \$7,200), and HARDSHELL (balance -0-) were inactive.

Very truly yours,



W. L. Kurtz

WLK:1b

Attachs: Progress Maps:
Thunder Mountain
Rawhide

cc: JHCourtright
RBCrist
JDSell ✓

1974 ESTIMATED EXPENDITURES

Unallocated 1974		\$500,000
Estimated unallocated 1973		\$455,000

Continuing Projects

3R (Anaconda)

Land: \$300 per month x 17 (Aug. '73-Dec. '74)	\$ 5,100	
Invoice Anaconda	<u>20,292</u>	\$ 25,392
Work: Deepen TR-10 4105'-5000'	\$21,000 x	
Drill new hole	→ 60,000	
Site Preparation	<u>5,000</u>	
		<u>86,000</u>
		\$111,392
	Say	\$115,000 ✓

Payable in 1973 with new Supplemental EA:

\$20,292	Anaconda invoice
1,500	Land Aug-Dec
<u>7,000</u>	TR-10
\$28,792	

Payable + Expense

*120,000 expenditure
used under production
was not in 1973*

Agreement calls for:

Total Expenditures by 22 June 74	- \$ 95,000
Total Expenditures by 22 June 75	- \$200,000

Spent to date: \$65,000
Balance in EA: \$-1,800

Mendoza Option

400/mo to July 74 then 600/mo to July '75

2nd year payments (July 74-July 75)	\$ 7,200	\$ 8,000
-------------------------------------	----------	----------

Thunder Mountain (Kerr-McGee)

Drill hole TM-8 should be completed in December 1973.
Estimated balance of EA as of 1 Jan. 74: \$60,000

Work: One diamond drill hole -- 4,000'	→ \$ 60,000
--	-------------

at 75 - 150,000 to be spent

Poston Butte

Search out joint venture partner
 Taxes \$ 6,000 ✓
 Estimated balance EA: \$6,000
 Sharecropping may return revenue
 between \$40-60,000 per year
 Straight rental: \$18,000 per year ✓

Red Hills

Balance EA: - \$1,500

Land: 130 claims \$13,000*
 State sec. 36 5,600*-due 2/20/74
 State sec. 2 6,300 -due 5/21/74
\$24,900

Work: Drill one hole \$ 66,300
 4,000 60,000* Say \$ 70,000 ✓

*hole includes claim +
State 36 committment

Bohme

Estimated balance (ASARCO + Hanna) \$160,000
 Estimated balance ASARCO only 50,500

Work: Drill AH-4 1500' \$ 20,000
 Drill AH-5 3000' 50,000
 Drill AH-6 76,000
 Land: \$1,000 per month 14,000

\$ 50,500 ✓

Work due by May 27, 1975

Silver State

Land: Silver State Cons. Mines \$12,500
 (due 31 Dec 73)
 Red Top - \$400/mo. 4,800
 Cordero (Sun Oil) 2,500
 Olive 3rd pay of 40,000 total 9,600
\$29,400

Water study 3,000
 Surveying 10,000
 Drilling @ \$5/ft. total costs 100,000

\$142,400 Say \$150,000 ✓

Estimated balance Dec. '73: -0-

Total Projects This Page: \$276,500

Rawhide

Estimated balance 1 Jan. 74: Minus \$7-10,000

Work -- assessment completed

Make up deficit

Supplement

\$ 10,000 ✓

to be spent in 1973

Clark Option

Land: Jan.-Dec. 74 \$ 2,080

(\$160 Jan-Nov; \$320 Dec)

8 claims assess. work 1,000

Surveying

Say \$ 4,000 ✓

Superior East

Estimated balance 1 Jan. 74: \$80,000

Work: Complete A-7 *in 1974* \$ 80,000

Offset A-2 *Assessment not for 1974* 100,000

Offset A-2 *Self Assessment - 20,000 =* 100,000

State (A-3:A-6) 27,000

Site Preparation 5,000

\$312,000

180,000 expendable. If not needed for claim assessment or work committed.

Legal \$ 15,000

Surveying 10,000

\$ 25,000

Say \$337,000
\$340,000

Hardshell

Assessment (Direct \$14,400) \$ 20,000

2 years

Silver Bell East

Inactive (assessment work from Silver Bell Unit)

Total Projects This Page: \$374,000

Grand Total Continuing Projects: \$833,500

1974 Potential Projects

Charleston

Land
Drilling
Legal, misc.

\$15,000
150,000
10,000

\$175,000

Lindsey Canyon

100,000

MIN. 837,000 Prod.
+ 625,000 Unroll + Gr. Roll
1462,000

*Not included
in activities
sum for some
separation*

An initial test of the following targets could be done cheaply and advantageously by contracting a rotary drill (1500) on a monthly basis. Drilling costs would be approximately \$12,500 per month, plus Asarco supervision and any land acquisition costs. \$150,000

- 1) Morning Star, San Bernardino Co., Calif.
Sec. 27, T15N, R14E.
Strong pervasive quartz-sericite alteration assoc. with sulfide mineralization in quartz monzonite at edge of gravel cover. I.P. survey negative.
Work: 2 RDH @ 500' each.
- 2) Gu Achi (Niapa Kam) Papago Reservation
E1/2, T2E, R13S. Dec 13
Would require working out lease with Indians. Pervasive zone of epidote alteration in clastics and volcanics; increasing in intensity towards cover; clots and spots of copper.
Work: 2-4 RDH @ 500'-1,000'.
- 3) Vaiva Vo Papago Reservation
Would require working out lease with Indians. Spotty alteration going under cover to east.
Work: 2-5 RDH @ 500'-1,000'.
- 4) West of Cholla Butte in search of faulted half of Poston Butte ore body or new mineralization along Sacaton-Poston Butte trend. Holes could be on either Gila Reservation (have to be put up for bid) or on fee land.
Work: 5 or more RDH @ 500'-1,000'.
- 5) Vekol Mine -- test for replacements in Cambrian Abrigo and/or Precambrian Mescal ls. On trend Lakeshore-Reward.
Work: RDH 2-5 @ 500'.
- 6) Covered area NE of cupriferous Laramide dikes in Santa Rosa Mountains, T11S, R5E. Require lease with Papago Tribe.
Work: 5 RDH @ 500'-1,000'.
- 7) Big Horn Mountains, sec. 35-36, T8W, R5N.
Test covered area in basin west of outcrops containing copper in clastics and volcanics.
Work: 5 RDH @ 500'-1,000'.
- 8) SE Roskruge Mountains, T15S, R10E.
Test weak propylitic alteration going beneath cover.
Work: 2-5 RDH @ 500'-1,000'.
- 9) Several areas in the Silver Bell to Morenci trend currently under study.
Work: RDH @ 500'-1,500'.

action

J.D.L.

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

November 7, 1973

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

Exploration Authorization Request
Charleston Project
Cochise County, Arizona

Dear Sir:

You have reviewed Mr. King's report on the subject project, visited the area in the field, and are in agreement that this copper prospect warrants two 3500-5000 foot diamond drill holes as a minimum test.

We are currently drafting an option agreement with the James Stewart Company calling for the following terms:

Year	Commitment
1	10,000' drilling; \$15,000 rental payment
2	15,000' drilling
3	\$50,000 rental payment
4	\$100,000 rental payment
5	\$150,000 rental payment
6	\$200,000 rental payment
7	\$250,000 per year until start of production

Upon start of production, \$500,000 per year for 5 years or until payback -- whichever comes first;

then

4.5% NSR on Federal land; 2% NSR on State land until a total of \$25 million has been paid (rental plus NSR), then perpetual 1% NSR.

The adjoining property is held by Sierra Minerals Management who have stated that they are willing to joint venture their ground, but only after Asarco consummates an agreement with the James Stewart Company.

I estimate funds to complete the first year's commitment as follows:

\$15,000	rental payment
150,000	10,000 feet of drilling
<u>10,000</u>	Legal, contingencies
\$175,000	

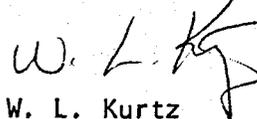
T. C. Osborne

- 2 -

November 7, 1973

Please request an authorization, conditional on signing an agreement with the James Stewart Company, in the amount of \$175,000. Forms 302-E and 302-EA are attached.

Respectfully submitted,



W. L. Kurtz

WLK:lb

Attachs: Forms & Map

cc: JHCourtright - w/encs.
RBCrist - w/o encs.
JRKing - w/o encs.
JDSell - w/o encs. ✓
ADCoumides -w/forms only

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

November 8, 1973

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

Supplemental Exploration
Authorization Request
3R (Anaconda) Project
Santa Cruz County, Arizona

Dear Sir:

The ASARCO drilling on the 3R Project and adjacent Thunder Mountain Project demonstrates that we are exploring a large porphyry copper system. Drill hole TR-10 was bottomed at 4105' and contained the following significant assays:

Interval	Length	% Cu	% MoS ₂	oz. Au	oz. Ag
3860-4105	245'	0.52	0.029*	0.006*	0.16*
4030-4105	75'	0.60			

*based on 50' composites.

The mineralization is increasing with depth and I concur with Mr. Graybeal that this hole should be deepened to 5,000 feet, and a new hole drilled 2,000 feet north of TR-10.

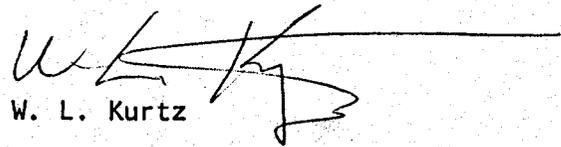
Land commitments to December 1974, including the \$16,000 renewal fee Anaconda negotiated for extending options, are \$25,392.

I estimate the cost to complete this phase of exploration as follows:

Deepen TR-10	\$ 21,000
Drill new hole	60,000
Land commitments	25,392
Site preparation	5,000
Legal, contingencies	<u>3,608</u>
	\$115,000

If you approve, please request a Supplemental Exploration Authorization for this amount. Forms 302-EA and 302-EB are enclosed.

Respectfully submitted,


W. L. Kurtz

WLK:lb
Encs: Forms & Map

JDS

T. C. Osborne

- 2 -

November 8, 1973

cc: JHCourtright - w/encs.
RBCrist - w/o encs.
FTGraybeal - w/o encs.
JDSell - w/o encs. ✓
ADCoumides - w/Forms only

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

November 8, 1973

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

Supplemental Exploration
Authorization Request
Red Hills Project
Pinal County, Arizona

Dear Sir:

During January 1973 ASARCO performed location work on its Federal lode claims and paid rental on its State Prospecting Permits to acquire a land position over a porphyry copper target at Red Hills. At that time we did not request drilling funds because we anticipated acquiring the adjoining ground held by the Red Hills Mining Company. This adjoining ground is now held under option by the Phelps Dodge Corporation.

The work commitment of \$5,600 on our State Prospecting Permit for section 36 must be completed by February 20, 1974. I now recommend the drilling of a 3500-5000 foot diamond drill hole in section 36 to test the porphyry copper exploration target that exists on our land (see attached map). This hole will also fulfill 1973-74 assessment work requirements on our 130 Federal lode claims.

I estimate costs to complete this work and the work requirements on State section 2, due May 27, 1974, as follows:

Drilling	\$ 60,000
State Section 2	6,300
Legal, contingencies	<u>3,700</u>
	\$ 70,000

If you approve, please request a Supplemental Exploration Authorization for this amount. Forms 302-EA and 302-EB are enclosed.

Respectfully submitted,


W. L. Kurtz

WLK:lb
Encs: Forms & Map

cc: JHCourtright - w/encs.
RBCrist - w/o encs.
JRKing - w/o encs.
JDSell - w/o encs. ✓
ADCoumides - w/Forms only

1976 Proposed Expenses
SW Exploration Division

A. CONTINUING PROJECTS

1. SANTA CRUZ "THE LANDS" (0075)

a) Drill 5 2500-foot holes in oxide area			
Drilling & Project Costs @ \$20/ft.		\$250,000	
b) Land Expenses (1/2 of mortgages & interest)			
1/15/76	\$26,000		
8/01/76	8,000		
1976 Taxes	<u>6,000</u>		
		<u>40,000</u>	\$ 290,000

2. SANTA CRUZ "PERIPHERAL" LANDS (0087)

a) Drill 3 3000-foot holes as offset of SC-23			
Drilling & Project - Asarco's 1/2		\$ 90,000	
b) Land; Asarco's 1/2 - estimate			
1) Matthewman		15,000	
2) Howard		60,000	
3) Land negotiations - Legal		20,000	
4) NAAC		<u>?</u>	+185,000

3. 3R

Anaconda (21 June 72) joint venture (107 unpatented, 21 patented)

Obligations:

	<u>By date</u>	<u>Spend</u>	<u>Cumulative total</u>
	21 June 76	\$400,000	
	21 June 77	640,000	
to earn 51% interest. Estimated total cumulative expenditures by 1 Jan. 76:		\$272,000	
Balance by 21 June 76:		\$128,000	

Land payments \$300/mo. with balance due 1 May 78
 \$213,650

1976 Work:

a) Chalcocite Zone:			
Road work		\$ 20,000	
Drill 3 holes @ 1,000 feet			
Drilling & Project Costs @ \$23.33		70,000	
b) 5,000-foot deep offset of TR-10		130,000	
c) Land \$300/month		4,000	
d) Misc.-Contingencies		<u>16,000</u>	240,000

4. THUNDER MOUNTAIN

Kerr-McGee (1 Oct. 72) joint venture on 160 unpatented lode claims. Obligation to spend \$150,000 by 1 Oct. 75 completed.

To earn 50% interest spend additional \$850,000 by 1 Oct. 78. This can be negotiated for extension.

Mendoza Option (1 Aug. 73) 7 unpatented claims total price \$71,400.

1 Aug. 75-1 Aug. 76	\$ 600/mo.
1 Aug. 76-1 Aug. 80	\$1012.50/mo.

Hay Option (16 July 74) 23 unpatented claims final payment August '76.

Sheehy Option - Asarco's 1/2 final payment \$3,750 due 24 Aug. 80.

1976 Work - Land:

*Mendoza assessment	\$ 1,000	
payments	11,500	
*Hay assessment	2,500	
payments (Asarco's 1/2)	2,200	
*Kerr-McGee assessment	20,000	
(if renegotiate, work commitment in addition to assessment estimated)	50,000	
Misc.-contingencies	<u>2,800</u>	90,000

5. SUPERIOR EAST

Continental Copper, Inc. Agreement (25 Mar. 71) covers 351 unpatented lode claims. \$50,000 per year work obligation. Upon production Asarco retain all proceeds until payback then split 80/20. Continental Copper right to earn additional 20%. Underlying Continental Copper agreement with CanUS calls for 3% NSR until a total of \$20 million is paid.

Asarco staked claims: 375

Asarco State Prospecting Permit: 1 Section

1976 Work:

Deepen A-5 (3145'-5000')	\$ 60,000	
Drill new 5500-foot hole	150,000	
Site preparation	10,000	
Supervision, contingencies 20%	<u>45,000</u>	265,000

6. RAWHIDE

Asarco spend \$500,000 by 1 June 80 to earn 45% interest in 139 unpatented lode claims held by Inspiration (spent to date: \$150,000).

1976 Work:

*Assessment	\$ 18,000	18,000
-------------	-----------	--------

7. ROCHESTER

Silver State Consolidated Mines, Inc.

Advance proceeds negotiated each year not to exceed \$50,000 and due 31 December.

Upon production 5% net proceeds until payback, then 15%.

Olive Group (19 Feb. 70) total price \$80,000

19 Feb. 76 \$36,800 (final payment)

Sunedco

a) Elaine claims (12 unpatented)

b) Assume Red Top Lease \$400/month until \$100,000 paid (total paid to 1 Jan. 76 \$29,200)

c) Upon production 2% NSR until Red Top purchased, then 5%. Advance royalty due Sunedco \$2500 @ \$4.35684 silver

Total Claims: 114

1976 Land:

Red Top	\$ 4,800	
Olive	36,800	
Sunedco (est.)	3,000	
Silver State		
31 Dec. 76	<u>50,000</u>	\$ 94,600

Additional land:

a) David's Placer Claims (future tailings area) option		5,000
--	--	-------

b) Nelson - 2 patented claims option		5,000
--------------------------------------	--	-------

*Assessment-Misc.-Contingencies	<u>20,400</u>	125,000
---------------------------------	---------------	---------

1976 Possible Work:

a) Drilling on Nenzel Hill with Avery down-hole-hammer angle: 8,000 feet @ \$10/ft. + \$3 project costs	\$104,000	104,000
---	-----------	---------

b) Water well test in Buena Vista Valley	\$ 20,000	20,000
--	-----------	--------

c) Preliminary patent survey	\$ 20,000	20,000
------------------------------	-----------	--------

8. HAYDEN HILL

Husse-Goff 4 claims: \$2,400 due 1 Feb. 76; \$3,600 due 1 Feb. 77; \$37,500 due prior 1 Feb. 78

8. HAYDEN HILL - Continued
Reycraft 2 partial claims: \$1,000 due 1 Dec. 75;
\$1,500 due 1 Dec. 76; \$2,500 due 1 Dec. 77;
\$10,000 prior 1 Dec. 78
*Asarco 61 Au claims - assessment work due

1976

Land	\$ 3,900	
Drilling and Project	<u>50,000</u>	54,000
9. OLBERG (Gila River Indian Reservation) 2 year Prospecting Permit (9 Sept. 75) Drilling & Project	\$75,000	75,000
10. HARDSHELL 135 claims *Assessment work (2 years) Mineralogical Study (student) Metallurgical at Central Research	\$35,000 \$10,000	35,000 10,000
11. NORTHWEST SILVER BELL 254 claims *Assessment work	\$30,000	30,000
12. SILVER BELL EAST *Assessment work from Silver Bell Unit		<u>-0-</u>

TOTAL CONTINUING PROJECTS:

\$1,561,000
(NAAC not included)

*Required assessment work to hold claims.

B. NEW PROJECTS

1. NORTH STAR, Pinal County, Arizona Land - Claims & State PP \$7,500 + (\$13,000 if perfect) Drilling - 4 rotary holes, spot cores	\$ 20,500 40,000
2. WEST CASA GRANDE MOUNTAINS Altered, mineralized water well cuttings - Drilling follow-up 4 holes @ 1500 @ \$10/ft.	60,000
3. XYZ	<u>60,000</u>

TOTAL NEW PROJECTS:

\$ 180,500

C. UNALLOCATED

\$ 500,000

GRAND TOTAL:

\$2,241,500

December 13, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Other Tidbits
GSA Meeting - Nov. 8-11, 1976
Denver, Colorado

Ken Hatfield, Kerr-McGee. Red Mountain, Silverton area, Colorado. Initial interest was the zonal arrangement of mineral trends (arrows) from the Telluride side pointing to Red Mtn. However, their drilling has been of only minor encouragement to date. A recent age date of 10-12 m.y. has been obtained on "mineralization." This has put a damper on exploring for a deeper copper target, even though several +3000 ft. holes are down.

Gary Moore, Exxon. Crandon, Wisconsin deposit, 45 miles NE of Flambeau, has announced 60 million tons of 1% copper. It is still open in several directions laterally and at depth and they are thinking in terms of 100-150 million tons. Will continue drilling when area ices up. (November ME and EMJ report 60 million tons located 200 feet below surface to maximum depth of 1675 feet, with a width of several hundred feet and one mile strike length. Values of 6.5% Zn and 1.0% Cu, with much lower values of silver, gold, and lead. Verbal tonnage factor is 7.3 cu. ft./ton.

Charlie Chapin, N.M. Bureau of Mines. He is very impressed at the similarity of the manganese in the Luis Lopez district of Socorro, N.Mex. versus that at Hardshell, Az., as well as both being in the moat series of volcanics.

Howard McCarthy, Geochemist, USGS. The Denver USGS has secured a multi-million dollar grant from ERDA. Part of this will be spent to conduct a comprehensive geochemical, geophysical, and geological survey of the Papago Indian Reservation. They will do some preliminary work in Nov.-Dec. then return for the Spring Field Session of Feb.-June 1977. They will do mostly pediment studies as that seems to be where the porphyries are; i.e., Lakeshore and Vekol Hills. Three new 15-minute geologic quads are in press: Comobabi, Santa Rosa, and Silver Reef; and some 5 others, Baboquivari, etc., are in the process of being compiled (mapped?).

Lee Heindl, formerly of the USGS, has now rejoined the Survey and also hopes to return to Arizona to complete his study of the Reservation. (Note: ASARCO has a preliminary non-released copy of his Tertiary text and bedrock map -- 1964-1965 vintage.)

F. T. Graybeal

- 2 -

McCarthy will be down in November to chat with Addison Smith, the BIA, the Indians, and hopefully to those companies which have and had permits on the reservation.

Vince McKelvey, Chief of USGS, while at dinner with his son Greg, Sy Creasey and other USGS, asked Sy what kind of pressure did the Survey have on them in Arizona. Sy stated that SMEA was critical. Vince would be interested in comments from industry on the role of the USGS.



J. D. Sell

JDS:lb

JOS Quarterly Reports
Jan 1969 — March 1982.

FTG
JRS

First Quarter Report
Jan - Feb - March 1980

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 18 days in overseeing road building, site preparation, casing recovery, and directional drilling attempt.

Tentic Project, Utah - Pb, Zn, Ag. 3 1/2 days in review of data including one day travel to area.

GENERAL EXPLORATION

Michilla Property, Chile - Cu. 22 days including 5 on the property, 3 in their office and government offices, one each at Chuquiaguamata and El Teniente mines, a weekend, 6 day travel, and 4 day report writing.

Exploration Meeting, New Jersey. 22 days including research, slide preparation, travel (2), and meeting (3 1/2).

Western Arizona Field Trip. 2 1/2 days of travel and discussion of Western Arizona core complexes, thrust faulting, related geology, and mineralization.

MISCELLANEOUS

Miscellaneous clean-up (1/2 day);

Holiday (1 day);

EOm & EOP reports (3 1/2 days); and

Weekends (10 days).

(91 days total).

Lois: Help - I don't have
lost the 4 Q's quarters 79 - 80
could I get a copy? Thanks

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 30, 1969

EXPLORATION STAFF MEMORANDUM

PDB
SIB
SRD
WGF
SEZ

ADV
HLC
WES
JDS 

BEK
RDK
RHL
NPW

The quarterly report from this office to New York contains in one section brief comments regarding mine, prospect and area examinations. Accordingly, you should submit promptly, not later than the 5th day of the month following, to this office a one or two sentence summary of all such examinations or reconnaissance for the Quarter. This summary should include the location, nature of the prospect and disposition.

J. H. Courtright
J.H. Courtright

JHC:lzb

May 5, 1969

TO: J.H. Courtright

FROM: J.D. Sell

First Quarter Examinations--J.D. Sell Jan, Feb, Mar, 1969.

1. Red Hill and East Silver Bell area.

Minor hematite stain along shears and joints in granite and quartzite. Low interpretive values and narrow zones. No further work suggested.

2. Papago Central Project.

With R. Karvinen, S. Davis, L. Jansen, and J. Kinnison. Sampling and inspection of areas around Lakeshore, and Copperosity areas. JEK found one small altered zone SE of Lakeshore which was recommended for geophysical work. Reports on areas submitted by RDK & JEK.

3. Lindsey Canyon (West Graham Mtns).

Reconnaissance and sampling with owner suggested possible target area. Follow up work by R. Karvinen, S. Davis, and T. Dalla Vista of continued sampling failed to find trends suggestive of target. Report submitted by RDK.

4. Santo Tomas Project, Sinaloa, Mexico.

Remapped project area with 3 ASARCO Mexicana geologists. Report prepared and distributed.

5. Table Top Area, Casa Grande District.

With L. Jansen. Reconnaissance sampling of large area of hematite-flooded (Ferromag breakdown) granite for low grade gold-silver possibilities. Very low results. No further work suggested.

6. Silver Crown Area, SE of Kirkland Junction, Yavapai Co.

Following initial examination with L. Jansen, we, with R. Karvinen and S. Davis, followed up with securing pulp samples, splitting and sampling of new core, and surface sampling. The early prepared pulps by Arizona Michigan Mining Company reported high gold-silver values which we confirmed in their sample. Our new samples failed to substantiate any values and the property was dropped from further examination.

7. White Tank Area, Maricopa County.

With L. Jansen made initial reconnaissance and followed up with detailed reconn geologic study. Geophysical studies also made. Surface indications were marginal and property finally dropped from consideration. Reports submitted by L. Jansen and geophysical department.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 30, 1969

TO: J.H. Courtright

FROM: J.D. Sell

Second Quarter Examinations
April, May, June, 1969

1. Hassayampa Basin, Helicopter Project.

With S.R. Davis a helicopter supported reconnaissance was conducted in the Hassayampa Basin and adjacent mountain ranges in the search for continued exploration targets. Several low priority color zones were noted and samples collected for geochemical analysis. Report submitted.

2. Hillsboro District, New Mexico.

Accompanied Mr. S.I. Bowditch, report submitted. Inspiration Copper Company continues to hold and drill the exposed porphyry. Remaining areas under cover and/or show very low values. No further work suggested.

3. Noipa Kam (Papago Indian Reservation).

With S.R. Davis, reconnaissance mapping and sampling of area showing copper and epidote in Cretaceous (?) conglomerate. Preliminary results suggest central area under cover. Geophysical studies did not delineate a target. Samples submitted to Dr. S.R. Titley, U of A, for petrographic examination, no report available. Continued mapping and reconnaissance in progress with final report at conclusion of field and laboratory examination.

4. Prescott (B.W. Copeland) Examinations.

Three areas were investigated with Copeland. 1) Slate Creek, 2) Wilhoit "Red Hills" and 3) Lynx quarry. Samples from Slate Creek area (narrow silver-quartz veins) submitted to El Paso with results not yet available. Reports submitted on other areas. No further work recommended.

5. Turkoiy Prospect (Cyprus), Baker, Calif.

Field examination of data, including drill core, supports concept of deep copper-moly potential of area.

J. D. Sell copy

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 26, 1969

TO: J. H. Courtright

FROM: J. D. Sell

Third Quarter Report
July 1 through September 30, 1969

Noipa Kam (Gu Achi) Epidote-Copper Area
Papago Central Project
Pima County, Arizona

Completion of field work (aided by SR Davis in early part) and submission of report on area of minor copper contained in weak to pervasive epidote alteration. Several factors suggest the possibility of a buried source intrusive under alluvial cover. Additional geophysical work in progress to aid interpretation.

Drum Mountain Copper-Moly Prospect
Curwood Property
Juab and Millard Counties, Utah

Mapping, sampling and completion of report on structural area in quartzite which may be underlain by an intrusive body. Very low geochemical values suggest no upward emplacement of values into the quartzite although numerous iron-manganese stained and coated breccias and pebble dikes were found. The adjacent, exposed and drilled, porphyry area showed very low copper-moly values. Low priority area.

Computer Workshop and Symposium
Salt Lake City, Utah

Attendance and participation in week long sessions of computer applications, workshop, and symposium papers conducted by the Society of Mining Engineers of AIME.

Caridad Porphyry Copper-Moly Prospect
Caridad (Nacozari), Sonora, Mexico

Start of a project in the Caridad area as a comprehensive study involving surface mapping, petrographic study and age-dating.

J. D. Sell 

JDS-copy

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 29, 1969

TO: J. H. Courtright

FROM: J. D. Sell

Fourth Quarter Examination
October-November-December 1969

1. La Caridad Project, Nacozari, Sonora, Mexico

The project is an expanded geologic, petrographic and age-dating problem involving B. E. Kilpatrick and myself from ASARCO, Tucson, geologists and a petrographer from Asarco Mexicana, and several people from the U of A (Petrographic and Age-dating work). Initiated in late September, the project has occupied the total fourth quarter.

Preliminary maps of the geology, mineralization and alteration of the main Caridad area have been completed at a scale of 1:3000. The area covered is approximately three square miles. Presently being mapped is a similar sized area known as Little Caridad. Originally (UN-Consejo), the area was mapped as "volcanics", but the recent work (mainly by BEK) shows abundant andesite, latite, and monzonitic breccias, some intrusive, which are probably near-surface equivalents to the units found at the main Caridad area.

Approximately two hundred rock samples have been collected over the main Caridad area. These include two surface lines (N-S and E-W), scattered surface samples, and selected core intervals from drill holes along the lines. These are presently being processed by the U of A for thin-section and polished-section studies.

The project is continuing with studies on problems in the main area, the Little Caridad area, and special topics as the types and distribution of breccias, the fracture-fault pattern, and the extent and features of the large-scale fault known to exist between the main deposit and Little Caridad. Scheduled is the collection of samples for comparative age-dating studies.


J. D. Sell 

JDS/kvs

cc: W. E. Saegart

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 1, 1970

TO: W. E. Saegart

FROM: J. D. Sell

First Quarter Report
January - March, 1970

1. La Caridad Project, Nacozari, Sonora, Mexico

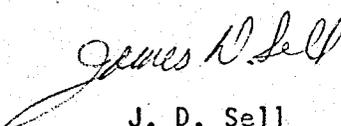
Additional compilation of mapping was completed and an interim report finalized during the quarter, along with the submittal of maps covering the joint work conducted over the main La Caridad porphyry area. Initial work has been completed in preparation of aiding B. E. Kilpatrick in compiling and writing the integrated geologic report covering all phases of the mapping and petrographic work.

2. Winchester Project, Cochise County, Arizona

Initiated in conjunction with C. E. Beverly of the Denver office, the entire Winchester Mountain range was sampled either by rock chip samples and/or stream sediment samples. The samples were geochemically analyzed for copper, lead, zinc, and molybdenum, and fire-assayed for gold-silver. Several geochemically interesting areas were resampled and on another silver-bearing area additional samples were taken. The final report and recommendation is being handled by C. E. Beverly.

3. Globe-Superior Project, Gila-Pinal Counties, Arizona

Compiling of available information on the drill hole data covering the Dacite Plateau between Globe and Superior has been undertaken. Seven drill hole locations are known with some available information on what was encountered. Additional compilation of data is continuing along with a study of the Whitetail Conglomerate (the first known post-mineral unit), and structural trends projecting into this area of deep volcanic-conglomerate cover.


J. D. Sell

JDS/kvs

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 1, 1970

MEMORANDUM TO: W. E. Saegart

Second Quarter Report
April - June 1970

1. Ground Hog Unit, Vanadium, New Mexico.

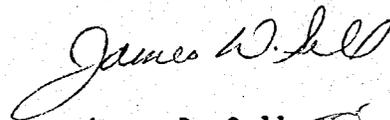
Inspection tour with comment report on some features and their possible interpretation and utilization.

2. Globe-Superior Study Area, Pinal County, Arizona.

Securing and integration of information with study of geology of area. Compilation and submittal of "Dacite Proposal" for land acquisition and drilling of target concepts under thick cover of volcanics and conglomerate.

3. Alaska-British Columbia

On loan to Canadian Division
ASARCO
535 Thurlow Street
Vancouver 5, British Columbia


James D. Sell 

JDS/kvs

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 31, 1970

To: W. E. Saegart

From: J. D. Sell

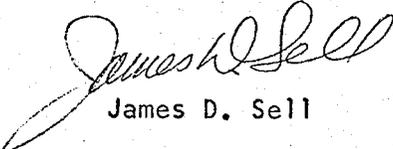
Re: Fourth Quarter Report
October-December 1970

1. Superior East Project, Pinal-Gila Counties, Arizona

Continued compilation of data and original field work utilizing G. S. Barnett, D. T. Friel, J. R. King, and R. P. Shannon for various phase studies. Such studies include the pre-mineral rocks and oxide copper mineralization on the east side of the Plateau, the sampling and outlining of alteration zones in several intrusives on the west side, the study of the fault-fracture pattern in the dacite, and a study of the depositional and clast history of the Whitetail conglomerate. Also, some additional claims were staked on the north and the common boundary with ICC established. Tours were set up and taken on mining properties of Magma, Inspiration, and Ranchers.

2. Papago Indian Reservation Map Acquisition, Arizona

A preliminary base map and original geology compilation conducted by L. A. Heindl and group during the mid-1950's was secured from L. A. Heindl. Drafting the geology onto the base map is underway. A preliminary report is being prepared on the volcanic rocks of the reservation to accompany the geology map. The map will be the first and only map compilation of the entire reservation using material collected by this group.


James D. Sell

JDS:mw

63000 cc / hole 3800 ft.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 18, 1971

MEMORANDUM FOR STAFF

Re: QUARTERLY REPORTS

In order to facilitate the preparation of the quarterly report for New York and to maintain a concise record for our office, each staff member should prepare a quarterly report (March 30, June 30, Sept. 30 and Dec. 30) of his activities.

This report is to be a quarterly exercise in brevity recording reconnaissance work, property examinations, geophysical work, attendance at meetings, field trips, mine tours, etc. For Project Work (Projects with a Mining Authorization) a simple statement of time devoted to the project is all that is necessary since the monthly reports cover this work.

A suggested format for Property Examination and Reconnaissance work is:

Property Examinations -

XYZ Prospect, T7S R10E, sec. 21, 22, Pinal County, Arizona.
Weak copper mineralization in widespaced shears in Precambrian granite. No potential at property or in adjacent areas recognized.

Reconnaissance -

Southern Pine Nut Range, Douglas County, Nevada. Mapping at scale of 1" = 1 mile. No significant leads to mineral potential recognized. Mapping to continue northward.

Greater detail than this should be recorded in your Property Examination Report and for Reconnaissance Work, such as the Safford Mapping Program, in your final report. For the more casual reconnaissance, detail may be recorded on the "Note File Sheet - Reconnaissance".

Your quarterly reports should be delivered to Mrs. Van Royen.


W. L. Kurtz

WLK:sh

cc: W. E. Saegart
C. Van Royen

CIRCULATE:

~~Balia~~
S. Barnett
~~B. Crist~~
Crittendon
B. Cummings
R. Davis
G. Farley
E. French

F. T. Graybeal
J. R. King
W. L. Kurtz
D. C. Rees
~~J. D. Sell~~
R. P. Shannon
G. J. Stathis
N. P. Whaley

ND REFINING COMPANY
Arizona

16, 1971

MEMORANDUM TO STAFF:

Quarterly Reports

Please submit a quarterly report to me by December 15th.

The last half of December might be a good time for all of you to finish all your "loose-end" reports so that you may start the new year with a clean slate.


W. L. Kurtz

WLK:lad

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 9, 1971

TO: W. L. Kurtz

FROM: J. D. Sell

Fourth Quarter Report
October-December 1971

1. SUPERIOR EAST PROJECT, Pinal-Gila Counties, Arizona

Drilling and geologic studies continue on the project area. Monthly and specific item reports have been continuously submitted.

2. MIAMI AREA STUDY, Gila County, Arizona

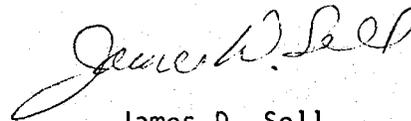
Studies by J. R. King and D. C. Rees, centered around the Bohme-Coryell land, continue west of Miami. D. C. Rees is presently the primary investigator and a preliminary report has been issued. More detailed sampling and integration of information is continuing.

3. ACID-CONSUMING COPPER STUDY

Compilation of data on the subject is continuing with preliminary figures available.

4. PAPAGO INDIAN RESERVATION STUDY

Transfer of available mapping conducted by L. A. Heindl and his group has been completed, but the legend and a few questionable areas have not been resolved. A bibliography of geology is also completed in preliminary form.



James D. Sell

JDS:lad

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 24, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

First Quarter Report
January-March 1972

1. Superior East Project, Pinal-Gila Counties, Arizona

Drilling and geologic studies continue on the project area. Monthly and specific item reports have been continuously submitted.

Mr. Cummings' report is in progress on the drilling data to date.

Joint-venture proposals have been made to Inspiration on land to the east. A similar proposal has been made to Magma on land in the Belmont area to the east.

Special use permit for Oak Flat drilling and road building extension to the south has been secured from the Forest Service.

2. Miami Area Study, Gila County, Arizona

A report on the work by King and Rees on the Bohme-Coryell ground has been submitted by Rees. Further sampling was accomplished by Rees and the interpretive results submitted by Sell. Additional thoughts on the flat faulting movement have been verbally presented by Rees and Sell.

Further information on the Carlota area has been received from Home-stake Production and a report submitted.

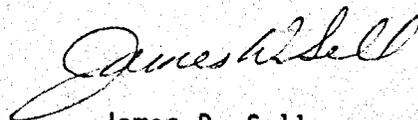
Joint-venture proposals have been made to Hanna on the Bohme-Coryell area and drill information has been received from them, along with some claim and proposal data.

3. Acid-Consuming Copper Study

A report on the subject has been submitted.

4. Papago Indian Reservation Study

No progress.



James D. Sell

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 30, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

Second Quarter Report
April-June 1972

1. Superior East Project, Pinal-Gila Counties, Arizona

Drilling exploration has terminated on the project under the present authorization. Individual reports and memos on specific items have been continuously submitted.

Mr. Cummings' report of the geology of the drill holes was completed and distributed. Mr. Crittendon's summary of the drill technique and costs is in progress. My summary of the project findings is in progress.

The Inspiration-ASARCO joint venture is still open; however, the Magma-ASARCO (Belmont area) proposal was turned down and Magma is reported to be preparing to drill on their own.

2. Miami Area Study, Gila County, Arizona

Hanna-ASARCO joint-venture proposal on the Bohme-Coryell ground continues to make progress. A report on imbricate faulting and restacking of known ore bodies has suggested the location of several additional ore bodies, several of which are on or near the Bohme ground.

James D. Sell

James D. Sell

JDS:lad

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

October 3, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

3rd Quarter Report
July-September 1972

1. Superior East Project, Pinal County, Arizona

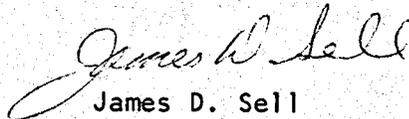
Several reports have been completed and distributed. These include the Summary report of the exploration activities, discoveries, and recommendations; also, the cost summary for the total expenditures.

2. Bohme Project, Gila County, Arizona

The agreement was signed between ASARCO and Hanna for the project. ASARCO has constructed three drill sites and road areas for drilling to commence in October.

3. Rawhide Project, Pinal County, Arizona

Agreement in principal has been reached with ICC for ASARCO participation by drilling. A new road into Rawhide Canyon has been constructed about half way and was terminated upon expenditure of the necessary assessment money. A report on the previous drilling and proposed holes has been submitted.


James D. Sell

JDS:lad

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

December 27, 1972

TO: W. L. Kurtz

FROM: J. D. Sell

4th Quarter Report
October-December 1972

1. Superior East Project, Pinal County, Arizona

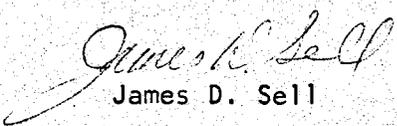
No new road work or drilling has been conducted on the project area during the quarter. Some time has been spent looking for claim and section corners, with butcher paper set out on some in anticipation of new aerial photographs for future control.

2. Bohme Project, Gila County, Arizona

Drilling is underway with AH-1 presently at a cored depth of 2113 feet in post-mineral Whitetail conglomerate. Coring is continuing. AH-2 is presently cased after being rotary drilled to a depth of 1988 feet with Whitetail conglomerate being in the lower portion. AH-3 is being deferred until a later date. No core has been split for assay and only a few specks of native copper have been observed in the Whitetail.

3. Rawhide Project, Pinal County, Arizona

No final agreement has been recorded. Continued evaluation of ground peripheral to the project has been made and some claims have been staked but not yet fully perfected. The American group of eight claims, adjacent to the northeast side, has been optioned. Preliminary evaluation of reestablishing a road for drilling in the northwest corner has been made.


James D. Sell

JDS:lab

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 9, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

First Quarter Report
January-March 1973

1. Bohme Project, Gila County, Arizona

Drill hole AH-1 was completed to 3863 feet in Devonian limestone. Manganese and zinc, along with various iron minerals (all highly oxidized), were found in several zones both in the Mississippian and Devonian limestones, suggestive of porphyry copper fringe-type mineralization.

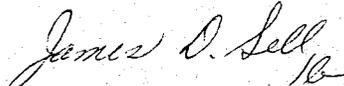
Drill hole AH-2 is presently in limestones at 3750, which were first intercepted at 3400 feet. Only minor mineralization and little recrystallization has been noted to date in the hole.

2. Rawhide Project, Pinal County, Arizona

The contract agreement is still unsigned by ICC. No further work, except minor claim evaluation, has been conducted on the property.

3. Superior East Project, Pinal County, Arizona

The open ground north of the Rawhide Project was cornered and validation drilling conducted. Roads for entry into State Lease Sections 4 and 5, with a spur eastward for Rawhide drilling, have all been worked on during the quarter.


James D. Sell

JDS:1b

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 29, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Second Quarter Report
April-June 1973

1. Bohme Project, Gila County, Arizona

Drill hole AH-2 continued in limestones from 3750 to 3770 feet, then cut quartzite to a final depth of 3781 feet. A total premineral intercept of 381 feet was cored. The limestone contained only weak recrystallization, alteration, and replacement mineralization. The favorable O'Carroll bed near the base of the Martin Limestone reflected the most values. AH-2 strongly limits the direction of mineralization from the mineralized intercepts in drill hole AH-1.

Drill hole AH-3 has been collared some 2500 feet SSE from AH-1. As of the end of the quarter, the hole was at 500 feet in Quaternary Gila Conglomerate.

2. Rawhide Project, Pinal County, Arizona

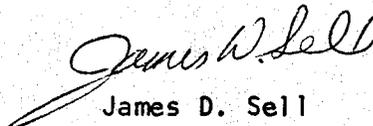
Road work has been extended into the northwest sector of the project area and a drill site constructed. The site will be occupied and drilled to completion during the third quarter.

3. Superior East Project, Pinal County, Arizona

Roads, drill sites, and holes have been placed in Section 4 (drill hole A-6 to a depth of 1358 feet in dacite) and Section 5 (drill hole A-3 to a depth of 1430 feet in dacite and temporarily terminated at 1445 feet in Whitetail Conglomerate). Both holes were tightly welded with caps and covered for reentry at a later date.

Road and site preparation for drill hole A-7 has been established some 3600 feet north of our A-4 hole.

Final surveying and submittal of the compromise line description has been submitted by T. L. Gant to the lawyers for settlement of the dispute. The suit has been placed on the "Indefinite" docket.


James D. Sell

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 13, 1973

TO: J. D. Sell

FROM: B. E. French

Monthly Report - July 1973
East Roskrige Mountains
Mapping Project
Pima County, Arizona

During July, mapping was continued at the northwest end of the study area. The northwest trending outcrop of Amole-type clastics previously mapped is truncated by a northeast trending fault and by unconformably overlying clastics and volcanics of the Roadside formation. This particular section of the Roadside formation consists of a lower "Claflin Ranch" unit which grades upward into "Silver Bell" agglomerates. This is the first place that a "Claflin Ranch" portion of the Roadside formation has been identified in the mapped area. This exposure forms an anticlinal structure, the axis of which trends northwesterly. Bedding generally dips 15° or less.

Recent mapping indicates that the northwest trending, high-angle reverse fault separating the Roskrige volcanics and Recortado ashflow from the older rocks is offset by northeast trending normal faults, some of which are mineralized. A north-northwest trending fault now occupied in part by Pictograph dike apparently offsets the northeast faults. The dike is basalt which has been age dated as Pliocene.

No pervasively altered areas have been encountered in the mapping this month. There are minor, local occurrences of epidote in the Roadside formation. At one place in the Amole clastics, thin epidote seams exist in closely spaced northeast fractures. This is probably related to a nearby northeast fault. There are also small scattered zones of limonite-staining and bleaching from pyritization along faults in the Cocoraque intrusive and in the Roadside formation.

Of interest, but as yet of undetermined significance, is the occurrence of secondary biotite on fractures in several places in the Cocoraque intrusive. No other alteration has been observed, but the intrusive does have a high silica content, either primary or as secondary flooding. Secondary K-spar and biotite veining (pegmatitic?) was also found in a small body of intrusion breccia located at the contact of Cocoraque intrusive and the Roadside formation.

Another week of field work will be required to complete mapping and to sample the Roskrige volcanics as mentioned last month.



B. E. French

BEF:lb

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 10, 1973

TO: J. D. Sell

FROM: B. E. French

Monthly Report - August 1973
East Roskrige Mountains
Mapping Project
Pima County, Arizona

Mapping during August did not reveal any significant alteration; however, several geologically interesting items were encountered. A small, isolated hill 1-1/4 miles east of Cocoraque Butte consists of Amole-type arkosic quartzite trending NW and dipping NE. In relation to the SW dips in bedrock to the SE, this suggests a NW trending anticline at least 3 miles in width and most of which is covered.

Except for a small exposure of Amole, the Roadside formation is the predominant unit NW of Cocoraque Butte. Exposures of the Cocoraque intrusive terminate about 1-1/2 miles NW of Cocoraque Butte.

At the northwesternmost end of the area mapped so far, a complex chaotic unit occurs. The matrix is a "muddy" andesite with exotic blocks of Amole and Cretaceous or older limestone. Dips at this end of the area also suggest a NW trending anticlinal structure approximately 2 miles in width. The Pictograph dike system extends NNW, apparently crosscutting this structure. The trend of Pictograph dike (Pliocene basalt) is parallel to that of the Laramide Cocoraque Butte intrusive.

Conoco has extended their holdings north and west of Cocoraque Butte. Their I.P. crew was encountered in Avra Valley and apparently has covered everything from the Pan Quemado Mountains south to Cocoraque Butte. Their company drill and a Shelton Bros. rig have been and are active from Cocoraque Butte north to Manville Road. One of the most recent holes is about one mile west of Karen Earley's house. Mr. Troy Stewart of Shelton Bros., encountered on a hole 2 miles due east of Cocoraque Butte, said he had recently completed a "string" of holes from west to east just north of the butte. Each hole was reportedly 500-600 feet in depth and usually about 100 feet into bedrock. According to him, nothing of interest was penetrated. He mentioned barren sediments and some basalt dikes.

Following the collection of the geochemical samples from the Roskrige volcanics and the scouting of Conoco's drill holes, a report will be forthcoming on this area.



B. E. French

BEF:lb

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

October 3, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Third Quarter Report
July-August-September 1973

1. Bohme Project, Gila County, Arizona

Drill hole AH-3 was completed during the quarter with a final depth of 3614 feet. Gila Conglomerate, Dacite, and Whitetail Conglomerate were cover rocks to a depth of 1743 feet. Diabase and Pinal Schist were encountered to final depth. The 1871 feet of premineral units contained sparse native copper and malaconite in the oxidized portions and variable pyrite-epidote in three zones, with only a trace of copper values.

2. Rawhide Project, Pinal County, Arizona

The drill site AI-1 was occupied during the quarter and rotary drilled to 2768 feet, encountering Dacite, earlier volcanics, and Whitetail Conglomerate. The hole is cased and will be cored during the coming quarter.

3. Superior East Project, Pinal County, Arizona

The drill site A-7 was occupied during the quarter and rotary drilled to 3150 feet where casing was set for future core drilling. Units encountered were Dacite, earlier volcanics, and Whitetail Conglomerate.


James D. Sell

JDS:lb

before; and all geologists submit 1/4 Rpt

W. L. N.
NOV 13 1973

RECEIVED
NOV 12 1973
S. W. U. S. EXPL. DIV.

All Geologists - submit your 1/4 Rpts so
that I can conform with Mr. Collins' instructions.

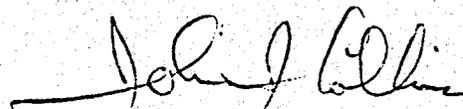
New York, November 9, 1973

MEMORANDUM FOR: Regional Managers
Asarco Exploration Department
North America

Quarterly Reports

You will be pleased to learn you have written your last routine monthly report. It may not be so pleasant to learn that you should substitute a quarterly report with just about as much effort but in a different format. It should be similar to our former quarterly reports, i.e., it should tell in readable style what you have accomplished, not only on Exploration Authorizations but on reconnaissance and general exploration and tell what the competition is doing in your territory. Be sure to estimate expenditures on projects and under "unallocated." Also tell what each of your geologists will be doing in the next quarter. Please write for the officers of the Company so that we don't have to edit for you. As to length, for every four geologists including yourself, submit no more than one page of single-spaced typing, i.e., if your division totals 7 geologists, you can submit up to 2 pages. The next report will be as of December 31 and should be mailed to reach New York on or before January 10. You can start writing the report before December 31.

The foregoing does not eliminate the need for progress reports on active projects. These should be prepared to review developments and make recommendations, either affirmative or negative, at appropriate intervals. Please don't wait until the last week before you run out of money. Overruns are not popular.


John J. Collins

cc: WLKurtz
KWhiting
MPBarnes
SVonFay
SAAanzalone
RLBrown
RJLacy
DDHarper

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

December 14, 1973

TO: W. L. Kurtz

FROM: J. D. Sell

Fourth Quarter Report
Oct.-Nov.-Dec. 1973

1. Superior East Project, Pinal County, Arizona.

The drill site A-7, which had been rotaried and cased to 3150', is in progress by coring during this quarter. The cored portion to date (Dec. 14 @ 4060') is Whitetail Conglomerate composed primarily of altered and fresh Pinal Schist clasts. Variable native copper is present, mostly averaging below 0.1% copper. One zone, typical of the deep basin environment found in A-4 to the south, has been intercepted and has appreciable copper, but no assays have been returned. The main basinal environment has not yet been encountered.

The coming quarter's activities will include the continuance of A-7 to its final depth and complete assay results. In continuance of testing the discovery area of AI-1 and A-2W, a hole will be drilled within that area. Study is being made as to the feasibility of cleaning out DCA-2 or drilling a new hole offset southeast of A-2W.

2. Bohme Project, Gila County, Arizona.

No additional drilling activities took place during the quarter. Two drill sites have been selected to further test the area. Both sites are in and awaiting a rotary drill. AH-4 is on the south to test the bedrock geology. AH-5 is an offset 1,000' southsoutheast of AH-1, which contained oxidized but previously well mineralized limestones. AH-5 is programmed to test the sulfide environment of the initial discovery.

3. Rawhide Project, Pinal County, Arizona.

The drill hole AI-1 was successfully cored to a depth of 3967'. The Pinal Schist bedrock was encountered at 3238'. The entire bedrock column contained variable total sulfides averaging less than 0.5%. However, the predominate sulfide was chalcopryrite and the entire column averaged 0.11% copper. The upper 279' of the sulfide intercept averaged 0.14% copper. The sulfide zone has characteristics of being in the central core zone of a porphyry copper system with low total sulfides, high chalcopryrite to pyrite ratio, numerous quartz, magnetite, and clay veinlets.

December 14, 1973

Future work includes the offset drilling discussed under Superior East, and the conducting of down-the-hole geophysical measurements in probes established in AI-1 and future holes.

4. Future Projects

Data gathering is under way on several potential project areas.

James D. Sell
James D. Sell

JDS:1b

J. O. Bell

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

December 5, 1973

MEMORANDUM TO GEOLOGISTS

4th Quarter Reports

Since many of you are going to play Santa Claus, please present me with your present of a quarterly report and, for projects, a monthly report by the 14th of December. Please write them in the format requested by Collins (memo recently distributed to you) ---- since I need to provide New York with more information your "exercise in brevity" can be enlarged. Especially needed is your evaluation of your General Reconnaissance to date and continuing work for next quarter if justified.

W. L. Kurtz
W. L. Kurtz

WLK:lb

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

March 21, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

First Quarter Report
Jan.-Feb.-March 1974

1. Superior East Project, Pinal County, Arizona

The drill hole A-7 was cored to completion at a depth of 6042 feet during the quarter. Only one zone of appreciable copper values, mainly as cuprite and native copper, was found although a second weaker zone was intercepted near the base of the Whitetail Conglomerate section. Verified (second assayer) assays suggest the following intercepts and values:

<u>Intercept Depth</u>	<u>Footage</u>	<u>Total Copper</u>
4695-4750	55 ft. @	1.17
4750-4800	50 ft. @	0.10
4800-4910	110 ft. @	1.46
4910-4960	50 ft. @	0.16
4960-5070	110 ft. @	0.70
5070-5120	50 ft. @	0.31
5120-5170	50 ft. @	0.05

Total intercepts suggest the following combinations:

4695-4910	215 ft. @	1.07	<u>or</u>
4695-5070	375 ft. @	0.84	<u>or</u>
4695-5120	425 ft. @	0.78	

Some native copper and probably fine chalcocite are also found in the top portion of the underlying Supai red beds. Assays are not yet available for the total intercept.

The old hole DCA-3 was also cleaned to around 2000 feet. The hole is reported to be 3000 feet deep and bottoming in Whitetail. If the hole can be successfully cleaned and cased for diamond drilling, the bedrock intercept will greatly aid in the interpretation of the area.

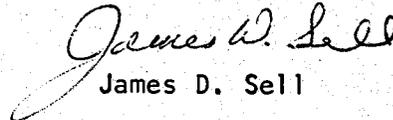
2. Bohme Project, Gila County, Arizona

Drill hole AH-4 was rotary drilled and cored to a terminal depth of 2807 feet. Bedrock, under gravels and Dacite, was intercepted at 2251 feet and the entire bedrock intercept of 556 feet was extremely broken and brecciated Precambrian Pinal Schist. The quartz and muscovite-bearing schist had no appreciable superimposed alteration effects and only minor spotty pyrite was noted. Assaying results are incomplete on the hole.

Drill hole AH-5 is presently being cored. Dacite was found from the surface to 987 feet where Precambrian diabase has been found and cored to 1101 feet. Variable to strong iron addition along fractures and in the mafic sites is increasing with depth, but little superimposed alteration effects have been noted. Coring is continuing.

3. Rawhide Project, Pinal County, Arizona

No additional work was conducted on the project during the quarter.


James D. Sell

JDS:1b

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

June 25, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Second Quarter Report
April-May-June 1974

1. Superior East Project, Pinal County, Arizona. The yearly work on State Lease sections south of Oak Flat has been completed by drilling. Drill hole A-3 (Section 5) was completed to 1949 feet in Whitetail Conglomerate. No higher grade cuttings were observed and the samples returned the lower range of geochemical values typical of the unit. Drill hole A-6 (Section 4) was completed to 1665 feet in Whitetail. Consistently higher geochemical values were found, but still in the lower range of interest. Both holes were capped for future entry.

The old drill hole DCA-3 has been cleaned and cased to 2993 feet and re-designated as hole DCA-3A. The hole will be core drilled to a bedrock penetration upon availability of a rig.

2. Bohme Project, Gila County, Arizona. Drill hole AH-4 was completed during the first quarter to a terminal depth of 2807 feet in brecciated Pinal Schist. Geochemical values in the bedrock were of a low order of magnitude.

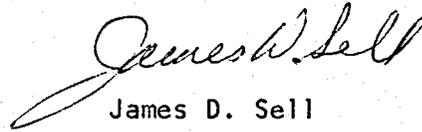
Drill hole AH-5 was completed to a depth of 4295 feet in Precambrian diabase when the drill rods twisted off using BX rods. True bedrock was encountered at 3468 feet after several false intercepts of basement type rocks. The top bedrock unit is Paleozoic Naco limestone only weakly altered and mineralized (oxidized). A strong fault was encountered at 3584-3588 and below the fault the first unit encountered was Precambrian Dripping Spring Quartzite, also highly oxidized but with an increase in limonites, especially in more porous units. A normal stratigraphic sequence followed downward by Barnes Conglomerate, Pioneer Shale, and diabase. Oxidized veinlets persisted to the bottom of the hole, but low to moderate geochemical values were found.

The fault zone cut out the entire Mississippian Escabrosa units and Devonian Martin units found highly mineralized in the adjacent hole AH-1.

Three quartz porphyry dikelets of 3, 2, and 1 feet were found cutting the lower part of the diabase from 4205-4226 feet. Although not highly mineralized, the porphyry was somewhat altered and was accompanied by increased iron amounts. One small 2-inch veinlet zone within a porphyry dikelet contained broken, and somewhat oxidized, pyrite sulfides.

3. Ray West Project, Pinal County, Arizona. Drill hole RW-5 has been commenced to apply for the annual assessment work. The depth reached to date is 2106 feet and is a mudstone section of the Whitetail Conglomerate. No assay values have been received, but only small amounts of native copper have been noted.

4. Rawhide Project, Pinal County, Arizona. No additional work was conducted on the project during the quarter.


James D. Sell

JDS:1b

ASARCO EXPLORATION RECORD

FIELD EXAMINATION
 LITERATURE SEARCH
 ASARCO FILE

Section I General Indexing

① Name(s) of Property or Area WHALEN-LAMB PROPERTY (AL claims)					② Country U.S.A.		③ State or Province Arizona	
					④ Co. or Map Sheet Pima Co.		⑤ File or Gore No. Aa-16.0.0	
⑥ Latitude N 31° 50'	⑦ Longitude W 111° 13' 30"	⑧ Mer. SR&GR	Tws. 18S	Rng. 11E	Sec. All 28, &	⑨ Examined by J. D. Sell		⑩ Date 8/16/74
						⑪ Office		⑫ Field Days 1

E1/2 29

Section II Sources of Information

⑬ References	Date	Title	Publications	Vol. No.
Mr. Al Whalen, letters, assay reports				
USGS Map I-745, Twin Buttes Quad., Geology (1973, Cooper)				

Section III Appraisal

⑭ Recommendations <input type="checkbox"/> Action Now <input type="checkbox"/> Too Low Grade <input checked="" type="checkbox"/> Too Small <input type="checkbox"/> Ownership Problem <input type="checkbox"/> Access Problem <input type="checkbox"/>	⑮ <input type="checkbox"/> Past Producer <input type="checkbox"/> Producer <input type="checkbox"/> Mineral Deposit <input type="checkbox"/> Prospect <input checked="" type="checkbox"/> Hope	<input type="checkbox"/> Geologic Concept <input type="checkbox"/> Geochem Anomaly <input type="checkbox"/> Geophy. Anomaly <input type="checkbox"/>	⑯ Production <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Commodity</th> <th style="width: 20%;">Tons</th> <th style="width: 20%;">Grade</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> ⑰ Reserves <input type="checkbox"/> Measured <input type="checkbox"/> Estimated <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Commodity</th> <th style="width: 20%;">Tons</th> <th style="width: 20%;">Grade</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Commodity	Tons	Grade										Commodity	Tons	Grade									
Commodity	Tons	Grade																									
Commodity	Tons	Grade																									
⑱ Num. Drill Holes <u>None</u> Approx. Total Footage _____	⑲ Excavations Few pits																										
⑳ Spectro. Analysis Attached	㉑ Assays Attached	㉒ Geochem Results Attached																									

Section IV Geologic Data

㉓ Commodity or Contained Metals Copper, lead, silver reported (Hand picked vein samples)

㉔ Ore Minerals - Major Chalcocite kernals w/oxides Minor _____

㉕ Host Rocks - Major Rhyolite, tuff beds & cgl. Minor _____

㉖ Age of Host Rocks Cretaceous

㉗ Environment _____

㉘ Alteration Minor Fe-stain along quartz, minor barite vein and shears.
 ㉙ Total Extent _____

㉚ Structure East-west qtz veins cutting tuff conglomerate (rhyolite) beds trending N10°-20°E.

㉛ Ore Occurrence Minor chalcocite kernals w/copper oxides in siliceous rhyolite and qtz veins w/minor barite. Minor extent outward in favorable tuff beds.
 ㉜ Age of Mineralization Laramide

㉝ Conclusions and Recommendations Very small length (±100 feet), narrow (1-3 feet) quartz filled shears crosscutting rhyolitic tuff conglomerate with some mineralization in favorable beds. Sparse distribution. See file for Geochem values. No interest.



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

1150 NORTH 7TH AVENUE
TELEPHONE 602-792-3010

September 11, 1974

Mr. Albert Whalen
425 W. Pennsylvania Street
Tucson, Arizona 85714

Dear Mr. Whalen:

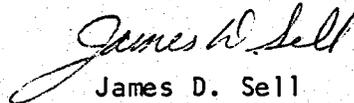
Enclosed are several copies of the assay results of the two samples I cut during our recent visit with you to your property north of Batamote Ranch, Arizona.

As you can see, the first sample confirms your assays of the high silver values in the quartz structures, but overall the copper content is low except in hand samples of the chalcocite pieces. The second sample is of the country rock and shows very low overall values.

The sparseness of the quartz structures, the minor movement of copper along some of the more porous tuff beds, and the vast amount of country rock precludes additional examination on our part.

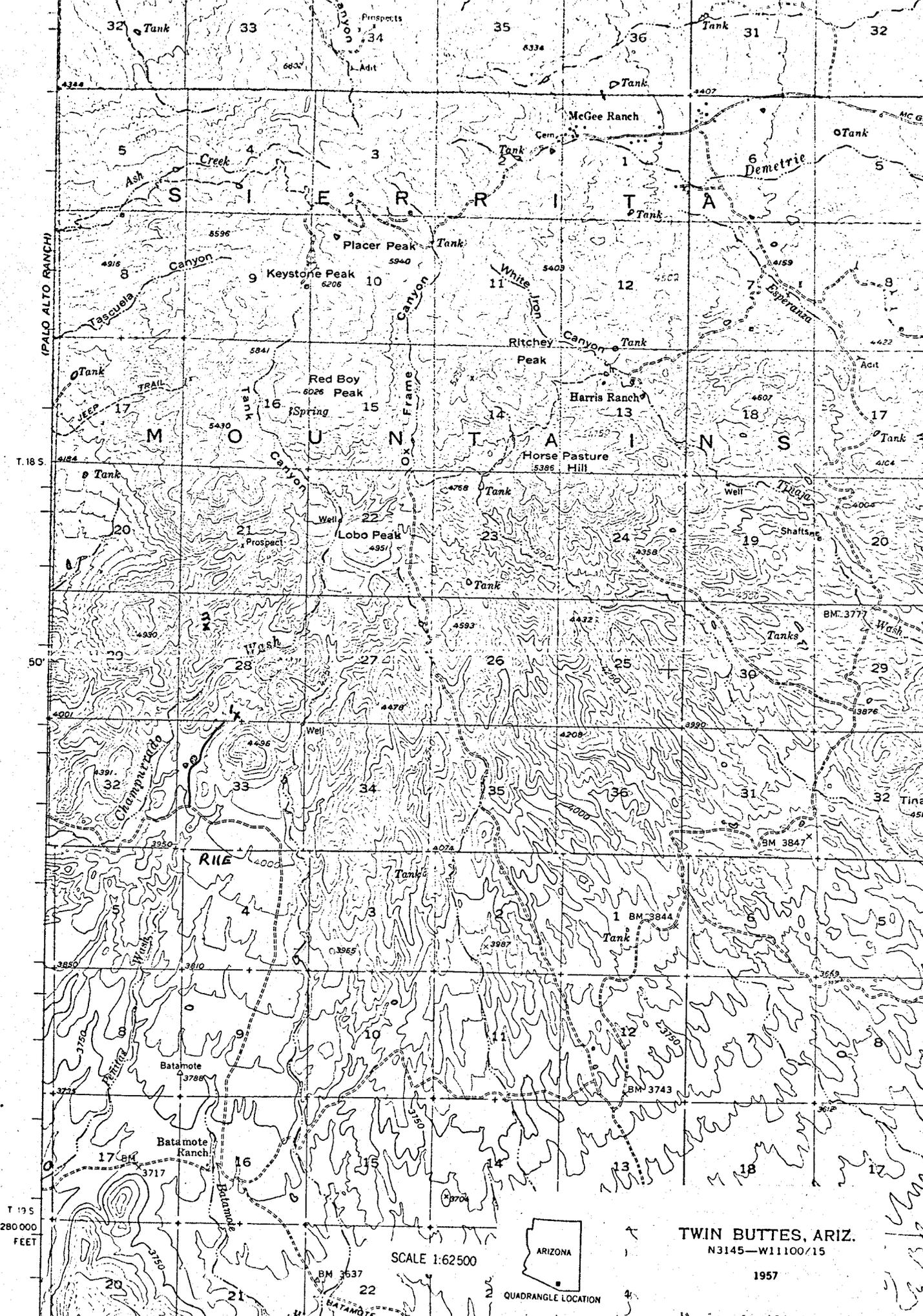
I thank you for the time and interest in your bringing the property to our attention.

Sincerely,


James D. Sell

JDS:lb
Encs.

cc: Dr. Clarence A. Lamb - w/encs.
P.O. Box 992
Silver City, New Mexico 88061



T 19 S
280 000
FEET

SCALE 1:62500



QUADRANGLE LOCATION

TWIN BUTTES, ARIZ.
N3145-W11100/15

1957

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

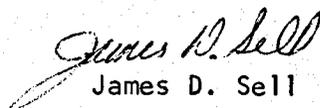
September 26, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Third Quarter Report
July-Aug.-Sept. 1974

1. Superior East Project, Pinal County, Arizona. Drill hole DCA-3A has been occupied by a core rig and coring has progressed from the bottom of the cased rotary hole (2993 feet) to the present depth of 4410 feet. The hole is in Whitetail Conglomerate with several altered schist-quartz monzonite slide blocks encountered below 4000 feet. No exceptional copper zones have been encountered in the Whitetail to date. Coring continues for a bedrock sulfide intercept.
2. Bohme Project, Gila County, Arizona. The project and joint venture with Hanna have been terminated. A final summation report including the drilling, assaying, and cost data has been completed and is being distributed.
3. Ray West Project, Pinal County, Arizona. Drill hole RW-5 encountered the premineral Pinal Schist bedrock at 2240 feet and continued in schist, with several spot cores, to the terminal depth of 2502 feet. The Pinal Schist was essentially unaltered and unmineralized and only low geochemical values returned. Further field work, consisting of mapping and sampling of the surrounding bedrock, is now in progress for continued evaluation of the covered area.
4. Rawhide Project, Pinal County, Arizona. No additional work was conducted on the project during the quarter.


James D. Sell

JDS:lb

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

December 26, 1974

TO: W. L. Kurtz

FROM: J. D. Sell

Fourth Quarter Report
Oct.-Dec. 1974

1. Superior East Project, Pinal County, Arizona. Drill hole DCA-3A continued coring from 4410 to the final depth of 5154 feet. Several moved blocks were encountered within the Whitetail sequence and also in the oxidized bedrock. The base of the Whitetail was at 4454 feet. Only marginal alteration-mineralization features were found in the sulfide portion.

Hole DCA-2A was reentered, cleaned, and casing set. Coring was started at 1352 in Whitetail and bedrock was found at 1452 feet. Schist, with some granite dikes, was encountered and contained marginal alteration-mineralization features to the termination depth of 2422 feet.

A report on the Whitetail copper potential has been completed and a report on the porphyry copper potential is being completed.

2. Ray West Project, Pinal County, Arizona. Mapping and sampling in the premineral outcrops south and east of the project area were conducted during the quarter. All leads terminated prior to reaching the edge of cover and no specific recommendations were forthcoming. The project has been terminated.
3. Rawhide Project, Pinal County, Arizona. No further work was conducted during the quarter.

James D. Sell
James D. Sell

JDS:1b

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

March 25, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

First Quarter Report
Jan.-March 1975

1. Superior East Project, Pinal County, Arizona.

Assays have been completed on DCA-2A and confirm the low copper values in the bedrock sulfide zone in Pinal Schist. Cooksley Geophysical has completed the drilling of the north line and will, during the last week of March, lay out the pot line, shoot, and record the data of the seismic survey. They will review the results prior to initiating the work on the south line.

The 1974 Summation Report has been completed and distributed. The porphyry copper potential was covered and recommendations for continued drilling were stated. Also, a report on the Cost Summary for the project was completed and distributed.

2. Rawhide Project, Pinal County, Arizona.

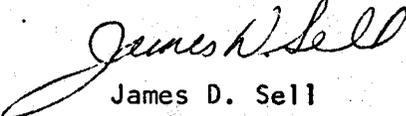
No further work was conducted during the quarter except for the work of the seismic line extension, the results of which will be reviewed this coming quarter.

3. General.

A study, compilation, and report on the District Metallogensis of Southern Arizona has been completed and is ready for distribution. Anomalous districts were outlined and recommendations for further study were initiated.

4. A course on Hydrothermal Systems was presented by Doctors Titley and Norton, Dept. of Geosciences, U of A., and was attended by fifteen people including myself. Companies represented included: Peñoles (Mexico) (2), Los Alamos Labs (1), Cities Service (1), Hecla (1), Superior Oil (1), Bear Creek (1), Homestake (1), Kerr-McGee (2), Gulf Minerals (1), Kennecott Exploration (2), and consultant (1).

5. SLC geophysical group carried out IP test measurements over drill holes AI-1, DCA-3A, and A-7, with negative results due to "the lack of signal strength".


James D. Sell

JDS:1b

AMERICAN SMELTING AND REFINING COMPANY
TUCSON ARIZONA

June 23, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Second Quarter Report
April-June 1975

1. Superior East Project, Pinal County, Arizona. Results of the first seismic line have not been returned from the computer processing. The second line will not be shot until evaluation of the first line data has been completed.

Tonto Drilling is modifying a CP-50 and are contracted to complete the rotary cased holes A-3 and A-5. Tentative starting time is mid-July.

2. Rawhide Project, Pinal County, Arizona. No additional work has been accomplished on the project area and evaluation of the seismic data is unavailable.
3. General. Evaluation of four deep drill hole results has been completed on the Bonanza Group, held by private interests, just west of Superior, Arizona. The Bonanza block is part of a large tilted basin and has limited exploration potential.

Several investigations of large claim blocks have been initiated in the Little and Big Dragoon Mountains of Cochise County. No results are available at this time.

James D. Sell
James D. Sell /s/

JDS:lb

ASARCO Incorporated
Tucson Arizona

September 30, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Third Quarter Report
July-August-September 1975

Superior East Project, Pinal County, Arizona. The Tonto Drilling rig CP-50 has been modified to pull fifty-foot sections of rods and mounted on a long trailer. The rig was moved on site in mid-September. After rigging up and bringing in the necessary supplies, the hole was entered and found to contain cement at 1210 feet. Tonto is presently cleaning the cement and should be coring below the casing at 1950 feet shortly.

The seismic survey results are not available, but SLC has requested a "best interpretation" report by mid-October.

Santa Cruz Project, Pinal County, Arizona. A study of the Santa Cruz area has been initiated by H. Kreis, R. Cummings, and myself. As it presently appears, the entire core will be reviewed as part of the study.

General. A number of shallow (100 feet or less) air-hammer drill holes were placed in the southern vein structure of the Bonanza claim block, held by private interests. Asarco collected the sample cuttings and assayed them for gold-silver. The results to date are not encouraging.

Initial reconnaissance of several areas in Central Cochise County has been completed and memos written on the work and interpretations.

James D. Sell
James D. Sell

JDS:1b

December 16, 1975

TO: W. L. Kurtz

FROM: J. D. Sell

Fourth Quarter Report
Oct.-Nov.-Dec. 1975

Superior East Project, Pinal County, Arizona. The Tonto Drilling Company was terminated in hole A-3 at a depth of 6008 feet. The tuff marker bed, with persistent copper values below, came in at a higher elevation than projected, but the grade of the copper is less than 0.1%. The Whitetail Conglomerate continued far below the original projections and a 45-foot slide block of diabase was penetrated (which assayed 0.20% copper) before conglomerate was again cored to the terminated depth.

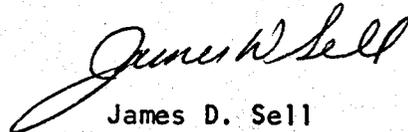
Seismic results are still unavailable.

Newmont has three rigs running in the area south of A-3.

Santa Cruz Project, Pinal County, Arizona. Relogging and partial interpretation of the drilling in the central part of the area have been completed. Structural complexities preclude a well defined pattern at the present time. Auxiliary studies by petrographic means by H. Kreis are being undertaken.

General. A relatively deep hole (+2000 feet) is being cored in the Gibson area, Gila County, by Arizona Mining Company. Mr. P. Kayser, principal owner, has allowed our logging of the core and correlation of the assaying. The hole is still in progress, and our interest will continue toward logging of the hole.

The Alice Mine area between Ray and Christmas was examined on a one-day basis. It is a complex area of faulting and various porphyry dike intrusions. Two holes, one thousand feet each, have been cored and the logs reviewed. Altered limestones are present, but detailed mapping is needed for control on exploration possibilities.


James D. Sell

JDS:1b

March 25, 1976

TO: F. T. Graybeal

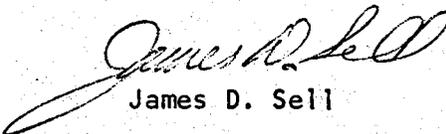
FROM: J. D. Sell

First Quarter Report
Jan.-Feb.-March 1976

Superior East Project, Pinal County, Arizona. Gravity stations were occupied during the quarter and tied in with the Newmont data. No formal report has been issued, but several items are open for interpretation. However, it appears that the gravity does not outline the total basin and interpretation remains difficult. A four-line gravity traverse was run by SLC over the Schultze granite-Pinal schist contact exposed east of the dacite plateau. Field data have not been reduced or interpreted, but it appears that the contact may be represented. However, it may be very weak and probably will be lost in the noise of the overlying dacite and thick conglomerates under the plateau.

Santa Cruz Project, Pinal County, Arizona. The relogging and evaluation of the drilling have been completed and are in final process of being approved for typing and final drafting. One interpretation is that a zone of intrusive brecciation and fluidization occupying an older Precambrian zone of weakness is a major feature in the horst block area.

General. The Gibson hole #11, NW, was completed by Arizona Mining Company to a depth of 3240 feet on March 21st. No zones of commercial mineralization were cut during the drilling, and interpretations of the projected continuations of the main Pasqual and Summit Veins remain open.


James D. Sell

JDS:lb

May 25, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Notes on the Meeting
Rocky Mountain Section
Geological Society of America
May 20-21, 1976
Albuquerque, New Mexico

Attached is the Abstract Booklet with Program.

The meeting was one of the largest held by the Rocky Mountain Section of GSA. Most in attendance were USGS and University, with only about two dozen explorationists known to me.

Two symposiums were held that pulled most of the people: 1) Regional Tectonics and Mineral Resources of Southwestern North America, and 2) Ash-Flow Tuffs.

All 14 papers in the Regional Tectonics Symposium (Abstract booklet p. 541 and pp. 543-544) plus an additional 14 papers are published in the New Mexico Geological Society Special Publication No. 6 (Asarco Library). Several of the additional papers published were discussed under slightly modified titles and contents.

Of specific interest is Charlie Phillips' paper on Copper Butte west of Ray (Abstract page 618, Paper page 174). In his paper he reports the size of the copper bearing occurrences is across several square miles and the content to exceed one million tons of copper metal, estimate of 50-100 million tons of ore grade with the estimated ore grade of 0.7% average for potential ore and ranging up to several percent. In his talk he quoted 100 million tons of 0.4% for both the Copper Butte and Buckeye deposits containing 3 million tons of available copper metal.

The Copper Butte zone lies under the south half of Copper Butte Mtn. (SW1/4, Sec. 19, T3S, R13E) and is in a N-S syncline form 2000 feet N-S by 1500 feet E-W and from 75 to 200 feet thick. It probably contains 40 to 60 million tons and is the best of the zones.

The Buckeye zone (N1/2, Sec. 35, T3S, R12E) is two miles to the southwest of Copper Butte and the drill pattern suggests it is some 2000 by 2000 feet in extent. A quick figure of 15 million tons of 0.6% was expressed and the context suggests it was in the Buckeye zone. The area contains more copper in limestone clasts than does Copper Butte, which is primarily in a mixed clast suite.

As shown on his Figure 5 (p. 179), the Copper Butte-Buckeye zones are contained within an exotic limonite band which trends N50°-60°E and extends several miles further southwest with scattered pods of exotic copper mineralization.

Of the five exotic copper deposits which he compares, only the Copper Butte zone does not have an identified hypogene sulfide source deposit.

David Giles of Earth Sciences (p. 127) compiled and presented a very good paper on the "Precambrian Mineralization in the Southern Rocky Mountains." He classified the deposits by environmental occurrences.

Tommy Thompson reported (p. 192) on his work for Asarco at Leadville in the "Down-Dropped Block." He will apparently continue the work this summer with an additional field hand.

A number of long-standing workers in volcanics phenomena such as R. L. Smith, R. A. Bailey, R. L. Christiansen, R. V. Fisher, P. W. Lipman, et al, as well as Wolfgang Elston, Charlie Chapin, and Rudy Epis, and Don Noble were in attendance and presented papers and/or discussions.

Robert L. Smith (pp. 633-634) points out the essentially straight line relationship between Caldera Area (Log area, Km^2) vs. the Ash Flow Volume of erupted material (Km^3).

He further points out his thoughts that, to have an ash-flow ejection, the material must be above a "Viscosity Barrier", which he believes is around 55% SiO_2 (basalt-andesite transition). Thus the compositional change and periodicity of ash-flow ejections.

A later paper (Hay, R.L, p. 589) suggested that his material in Kenya must have erupted thru Smith's viscosity barrier as the SiO_2 content was lower.

In a question period at the close of the total Symposium on Ash Flows, an unidentified individual noted that in Smith's diagrams it could be shown that ".....irregardless of caldera size, about 1 Km of vertical material is tapped and blown out in any ash flow tuff explosion...." Smith just shook his head in an affirmative manner but made no comment. The suggestion was not discussed further.

Several papers, including Bailey (Roy A., p. 567), noted the close relationship (100,000 years or less) between the close of caldera collapse and the start of resurgent doming. No agreement was noted by the various papers on either the mechanism, cause, or why of resurgent doming.

Wolfgang Elston (p. 585) made an interesting comment that the K_2O variation in the calc-alkalic suite may represent a crustal thickness rather than a depth to the Benioff zone (of a subducted slab). He did not dispute a subducted slab, per se, but indicated that the areas far inland (as Colorado-New Mexico) may not require a second slab (a la Lipman) or a flatter slab (a la Heidrick and others) to account for the suite found.

McKee (pp. 610-611) noted that ash-flow sheets are poor places to look for ore deposits. He also showed one slide which indicated for western Nevada (except Carlin-type gold) that the gold productive host rock was andesite (98%), rhyolite (2%), and non-volcanic (0.3%). Of course, he was jumped on for his statement that caldera structures were not ore controls, and he

defended it in the light of "at the time of formation" mode and said he would not be responsible if the "ore fluids" wished to use the structure, units, etc. at a later period.

Rytuba (James J., p. 625) presented an interesting paper. He reports the McDermitt mine has reserves of 3 million tons containing 10 pounds of mercury per ton. His abstract does not mention it, but his talk and slides suggested an earlier caldera development on the southwest side of the present caldera. This noting of nested and superimposed caldera structures was repeated time and again throughout the meeting.

T. A. Steven (pp. 635-636) ran through the San Juan volcanic field and suggested the underlying batholith is expressed within the gravity low exhibited in the area. He mentions that the Platoro caldera is the earliest found with the Summittville caldera being nested inside the Platoro complex and represents a small volume, high level emplacement prior to the large batholith emplacement. As noted, the Platoro-Summittville is outside the gravity low boundaries. He noted that the Platoro-Summittville is mineralized, as are the very latest Creede-Silverton sectors. No comment was solicited on why the intervening caldera developments have very slight (apparent) associated mineralization.

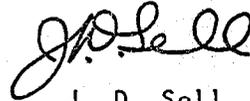
At lunch, Harold Bonham, all four SAGE people, Charles Phillips, and I were involved in the total question of caldera development, et al, and mineralization, and the question again was raised: Why some are mineralized; why do some have resurgent centers; etc. Bonham's comment was that he felt that sufficient time had to transpire, ground preparation necessary (multiple events), a source area, and collecting (entrapment, precipitation) area available similar to that of productive porphyry copper system. The point was brought up that several speakers had suggested 1-2 million years for productive mineralization event whereas similar or less time for the cycle of volcanic activity, ash-fall, caldron collapse, resurgent doming, rhyolite dome emplacement to completion.

The question was asked: Does the mineralization event actually go on concurrently throughout the cycle but, being constantly interrupted by the cycle, it is unable to manifest itself into a productive deposit, and hence post all caldera events the mineralization had the time to occupy the sites without further mishap? (i.e., Could you test the ash-flows, etc. for trace amounts and predict if a productive deposit might be associated?) Bonham's comment was "No." Work to date does not suggest a continuum of mineralization from early volcanism to post caldera ring dike development.

Don Peterson (p. 618) gave a very good talk on the subject of flattening ratios and pointed out the concept, use, etc. He said that all groups have not been successful in applying it (no names), but that Magma Copper had used it and, through the use of a cartoon, showed that Magma's geologist had reached the conclusion of a ratio of 1.673 equals 1788 feet, but that the shaft found the base at 1775 feet below collar for #9 Shaft.

May 25, 1976

The New Mexico Geological Society released Special Publication No. 5, Cenozoic Volcanism in Southwestern New Mexico (151 pages) (copy in Library), which puts in print in one volume much of the work accomplished in the last few years of updated previous material.



J. D. Sell

JDS:1b

June 28, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

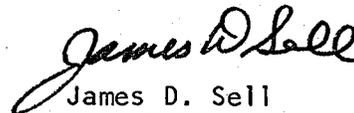
Second Quarter Report
April-May-June 1976

Superior East Project, Pinal County, Arizona. The gravity report by the Geophysical Group at SLC suggests that the gravity interpretation of the granite-schist contact would be greatly diminished under the dacite and conglomerate cover. No further work is planned.

The seismic report by J. R. Cooksley has been received and suggests a bowl-shaped configuration with about equal slopes both to the east and west, with the low axis lying east of Devil's Canyon. The work suggests a further east extension of the favorable copper zone in conglomerate which may extend east to the Rawhide Canyon fault.

Santa Cruz Project, Pinal County, Arizona. A report entitled "A Structural and Related Mineral Reinterpretation of the Santa Cruz Horst Block" has been distributed covering the interpretation of the relogging and evaluation conducted during the winter.

Greater Casa Grande Basin Studies Project, Pinal County, Arizona. Field work is in progress around the entire Casa Grande Basin. The first area under study is the old Santa Rosa project area and its extension toward Table Top and Antelope Peak. Numerous porphyry dikes of various affinities have been found cutting the Precambrian granite. Minor alteration and pyritic additions with several breccia zones within a general northeast trend zone suggest a zone of recurrent movement favorable for the emplacement of a Laramide porphyry system. Geochemical and thin-section data are being assembled for outlining a permissible zone for projection under cover.


James D. Sell

JDS:1b

FROM: F. T. GRAYBEAL

9/30

TO: JDS

On future quarterly reports would you also include the submittals like Middlemore - probably took a day of your time listening to Birchfield + writing up. This one particularly of interest because we may work there in future per your recommendations - Thanks.

September 29, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Third Quarter Report
July-August-September 1976

Superior East Project, Pinal County, Arizona. Bryant Construction revamped the road east of Devils Canyon and prepared drill site A-8. Joy Drilling started coring from the surface with an unmodified Joy 22 which cored NC to the depth of 1971 where they set casing. A Joy 22 Heavy Duty rig and crews were moved onto the cased hole and they are continuing the core at NX size. The following depth-units had been encountered at the A-8 site.

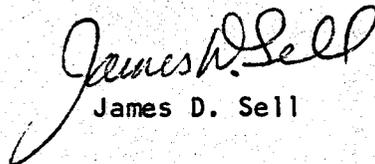
Surface-1583 Dacite with basal vitrophyre and tuff
1583-2213 Earlier Volcanics
2213-2271 Whitetail Conglomerate

Additional data was gathered at Continental Copper's request on the Margaret group.

Santa Cruz and Olberg Projects, Pinal County, Arizona. Three and one half weeks were spent on the projects reviewing with H. Kreis and handling the drilling and logging while Kreis was on vacation. H. Kreis handled all reporting on the projects.

Greater Casa Grande Basin Studies Project, Pinal County, Arizona. Field and laboratory work was concluded in the SW part of the area, encompassed by the Santa Rosa, Indian Butte, and Antelope Peak sub-areas. A drill target was outlined and the report and maps are being processed.

A minor amount of work was done in the north-central area north of the Sacaton deposit. Of interest was a dike zone which was offset by numerous 10-30 foot displacement faults which aggregated over 1100 feet of total offset over the mapped length. The dike trends NE and goes under cover on both ends whereas the offsetting faults trend NW.


James D. Sell

JDS:lb

December 21, 1976

TO: F. T. Graybeal

FROM: J. D. Sell

Fourth Quarter Report
October-November-December 1976

Superior East Project, Pinal County, Arizona. Coring of hole A-8 continues during the quarter. As of the end of the reporting period the hole has reached a depth of 4767 feet. NX size core was terminated at 3197 feet and BX initiated and continued. Core recovery has been very good in badly crushed and faulted premineral units. The following depth-units have been encountered in the hole.

Surface-1583 Dacite with basal vitrophyre and tuff
1583-2213 Earlier Volcanics
2213-3226 Whitetail Conglomerate
3226-4767 Premineral Units

The Premineral Unit is Precambrian Pinal Schist intruded by a number of aplitic and porphyry dikes and sills. Superimposed on the units is a variable quartz-sericite alteration containing a variable amount of copper. Included in the mineralization are a number of quartz-sulfide veins containing high-grade bornite-chalcocite mineralization.

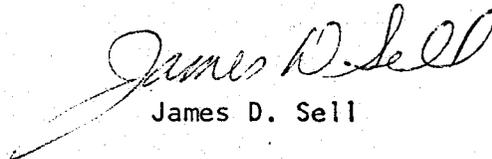
Present interpretation of the Premineral units is as follows:

- 3226-3774 Pinal Schist with four thin Laramide granite aplite dikes (4-10 ft. thick). The block is oxidized and is considered the slide block capping unit as found in the surrounding holes.
- 3774-3777 Basal Fault Zone dipping 15°-20°.
- 3777-3879 Pinal Schist with basal gouge-fault zone. Oxidized and carrying 120-345 ppm copper. One section contains six inches of massive chalcocite.
- 3879-4767 Pinal Schist intruded by five Laramide biotite feldspar porphyry dikes and sills varying from 4 to 168 feet in drilled thickness. All units contain sulfides of chalcocite and bornite in quartz veins and/or quartz-sericite alteration bands with minor pyrite. Chalcopyrite is very rare except for below 4744 feet where pyrite-chalcopyrite is the dominant sulfides. Copper values of above 0.50% extend from the oxide-sulfide interface at 3879, down to 4525 feet. The 646 foot intercept weighted average is 1.57% copper. Within the intercept are seven quartz-sulfide veins varying from 1 foot to 25 feet wide with an aggregate cumulative footage of 93 feet averaging 7.06% copper (the best intercept being 20 feet of 19.05%). The aggregate wall rock of 553 feet averages 0.64% copper.

In the interval below 4525 feet the copper content drops rapidly with the 242 feet averaging around 0.16% copper on incomplete assay returns.

Low values of moly, gold, and silver have been returned on scattered sampling.

Indian Butte Project, Pinal County, Arizona. Four holes were drilled on a 4000-6000 foot spacing within an inferred dike zone expressed in bedrock mapping to the southwest and Asarco's 1967 Santa Rosa project to the northeast. Three holes encountered either Laramide andesite, hornblende monzonite, or black porphyry while the fourth encountered only Precambrian Oracle Granite. Low geochemical values were noted. Weak alteration (clay with some sericite) was found in all four drill holes.



James D. Sell

JDS:lb

March 24, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

First Quarter Report
Jan., Feb., March 1977Superior East Project, Pinal County, Arizona

Coring of Hole A-8 continued at BX size from the reporting depth of 4767 feet at the end of the last quarter to the terminal depth of 4907 feet. As reported previously, the grade dropped rapidly, along with alteration effects, below 4525 feet and in the interval 4767-4907 feet. Three assays, scattered, returned 0.11, 0.06, and 0.06 percent copper. Continued low values for lead, zinc, moly, gold, and silver were also noted.

Requests for two additional drill sites were received from the Forest Service. Hole A-9 was located approximately 800 feet northeast of A-8 and is now coring. Only a short time was needed to build a site on an old access road. Another drill site was constructed, together with an access road, some 800 feet west of A-8. This site is scheduled to be occupied following completion of A-9.

Hole A-9 was cored NC size from the surface to 2357 feet; cored NX size from 2357 to 3624 feet; and is continuing with BX size. As of the end of the quarter the BX size had progressed to a depth of 3760 feet. The following depth-units have been encountered.

Surface-1478	Dacite
1478-2194	Earlier Volcanics
2194-3275	Whitetail Conglomerate
3275-3682	Slide Blocks of Pinal Schist cut by minor quartz monzonite and quartz monzonite porphyry. The blocks are variably crushed, totally oxidized, and variably altered and mineralized (leached).
3682-3693	Fault zone at 10°, with increased dip toward base
3693-3760	In-place block of Pinal Schist, totally oxidized, variably altered with strong quartz-sericite bands which parallel and cross-cut schistosity. This leached capping contains 10-15% iron oxide as replacement along schistosity and fine disseminations.

Reports completed during the quarter include a daily drill log with unit contacts of hole A-8. Joy drilling rates compared favorably with other contractors in the area. A graphic-log assay section was also completed and submitted.

March 24, 1977

Indian Butte Project, Pinal County, Arizona

A fifth hole was drilled in the project area. Hole IB-5 was located in the northern part to test for an expansion of the porphyry dike swarm. Precambrian granite with weak iron-oxidation and clay alteration was encountered with correspondingly low geochemical values.

The final report, "Drilling Results and Interpretation", has been distributed.

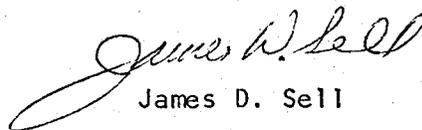
General Exploration and Reconnaissance

Several areas were investigated during the quarter. This includes a special report on Block Cave Leaching, a brief review of the Barstow (Waterloo) property, a review and report on Quintana's Devils Canyon Project which adjoins the Superior East Project on the south. Quintana drilled two holes to presumed bedrock without encountering encouraging values or alteration. A third hole is cased deep into the Whitetail Conglomerate. We declined to participate in the project.

A one-day examination and later review of the Payson area were made. The Gold-Angel Resources property drilled four holes and found anomalous copper values, mainly as disseminated bornite, in a greenstone complex. Continued review of the area will be undertaken.

Material has been secured for recon mapping of a large block of ground surrounding the Pioneer outcrop. The recon, called the 96-Recon will be undertaken piecemeal as time dictates.

An ongoing Company review of Landsat Images had an interim conclusion with a meeting in Salt Lake City. My memo on the exercise has been distributed. Further studies are apparently on stream for study of enhanced images.



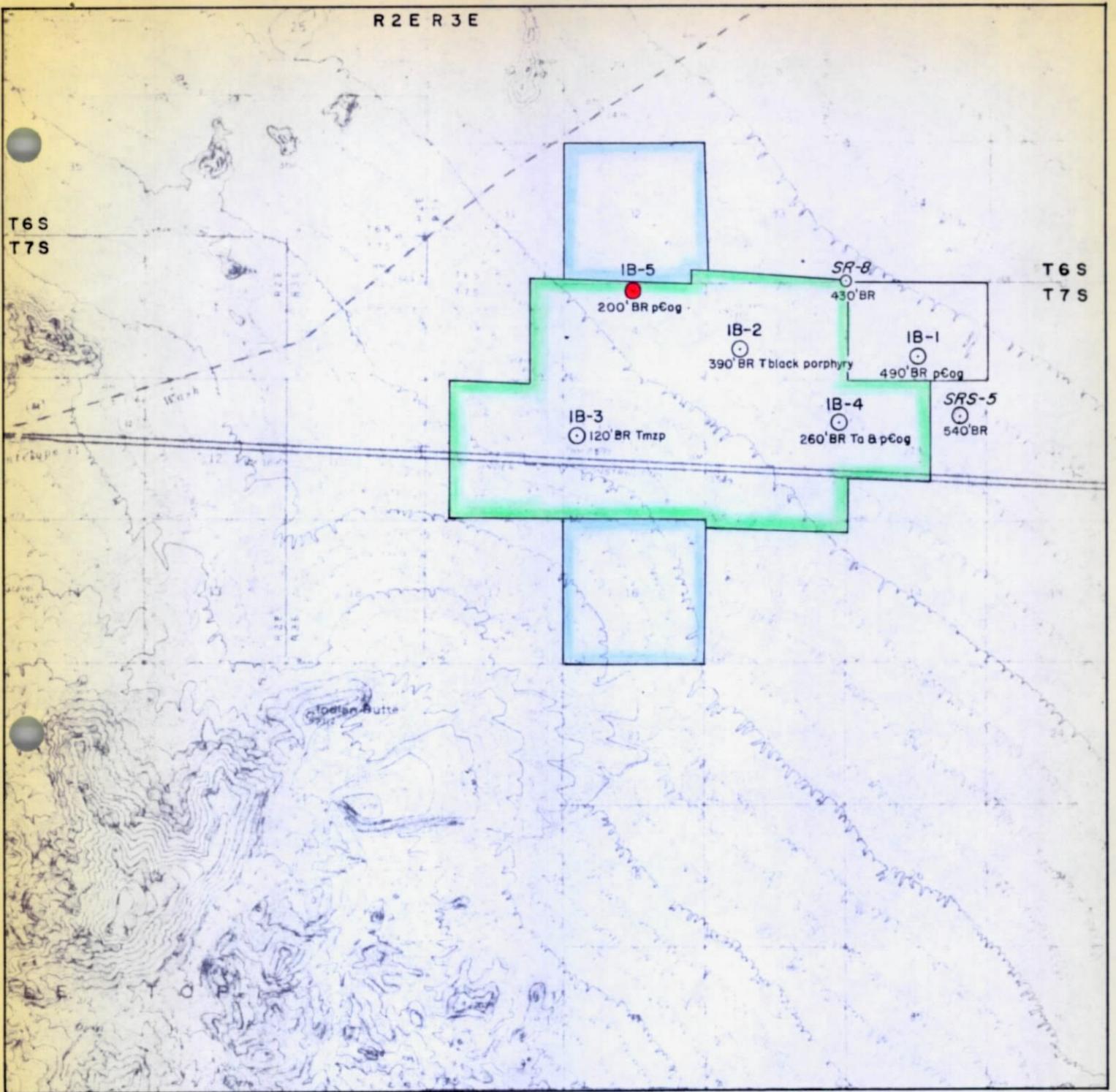
James D. Sell

JDS:lb

R 2 E R 3 E

T 6 S
T 7 S

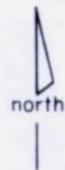
T 6 S
T 7 S



EXPLANATION

- SR-8
○ Previous ASARCO Drilling
(showing depth to bedrock)
- IB-3
● Current ASARCO Drilling
(showing depth to bedrock
& rock type)

- ASARCO State Lease
- ASARCO Fed. Min. Claims



TO ACCOMPANY	<i>Report</i>
DATED	<i>March 24, 1977</i>
BY	<i>J. S. Lee</i>

DRILLING PROGRESS MAP
for the *1st* Quarter of 1977
INDIAN BUTTE PROJECT
Pinal County, Arizona
SCALE 1" = 1 mile

JDS

Dec, 1976

June 10, 1977

TO: F. T. Graybeal
FROM: J. D. Sell

Second Quarter Report
April-May-June, 1977

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 31-1/2 days of the time have been involved in logging and sampling hole A-9, which was terminated, and the logging of A-10, which is continuing. Geophysical probe work was accomplished and a triangulation net established and surveyed in the area of present interest.

GENERAL EXPLORATION

96-Recon., Pinal Co., Arizona - Cu. Six days have been spent mapping the 96-SW quad. Numerous dikes, post-Laramide conglomerates, etc. have been found with very minor mineralization in premineral units. Mapping will continue.

Gibson Property, Gila County, Arizona - Cu. One-half day was spent with the owner on discussion of potential. Mr. Kayser will apparently drill one more hole testing the vein zone projection.

Middlemarch Area, Cochise County, Arizona - Cu. One-half day was spent on reviewing our files and talking with the owner on dewatering the shaft for inspection. The shaft caved at one point and we have not been contacted by the owner since. Will follow-up.

Margarita Property, Santa Cruz County, Arizona - Au. One-half day was spent reviewing the drilling results with a consulting geologist. Values appear to be restricted and of very low tenor, altho' Asarco sampling ten years ago returned higher values of moderate interest today. Recheck.

Red Bird Mine, Cochise County, Arizona - Cu. One day was spent reviewing files and one-half day was spent sampling underground. Interesting moly values. Deserves further attention (see S. R. Davis' report).

Square Top Hills Area, Cochise County, Arizona - Cu, Pb, Zn. One-half day was spent in the field. Intriguing dikes and altered limestone in area. Deserves follow-up (see S. R. Davis' report).

Quintana Devils Canyon Project, Pinal County, Arizona - Cu. One-half day was spent reviewing the project concept with a consulting geologist, one-half day looking at premineral core and discussing project and problems, one day locating drill site with contractor. Recommended test of concept.

June 10, 1977

Miscellaneous: Thirteen days were spent on Tucson miscellaneous, including a one-day AIME field trip to Ray, 2-1/2 days on porphyry map, 1 day on grade-tonnage compilation, 2-1/2 aggregate on internal miscellaneous thoughts, 4 days of EOM & EOQ reports, and 2 holidays. Ten days vacation time.

James D. Sell
James D. Sell

JDS:1b

May 31, 1977

Memorandum to Geologists

Quarterly Reports

Please prepare your quarterly reports according to the format noted below:

EXPLORATION AUTHORIZATIONS

Bon Project - Cu

In one short sentence, state the % of the quarter (or number of days) involved with the project and what was done. All other detail will be obtained from the monthly reports.

GENERAL EXPLORATION

Round Mtn. mine, Toquima Range, Nye County, Nev. - Au. Write 1-2 sentences telling what deposit is, what was done, recommendations, and whether or not more work will be done.

Pearce Hills Reconnaissance, Cochise County, Ariz. - Cu, Ag. Days worked, what you are doing, any encouragement, plans for next quarter -- all in 1 or 2 sentences.

Miscellaneous: Field trips and where, meetings, short courses, and topical studies and how long (like LANDSAT).

The idea is for you to tell me exactly what you did, the results, and whether you plan any further work. I want to know everything you did, but I want it stated as succinctly as possible.

F. T. Graybeal
F. T. Graybeal

FTG:1b

ASARCO

Southwestern Exploration Division

September 19, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Third Quarter Report
July-August-September, 1977

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 14 days were spent logging, etc. hole A-10 which was suspended during the quarter.

Devils Canyon - Cu. 14-3/4 days were spent moving, setting up, drill site preparation, logging the core, etc. of hole QDC-5 which is continuing.

GENERAL EXPLORATION

96-Reconn., Pinal County - Cu. 1-1/2 days were spent reviewing the general area and the new geophysical report on the area.

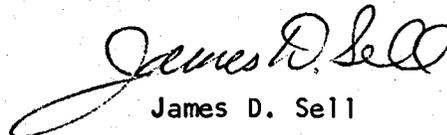
Margarita Property, Santa Cruz Co. - Au. 1/4 day spent on writing the report on the information gathered.

Outside Submittals - Cu, Au, Ag. 1/2 day on A. Still's Mule Mountain plug thoughts; 1/4 day on R. Lunden's precious metals in Silver Bell equivalent units.

Miscellaneous Exploration. 13 days total, including 3/4 day on Spade Cooley's transport trend map; 1-1/4 days with Land Consultant, SE problems and tour; 9 days on Porphyry Copper Map and study breakdown; 1/2 day on ERDA report review; and 1-1/2 days on review of Limestone Replacement deposits.

Miscellaneous Governmental. 1-1/4 days including 1 day on Forest Service Roadless Areas; and 1/4 day on the Tucson South West Area Planning (SWAP) preliminary zoning and ideas.

Miscellaneous Office. 19-1/2 days including 5 days on vacation; 2 holidays; 3-1/4 EOM & EOQ; 6-1/4 on IAGOD paper; 1-1/2 at Symposium at Museum Northern Arizona; 1/2 on Silver Bell paper review; and 1 miscellaneous clean-up.


James D. Sell

JDS:lb

December 20, 1977

TO: F. T. Graybeal

FROM: J. D. Sell

Fourth Quarter Report
Oct.-Nov.-Dec., 1977

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 8 days were spent logging, etc. hole A-10 which was reentered during the quarter.

Devils Canyon - Cu. 22-3/4 days were spent logging, sampling, and report writing on hole QDC-5 which was cased and terminated at 2904 feet.

GENERAL EXPLORATION

96 Hills SW Recon., Pinal Co. - Cu. 17-1/2 days were spent in field mapping, sample collection, interpretation, and report writing.

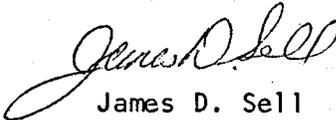
Limestone Replacement Research. 2-1/4 days were spent in library research.

Asarco Az.-N.M. Field Trip. 4 days were spent in the Silver City-Morenci-Johnson Camp areas.

Miscellaneous Exploration. 2-1/2 days were spent on a Massive Sulfide field trip and study.

Miscellaneous Governmental. 3/4 of a day was spent on the Tucson Southwest Area Planning (SWAP) program.

Miscellaneous Office. 9-1/4 days total: including 4 days holiday, 3 days EOM & EOQ, 1 day AIME Conference, 1/2 day Tucson exploration meeting, 1/2 day mining law review, and 1/4 day annual physical.


James D. Sell

JDS:1b

JDS

February 28, 1978

TO: Geologists

FROM: F. T. Graybeal

Property Submittals

It is common practice after making a field examination of a property submittal with the owner, to provide the owner with a copy of the sample results and a sample location map. Although there is no firm policy in this regard there is no reason for it not to continue for properties on which we do not plan further work and where the owner requests the information.

This note is merely written as a reminder that you should not provide copies of your geologic maps or file data without first checking with me. Geologic maps often provide more interpretive insight than factual data, the former perhaps useful at some later date and I do not wish to provide the opposition with such information.

F. T. Graybeal
F. T. Graybeal

FTG:1b

cc: WLKurtz

March 23, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

First Quarter Report
Jan.-Feb.-March 1978

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 18-1/2 days were spent logging, splitting core, reviewing and compiling assays, and report writing. Hole A-10 bottomed at 4282 feet.

Devils Canyon - Cu. 12-1/2 days were spent logging and checking on hole QDC-5 which was at 4049 feet in Pinal Schist.

GENERAL EXPLORATION

Limestone Replacement Research. 5-1/2 days spent on literature-file research.

Miscellaneous field reviews. Picacho Mtn. (2), Little Table Mtn. (2), Roadside Mine (1), Sacaton Basal Fault (1), Payson-Copper Mtn. (1-1/2), Red Bird Hills (1), and Oro Blanco recon. (1).

Miscellaneous Office. Office clean-up and submittals (4), review AIME paper (1), revise metallogenesis paper (2), uranium review (1/2), and EOM & EOQ & holidays (5).

Continued Studies. Colorado State University Fluvial Systems Conference (7).

James D. Sell
James D. Sell

JDS:1b

April 5, 1978

TO: Geologists

FROM: F. T. Graybeal

Quarterly Reports

I had thought it was clear that your quarterly reports were to be concise, accurate, and complete. If you will refer to my note on this subject of May 31, 1977 you will see I asked for a summary of everything you did and the number of days you spent doing it. However, as I read your reports and compare them to your monthly time sheets I often find little resemblance between the two. Commonly the quarterly report accounts for 15-20 days in a 60-day quarter.

Henceforth quarterly reports will be returned if they are incomplete -- meaning I want you to account for every day worked and reported on the monthly time sheets. Mrs. Bormolini can provide you with the actual number of working days in the quarter if you wish; however, during periods of extended general exploration activity we all work more than a 5-day week anyway so the "accountable" number of days is irrelevant. The idea is for me to know what you are doing without searching the monthly time sheets rather than to keep a count of how many days you were on the job. I have also noticed that too much miscellaneous is being reported; this column is for vacation, physical, sickness, holiday, but not for any geologically-related work (land, mining law, etc.) as has been previously made quite clear.

I am attaching your time sheets for Oct.-Dec. with some brief comments and a handwritten note regarding the adequacy of the quarterly reports. I would appreciate your cooperation in the future which can't take more than one hour every quarter.

F. T. Graybeal
F. T. Graybeal

FTG:lb

JDS

Thanks for your
cooperation - good etc etc.
everywhere.

I can't find anything to
complain about - sigh!

But you should see some
of the others.

F.T.G.

Employ

J. D. Sell

Month: October, 19 77

	GENERAL EXPLORATION					E.A. Other	EXPLORATION PROJECTS						OPERATING UNITS					(19)
	(1)	(2)	(3)	(4)	(5)		E.A. 0010	E.A. 0011	E.A. 0040	E.A. 0042	E.A. 0075	E.A. 0138	E.A. 0087	E.A. 0013	E.A. 0128	E.A. 0136	E.A. 0139	
EXPLORATION:																		
Mine Examination & Sampling		4																
Field Geological Reconnaissance																		
Field Geological Mapping			2															
Field Surveying																		
Drilling Supervision																		
Core Logging																	6 1/2	
Computations (a)																		
Compilations, Maps & Sections																		
Ore Reserve Estimates																		
Property Negotiations																		
Research (b)					1													
Report Writing & Correspondence																		
Drafting																		
Routine Office Work			3 1/2															1 1/2
Vacation (show dates)																		
<i>EOM, EOQ & Holidays</i>	2 1/2																	
GEOPHYSICAL:																		
Field Geophysical Surveying																		
Computations																		
Research																		
Report Writing & Correspondence																		
Routine Office Work																		
ADMINISTRATION:																		
Cost & Outcome Estimates																		
Real Property Administration																		
Report Writing																		
Routine Office Work																		
Schedule Calculations																		
	2 1/2	4	5 1/2	1														8



499-01-610

EA 0139-00-530

(a) Surveys, samples, etc.

(b) Literature, files

32°00'N, 111°00'W
32°14'N, 118°56'W

Mine, Prospect, Area Name, County, etc

- (1) Tucson Office, Miscellaneous
- (2) *Staff A, NM Field Trip, Toc. General*
- (3) *Toc Gen. (96 SW Recon.)*
- (4) *Toc Gen. (Lms Replacement)*
- (5) _____
- (6) _____
- (7) _____

Exploration Projects

- MA 0010 Superior
- MA 0011 Rochester
- MA 0040 3R
- MA 0042 Thunder Mtn.
- MA 0075 Santa Cruz
- MA 0138 Mammoth Wash

Unit, Office, etc.

- (19) (a)
- (b) 0087 Peripheral
- (c) 0013 Hardshell
- (d) 0128 Bon
- (e) 0136 NAAC
- (f) 0139 Devils Canyon

TIME DISTRIBUTION SHEET, WORKING DAYS

Employee: J. D. Sell

Month: November, 19 77

	GENERAL EXPLORATION						EXPLORATION PROJECTS						OPERATING UNITS					
	(1)	(2)	(3)	(4)	(5)	E.A. Other	E.A. 0010	E.A. 0011	E.A. 0040	E.A. 0042	E.A. 0075	E.A. 0138	E.A. 0087	E.A. 0013	E.A. 0128	E.A. 0136	E.A. 0139	(19)
EXPLORATION:																		
Mine Examination & Sampling																		
Field Geological Reconnaissance																		
Field Geological Mapping					3													
Field Surveying																		
Drilling Supervision																		
Core Logging																	4	
Computations (a)																		
Compilations, Maps & Sections																		
Ore Reserve Estimates																		
Property Negotiations																		
Research (b)					2 1/2													
Report Writing & Correspondence																	4 3/4	
Drafting																		
Routine Office Work	2 3/4	1 1/4	1 1/4	2 1/2														
Vacation (show dates)																		
GEOPHYSICAL:																		
Field Geophysical Surveying																		
Computations																		
Research																		
Report Writing & Correspondence																		
Routine Office Work																		
ADMINISTRATION:																		
Cost & Outcome Estimates																		
Real Property Administration																		
Report Writing																		
Routine Office Work																		
Schedule Calculations																		
	3	1	1	3	5		2											

I think I see this squared in at bottom - OK.



	Mine, Prospect, Area Name, County, etc	Exploration Projects	Unit, Office, etc.
(a) Surveys, samples, etc.	3 (1) Tucson Office, Miscellaneous EDM & Holes	MA 0010 Superior	(19) (a)
(b) Literature, files (32° 07' N, 114° 07' W)	1 (2) " " " " Mining Law & SWAP	MA 0011 Rochester	(b) 0087 Peripheral
(32° 14' N, 110° 50' W)	1 (3) " " " " Replacement & Deposits	MA 0040 3R	(c) 0013 Hardshell
(34° 30' N, 112° 01 1/2' W)	3 (4) " " " " Massive Sulf. Field Trip	MA 0042 Thunder Mtn.	(d) 0128 Bon
(33° 00' N, 111° 00' W)	5 (5) " " " " 96 SW Hills Recon.	MA 0075 Santa Cruz	(e) 0136 NAAC
	(6)	MA 0138 Mammoth Wash	(f) 0139 Devils Canyon
	(7)		

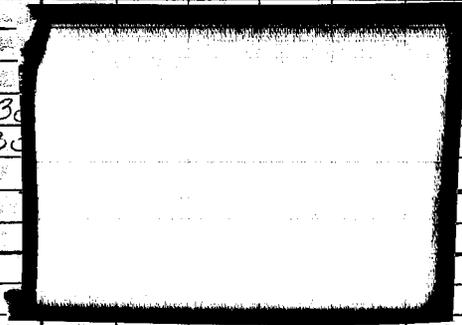
Employ

J. D. Sell

Month: December

1977

	GENERAL EXPLORATION					E.A. Other	EXPLORATION PROJECTS					OPERATING UNITS						
	(1)	(2)	(3)	(4)	(5)		E.A. 0010	E.A. 0011	E.A. 0040	E.A. 0042	E.A. 0075	E.A. 0138	E.A. 0087	E.A. 0013	E.A. 0128	E.A. 0136	E.A. 0139	(19)
EXPLORATION:																		
Mine Examination & Sampling																		
Field Geological Reconnaissance																		
Field Geological Mapping		1																
Field Surveying																		
Drilling Supervision																		
Core Logging							6											
Computations (a)																		
Compiations, Maps & Sections																		
Ore Reserve Estimates																		
Property Negotiations																		
Research (b)																		
Report Writing & Correspondence		5 1/2															6	
Drafting																		
Routine Office Work																		
Vacation (show dates) → meeting				1	1/2													
EDM, EQQ, Holiday	2																	
GEOPHYSICAL:																		
Field Geophysical Surveying																		
Computations																		
Research																		
Report Writing & Correspondence																		
Routine Office Work																		
ADMINISTRATION:																		
Cost & Outcome Estimates																		
Real Property Administration																		
Report Writing																		
Routine Office Work																		
Schedule Calculations																		
	2	6 1/2	1	1/2													6	



(a) Surveys, samples, etc.
 (b) Literature, files 3300N, 1100W

Mine, Prospect, Area Name, County, etc	Exploration Projects	Unit, Office, etc.
(1) Tucson Office, Miscellaneous, EDM, EQQ	MA 0010 Superior	(19) (a)
(2) " " 96 Hill SW, Kearney	MA 0011 Rochester	(b) 0087 Peripheral
(3) " " AIME Conference (Tucson)	MA 0040 3R	(c) 0013 Hardshell
(4) " " Exploration Meeting	MA 0042 Thunder Mtn.	(d) 0128 Bon
(5) _____	MA 0075 Santa Cruz	(e) 0136 NAAC
(6) _____	MA 0138 Mammoth Wash	(f) 0139 Devils Canyon

ASARCO

Rocky Mountain
Exploration Division

July 6, 1978

TO: D.M. Smith, Jr.

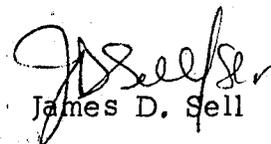
FROM: J.D. Sell

Denver Office
2nd Quarter Report
April-May-June, 1978

Field work on the limestone replacement search is as follows since arriving at the Denver office:

- 1) Weston Pass area, Lake County. Four days were spent sampling the various units exposed and in minor workings. An excellent build-up of replacement textured features appear to the north of Weston Pass.
- 2) Gilman area, Eagle County. Two days were spent examining the general area with control samples taken for comparison evaluation.
- 3) Carbonate Hill, Lake County. One-and-a-half days were spent examining the general area with control samples taken for comparison evaluation.
- 4) Fairplay, Park County. One day was spent on general reconnaissance of the surrounding area. A number of altered areas extend from the Alma district south with carbonate units nearby. Follow-up is expected.
- 5) Aspen, Pitkin County. One day was spent on general reconnaissance of the area. The main exposed alteration is near Sopris (town) and east of Glenwood Springs. Both will be followed up.
- 6) East Tennessee Creek, Lake County. One day was spent in the area of a quartz-gold vein system and an altered porphyry with various samples taken.

The Gilman, Carbonate Hill, and East Tennessee Creek areas were visited with Dennis Krasowski and Kurt Von Fay. Two days were also spent on review in the Denver office.


James D. Sell

JDS:slr

June 19, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Second Quarter Report
April-May-June 1978

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 11 days were spent on comprehensive report with suggestions on continued exploration. Also flagging and filing of new road permits with Forest Service.

Devils Canyon - Cu. 12-1/2 days were spent in final logging and writing a summation and final report.

GENERAL EXPLORATION

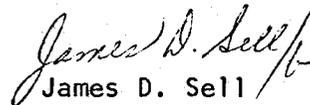
Limestone Replacement Research. 21-1/2 days were spent in review and literature-file research, including travel to Denver and field.

96SW Hills. 3 days were spent in report writing on mapping project.

Miscellaneous Field Reviews. Little Table Mountain (1), Bagdad (AIME) (2), San Manuel (AIME) (1/2), Pinto Valley (AIME) (1-1/2), Anderson Mine (AGS) (1).

Miscellaneous Meetings & Workshops. 6 days at Cordilleran GSA Meeting, field trip, and write-up; report on Fluvial Systems (Ft. Collins, Colo.) meeting (1); and BLM wilderness workshop (1-1/2).

Miscellaneous Office and Field. Rotary drilling observation (1/2); Sal Anzalone lecture (1/2); various file memos and field notes (1); general office clean-up (2-1/2); and EOM, EOQ, and holidays (4).


James D. Sell

JDS:1b

ASARCO

Rocky Mountain
Exploration Division

September 22, 1978

TO: D. M. Smith, Jr.

FROM: J. D. Sell

Third Quarter Report
July-August-September, 1978

GENERAL EXPLORATION

The entire quarter was spent in the Limestone Replacement Search, vein examinations, and the IAGOD meeting, as follows:

Aspen South Area, 3 days. Mineral zone cutting both limestone and dolomitized units. Report pending.

Black Cloud Area, 2 days. Underground sampling of Leadville and Manitou replacement horizons adjacent to mineral bodies. Report pending.

Fourmile Area, 8 days. Includes Hilltop-Peerless, Mudsill-Sacramento, and Sheep Mountain subareas. Excellent replacement textures and mineralization features.

Galena Mountain Area, 1 day. Vein structures.

Glenwood Springs Area, 4½ days. Includes Deep Creek, Glenwood Canyon, and Mount Sopris subareas. Narrow weak vein and associated replacement zones in limestone and dolomite units (first two subareas), and late Tertiary intrusive-fluidization events.

Grand Junction Area, 2½ days. Review of earlier work and replacement exploration problems with C. E. Beverly.

Leadville-Buena Vista Region review, 5½ days. General review of units and their alteration-mineralization.

Long and Derry Area, 1 day. Excellent replacement textures and mineralization features.

Pennsylvania-Mosquito Creek Area, 2 days. Outskirts of main-Alma-Mosquito district, with excellent replacement textures and mineralization features.

September 22, 1978

Silverton-Ouray Area, 7 days. General inspection of greater Silverton district; inspection and review of Idarado Mine and geology-mineralization; and Leadville Unit exposure investigation.

Tin Cup (Gold Cup) Area, 5 days. Excellent replacement textures and mineralization near gold-tungsten-moly zone.

Trout Creek Area, 4 days. Predominantly limestone with weakly developed dolomite replacement features.

Limestone Replacement Search Field Review, 4 days. Inspection and review of areas with favorable replacement textures and mineralization characteristics.

Denver Office File Review and Report Writing, 22 days. Mainly associated with areas listed above and includes two days off.

Denver Office end-of-month and end-of-quarter, 3 days.

IMMSA Tour of Gilman-Leadville Area, 2 days.

Exploration meeting preparation and participation, 4 days.

Tucson Office, IAGOD meeting, paper presentation, travel, and report (Salt Lake City), 11 days.

Total: 92 days


James D. Sell

JDS:eff

CC: F. T. Graybeal

JOS

November 15, 1978

*Cancelled 11/16/78
til late Jan.*

TO: All Geologists

FROM: F. T. Graybeal

I would like to have an in-house meeting either Dec. 11 and 12 or Dec. 12 and 13. The meeting will take one to one and one-half days and would involve each geologist reviewing projects and reconnaissance work for which he has been responsible. The presentation should be informal with little or no preparation. We would make use of blackboards and such other materials as necessary including report maps which can be easily laid out for a group of 8 or 10.

The purpose of this note is simply to inquire whether anyone would not be available during that period of the 11th to the 13th of December. Please let Lois know now if you can't make this meeting. I will assign topics to be discussed after the meeting dates are confirmed.

F. T. Graybeal

F. T. Graybeal

FTG:lb

cc: WLKurtz
RBCrist

November 16, 1978

TO: All Geologists

FROM: F. T. Graybeal

Due to a plethora of vacations from the 11th of December through about the 8th of January, our in-house meeting will be postponed until sometime late in January.

Thanks anyway.

FTG.

F. T. Graybeal

FTG:1b

cc: WLKurtz
RBCrist

December 14, 1978

TO: F. T. Graybeal

FROM: J. D. Sell

Fourth Quarter Report
Oct.-Nov.-Dec. 1978

GENERAL EXPLORATION

Denver Office -- Limestone Replacement Search

- 2-1/2 days in examination of the Ouray-Silverton-Ironton area including the Silver Crown Vein and Albany Gulch Leadville Limestone areas. Vein has low priority while limestone indicates interesting values.
- 4 days travel time to Tucson and general clean-up.
- 9 days (Tucson office) compilation of general data and reports on Fourmile (Addendum), Gold Cup, and Aspen areas. All show very interesting values, with Fourmile and Gold Cup being in inactive areas.

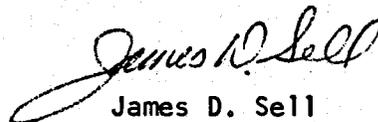
Tucson Office

- 7-1/2 days on Miscellaneous Arizona submittals, review, and general clean-up.
- 3 days, Silver City, New Mexico (Ground Hog Unit) on replacement units.
- 1 day, Tombstone limestone alteration (marble) with manganese.
- 7-1/2 days, Central Arizona Field Conference (Asarco), arrangements, participation, and follow-up of surface and/or underground tours at Magma (Superior), Christmas, Pinto Valley, Inspiration, and Superior East Project.
- 1-1/2 days participation on Paleozoic field trip of AGS-NMGS.
- 2 days on Porphyry Copper Map.
- 1 day at Arizona AIME Conference (Tucson).
- 2-1/2 days EOM & EOQ.
- 31 days holiday and weekends.
- 9 days vacation.

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 10-1/2 days logging core on hole A-11 which has penetrated the volcanic units and into the unmineralized Whitetail Conglomerate.

Total: 92 days.


James D. Sell

JDS:lb

cc: DMSmith, Jr.

March 23, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

First Quarter Report
Jan.-Feb.-March 1979

EXPLORATION AUTHORIZATIONS

Superior East - Cu. 12 days in logging, core splitting, and review of hole A-11 from Whitetail Cgl. into sulfide in Pinal Schist.

The Lands - Cu. 1 day logging on exchange drilling data.

GENERAL EXPLORATION

Tucson Office

13 days on Mexican field trips to Durango-Chichuahua and Tayoltita regions
9-1/2 days on JHC compilation-survey report
7 days clean-up on previous vacation time
6 days on AIME annual meeting, New Orleans
2 days on miscellaneous Arizona submittals, etc.
2 days on Tucson office exploration meeting
2 days on U of A Geoscience meeting
1-1/2 days on AGS Western Arizona field trip
1/2 day on legislature-Alaska lands correspondence
2 days on EOM & EOQ
1 day holiday
20 days weekends

Denver Office

5-1/2 days on Black Cloud Unit report
5 days on comprehensive report


James D. Sell

JDS:1b

cc: DMSmith, Jr.

May 31, 1977

Memorandum to Geologists

Quarterly Reports

Please prepare your quarterly reports according to the format noted below:

EXPLORATION AUTHORIZATIONS

Bon Project - Cu

In one short sentence, state the % of the quarter (or number of days) involved with the project and what was done. All other detail will be obtained from the monthly reports.

GENERAL EXPLORATION

Round Mtn. mine, Toquima Range, Nye County, Nev. - Au. Write 1-2 sentences telling what deposit is, what was done, recommendations, and whether or not more work will be done.

Pearce Hills Reconnaissance, Cochise County, Ariz. - Cu, Ag. Days worked, what you are doing, any encouragement, plans for next quarter -- all in 1 or 2 sentences.

Miscellaneous: Field trips and where, meetings, short courses, and topical studies and how long (like LANDSAT).

The idea is for you to tell me exactly what you did, the results, and whether you plan any further work. I want to know everything you did, but I want it stated as succinctly as possible.

F. T. Graybeal
F. T. Graybeal

FTG:lb

May 22, 1979

TO: Geologists

FROM: F. T. Graybeal

Quarterly Reports

Please prepare your quarterly reports in exact conformance to previous instructions which you should carefully review. Account for all working days in the quarter. Give the number of days worked on authorized projects, but nothing more. Give the type of deposit, what you did, your recommendations, your plans for more work, and the number of days worked for each prospect or reconnaissance project in 3 sentences or less (long. and lat. can be omitted), regardless of whether there is an ERS. Do not tell me to see anything else -- I want everything you did briefly told on the quarterly reports.

These reports are designed to serve a multitude of purposes efficiently and are not to reflect the independent/original approach of the individual. You have ample opportunity on all other reports to design them according to your own approach. All drafts will be reviewed for organization by Mrs. Bormolini and those not rigidly prepared according to my previously and clearly stated instructions will be returned.

F. T. Graybeal
F. T. Graybeal

FTG:1b

June 22, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Second Quarter Report
April-May-June 1979

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 23-1/2 days of logging, core splitting, assay calculations, and review of hole A-11, with recommendations on follow-up drilling.

Santa Cruz Project - Cu. 1 day field review of exchange core.

GENERAL EXPLORATION

Tucson Office

Pioche District, Lincoln Co., Nev. - Ag-Pb. 2 days on reconn for criteria and replacement textures as guide to mineral areas. Textures are subtle but available and will be used in follow-up of limestone replacement districts of Nevada and Utah.

Eureka District, Eureka Co., Nev. - Ag-Pb. 2 days on reconn as above; further confirmation of textures. (Note: 3 days additional travel time for the above two reconnaissance-study districts.) (Note: 7-1/2 days of literature research and review of Nevada districts having potential criteria for limestone replacement deposits.)

Greater Leadville District, Lake Co., Colo. - Ag-Pb-Zn. 5 days field review with Denver group and R.B.Cummings on general problems and criteria follow-up in search for limestone replacement types.

Tombstone District, Cochise Co., Arizona - Ag-Pb-Zn-Cu. 2 days field review of exploration problems and guides with proposal for additional work by B.J.Devere, Jr.

Comprehensive Report and Review, General - Ag-Pb-Zn-Cu. 10-1/2 days compiling report-review of characteristics, criteria, and exploration-drilling problems involved in limestone replacement search.

MISCELLANEOUS

SEG-AGE-UA Colloq. Conferences (3 days);
AGS Western Arizona Field Trip (2 days);
Miscellaneous clean-up and reassemblage of AIME (Pinal Mtn. Section) talk (1 day);
SW Area Planning meeting and report of Tucson area (1 day);
Holidays (2 days);
EOM & EOQ reports (2 days); and
Weekends (20 days).

June 22, 1979

Denver Office

2 days on Exploration Note Files on past limestone replacement search in Colorado with recommendations for follow-up work.


James D. Sell

JDS:1b

September 24, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

Third Quarter Report
July-August-September 1979

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 13 days of assay calculations and report writing along with discussions with directional drill firms.

GENERAL EXPLORATION

Tucson Office

Eureka District, Eureka Co., Nev. - Ag, Pb. 16 days sampling and reconnaissance in district having potential for undiscovered replacement bodies in well-textured limestones-dolomites; plus 8 days report compilation and 2 days travel.

Eureka District (Tintic), Juab Co., Utah - Ag, Pb, Zn. 11-1/2 days in Chief Consolidated Mining Company's office scanning maps and files, and talking with various people who have worked in district having rich pipe and manto-type replacement orebodies; plus 2 days review in Tucson Office, 8-1/2 days of map and report compilation, plus 3-1/2 days travel.

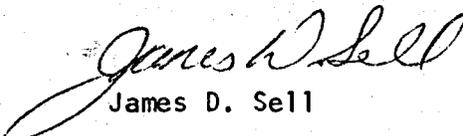
Desert Mountain District, Juab Co., Utah - Cu, Ag. One day was spent in travel and examination of Rockwell Shaft area which has reported 5% Cu and 30 oz. Ag/ton in working presently underwater, but leasor intends to dewater and confirm. Vein is exposed in only short lengths with alluvial cover along strike.

Colorado Office

Fourmile District, Park Co., Colo. - Ag, Pb, Zn. 6 days were spent in review of the district and sampling the Peerless-Dauntless area with R. Johansing to better evaluate limestone replacement textures and vein control; also 1-1/2 days spent in travel.

MISCELLANEOUS

Miscellaneous clean-up (1 day);
Holiday (1 day);
EOM and EOQ reports (2 days); and
Weekends (15 days).


James D. Sell

JDS:1b



Southwestern Exploration Division

December 20, 1979

TO: F. T. Graybeal

FROM: J. D. Sell

F. T. G.
Fourth Quarter Report
October-November-December 1979

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 8-1/2 days of discussion and core inspection spent with Engineers for feasibility and with directional drilling and core drilling contractors for program.

GENERAL EXPLORATION

Eureka District, Eureka Co., Nev. - Ag, Pb. 4-1/2 days spent on report compilation continuation.

Carlsbad?
Tintic District, Juab Co., Utah - Ag, Pb, Zn. 10-1/2 days completing report on potential of district and ground held by Chief Consolidated Mining Company.

Mammoth-San Manuel, Pinal Co., Arizona - Cu. 3 days spent evaluating covered area with minor interior premineral exposures as possible displacement area for San Manuel cap or new porphyry system. Continued work recommended.

MISCELLANEOUS

Rocky Mountain Association of Geologist Basin and Range Symposium Field Trip to Nevada. 6-day field trip covering south and east central Nevada.
Arizona Geological Society Mogollon Rim Field Trip. One-day field trip covering area around Payson with one-day travel time.

SME of AIME and Arizona AIME Conference Meeting. Two separate meetings of 3 and 1 day each.

Titely-Beane Phase Diagram and Fluid Inclusion Short Course. 3-day in-house short course.

Tucson Office clean-up (3-1/2 days);

Holidays (5 days);

EOM & EQQ reports (1);

Vacation (18); and

Weekends (23 days).

James D. Sell
James D. Sell

JDS:1b

March 25, 1980

TO: F. T. Graybeal

FROM: J. D. Sell

First Quarter Report
Jan.-Feb.-March 1980

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 18 days in overseeing road building, site preparation, casing recovery, and directional drilling attempt.

Tintic Project, Utah - Pb, Zn, Ag. 3-1/2 days in review of data including one day travel to area.

GENERAL EXPLORATION

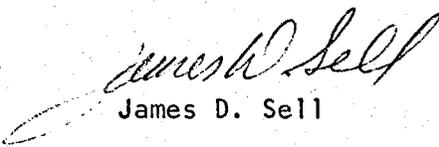
Michilla Property, Chile - Cu. 22 days including 5 on the property, 3 in their office and government offices, one each at Chuquicamata and El Teniente Mines, a weekend, 6 days travel, and 4 days report writing.

Exploration Meeting, New Jersey. 22 days including research, slide preparation, travel (2), and meeting (3-1/2).

Western Arizona Field Trip. 2-1/2 days of travel and discussion of Western Arizona core complexes, thrust faulting, related geology, and mineralization.

MISCELLANEOUS

Miscellaneous clean-up (1/2 day);
Holiday (1 day);
EOM & EOQ reports (3-1/2 days); and
Weekends (18 days).
(91 days total)


James D. Sell

JDS:lb

June 26, 1980

TO: F. T. Graybeal

FROM: J. D. Sell

Second Quarter Report
April-May-June, 1980

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 8½ days in core logging, drill supervision, and overseeing road-site building.

Rawhide Project - Cu. 4½ days in core logging and drill supervision.

Chief Consolidated Project, Utah - Pb, Zn, Ag. 44 days including 11½ days field work, 9 days field office compilation, 11 days office compilation, 7½ days data collection -- inquiry in SLC and Laramie (including travel), and 5 days in travel to and from Tucson.

GENERAL EXPLORATION

Eureka, Nevada, Limestone Replacement Search - 2½ days in compilation of spectrographic data.

Cooks Peak, New Mexico, Limestone Replacement Search 4 days in visit to area and report file search.

Volcanic Rock Field Course, Nevada and California. 7 days in classwork and field work including one day travel time.

Miscellaneous Field Trips and Meetings. AIME meeting and field trip, Morenci, Arizona (2 days); GSA meeting, Ogden, Utah (2 days); and Rochester, Nevada field trip (1 day).

MISCELLANEOUS

EOM and EOQ Reports (4 days);
Holiday (1 day); and
Weekends (10½ days).
Total of 91 days.


James D. Sell

JDS:lb

September 26, 1980

TO: W. L. Kurtz

FROM: J. D. Sell

Third Quarter Report
July-Aug.-Sept., 1980

EXPLORATION AUTHORIZATIONS

Superior East Project - Cu. 7½ days were spent in supervision, logging, and report writing.

Rawhide Project - Cu. Only minor supervision on this project and in conjunction with Superior East.

Chief Consolidated Project, Utah - Pb, Zn, Ag. 63½ days total including 43 on office map compilation, sections, and supervision; 14 on sampling, 5 on travel to SLC, Provo, etc. for consultation (Gp), meetings, and map reproduction; and 1½ days travel to and from Tucson.

GENERAL EXPLORATION

Eureka Deluxe, Utah prospect. 1 day on examination of massive fractured, fissured, and calcium carbonate filling in favorable limestone replacement stratigraphy; deeply oxidized, minor iron oxide.

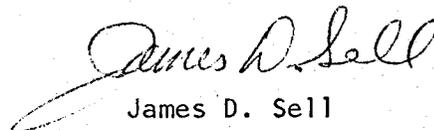
Hot Stuff, Utah prospect. 1 day on examination of massive iron oxide replacement of limited tonnage in favorable replacement limestone with shale trap.

Eureka, Nevada, Limestone Replacement Search. 2 days spent in compositing spectrographic data.

MISCELLANEOUS

EOM & EQ Reports (2 days);
Miscellaneous cleanup (2);
Days off (4), and
Weekends (9).

Total of 92 days.


James D. Sell

JDS:lb

JDS

September 10, 1980

MEMORANDUM TO ALL GEOLOGISTS

Quarterly Reports

To facilitate my preparation of the SWED quarterly report which is sent to New York, would you please be sure to include in your March, June, September, and December monthly project reports a statement of work planned for the next quarter.

W. L. Kurtz
W. L. Kurtz

WLK:1b



Southwestern Exploration Division

December 22, 1980

TO: W. L. Kurtz

FROM: J. D. Sell

4th Quarterly Report
Oct.-Nov.-Dec. 1980

AUTHORIZED PROJECT:

Chief Consolidated Project, EA-0198, Utah, Pb-Zn-Ag: 57 days were spent on the project in supervision of (and) compilation of map data, surface sampling, integration of data, conference with geophysical survey crew, explanation of data thoughts, and includes 3 days travel to, in, and out of New York for presentation.

GENERAL:

All as Tucson general, including:

General Office work, 1½ days;
Arizona AIME Conference meeting, 1 day;
Physical examination, ½ day;
EOM & EQO, 2 days;
Holidays, 4 days;
Weekends and days off, 16 days;
Vacation, 10 days.

Total: 92 days.

James D. Sell
James D. Sell

JDS:1b

March 24, 1981

TO: W. L. Kurtz

FROM: J. D. Sell

1st Quarterly Report
Jan.-Feb.-March 1981

AUTHORIZED PROJECTS:

Superior East Project, EA-0010, Arizona, Cu: 13 days were spent on the project in supervision of drilling, core examination, and data projection, including discussions with Navi-Drill Personnel who are presently operating a directional drill in hole A-12.

Chief Consolidated Project, EA-0198, Utah, Pb-Zn-Ag: 36 1/2 days were spent on the project in supervision of (and) compilation and integration of map data, and traveling.

GENERAL:

All as Tucson general, including:

- Jerome examination (including travel), 5 days;
- General office work, 3 1/2 days;
- U of A Geoscience Daze program, 1/2 day;
- AGS Tectonic Symposium program, 2 days;
- Holidays, 2 days;
- EOM & EOQ, 2 days;
- Weekends, 18 1/2 days;
- Surgery and recovery, 7 days.

Total: 90 days.

James D. Sell
James D. Sell

JDS:rg

June 29, 1981

TO: W. D. Payne

FROM: J. D. Sell

Second Quarterly Report
April-May-June, 1981

AUTHORIZED PROJECTS

Superior East Project, EA-0010, Arizona, Cu: 25 days were spent on the project in supervision of drilling, core logging, core sampling, assay calculations, and data projection.

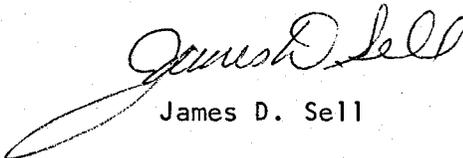
Chief Consolidated Project, EA-0198, Utah, Pb-Zn-Ag: Two and one half days were spent in conference and report writing.

GENERAL

All as Tucson general, including:

Utah-Nevada research project and report, 6 days;
General carbonate research, 5 days;
General office work, 4 days
EOM & EOQ, 3 1/2 days;
Surgery and recovery, 17 days;
Holidays, 2 days
Weekends, 26 days.

Total: 91 days.


James D. Sell

JDS:rg

September 28, 1981

TO: W. D. Payne

FROM: J. D. Sell

Third Quarterly Report
July-August-September 1981

AUTHORIZED PROJECTS:

Superior East Project, EA-0010, Arizona, Cu: 9 days were spent on the project in supervision of drilling, core logging, and report writing.

Chief Consolidated Project, EA-0198, Utah, Pb-Zn-Ag: 36½ days were spent on the project in supervision of shaft-surface installation and repair, map and report compilation, field checks, meetings, and travel to Eureka.

GENERAL:

All as Tucson General, including:

Utah-Nevada General Exploration Recon:

- a) Vipont, Utah, 3 days (including 1 day travel);
- b) Frisco, Utah, 1 day;
- c) Eldorado, Nevada, 2 days (including 1 day travel);

Montana Geological Society Field Conference, 6 days (including 2 days travel);

ASARCO Butte, Montana Tour, 2 days;

Vacation (July 6-17), 10 days;

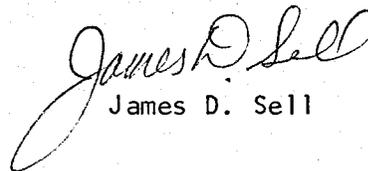
EOM & EOQ, 4 days;

Company Holiday, 2 days;

Tucson General Clean-up & Miscellaneous Reports, 5½ days;

Weekends, 11 days.

Total: 92 days


James D. Sell

JDS:lb

December 28, 1981

TO: W.D. Payne

FROM: J.D. Sell



Fourth Quarterly Report
October-November-December 1981

Authorized Projects

Superior East Project, EA-0010 - Cu

Twenty-two (22) days were spent on the project in supervision, core logging, core splitting, and report compilation.

Chief Consolidated Project, EA-0198 - Pb-Zn-Ag

Sixteen and a half (16½) days were spent on the project in supervision of shaft and drift repair, map and report compilation, meetings, underground (1600' level, Chief no. 2, sampling), and travel to and from Eureka.

General

All the following as Tucson General Exploration, including:

Superdrill Tour of Lakeshore & Miami	1½ days
Iron Mountain Submittal	1 day
Management Seminar	1 day
Office Move and Clean-up	2 days
II MMRE Organization	3½ days
Annual Company Physical	½ day
Tucson General Clean-up	1½ days
SME-AIME Conventions and Discussions (Denver)	3 days
Company Holidays	4 days
EOM and EOQ	3½ days
Vacation	14 days
Week-ends	18 days

Total: 92 days.

JDS/mlm

March 25, 1982

TO: W. D. Payne

FROM: J. D. Sell

First Quarter Report
Jan.-Feb.-March 1982

AUTHORIZED PROJECTS

Superior East Project, EA-0010, Cu.

Thirty (30) days were spent on the project in logging, sampling, compiling assay data, and various report writings.

Chief Consolidated Project, EA-0198, Pb-Zn-Ag.

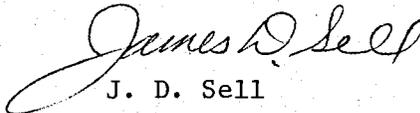
Nineteen (19) days were spent on the project in travel, shaft inspection, geological discussions, underground sampling, compilation of assay and geochemical data, and various report writings.

GENERAL

All of the following is Tucson General Exploration, including:

Utah-Nevada Limestone Replacement Planning	6 days
Waulsortian Field Conference, Texas	3 "
Holy Joe Peak magnetics, field investigation	1 "
U of A Geoscience Daze	1/2 "
EOM & EOQ	3 1/2 "
Company Holidays	1 "
Weekends	26

Total: 90 days


J. D. Sell

JDS:mek