CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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#1156 ASARCO

341729

RECEIPT FOR INSURED MAIL DOMESTIC—INTERNATIONAL

ADDRESSED FOR DELIVERY AT
(Post Office, State and Country)

60204

POSTAGE	AIR ☐	$ 2.43
INSURANCE COVERAGE		$ 150.
INSURANCE FEE		100 ¢
SPEC. HANDLING		¢
DOMESTIC ONLY	SPECIAL DELIVERY	¢
	ADDRESSEE ONLY	¢
RETURN RECEIPT (Except to Canada)		¢

~~$3.43~~ Total

FRAGILE ☐ LIQUID ☐ PERISHABLE ☐

(POSTMARK)

TUCSON, AZ KINO STA. USPO JUN 29 1981

CUSTOMER OVER

POSTMASTER By

SHIPPER'S COPY

United Parcel Service

CUSTOMER COUNTER RECORD

755003

DATE 10 / 11 / 77

RECEIVED FROM (PLEASE USE STAMP OR PRINT)

NAME Heinrichs Geo Exploration Co.

STREET PO Box 4 - 810 W 9th St

CITY Wilson, Kans. STATE 67505

C6.50 Nerv 623-0578

UPS

871x70

STAMP YOUR UPS SHIPPER NUMBER ABOVE

NAME	STREET NUMBER	STREET NAME	CITY	STATE	ZIP CODE
VNT Nuclo Consult	1732	Central St.	Evanston	Ill	60204

#1156

Pd. Petty Cash

chgd.

WEIGHT

AIR

MID WEST	NORTH EAST	SOUTH EAST	TEXAS	OTHER			

GROUND

ZONE L	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7	ZONE 8
					19		

ENTER EACH PACKAGE ON A SEPARATE LINE. INCREASE FRACTION OF POUND TO NEXT FULL POUND. ENTER WEIGHT ACCORDING TO DESTINATION ZONE AND TYPE OF SERVICE.

C.O.D. AMOUNT	PACKAGE CHARGE
	4.26

1 C.O.D. CHARGES	.29
EXCESS VALUATION & PICKUP CHARGES	2.00
TOTAL CHARGES	6.55

"UNLESS A GREATER VALUE IS DECLARED IN WRITING ON THIS RECEIPT ON THE LINE BELOW THE ENTRY FOR THE PACKAGE TO WHICH IT APPLIES, THE SHIPPER HEREBY DECLARES THE RELEASED VALUE OF EACH PACKAGE, OR ARTICLE NOT ENCLOSED IN A PACKAGE, COVERED BY THIS RECEIPT TO BE $100. THE ENTRY OF A C.O.D. AMOUNT IS NOT A DECLARATION OF VALUE. IN ADDITION, THE MAXIMUM DECLARED VALUE FOR AIR SERVICE SHIPMENTS IS $1,000 AND THE MAXIMUM CARRIER LIABILITY IS $1,000. CLAIMS NOT MADE TO CARRIER WITHIN 9 MONTHS OF SHIPMENT DATE ARE WAIVED. CUSTOMER'S CHECK ACCEPTED AT SHIPPER'S RISK UNLESS OTHERWISE NOTED ON C.O.D. TAG."

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RECEIVED BY

PACKAGES	MID WEST	NORTH EAST	SOUTH EAST	TEXAS	OTHER				COD'S	MISC.
1										8
	L	2	3	4	5	6	7	8		

THIS SPACE FOR U.P.S. OFFICE USE ONLY

U1227P 12-76

©THE DRAWING BOARD • BOX 505 • DALLAS, TEXAS 75221

VME-Nitro Consult, Inc.
1732 Central Street, Box 1502 • Evanston, Illinois 60204
Phone 328-0400

MESSAGE

TO Mr. Walter Heinrichs
Heinrichs Geoexploration
P.O. Box 5964
Tucson, Az. 85703

DATE 7/28/77

Mr. Heinrichs,

Thanks for running the test using camera #4544 in VRE93. The test appears appears O.K. - sample attached

Very Truly yours
Ed Weigand

BY

REPLY

DATE

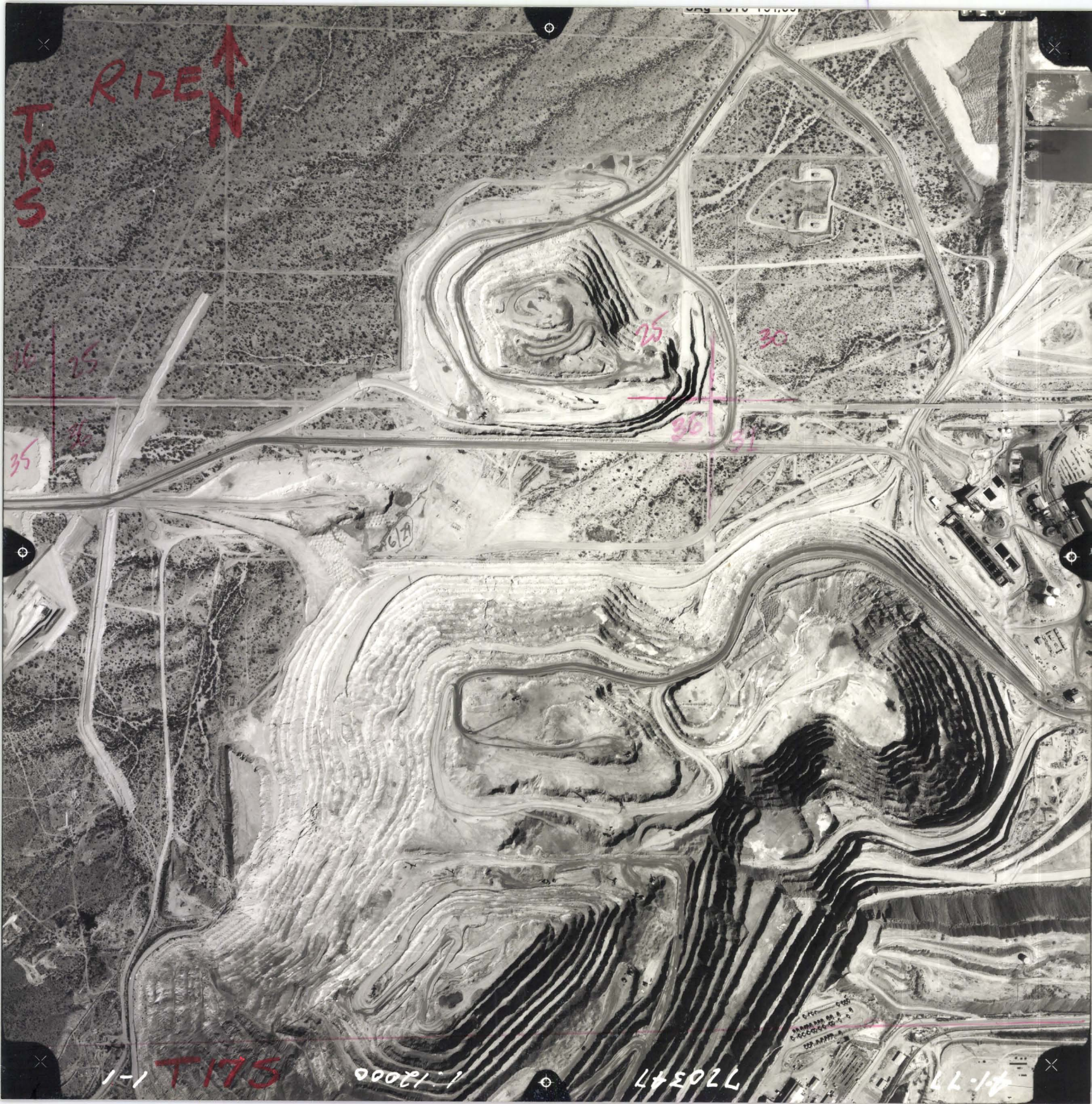
GEOEX
Job # 1156

None Necessary

GEOEX
Cable: GEOEX
REC'D AUG 1 1977 REC'D
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

SIGNED

Form N6-R73 The Drawing Board, Inc., Box 505, Dallas, Texas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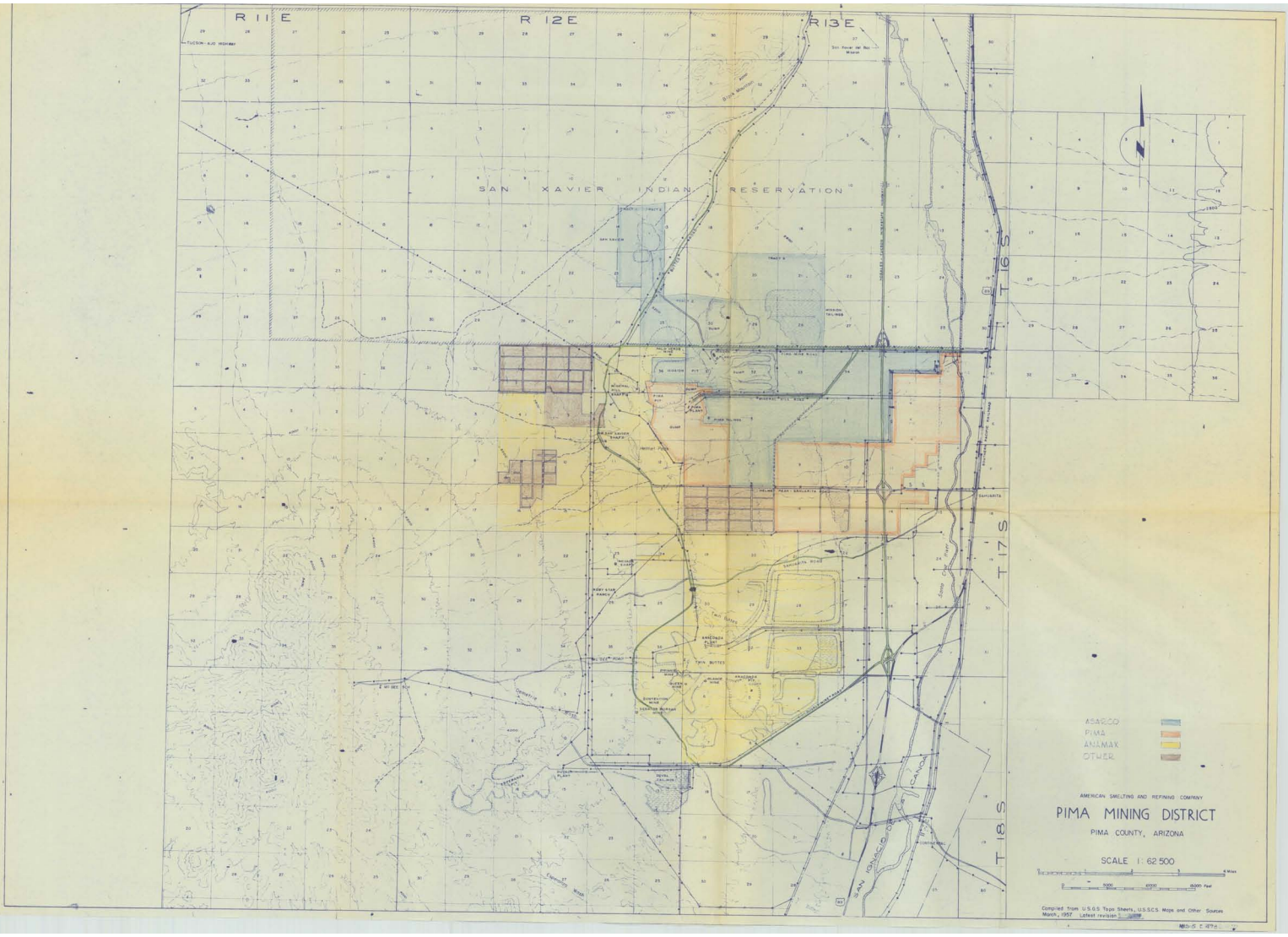
R 11 E
R 12 E
R 13 E
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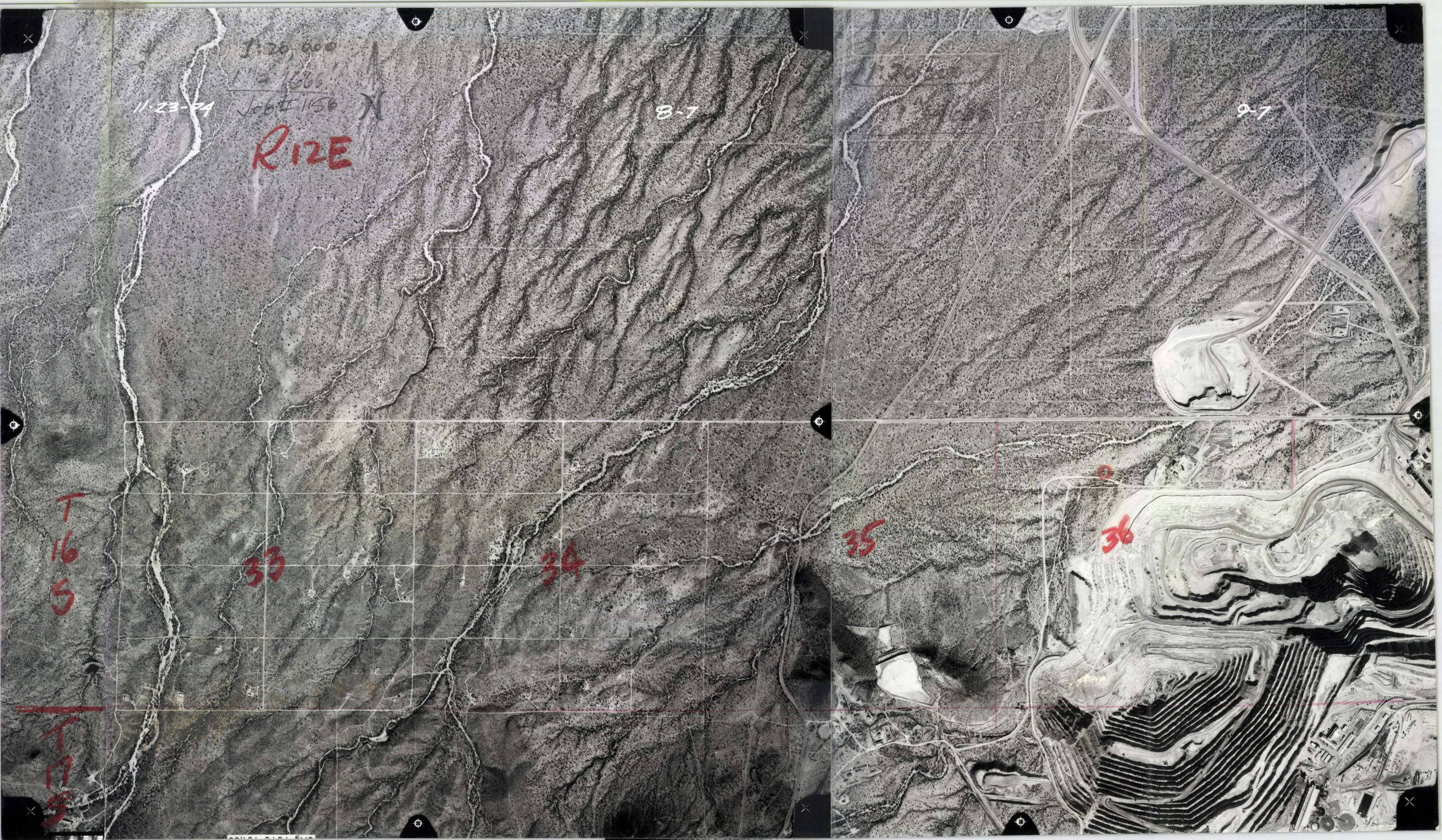
SAN XAVIER INDIAN RESERVATION
SAN IGNACIO DE LA CANOA
ASARCO
PIMA
ANAMAX
OTHER
AMERICAN SMELTING AND REFINING COMPANY
PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA
SCALE 1: 62 500
Compiled from U.S.G.S. Topo Sheets, U.S.S.C.S. Maps and Other Sources
March, 1957 Latest revision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Job # 1156
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EDINRICHS
GEOEX
GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

REC'D JUN 2 7 1977

#1156

EDINRICHS
GEOEX
GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

REC'D JUN 2 7 1977

#1156

July 27, 1977

ASARCO Incorporated
Mission Unit
Sahuarita, AZ 85629

Attention: Mr. Roy S. Herde, Manager

Re: GEOEX Job #1156
Eisenhower Blast Monitoring
Eisenhower Blast No. 1
(IKE 4-A-3210)

Dear Roy:

Thanks for your letter of 21 July 1977 and attached data to wit: a sketch showing hole pattern, individual shot hole delay times and sequences; a one inch equals 100 feet scale sketch showing shot location in reference to your coordinate system; and two pages of Pit Shot Report forms which recorded individual hole depths, pounds of ANFO loaded in each hole, and column length of ANFO and stemming in each hole.

These data, together with the ASARCO 1:62,500-scale, partially colored surface ownership map you provided me earlier, aerial photography we procured from Cooper Aerial Surveys, the shot recorded velocity record and interpreted results and U.S. Geological Survey published geological maps and reports on the area, all together should be adequate information - at least for the present.

For your records, Eisenhower Blast No. 1 registered a particle velocity in each plane (longitudinal, vertical and transverse) of less than 0.02 inches per second respectively. The recorder was located, as scaled from 1:20,000 scale aerial photography, 500 feet south and 150 feet west of the N.E. corner of Section 34, T.16S., R.12E. This is also the N.E. corner of the subdivision. This position is approximately on a line between the shot location and the apparent specific subject's property in question, which is located on a small rise about 800 feet farther to the west. The degree of recorded effect is considered negligible. Of course, larger blasts would have proportionately greater effects.

Per my phone call to Bill Gay on the 18th, the recorder was returned the

next day to avoid added rental charges.

We will await your further instructions.

Our interim statement is enclosed herewith.

Sincerely,

Heinrichs GEOEXploration Co.

Walter E. Heinrichs, Jr.
President & General Manager

WEH:mt
Enc. Statement

ASARCO

Mission Unit

Roy S. Herde
Manager

S. L. Burrill
Superintendent

July 21, 1977

HEINRICHS
GEOEX
Cable: GEOEX

REC'D JUL 22 1977 REC'D

BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

Mr. Walter E. Heinrichs, Jr.
Heinrichs Geoexploration Company
P. O. Box 5964
Tucson, Arizona 85703

Re: Eisenhower Blast No. 1

Dear Walt:

Attached are the following items:

1. A schematic sketch showing the manner in which the holes in the Eisenhower shot of June 29, 1977 were delayed.

2. A 100' scale map showing the location of the shot in relation to our coordinate system.

3. Two (2) pages of a pit shot report listing the number of holes, the depth, pounds of powder, etc.

If there is any other information that you require, please let us know.

Sincerely,

Roy S. Herde

Roy S. Herde

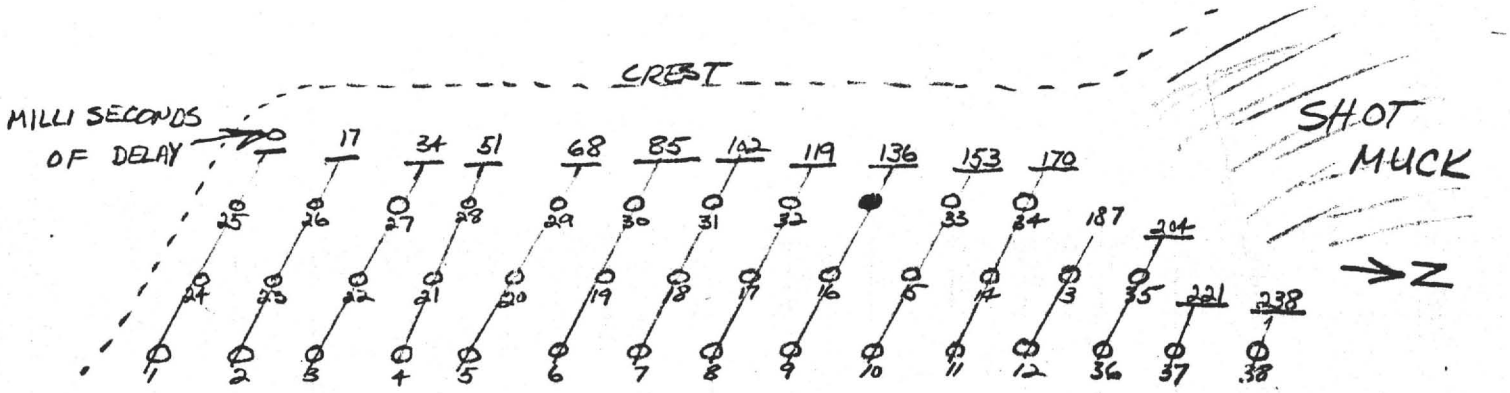
RSH/mln
attachs

SHOT DELAYED AS PER SKETCH.

H F Balconi

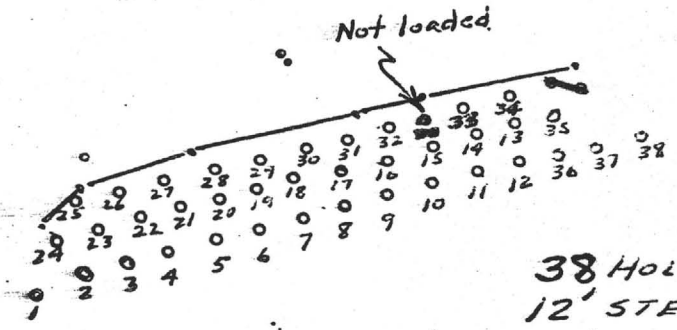
IKE 3210 6.29.77

38 HOLES LOADED



● = HOLE NOT LOADED

E 762,000



38 HOLES 9" DIAM.
12' STEMMING
24' x 21' SPACING
SURVEYED BY LUIS LEYVA
1" = 100'

N 364 000

~~MISSION~~
IKE

LEGEND

000 – 0.29	BLUE
0.30 – +	RED

HOLE NUMBERS _____

DATE BLASTED 6-29-77

Shot No. 4-A

Bench 3210

PIT SHOT REPORT

AMERICAN SMELTING AND REFINING COMPANY
MISSION UNIT

Type of Shot: BANK

Description of Material: CALICHE

Shot No.: IKE 3210 No. of Hole: 37 - 9"

Date: 6·29·77 Day of Week: WED.

Page No.: 1·2

Material	Issued	Material	Issued
(1) A. N. Bulk lb.	28010	(10 Detcord 50	
(2)		(11) Caps	2
(3) Slurry		(12) Fuse	10
(4)		(13) MS-5	
(5) 60% Gel 1"x8"		(14) MS-9	
(6) 60% Gel 2"x8"		(15) MS-17	
(7) 1 # Boosters	38	(16) D-45	
(8) Boosters		(17) 724-P	
(9) Detcord 30		(18)	

Hole No.	Depth	Water	Stem	Rise 8	(1)	LBS. ~~(2)~~ ANFO	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	Remarks
1 1	46		12	34		782					1												
2 2	45		↓	33		759					↓												
3 3	45			33		759																	
4 4	45			33		759																	
5 5	45			33		759																	
6 6	45			33		759																	
7 7	43			31		713																	
8 8	43			31		713																	
9 9	40			28		644																	
10 10	40			28		644																	
11 11	45			33		759																	
12 12	45			33		759																	
13 13	45			33		759																	
14 14	45			33		759																	
15 15	41			29		667																	
16 16	42			30		690																	
17 17	40			28		644																	
18 18	42			30		690																	
19 19	45			33		759																	
20 20	45			33		759																	
21 21	45			33		759																	
22 22	45			33		759																	
23 23	45			33		759																	
24 24	46			34		782																	
25 25	45			33		759																	
				798																			

General Remarks: 840 0.8788

Powder Foreman

P - 8A - Revised 9-75

PIT SHOT REPORT

AMERICAN SMELTING AND REFINING COMPANY
MISSION UNIT

Type of Shot: 2

Description of Material: IKE 3210

Shot No. _____ No. of Hole _____

Date: 6·29·77 Day of Week _____

Page No. 2·2

Material	Issued	Material	Issued
(1) A. N. Bulk lb.		(10 Detcord 50	
(2)		(11) Caps	
(3) Slurry	2	(12) Fuse	
(4)		(13) MS-5	
(5) 60% Gel 1"x8"		(14) MS-9	
(6) 60% Gel 2"x8"		(15) MS-17	
(7) 1 # Boosters		(16) D-45	
(8) Boosters		(17) 724-P	
(9) Detcord 30		(18)	

Hole No.	Depth	Water	Stem	Rise	(1)	LBS (2) ANFO	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	Remarks
26 1	46		12	34		782					1												
27 2	45		↓	33		759					↓												
28 3	47			35		805																	
29 4	46			34		782																	
30 5	45			33		759																	
31 6	42			30		690																	
32 7	41			29		667																	
33 8	40			28		644																	
34 9	42			30		690																	
35 10	45			33		759																	
36 11	45			33		759																	
37 12	45			33		759																	
38 13	45			33		759																	
14				420		27,968		Calculated by W.K.C. Nourse															
15																							
16																							
17																							
18																							
19																							
20																							
21																							
22																							
23																							
24																							
25																							

General Remarks

H F Salcori
Powder Foreman

P - 8A - Revised 9-75

7/18/77

Job # 1156

Walt Called.

Bill Gary 622-4891

Mission -

~~Walt~~ He agrees

best to return

unit for now.

Will send 1st shot

data via mail to GEOEX

W.

VME-Nitro Consult Inc.

#7156

GEOEX
Cable: GEOEX
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

REC'D JUL 18 1977 REC'D

July 13, 1977

Client Heinrichs Geoexploration

Gentlemen:

The results of the seismograph test on the date and time shown, as recorded from the location given, are tabulated below:

RECORDING NO. 239773

OPERATION ASARCO, Pima County

Blast Data

Date	6/29/77
Time	2:17½ PM
No. of Holes	21
Max. Expl/Delay (lbs)	not given
Total Expl Charge (lbs)	not given
Distance (ft.)	8200
Test Location	Photo plot

Results

Velocity Each Plane (ips)

Longitudinal	<0.02
Vertical	<0.02
Transverse	<0.02
Resultant Velocity (ips)	
Air Overpressure (dB)	
Frequency (Hz)	
Displacement (in.)	
% of Energy Ratio	
Energy Ratio	

Remarks Traces were faint, best reading possible.

Respectfully submitted,

VME-Nitro Consult, Inc.

Dennis A. Clark

DAC/gg

VME-Nitro Consult Inc.

July 13, 1977

#1156

GEOEX
Cable: GEOEX
REC'D JUL 18 1977 REC'D
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

Client Heinrichs Geoexploration

Gentlemen:

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Results

Velocity Each Plane (ips)

Longitudinal	<0.02
Vertical	<0.02
Transverse	<0.02
Resultant Velocity (ips)	
Air Overpressure (dB)	
Frequency (Hz)	
Displacement (in.)	
% of Energy Ratio	
Energy Ratio	

Remarks Traces were faint, best reading possible.

Respectfully submitted,

VME-Nitro Consult, Inc.

Dennis A. Clark

DAC/gg

Recording No. One (1) Date 6/29/77 Seis. No. VR-E ~~[illegible]~~ 93

Seis. Position Photo plot Seis. Range 0.25

Location of Shot Point Photo Plot 6/29

Distance 8200'+ (800' to house) Time Fired 2:17½ P.M. Manufacturer ✱ Strength ✱

Total Explosive Charge ✱ Max. Explosive/Delay ✱

No. Holes 21 Hole Diameter 9" Loaded by Lichtenhan Open Face or Buffer O.F.

Depth of Holes 40'-47' Height of Bank 40' No. of Decks One Slit Stemming Ave. 12'-Sand

Hole No.	✱													
Spacing	24' parallel to face, in rows 21' deep from face & 21' apart													
Burden	12' partly consolidated alluvial sand & gravel →													
Explosive	✱													
Detonator	✱													

Seis Operator M. Heinrichs Camera No. 4179 Seal ____ T. O.K. ____

FOR V. M. E. USE ONLY

Remarks Bill Nourse witnessed location of seis position

Diagram: See engineers sketch map & blast foreman's records for ~~[illegible]~~ data (above)

Client ASARCO - Pima County AZ Job Loc. Mission-Curtytom

Reported by M. Heinrichs (GEOEX #1156) Title P.E. & CPGS #688

Tucson, Arizona 85703

HEINRICHS GEOEXPLORATION COMPANY P. O. BOX 5964 TUCSON, ARIZONA Phone (Area 602) 623-0578

85703 Zip.

Recording No. One (1) Date 6/29/77 Seis. No. ~~[illegible]~~ 13

Seis. Position Photo plot Seis. Range 0.25

Location of Shot Point Pl. to Plot 1/29

Distance 3200' +800' to house Time Fired 2:11½ PM Manufacturer ✱ Strength ✱

Total Explosive Charge ✱ Max. Explosive/Delay ✱

No. Holes 21 Hole Diameter 9" Loaded by [illegible] Open Face or Buffer O.F.

Depth of Holes 40'-47' Height of Bank 40' No. of Decks One Stemming Ave. 12'-Sand

Hole No.	✱														
Spacing	24'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21' deep from face & 21' apart								
Burden	12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	→
Explosive	✱														
Detonator	✱														

Seis Operator [illegible] Camera No. 4179 Seal ____ T. O.K. ____

FOR V. M. E. USE ONLY

Remarks Bill No use [illegible] location / seis position

Diagram: [illegible] & [illegible] for ✱ data

Client ASARCO [illegible] Job Loc. Mission-Curly Horn

Reported by [illegible] Title PE & CPGS #688

Tucson, Arizona 85703

HEINRICHS GEOEXPLORATION COMPANY P. O. BOX 5964 TUCSON, ARIZONA Phone: (Area 602) 623-0578

HEINRICHS GEOEXPLORATION COMPANY

P.O. BOX 5964, TUCSON, ARIZONA 85703, 806 WEST GRANT ROAD, PHONE: (602) 623-0578

Recording No. One (1) Date 6/29/77 Seis. No. VR-E ~~[illegible]~~ 93

Seis. Position Photo plot Seis. Range 0.25

Location of Shot Point Photo Plot 6/29

Distance 3200' + 800' to house Time Fired 2:17½ P.M. Manufacturer ☆ Strength ☆

Total Explosive Charge ☆ Max. Explosive/Delay ☆

No. Holes 21 Hole Diameter 9" Loaded by Lichtenhan Open Face or Buffer O.F.

Depth of Holes 40'-47' Height of Bank 40' No. of Decks One Slit Stemming Ave: 12'-Sand

Hole No.	☆														
Spacing	24'	parallel to face, in rows 21' deep from face & 21' plat													
Burden	12'	partly consolidated alluvial sand & gravel →													
Explosive	☆														
Detonator	☆														

Seis Operator [signature] Camera No. 4179 Seal ____ T. O.K. ____

FOR V. M. E. USE ONLY

Remarks Bill Nourse witnessed location of seis position

Diagram: See engineers sketch map & blast foreman's records for ☆ data (above)

Client ASARCO - Pima County, AZ Job Loc. Mission - Curlyhorn

Reported by [signature] (GEOEX #1156) Title P.E. & CPGS #688

HEINRICHS GEOEXPLORATION COMPANY

P.O. BOX [illegible] TUCSON, ARIZONA 85703 806 WEST GRANT ROAD PHONE (602) 623-0578

Recording No. [illegible] (1) Date 6/[illegible]/77 Seis. No. VRE ~~[illegible]~~ 93

Seis. Location Photo plot Seis. Range 0.25

Location of Shot Point Plot [illegible]

Distance 8200'+ + 800' to house Time Fired [illegible] Manufacturer X Strength X

Total Explosive Charge X Max. Explosive Delay X

No. Holes [illegible] Hole Diameter [illegible] Loaded by Lichtenhan Open Face or Buffer [illegible]

Depth of Holes 40'-47' Height of Bank 40' No. of Decks One Solid Terminal Ave. 12' Sand

Hole No.	X
Spacing	24' [illegible] face in [illegible] 21' [illegible] 21' [illegible]
Burden	[illegible] partly consolidated alluvial sand & gravel
Explosive	X
Detonator	X

Seis. Operator [illegible] Camera No. 4174 [illegible] T.O.F.

FOR V.A.T. USE ONLY

Remarks Bill Nourse witnessed location of seis position.

Diagram [illegible] sketch map & blast [illegible] for X data (above)

Client [illegible] Pima County, AZ Job Loc. [illegible] Lighton

Reported by [illegible] (GEOEX #[illegible]) Title [illegible] #686

March 15, 1977

ASARCO, Inc.
Box 111
Sahuarita, AZ 85629

Attention: Mr. Roy Herde

Re: GEOEX Proposal #1156
Blast Monitoring
Mission Unit,
Pima County, Arizona

Gentlemen:

This will confirm and elaborate on the recent phone conversations with Mr. Herde, our Chris Ludwig and myself.

Considerations are being made regarding the desirability of quantitative seismic energy monitoring of blasting effects on (or adjacent to) a particular dwelling located some distance west of your operations.

Acting in the capacity of professional geophysicists, GEOEX personnel have over the years engaged in this type of work on several occasions resulting in beneficial legal decisions directly or indirectly on behalf of clients being accused of blast damage. Because of infrequent calls for this type of service in Arizona, GEOEX rents appropriate equipment when called on. Moreover, this gives our clients the availability of both in-state and some out of state technical opinion at no appreciable added cost.

Current basic instrument rental fees vary from $316.25 per month minimum, to $350.75 per month minimum depending on model options. Three models, E, F, and G are currently available. All give three dimensional particle velocity data on a certified, factory-sealed and developed, permanent record. In addition to this, model F gives a record of sound recorded in decibels, and model G digitally records the maximum amplitude in each of three planes (longitudinal, vertical and transverse components). Each model E 60 second record costs $13.80 - developed,and model F & G cost $13.95 for each 60 second developed record. One 60 second total record duration is required per shot to be recorded. Most shots are easily captured within the 60 second interval, by careful watch and/or radio synchronization. If a multiple blast of over, say 30 seconds duration is contemplated to be recorded, multiple recorders and/or longer film capacity magazines may be required at added cost.

GEOEX personnel fees are charged at $25.00 per professional man hour, outside our Tucson office. Sub-professionals or technicians, $15.00 per man hour, and helpers $10.00 per man hour. Overtime at 1.5 times these rates applies over eight hours in one day or over 40 hours in one week. Tucson office time is charged at $20.63 per professional man hour, $12.50 per technician man hour and $10.00 per helper hour.

Vehicles are charged at $17.50 per day plus $0.21 per mile per vehicle.

Expenses directly incidental to the job are charged at 115% of our cost and include any special outside fees, taxes, bonds, or insurance, instrument freight, trespass liability or related permits, communications, reproductions and expendables such as stakes, flagging, etc.

GEOEX assumes all workmen's compensation liability, public liability, and property damage liability incurred by GEOEX employees in connection with their work.

Personnel and equipment availability is normally three weeks or less and sometimes under a week. However, the more notice we have the better we can be prepared and the more efficiently we can operate on your behalf.

Accurate plan maps and records, blast holes locations, charge size, weight, type, and position in each hole, related delays per charge or charges, type of stemming, related rock types and structural geologic information underlying the dwelling area and area between there and the shot points, together with an accurate plan map showing relative position of same with respect to the dwelling involved. The better these data are, the better can be our conclusions and the more convincing we can be as technical witnesses in the case of litigation.

Payment of professional invoices is due on presentation. An advance to defray initial equipment procurement and related start up expenses will be requested when decided. Our receipt of such an advance will serve as our definite notice to proceed on your behalf. Subsequent progress statements will be submitted periodically depending on elapsed time and scope of effort expended. A final statement will accompany or follow the conclusion of all work on your behalf.

Technical witness testimony is done at $25.00 per professional man hour on a continuing non interrupted contract basis. Should a dormant period of fifteen days or more ensue between final field work reporting and eventual testimony work, the minimum first testimony day or testimony standby day charge is $250.00, and the same for any subsequent first day following an interrupted period of four or more days between calls. The reason for this policy is to minimize an uncertain standby situation developing and to allow for proper testimony refresher preparation. Otherwise such work is done on a weekly retainer basis of $825.00 per week or $3000.00 per month. In any case, expenses are additional at 115% our cost as previously stated.

Your acceptance of this proposal may be indicated by executing the extra copy of this letter as provided below and returning it to us.

Sincerely,

Heinrichs GEOEXploration Co., Inc.

Walter E. Heinrichs, Jr., Pres.
P.E. AZ#2447, C.P.G.S.#688

Accepted:_____
date

For ASARCO, Inc.

By:_____

Title:_____

WEH:mt
Encl: Extra Copy

6/21/77
Mr. Loren Schiller, Purchasing Agent.
Called.
W.

2-3

3/14/77

ASARCO Inc.

Att'n Roy. Clarde

Box 111

Sahuarita, AZ

85629