

CONTACT INFORMATION  
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Arizona Geological Survey  
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Tucson, Arizona 85701  
520-770-3500  
<http://www.azgs.az.gov>  
[inquiries@azgs.az.gov](mailto:inquiries@azgs.az.gov)

The following file is part of the

James Doyle Sell Mining Collection

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Superior East

Miscellaneous, Contracts, Thoughts, et al.

Structural Basin Study.

Water

Feb 5, 1975

Newmont continues drilling on Stall Lease to S of Ed Plot.

Lester Cox just completed MJ-11 to a depth of 805 feet by rigging up two compressors in tandem. Feel he can go to 1200 ±.

Water flow strong with level at 300 feet. Used some 150 sacks of cement in three attempts to seal off water. Water came in full after drilling some 50 ft below each cement job.

Hole ± in W 1/2 of Sec. 3.

Capped with pipe & welded # open hole. will vent?

Road now completed between A-6 area and Hagen Government Gravel road. Connected by Grogman. A-1100-1200 - Jan.

"Hackett" drilling Co with ± Feeding 500 in lower end drilling with pipe set trouble.

Was stuck week of Jan 30<sup>th</sup>.

At least 2 holes should

Check new Newmont hole  
in Section 6

---

Got in 1 June 15<sup>th</sup>



|     |                 |         |            |
|-----|-----------------|---------|------------|
| Guy | 839.16          | Sec. 2  | road.      |
|     | 11,902.96       | Sec. 3  | road only. |
|     | 1,453.33        | Sec. 8  | dull bit   |
|     | 873.00          | Sec. 9  | dull bit   |
|     | <u>1,295.08</u> | Sec. 10 | gravel     |
|     | 16,363.49       |         |            |

Sec. 2. Cust  $\frac{970}{500} \frac{24.46}{12,231.08} / \text{ft}$  deepening.

Sec. 8 Bayls  $1950' \frac{8.92}{17,395.97} / \text{ft}$  from surface

Sec. 9 LWD  $795' \frac{15.25}{12,123.35} / \text{ft}$  from surface.

Sec. 10 Cust  $\frac{13.15}{-7.40}{575' \frac{20.23}{11,632.60} / \text{ft}}$  deepening.

Sec. 12 Bayls  $4120' \frac{11.56}{4,857.16} / \text{ft}$  from surface

Sec. 16 Bayls  $\frac{3434}{2593}{841' \frac{28.20}{23,719.30} / \text{ft}}$  deepening.

Bayls ~~1873~~ 1975  
 $2500-3000 = 12.25 / \text{ft}$  16.50 / ft.  
 $3000-3500 = 14.35 / \text{ft}$  18.35 / ft.

3485  
 1745

Ch WRR-18

for Hanfield Shulholes

Ch for clearance interg public.

GP-548

GP-615

Ch for ~~new~~ copy of ABM 190.

July 12, 1979

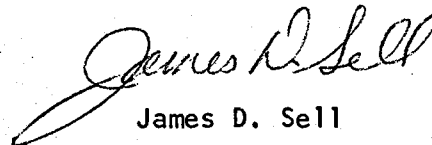
TO: F. T. Graybeal

FROM: J. D. Sell

NL/McCullough Services

Mr. Cliff Marshall, District Salesman and my contact for services on A-11, Superior East, BX drill rod recovery, has sent their book of services and price list. (Filed with NPW drill service bookcase.)

The first single page brochure tells the whole story and it worked exceptionally well at A-11. Additional interesting information is given in their brochure MC-12, Pipe Recovery Manual, in center of book.



James D. Sell

JDS:1b

NPhaley

SUPERIOR E.

I need - NOW - to know  
availability of Mollenhaver  
Dynadrill, Navidrill.

A-13 is into pre-mineral  
and may or may not drill  
more than a month or so.

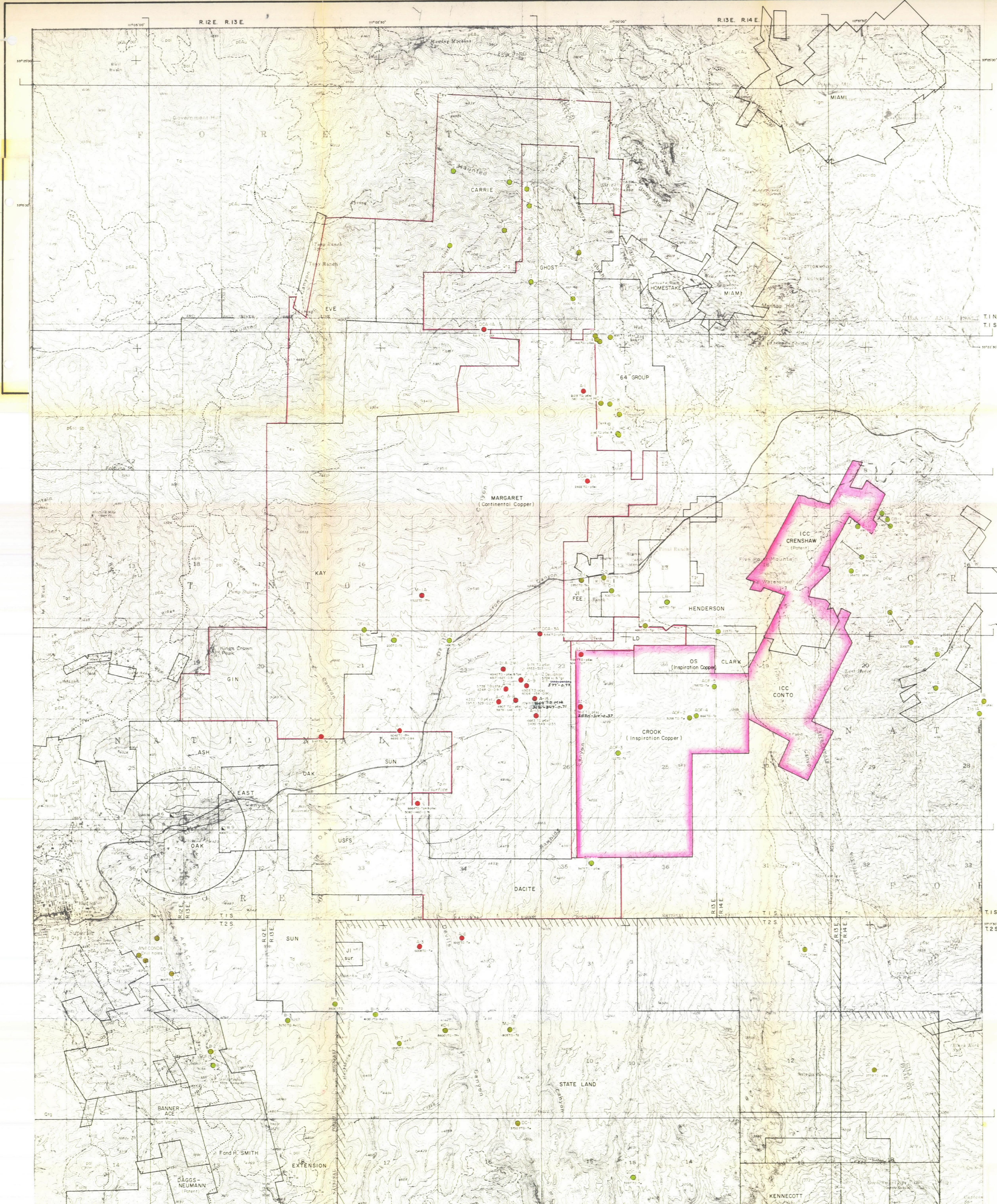
At the moment the above  
should consume all your time.

It's late June and we still have  
no angle penetrations

cc: WLK  
JDS ✓

FTG  
6/24/80





LAND STATUS LEGEND

- ASARCO claims
- ASARCO state lease
- FEE ASARCO fee land
- CONTINENTAL COPPER MARGARET CLAIMS (under option to ASARCO)
- INSPIRATION COPPER CROOK'S CLAIMS (under joint-venture with ASARCO)
- INSPIRATION COPPER claims
- MAGMA COPPER claims
- FOREST SERVICE WITHDRAWAL
- FEE LAND (others)
- FEDERAL CLAIMS and/or PATENT (others)
- STATE LEASE LAND (others)

EXPLANATION

- Quaternary: Qol, Qig, Qhs Cover
- Tertiary: Td, Tl, Tev, Tw. Td: Oolite, 20 my; Tl: Intrusive, 20 my; Tev: Early Volcanics; Tw: Whitetail Conglomerate, 32 my.
- Laramide: Tgr, Tam, Tgm, Tgd, Tga. Intrusives (Tgr), 58-60 my; (Tam), 60-63 my; (Tgm), 62 my; (Tgd-Tgm), 70-72 my; (Tga) Replacement ore in Devonian thru Pennsylvania.
- Devonian: Pol, B, Tr, Me, Dm. Pol: Undifferentiated Sediments (Pol), Suppl (Ps), Vaso (Trn); Escabrosa (Me); Morini (Dm); (B) Replacement ore in Devonian thru Pennsylvania.
- Precambrian: pEau, pSc. Sediments & Associated Diabase; pSc: Riolite Schist & Associated Diabase.
- Drill Hole (showing depth TD and rock type): A-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
- ASSAY DATA KEY: depth-length-% Cu; 4317 - 623 - 0.31.
- Drill by ASARCO (red dot)
- Drill by other companies (green dot)



BRYANT CONSTRUCTION COMPANY  
843 Spray Street  
Superior, AZ 85273

*Carol.  
follow the  
PO # for the  
206 Jim*

February 1, 1983

Mr. James D. Sell  
ASARCO Incorporated  
Southwestern Exploration Division  
P. O. Box 5747  
Tucson, AZ 85703

Dear Mr. Sell:

Bryant Construction Company will provide the following equipment and labor at a flat rate of \$550.00 per day:

One 160 CFM Compressor  
One Pickup  
All Drilling and Blasting Equipment  
Two Equipment Operators

Following is a list of equipment rates operated and maintained by Contractor:

|                      |   |                  |
|----------------------|---|------------------|
| D7F Dozer and Ripper | - | \$80.00 per hour |
| Hough Loader         | - | \$50.00 per hour |
| Backhoe Loader       | - | \$35.00 per hour |
| 12 Yard Dump Truck   | - | \$40.00 per hour |

Dynamite, fuse, and primers will be supplied by Contractor and billed to ASARCO plus 10%.

Cost of third party work, gravel, etc. at cost plus 10%.

Workmen's Compensation Insurance Policy No. 91903-5.

General Comprehensive Liability Insurance  
Continental Casualty Company Policy No. 005-30-19-75.

Very truly yours,

*Paul T. Bryant*  
Paul T. Bryant

RECEIVED

FEB - 9 1983

S. W. U. S. EXPL. DIV.

FROM: W. L. KURTZ

FEB 23 1964

TO: JR Stringham

Tuesday I noticed the  
land adjacent to TI was  
being cleared and a bunch of  
survey stakes.

Is that development that  
Bill Crist successfully stopped —  
by water health department —  
trying to develop again.  
We don't want our wet  
polluted.

CC, T. J. Sell



JOY MANUFACTURING COMPANY  
707 BOYD BOULEVARD  
P. O. DRAWER 489  
LaPORTE, INDIANA 46350  
Phone: (219) 362-2191

February 29, 1984

Mr. Jim Sell  
ASARCO, Incorporated  
P. O. Box 5747  
Tucson, Arizona 85703

Dear Jim:

We appreciated receiving the invitation to bid on your core drilling at Superior. We understand you want to drill BX in Hole A-15 from 2029 feet.

Please consider the following:

|   |              |                  |
|---|--------------|------------------|
| Mobilization                                  | \$500.00/rig | same             |
| Demobilization                                | \$500.00/rig | same             |
| *BX Wireline Core Drilling - 2000 to 2500 ft. | \$20.50/ft.  | 21 <sup>20</sup> |
| 2500 to 3000 ft.                              | \$22.70/ft.  | 23 <sup>40</sup> |
| 3000 to 3500 ft.                              | \$25.50/ft.  | 26 <sup>20</sup> |
| 3500 to 4000 ft.                              | \$29.00/ft.  | 29 <sup>70</sup> |
| 4000 to 4500 ft.                              | \$33.30/ft.  | 34 <sup>00</sup> |
| 4500 to 5000 ft.                              | \$38.70/ft.  | 39 <sup>20</sup> |

*was for depths below 3500'*  
\*Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$368 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$46.00 per hour plus bit and other in-hole supplies at actual cost.

If Joy should elect to invoke the above bad rock clause, it is understood by both parties that it will be only under conditions of around-the-clock operation by competent drilling crews. ASARCO will be notified by mail or telephone before any hourly charges are accrued under this clause, and ASARCO reserves the right to terminate the drilling at any time after such notification.

RECEIVED

MAR - 5 1984

S. W. U. S. EXPL. CO.



February 29, 1984

*same* ↓

Rig Time & Hourly Work

|   |   |
|---|---|
| Setting and Pulling Casing and Pipe   | \$46.00/hour +<br>materials used                  |
| Cementing and/or Plugging Drill Holes<br>(two man crew). Includes all time required<br>to maintain good hole conditions while<br>drilling. Also includes time required to<br>close or complete hole as required                                 | \$46.00/hour +<br>materials used                  |
| Reaming, if necessary   | \$46.00/hour +<br>materials used                  |
| Survey  | \$46.00/hour +<br>customer supplies<br>instrument |
| Re-entering Previously Drilled Holes<br>(two man crew). Includes all time<br>worked entering previously drilled<br>hole until wireline core bit is cut-<br>ting in solid rock formation on true<br>bottom of hole. This will also in-<br>clude: | \$55.00/hour +<br>materials used                  |
| (a) Time which is required to line up<br>drill over previously drilled hole.  |   |
| (b) Time required to set casing in<br>predrilled hole before starting to<br>drill with wireline tools.  |   |
| Standby Time for Your Convenience   | \$30.00/hour                                      |
| Overtime Premium in Excess of 88 Hours<br>per two week period   | \$6.00/man hour                                   |

Supplies

|   |    |                         |
|---|----|-------------------------|
| Casing Ordered Left in Place                      | NC | \$9.00/foot             |
|   | NX | \$8.00/foot             |
|   | BX | \$6.50/foot             |
| Casing Lost through Normal Drilling<br>Operations |    | At 70% of list<br>price |

February 29, 1984

Supplies (continued)

|   |                          |
|---|--------------------------|
| Diamond Bit Loss in Excess of \$2.50/ft.                  | At Actual Cost           |
| Drilling Mud & Additives                                  | At Jobsite Cost<br>+ 20% |
| Weather-treated Core Boxes which hold<br>ten feet of core | \$2.25 each              |

Water Pumping or Hauling

|                                  |                  |
|----------------------------------|------------------|
| Water Truck Usage                | \$600.00/month   |
| Mileage                          | \$.75/mile       |
| Water Truck Driver (if required) | \$2,000.00/month |

The above prices are firm if accepted within 60 days and will remain in effect until 9/25/84.

We understand ASARCO will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to Joy. We further understand that ASARCO will provide all rights of ingress and egress to all lands that may be required to enable Joy to carry out the specified work.

We would look forward to working with you on this project.

Yours very truly,

JOY MANUFACTURING COMPANY



J. H. Koontz  
General Manager  
Contract Core Drill Division

JHK/js

# ASARCO

JDS

Exploration Department  
Southwestern United States Division

James D. Sell  
Manager

April 16, 1984

Mr. Mike Guzman, Jr.  
President, Guzman Construction Co.  
Box 3100  
Globe, AZ 85501

Dear Mike:

Your letter to Mr. William Kurtz has been passed on to me concerning the Silver King Mine north of Superior, AZ.

ASARCO Exploration would be pleased to secure further information on the last status and terms.

Until I see you again,

Sincerely,



James D. Sell

JDS/cg

**GUZMAN CONSTRUCTION CO.**

PLANTS:  
GLOBE: 425-5775  
SUPERIOR: 689-5632  
WINKELMAN: 356-666

READY MIX CONCRETE  
ASPHALT PAVING  
EXCAVATING & EQUIPMENT RENTAL  
"SINCE 1941"

MAIN OFFICE  
BOX 3100  
GLOBE, ARIZONA 85501

April 13, 1984

ASARCO Inc.  
P.O. Box 5747  
Tucson, AZ 85703

Attn: ~~William Kurtz~~ JDSell

Dear Sir,

The board of directors of Guzman Construction Company has decided to offer the famous Silver King Mine in Superior, Arizona for exploration and development. This old mine was shut down in the late 1800's after it produced 6 million ounces of silver. It was re-opened from 1918 to 1920 and produced another 300,000 ounces. The area has never had any deep drilling.

Presently there is a 300 ton per day Merrill-Crow zinc recovery system with leach pad, holding ponds for pregnant, barren and overflow solutions. A complete laboratory and refining process is also available.

If more information is desired we will be happy to forward same.

Best regards,

*Mike Guzman, Jr.*  
Mike Guzman, Jr.  
President, Guzman Const. Co.

MG/mg

RECEIVED

APR 16 1984

EXPLORATION DEPARTMENT

July 16, 1984

File Memorandum

Superior East Project (EA-0010)  
Pinal County, AZ

Casing now at the J. I. Ranch pipe rack consists of:

|         |              |            |            |
|---------|--------------|------------|------------|
| NC Rods | 10 feet long | 44 each =  | 440 feet   |
| NX Rods | 20 feet long | 57 each =  | 1140 feet  |
| NX Rods | 15 feet long | 100 each = | 1500 feet. |

*H.M. Stone*  
H. M. Stone

HMS/cg

cc: TCBenavidez  
JDSell  
Superior East File  
Warehouse Inventory File

# ASARCO

Southwestern Exploration Division

JDS

February 11, 1985

TO: W. L. Kurtz

FROM: J. D. Sell

Reproposal for Hole A-16  
Superior East Project  
Pinal County, AZ

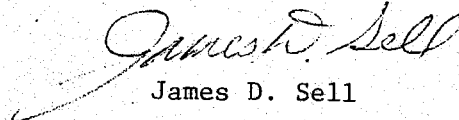
After the discussions with you and F.T. Graybeal in Reno on February 5, 1985, and the decision to place the next hole at Superior East southerly from Hole A-8, I submit the site as shown on the attached map.

The road had previously been approved by the Forest Service and J.R. Stringham will notify them that we will start construction soon while the fire danger is low.

At the budget level of \$10,000, the entire sum will be taken up in construction in this assessment year.

The proposed drill site is about midway between Hole A-8 (646 feet of 1.57% Cu) and Hole A-13 (392 feet of 0.67% Cu) to the southeast, and will ultimately test the continuation of the higher grade zone as shown on attached Section A-A', with the top around 3675 feet below the surface.

JDS:mek  
Attachments

  
James D. Sell

cc: F. T. Graybeal

R. 13 E.



BASE FROM U.S.G.S. SUPERIOR ARIZ. 7.5' QUAD.

EXPLANATION

-  Existing Roads
-  Approved Rights-of-way
-  Proposed Drill Site



|              |                |
|--------------|----------------|
| TO ACCOMPANY | <i>memo</i>    |
| TO           | <i>WCK</i>     |
| DATED        | <i>2-11-85</i> |
| BY           | <i>JDS</i>     |

PLAN OF ASARCO DRILL HOLES  
U.S. FOREST SERVICE

PINAL COUNTY, ARIZONA

SCALE : 1" = 500'

J.D. Sell

Jan, 1983

MVK-5466





April 1985

April A/R #s.

Total to date

499-01 \$39,785.84

800 \$43,481.12

81,719.21

83,266.96

239,530.51

x

Hbho EA 368-00

Amount authorized 500.

Spent as of April 85 558.70

# over 5,038.70

SE Proj. EA-0010-19

Amount authorized 90,000.

Spent as of April 85 127,212.17

over 37,212.17

# ASARCO

ASARCO Incorporated

JAN 22 1986

Exploration

## Exploration Department

Frederick T. Graybeal  
Chief Geologist

January 16, 1986

Mr. J. D. Sell, Manager  
Southwestern Exploration  
Division  
Tucson, Arizona

Superior East Project  
Pinal County, AZ

Dear Mr. Sell:

Thank you for your letters of December 20 and December 23 which compile the results of drilling to date at Superior East. I have no problems with your recommendation for hole A-16. I would note that at this point in the evolution of the project I would not be inclined to constrain drill hole locations according to grid coordinates. At this point we are still exploring a system which is imperfectly known and geologic constraints should govern all drilling.

Very truly yours,

*F. T. Graybeal*  
F. T. Graybeal

cc: W. L. Kurtz

TO: H.G. Kreis  
From: J.D. Sell

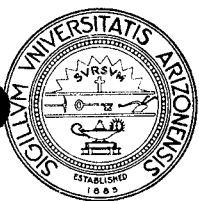
Jan. 17, 1986

Precious Metal Review  
Superior East Project  
Pinal-Gila Co's. AZ

Please place on your agenda a time slot to review a few mile swath around the Superior East area for all the precious metal shows and formulate an exploration plan.

James D Sell

cc: W.K. Kuntz



THE UNIVERSITY OF ARIZONA  
TUCSON, ARIZONA 85721

COLLEGE OF ENGINEERING AND MINES  
DEPARTMENT OF HYDROLOGY AND WATER RESOURCES  
TEL. (602) 621-3131

ASARCO Incorporated

MAR 27 1986

March 25, 1986

SVV Exploration

Dr. F.T. Graybeal  
Chief Geologist  
ASARCO Inc.  
180 Maiden Lane  
New York, NY 10038

Dear Dr. Graybeal:

Our research group at the University of Arizona, Department of Hydrology and Water Resources, is presently characterizing the fracture and matrix flow properties of welded tuff. Our field site is located a few miles east of Superior, Arizona. It has come to our attention that ASARCO Inc. has already diamond cored boreholes in the same dacite unit that we are investigating. Any information on this dacite unit will help us in our research. This letter is to ask permission to inspect cores of the dacite that ASARCO still has in its possession, and also to read the core descriptions. We have been in contact with Mr. Jim Sell, Geology Department of ASARCO, Tucson, Arizona, and he requires your permission for granting our request.

Your assistance would be appreciated.

Sincerely,

Daniel D. Evans  
Professor

3/31 tel. from FTG  
Huddle!

DDE:fj

✓cc: Mr. Jim Sell

Sidemann

4/2/86 Called to tell him about core at USGS & ASO. All our core E of Devils Canyon. They are doing fracture studies & fracture filling around #9 shaft & the old highway tunnel towards Superior. They secured rock from #9 shaft.

May 9, 1980

Mr. D. W. Peterson, USGS

5400 Mac Arthur Blvd  
Vancouver, WASH 98661

A-13 Sec 1610

SW $\frac{1}{4}$  SW $\frac{1}{4}$  SE $\frac{1}{4}$  SW $\frac{1}{4}$  Sec 23 T15 R13E

AI-2 Sec 1497

SW $\frac{1}{4}$  NE $\frac{1}{4}$  SW $\frac{1}{4}$  SE $\frac{1}{4}$  Sec 23, T15, R13E.

Delivered to Mr. Leo Davis

USGS Tucson Magnetism & Seismological Observatory

7290 E Tanager Verde Road

Tucson

ph 792-6420.

Aug 17, 1976

Mr. Michael F. Sheridan

Prof of Geol

Dept of Geol

Az State Univ

Tempe, AZ 85281

2 drill holes of dacite <sup>between</sup> ~~near~~ of Pinto Valley & near AZ  
Bohne Ranch

WLK - WDG

4/8/84

JOS.

Magma Power Line  
Superior - Pinto Valley  
Pinal - Gila Counties

A Mr. Alex Acosta, land man for  
Magma Copper Company, ph. 325-3305,  
called. ~~to~~

Magma wishes to run a power line  
from Superior to Pinto Valley and stay  
within the present SRP-APS corridor which  
crosses the LI Ranch fee land in section 14,  
T1S, R13E.

He will call Monday, April 14, to confirm  
coming to Tucson and discuss the situation.

This will also cross unpatented mining  
claims of which we gave right-of-way OK's  
~~for~~ See S.E. Document 23 for APS; Documents  
23-A and 23-B for SRP.

James D. Self

FILE

Will send drawing —

Superior rate w/ SRP is much lower & over the contract will  
pay 9 mo.

23-A  
23-B

RBC file drawer

To Sell  
Date 4-9-86 Time 3:35

**WHILE YOU WERE OUT**

M. Alex Austin  
of Magma  
Phone 1-385-3305  
Area Code Number Extension

|                   |  |                 |  |
|-------------------|--|-----------------|--|
| TELEPHONED        |  | PLEASE CALL     |  |
| CALLED TO SEE YOU |  | WILL CALL AGAIN |  |
| WANTS TO SEE YOU  |  | URGENT          |  |

RETURNED YOUR CALL ☒

Message Phx tomorrow  
til 4:00 today

Operator



**AMPAD**  
EFFICIENCY®

23-006

50 SHEET PAD

# ASARCO

Exploration Department  
Southwestern United States Division

May 7, 1986

Mr. Bert Apker  
Evans, Kitchel & Jenckes, P.C.  
2600 North Central Avenue  
Phoenix, Arizona 85004-3099

Dear Mr. Apker:

Enclosed is a copy of a letter and attachments I sent to Mr. Woods in New York. After receiving same, Mr. Woods called and suggested that since you were handling this adjudication for us, that I drop you a note and seek your advise on the question of the completed Statement of Claimant Forms.

Sincerely,

*W. D. Gay*  
W. D. Gay  
Land Engineer

WDG:mek  
encs.

*6-16 River notes*

cc: J. D. Sell



# ASARCO

Southwestern Exploration Division

JDS

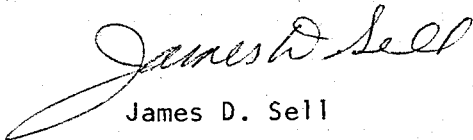
July 21, 1986

To: W. D. Gay

From: James D. Sell

Superior East Area  
Newmont's Sun 52-71 Group  
Pinal County, AZ

Please check that Newmont has filed their assessment work for the year ending September 1, 1986, on their Sun 52 thru 71 group block. This block is north of Oak Flat and south of our Kay and Margaret claims.



James D. Sell

JDS:mek

## DESERT VARNISH REVISITED

Carleton B. Moore

Investigations of the development of artificial desert varnish show that it may be produced by the application of a dissolved manganese salt ( $\text{MnSO}_4$ ,  $\text{MnCl}_2$ ) to a rock surface made alkaline with sodium hydroxide. Under these conditions the manganese is oxidized to a higher, insoluble, oxidation state as shown in Figure 1.

Artificial varnish applied to rock surfaces in Petrified Forest National Park during the summer of 1978 has been revisited. The artificial varnish shows no sign of deterioration and satisfactorily covers the defacing scars that were originally present.

Our studies of artificial desert varnish together with field investigations of natural desert varnish indicate that the formation and preservation of varnish is a function of a stable rock surface, and alkaline environment, and a source of manganese, iron and clay particles. The source of manganese, iron and clay as well as the alkalinity is suggested to occur along intermittent streams in arid areas.

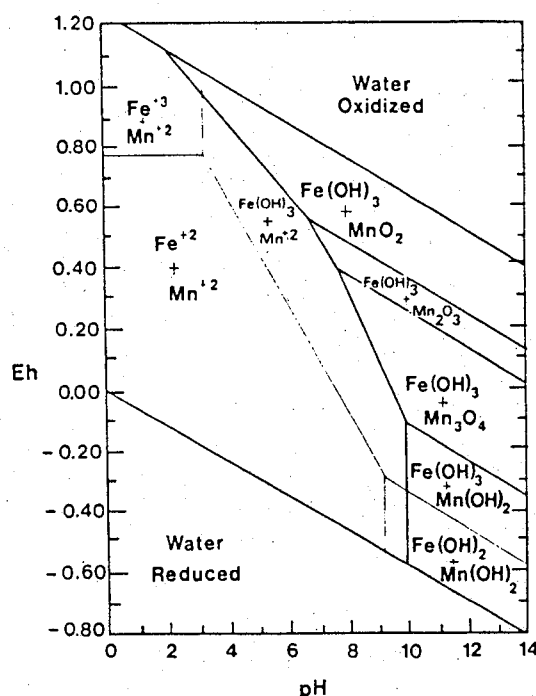


FIG. 1 Eh-pH diagram for  $\text{Fe}^{2+}$  and  $\text{Mn}^{2+}$  concentrations of  $10^{-5}$  molar at atmospheric pressure and  $25^\circ\text{C}$ .

December 5, 1986

## FILE NOTE

Native Copper Potential  
Whitetail Basin  
Superior East Project  
Pinal County, AZ

With the closing of the Superior Division of Magma Copper Company, Superior, AZ, it is possible that Magma will drop some of their outlying claims at some time.

Mr. Bill Gay checked the courthouse on December 4, 1986, and determined that Magma had filed their assessment work on Sept. 18, 1986, covering the Ash-Oak-Sun groups located west and north of the F.S. Oak Flat Withdrawal.

The eastern portion of the Sun 52-71 is underlain by the copper-bearing Whitetail Conglomerate.

Two maps are attached showing the presently held claims by Magma, Asarco, and the Forest Service Withdrawal. Also marked is the designated outline of the native copper potential.

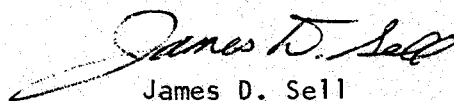
Based on the November 8, 1974 "Whitetail Copper Potential" report by J.D. Sell, the potential of the blocks are tabulated in Table 1 below. The calculations are based on the thickness of the drill intercepts, the geologic parameters of a copper-bearing block extending from the Devils Canyon Fault (on the east) and wedging westward to a pinch-out. The reserve calculation is limited westward at the 250 foot thickness of the unit -- a thickness thought necessary for any mining purposes. As before, a plus 0.8% copper content is used for the grade of the blocks. The Asarco areas have been recalculated to include only that below the retained claims presently held.

Table 1. Tonnage - thickness

|                    |   |  |
|--------------------|---|--|
| Magma "Sun" Claims | : | 348 mill tons ave. 400' thick  |
| Asarco North       | : | 169 mill tons ave. 335' thick  |
| Asarco East        | : | <u>110</u> mill tons ave. <u>490</u> ' thick                                 |
| Total              |   | 627 mill tons ave. 400' thick<br>with plus 0.8% copper, mainly as native Cu. |

It should be recognized that in any in situ leach program by drill holes, using, perhaps, the ammonia leach sequence, the drill holes could be extended beneath other lands such as Oak Flat and increase the available tonnage to be leached.

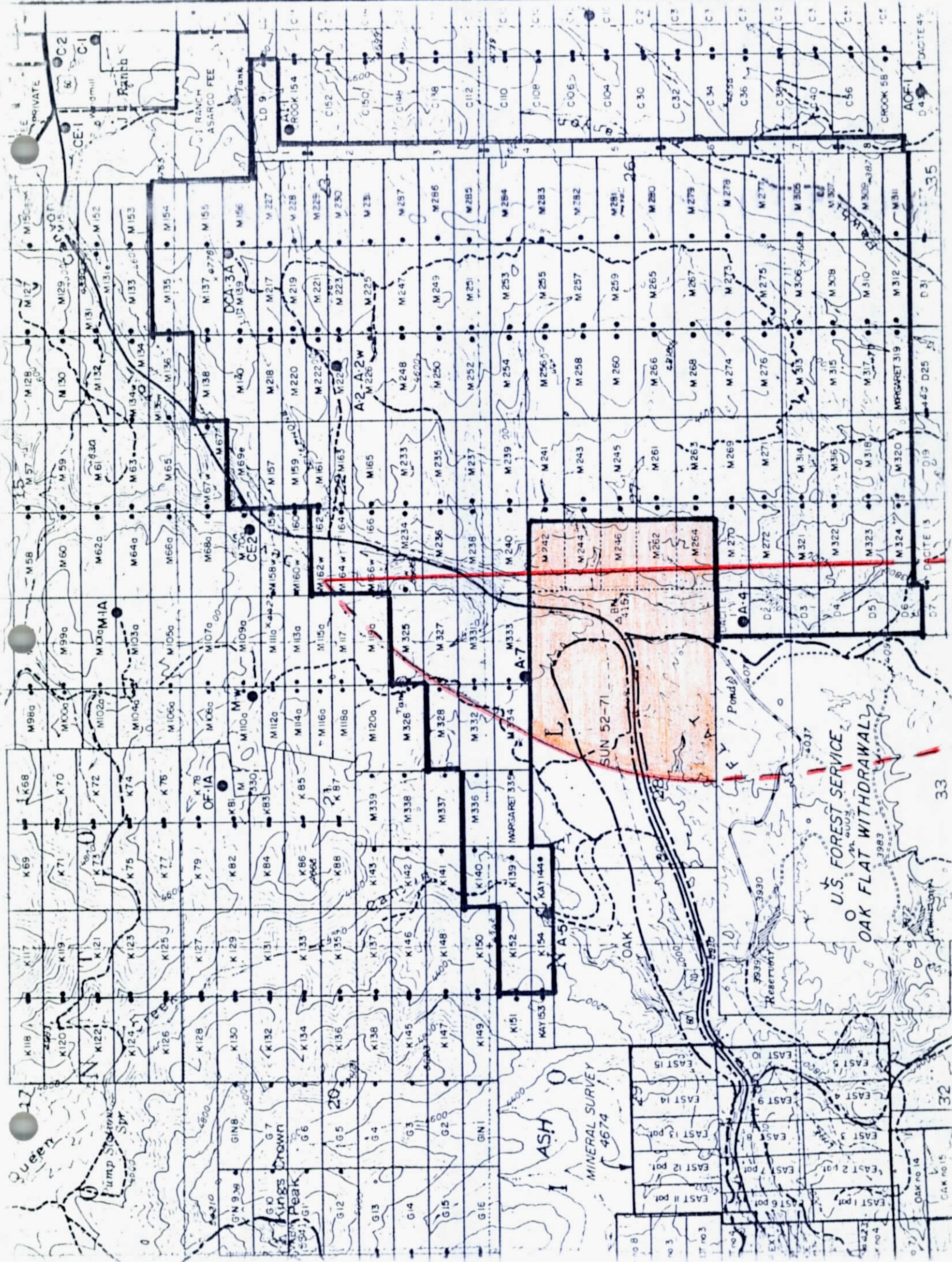
SWED will continue to monitor the status of the Sun 52-71 group as well as the adjacent Ash-Oak groups with this important reserve.

  
James D. Sell

JDS:mek  
Att.

CC: W.L. Kurtz, W.D. Gay, R.L. Brown







|     |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|
| 29  | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |
| ASH |    |    |    |    |    |    |    |    |    |    |    |    |

|    |    |    |    |    |
|----|----|----|----|----|
| 11 | 12 | 13 | 14 | 15 |
| 10 | 9  | 8  | 7  | 6  |
| 5  | 4  | 3  | 2  | 1  |
| 11 | 12 | 13 | 14 | 15 |

|     |    |    |    |    |    |    |    |    |    |           |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|-----------|----|----|----|----|----|----|----|----|----|
| 33  | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43        | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
| OAK |    |    |    |    |    |    |    |    |    | SUN 52-71 |    |    |    |    |    |    |    |    |    |
| 42  | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32        | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 |

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| Block 1     | Block 2     | Block 3     | Block 4     |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |
| Sub-Block 1 | Sub-Block 2 | Sub-Block 3 | Sub-Block 4 |

EAST  
1-5

OAK FLAT

OAK

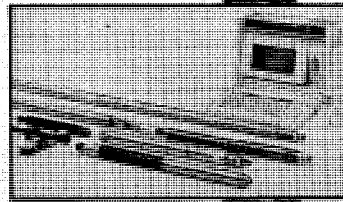
SUN 1-51

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88. Hogan, D. K. In-Situ Copper Leaching at the Old Reliable Mine. Min. Mag., v. 24, No. 5, May 1974, pp. 353-359.
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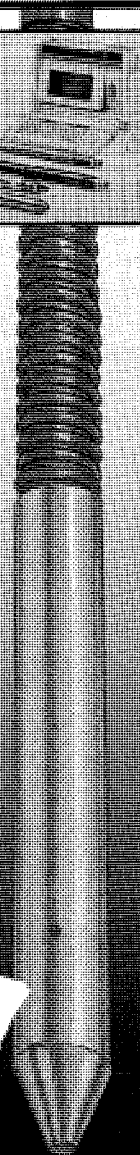
Downhole surveying's a lot easier, faster and more accurate with this new, completely self-contained S S Multi-Shot II™ gyro probe that'll memorize up to 900 sets of readings at pre-selected times.

No transmission systems . . . no conductor cable. Simply program the probe for the readings you want . . . run it downhole . . . bring it back to the surface . . . and connect it to the computer. It'll transfer an immediate printout on hole angle, direction, and tool face. It's incredible.

Humphrey manufactures a complete line of magnetic and non-magnetic (gyro) photographic and electric/electronic directional survey equipment including survey systems, orientation systems, and steering tools, with computer-based data processing and software.



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memory probe  
outthinks  
them all!**



Write for full information:

Humphrey Inc., Dept. E87,  
9212 Balboa Avenue,  
San Diego, CA 92123 U.S.A.  
Phone (619) 565-6631,  
TWX: 910-335-2001



**Humphrey Inc.**

San Diego • Philadelphia  
Houston • Wichita

WORLDWIDE REPRESENTATION

ASARCO Incorporated

FEB 9 1987

SW Exploration

# GYROSCOPES

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Humphrey Inc., founded 1946

**DUNS No. 008232605**  
**SIC No. 3829**



### For further information contact:

Harold Kries  
Humphrey Inc., Dept. DB86  
9212 Balboa Avenue, San Diego, CA 92123 U.S.A.  
Phone (619) 565-6631, TWX 910-335-2001  
FAX 619-565-6873



**Humphrey Inc.**

WICHITA, PHILADELPHIA  
SAN DIEGO, HOUSTON

**WORLDWIDE REPRESENTATION**

ASARCO Incorporated

FEB 9 1987

SW Exploration



# ASARCO

Southwestern Exploration Division

JDS

March 3, 1987

To: W. D. Gay

From: J. D. Sell

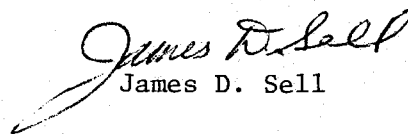
Superior East Area  
Newmont's Sun 52-71 Group  
Pinal County, Arizona

I learned yesterday that Newmont will close the Superior, AZ, unit on March 31, 1987.

At that date no one will be on the payroll except for two (ex-general manager and one other) who will be hired as Consultants for at least the remainder of the year. They will each spend three days, or a six day week total, to look after the surface facilities and answer the phone.

Thus I expect Newmont to drop their unpatented claims at some time, so please remember to check the assessment work files as per my note of July 21, 1986.

JDS:mek

  
James D. Sell

# ASARCO

JDS

Exploration Department  
Southwestern United States Division

June 19, 1987

Dept. of Water Resources  
State of Arizona  
99 E. Virginia, Suite 100  
Phoenix, AZ 85004

Superior East Project  
Pinal County, Arizona

Gentlemen:

In compliance with drill hole regulations ASARCO Incorporated requests a drilling permit as described in the attached "Notice of Intention to Drill" form. When the permit is obtained and the hole drilled our contractor, Harness Drilling Company, will complete and file the "Project Completion Report for Exploration Drilling." A check for the \$10 filing fee is enclosed.

If you have any questions, please call or write to me or J.D. Sell, Manager SWED.

Very truly yours,

*William D. Gay*  
William D. Gay  
Land Engineer

WDG:mek  
Atts.

cc: W.L. Kurtz  
J.D. Sell  
H.G. Kreis  
J. Harness, Harness Drilling Co.

EXPLORATION WELL(S)

DEPARTMENT OF WATER RESOURCES (DWR)

EXPLORATION WELL(S)

FILING FEE \$10.00

NOTICE OF INTENTION TO DRILL

EXPLORATION WELL(S)

Section 45-596, Arizona Revised Statutes and Rule R12-15-817 provide: Prior to drilling one or more exploration wells, the well owner, lessee or exploration firm shall file a Notice of Intention to Drill on a form provided by the Department.

## WELL/LAND LOCATION

1. Township 1 N/WS  
Range 13 E/W  
Section 23

In the case of a single well,  
list 10-acre subdivision

SW 1/4, SW 1/4, SW 1/4

2. County Pinal

3. Applicant:

ASARCO Incorporated

Name

P.O. Box 5747

Address

Tucson, AZ 85703

City State Zip

4. J.D. Sell/W.D. Gay

NAME OF CONTACT PERSON

Phone (602) 792-3010

5. Owner of well:

Applicant

Name

Same as above

Address

City State Zip

6. Purpose of well(s) drilled  
pursuant to this Notice:

Mineral Exploration X

Geotechnical       

Cathodic Protection       

Grounding       

7. Number of wells 1  
(See Condition 3 on reverse)

8. Owner of land:  
U.S. Department of Agriculture  
Forest Service

Name

Rt. 1, Box 33

Address

Globe, AZ 85501

City State Zip

9. DESCRIPTION OF WELL:

Diameter 5 3/4 inches

Depth Approx. 1000 feet

Type of casing Steel Surface  
(If none, so state) Casing

10. Construction will start:

June 25 1987

Month Day Year

11. Drilling firm:

Harness Drilling Co., Inc.

Name

P.O. Box 43367

Address

Tucson, AZ 85733

City State Zip

64

DWR License Number

12. Period well will remain  
in use 0 months.

13. Proposed method of  
abandonment of well(s)  
after project is  
completed:

Surface casing will be  
capped with a steel  
plate and drill hole  
will be available for  
re-entry.

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

File No.                     

Filed                      By                     

Input                      By                     

Duplicate

Mailed                      By                     

Registration                     

AMA/INA                     

W/S                      S/B                     

14. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials? Yes        No X  
If yes, a request for a variance must accompany this application pursuant to R12-15-820.

## GENERAL INSTRUCTIONS

- Fill out this form in duplicate and mail to Department of Water Resources, Suite 100, 99 East Virginia, Phoenix, Arizona 85004.
- Proper filing fee of \$10.00 must accompany Notice.

I state that this Notice is filed in compliance with Rule R12-15-809 and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

DATE 6/19/87

DWR 55-40-8/86 (Revised)

William D. Gay  
Signature of Applicant  
William D. Gay, Land Engineer

Voucher No.

6-125

Month

June 19 87

ASARCO Incorporated  
Tucson Office  
Tucson, Arizona 85703

Filing fee for Notice of Intention to drill Exploration Well \$10.00

DETACH BEFORE PRESENTING FOR PAYMENT

**ASARCO**

COPY

ASARCO Incorporated  
Tucson Office  
Tucson, Arizona 85703

91-2  
1221

THE VALLEY NATIONAL BANK OF ARIZONA  
Tucson, Arizona 85701

Check

June 19 19 87 26919

PAY  
TO THE ORDER OF

The sum of \$10 and 00 Cts Dollars \$ 10.00

ASARCO Incorporated

DEPARTMENT OF WATER RESOURCES  
Suite 100, 99 East Virginia  
Phoenix, AZ 85004

*[Signature]*  
*[Signature]*

June 19, 1987

W. D. Gay/D. A. Melhado

Activities - Hole A-16  
Superior East Project  
Pinal County, Arizona

A Supplemental Exploration Authorization for the amount of \$15,000 has been requested. Of this amount we will spend \$14,000 on the road clean-up, surface pipe, and drilling of the new hole A-16.

Paul Bryant, Construction Contractor, Superior, Arizona, phone: 601/689-2627, will take a front-end loader in and clean the road from the gate to the drill site A-16 (as per telephone call of 6/19/87). Paul will also take a piece of 7" pipe from the JI Ranch storage and take it to the drill site. He will call in these charges which must be deducted from the \$14,000 to be expended.

Joe Harness Drilling Company, Tucson, Arizona, phone: 602/623-4668, has submitted a drilling contract which is attached. Now that we have his Dept. of Water Resources license number, we need to complete the report to the Arizona DWR for this work.

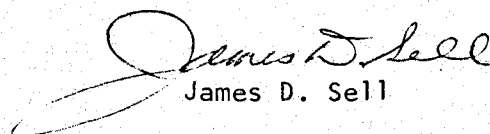
We will also need the Harness costs for getting started (mobilization and demobilization, set-up, etc.), including drilling and setting the 7" surface pipe, as soon as possible in order to estimate the depth he may be able to get to with the remaining monies.

Harness will establish a 5-gallon pile of cuttings per ten feet of drilling at one side of the drill pad. These need to be washed and put in a vial, marked and boxed, for a drill log and thus someone should do this soon after he starts to make sure he understands the procedure and also to secure the vials and information.

I believe we can safely leave the hole uncased below the 7" casing, in the event we wish to deepen the hole by rotary drilling next year.

Harness expects to move on site the week of June 22. You should have a copy of the contract when you go up. You may want to go up at the same time he goes in to look at it to make sure he is at the right site.

JDS:mek  
Atts.

  
James D. Sell

cc: W.L. Kurtz  
H.G. Kreis

JOE B. HARNESS

YARD PHONE 602-623-4668  
HOME PHONE 602-~~282~~-~~3008~~



## HARNES DRILLING COMPANY, INC.

BOX 43367 - TUCSON, ARIZONA 85733

June 19, 1987

Jim Sell  
Asarco Inc.  
Mining Dept.  
1150 N 7TH Ave  
Superior, Az. Loc

Mob and Demob ..... 500.00 Each

Drill 5 3/4 to 6" Hole Apx 1000 Ft @\$11.50 Per Ft

Per Dem , 3Men, \$40.00 Per Day, Each.

Rig and crew for setting caseing, \$125.00 per Hr.

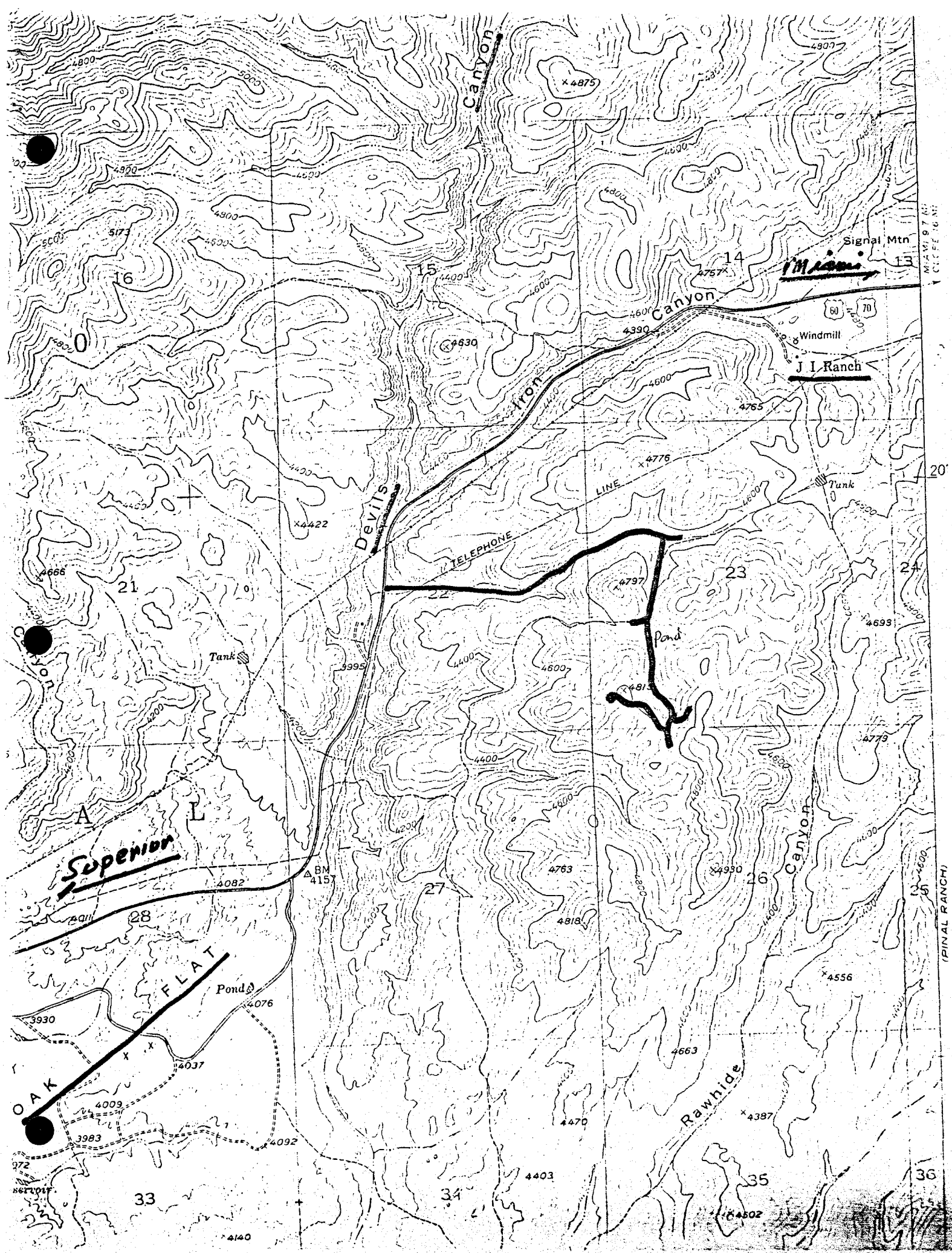
Drillling, Setting, Surface Pipe And Cement In Place

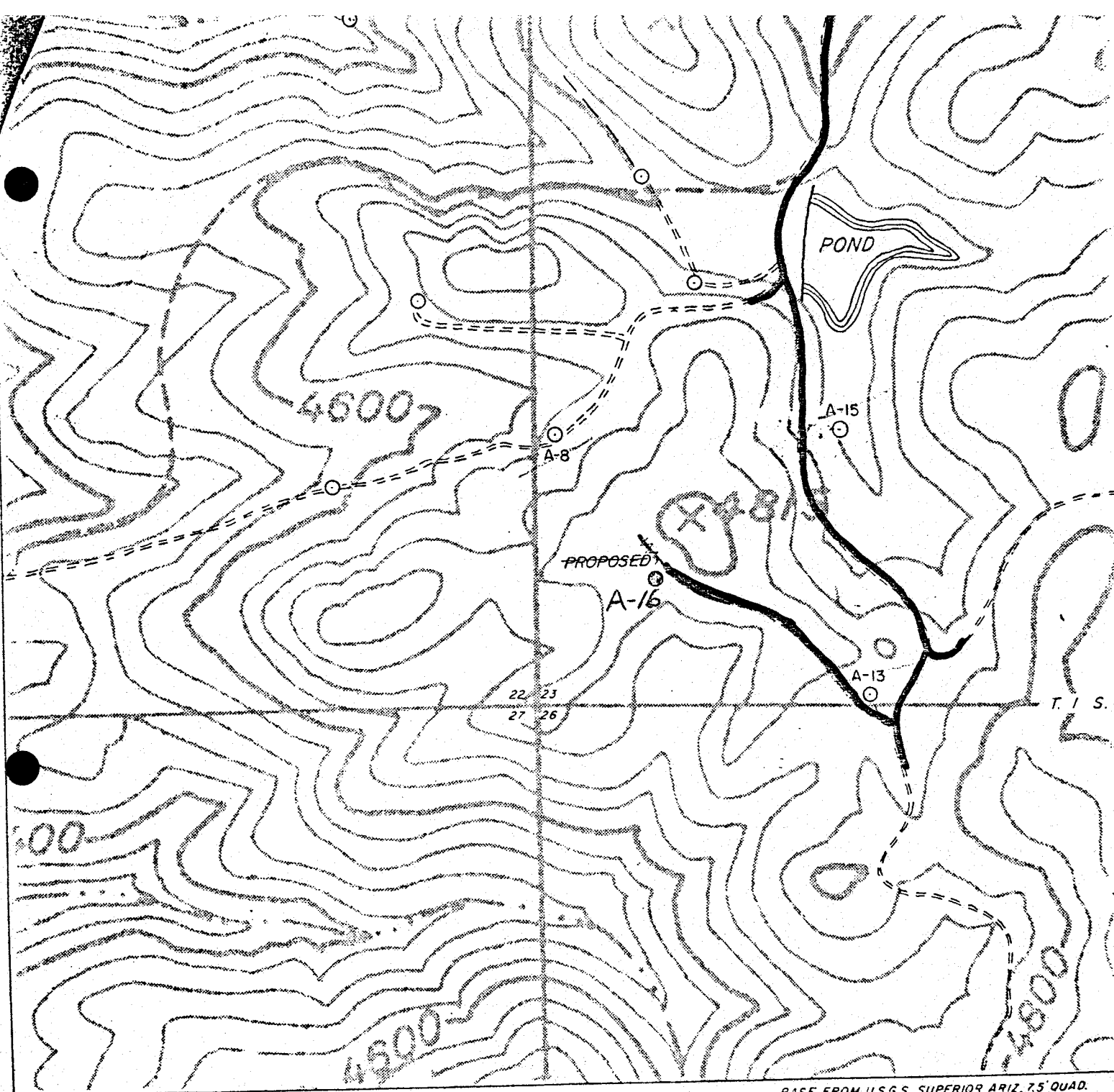
Rig And Crew..... : 135.00 Per Hr.

*J. B. Harness*  
Joe B. Harness, Pres.

AZ DWR # 64

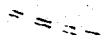


Contractor's Lic # 044870-005





BASE FROM U.S.G.S. SUPERIOR ARIZ. 7.5' QUAD.

# EXPLANATION

-  Existing Roads
-  Approved Rights-of-way
-  Proposed Drill Site

NORTH

|               |          |
|---------------|----------|
| TO ACCOMPLISH | 12/11/83 |
| BY            | WICK     |
| DATE          | 2-11-85  |
| LY            | WAS      |

## PLAN OF ASARCO DRILL HOLES U.S. FOREST SERVICE

PINAL COUNTY, ARIZONA

SCALE: 1" = 500'

J.D. Sell

Jan, 1983

MVK-54



JOE B. HARNESS

YARD PHONE 602-623-4668  
HOME PHONE 602-~~202~~-~~2002~~



## HARNESS DRILLING COMPANY, INC.

BOX 43367 · TUCSON, ARIZONA 85733

June 19, 1987

Jim Sell  
Asarco Inc.  
Mining Dept.  
1150 N 7TH Ave  
Superior, Az. Loc

Mob and Demob ..... 500.00 Each

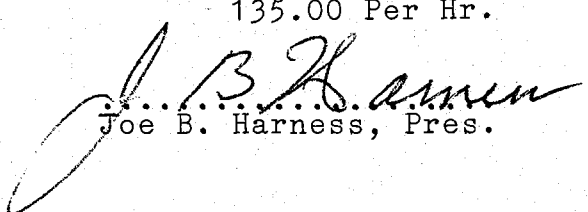
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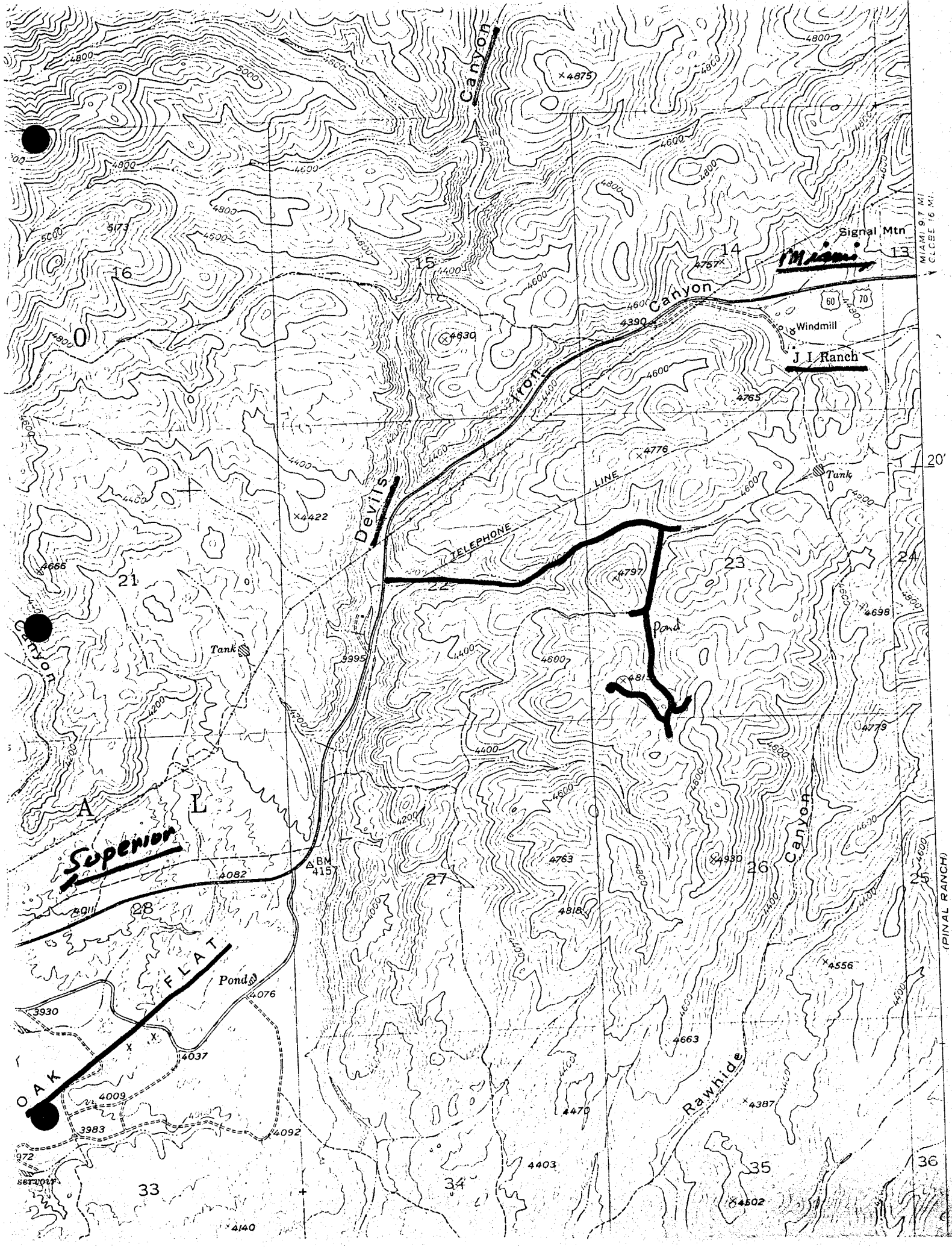
Drillling, Setting, Surface Pipe And Cement In Place

Rig And Crew..... 135.00 Per Hr.

  
Joe B. Harness, Pres.

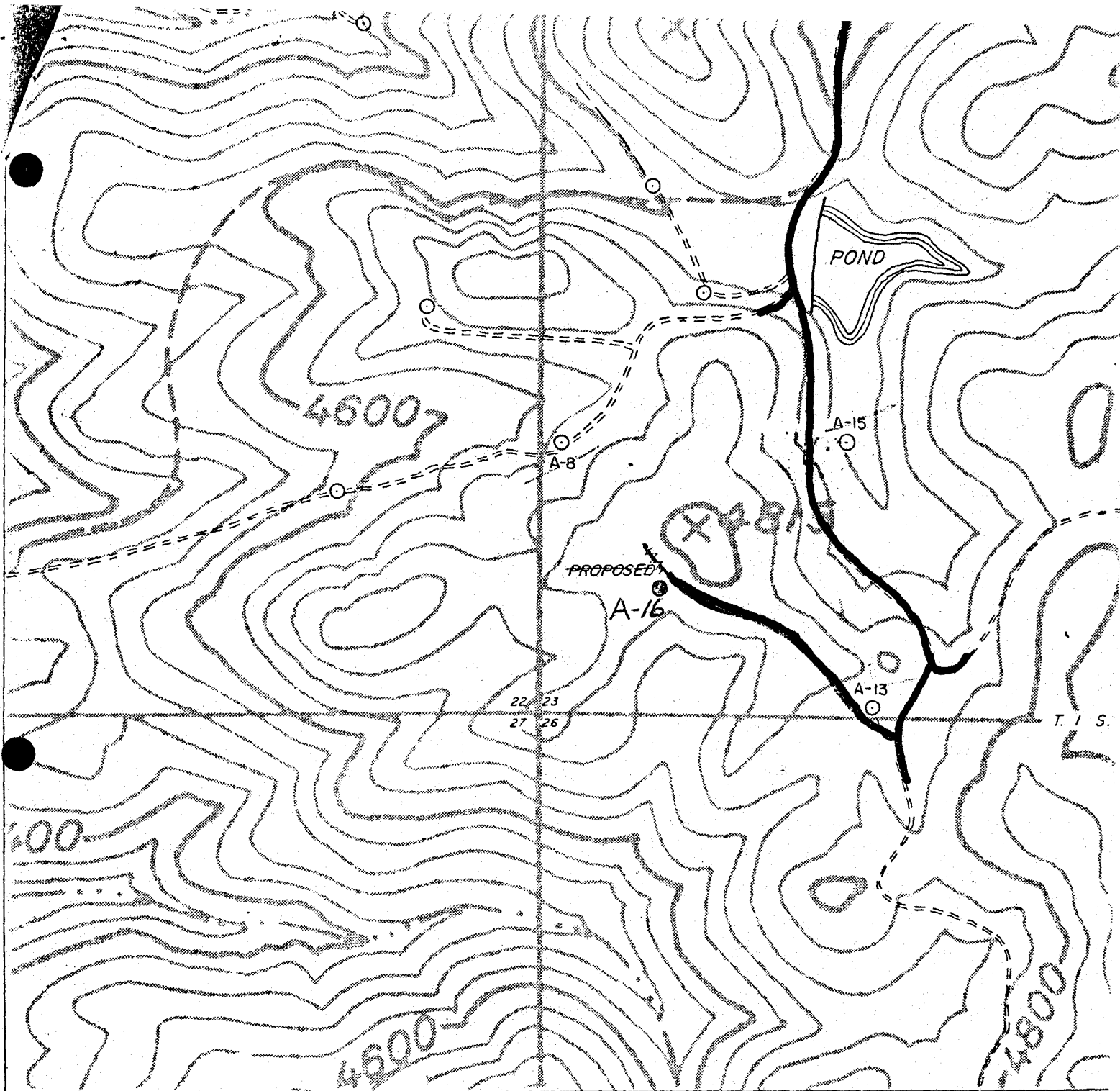
AZ DWR #64

Contractor's Lic. #044870-005



MIAMI 9.7 MI  
CLCEE 16 MI

(PINAL RANCH)



BASE FROM U.S.G.S. SUPERIOR ARIZ. 7.5' QUAD.

EXPLANATION

- Existing Roads
- Approved Rights-of-way
- Proposed Drill Site

NORTH

|              |                |
|--------------|----------------|
| TO ACCOMPANY | <i>MEMO</i>    |
| TO           | <i>WCK</i>     |
| DATE         | <i>2-11-85</i> |
| BY           | <i>LAS</i>     |

PLAN OF ASARCO DRILL HOLES  
U.S. FOREST SERVICE

PINAL COUNTY, ARIZONA

SCALE: 1" = 500'

J.D. Sell

Jan, 1983

MVK-54

# ASARCO

JDS

Exploration Department  
Southwestern United States Division

June 19, 1987

Mr. Joe Harness  
Harness Drilling Company, Inc.  
Box 43367  
Tucson, AZ 85733

Hole A-16  
Superior East  
Pinal County, AZ

Dear Joe:

Attached is a copy of your contract which is accepted for the rotary drilling, starting at the surface, in the Asarco hole A-16.

Also attached are two maps showing the location.

Please notify Asarco when you visit the area and probably someone can go along for confirmation of the drill site.

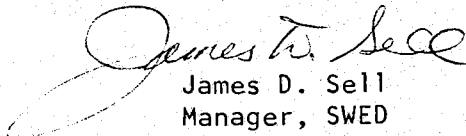
Paul Bryant, Superior, phone: 689-2627, will clean the road and move a length of 7" surface casing pipe to the drill site.

As stated verbally to you, Asarco wishes to have a line of cuttings (5 gallons per 10 feet) laid out to one side so that our geologist can prepare a sample for logging.

Please call the office, 792-3010, with any questions, and talk to me, Bill Gay, or Don Melhado.

We appreciate your service.

Sincerely,

  
James D. Sell  
Manager, SWED

JDS:mek  
Att.

cc: A.J. Robles  
H.G. Kreis  
W.D. Gay  
W.L. Kurtz

ASARCO Incorporated P. O. Box 5747 Tucson, Az 85703-0747  
1150 North 7th Avenue (602) 792-3010

JOE B. HARNESS

YARD PHONE 602-623-4668  
HOME PHONE 602-~~302~~ ~~3000~~



## HARNESS DRILLING COMPANY, INC.

BOX 43367 · TUCSON, ARIZONA 85733

June 19, 1987

Jim Sell  
Asarco Inc.  
Mining Dept.  
1150 N 7TH Ave  
Superior, Az. Loc

Mob and Demob ..... 500.00 Each

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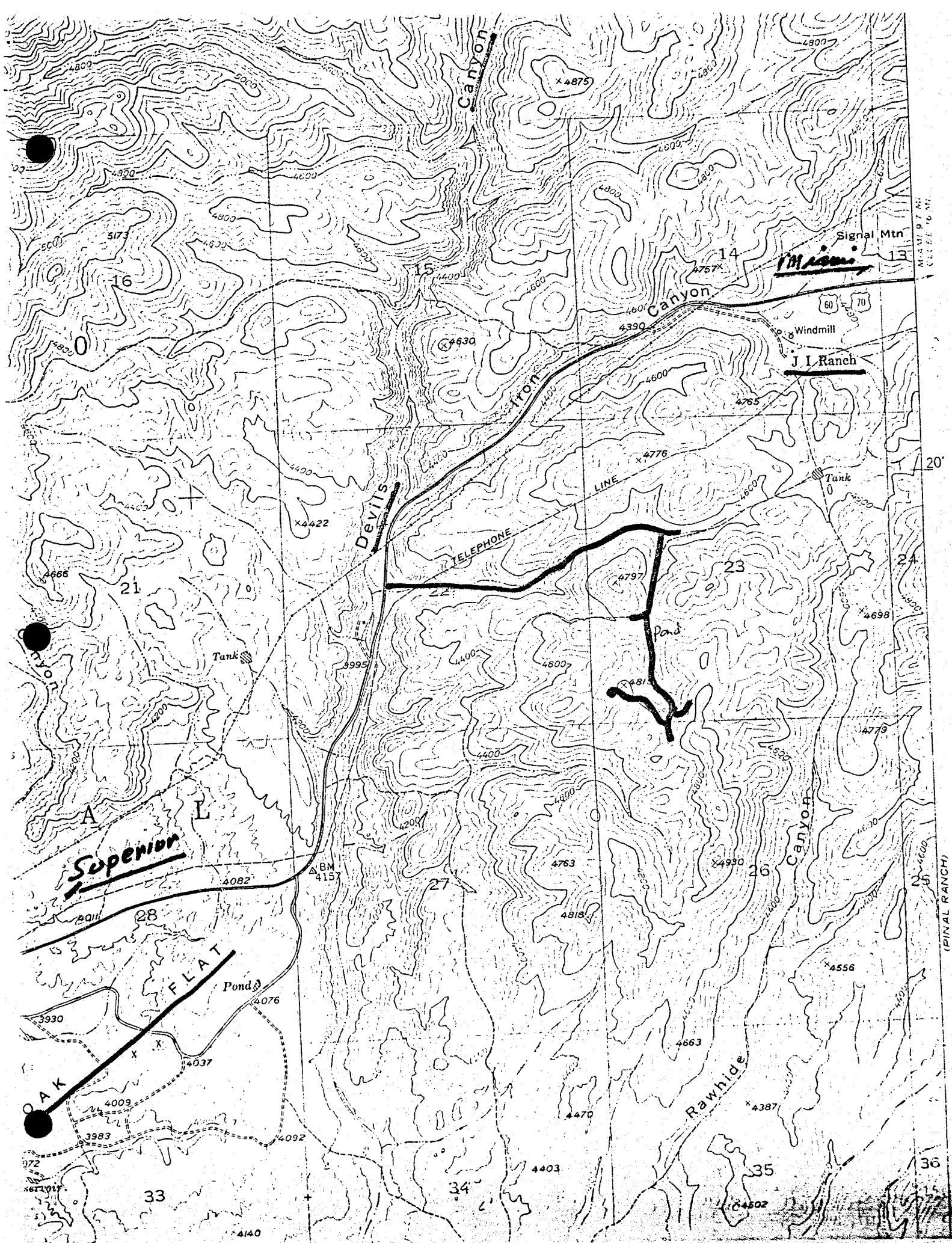
Drillling, Setting, Surface Pipe And Cement In Place

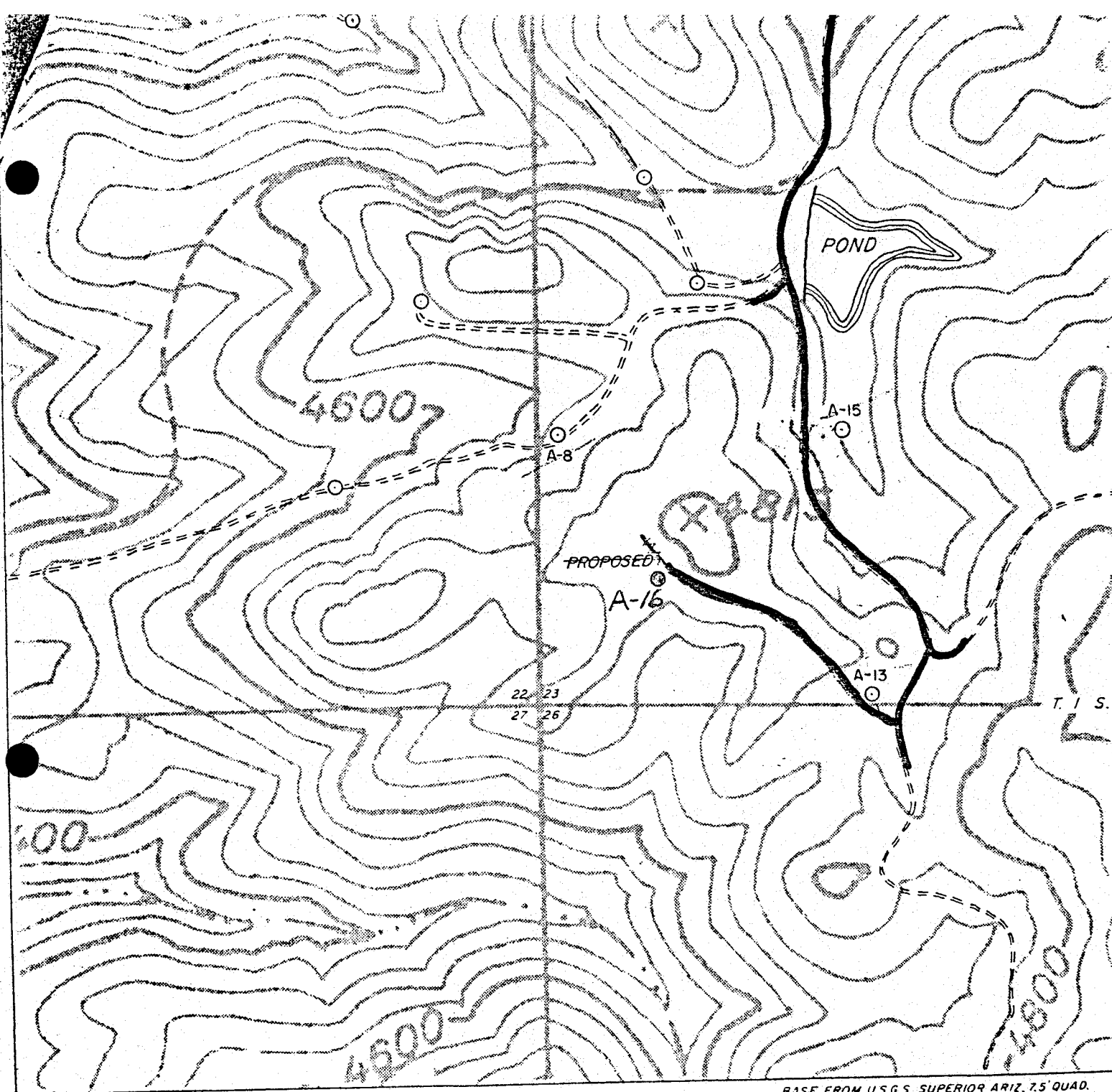
Rig And Crew..... : 135.00 Per Hr.

*J. B. Harness*  
Joe B. Harness, Pres.

DWR # 64  
Contractor's Lic. # 046870-005

*Contract Accepted*  
*J. B. Harness*





BASE FROM U.S.G.S. SUPERIOR ARIZ. 7.5' QUAD.

EXPLANATION

- Existing Roads
- Approved Rights-of-way
- Proposed Drill Site



|               |         |
|---------------|---------|
| TO ACCOMPLISH | MEETING |
| TO            | WICK    |
| DATE          | 2-11-85 |
| BY            | JAS     |

PLAN OF ASARCO DRILL HOLES  
U.S. FOREST SERVICE

PINAL COUNTY, ARIZONA

SCALE: 1" = 500'

J.D. Sell

Jan, 1983

MYK-54

# PURCHASE ORDER

DATE

June 19, 1987

ORDER NO.

T-140-7

PLANT JOB NO.

**American Smelting And Refining Co.**

TUCSON OFFICE

P. O. BOX 5747

1150 NORTH 7TH AVENUE

TUCSON, ARIZONA 85703

REQUISITION NO.

APPROPRIATION NO.

To:

Harness Drilling Company, Inc.  
P. O. Box 43367  
Tucson, Arizona 85733

FINAL DESTINATION — PLEASE NOTE CONSIGNMENT BELOW

DATE REQUIRED AT DESTINATION:

CONSIGNMENT — SELLER WILL SHIP TO

SHIPPING INTERVAL PROMISED

SELLER WILL SHIP BEFORE:

POINT OF SHIPMENT

TERMS:

— RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS —

F.O.B. POINT

SHIP VIA

| QUANTITY | UNIT | SPECIFICATIONS  | ITEM NO. | UNIT PRICE |
|----------|------|---|----------|------------|
|          |      | <p>Harness Drilling Company, Inc., hereinafter referred to as CONTRACTOR, will initiate and drill an exploration hole at ASARCO Incorporated's Superior East Project, Pinal County, Arizona, the final depth of which will be specified by ASARCO's representative(s) at the jobsite. Payment for work performed will be in accordance with CONTRACTOR's letter of proposal dated June 19, 1987, a copy of which is attached hereto and made a part of this order.</p> <p>CONTRACTOR will provide a drill and water truck complete with crews and accessories. Mobilization of CONTRACTOR's equipment will commence on or about late June, 1987.</p> <p>It is understood by both parties to this order that CONTRACTOR will perform all work in a diligent and workmanlike manner and in accordance with recognized standard drilling practices. ASARCO will not be charged for delays caused by failure of CONTRACTOR's equipment or personnel.</p> <p>CONTRACTOR and his personnel will make every effort to minimize disturbance of the natural environment, and drill crews will establish and maintain sanitation systems which are acceptable to ASARCO and which comply with standards set by any government agency whether federal, state, county, or municipal which has jurisdiction over the site area.</p> <p>CONTRACTOR's particular attention is called to Clause Eleven (11) on the reverse of this order. Before entering upon ASARCO's property to perform this work, CONTRACTOR will submit acceptable evidence of compliance with the Workmen's Compensation Laws of the State of Arizona and, on ASARCO's standard insurance form, acceptable evidence of other required insurance.</p> |          |            |

ACCEPTED FOR: Harness Drilling Company, Inc.

By: *[Signature]* Title

## IMPORTANT

Attached Acknowledgment Card must be completed and returned promptly.

Orig: Harness Drilling Company, Inc. ✓

cc: " " " " , for acceptance

JDSell, WDGay, Accounting Dept., File

PLEASE ENTER OUR ORDER FOR THE ITEMS SPECIFIED ABOVE, SUBJECT TO ALL INSTRUCTIONS AND PROVISIONS ON REVERSE SIDE.

*[Signature]*  
Manager, Southwestern United States Division



## INSTRUCTIONS

**INVOICE:** Priced invoices in the requisite number giving the correct purchase order and requisition numbers, together with required Bills of Lading, must be forwarded on day of each shipment AS PER SPECIAL SHIPPING INSTRUCTIONS ACCOMPANYING THIS ORDER, otherwise delay in payment of account may result.

**TERMS:** As previously arranged or specified on this order. Care must be exercised to show cash discount, if allowed, on face of invoice.

## PROVISIONS

**1. ACCEPTANCE:** Acceptance of this order constitutes acceptance of all terms herein stated. All representations and warranties by the seller relating to the subject-matter of this order or its performance shall be binding on the seller as if fully set forth herein, and shall survive inspection and acceptance of the goods ordered. No acknowledgment or acceptance of this order or any other communication by the seller shall vary or add any terms or conditions to those contained herein and any such attempted modification or addition which is not accepted in writing by the buyer, shall be void and may be disregarded without further notice or disclaimer.

**2. PRICES:** This order must not be filled at higher prices than last quoted without authority of the buyer.

**3. SHIPMENTS:** All materials must be forwarded by the route designated and seller will be held strictly accountable for any deviation therefrom.

When the material covered by this order shall aggregate a carload shipment or more, the seller must forward in carload lots, unless duly authorized in writing by the buyer to ship in less than carloads. If this order aggregates less than a minimum carload, seller must forward the entire quantity at one time unless otherwise authorized in writing by the buyer.

When blocking or dunnage, etc., not constituting a part of the car are used to protect and make shipments secure in transit, seller must show on Bills of Lading, separately, the weights of such materials, provided the lading shall aggregate a minimum carload or more, and will be held responsible for failure to comply with this rule.

Shipments will not be considered as completed until Bill of Lading, or express or mail receipt is received.

**4. PACKING AND CARTAGE CHARGES:** No charge will be allowed for packing, boxing or cartage, unless agreed upon at the time of purchase; damage to any material not properly packed to insure adequate protection in transit will be charged to the seller. All packing must conform with tariff or classification requirements so as to secure lowest possible freight rates. It is understood the buyer will receive the benefit of any decrease in freight charges between time of quotation and date of shipment, where freight enters into the price originally quoted.

**5. QUALITY AND INSPECTION:** All material furnished must be as specified and will be subject to inspection and approval of buyer after delivery. The right is reserved to reject and return at the risk and expense of the seller such portion of any shipment which may be defective or fail to comply with the specifications without invalidating the remainder of the order. If rejected it may be held for disposition at the expense and risk of the seller.

**6. QUANTITY:** The specific quantity ordered must not be changed without buyer's permission in writing.

**7. NON-PERFORMANCE:** Buyer reserves the right to cancel this order or any portion of same if delivery is not made when and as specified, time being of the essence of this order, and charge seller for any loss entailed.

**8. PATENTS:** The seller hereby guarantees the buyer against all losses of profits, damages, or both, resulting from any patent infringement by reason of purchasing or using goods covered by this order, or by reason of any loss suffered in not being able, without liability, to use such goods. This guarantee also includes the reimbursement to the buyer of all litigation costs which it may suffer as the result of any suit respecting the purchase or use of such goods, in addition to the recoveries which may be secured against it of profits and/or damages.

## GENERAL:

**9.** The material on this order must be furnished only by the person or firm to whom the order is addressed unless otherwise authorized by the buyer.

**10.** No drafts for purchases made will be honored unless by agreement.

**11.** If it becomes necessary for the seller or any agent, contractor, or employee thereof to enter upon the property of the buyer in order to construct, inspect or deliver hereunder, the seller hereby agrees to protect the buyer's property and all persons thereon from injury, damage or loss, and the seller shall save harmless and indemnify the buyer from and against any expense, loss or damage on account of any claim, demand or suit made by any person whomsoever, including any employee of the buyer, which is in any way caused by or connected with or grows out of the performance hereunder by the seller or any agent, contractor or employee thereof; provided however that the seller shall not be required to indemnify the buyer against any loss caused solely by the negligence or willful fault of the buyer or its employees. If the seller performs any work hereunder knowing it to be contrary to any local law, ordinance, rule and regulation, the seller shall bear all costs arising therefrom. Seller to carry Liability Insurance and to carry Workmen's Compensation Insurance as provided by the laws of the State in which the work is performed and further, is to obtain a certificate for same, which is to be furnished for the file of the buyer. If for any reason the seller's or any subcontractor's employees or agents may acquire a status imposing liability on the buyer for employer's contributions or taxes under the Federal Social Security Act or under any State Unemployment Insurance, Old Age Benefit, or similar Acts, the seller shall be exclusively liable for, and shall indemnify the buyer against, the same and does agree to comply with all laws and regulations so as to relieve the buyer from any and all liability therefor or the responsibility of making any reports or keeping any records with respect thereto.

**12.** In accepting this order the seller certified that these goods were produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and of the regulations and orders of the United States Department of Labor issued under Section 14 thereof. It will be necessary in order for us to honor your future invoices to us that the above clause or a substantial equivalent thereof appear on your invoices.

**13.** By acceptance of this order, seller warrants that the prices specified do not exceed the maximum prices established under any applicable United States law or regulation thereunder.

JOE B. HARNESS

A.J.R.

YARD PHONE 602-623-4668  
HOME PHONE 602-~~222~~ ~~3000~~



JUN 19 1987

## HARNESS DRILLING COMPANY, INC.

BOX 43367 • TUCSON, ARIZONA 85733

June 19, 1987

Jim Sell  
Asarco Inc.  
Mining Dept.  
1150 N 7TH Ave  
Superior, Az. Loc

Mob and Demob ..... 500.00 Each

Drill 53/4 to 6" Hole Apx 1000 Ft @\$11.50 Per Ft

Per Dem , 3Men, \$40.00 Per Day, Each.

Rig and crew for setting caseing, \$125.00 per Hr.

Drillling, Setting, Surface Pipe And Cement In Place

Rig And Crew..... 135.00 Per Hr.

*J. B. Harness*  
Joe B. Harness, Pres.

DWR # 64

Contractor License # 046870-005



# CERTIFICATE OF INSURANCE

SET TAB STOPS AT ARROWS  
ISSUE DATE (MM/DD/YY)

06-22-87 1ge

## PRODUCER

**ASSOCIATED INSURANCE AND SURETY, INC.**  
POST OFFICE BOX 13329  
TUCSON AZ 85732-3329  
(602) 795-8511

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

## COMPANIES AFFORDING COVERAGE

COMPANY LETTER **A** NORTHBROOK PROPERTY & CASUALTYCOMPANY LETTER **B**COMPANY LETTER **C**COMPANY LETTER **D**COMPANY LETTER **E**

## INSURED

**HARNES DRILLING COMPANY, INC.**  
JOE B. HARNES, INDIVIDUALLY  
P O BOX 43367  
TUCSON AZ 85733

## COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

| CO<br>LTR | TYPE OF INSURANCE   | POLICY NUMBER | POLICY EFFECTIVE<br>DATE (MM/DD/YY) | POLICY EXPIRATION<br>DATE (MM/DD/YY) | LIABILITY LIMITS IN THOUSANDS |                         |           |
|-----------|---|---------------|-------------------------------------|--------------------------------------|-------------------------------|-------------------------|-----------|
|           |   |               |                                     |                                      |                               | EACH<br>OCCURRENCE      | AGGREGATE |
| A         | <b>GENERAL LIABILITY</b>  | Binder #4934  | 06-20-87                            | 06-20-88                             | BODILY INJURY                 | \$                      | \$        |
|           | <input checked="" type="checkbox"/> COMPREHENSIVE FORM  |               |                                     |                                      | PROPERTY DAMAGE               | \$                      | \$        |
|           | <input checked="" type="checkbox"/> PREMISES/OPERATIONS UNDERGROUND EXPLOSION & COLLAPSE HAZARD |               |                                     |                                      | BI & PD COMBINED              | \$ 1,000,               | \$ 1,000, |
|           | <input checked="" type="checkbox"/> PRODUCTS/COMPLETED OPERATIONS                               |               |                                     |                                      | PERSONAL INJURY               |                         | \$ 1,000, |
|           | <input checked="" type="checkbox"/> CONTRACTUAL   |               |                                     |                                      |                               |                         |           |
|           | <input checked="" type="checkbox"/> INDEPENDENT CONTRACTORS                                     |               |                                     |                                      |                               |                         |           |
|           | <input checked="" type="checkbox"/> BROAD FORM PROPERTY DAMAGE                                  |               |                                     |                                      |                               |                         |           |
|           | <input checked="" type="checkbox"/> PERSONAL INJURY   |               |                                     |                                      |                               |                         |           |
| A         | <b>AUTOMOBILE LIABILITY</b>   | Binder #4934  | 06-02-87                            | 06-20-88                             | BODILY INJURY (PER PERSON)    | \$                      |           |
|           | <input checked="" type="checkbox"/> ANY AUTO  |               |                                     |                                      | BODILY INJURY (PER ACCIDENT)  | \$                      |           |
|           | <input type="checkbox"/> ALL OWNED AUTOS (PRIV. PASS.)  |               |                                     |                                      | PROPERTY DAMAGE               | \$                      |           |
|           | <input type="checkbox"/> ALL OWNED AUTOS (OTHER THAN PRIV. PASS.)                               |               |                                     |                                      | BI & PD COMBINED              | \$ 1,000,               |           |
|           | <input type="checkbox"/> HIRED AUTOS  |               |                                     |                                      |                               |                         |           |
|           | <input type="checkbox"/> NON-OWNED AUTOS  |               |                                     |                                      |                               |                         |           |
|           | <input type="checkbox"/> GARAGE LIABILITY   |               |                                     |                                      |                               |                         |           |
|           | <b>EXCESS LIABILITY</b>   |               |                                     |                                      | BI & PD COMBINED              | \$                      | \$        |
|           | <input type="checkbox"/> UMBRELLA FORM  |               |                                     |                                      |                               |                         |           |
|           | <input type="checkbox"/> OTHER THAN UMBRELLA FORM   |               |                                     |                                      |                               |                         |           |
|           | <b>WORKERS' COMPENSATION<br/>AND<br/>EMPLOYERS' LIABILITY</b>                                   |               |                                     |                                      | STATUTORY                     |                         |           |
|           |   |               |                                     |                                      | \$                            | (EACH ACCIDENT)         |           |
|           |   |               |                                     |                                      | \$                            | (DISEASE-POLICY LIMIT)  |           |
|           |   |               |                                     |                                      | \$                            | (DISEASE-EACH EMPLOYEE) |           |
|           | <b>OTHER</b>  |               |                                     |                                      |                               |                         |           |

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

## CERTIFICATE HOLDER

**ASARCO INC.**  
MINING DEPARTMENT - JIM SELL  
1170 N 7TH AVENUE  
TUCSON AZ 85705

## CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL \_\_\_\_\_ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

# INSURANCE BINDER

THIS BINDER IS A TEMPORARY INSURANCE CONTRACT, SUBJECT TO THE CONDITIONS SHOWN ON THE REVERSE SIDE OF THIS FORM.

Binder No.

4934

NAME AND ADDRESS OF AGENCY

**ASSOCIATED INSURANCE AND SURETY, INC.**  
POST OFFICE BOX 13329  
TUCSON ARIZONA 85732-3329  
(602) 795-8511

COMPANY

**NORTHBROOK PROPERTY & CASUALTY CO.**

Effective 12:01 a.m. June 20, 19 87  
Expires ☒ 12:01 am ☐ Noon Aug. 20 19 87

☐ This binder is issued to extend coverage in the above named company per expiring policy # \_\_\_\_\_ (except as noted below)

NAME AND MAILING ADDRESS OF INSURED

**HARNESS DRILLING COMPANY, INC. and Harness**  
Geothermal Air Drilling Service and  
Joe B. Harness, Individually  
P O Box 43367  
Tucson, AZ 85733

Description of Operation/Vehicles/Property

Veh #1: '75 GMC Flatbed #9670  
Veh #2: '79 Kenworth Tractor #65GL  
Veh #3: '78 Great Dane semitrailer #0524

| Type and Location of Property |   | Coverage/Perils/Forms       | Amt of Insurance | Ded. | Coins. % |
|-------------------------------|---|-----------------------------|------------------|------|----------|
| PROPERTY                      | EQUIPMENT FLOATER:<br>'68 Failing 1250 Rotary Rig, 32' Tower,<br>w/5x6 Mud Pump, 252 Leroy Compressor<br><br>'Semi-cole Drill, Reversible Circulation,<br>on tracks | "All Risk" Replacement Cost | \$25,000.        | 500  | 100      |
|                               |   |                             | \$30,000.        | 500  | 100      |

| LIABILITY   | Type of Insurance | Coverage/Forms  | Limits of Liability                      |               |
|---|-------------------|---|--|---------------|
|   |                   |   | Each Occurrence                          | Aggregate     |
| <input type="checkbox"/> Scheduled Form<br><input checked="" type="checkbox"/> Comprehensive Form<br><input checked="" type="checkbox"/> Premises/Operations<br><input checked="" type="checkbox"/> Products/Completed Operations<br><input type="checkbox"/> Contractual<br><input checked="" type="checkbox"/> Other (specify below) Broad Form C.G.L.<br><input type="checkbox"/> Med. Pay. \$ _____ Per Person<br><input checked="" type="checkbox"/> Personal Injury |                   |   | Bodily Injury                            | \$ _____      |
|   |                   |   | Property Damage                          | \$ _____      |
|   |                   |   | Bodily Injury & Property Damage Combined | \$ 1,000,000. |
|   |                   | <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> B <input checked="" type="checkbox"/> C | Personal Injury                          | \$ 1,000,000. |
|   |                   |   |  |               |

| AUTOMOBILE  | Type of Insurance | Coverage/Forms                           | Limits of Liability   |  |                               |          |
|---|-------------------|--|---|--|-------------------------------|----------|
|   |                   |  |   |  |                               |          |
|   |                   |  | <input checked="" type="checkbox"/> Liability <input type="checkbox"/> Non-owned <input type="checkbox"/> Hired |  | Bodily Injury (Each Person)   | \$ _____ |
|   |                   |  | <input type="checkbox"/> Comprehensive-Deductible \$ _____  |  | Bodily Injury (Each Accident) | \$ _____ |
|   |                   |  | <input checked="" type="checkbox"/> Collision-Deductible \$ 1,000 - Vehicle #1 & #2                             |  | Property Damage               | \$ _____ |
| <input type="checkbox"/> Medical Payments \$ _____                                  |                   | Bodily Injury & Property Damage Combined | \$ 1,000,000.   |  |                               |          |
| <input checked="" type="checkbox"/> Uninsured Motorist \$ _____                     |                   |  |   |  |                               |          |
| <input type="checkbox"/> No Fault (specify):  |                   |  |   |  |                               |          |
| <input checked="" type="checkbox"/> Other (specify): Specified Perils - Veh #1 & #2 |                   |  |   |  |                               |          |

☐ WORKERS' COMPENSATION — Statutory Limits (specify states below)

☐ EMPLOYERS' LIABILITY — Limit \$ \_\_\_\_\_

SPECIAL CONDITIONS/OTHER COVERAGES

NAME AND ADDRESS OF ☐ MORTGAGEE ☐ LOSS PAYEE ☐ ADD'L INSURED  
LOAN NUMBER \_\_\_\_\_

ASSOCIATED INSURANCE AND SURETY, INC.

*Ronald L. Edwards* 06-22-87  
Signature of Authorized Representative Date 18e

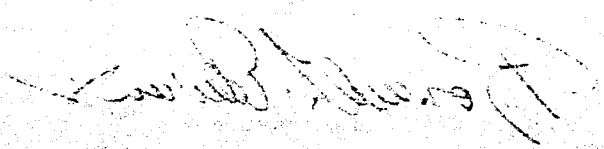
### **CONDITIONS**

This Company binds the kind(s) of insurance stipulated on the reverse side. This insurance is subject to the terms, conditions and limitations of the policy(ies) in current use by the Company.

This binder may be cancelled by the insured by surrender of this binder or by written notice to the Company stating when cancellation will be effective. This binder may be cancelled by the Company by notice to the Insured in accordance with the policy conditions. This binder is cancelled when replaced by a policy. If this binder is not replaced by a policy, the Company is entitled to charge a premium for the binder according to the Rules and Rates in use by the Company.

### **APPLICABLE IN NEVADA**

Any person who refuses to accept a binder which provides coverage of less than \$1,000,000.00 when proof is required: (A) Shall be fined not more than \$500.00, and (B) is liable to the party presenting the binder as proof of insurance for actual damages sustained therefrom.

A handwritten signature in dark ink, appearing to be "David B. [illegible]", is located at the bottom left of the page. The signature is written in a cursive, flowing style.

**BRYANT CONSTRUCTION CO.**  
 General Contractors Lic. No. A-43332  
 843 SPRAY ST., SUPERIOR, AZ 85273  
 Phone 689-2627

ASARCO Incorporated

JUL 29 1987

SW Exploration

**INVOICE**  
 001901

July 28, 1987

SOLD TO

ASARCO  
 Box 5747  
 Tucson, Az 85703

SHIP TO

Attn: Bill Gay

| CUST. ORDER NO. | DATE SHIPPED | SHIPPED VIA | TERMS | SALESMAN | F.O.B. | OUR ORDER NO. |
|-----------------|--------------|-------------|-------|----------|--------|---------------|
|-----------------|--------------|-------------|-------|----------|--------|---------------|

| QUANTITY | DESCRIPTION                                       | UNIT PRICE | AMOUNT |
|----------|---|------------|--------|
|          | Superior East Project                             |            |        |
| 6-24-87  | 8 hrs Hough Loader Repairing Roads @ 55.00        |            | 440.00 |
|          | 8 hrs Laborer and Pickup @ 16.00 per Hr.          |            | 128.00 |
| 6-25-87  | 4 hrs Hough Loader Repairing Roads @ 55.00 Per hr |            | 220.00 |
|          | 4 hrs Laborer and Pickup @ 16.00 per hr           |            | 64.00  |
|          |   |            | 852.00 |
|          |   |            | 33.00  |
|          |   |            | 885.00 |
|          | 5% tax on 660.00                                  |            |        |
|          | Total   |            |        |

APPROVED FOR PAYMENT

By: *James H. Lee*

((Signature),

October 28, 1987

J.D. Sell

Magma Copper  
Sun Claims Assessment

On October 20, 1987 the records were check at the Pinal County Recorder's office, and it was affirmed that Magma Copper had filed their assessment work for the year ending September 1988, on Sun 52-71 claims.

WDG:mek

cc: W. D. Gay

*W. D. Gay*  
W. D. Gay

SR Tittley 2/5/88  
2

pink feldspar specimens poorly generally lamellar!



February 12, 1988

F. T. Graybeal  
New York Office

Land Status - Mineral Inventory  
Superior East Project  
Pinal County, Arizona

For clarification of some thoughts expressed during your recent visit to SWED, I submit the following Figure 1.

Figure 1 is a plat of the present claim outline (in orange), the "porphyry copper" resource (solid red), with dashed outer rim of lower grade potential (dashed red), and the native copper resource (green), on the topographic base.

To restate:

The porphyry copper present resource is 204 million tons at 0.90% copper, with the dashed line expressing potential extension out to 0.50% copper. (See report: Revised Sections - Plans and Mineral Inventory, SE Proj., 2 p. plus 19 attachments, Dec. 20, 1985.)

The native copper resource on restricted blocks:

|          |                  |                   |
|----------|------------------|-------------------|
| Asarco   | 136 million tons | } at 0.80% copper |
| Newmont  | 175 " "          |                   |
| Oak Flat | 120 " "          |                   |

The outline shows the resource potential of two-three times the above figure, at 0.80% copper. (See report: Whitetail Copper Potential, SE Proj., 6 p. plus 18 attachments, Nov. 8, 1974.)

Also see the report: Best Fit claims, SE Proj., 3 p. plus 2 maps, July 16, 1984, for further information on the total area.

As can be noted, the present claim boundary north of the porphyry copper discovery may be very close, one claim width, to the low-grade outer fringe. Likewise to the north and south of the native copper outline, the present claim block boundary is within the resource outline.

Hole A-16 is the current Asarco hole in progress.

Newmont has recorded the assessment work on the Sun 52-71 claim block for the year ending August 31, 1987. The Oak group is patented.

F. T. Graybeal

February 12, 1988  
Page 2

To our knowledge, the "dropped" Kay, Margaret, and Dacite claims have not been picked up by others.

Should more claims be added to our position?

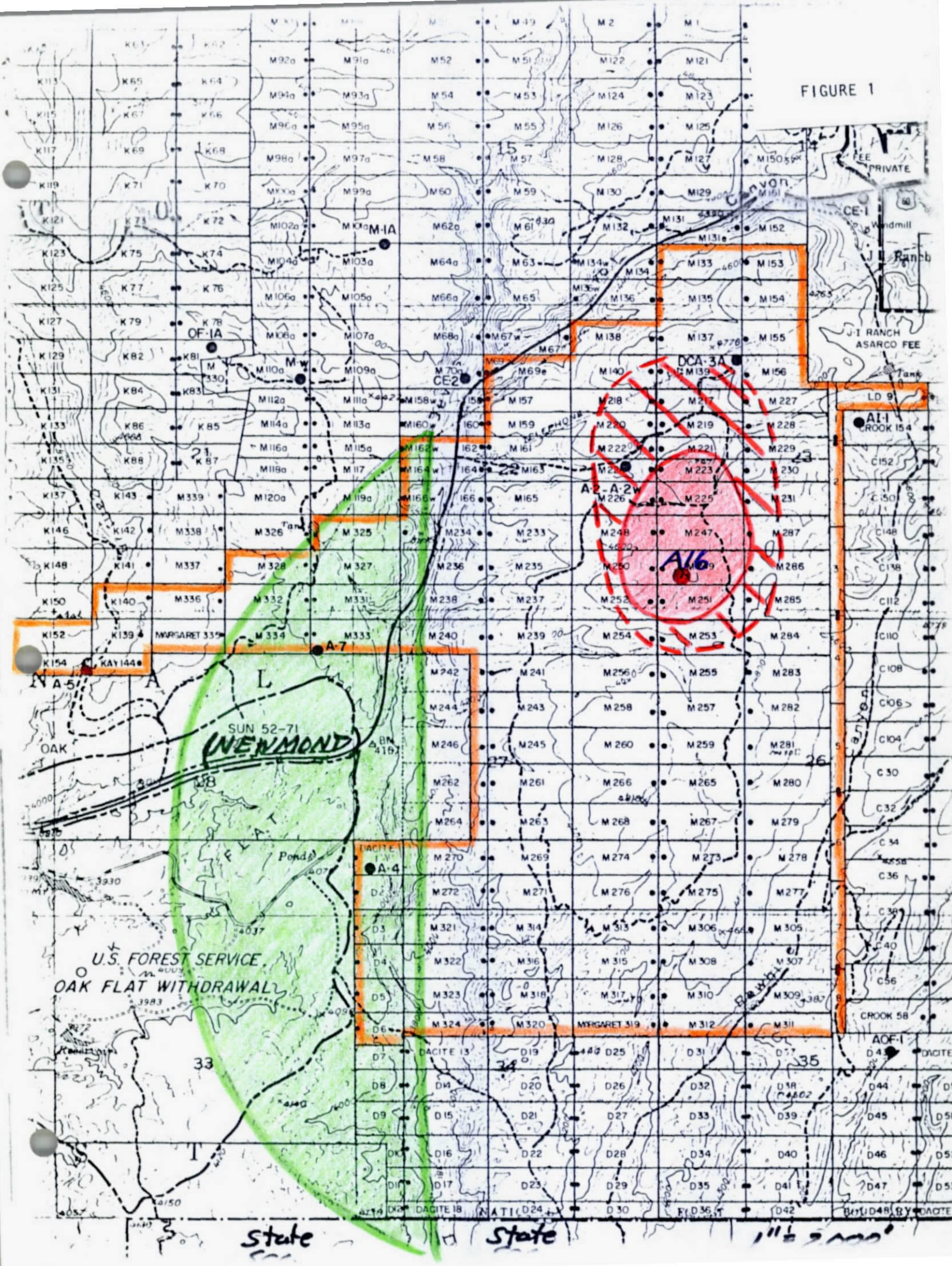
JDS:mek  
Att.

James D. Sell

cc: W.L. Kurtz  
W.D. Gay



FIGURE 1





# PURCHASE ORDER

## American Smelting And Refining Co.

TUCSON OFFICE  
P. O. BOX 5747

1150 NORTH 7TH AVENUE  
TUCSON, ARIZONA 85703

DATE

ORDER NO.

REQUISITION NO.

PLANT JOB NO.

APPROPRIATION NO.

To:

DATE REQUIRED AT DESTINATION:

SHIPPING INTERVAL PROMISED

SELLER WILL SHIP BEFORE:

POINT OF SHIPMENT

TERMS:

F.O.B. POINT

FINAL DESTINATION — PLEASE NOTE CONSIGNMENT BELOW

CONSIGNMENT — SELLER WILL SHIP TO

— RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS —

SHIP VIA

| QUANTITY | UNIT | SPECIFICATIONS | ITEM NO. | UNIT PRICE |
|----------|------|----------------|----------|------------|
|          |      |                |          |            |



### IMPORTANT

Attached Acknowledgment Card must  
be completed and returned promptly.

PLEASE ENTER OUR ORDER FOR THE ITEMS SPECIFIED ABOVE, SUB-  
JECT TO ALL INSTRUCTIONS AND PROVISIONS ON REVERSE SIDE.

## INSTRUCTIONS

**INVOICE:** Priced invoices in the requisite number giving the correct purchase order and requisition numbers, together with required Bills of Lading, must be forwarded on day of each shipment AS PER SPECIAL SHIPPING INSTRUCTIONS ACCOMPANYING THIS ORDER, otherwise delay in payment of account may result.

**TERMS:** As previously arranged or specified on this order. Care must be exercised to show cash discount, if allowed, on face of invoice.

## PROVISIONS

**1. ACCEPTANCE:** Acceptance of this order constitutes acceptance of all terms herein stated. All representations and warranties by the seller relating to the subject-matter of this order or its performance shall be binding on the seller as if fully set forth herein, and shall survive inspection and acceptance of the goods ordered. No acknowledgment or acceptance of this order or any other communication by the seller shall vary or add any terms or conditions to those contained herein and any such attempted modification or addition which is not accepted in writing by the buyer, shall be void and may be disregarded without further notice or disclaimer.

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When blocking or dunnage, etc., not constituting a part of the car are used to protect and make shipments secure in transit, seller must show on Bills of Lading, separately, the weights of such materials, provided the lading shall aggregate a minimum carload or more, and will be held responsible for failure to comply with this rule.

Shipments will not be considered as completed until Bill of Lading, or express or mail receipt is received.

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**5. QUALITY AND INSPECTION:** All material furnished must be as specified and will be subject to inspection and approval of buyer after delivery. The right is reserved to reject and return at the risk and expense of the seller such portion of any shipment which may be defective or fail to comply with the specifications without invalidating the remainder of the order. If rejected it may be held for disposition at the expense and risk of the seller.

**6. QUANTITY:** The specific quantity ordered must not be changed without buyer's permission in writing.

**7. NON-PERFORMANCE:** Buyer reserves the right to cancel this order or any portion of same if delivery is not made when and as specified, time being of the essence of this order, and charge seller for any loss entailed.

**8. PATENTS:** The seller hereby guarantees the buyer against all losses of profits, damages, or both, resulting from any patent infringement by reason of purchasing or using goods covered by this order, or by reason of any loss suffered in not being able, without liability, to use such goods. This guarantee also includes the reimbursement to the buyer of all litigation costs which it may suffer as the result of any suit respecting the purchase or use of such goods, in addition to the recoveries which may be secured against it of profits and/or damages.

## GENERAL:

**9.** The material on this order must be furnished only by the person or firm to whom the order is addressed unless otherwise authorized by the buyer.

**10.** No drafts for purchases made will be honored unless by agreement.

**11.** If it becomes necessary for the seller or any agent, contractor, or employee thereof to enter upon the property of the buyer in order to construct, inspect or deliver hereunder, the seller hereby agrees to protect the buyer's property and all persons thereon from injury, damage or loss, and the seller shall save harmless and indemnify the buyer from and against any expense, loss or damage on account of any claim, demand or suit made by any person whomsoever, including any employee of the buyer, which is in any way caused by or connected with or grows out of the performance hereunder by the seller or any agent, contractor or employee thereof; provided however that the seller shall not be required to indemnify the buyer against any loss caused solely by the negligence or willful fault of the buyer or its employees. If the seller performs any work hereunder knowing it to be contrary to any local law, ordinance, rule and regulation, the seller shall bear all costs arising therefrom. Seller to carry Liability Insurance and to carry Workmen's Compensation Insurance as provided by the laws of the State in which the work is performed and further, is to obtain a certificate for same, which is to be furnished for the file of the buyer. If for any reason the seller's or any subcontractor's employees or agents may acquire a status imposing liability on the buyer for employer's contributions or taxes under the Federal Social Security Act or under any State Unemployment Insurance, Old Age Benefit, or similar Acts, the seller shall be exclusively liable for, and shall indemnify the buyer against, the same and does agree to comply with all laws and regulations so as to relieve the buyer from any and all liability therefor or the responsibility of making any reports or keeping any records with respect thereto.

**12.** In accepting this order the seller certified that these goods were produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and of the regulations and orders of the United States Department of Labor issued under Section 14 thereof. It will be necessary in order for us to honor your future invoices to us that the above clause or a substantial equivalent thereof appear on your invoices.

**13.** By acceptance of this order, seller warrants that the prices specified do not exceed the maximum prices established under any applicable United States law or regulation thereunder.

# PURCHASE ORDER

|                   |
|-------------------|
| PLANT JOB NO.     |
| APPROPRIATION NO. |

## American Smelting And Refining Co.

TUCSON OFFICE  
P. O. BOX 5747

1150 NORTH 7TH AVENUE  
TUCSON, ARIZONA 85703

|                 |
|-----------------|
| DATE            |
| ORDER NO.       |
| REQUISITION NO. |

|                               |                          |
|-------------------------------|--------------------------|
| To:                           |                          |
| DATE REQUIRED AT DESTINATION: |                          |
| SHIPPING INTERVAL PROMISED    | SELLER WILL SHIP BEFORE: |
| POINT OF SHIPMENT             | TERMS:                   |
| F.O.B. POINT                  |                          |

|  |
|--|
| FINAL DESTINATION — PLEASE NOTE CONSIGNMENT BELOW      |
| CONSIGNMENT — SELLER WILL SHIP TO                      |
| — RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS — |
| SHIP VIA   |

| QUANTITY | UNIT | SPECIFICATIONS | ITEM NO. | UNIT PRICE |
|----------|------|----------------|----------|------------|
|          |      |                |          |            |



### IMPORTANT

*Attached Acknowledgment Card must be completed and returned promptly.*

PLEASE ENTER OUR ORDER FOR THE ITEMS SPECIFIED ABOVE, SUBJECT TO ALL INSTRUCTIONS AND PROVISIONS ON REVERSE SIDE.

A-16

Collar  $\pm$  4770'

present 1020'

elev  $\frac{Tb}{Ter}$

3150

1620' depth  
found 1692

elev  $\frac{Ter}{Tw}$

2350

2420' depth  
found 2231

30.

elev  $\frac{Tcu}{Dc}$

1100

3670

NC

25'  $\frac{1}{100,000}$

Ph  
.035 Au

Zn  
.004

Mn  
.03

33,000  
16  
49,100  
50,000

JDS

ASARCO Incorporated

MAY 3 1988

SW Exploration

JOY-CBC DRILLING

707 BOYD BOULEVARD  
P.O. DRAWER 489  
LAPORTE, INDIANA 46350  
PHONE: (219) 362-2191

May 3, 1988

Mr. Jim Sell  
Asarco Incorporated  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

*hole A-16*

We appreciated receiving the invitation to bid on your core drilling near Superior, Arizona. We have drilled in the area before. We understand you have a rotary hole cased to 1020 feet with four inch pipe to bottom and want to commence coring with NC wireline tools.

Please consider the following:

|                                      |                    |                     |
|--------------------------------------|--------------------|---------------------|
| Mobilization                         |                    | \$600.00/rig        |
| Demobilization                       |                    | \$600.00/rig        |
| Extra Road Truck Trips (if required) |                    | \$150.00/round trip |
| <u>Core Drilling</u>                 | <u>NC Wireline</u> | <u>NX Wireline</u>  |
| 1000 to 1500 feet                    | \$19.20/foot       | \$17.70/foot        |
| 1500 to 2000 feet                    | \$20.50/foot       | \$19.00/foot        |
| 2000 to 2500 feet                    | \$22.20/foot       | \$20.70/foot        |

Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$400.00 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$50.00 per hour plus bit and other in-hole supplies at actual cost.

Rig Time & Hourly Work

|   |                                  |
|---|----------------------------------|
| Setting and Pulling Casing and Pipe<br>(two man crew) | \$50.00/hour +<br>materials used |
|---|----------------------------------|

FORMERLY JOY CONTRACT DRILL DIVISION



Mr. Jim Sell  
Asarco Incorporated

Page 2  
May 3, 1988

Rig Time & Hourly Work (continued)

|   |   |
|---|---|
| Cementing and/or Plugging Drill Holes (two man crew). Includes all time required to maintain good hole conditions while drilling. Also includes time required to close or complete hole as required.                      | \$50.00/hour + materials used             |
| Reaming, if necessary (two man crew)  | \$50.00/hour + materials used             |
| Survey (two man crew)   | \$50.00/hour + Asarco supplies instrument |
| Re-entering Previously Drilled Holes (two man crew). Includes all time worked entering previously drilled hole until wireline core bit is cutting in solid rock formation on true bottom of hole. This will also include: | \$60.00/hour + materials used             |
| (a) Time which is required to line up drill over previously drilled hole.   |   |
| (b) Time required to set casing in pre-drilled hole before starting to drill with wireline tools.   |   |
| (c) All time required to correct any problems encountered with existing casing or pipe in hole.   |   |
| Standby Time for Your Convenience   | \$35.00/hour                              |
| Extra Labor Authorized by Asarco (if required)  | \$20.00/man hour                          |
| Overtime Premium in Excess of 88 hours per two-week pay period (if requested)   | \$6.00/man hour                           |
| <u>Supplies</u>   |   |
| Casing Ordered Left in Place  | NX \$8.00/foot                            |

Mr. Jim Sell  
Asarco Incorporated

Page 3  
May 3, 1988

Supplies (continued)

|  |                       |
|--|-----------------------|
| Casing Lost through Normal Drilling Operations         | 70% of List Price     |
| Diamond Bit Loss in Excess of \$2.50/foot              | At Actual Cost        |
| Drilling Mud & Additives                               | At Jobsite Cost + 20% |
| Weather-treated Core Boxes which hold ten feet of core | \$2.50 each           |
| Special Purchases Authorized by Customer (if required) | At Cost + 20%         |

Water Pumping or Hauling

|  |                      |
|--|----------------------|
| Water Pump Rental                      | \$400.00/month       |
| Supply Pump & Pipeline Work            | \$20.00/man hour     |
| Water Truck Usage                      | \$600.00/month       |
| Mileage                                | \$.75/mile           |
| Water Truck Driver (if required)       | \$20.00/man hour     |
| <u>Per Diem</u> (excluding local help) | \$15.00/man/work day |

The above prices are firm if accepted within 30 days and will remain in effect until 9/25/88. Our terms are Net 30 Days on monthly progress invoices.

We understand Asarco will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to JOY-CBC Drilling. We further understand that Asarco will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable JOY-CBC Drilling to carry out the specified work.

We propose doing this work with a Joy Truck Mounted 22 Drill and Joy Wireline Equipment. We will probably work two shifts

Mr. Jim Sell  
Asarco Incorporated

Page 4  
May 3, 1988

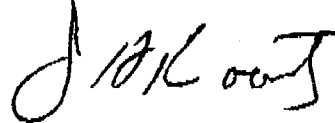
per day unless hole conditions warrant round the clock operation.

You should contact Nino Trujillo (602-884-5866) to confirm a starting date.

We would look forward to working with you on this project.

Yours very truly,

JOY-CBC DRILLING

A handwritten signature in dark ink, appearing to read "J H Koontz", is written over the typed name.

J. H. Koontz  
Vice President &  
General Manager

JHK/ts

# ASARCO

Exploration Department  
Southwestern United States Division

May 11, 1988

Dept. of Water Resources  
State of Arizona  
99 E. Virginia, Suite 100  
Phoenix, AZ 85004

Superior East Project  
Pinal County, AZ

Gentlemen:

In compliance with drill hole regulations ASARCO Incorporated requests a drilling permit as described in the attached "Notice of Intention to Drill or Deepen a Well" form. A check for the \$10 filing fee is enclosed.

If you have any questions, please call or write to me or J.D. Sell, Manager, SWED.

Sincerely yours,



W. D. Gay  
Land Engineer

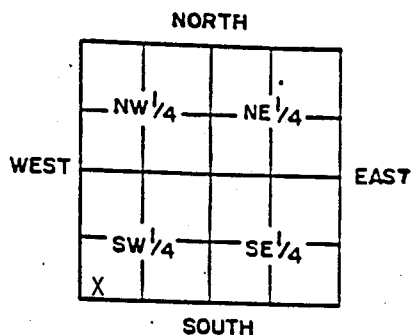
WDG:mek  
att.

cc: W.L. Kurtz  
J.D. Sell  
C.L. Snow  
Joy-CBC Drilling

FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES (DWR)  
NOTICE OF INTENTION TO DRILL OR DEEPEN A WELL  
OUTSIDE OF AN ACTIVE MANAGEMENT AREA

Section 45-596, Arizona Revised Statutes, provides: In an area not subject to Active Management, a person may not drill or cause to be drilled any well or deepen an existing well without first filing a Notice of Intention to Drill with the Department.



INDICATE WELL LOCATION BY X  
(Above diagram represents one  
640 acre section.)

WELL/LAND LOCATION:

- Township 1 N/S
- Range 13 E/W
- Section 23
- SW 1/4, SW 1/4, SW 1/4  
10 acre subdivision
- County Pinal

- Owner of well:  
ASARCO Incorporated  
Name P.O. Box 5747  
Mailing address Tucson AZ 85703  
City Tucson State AZ Zip 85703  
Telephone (602) 792-3010

- Owner of land:  
U.S. Dept. of Agriculture  
Forest Service  
Name Rt. 1, Box 33  
Mailing Address Globe, AZ 85501  
City Globe State AZ Zip 85501

DESCRIPTION OF WELL:

- Diameter 6 3/4 inches  
Depth About 1000 feet
- Type of casing Steel Surface
- Design pump capacity:  
N/A gallons per minute
- Estimate of total annual  
pumping: -0- acre feet
- Principal use of water:  
None  
(Be Specific)
- Other uses intended:  
None  
(Be Specific)
- If for irrigation, state the  
number of acres to be irrigated:  
-0- acres
- Construction will start about:  
June 1988  
Month Year

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

FILE NO. \_\_\_\_\_

FILED \_\_\_\_\_ BY \_\_\_\_\_

INPUT \_\_\_\_\_ BY \_\_\_\_\_

DUPLICATE  
MAILED \_\_\_\_\_ BY \_\_\_\_\_

REGISTRATION NO. \_\_\_\_\_

INA \_\_\_\_\_

W/S \_\_\_\_\_ S/B \_\_\_\_\_

PLACE OF USE:

- Township N/A - N/S
- Range N/A E/W
- Section N/A
- Legal description  
of land N/A
- Type well:  
N/A Exempt  
N/A Non-Exempt
- Action Requested:  
Drill Deepen X Replace  
55-518290
- This notice filed by:  
Owner X  
Lessee \_\_\_\_\_  
ASARCO Incorporated  
Name \_\_\_\_\_  
P.O. Box 5747  
Address Tucson, AZ 85703  
City Tucson State AZ Zip 85703  
Telephone (602) 792-3010
- Drilling Firm:  
JOY-CBC DRILLING  
Name \_\_\_\_\_  
707 Boyd Blvd.  
Address P.O. Drawer 489  
LaPorte, Indiana 46350  
City LaPorte State IN Zip 46350  
75  
DWR License Number

- Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials: Yes No X

GENERAL INSTRUCTIONS

- Fill out this form in duplicate and send to 99 East Virginia, Suite 100, Phoenix, Az. 85004.
- For specific instructions, limitations and conditions, see the reverse side of this form.
- This form is to be used to drill, deepen or replace a well outside of an Active Management Area.
- If the well is a replacement or deepening of an existing well, state the registration number of the existing well in Item 21.
- Construction standards for new and replacement wells and the deepening and abandonment of existing wells shall be in accordance with Department Rules and Regulations.

I state that this Notice is filed in compliance with ARS 45-596 and is complete and correct to the best of my knowledge and belief and that I understand the limitations under which I must operate this well set forth on the reverse side of this form.

DATE 5-11-88

Signature of Person Filing

DWR-55-41-8/86B (Revised)

W.D. Gay  
W.D. Gay, Land Engineer

Voucher No.      Month  
5-101      May      19 88

ASARCO Incorporated  
Tucson Office  
Tucson, Arizona 85703

Filing fee

\$10.00

DETACH BEFORE PRESENTING FOR PAYMENT

**ASARCO**

THE VALLEY NATIONAL BANK OF ARIZONA  
Tucson, Arizona 85701

ASARCO Incorporated  
Tucson Office  
Tucson, Arizona 85703

91-2  
1221

Check

May 12      1988      28747

PAY  
TO THE ORDER OF

The sum of \$10 and 00 Cts      Dollars \$10.00

DEPARTMENT OF WATER RESOURCES  
State of Arizona  
99 E. virginia, Suite 100  
Phoenix, AZ 85004

ASARCO Incorporated

*SA Myers*  
*P.E. Hartman*

⑆122100024⑆

2000⑈0673⑈

# ASARCO

Exploration Department  
Southwestern United States Division

May 12, 1988

Mr. J.H. Koontz  
Vice President & General Manager  
JOY-CBC DRILLING  
707 Boyd Boulevard  
P.O. Drawer 489  
LaPorte, Indiana 46350

Superior East Project  
Pinal County, Arizona

Dear Mr. Koontz:

Attached is Asarco's Purchase Order T-141-8 for drilling at Superior East Project, Pinal County, Arizona, which is to start about June 13, 1988. Please sign the acknowledgement copy and return it to me as soon as possible.

Sincerely yours,



W. D. Gay  
Land Engineer, SWED

WDG:mek  
Att.

cc: J.D. Sell  
C.L. Snow

# PURCHASE ORDER

DATE May 11, 1988

ORDER NO.  
T-141-8

## American Smelting And Refining Co.

TUCSON OFFICE  
P. O. BOX 5747

1150 NORTH 7TH AVENUE  
TUCSON, ARIZONA 85703

REQUISITION NO.

PLANT JOB NO.

APPROPRIATION NO.

To: JOY-CBC DRILLING  
707 Boyd Boulevard  
P.O. Drawer 489  
LaPorte, Indiana 46350

DATE REQUIRED AT DESTINATION:

SHIPPING INTERVAL PROMISED

SELLER WILL SHIP BEFORE:

POINT OF SHIPMENT

TERMS:

F.O.B. POINT

FINAL DESTINATION — PLEASE NOTE CONSIGNMENT BELOW

CONSIGNMENT — SELLER WILL SHIP TO

— RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS —

SHIP VIA

| QUANTITY | UNIT | SPECIFICATIONS  | ITEM NO. | UNIT PRICE |
|----------|------|---|----------|------------|
|          |      | <p>JOY-CBC DRILLING, hereinafter referred to as CONTRACTOR will core drill an exploration hole at ASARCO Incorporated's Superior East Project, Pinal County, Arizona, the final depth of which will be specified by ASARCO's representative(s) at the jobsite. Payment for work performed will be in accordance with CONTRACTOR's letter of proposal dated May 3, 1988, a copy of which is attached hereto and made a part of this order.</p> <p>CONTRACTOR will provide a drill and water truck complete with crews and accessories.</p> <p>Mobilization of CONTRACTOR's equipment will commence on or about June 13, 1988.</p> <p>It is understood by both parties to this order that CONTRACTOR will perform all work in a diligent and workmanlike manner and in accordance with recognized standard drilling practices. ASARCO will not be charged for delays caused by failure of CONTRACTOR's equipment or personnel.</p> <p>CONTRACTOR and his personnel will make every effort to minimize disturbance of the natural environment, and drill crews will establish and maintain sanitation systems which are acceptable to ASARCO and which comply with standards set by any government agency whether federal, state, county, or municipal which has jurisdiction over the site area.</p> <p>CONTRACTOR's particular attention is called to Clause Eleven (11) on the reverse of this order. Before entering upon ASARCO's property to perform this work, CONTRACTOR will submit acceptable evidence of compliance with the Workmen's Compensation Laws of the State of Arizona and, on ASARCO's standard insurance form, acceptable evidence of other required insurance.</p> |          |            |

### IMPORTANT

Attached Acknowledgment ~~Form~~ must  
be completed and returned promptly.  
Orig. & cc: JOY-CBC DRILLING  
cc: JDSell, WDGay, Acctg. Dept., File

PLEASE ENTER OUR ORDER FOR THE ITEMS SPECIFIED ABOVE, SUBJECT TO ALL INSTRUCTIONS AND PROVISIONS ON REVERSE SIDE.

*W. D. Gay for J. D. Sell*  
J.D. Sell, Manager, SWED



## INSTRUCTIONS

**INVOICE:** Priced invoices in the requisite number giving the correct purchase order and requisition numbers, together with required Bills of Lading, must be forwarded on day of each shipment AS PER SPECIAL SHIPPING INSTRUCTIONS ACCOMPANYING THIS ORDER, otherwise delay in payment of account may result.

**TERMS:** As previously arranged or specified on this order. Care must be exercised to show cash discount, if allowed, on face of invoice.

## PROVISIONS

1. **ACCEPTANCE:** Acceptance of this order constitutes acceptance of all terms herein stated. All representations and warranties by the seller relating to the subject-matter of this order or its performance shall be binding on the seller as if fully set forth herein, and shall survive inspection and acceptance of the goods ordered. No acknowledgment or acceptance of this order or any other communication by the seller shall vary or add any terms or conditions to those contained herein and any such attempted modification or addition which is not accepted in writing by the buyer, shall be void and may be disregarded without further notice or disclaimer.

2. **PRICES:** This order must not be filled at higher prices than last quoted without authority of the buyer.

3. **SHIPMENTS:** All materials must be forwarded by the route designated and seller will be held strictly accountable for any deviation therefrom.

When the material covered by this order shall aggregate a carload shipment or more, the seller must forward in carload lots, unless duly authorized in writing by the buyer to ship in less than carloads. If this order aggregates less than a minimum carload, seller must forward the entire quantity at one time unless otherwise authorized in writing by the buyer.

When blocking or dunnage, etc., not constituting a part of the car are used to protect and make shipments secure in transit, seller must show on Bills of Lading, separately, the weights of such materials, provided the lading shall aggregate a minimum carload or more, and will be held responsible for failure to comply with this rule.

Shipments will not be considered as completed until Bill of Lading, or express or mail receipt is received.

4. **PACKING AND CARTAGE CHARGES:** No charge will be allowed for packing, boxing or cartage, unless agreed upon at the time of purchase; damage to any material not properly packed to insure adequate protection in transit will be charged to the seller. All packing must conform with tariff or classification requirements so as to secure lowest possible freight rates. It is understood the buyer will receive the benefit of any decrease in freight charges between time of quotation and date of shipment, where freight enters into the price originally quoted.

5. **QUALITY AND INSPECTION:** All material furnished must be as specified and will be subject to inspection and approval of buyer after delivery. The right is reserved to reject and return at the risk and expense of the seller such portion of any shipment which may be defective or fail to comply with the specifications without invalidating the remainder of the order. If rejected it may be held for disposition at the expense and risk of the seller.

6. **QUANTITY:** The specific quantity ordered must not be changed without buyer's permission in writing.

7. **NON-PERFORMANCE:** Buyer reserves the right to cancel this order or any portion of same if delivery is not made when and as specified, time being of the essence of this order, and charge seller for any loss entailed.

8. **PATENTS:** The seller hereby guarantees the buyer against all losses of profits, damages, or both, resulting from any patent infringement by reason of purchasing or using goods covered by this order, or by reason of any loss suffered in not being able, without liability, to use such goods. This guarantee also includes the reimbursement to the buyer of all litigation costs which it may suffer as the result of any suit respecting the purchase or use of such goods, in addition to the recoveries which may be secured against it of profits and/or damages.

## GENERAL:

9. The material on this order must be furnished only by the person or firm to whom the order is addressed unless otherwise authorized by the buyer.

10. No drafts for purchases made will be honored unless by agreement.

11. If it becomes necessary for the seller or any agent, contractor, or employee thereof to enter upon the property of the buyer in order to construct, inspect or deliver hereunder, the seller hereby agrees to protect the buyer's property and all persons thereon from injury, damage or loss, and the seller shall save harmless and indemnify the buyer from and against any expense, loss or damage on account of any claim, demand or suit made by any person whomsoever, including any employee of the buyer, which is in any way caused by or connected with or grows out of the performance hereunder by the seller or any agent, contractor or employee thereof; provided however that the seller shall not be required to indemnify the buyer against any loss caused solely by the negligence or willful fault of the buyer or its employees. If the seller performs any work hereunder knowing it to be contrary to any local law, ordinance, rule and regulation, the seller shall bear all costs arising therefrom. Seller to carry Liability Insurance and to carry Workmen's Compensation Insurance as provided by the laws of the State in which the work is performed and further, is to obtain a certificate for same, which is to be furnished for the file of the buyer. If for any reason the seller's or any subcontractor's employees or agents may acquire a status imposing liability on the buyer for employer's contributions or taxes under the Federal Social Security Act or under any State Unemployment Insurance, Old Age Benefit, or similar Acts, the seller shall be exclusively liable for, and shall indemnify the buyer against, the same and does agree to comply with all laws and regulations so as to relieve the buyer from any and all liability therefor or the responsibility of making any reports or keeping any records with respect thereto.

12. In accepting this order the seller certified that these goods were produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and of the regulations and orders of the United States Department of Labor issued under Section 14 thereof. It will be necessary in order for us to honor your future invoices to us that the above clause or a substantial equivalent thereof appear on your invoices.

13. By acceptance of this order, seller warrants that the prices specified do not exceed the maximum prices established under any applicable United States law or regulation thereunder.

ACKNOWLEDGMENT

PURCHASE ORDER

American Smelting And Refining Co.

TUCSON OFFICE  
P. O. BOX 5747

1150 NORTH 7TH AVENUE  
TUCSON, ARIZONA 85703

DATE  
May 11, 1988

ORDER NO.  
T-141-8

REQUISITION NO.

PLANT JOB NO.

CORPORATION NO.

To: JOY-CBC DRILLING  
707 Boyd Boulevard  
P.O. Drawer 489  
LaPorte, Indiana 46350

DATE REQUIRED AT DESTINATION:

SHIPPING INTERVAL PROMISED

SELLER WILL SHIP BEFORE:

POINT OF SHIPMENT

TERMS:

F.O.B. POINT

FINAL DESTINATION — PLEASE NOTE CONSIGNMENT BELOW

CONSIGNMENT — SELLER WILL SHIP TO

— RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS —

SHIP VIA

QUANTITY

UNIT

SPECIFICATIONS

ITEM  
NO.

UNIT PRICE

JOY-CBC DRILLING, hereinafter referred to as CONTRACTOR will core drill an exploration hole at ASARCO Incorporated's Superior East Project, Pinal County, Arizona, the final depth of which will be specified by ASARCO's representative(s) at the jobsite. Payment for work performed will be in accordance with CONTRACTOR's letter of proposal dated May 3, 1988, a copy of which is attached hereto and made a part of this order.

CONTRACTOR will provide a drill and water truck complete with crews and accessories.

Mobilization of CONTRACTOR's equipment will commence on or about June 13, 1988.

It is understood by both parties to this order that CONTRACTOR will perform all work in a diligent and workmanlike manner and in accordance with recognized standard drilling practices. ASARCO will not be charged for delays caused by failure of CONTRACTOR's equipment or personnel.

CONTRACTOR and his personnel will make every effort to minimize disturbance of the natural environment, and drill crews will establish and maintain sanitation systems which are acceptable to ASARCO and which comply with standards set by any government agency whether federal, state, county, or municipal which has jurisdiction over the site area.

CONTRACTOR's particular attention is called to Clause Eleven (11) on the reverse of this order. Before entering upon ASARCO's property to perform this work, CONTRACTOR will submit acceptable evidence of compliance with the Workmen's Compensation Laws of the State of Arizona and, on ASARCO's standard insurance form, acceptable evidence of other required insurance.

ACCEPTED FOR: JOY-CBC DRILLING

By:

IMPORTANT

~~Attached~~ Acknowledgment Card must  
be completed and returned promptly.  
Orig. & cc: JOY-CBC DRILLING  
cc: JDSell, WDGay, Acctg. Dept., File

PLEASE ENTER OUR ORDER FOR THE ITEMS SPECIFIED ABOVE, SUBJECT TO ALL INSTRUCTIONS AND PROVISIONS ON REVERSE SIDE.

W. D. Gay for J. D. Sell  
J.D. Sell, Manager, SWED

## INSTRUCTIONS

**INVOICE:** Priced invoices in the requisite number giving the correct purchase order and requisition numbers, together with required Bills of Lading, must be forwarded on day of each shipment AS PER SPECIAL SHIPPING INSTRUCTIONS ACCOMPANYING THIS ORDER, otherwise delay in payment of account may result.

**TERMS:** As previously arranged or specified on this order. Care must be exercised to show cash discount, if allowed, on face of invoice.

## PROVISIONS

1. **ACCEPTANCE:** Acceptance of this order constitutes acceptance of all terms herein stated. All representations and warranties by the seller relating to the subject-matter of this order or its performance shall be binding on the seller as if fully set forth herein, and shall survive inspection and acceptance of the goods ordered. No acknowledgment or acceptance of this order or any other communication by the seller shall vary or add any terms or conditions to those contained herein and any such attempted modification or addition which is not accepted in writing by the buyer, shall be void and may be disregarded without further notice or disclaimer.

2. **PRICES:** This order must not be filled at higher prices than last quoted without authority of the buyer.

3. **SHIPMENTS:** All materials must be forwarded by the route designated and seller will be held strictly accountable for any deviation therefrom.

When the material covered by this order shall aggregate a carload shipment or more, the seller must forward in carload lots, unless duly authorized in writing by the buyer to ship in less than carloads. If this order aggregates less than a minimum carload, seller must forward the entire quantity at one time unless otherwise authorized in writing by the buyer.

When blocking or dunnage, etc., not constituting a part of the car are used to protect and make shipments secure in transit, seller must show on Bills of Lading, separately, the weights of such materials, provided the lading shall aggregate a minimum carload or more, and will be held responsible for failure to comply with this rule.

Shipments will not be considered as completed until Bill of Lading, or express or mail receipt is received.

4. **PACKING AND CARTAGE CHARGES:** No charge will be allowed for packing, boxing or cartage, unless agreed upon at the time of purchase; damage to any material not properly packed to insure adequate protection in transit will be charged to the seller. All packing must conform with tariff or classification requirements so as to secure lowest possible freight rates. It is understood the buyer will receive the benefit of any decrease in freight charges between time of quotation and date of shipment, where freight enters into the price originally quoted.

5. **QUALITY AND INSPECTION:** All material furnished must be as specified and will be subject to inspection and approval of buyer after delivery. The right is reserved to reject and return at the risk and expense of the seller such portion of any shipment which may be defective or fail to comply with the specifications without invalidating the remainder of the order. If rejected it may be held for disposition at the expense and risk of the seller.

6. **QUANTITY:** The specific quantity ordered must not be changed without buyer's permission in writing.

7. **NON-PERFORMANCE:** Buyer reserves the right to cancel this order or any portion of same if delivery is not made when and as specified, time being of the essence of this order, and charge seller for any loss entailed.

8. **PATENTS:** The seller hereby guarantees the buyer against all losses of profits, damages, or both, resulting from any patent infringement by reason of purchasing or using goods covered by this order, or by reason of any loss suffered in not being able, without liability, to use such goods. This guarantee also includes the reimbursement to the buyer of all litigation costs which it may suffer as the result of any suit respecting the purchase or use of such goods, in addition to the recoveries which may be secured against it of profits and/or damages.

### GENERAL:

9. The material on this order must be furnished only by the person or firm to whom the order is addressed unless otherwise authorized by the buyer.

10. No drafts for purchases made will be honored unless by agreement.

11. If it becomes necessary for the seller or any agent, contractor, or employee thereof to enter upon the property of the buyer in order to construct, inspect or deliver hereunder, the seller hereby agrees to protect the buyer's property and all persons thereon from injury, damage or loss, and the seller shall save harmless and indemnify the buyer from and against any expense, loss or damage on account of any claim, demand or suit made by any person whomsoever, including any employee of the buyer, which is in any way caused by or connected with or grows out of the performance hereunder by the seller or any agent, contractor or employee thereof; provided however that the seller shall not be required to indemnify the buyer against any loss caused solely by the negligence or willful fault of the buyer or its employees. If the seller performs any work hereunder knowing it to be contrary to any local law, ordinance, rule and regulation, the seller shall bear all costs arising therefrom. Seller to carry Liability Insurance and to obtain a certificate for same, which is to be furnished for the file of the buyer. If for any reason the seller's or any subcontractor's employees or agents may acquire a status imposing liability on the buyer for employer's contributions or taxes under the Federal Social Security Act or under any State Unemployment Insurance, Old Age Benefit, or similar Acts, the seller shall be exclusively liable for, and shall indemnify the buyer against, the same and does agree to comply with all laws and regulations so as to relieve the buyer from any and all liability therefor or the responsibility of making any reports or keeping any records with respect thereto.

12. In accepting this order the seller certified that these goods were produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and of the regulations and orders of the United States Department of Labor issued under Section 14 thereof. It will be necessary in order for us to honor your future invoices to us that the above clause or a substantial equivalent thereof appear on your invoices.

13. By acceptance of this order, seller warrants that the prices specified do not exceed the maximum prices established under any applicable United States law or regulation thereunder.

JOY-CBC DRILLING

707 BOYD BOULEVARD  
P.O. DRAWER 489  
LAPORTE, INDIANA 46350  
PHONE: (219) 362-2191

May 3, 1988

Mr. Jim Sell  
Asarco Incorporated  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

We appreciated receiving the invitation to bid on your core drilling near Superior, Arizona. We have drilled in the area before. We understand you have a rotary hole cased to 1020 feet with four inch pipe to bottom and want to commence coring with NC wireline tools.

Please consider the following:

|                                      |                    |                     |
|--------------------------------------|--------------------|---------------------|
| Mobilization                         |                    | \$600.00/rig        |
| Demobilization                       |                    | \$600.00/rig        |
| Extra Road Truck Trips (if required) |                    | \$150.00/round trip |
| <u>Core Drilling</u>                 | <u>NC Wireline</u> | <u>NX Wireline</u>  |
| 1000 to 1500 feet                    | \$19.20/foot       | \$17.70/foot        |
| 1500 to 2000 feet                    | \$20.50/foot       | \$19.00/foot        |
| 2000 to 2500 feet                    | \$22.20/foot       | \$20.70/foot        |

Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$400.00 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$50.00 per hour plus bit and other in-hole supplies at actual cost.

Rig Time & Hourly Work

|   |                                  |
|---|----------------------------------|
| Setting and Pulling Casing and Pipe<br>(two man crew) | \$50.00/hour +<br>materials used |
|---|----------------------------------|

FORMERLY JOY CONTRACT DRILL DIVISION

Mr. Jim Sell  
Asarco Incorporated

Page 2  
May 3, 1988

Rig Time & Hourly Work (continued)

Cementing and/or Plugging Drill Holes (two man crew). Includes all time required to maintain good hole conditions while drilling. Also includes time required to close or complete hole as required. \$50.00/hour + materials used

Reaming, if necessary (two man crew) \$50.00/hour + materials used

Survey (two man crew) \$50.00/hour + Asarco supplies instrument

Re-entering Previously Drilled Holes (two man crew). Includes all time worked entering previously drilled hole until wireline core bit is cutting in solid rock formation on true bottom of hole. This will also include: \$60.00/hour + materials used

- (a) Time which is required to line up drill over previously drilled hole.
- (b) Time required to set casing in pre-drilled hole before starting to drill with wireline tools.
- (c) All time required to correct any problems encountered with existing casing or pipe in hole.

Standby Time for Your Convenience \$35.00/hour

Extra Labor Authorized by Asarco (if required) \$20.00/man hour

Overtime Premium in Excess of 88 hours per two-week pay period (if requested) \$6.00/man hour

Supplies

Casing Ordered Left in Place NX \$8.00/foot

Mr. Jim Sell  
Asarco Incorporated

Page 3  
May 3, 1988

Supplies (continued)

|  |                       |
|--|-----------------------|
| Casing Lost through Normal Drilling Operations         | 70% of List Price     |
| Diamond Bit Loss in Excess of \$2.50/foot              | At Actual Cost        |
| Drilling Mud & Additives                               | At Jobsite Cost + 20% |
| Weather-treated Core Boxes which hold ten feet of core | \$2.50 each           |
| Special Purchases Authorized by Customer (if required) | At Cost + 20%         |

Water Pumping or Hauling

|  |                      |
|--|----------------------|
| Water Pump Rental                      | \$400.00/month       |
| Supply Pump & Pipeline Work            | \$20.00/man hour     |
| Water Truck Usage                      | \$600.00/month       |
| Mileage                                | \$.75/mile           |
| Water Truck Driver (if required)       | \$20.00/man hour     |
| <u>Per Diem</u> (excluding local help) | \$15.00/man/work day |

The above prices are firm if accepted within 30 days and will remain in effect until 9/25/88. Our terms are Net 30 Days on monthly progress invoices.

We understand Asarco will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to JOY-CBC Drilling. We further understand that Asarco will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable JOY-CBC Drilling to carry out the specified work.

We propose doing this work with a Joy Truck Mounted 22 Drill and Joy Wireline Equipment. We will probably work two shifts

MAY 3 '88 12:43 JOY MFG CO RAPORTE IN

PAGE.02

Mr. Jim Sell  
Asarco Incorporated

Page 4  
May 3, 1988

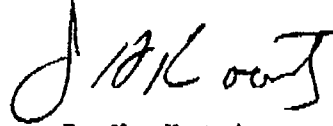
per day unless hole conditions warrant round the clock operation.

You should contact Nino Trujillo (602-884-5866) to confirm a starting date.

We would look forward to working with you on this project.

Yours very truly,

JOY-CBC DRILLING

A handwritten signature in dark ink, appearing to read "J H Koontz", written in a cursive style.

J. H. Koontz  
Vice President &  
General Manager

JHK/ts

JDS



707 BOYD BOULEVARD / LAPORTE, IN 46350 / PHONE & FAX: (219) 362-2191

June 7, 1988

Mr. W. D. Gay  
Asarco  
P.O. Box 5747  
Tucson, AZ 85703-5747

Dear Bill:

Attached is the signed Acknowledgement Order T-141-8.

Two Certificates of Insurance will be mailed directly to you from our insurers. One is for Workers' Comp. and the other is for General Liability and Auto.

I understand you have made arrangements with Nino Trujillo for startup.

Thanks for awarding this work to JOY-CBC Drilling.

Yours very truly,

JOY-CBC DRILLING

J. H. Koontz  
Vice President &  
General Manager

JHK/ts

Attachment:

ASARCO Incorporated

JUN 10 1988

SW Exploration

cc: C.L. SNOW (6/10/88)



## ACKNOWLEDGMENT

ASARCO PD 1  
REVISED 1/1/58

## PURCHASE ORDER

## American Smelting And Refining Co.

TUCSON OFFICE  
P. O. BOX 57471150 NORTH 7TH AVENUE  
TUCSON, ARIZONA 85703DATE  
May 11, 1988ORDER NO.  
T-141-8

REQUISITION NO.

PLANT JOB NO.

APPROPRIATION NO.

To: JOY-CBC DRILLING  
707 Boyd Boulevard  
P.O. Drawer 489  
LaPorte, Indiana 46350

DATE REQUIRED AT DESTINATION:

SHIPPING INTERVAL PROMISED

SELLER WILL SHIP BEFORE:

POINT OF SHIPMENT

TERMS:

F.O.B. POINT

FINAL DESTINATION — PLEASE NOTE CONSIGNMENT BELOW

CONSIGNMENT — SELLER WILL SHIP TO

— RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS —

SHIP VIA

QUANTITY UNIT

## SPECIFICATIONS

ITEM  
NO.

UNIT PRICE

JOY-CBC DRILLING, hereinafter referred to as CONTRACTOR will core drill an exploration hole at ASARCO Incorporated's Superior East Project, Pinal County, Arizona, the final depth of which will be specified by ASARCO's representative(s) at the jobsite. Payment for work performed will be in accordance with CONTRACTOR's letter of proposal dated May 3, 1988, a copy of which is attached hereto and made a part of this order.

CONTRACTOR will provide a drill and water truck complete with crews and accessories.

Mobilization of CONTRACTOR's equipment will commence on or about June 13, 1988.

It is understood by both parties to this order that CONTRACTOR will perform all work in a diligent and workmanlike manner and in accordance with recognized standard drilling practices. ASARCO will not be charged for delays caused by failure of CONTRACTOR's equipment or personnel.

CONTRACTOR and his personnel will make every effort to minimize disturbance of the natural environment, and drill crews will establish and maintain sanitation systems which are acceptable to ASARCO and which comply with standards set by any government agency whether federal, state, county, or municipal which has jurisdiction over the site area.

CONTRACTOR's particular attention is called to Clause Eleven (11) on the reverse of this order. Before entering upon ASARCO's property to perform this work, CONTRACTOR will submit acceptable evidence of compliance with the Workmen's Compensation Laws of the State of Arizona and, on ASARCO's standard insurance form, acceptable evidence of other required insurance.

ACCEPTED FOR: JOY-CBC DRILLING

By: *J.D. Sell* 5/17/88

## IMPORTANT

~~Attached~~ Acknowledgment ~~Card~~ must  
be completed and returned promptly.

Orig. &amp; cc: JOY-CBC DRILLING

cc: JDSell, WDGay, Acctg. Dept., File

PLEASE ENTER OUR ORDER FOR THE ITEMS SPECIFIED ABOVE, SUBJECT TO ALL INSTRUCTIONS AND PROVISIONS ON REVERSE SIDE.

*W.D. Gay for J.D. Sell*  
J.D. Sell, Manager, SWED

JOY-CBC DRILLING

707 BOYD BOULEVARD  
P.O. DRAWER 489  
LAPORTE, INDIANA 46350  
PHONE: (219) 362-2191

May 3, 1988

Mr. Jim Sell  
Asarco Incorporated  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

We appreciated receiving the invitation to bid on your core drilling near Superior, Arizona. We have drilled in the area before. We understand you have a rotary hole cased to 1020 feet with four inch pipe to bottom and want to commence coring with NC wireline tools.

Please consider the following:

|                                      |                    |                     |
|--------------------------------------|--------------------|---------------------|
| Mobilization                         |                    | \$600.00/rig        |
| Demobilization                       |                    | \$600.00/rig        |
| Extra Road Truck Trips (if required) |                    | \$150.00/round trip |
| <u>Core Drilling</u>                 | <u>NC Wireline</u> | <u>NX Wireline</u>  |
| 1000 to 1500 feet                    | \$19.20/foot       | \$17.70/foot        |
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Rig Time & Hourly Work

|   |                                  |
|---|----------------------------------|
| Setting and Pulling Casing and Pipe<br>(two man crew) | \$50.00/hour +<br>materials used |
|---|----------------------------------|

FORMERLY JOY CONTRACT DRILL DIVISION

Mr. Jim Sell  
Asarco Incorporated

Page 2  
May 3, 1988

Rig Time & Hourly Work (continued)

|   |   |
|---|---|
| Cementing and/or Plugging Drill Holes (two man crew). Includes all time required to maintain good hole conditions while drilling. Also includes time required to close or complete hole as required.                      | \$50.00/hour + materials used             |
| Reaming, if necessary (two man crew)  | \$50.00/hour + materials used             |
| Survey (two man crew)   | \$50.00/hour + Asarco supplies instrument |
| Re-entering Previously Drilled Holes (two man crew). Includes all time worked entering previously drilled hole until wireline core bit is cutting in solid rock formation on true bottom of hole. This will also include: | \$60.00/hour + materials used             |
| (a) Time which is required to line up drill over previously drilled hole.   |   |
| (b) Time required to set casing in pre-drilled hole before starting to drill with wireline tools.   |   |
| (c) All time required to correct any problems encountered with existing casing or pipe in hole.   |   |
| Standby Time for Your Convenience   | \$35.00/hour                              |
| Extra Labor Authorized by Asarco (if required)  | \$20.00/man hour                          |
| Overtime Premium in Excess of 88 hours per two-week pay period (if requested)   | \$6.00/man hour                           |

Supplies

|                              |                |
|------------------------------|----------------|
| Casing Ordered Left in Place | NX \$8.00/foot |
|------------------------------|----------------|

Mr. Jim Sell  
Asarco Incorporated

Page 3  
May 3, 1988

Supplies (continued)

|  |                       |
|--|-----------------------|
| Casing Lost through Normal Drilling Operations         | 70% of List Price     |
| Diamond Bit Loss in Excess of \$2.50/foot              | At Actual Cost        |
| Drilling Mud & Additives                               | At Jobsite Cost + 20% |
| Weather-treated Core Boxes which hold ten feet of core | \$2.50 each           |
| Special Purchases Authorized by Customer (if required) | At Cost + 20%         |

Water Pumping or Hauling

|  |                      |
|--|----------------------|
| Water Pump Rental                      | \$400.00/month       |
| Supply Pump & Pipeline Work            | \$20.00/man hour     |
| Water Truck Usage                      | \$600.00/month       |
| Mileage                                | \$.75/mile           |
| Water Truck Driver (if required)       | \$20.00/man hour     |
| <u>Per Diem</u> (excluding local help) | \$15.00/man/work day |

The above prices are firm if accepted within 30 days and will remain in effect until 9/25/88. Our terms are Net 30 Days on monthly progress invoices.

We understand Asarco will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to JOY-CBC Drilling. We further understand that Asarco will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable JOY-CBC Drilling to carry out the specified work.

We propose doing this work with a Joy Truck Mounted 22 Drill and Joy Wireline Equipment. We will probably work two shifts

Mr. Jim Sell  
Asarco Incorporated

Page 4  
May 3, 1988

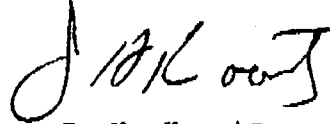
per day unless hole conditions warrant round the clock operation.

You should contact Nino Trujillo (602-884-5866) to confirm a starting date.

We would look forward to working with you on this project.

Yours very truly,

JOY-CBC DRILLING

A handwritten signature in dark ink, appearing to read "J H Koontz", written in a cursive style.

J. H. Koontz  
Vice President &  
General Manager

JHK/ts

# JOY - CBC DRILLING

Formerly Joy Contract Drill Division

707 BOYD BLVD.  
LA PORTE, IN 46350

*Original to Party 11/1/88*

JDS

PLEASE REMIT TO  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CUSTOMER'S ORDER NO. | DATE | REQ. NO.            | DATE | AT REC. POINT | B.O. NO. |
|----------------------|------|---------------------|------|---------------|----------|
| T-141-8              |      |                     |      |               |          |
| CONTRACT             | CODE | OUR<br>ORD'R<br>NO. | DATE | AT SHIP POINT |          |
|                      |      |                     |      | 03-0006-24    |          |

03006

SOLD  
TO

ASARCO INC.  
ATTN: MR. JIM SELL OR MR. BILL GAY  
P.O. BOX 5747  
TUCSON, AZ 85703-5747

TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

INVOICE NO. AZ1033

INVOICE DATE 7/5/88

SHIPPED  
TO

SUPERIOR, ARIZONA

PLEASE REMIT TO  
JOY - CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

DATE SHIPPED

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-362-2191

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

| ORIGINAL<br>QUANTITY<br>ORDERED | PART NUMBER | DESCRIPTION | CODE | UNIT PRICE | QUANTITY<br>BACK<br>ORDERED | QUANTITY<br>SHIPPED | AMOUNT |
|---------------------------------|-------------|-------------|------|------------|-----------------------------|---------------------|--------|
|---------------------------------|-------------|-------------|------|------------|-----------------------------|---------------------|--------|

For 277.' core drilling near Superior, Arizona for period ending 6/25/88 as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COST |
|---------------------|------|-------|-------|------------|-----------|------------|
| A-16(90°)           | NC   | 1028. | 1305. | 277.       | 19.20     | 5,318.40   |

## (58 -1007) RE-ENTRY

|      |         |                         |  |  |  |          |
|------|---------|-------------------------|--|--|--|----------|
| A-16 | June 14 | 16 Hours                |  |  |  |          |
|      | June 15 | 16 Hours                |  |  |  |          |
|      | June 16 | 20 Hours                |  |  |  |          |
|      | June 17 | 14 Hours                |  |  |  |          |
|      |         | 66 Hours @ \$60.00/hour |  |  |  | 3,960.00 |

## (586-1007) CEMENTING, PLUGGING, HOLE CONDITIONING & CLOSING HOLE

|      |         |                         |  |  |  |          |
|------|---------|-------------------------|--|--|--|----------|
| A-16 | June 20 | 8 Hours                 |  |  |  |          |
|      | June 21 | 8 Hours                 |  |  |  |          |
|      | June 22 | 5 Hours                 |  |  |  |          |
|      | June 23 | 1 Hour                  |  |  |  |          |
|      |         | 22 Hours @ \$50.00/hour |  |  |  | 1,100.00 |

## (587-1101) MUD & ADDITIVES

|      |   |                            |        |  |  |        |
|------|---|----------------------------|--------|--|--|--------|
| A-16 | 4 | 5 Gallon EZ Mud @ \$133.54 | 534.16 |  |  |        |
|      | 1 | Mud Seal @ \$19.26         | 19.26  |  |  |        |
|      | 1 | Multi Seal @ \$25.92       | 25.92  |  |  | 579.34 |

**DUPLICATE**

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

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

FORM  
NV-88-1

# JOY - CBC DRILLING

Formerly Joy Contract Drill Division

PAGE NO. 2

SOLD ASARCO INC.

MR. JIM SELL OR MR. BILL GAY

OUR  
ORDER  
NO.

AT REC. POINT

AT SHIP POINT

B.O. NO.

INVOICE NO.

AZ1033

| FINAL<br>QUANTITY<br>ORDERED | UNIT | PART NUMBER | DESCRIPTION | CODE | UNIT PRICE | QUANTITY<br>BACK<br>ORDERED | QUANTITY<br>SHIPPED | AMOUNT |
|------------------------------|------|-------------|-------------|------|------------|-----------------------------|---------------------|--------|
|------------------------------|------|-------------|-------------|------|------------|-----------------------------|---------------------|--------|

(587-1102) CEMENT

|      |   |                          |  |  |  |  |  |       |
|------|---|--------------------------|--|--|--|--|--|-------|
| A-16 | 4 | 94# Cement @ \$6.66/each |  |  |  |  |  | 26.64 |
|------|---|--------------------------|--|--|--|--|--|-------|

(586-1008) WATER HAUL

June 14 through June 25

|                                  |              |  |  |        |
|----------------------------------|--------------|--|--|--------|
| 1 Truck @ \$600.00/month (12/30) | 240.00       |  |  |        |
| 31 Miles @ \$.75/mile            | <u>23.25</u> |  |  | 263.25 |

(586-1009) PER DIEM

|               |                       |  |  |        |
|---------------|-----------------------|--|--|--------|
| R. A. Gardner | 10 Days               |  |  |        |
| M. A. Cordova | 9 Days                |  |  |        |
| R. A. Cordova | 8 Days                |  |  |        |
| A. Martinez   | <u>9 Days</u>         |  |  |        |
|               | 36 Days @ \$15.00/day |  |  | 540.00 |

(586-1005) MOBILIZATION

|          |  |  |  |               |
|----------|--|--|--|---------------|
| Rig 8869 |  |  |  | <u>600.00</u> |
|----------|--|--|--|---------------|

TOTAL INVOICE: \$12,387.60

DUPLICATE

# ASARCO

Exploration Department  
Southwestern United States Division

March 7, 1989

Mr. Steve Rossi  
Arizona Dept. of Water Resources  
310 S. Meyer Ave.  
Tucson, AZ 85701

Exploration Drill Hole  
DWR No. 55-518290

Dear Mr. Rossi:

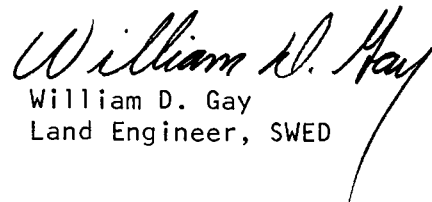
This letter is to follow up on our telephone conversation yesterday concerning the deepening of exploration drill hole (DWR No. 55-518290 and Asarco's No. A-16).

There was a misunderstanding on my part during our telephone conversation on May 20, 1988, about the need for a Notice of Intention to Deepen this hole. I thought a letter to your Phoenix Office when the hole was abandoned was the only requirement.

In order to rectify this, enclosed is the original request for deepening the hole and the driller's completion report.

I appreciate your help in clearing up this matter.

Very truly yours,

  
William D. Gay  
Land Engineer, SWED

WDG:mek

cc: J.D. Sell



# ASARCO

Exploration Department  
Southwestern United States Division



May 11, 1988

Dept. of Water Resources  
State of Arizona  
99 E. Virginia, Suite 100  
Phoenix, AZ 85004

Superior East Project  
Pinal County, AZ

Gentlemen:

In compliance with drill hole regulations ASARCO Incorporated requests a drilling permit as described in the attached "Notice of Intention to Drill or Deepen a Well" form. A check for the \$10 filing fee is enclosed.

If you have any questions, please call or write to me or J.D. Sell, Manager, SWED.

Sincerely yours,

*W. D. Gay*  
W. D. Gay  
Land Engineer

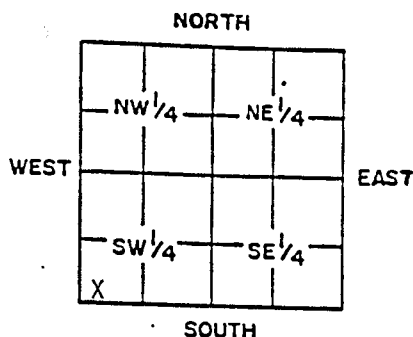
WDG:mek  
att.

cc: W.L. Kurtz  
J.D. Sell  
C.L. Snow  
Joy-CBC Drilling

FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES (DWR)  
NOTICE OF INTENTION TO DRILL OR DEEPEN A WELL  
OUTSIDE OF AN ACTIVE MANAGEMENT AREA

Section 45-596, Arizona Revised Statutes, provides: In an area not subject to Active Management, a person may not drill or cause to be drilled any well or deepen an existing well without first filing a Notice of Intention to Drill with the Department.



INDICATE WELL LOCATION BY X  
(Above diagram represents one  
640 acre section.)

WELL/LAND LOCATION:

1. Township 1 N S
2. Range 13 E W
3. Section 23
4. SW 1/4, SW 1/4, SW 1/4  
10 acre subdivision
5. County Pinal
6. Owner of well:  
ASARCO Incorporated  
Name P.O. Box 5747  
Mailing address Tucson AZ 85703  
City Tucson State AZ Zip 85703  
Telephone (602) 792-3010
7. Owner of land:  
U.S. Dept. of Agriculture  
Forest Service  
Name Rt. 1, Box 33  
Mailing Address Globe, AZ 85501  
City Globe State AZ Zip 85501

DESCRIPTION OF WELL:

8. Diameter 6 3/4 inches  
Depth About 1000 feet
9. Type of casing Steel Surface
10. Design pump capacity:  
N/A gallons per minute
11. Estimate of total annual  
pumping: -0- acre feet
12. Principal use of water:  
None  
(Be Specific)
13. Other uses intended:  
None  
(Be Specific)
14. If for irrigation, state the  
number of acres to be irrigated:  
-0- acres
15. Construction will start about:  
June 1988  
Month June Year 1988

PLACE OF USE:

16. Township N/A - N/S
17. Range N/A E/W
18. Section N/A
19. Legal description  
of land N/A

20. Type well:  
N/A Exempt  
N/A Non-Exempt
21. Action Requested:  
Drill Deepen X Replace  
55-518290

22. This notice filed by:  
Owner X  
Lessee ASARCO Incorporated  
Name P.O. Box 5747  
Address Tucson, AZ 85703  
City Tucson State AZ Zip 85703  
Telephone (602) 792-3010

23. Drilling Firm:  
JOY-CBC DRILLING  
Name 707 Boyd Blvd.  
Address P.O. Drawer 489  
LaPorte, Indiana 46350  
City LaPorte State IN Zip 46350

DWR License Number 75

24. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials: Yes    No X

GENERAL INSTRUCTIONS

1. Fill out this form in duplicate and send to 99 East Virginia, Suite 100, Phoenix, Az. 85004.
2. For specific instructions, limitations and conditions, see the reverse side of this form.
3. This form is to be used to drill, deepen or replace a well outside of an Active Management Area.
4. If the well is a replacement or deepening of an existing well, state the registration number of the existing well in Item 21.
5. Construction standards for new and replacement wells and the deepening and abandonment of existing wells shall be in accordance with Department Rules and Regulations.

I state that this Notice is filed in compliance with ARS §45-596 and is complete and correct to the best of my knowledge and belief and that I understand the limitations under which I must operate this well set forth on the reverse side of this form.

DATE 5-11-88 Signature of Person Filing W.D. Gay

DWR-55-41-8/86B (Revised)

W.D. Gay, Land Engineer

BILL GAY

RETAIN THIS IN YOUR FILE  
FOR REFERENCE ONLY.

NOTE - THIS RECORD WAS NOT  
FILED WITH THE AZ DWA PER  
YOUR INSTRUCTIONS. HAD YOU  
TOLD ME THERE WAS A FILING  
REQUIREMENT, THIS IS WHAT  
IT WOULD HAVE LOOKED LIKE.

JACout  
7/12/88

ASARCO Incorporated

JUL 14 1988

SW Exploration

## PROJECT COMPLETION REPORT FOR EXPLORATION DRILLING

This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well drilling project.

1. Owner ASARCO INC.

Name

P.O. BOX 5747; TUCSON, AZ 85703

Address

2. Lessee or Operator

Name

Address

3. Driller JOY-CBC DRILLING

Name

750 E. EVANS BLVD.; TUCSON, AZ 85713

Address

4. Location of

1(N/S?)

13(E/W?)

23

SW SW SW

Township

Range

Section

1/4 1/4 1/4

DESCRIPTION OF WELL

5. Type of casing (if installed)

6. Abandonment method and materials used if abandoned:

7. Construction details if completed for monitoring purposes, re-entry or conversion to water wells: Hole A-16 was re-entered to 1028'. 1028' of 4" pipe was set. The hole was drilled NC from 1028' to 1380'. Upon completion the hole was filled with heavy mud and the cap was reinstalled.

8. Date or period drilled 6/14/88 through 6/29/88

## LOG OF WELL



Unconsolidated Formation



Consolidated Formation 1028' - 1380'

Depth to water in feet below land surface: Indeterminant  
(if encountered or detected) if any

I state that this report is filed in compliance with ARS 45-600 and is complete and correct to the best of my knowledge and belief.

Driller's Signature

J. H. KOONTZ 7/12/88

Date

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

Registration No. \_\_\_\_\_

Received \_\_\_\_\_ By \_\_\_\_\_

Entered \_\_\_\_\_ By \_\_\_\_\_

File No. \_\_\_\_\_





# ASARCO

JDS

Exploration Department  
Southwestern United States Division  
James D. Sell  
Manager

July 10, 1989

Dept. of Water Resources  
State of Arizona  
99 E. Virginia, Suite 100  
Phoenix, AZ 85004

Exploration Drill Hole  
DWR No. 55-518290

Gentlemen:

Asarco will again deepen an exploration hole (DWR No. 55-518290, Asarco No. A-16) east of Superior, Arizona.

I submit the notice as per Section 45-596, ARS.

A check for the \$10 filing fee is enclosed.

Sincerely,

JDS:mek  
Att.

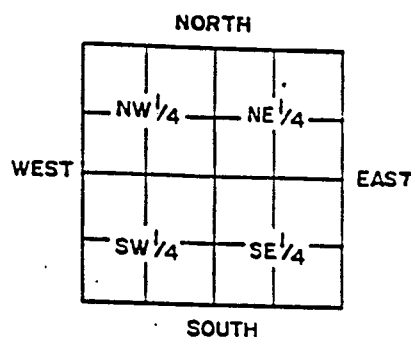
  
James D. Sell

cc: W.L. Kurtz  
W.D. Gay  
C.L. Snow  
C.B.C. Drilling

FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES (DWR)  
NOTICE OF INTENTION TO DRILL OR DEEPEN A WELL  
OUTSIDE OF AN ACTIVE MANAGEMENT AREA

Section 45-596, Arizona Revised Statutes, provides: In an area not subject to Active Management, a person may not drill or cause to be drilled any well or deepen an existing well without first filing a Notice of Intention to Drill with the Department.



INDICATE WELL LOCATION BY X  
(Above diagram represents one  
640 acre section.)

## WELL/LAND LOCATION:

1. Township 1 N/S
2. Range 13 E/W
3. Section 23
4. SW 1/4, SW 1/4, SW 1/4  
10 acre subdivision
5. County Pinal

6. Owner of well:  
ASARCO Incorporated

Name  
P.O. Box 5747  
Mailing address  
Tucson AZ 85703  
City State Zip  
Telephone (602) 792-3010

7. Owner of land:  
U.S. Dept. of Agriculture  
Forest Service  
Name  
Rt. 1, Box 33  
Mailing Address  
Globe, AZ 85501  
City State Zip

## DESCRIPTION OF WELL:

8. Diameter 4 1/2 inches
- Depth 1400 feet
9. Type of casing Steel Surface
10. Design pump capacity:  
N/A gallons per minute
11. Estimate of total annual  
pumping: -0- acre feet
12. Principal use of water:  
None  
(Be Specific)
13. Other uses intended:  
None  
(Be Specific)
14. If for irrigation, state the  
number of acres to be irrigated:  
-0- acres
15. Construction will start about:  
August 1989  
Month Year

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

FILE NO. \_\_\_\_\_  
FILED \_\_\_\_\_ BY \_\_\_\_\_  
INPUT \_\_\_\_\_ BY \_\_\_\_\_  
DUPLICATE  
MAILED \_\_\_\_\_ BY \_\_\_\_\_  
REGISTRATION NO. \_\_\_\_\_  
INA \_\_\_\_\_  
W/S \_\_\_\_\_ S/B \_\_\_\_\_

## PLACE OF USE:

16. Township N/A N/S
17. Range N/A E/W
18. Section N/A
19. Legal description  
of land N/A

20. Type well:  
N/A Exempt  
N/A Non-Exempt
21. Action Requested:  
Drill DeepenX Replace  
55-518290

22. This notice filed by:

Owner X  
Lessee \_\_\_\_\_  
ASARCO Incorporated  
Name  
P.O. Box 5747  
Address  
Tucson, AZ 85703  
City State Zip  
Telephone (602) 792-3010

23. Drilling Firm:  
JOY-CBC Drilling  
Name  
707 Boyd Blvd.  
Address P.O. Drawer 489  
LaPorte, Indiana 46350  
City State Zip  
75

DWR License Number

24. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials: Yes \_\_\_ No X

## GENERAL INSTRUCTIONS

1. Fill out this form in duplicate and send to 99 East Virginia, Suite 100, Phoenix, Az. 85004.
2. For specific instructions, limitations and conditions, see the reverse side of this form.
3. This form is to be used to drill, deepen or replace a well outside of an Active Management Area.
4. If the well is a replacement or deepening of an existing well, state the registration number of the existing well in Item 21.
5. Construction standards for new and replacement wells and the deepening and abandonment of existing wells shall be in accordance with Department Rules and Regulations.

I state that this Notice is filed in compliance with ARS 845-596 and is complete and correct to the best of my knowledge and belief and that I understand the limitations under which I must operate this well set forth on the reverse side of this form.

DATE 7/10/89

Signature of Person Filing

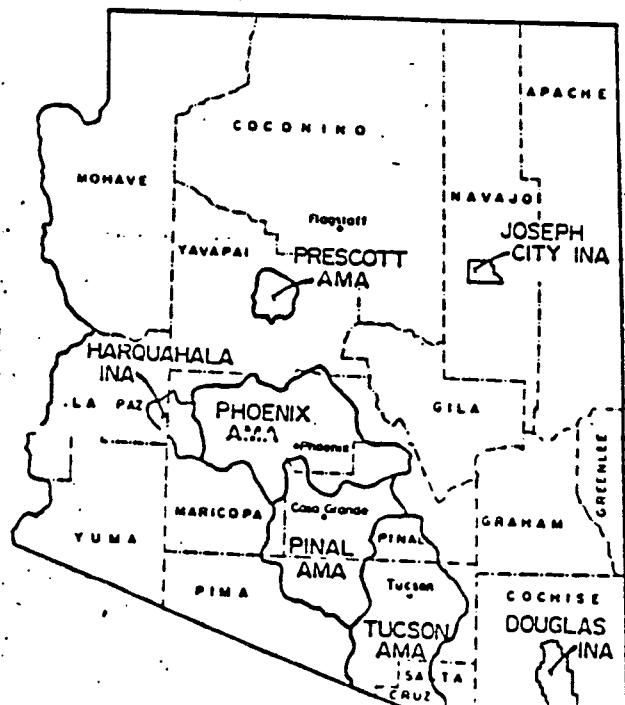
James D. Sell  
James D. Sell, Manager SWED

DWR-55-41-8/86B (Revised)



SPECIFIC INSTRUCTIONS, LIMITATIONS AND CONDITIONS

1. Upon receipt of the return of this annotated Notice, the owner is authorized to proceed in drilling or deepening the well as set forth on this Notice.
2. An exempt well means a well having a pump with a maximum capacity of not more than thirty-five (35) gallons per minute and may include the application of water to less than two (2) acres of land to produce plants or parts of plants for sale, human consumption or for use as feed for livestock, range livestock or poultry.
3. Only one exempt well may be drilled or used to serve the same use at the same location.
4. A non-exempt well is any well which exceeds the limitations, as indicated in paragraph 2 above. However, water from a non-exempt well located in an Irrigation Non-Expansion Area, may not be withdrawn to irrigate any acres which are not eligible to be irrigated pursuant to ARS §45-434 or §45-437. Also, owners of non-exempt wells located in Irrigation Non-Expansion Areas, are subject to the measuring device and annual report requirements of ARS §45-437.
5. The drilling or deepening of this well shall be completed within one (1) year of the date of this Notice.
6. Within thirty (30) days after the installation of pumping equipment on this well, the registered well owner shall file the prescribed Completion Report. A form for this purpose will be furnished to the registered owner with the return of an annotated copy of this Notice.
7. The person to whom a well is registered shall notify the Department of a change in ownership or a change in data relating to this well. The prescribed form for these purposes will be furnished to the registered owner with the return of the annotated copy of this Notice.
8. A sketch map showing the general boundaries of the Active Management Areas and Irrigation Non-Expansion Areas is shown at the right. Maps of greater detail are available on request.



EXPLORATION WELL(S)  
FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES (DWR)  
NOTICE OF INTENTION TO DRILL  
EXPLORATION WELL(S)

EXPLORATION WELL(S)

JDS

Section 45-596, Arizona Revised Statutes and Rule R12-15-817 provide: Prior to drilling one or more exploration wells, the well owner, lessee or exploration firm shall file a Notice of Intention to Drill on a form provided by the Department.

WELL/LAND LOCATION

1. Township 1 N/S  
Range 13 W/W  
Section 23

In the case of a single well,  
list 10-acre subdivision

SW 1/4, SW 1/4, SW 1/4

2. County Pinal

3. Applicant:  
ASARCO Incorporated  
Name

P.O. Box 5747  
Address  
Tucson, AZ 85703  
City State Zip

4. J.D.Sell/W.D. Gay  
NAME OF CONTACT PERSON  
Phone 602-792-3010

5. Owner of well:  
ASARCO Incorporated  
Name  
P.O. Box 5747  
Address  
Tucson AZ 85703  
City State Zip

6. Purpose of well(s) drilled  
pursuant to this Notice:  
Mineral Exploration X  
Geotechnical \_\_\_\_\_  
Cathodic Protection \_\_\_\_\_  
Grounding \_\_\_\_\_

7. Number of wells 1  
(See Condition 3 on reverse)

8. Owner of land:  
U.S. Dept. of Agriculture  
Forest Service  
Name  
Rt. 1, Box 33  
Address  
Globe AZ 85501  
City State Zip

9. DESCRIPTION OF WELL:  
Diameter 4" inches  
Depth 1400 feet  
Type of casing Steel Surface  
(If none, so state)

10. Construction will start:  
August 1989  
Month Day Year

11. Drilling firm:

CBC Drilling

Name  
707 Boyd Blvd.  
P.O. Drawer 489  
Address  
LaPorte, Indiana 46350  
City State Zip

75  
DWR License Number

12. Period well will remain  
in use 2 months.

13. Proposed method of  
abandonment of well(s)  
after project is  
completed:

Seal with steel cap  
on surface casing.

|   |           |
|---|-----------|
| DO NOT WRITE IN THIS SPACE<br>OFFICE RECORD |           |
| File No. _____                              |           |
| Filed _____                                 | By _____  |
| Input _____                                 | By _____  |
| Duplicate _____                             |           |
| Mailed _____                                | By _____  |
| Registration _____                          |           |
| AMA/INA _____                               |           |
| W/S _____                                   | S/B _____ |

14. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials? Yes No X  
If yes, a request for a variance must accompany this application pursuant to R12-15-820.

GENERAL INSTRUCTIONS

1. Fill out this form in duplicate and mail to Department of Water Resources, 15 South 15th Ave. Phoenix, Arizona 85007
2. Proper filing fee of \$10.00 must accompany Notice.

I state that this Notice is filed in compliance with Rule R12-15-809 and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

DATE 7/19/89  
DWR 55-40-10/88 (Revised)

James D. Sell  
Signature of Applicant  
James D. Sell, Manager SWED

cc: W D GAY

CONDITIONS

1. Construction and abandonment standards for all wells shall be in accordance with DWR Rules R12-15-811 and R12-15-816.
2. Drilling of the well(s) shall be completed within one (1) year after the date of Notice.
3. Mineral exploration, geotechnical cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these wells, then the well(s) must be properly abandoned in accordance with Condition 1 above.
4. More than one well may be drilled under a single notice for mineral exploration, geotechnical, cathodic protection and grounding purposes, so long as they are located within a single section.
5. A Project Completion Report (DWR-55-42-10/83) must be filed for each hole, within 30 days of completion of drilling. A Well Driller Report (DWR-55-6-Rev.) for each hole drilled, must be filed by the well driller within 30 days of completion of drilling for geotechnical, cathodic protection, and grounding wells.
6. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic protection or grounding purposes.
7. Special construction standards required pursuant to R12-15-821: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# ASARCO

Exploration Department  
Southwestern United States Division  
James D. Sell  
Manager

July 10, 1989

Mr. James H. Koontz, V.P.  
C.B.C. Drilling  
707 Boyd Blvd.  
P.O. Drawer 489  
LaPorte, IN 46350

Reoccupy Site A-16  
Superior East Project  
Pinal County, AZ

Dear Jim:

I've talked with Nino and he says he'll have a rig and good men available to reoccupy site A-16 of the Superior East Project.

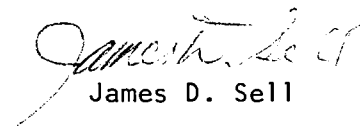
I intend to start around the 15th of August and continue into September to satisfy the assessment work back-to-back.

As your records will show, the hole is presently NC core at a depth of 1380 feet.

The road from Devil's Canyon to the site has recently been cleared and you should not have any problems moving back on.

Asarco looks forward to your contract bid for this continued drilling.

Sincerely,

  
James D. Sell

JDS:mek

cc: Nino Trujillo  
W.D. Gay/D.A. Melhado

JDS

July 18, 1989

W.D. Gay/D.A. Melhado

Reentering Hole A-16  
Superior East Project  
Pinal County, AZ

I have asked C.B.C. Drilling to send us a bid on continuing drilling in hole A-16 which is at a depth of 1380 feet.

Nino Trujillo has been called and a rig and crew requested to start around August 15, 1989 and drill over the assessment years in back-to-back assessment.

We need to spend \$15,000 (146 claims) per assessment year, so C.B.C. Drilling should drill out a \$30,000 total invoice during this drilling phase.

You should be there to start them off, provide core storage trailer, locks, boxes, etc. Use the "used" boxes in the Miami Warehouse.

Weekly visits to pick up shift reports and check on progress should be made.

JDS:mek

  
James D. Sell

cc: W.L. Kurtz  
Nino Trujillo

884-5-864

$$750 \text{ mch } 750 \text{ duels} = 1500$$

\$40/day, paid  
16  
960

1.7 days  $1320 - 1500 = 120 @ 19.20 = 2304$

4.2' m x 16 7.1'  $1500 - 2000 = 500 @ 20.50 = 10,250$

70' day 7.1'  $2000 - 2500 = 500 @ 22.20 = 11,100$   
2350 = 5217  
20,000

|          |      | NC                  | NX   | base of hole |  |
|----------|------|---------------------|------|--------------|--|
| hole     | A-8  | 1971                | 3197 | 2213         |  |
|          | A-9  | 2357                | 3624 | 2194         |  |
|          | A-10 | 2437                | 3417 | 2138         |  |
|          | A-11 | 2580                | 3772 | 2215         |  |
| 12 weeks | A-13 | 2343                | 4643 | 2036         |  |
|          | A-14 | not to 1534<br>2891 | 5493 | 2289         |  |
|          | A-15 | GARDNER!            | 1101 | 2029         |  |
|          | A-16 |                     |      |              |  |

Collar 4780

Collar 4780

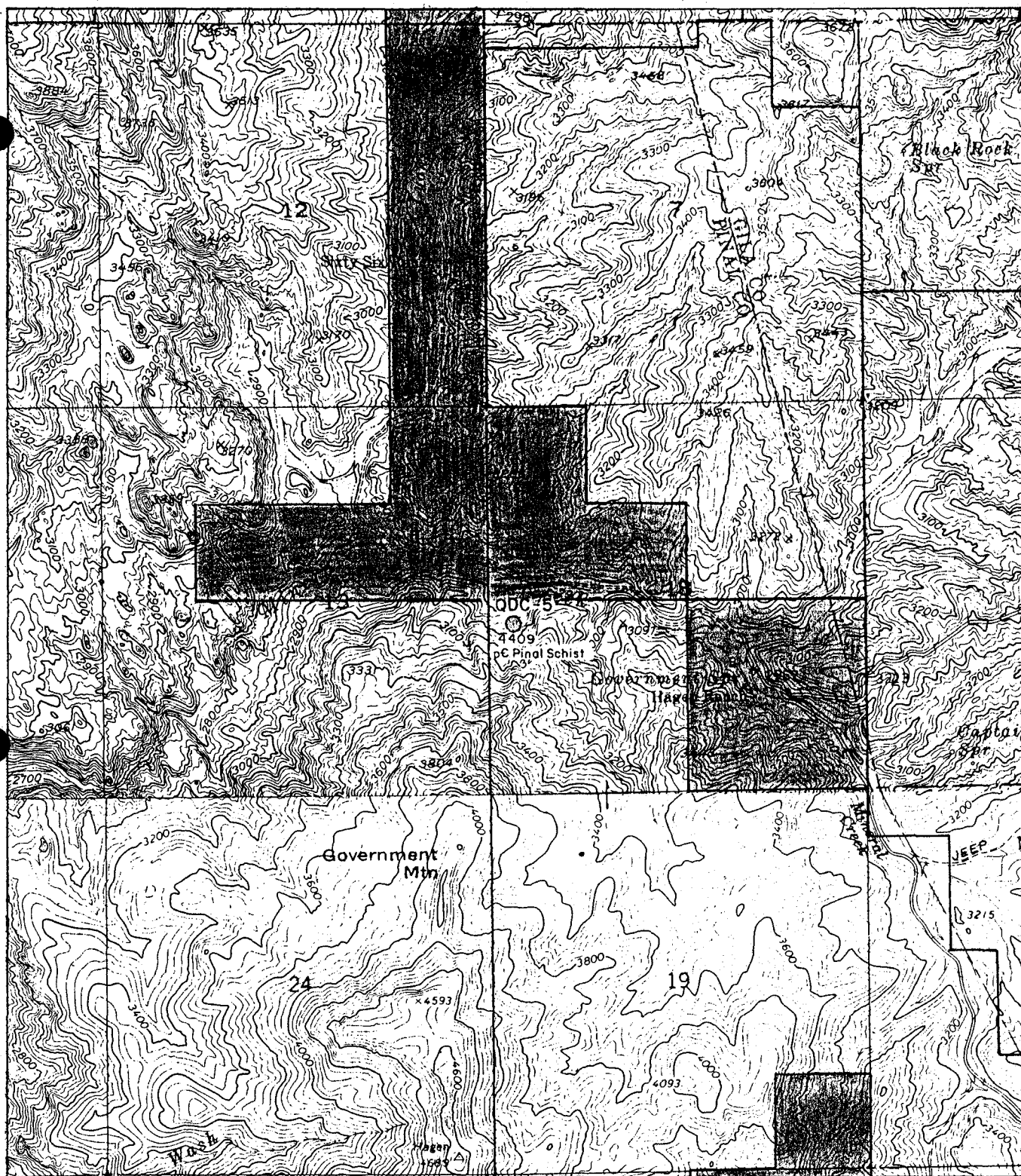
NX casing left in = \$800/ft.

$$\begin{array}{r} 2400 \\ \hline 2380 \end{array} \text{ Der } A-16 \text{ est.}$$






$$\begin{array}{r} 2350 \\ \hline 18,800 \end{array}$$

Jim Koontz 219/342-2191

A-16  
est.  
 $\begin{array}{r} 4780 \\ 3150 \\ \hline 1630 \end{array}$  1d/1m



# **EXPLANATION**

-  State Prospecting Permit
-  Unpatented Claims
-  Hagen Lease
-  Other Owners
-  QDC-5 ASARCO Hole & Designation

|              |                      |
|--------------|----------------------|
| TO ACCOMPANY | <i>Quarterly</i>     |
| Report       |                      |
| DATED        | <i>June 26, 1978</i> |
| BY           | <i>J. D. Lee</i>     |

DRILLING PROGRESS MAP  
For The 2<sup>nd</sup> Quarter, 1978  
**DEVILS CANYON PROJECT**  
GILA & PINAL COUNTIES, ARIZONA  
SCALE: 1" = 2000'

Devils Canyon Well Hole QDC-5

NW<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> of Sec. 18, T2S, R14E

Pinal Co., AZ

STATE LEASE LAND

Collar Elev. 2950'

0-58 Talus

58-500 Qtzite

500-4409 Schist

Drilled from 8/4/77 to 11/11/77 and 1/12/78 to 4/10/78

Casing left in hole:

4 1/2" OD - Surface to 123'

NX Casing 886' - 1442'

BX Casing 1473' - 2904'

high water pressure at 3305' ann.

Note: 7" of rain in 7 days, in March 1978, was recorded at  
Hagen's Ranch!

That fault zone encountered from 2805-2875 feet.





707 BOYD BOULEVARD / LaPORTE, INDIANA 46350 / PHONE & FAX: (219) 362-2191

July 25, 1989

ASARCO Incorporated

Mr. Jim Sell  
Asarco Incorporated  
P.O. Box 5747  
Tucson, AZ 85703

AUG 1 1989

See my previous

Dear Jim:

We appreciated receiving the invitation to bid on your core drilling near Superior, Arizona. This is a continuation of last year's work which will involve reentering and cleaning out the hole to 1380 and coring NC from there. It is hoped that the Bentonite mud pumped at closure last year will have helped contain the lost circulation problems we were experiencing.

Please consider the following:

|                                      |                     |                     |
|--------------------------------------|---------------------|---------------------|
| Mobilization                         |                     | \$750.00/rig        |
| Demobilization                       |                     | \$750.00/rig        |
| Extra Road Truck Trips (if required) |                     | \$150.00/round trip |
| <u>Core Drilling</u>                 | <u>NCE Wireline</u> | <u>NXE Wireline</u> |
| 1000 to 1500 Feet                    | \$19.20/foot        | \$17.70/foot        |
| 1500 to 2000 Feet                    | \$20.50/foot        | \$19.00/foot        |
| 2000 to 2500 Feet                    | \$22.20/foot        | \$20.70/foot        |

Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$440.00 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$55.00 per hour plus bit and other in-hole supplies at actual cost.

Rig Time & Hourly Work

|   |                                  |
|---|----------------------------------|
| Setting and Pulling Casing and Pipe<br>(two man crew) | \$55.00/hour +<br>materials used |
|---|----------------------------------|

Rig Time & Hourly Work (continued)

Cementing and/or Plugging Drill Holes (two man crew). Includes all time required to maintain good hole conditions while drilling. Also includes time required to close or complete hole as required.

\$55.00/hour +  
materials used

Reaming, if necessary (two man crew)

\$55.00/hour +  
materials used

Survey (two man crew)

\$55.00/hour +  
Asarco supplies  
instrument

Re-entering Previously Drilled Holes (two man crew). Includes all time worked entering previously drilled hole until wireline core bit is cutting in solid rock formation on true bottom of hole. This will also include:

\$60.00/hour +  
materials used

- (a) Time which is required to line up drill over previously drilled hole.
- (b) Time required to set casing in pre-drilled hole before starting to drill with wireline tools.
- (c) All time required to correct any problems encountered with existing casing or pipe in hole.

Standby Time for Your Convenience

\$40.00/hour

Extra Labor authorized by Asarco (if required)

\$20.00/man hour

Overtime Premium in Excess of 88 hours per two-week pay period (if requested)

\$6.00/man hour

Supplies

Casing Ordered Left in Place

NX \$8.00/foot

Casing Lost through Normal Drilling Operations

70% of List Price

Mr. Jim Sell  
Asarco Incorporated

PAGE 3  
July 25, 1989

Supplies (continued)

|   |                          |
|---|--------------------------|
| Diamond Bit Loss in Excess of \$2.50/foot                 | At Actual Cost           |
| Drilling Mud and Additives                                | At Jobsite Cost<br>+ 20% |
| Weather-treated Core Boxes which hold<br>ten feet of core | \$2.50 each              |
| Special Purchases authorized by Customer<br>(if required) | At Cost + 20%            |

Water Pumping or Hauling

|  |                         |
|--|-------------------------|
| Water Pump Rental                      | \$400.00/month          |
| Supply Pump & Pipeline Work            | \$20.00/man hour        |
| Water Truck Usage                      | \$600.00/man hour       |
| Mileage                                | \$.75/mile              |
| Water Truck Driving (if required)      | \$20.00/man hour        |
| <u>Per Diem</u> (Excluding local help) | \$15.00/man/work<br>day |

The above prices are firm if accepted within 30 days and will remain in effect until 9/25/89. Our terms are Net 30 Days on monthly progress invoices.

We understand Asarco will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to CBC Drilling. We further understand that Asarco will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable CBC Drilling to carry out the specified work.

We propose doing this work with a truck mounted 22 drill and wireline equipment. We will probably work two shifts per day unless hole conditions warrant round the clock operation.

You should contact Nino Trujillo (602-884-5866) to confirm a starting date.

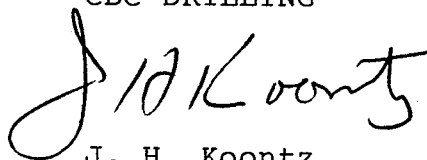
Mr. Jim Sell  
Asarco Incorporated

PAGE 4  
July 25, 1989

We would look forward to working with you on this project.

Yours very truly,

CBC DRILLING

A handwritten signature in dark ink, appearing to read "J H Koontz", written in a cursive style.

J. H. Koontz  
Vice President &  
General Manager

JHK/ts  
Facsimile:7-25-89

7/25/89

JAS

P.J.M.



1 1989

ASARCO, INC.  
P.O. BOX 5747  
TUCSON, AZ. 85703

ASARCO INCORPORATED

AUG 1 1989

SW Exploration

ARIZONA  
DEPARTMENT  
OF WATER  
RESOURCES

Rose Mofford, Governor  
N. W. Plummer  
Director

RE: Registration No. 55-525398  
File No. C(1-13)23ccc

Dear Well Owner:

15 South 15th Avenue  
Phoenix, Arizona 85007

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a monitor or exploration well which you recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. § 45-596. Your designated driller has been mailed a Well Drilling Card which he must have in his possession before commencing to drill.


☐ Since this well is being authorized as a monitor well, or for cathodic protection, grounding, geotechnical or piezometer purposes, our standard driller report form is being furnished to the driller which he must complete and return within 30 days after the completion of drilling. A Completion Report form is being furnished to you for monitor wells where pump equipment is authorized to be installed so that you may submit the report within 30 days after the installation of pumping equipment as required by A.R.S. § 45-600.

☒ This well is authorized for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion Report is being furnished your designated driller for each hole to be drilled. He is required to submit the Project Completion Report within 30 days after completion of drilling. You should insist that this be done.

In the event that you determine it necessary to change the location of the proposed well, you must obtain the written approval of the Department of Water Resources before proceeding with the drilling. A properly-signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location than originally authorized.

For your future use, A Change of Well Information form is enclosed should it become needed. Per A.R.S. § 45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, including abandonment, in order to keep the well registration file current and accurate.

Sincerely,

  
Richard A. Gessner  
Chief, Operations Division

Enclosures

cc: W.D. Gay (8/1/89)

DWR-55-51-6/89



ARIZONA DEPARTMENT OF WATER RESOURCES  
Operations Division  
15 South 15th Avenue  
Phoenix, Arizona 85007

CHANGE OF WELL INFORMATION

Well Reg. No. 55-525398

File (location) No. C(1-13)23ccc

I/We request the following well information be changed:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_, 19\_\_\_\_

\_\_\_\_\_  
Signature of current Well Owner

(DO NOT CUT THIS FORM IN HALF)

STATEMENT OF CHANGE OF WELL OWNERSHIP

I, \_\_\_\_\_, state that I am (no longer) the (new)  
(please print)  
owner of the well described below:

Township \_\_\_\_\_ Range \_\_\_\_\_ Section \_\_\_\_\_; \_\_\_\_\_  $\frac{1}{4}$  \_\_\_\_\_  $\frac{1}{4}$  \_\_\_\_\_  $\frac{1}{4}$

Well Registration No. \_\_\_\_\_ File (location) No. \_\_\_\_\_

\_\_\_\_\_  
Previous Owner

\_\_\_\_\_  
PRINT New Owner's Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Signature of New Owner

\_\_\_\_\_  
City State Zip

\_\_\_\_\_  
Address

DATED: \_\_\_\_\_

\_\_\_\_\_  
City State Zip

NOTE: A.R.S. §45-593.C. requires that the Department be notified of change of well ownership and that the well owner is required to keep the Department's Well Registration records current and accurate. Well data and ownership changes must be submitted within thirty (30) days after changes take place.

SAVE THIS FORM TO REPORT FUTURE CHANGES IN OWNERSHIP, CHANGES IN ADDRESS, OR CHANGE IN WELL DATA SUCH AS PUMP CAPACITY, CORRECTION OF LEGAL DESCRIPTION, CHANGE OF WELL DRILLER, PRIOR TO DRILLING THE WELL, IN ADDITION TO AMENDING INFORMATION PREVIOUSLY FILED.

\* \* \* \* \*

ARIZONA DEPARTMENT OF WATER RESOURCES  
15 South 15th Avenue  
Phoenix, Arizona 85007

NOTICE OF ABANDONMENT

A.R.S. §45-594; R12-15-816(E): The owner or operator of the well shall notify the Department in writing no later than thirty days after the abandonment has been completed.

1. Well location;  
Township \_\_\_\_\_  
Range \_\_\_\_\_  
Section \_\_\_\_\_  
\_\_\_\_\_  
(10 acre subdivision)  
County \_\_\_\_\_
2. Owner of the well:  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_
3. Owner of the land:  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_
4. Well Description:  
Depth of hole \_\_\_\_\_  
Diameter of hole \_\_\_\_\_  
Type of casing \_\_\_\_\_
5. Well Registration Number:  
55-525398  
File Number: \_\_\_\_\_
6. Prior to abandonment, did the well penetrate any water-bearing layers?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Unknown \_\_\_\_\_
7. Prior to abandonment, did the well have 20' of steel surface casing and 20' of grout in the annular space surrounding the surface casing?  
Yes \_\_\_\_\_ No \_\_\_\_\_
8. If the answer to No. 7 is no, was the top 20' of casing removed prior to setting the cement plug?  
Yes \_\_\_\_\_ No \_\_\_\_\_
9. Was the well filled with cuttings or other non-toxic material prior to setting the cement plug?  
Yes \_\_\_\_\_ No \_\_\_\_\_
10. If the answer to No. 9 is yes, what material was used to fill the well?  
\_\_\_\_\_
11. How deep does the cement plug extend below land surface?  
\_\_\_\_\_
12. Was the well backfilled above the cement plug?  
Yes \_\_\_\_\_ No \_\_\_\_\_
13. Date abandonment complete: \_\_\_\_\_

I state that this Notice is filed in compliance with A.R.S. §45-594: R12-15-816(E), and is complete and correct to the best of my knowledge and belief.

DATE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

Section 45-596, Arizona Revised Statutes and Rule R12-15-817 provide: Prior to drilling one or more exploration wells, the well owner, lessee or exploration firm shall file a Notice of Intention to Drill on a form provided by the Department.

## WELL/LAND LOCATION

1. Township 1 ~~N~~/S  
Range 13 ~~N~~/W  
Section 23

In the case of a single well,  
list 10-acre subdivision

SW 1/4, SW 1/4, SW 1/4

2. County Pinal

3. Applicant:  
ASARCO Incorporated

Name

P.O. Box 5747

Address

Tucson, AZ 85703

City State Zip

4. J.D.Sell/W.D. Gay  
NAME OF CONTACT PERSON  
Phone 602-792-3010

5. Owner of well:

ASARCO Incorporated

Name

P.O. Box 5747

Address

Tucson AZ 85703

City State Zip

6. Purpose of well(s) drilled  
pursuant to this Notice:

Mineral Exploration X

Geotechnical     

Cathodic Protection     

Grounding     

7. Number of wells 1  
(See Condition 3 on reverse)

8. Owner of land:  
U.S. Dept. of Agriculture  
Forest Service

Name

Rt. 1, Box 33

Address

Globe AZ 85501

City State Zip

9. DESCRIPTION OF WELL:

Diameter 4" inches

Depth 1400 feet

Type of casing Steel Surface  
(If none, so state)

10. Construction will start:  
August 1989  
Month Day Year

11. Drilling firm:

CBC Drilling

Name

707 Boyd Blvd.  
P.O. Drawer 489

Address

LaPorte, Indiana 46350

City State Zip

75

DWR License Number

12. Period well will remain  
in use 2 months.

13. Proposed method of  
abandonment of well(s)  
after project is  
completed:

Seal with steel cap  
on surface casing.

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

File No. 6(1-13) 23 CCC

Filed 7-12-89 By sk

Input      By     

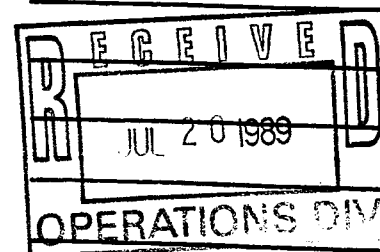
Duplicate

Mailed 7-25-89 By sk

Registration 55-525398

AMA/INA     

W/S L8 S/B     



14. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials? Yes      No X  
If yes, a request for a variance must accompany this application pursuant to R12-15-820.

## GENERAL INSTRUCTIONS

1. Fill out this form in duplicate and mail to Department of Water Resources, 15 South 15th Ave Phoenix, Arizona 85007
2. Proper filing fee of \$10.00 must accompany Notice.

I state that this Notice is filed in compliance with Rule R12-15-809 and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

DATE 7/19/89

DWR 55-40-10/88 (Revised)

James D. Sell  
Signature of Applicant  
James D. Sell, Manager SWED

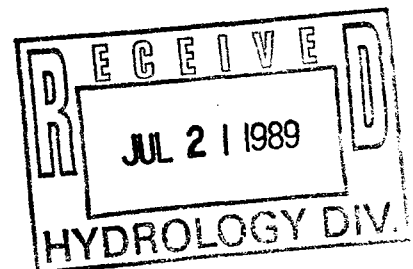
CONDITIONS

1. Construction and abandonment standards for all wells shall be in accordance with DWR Rules R12-15-811 and R12-15-816.
2. Drilling of the well(s) shall be completed within one (1) year after the date of Notice.
3. Mineral exploration, geotechnical cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these wells, then the well(s) must be properly abandoned in accordance with Condition 1 above.
4. More than one well may be drilled under a single notice for mineral exploration, geotechnical, cathodic protection and grounding purposes, so long as they are located within a single section.
5. A Project Completion Report (DWR-55-42-10/83) must be filed for each hole, within 30 days of completion of drilling. A Well Driller Report (DWR-55-6-Rev.) for each hole drilled, must be filed by the well driller within 30 days of completion of drilling for geotechnical, cathodic protection, and grounding wells.
6. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic protection or grounding purposes.
7. Special construction standards required pursuant to R12-15-821: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

USARCO Incorp.

AUG 1 1989

SW Exploration



ASARCO, INC.  
P O BOX 5747  
TUCSON, AZ. 85703

STATE OF ARIZONA  
DEPARTMENT OF WATER RESOURCES  
WATER RIGHTS ADMINISTRATION  
99 EAST VIRGINIA  
PHOENIX, ARIZONA 85004

RECEIPT

| KIND<br>ENTRY | FILE REFERENCE NO. |
|---------------|--------------------|
| 55            | 525398             |
|               | THRU               |

| ACCOUNT NO.    |        |         |      | INT.<br>ACCT. | ITEM DESCRIPTION                            | RATE | \$ AMOUNT |
|----------------|--------|---------|------|---------------|---|------|-----------|
| FUND<br>SOURCE | AGENCY | CHAPTER | DIV. |               |   |      |           |
|                |        |         |      |               | FILING FEE FOR NOTICE OF INTENTION TO DRILL |      | 10.00     |
|                |        |         |      |               | REGISTRATION#                               |      |           |
|                |        |         |      |               | C/1-13) 23000                               |      | 55-525398 |
|                |        |         |      |               |   |      |           |
|                |        |         |      |               |   |      |           |
|                |        |         |      |               |   |      |           |

7/25/89/ek  
CK#0031324

TOTAL \$10.00

AUG 1 1989  
SW Exploration



August 9, 1989

D.A. Melhado

Hole A-16  
Superior East Project  
Pinal County, AZ

I have talked with Nino and Jim Koontz of CBC Drilling and they believe they will have a rig available to go to A-16 during the week of August 14.

I would prefer that they move up on the 17-18 of August, set-up, and start coring on Monday, August 21.

You should keep in touch with Nino (602/884-5866) and be ready to provide a trailer, lock (keep extra key for Tucson), core boxes, marker pens, etc. for the job, as per my earlier memo of July 18, 1989.

As you and I discussed, you will also bring down core from the Miami warehouse to the Venture mini-storage on your return trips with the new Superior A-16 core.

A copy of the drilling contact is attached.

My projection is that they will go from Dacite to Earlier Volcanics around 1630 feet and then from Earlier Volcanics to Whitetail Conglomerate around 2380 feet.

Based on drill holes in the vicinity, they converted from NC to NX core size at an average of 2340 foot depth.

You will need to keep track of costs, but my view is that only about \$20K will be spent in drilling by this time. We may be lucky and get the hole down to 2600-2800 feet (as in A-11 & A-14) and if so, then we'd be near the \$30K expenditure needed.

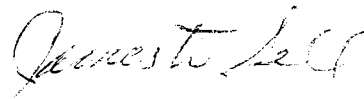
We need to know how the heavy mud placed in the hole last year has preserved the hole for this year. If it did well, then after talking with Mr. Koontz, I would prefer to heavy mud the new hole (if \$30K expenditures have been made) rather than to spend \$15-20K in casing costs to that depth.

Of course, rock conditions will ultimately dictate what has to be done.

Keep informed.

JDS:mek  
Att.

cc: W.L. Kurtz

  
James D. Sell



707 BOYD BOULEVARD / LaPORTE, INDIANA 46350 / PHONE & FAX: (219) 362-2191

July 25, 1989

Mr. Jim Sell  
Asarco Incorporated  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

We appreciated receiving the invitation to bid on your core drilling near Superior, Arizona. This is a continuation of last year's work which will involve reentering and cleaning out the hole to 1380 and coring NC from there. It is hoped that the Bentonite mud pumped at closure last year will have helped contain the lost circulation problems we were experiencing.

Please consider the following:

|                                      |                     |                     |
|--------------------------------------|---------------------|---------------------|
| Mobilization                         |                     | \$750.00/rig        |
| Demobilization                       |                     | \$750.00/rig        |
| Extra Road Truck Trips (if required) |                     | \$150.00/round trip |
| <u>Core Drilling</u>                 | <u>NCE Wireline</u> | <u>NXE Wireline</u> |
| 1000 to 1500 Feet                    | \$19.20/foot        | \$17.70/foot        |
| 1500 to 2000 Feet                    | \$20.50/foot        | \$19.00/foot        |
| 2000 to 2500 Feet                    | \$22.20/foot        | \$20.70/foot        |

Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$440.00 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$55.00 per hour plus bit and other in-hole supplies at actual cost.

Rig Time & Hourly Work

|   |                                  |
|---|----------------------------------|
| Setting and Pulling Casing and Pipe<br>(two man crew) | \$55.00/hour +<br>materials used |
|---|----------------------------------|

Rig Time & Hourly Work (continued)

Cementing and/or Plugging Drill Holes (two man crew). Includes all time required to maintain good hole conditions while drilling. Also includes time required to close or complete hole as required.

\$55.00/hour +  
materials used

Reaming, if necessary (two man crew)

\$55.00/hour +  
materials used

Survey (two man crew)

\$55.00/hour +  
Asarco supplies  
instrument

Re-entering Previously Drilled Holes (two man crew). Includes all time worked entering previously drilled hole until wireline core bit is cutting in solid rock formation on true bottom of hole. This will also include:

\$60.00/hour +  
materials used

- (a) Time which is required to line up drill over previously drilled hole.
- (b) Time required to set casing in pre-drilled hole before starting to drill with wireline tools.
- (c) All time required to correct any problems encountered with existing casing or pipe in hole.

Standby Time for Your Convenience

\$40.00/hour

Extra Labor authorized by Asarco (if required)

\$20.00/man hour

Overtime Premium in Excess of 88 hours per two-week pay period (if requested)

\$6.00/man hour

Supplies

Casing Ordered Left in Place

NX \$8.00/foot

Casing Lost through Normal Drilling Operations

70% of List Price

Mr. Jim Sell  
Asarco Incorporated

PAGE 3  
July 25, 1989

Supplies (continued)

|   |                          |
|---|--------------------------|
| Diamond Bit Loss in Excess of \$2.50/foot                 | At Actual Cost           |
| Drilling Mud and Additives                                | At Jobsite Cost<br>+ 20% |
| Weather-treated Core Boxes which hold<br>ten feet of core | \$2.50 each              |
| Special Purchases authorized by Customer<br>(if required) | At Cost + 20%            |

Water Pumping or Hauling

|  |                         |
|--|-------------------------|
| Water Pump Rental                      | \$400.00/month          |
| Supply Pump & Pipeline Work            | \$20.00/man hour        |
| Water Truck Usage                      | \$600.00/man hour       |
| Mileage                                | \$.75/mile              |
| Water Truck Driving (if required)      | \$20.00/man hour        |
| <u>Per Diem</u> (Excluding local help) | \$15.00/man/work<br>day |

The above prices are firm if accepted within 30 days and will remain in effect until 9/25/89. Our terms are Net 30 Days on monthly progress invoices.

We understand Asarco will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to CBC Drilling. We further understand that Asarco will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable CBC Drilling to carry out the specified work.

We propose doing this work with a truck mounted 22 drill and wireline equipment. We will probably work two shifts per day unless hole conditions warrant round the clock operation.

You should contact Nino Trujillo (602-884-5866) to confirm a starting date.

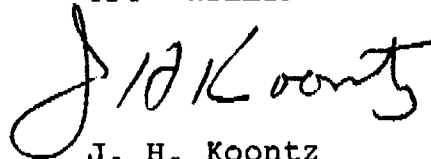
Mr. Jim Sell  
Asarco Incorporated

PAGE 4  
July 25, 1989

We would look forward to working with you on this project.

Yours very truly,

CBC DRILLING

A handwritten signature in dark ink, appearing to read "J H Koontz", written in a cursive style.

J. H. Koontz  
Vice President &  
General Manager

JHK/ts



CO Incorp.

**CBC DRILLING**

Formerly Joy Contract Drill Division

**DUPLICATE**

JDS

SEP 5 1989

SW Exploration

707 BOYD BLVD.  
LA PORTE, IN 46350PLEASE REMIT TO  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03946              |                         |                            | 03-0946-24          |

SOLD  
TOASARCO INC.  
ATTN: MR. JIM SELL  
P.O. BOX 5747  
TUCSON, AZ 85703TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

INVOICE NO. AZ1175

INVOICE DATE 9/1/89

SHIPPED  
TO

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

DATE SHIPPED

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-362-2191

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

For 201.' core drilling near Superior, Arizona for period ending August 25, 1989  
as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COST |
|---------------------|------|-------|-------|------------|-----------|------------|
| A-16                | NC   | 1380. | 1500. | 120.       | 19.20     | 2,304.00   |
|                     | NC   | 1500. | 1581. | 81.        | 20.50     | 1,660.50   |
|                     |      |       |       | 201.       |           | 3,964.50   |

(586-1009) REENTRY

|      |         |                         |          |
|------|---------|-------------------------|----------|
| A-16 | Aug. 21 | 3 Hours                 |          |
|      | Aug. 22 | 16 Hours                |          |
|      | Aug. 23 | 3 Hours                 |          |
|      |         | 22 Hours @ \$60.00/hour | 1,320.00 |

(586-1007) CEMENTING, PLUGGING, HOLE CONDITIONING AND CLOSING HOLE

|      |         |                       |       |
|------|---------|-----------------------|-------|
| A-16 | Aug. 23 | 1 Hour @ \$55.00/hour | 55.00 |
|------|---------|-----------------------|-------|

(586-1008) WATER HAUL

|                                 |  |       |       |
|---------------------------------|--|-------|-------|
| August 21 through August 25     |  |       |       |
| 1 Truck @ \$600.00/month (4/30) |  | 80.00 |       |
| 5 Miles @ \$.75/mile            |  | 3.75  |       |
|                                 |  |       | 83.75 |

W.D. GAY

FORM  
INV.-89-1

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

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

**CBC DRILLING**

Formerly Joy Contract Drill Division

**DUPLICATE**

SOLD TO ASARCO INC. ATTN: MR. JIM SELL

PAGE NO.

2

INVOICE NO

AZ1175

(587-1101) MUD AND ADDITIVES

|   |                               |              |
|---|-------------------------------|--------------|
| 2 | 5 Gal. EZ Mud @ \$131.04/each | 262.08       |
| 1 | Mud Seal @ \$18.90 each       | <u>18.90</u> |

280.98

(586-1009) PER DIEM

|          |               |
|----------|---------------|
| Michael  | 5 Days        |
| Salgado  | 5 Days        |
| Figueroa | 5 Days        |
| Norman   | <u>5 Days</u> |

20 Days @ \$15.00/man/work day

300.00

(586-1005) MOBILIZAITON

Rig 9103

750.00

TOTAL INVOICE:

\$6,754.23

TELEPHONE  
NUMBER

33-001 380 241 DISSEMINATED BOX  
33-000 90 241 640

00000000

A-16

TD 2446'

MESSAGE

| RECEIVED       |                 |
|----------------|-----------------|
| MAILED         | RECEIVED        |
| CALL TO ACTION | WILL CALL AGAIN |
| TELEPHONE      | PLEASE CALL     |

PHONE

TO

IN

WHITE AND WERE OUT

DATE

TIME

TO

ASARCO Incorporated

**CBC DRILLING**  
Formerly Joy Contract Drill Division*Original sent to  
Acctg 10/6/89***ORIGINAL**

JDS

**OCT 16 1989**707 BOYD BLVD.  
LA PORTE, IN 46350

SW Exploration

**PLEASE REMIT TO**P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03946              |                         |                            | 03-0946-24          |

**SOLD TO**ASARCO INC.  
ATTN: MR. JIM SELL  
P.O. BOX 5747  
TUCSON, AZ 85703TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM**INVOICE NO.** AZ1189**INVOICE DATE** 10/4/89**SHIPPED TO**

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130**DATE SHIPPED**ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-362-2191**SHIPPED VIA****P. O. ADDRESS****MARKS****REQUESTED ROUTING****SHIPPED FROM**

For 537.' core drilling near Superior, Arizona for period 9/1/89 - 9/23/89 as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COST |
|---------------------|------|-------|-------|------------|-----------|------------|
| A-16 (90°)          | NC   | 1909. | 2000. | 91.        | 20.50     | 1,865.50   |
|                     | NC   | 2000. | 2446. | 446.       | 22.50     | 10,035.00  |
|                     |      |       |       | 537.       |           | 11,900.50  |

(586-1007) CEMENTING, PLUGGING, HOLE CONDITIONING AND CLOSING HOLE

|         |                        |        |
|---------|------------------------|--------|
| Sep. 1  | 1 Hour                 |        |
| Sep. 2  | 1 Hour                 |        |
| Sep. 11 | 1 Hour                 |        |
| Sep. 20 | 3 Hours                |        |
|         | 6 Hours @ \$55.00/hour | 330.00 |

(586-1008) WATER HAUL

|                                  |        |
|----------------------------------|--------|
| September 1 through September 31 |        |
| 1 Truck @ \$600.00/month (21/30) | 420.00 |
| 34 Miles @ \$.75/mile            | 25.50  |
|                                  | 445.50 |

(587-1101) MUD AND ADDITIVES

|                                  |          |
|----------------------------------|----------|
| 15 5 Gal. EZ Mud @ \$131.04 each | 1,965.60 |
| 2 Mud Seal @ \$18.90 each        | 37.80    |
| 6 50# Mud @ \$5.17 each          | 31.02    |
| 2 5 Gal. Sol. Oil @ \$33.23 each | 66.46    |
|                                  | 2,100.88 |

cc W.D.G.A X

FORM  
INV-89-1F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED  
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE  
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS  
OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

**CBC DRILLING**

Formerly Joy Contract Drill Division

**ORIGINAL**

SOLD TO ASARCO INC. ATTN: MR. JIM SELL

PAGE NO.

2

INVOICE NO.

AZ1189

(586-1009 PER DIEM

Michael 17 Days

Salgado 16 Days

Figueroa 16 Days

Norman 17 Days

66 Days @ \$15.00/man/work day

990.00

TOTAL INVOCIE: \$15,766.88

NOTE: Hole Log for Hole A-16 was mailed directly to the  
Arizona DWR (copy attached).

WORK COMPLETED

APPROVED FOR PAYMENT

By: \_\_\_\_\_  
((Signature),

ASARCO Incorporated

**OCT 16 1989**

SW Exploration



L  
D  
T  
O

Joy CBL Drilling  
Job # 03-0946-24  
Adarco Superior #9



# Mesa Fuel Co

P.O. BOX 6176  
PHOENIX, ARIZONA 85005-6176  
(602) 892-5776  
AZ VENDOR LIC. #08832  
FED. I.D. #86-0109486

INVOICE  
17078

DATE 9-13 19 89

| P. O. NUMBER |                 | THIS INVOICE INCLUDES FEDERAL & STATE GASOLINE TAXES BUT DOES NOT INCLUDE FEDERAL EXCISE TAX ON DIESEL FUEL NOR STATE USE FUEL TAX UNLESS SHOWN AS A SEPERATE ITEM. |       | CASH   |    | CHARGE |  |
|--------------|-----------------|---|-------|--------|----|--------|--|
|              |                 |   |       |        |    | X      |  |
| NUMBER       | PRODUCT         | QUANTITY  | PRICE | AMOUNT |    |        |  |
| BULK         | DIC             | 113.4   | .689  | 78     | 13 |        |  |
| BULK         | 41F             | 63.3  | .969  | 61     | 34 |        |  |
|              |                 |   |       |        |    |        |  |
| 2-5/11       | Soluble Oil - D | 10  | 5.25  | 52     | 50 |        |  |
|              |                 |   |       |        |    |        |  |
|              |                 | TX  | .055  | 4      | 18 |        |  |
|              |                 |   |       | 199    | 15 |        |  |

ORIGINAL

TERMS: NET \_\_\_\_\_ DAYS. PAST DUE AFTER \_\_\_\_\_. If account unpaid within time permitted, customer agrees to pay interest at 18% PER ANNUM and attorney's fees if account is referred to an attorney for collection. The undersigned hereby states that he is authorized to bind the principal to the terms hereof.

DELIVERED BY: Spencer CUSTOMER SIGNATURE: Robert Michael BULK SALE ☐ TYPE OF CONTAINER

TAX HAND-L = \$33.23 / 5 GAL  
5 GAL x 5.25 x 1.055 x 1.2 =  
JMC 10/3/89

**DUPLICATE**

## PROJECT COMPLETION REPORT FOR EXPLORATION DRILLING

This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well drilling project.

1. Owner ASARCO, INC.P.O. BOX 5747; TUCSON, AZ 85703

Name

Address

2. Lessee or Operator \_\_\_\_\_

Name

Address

3. Driller CBC DRILLING

Name

750 E. EVANS BLVD.; TUCSON, AZ 85713

Address

4. Location: 1S 13W 23 SW SW SW WELL REGISTRATION NO. 55- 525398Township Range Section  $\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$ 

(a requirement)

## DESCRIPTION OF WELL

5. Type of casing (if installed) \_\_\_\_\_

6. Abandonment method and materials used if abandoned: \_\_\_\_\_

7. Construction details if completed for monitoring purposes, re-entry or conversion to water wells: Hole A-16 was reentered at 1380' and drilled NC to 2446'. Upon completion the hole was filled with heavy mud and the cap was reinstalled.

8. Date or period drilled 8/21/89 through 9/20/89

## LOG OF WELL

☐ Unconsolidated Formation☒ Consolidated Formation 1380 - 2446'

Depth to water in feet below land surface: Indeterminant  
(if encountered or detected) if any

I state that this report is filed in compliance with ARS 345-600 and is complete and correct to the best of my knowledge and belief.

J. H. KOONTZ 10/4/89  
Driller's Signature Date

DO NOT WRITE IN THIS SPACE  
OFFICE RECORDRegistration No. 55-525398

Received \_\_\_\_\_ By \_\_\_\_\_

Entered \_\_\_\_\_ By \_\_\_\_\_

File No. C(1-13)23ccc

OCT 17 1989

SW Expiration

# KOFA Drilling Corp.

12805 W. Emigh Rd. • Tucson, Arizona 85743 • (602) 792-9300

October 13, 1989

ASARCO

P. O. Box 5747

Tucson, AZ 85703

Proposal #89-19

ASARCO P. O. #T-271-9

Please find below our proposal for the new well you have planned at your ranch in Superior. Our prices for the well will be as follows:

1. Mobilization and demobilization: \$2,400.00  
This includes mobilization of men and equipment from yard to job site and return, as well as set-up on hole.
2. Drilling:  
Drill and case hole with either 6 inch or 4 inch steel casing as ground conditions and water conditions dictate at \$16.00 per foot.
3. Surface casing: 350.00  
Install 20 feet of surface casing grouted in place as required by state law.
4. Rig time delays:  
Time spent on tear-down, cementing operations, delays for client convenience, lack of roads, or survey operations will be charged at \$75.00 per hour.
5. Water truck:  
A water truck will be supplied by Kofa Drilling Corporation at no charge to the customer.
6. Mud and additives:  
All mud and additives, foamer, polymer, cement or lost circulation materials will be charged at list prices.
7. Water:  
Water supply in sufficient quantities for normal drilling operations will be supplied at no cost to Kofa Drilling Corporation.



# **KOFA Drilling Corp.**

12805 W. Emigh Rd. • Tucson, Arizona 85743 • (602) 792-9300

8. Access:

Road and drill site accessible with 2-wheel drive vehicles carrying normal loads will be supplied at no cost to Kofa Drilling Corporation.

9. Subsistence:

Subsistence of \$35.00 per day per man for a two man crew will be charged.

Kofa Drilling Corporation's drilling prices include all costs of normal drilling operations including labor, fuel, bits, and mud mixing time. WE have equipment and men available. Kofa Drilling Corporation is licensed and bonded as a General Drilling Contractor and holds an Arizona Water Well license.



10-20-89

They are working  
on the Yeager mtn  
Project (Went beyond  
in NV.

They are testing  
dry drilling equip-  
ment & are looking  
at the Wocits for  
a test program

They never talked  
to Maxima who  
said they hit water  
but were able to  
seal it off in  
shaft.

Wants water  
date - will  
send request

I asked if they  
might drill where  
we wanted with  
hole we could  
rent.

To JDS  
Date 10/19/89 Time 3:15 ☐ AM ☒ PM  
**WHILE YOU WERE OUT**  
M Jim Meyer  
of Westinghouse LV  
Phone (702) 295-5881  
Area Code 702 Number 295 Extension 5881  

|                   |                                     |                 |                          |
|-------------------|-------------------------------------|-----------------|--------------------------|
| TELEPHONED        | <input checked="" type="checkbox"/> | PLEASE CALL     | <input type="checkbox"/> |
| CALLED TO SEE YOU | <input type="checkbox"/>            | WILL CALL AGAIN | <input type="checkbox"/> |
| WANTS TO SEE YOU  | <input type="checkbox"/>            | URGENT          | <input type="checkbox"/> |

|                    |                          |
|--------------------|--------------------------|
| RETURNED YOUR CALL | <input type="checkbox"/> |
|--------------------|--------------------------|

  
Message Re info on  
Superior Area  
Yucca Mtn Project  
  
  
  
  
Operator Mary



November 6, 1989

FILE NOTE

Department of Energy Drilling  
Oak Flat Area  
Superior East Project  
Pinal County, Arizona

James L. Moyer and J.N. "Nick" Stellavato followed up on the Department of Energy request (attached) on information on the dacite Plateau area of our Superior East project.

They had some data from the Arizona Water Department where Asarco had requested water rights or some of the drill holes we have completed.

Moyer and Stellavato were interested in holes only around Oak Flat as they believe that is the area they want to drill in (i.e., a non-mining company area).

Thus I gave them the following information (with only section designation -- not drill hole numbers).

| <u>(Hole)</u> | <u>Depth to base of Dacite</u> | <u>Water Information</u>   |
|---------------|--------------------------------|----------------------------|
| (A-4)         | 1975 ft.                       | Water between 400-1500 ft. |
| (A-5)         | 2274 ft.                       | Unknown                    |
| (A-7)         | 2100 ft.                       | Water between 360-1475 ft. |

The Dept. of Energy is having a large drilling machine built which will be capable of drilling to 6000-7000 feet (at Yucca Mtn., NV) with a dual pipe set-up with roller-cones on the outside and open-space in center for coring. The outside will be 12"-15" with the inner core being NC. They envision to core 20' then ream-drill 20', then core and repeat-repeat-repeat.

Apparently, the Oak Flat area is very similar to the Yucca Flat area and having minor water, other than the perched, fracture controlled zone, is one of the better areas to test this machine and drilling sequence.

They will visit Magma at Superior and the Forest Service in Globe in the next few days.

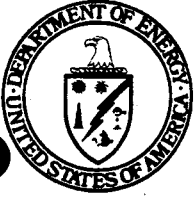
They say they will only test the volcanic section here in Arizona and that the cuttings and reports will be available to interested parties, and of course, the hole available for others to continue after they are through.

Their first site proposed (in case the FS will not let them drill on Oak Flat) is south of hole A-4, some 2500 ft, on Asarco claims. I asked them to keep in touch as they proceeded in their study of sites.

JDS:mek  
Att.

  
James D. Sell

cc: R.L. Brown  
W.L. Kurtz



## Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

OCT 31 1989

WBS # 1.2.3

QA: N/A

ASARCO Incorporated

J. D. Sell  
ASARCO Incorporated  
Post Office Box 5747  
Tucson, AZ 85703

NOV 3 1989

SW Exploration

### REQUEST FOR INFORMATION ON APACHE LEAP


Jim Moyer, a geologist at our Sample Management Facility (SMF), mentioned in a recent telephone conversation with you that we are interested in doing some experimental dry-drilling in volcanic rocks, and that we were considering some area near Apache Leap, east of Superior, as a possible site. You indicated that ASARCO has drilling records from a number of air-drilled holes in the general area and that you might provide us with some of the data from them.

We are interested only in the upper, dacite/tuff part of the section, and the information we need includes:

- o Thickness of the dacite
- o Depth to water zones and, if possible, thickness of the zones
- o An estimate of volume (gallons per minute) when encountered
- o Indications of water in any deeper intervals below the volcanics

Our area of interest encompasses T.1 S, R.13 E., secs. 2, 3, 12-15, 21-28, 35, and T.2 S., R.13 E., secs. 3-9.

Any information that you can provide to this office will be greatly appreciated. Should you be interested in geologic information resulting from dry drilling or in the dry drilling technology we will be developing at Apache Leap, we would be glad to make this information available to you. Coordinate your request through the SMF representatives. If you have any questions, please contact Roy C. Long of my staff at (702) 794-7503.

  
Carl P. Gertz, Project Manager  
Yucca Mountain Project Office

YMP:RCL-485

J. D. Sell

-2-

OCT 31 1989

cc:

J. N. Stellavato, SAIC, Las Vegas, NV  
J. H. Peck, SAIC, Las Vegas, NV  
M. S. Whitfield, USGS, Denver, CO  
R. L. Bullock, FSN, Las Vegas, NV  
B. B. Garms, FSN, Las Vegas, NV  
R. F. Pritchett, REEC Co, Las Vegas, NV  
J. C. Mc Daniel, REEC Co, Las Vegas, NV  
C. J. Mason, REEC Co, Las Vegas, NV

NICK STELLAVATO - SAIC

James L. Moyer

Supervisor (Field Operations)  
Technical & Management  
Support Services

Westinghouse Electric Corporation  
Nuclear Services Division  
Valley Bank Center  
101 Convention Center Drive  
Las Vegas Nevada 89109  
(702) 295-5881  
FTS 544-5881

# ASARCO

Exploration Department  
Southwestern United States Division

James D. Sell  
Manager

November 15, 1989

Mr. Carl P. Gertz, Project Manager  
Yucca Mountain Project Office  
Department of Energy  
Nevada Operations Office  
P.O. Box 98518  
Las Vegas, NV 89193-8518

Apache Leap  
Pinal County, AZ

Dear Mr. Gertz:

Mr. Jim Moyer and J. "Nick" Stellavato have been into this office and collected the information that they requested which Asarco had in its files.

Should your site selection for your equipment test program be on Asarco mineral claims, Asarco would work with you on the logistics and units through the volcanic section.

Drilling below 2000 feet would necessitate input from the New York Office.

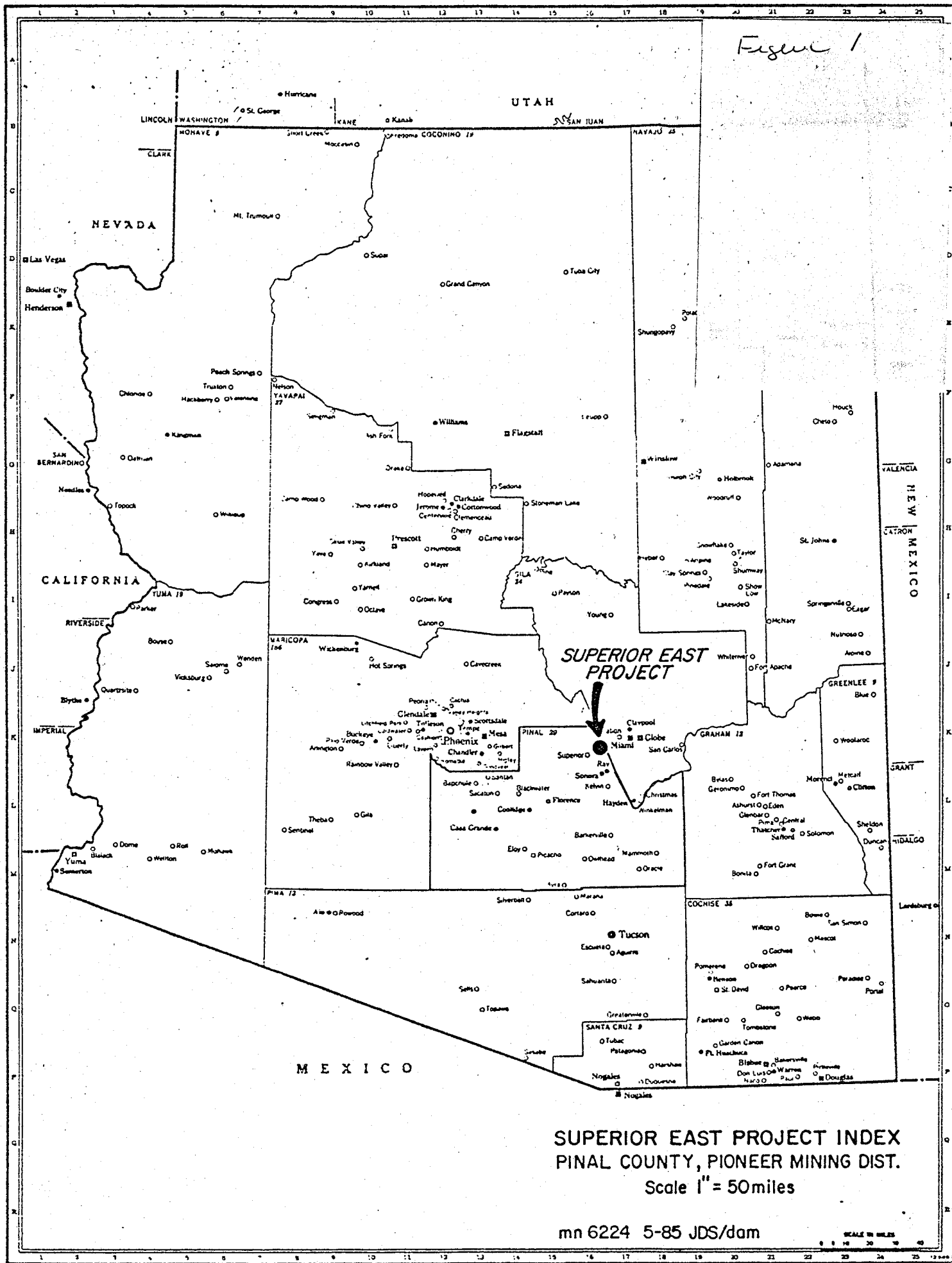
Sincerely,



James D. Sell

JDS:mek

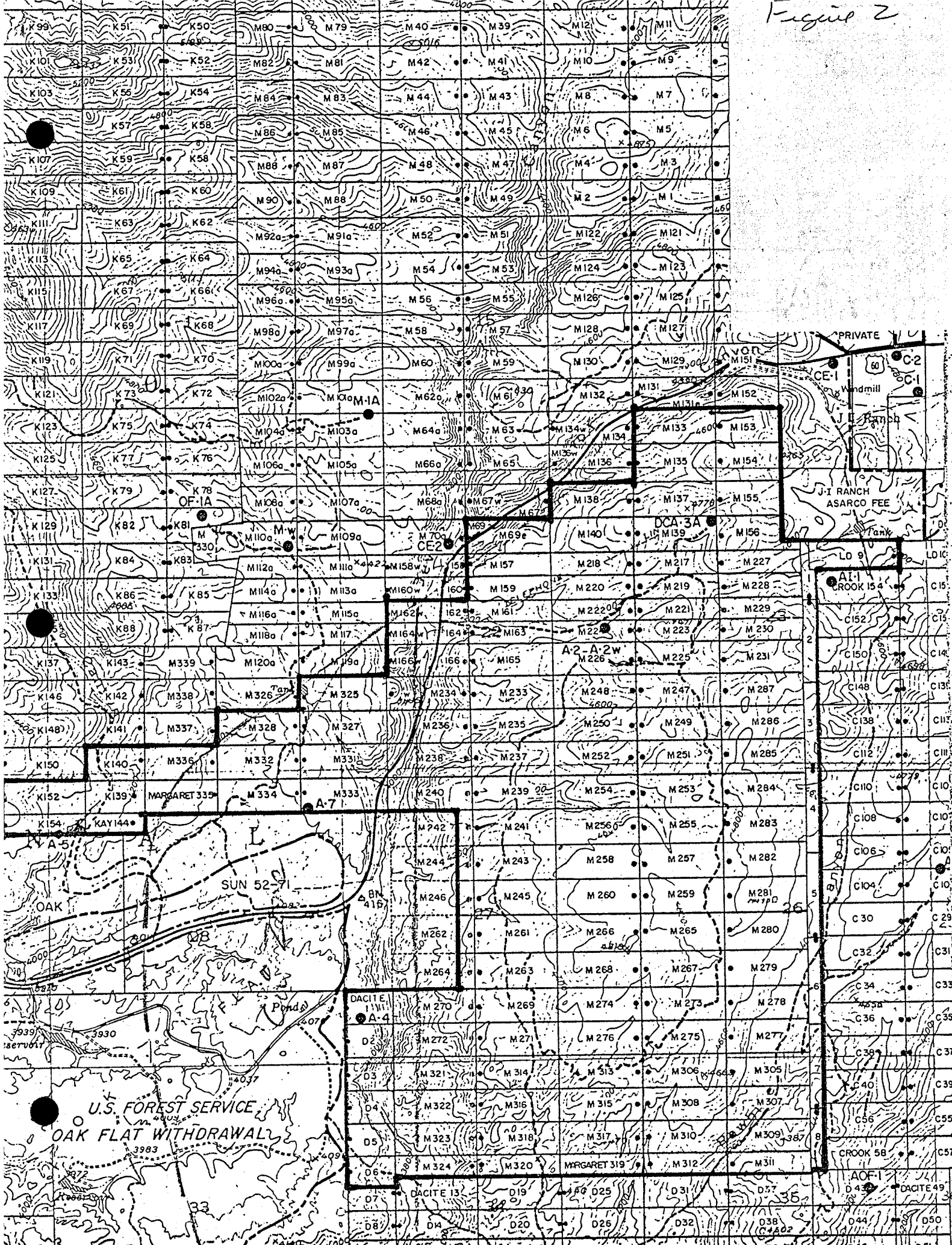
cc: W.L. Kurtz  
R.L. Brown

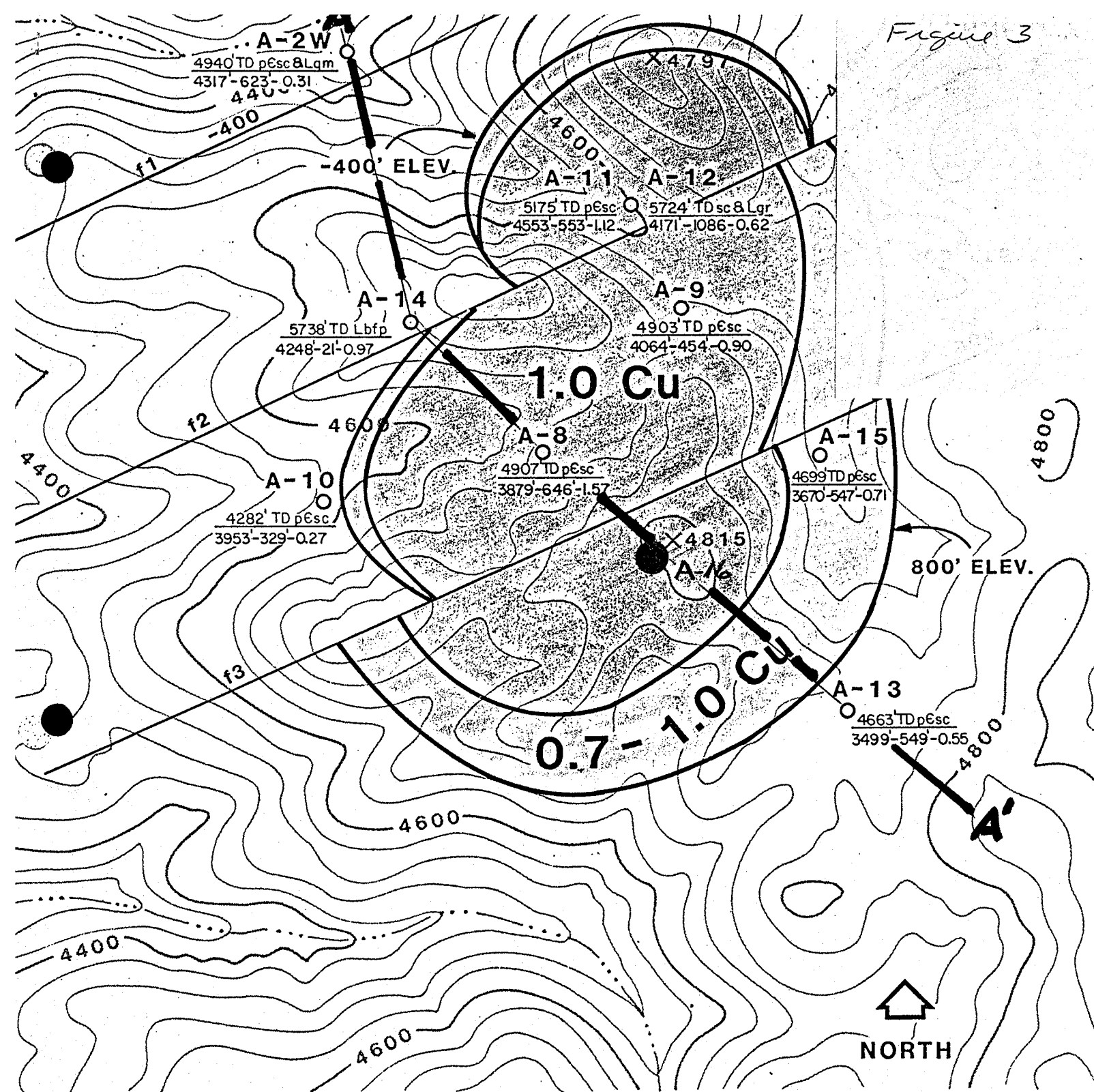


mn 6224 5-85 JDS/dam



Figure 2.





DEC 1985

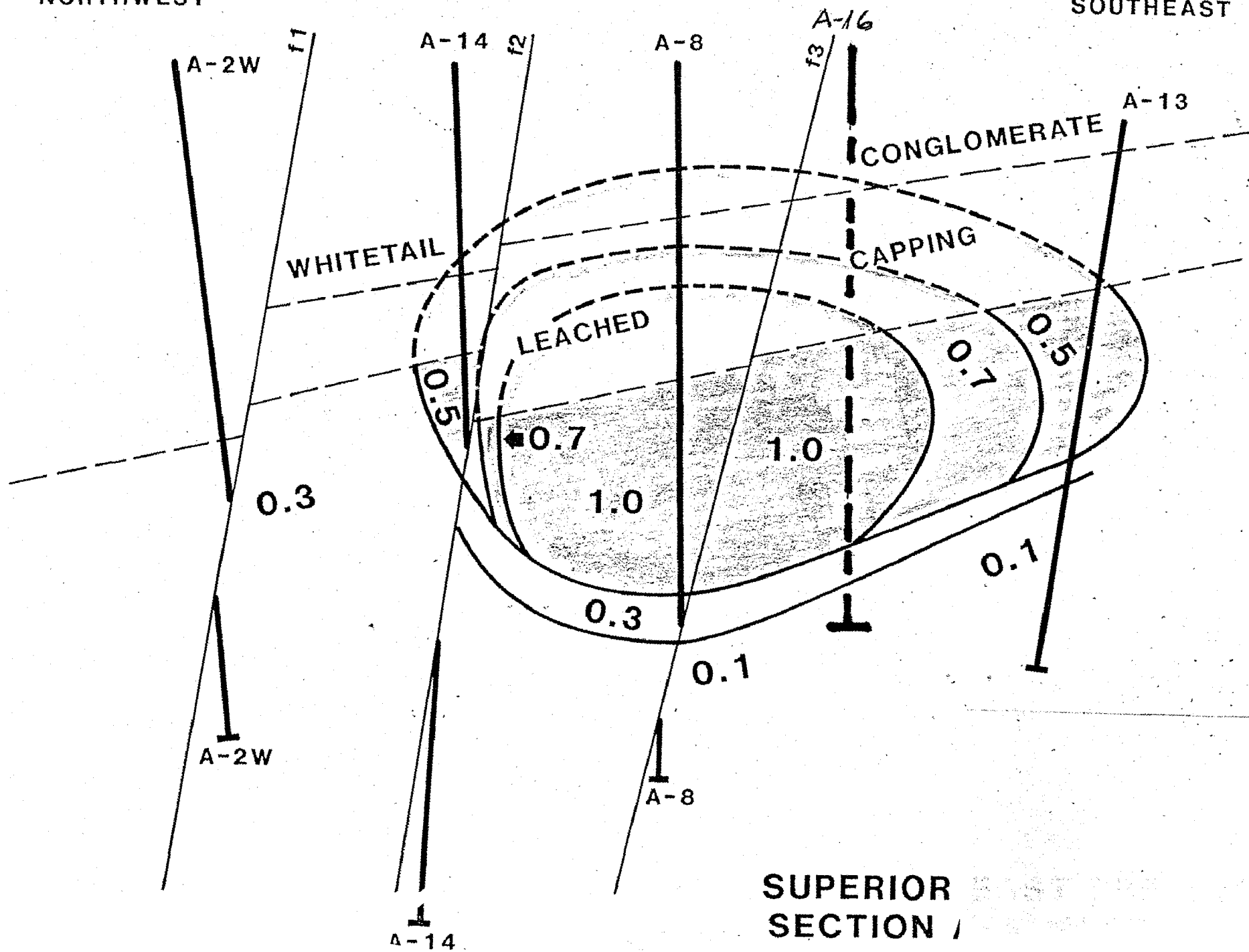
**A-8**  
**ASARCO hole & designation**  
4907 TD pccs **total depth rock type**  
 3879-646-1.57 **depth-length-%copper**

**PRE-MINERAL ROCK TYPE**

|      |                                    |
|------|------------------------------------|
| Lbfp | Laramide biotite feldspar porphyry |
| Lqm  | Quartz monzonite                   |
| Lgr  | Granite                            |
| pEsc | Schist                             |

NORTHWEST

SOUTHEAST



1-8-90

Jim Meyer

702/295-5881

A-5

Shuffled up air to 640' , mud running  
Maxflow 3000 6 3/4 hole.

45.9 ft/shft.

Reblications ??

|                              |                                     |  |                                     |
|------------------------------|-------------------------------------|--|-------------------------------------|
| To <u>JDS</u>                |                                     |  |                                     |
| Date <u>1/11/90</u>          |                                     | Time <u>11:45</u> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM |                                     |
| <b>WHILE YOU WERE OUT</b>    |                                     |  |                                     |
| M <u>Jim Meyer</u>           |                                     |  |                                     |
| of <u>LV</u>                 |                                     |  |                                     |
| Phone ( )                    |                                     |  |                                     |
| Area Code                    |                                     | Number   | Extension                           |
| TELEPHONED                   | <input checked="" type="checkbox"/> | PLEASE CALL  | <input checked="" type="checkbox"/> |
| CALLED TO SEE YOU            | <input type="checkbox"/>            | WILL CALL AGAIN  | <input type="checkbox"/>            |
| WANTS TO SEE YOU             | <input type="checkbox"/>            | URGENT   | <input type="checkbox"/>            |
| RETURNED YOUR CALL           |                                     | <input type="checkbox"/>   |                                     |
| Message <u>Said you have</u> |                                     |  |                                     |
| <u>his phone no.</u>         |                                     |  |                                     |
| <u>me.</u>                   |                                     |  |                                     |
| Operator                     |                                     |  |                                     |

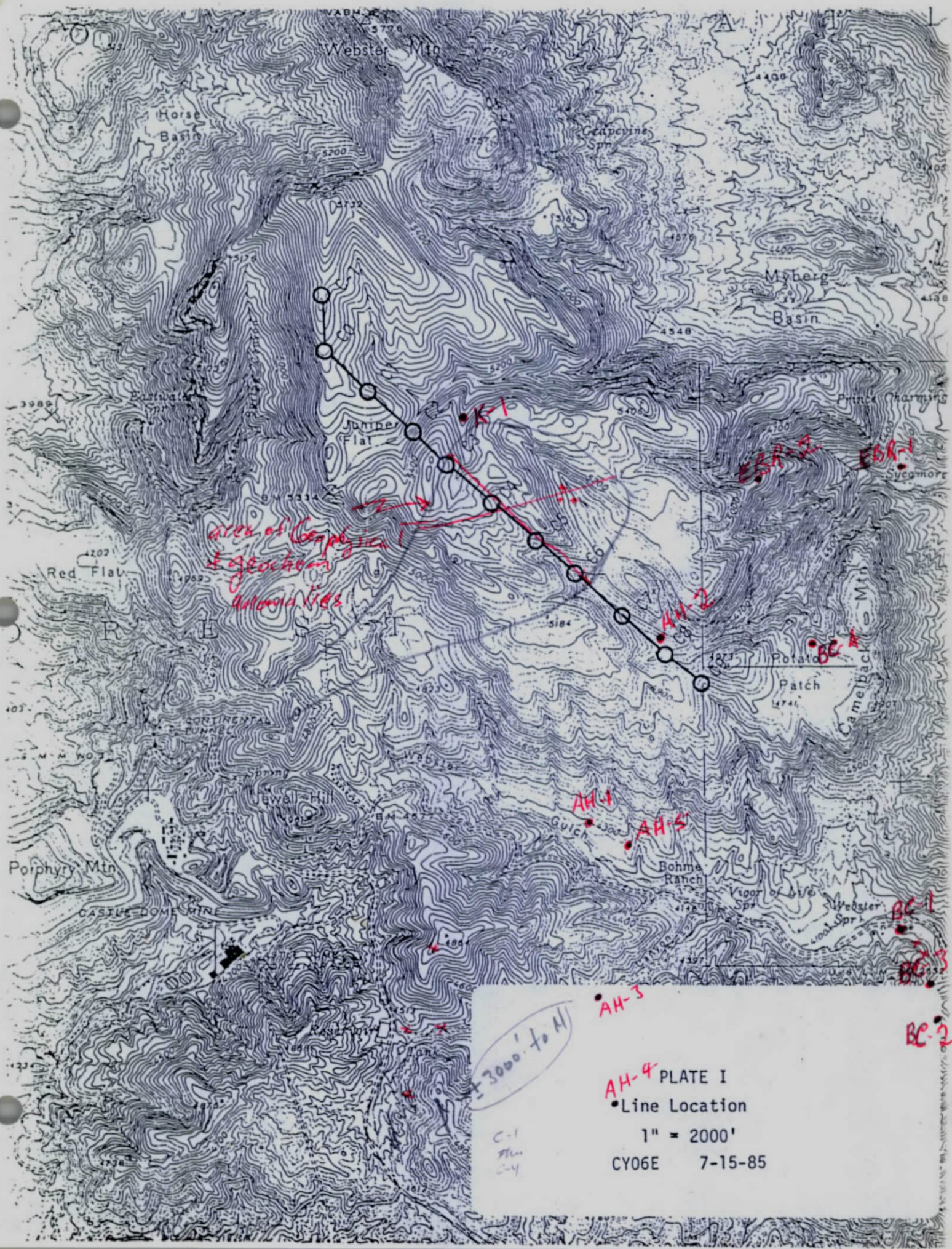
AMPAD  
EFFICIENCY

REORDER  
#23-000









3000' to 4111

AH-4

PLATE I

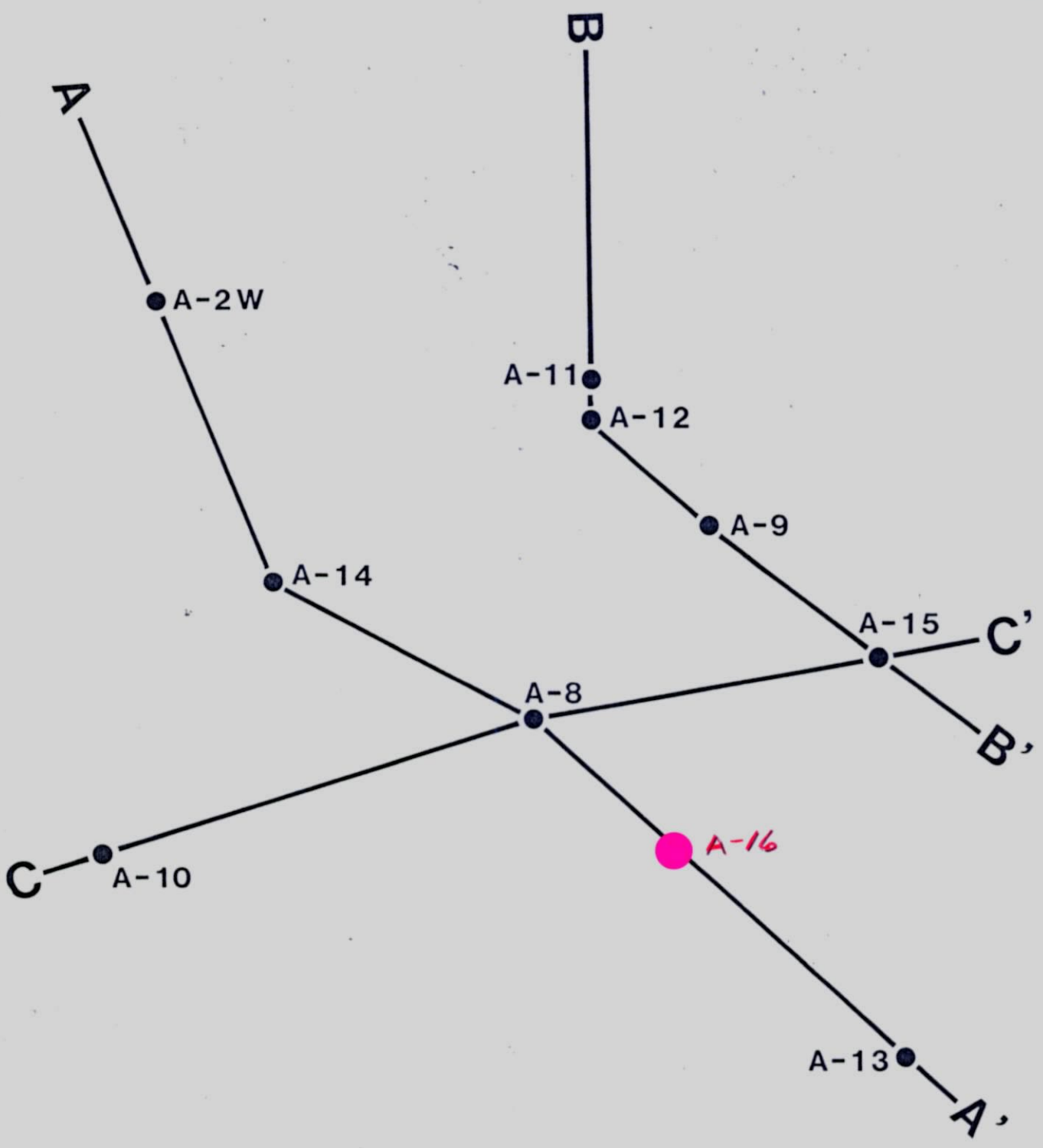
Line Location

1" = 2000'

CY06E 7-15-85

C-1  
Mm  
24





SECTION LINES

1" = 400'

SUPERIOR EAST PROJECT  
PINAL COUNTY ARIZONA

NORTH

SOUTHEAST

A-11

A-12

A-15

CONGLOMERATE

WHITETAIL

LEACHED

CAPPING

CORE

1.0

A-11

A-12

A-9

f3

f2

f1

0.5 0.7 0.4 0.9 0.6 0.5 0.7 0.4 0.2 0.5 0.3 0.1

SUPERIOR EAST PROJECT  
SECTION B-B' RESTORED

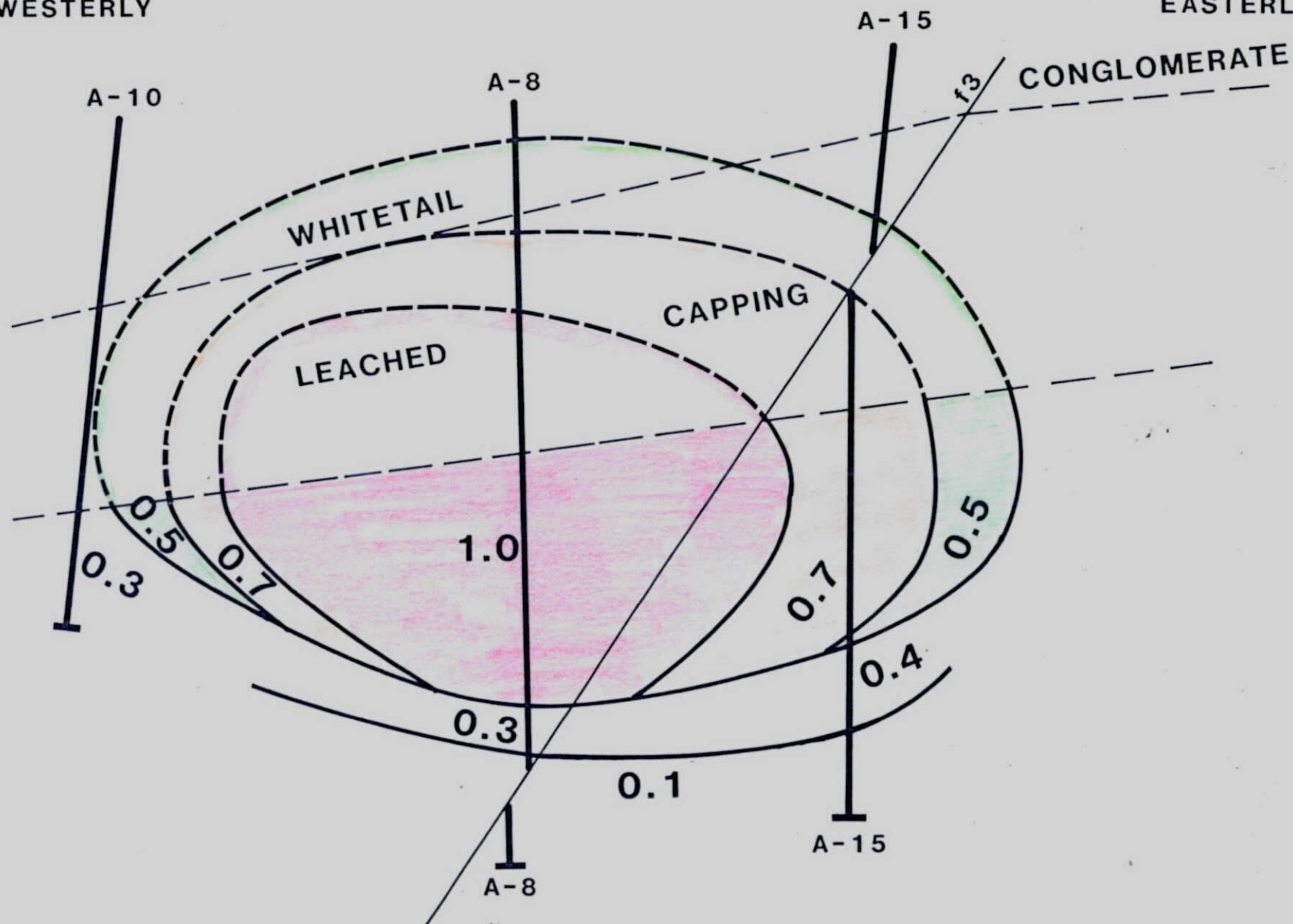
1" = 400'

6338 12/85

ATTACHMENT R

WESTERLY

EASTERLY



SUPERIOR EAST PROJECT  
SECTION C-C' RESTORED

1" = 400'

6339 12/85

ATTACHMENT S

## Superior East

Located some 6.5 miles ~~west~~ east of Phoenix.  
Drill Hole A-16 presently at 2446 feet  
in Whitetail Conglomerate.

Anticipated T.D. around 5400 feet.

Will test high-grade zone,  $\pm 400'$  of  $+1\%$  Cu  
Mineral Inventory:

|                           |            |
|---------------------------|------------|
| 143 mill. tons at 1.03%   | 0.7 Cutoff |
| or 204 mill tons at 0.90% | 0.5 Cutoff |
| (1985)                    |            |

Assessment completed to Aug. 31, 1990

Request funds to complete hole.

May 17, 1990

## FILE NOTE

Dept. of Energy (DOE)  
Drilling  
Oak Flats Area  
Superior East Project  
Pinal County, Arizona

The Department of Energy (DOE), Yucca Mountain Project -- Apache Leap prototype drilling was started earlier in the month and is now at 1280 feet in the welded tuff section of the dacite unit. They will probably terminate the program at around 1700 feet in dacite. Estimated depth to the base of the dacite is  $\pm 1900$  feet, based on adjacent Asarco hole A-4 and surface differential. The DOE hole is 900 feet west of A-4. Map attached.

This portion of the prototype drilling is using a Lang 3000 (only one of its kind) with a rotary bit with a core hole passage in the center. As the attached booklet indicates, the hole is started off (after surface casing of 20-50 feet has been set), with a core hole, then reamed down, then another core, ream, etc., etc. Note that the rotary bit stays on bottom all the time. They have now changed to 20 foot core advance as they have found that longer core runs tend to move off of center-line whereas the stiffer rotary pipe does not wander as much.

As this is a research project, they have tried many kinds of rotary bits and configurations, such as drag-tooth edges, etc., as well as flat-face diamond bit types.

This is all AIR drilling, with three big compressors for rotary (1500 cfm at 150 psi) and dropping back to 2 compressors (700 cfm at 250 psi) for coring. They cool the air down to 60°F before sending it to the bottom.

As large chunks of dacite are chipped off during the rotary reaming phase, it takes the large volume to put these on the surface for collecting.

They set the first string of 10" ID pipe (in a 14½" hole) at 1100 feet to seal off the water which they hit from 300-400 feet. They are presently drilling a 9½" rotary hole with HQ core advancing a 4" hole.

They hope to complete the hole by the end of June and prepare it for a water well for the Forest Service by back filling with gravel to around 600 feet, fill with cement to 500 feet, then perforates the casing from 450 to 250 feet to include the water zone.

Numerous geophysical tools will be run in the hole in the open part prior to closing down.

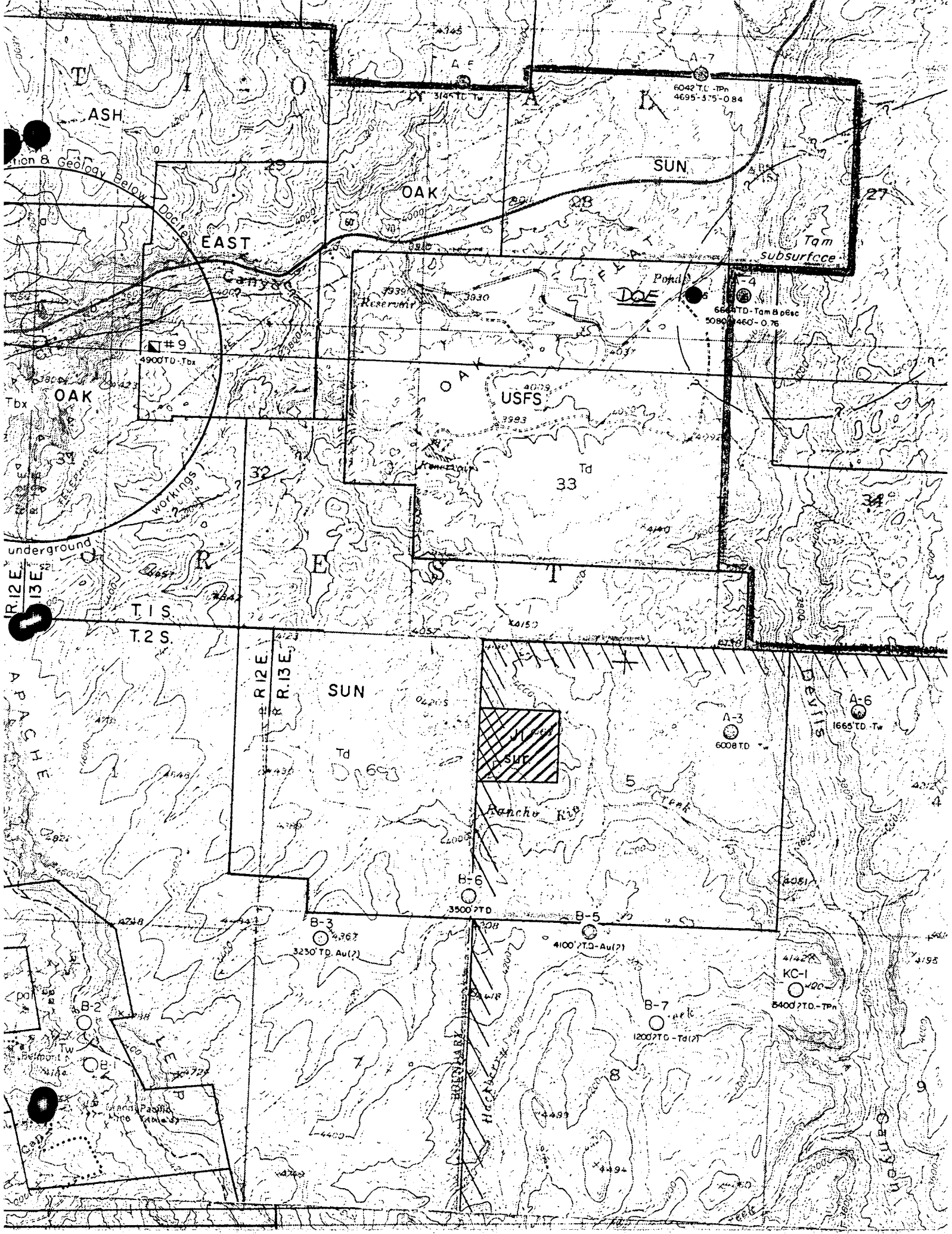
I have asked for Asarco to be placed on their final report mailing list.

JDS:mek  
Att.

*James D. Sell*  
James D. Sell

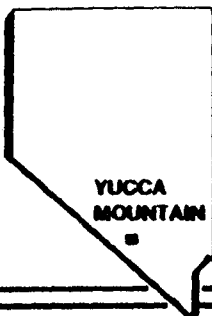
cc: W.L. Kurtz  
F.T. Graybeal





U.S. DEPARTMENT OF ENERGY

**O  
C  
R  
W  
M**

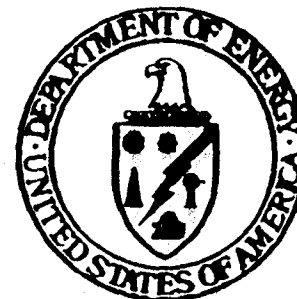


YUCCA  
MOUNTAIN

# **YUCCA MOUNTAIN PROJECT**

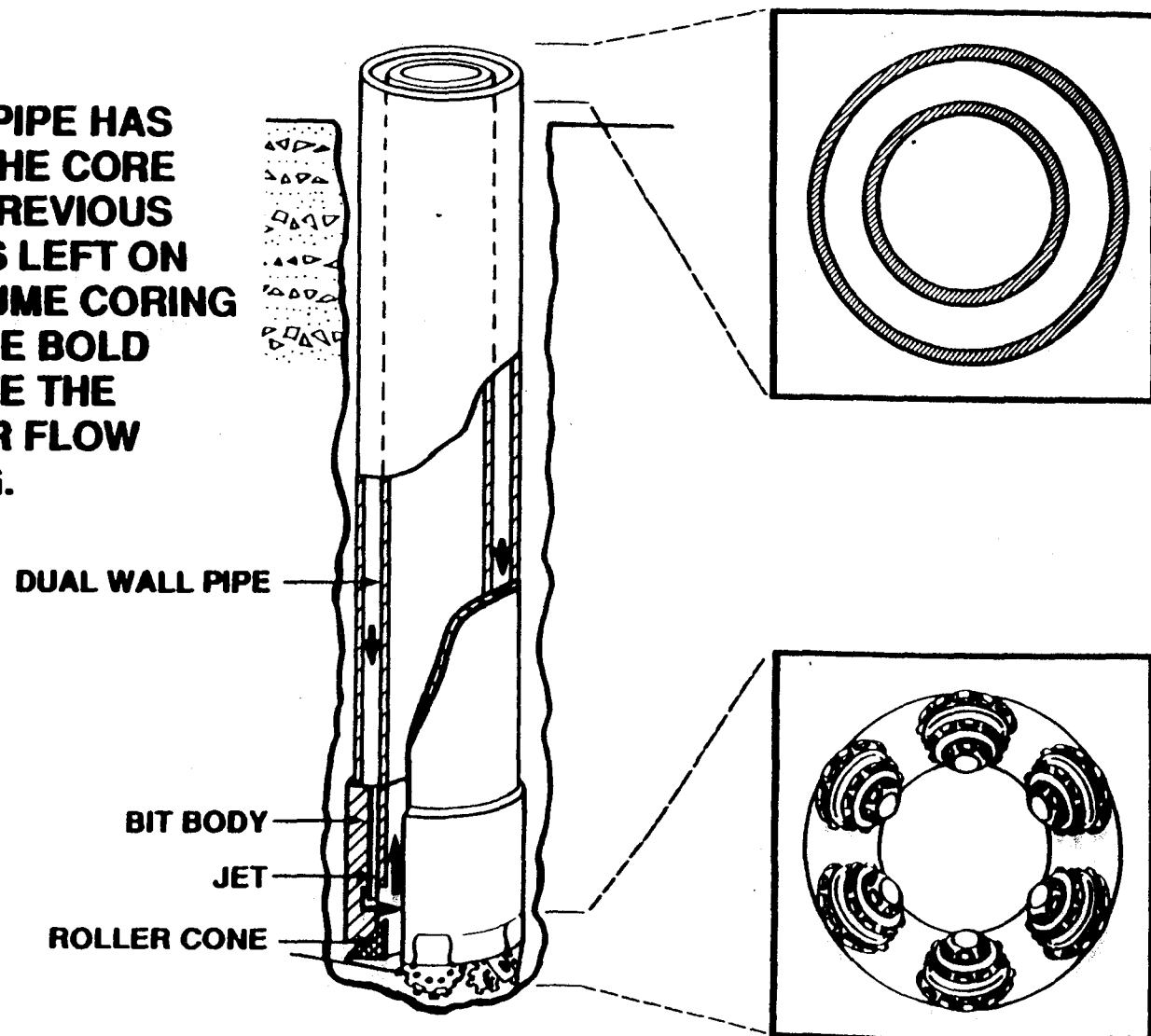
## **APACHE LEAP PROTOTYPE DRILLING**

UNITED STATES DEPARTMENT OF ENERGY  
NEVADA OPERATIONS OFFICE/YUCCA MOUNTAIN PROJECT OFFICE



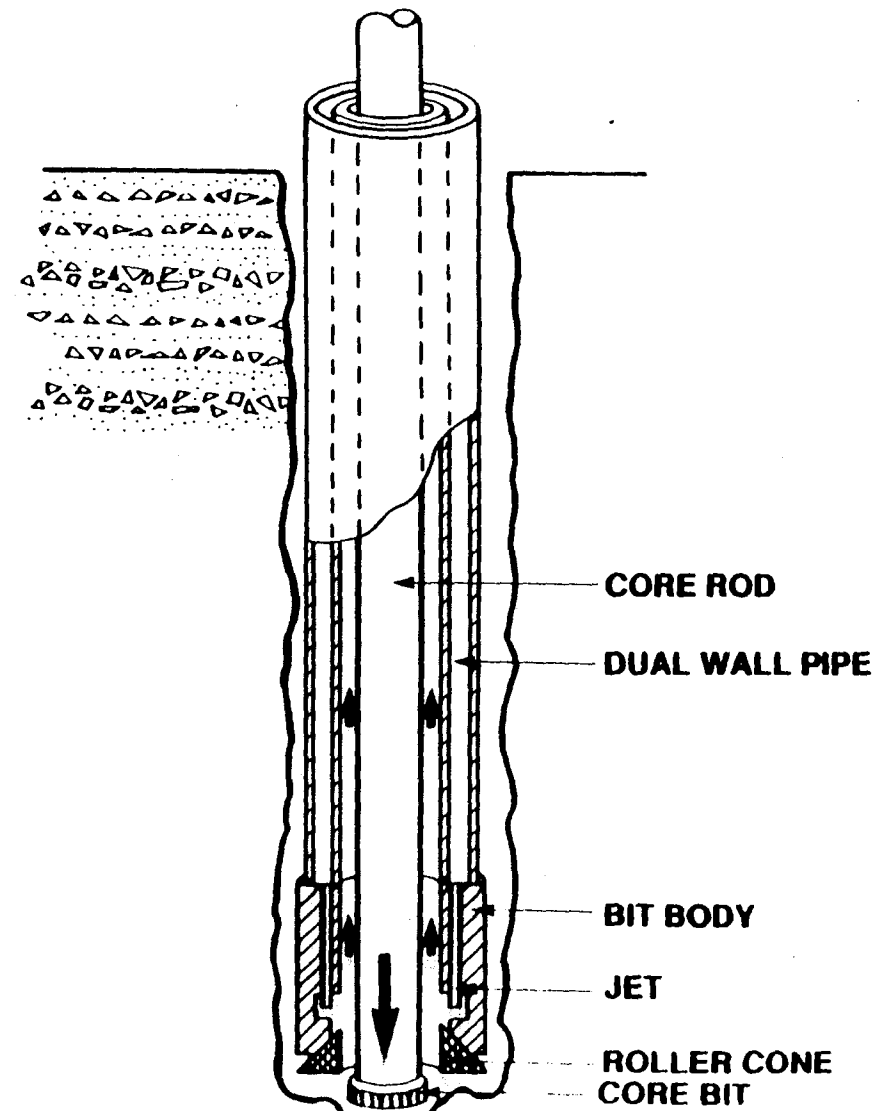
# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO. 1

THE DUAL WALL PIPE HAS  
REAMED DOWN THE CORE  
TRACK FROM A PREVIOUS  
CORE RUN AND IS LEFT ON  
BOTTOM TO RESUME CORING  
OPERATIONS. THE BOLD  
ARROWS INDICATE THE  
DIRECTION OF AIR FLOW  
DURING REAMING.



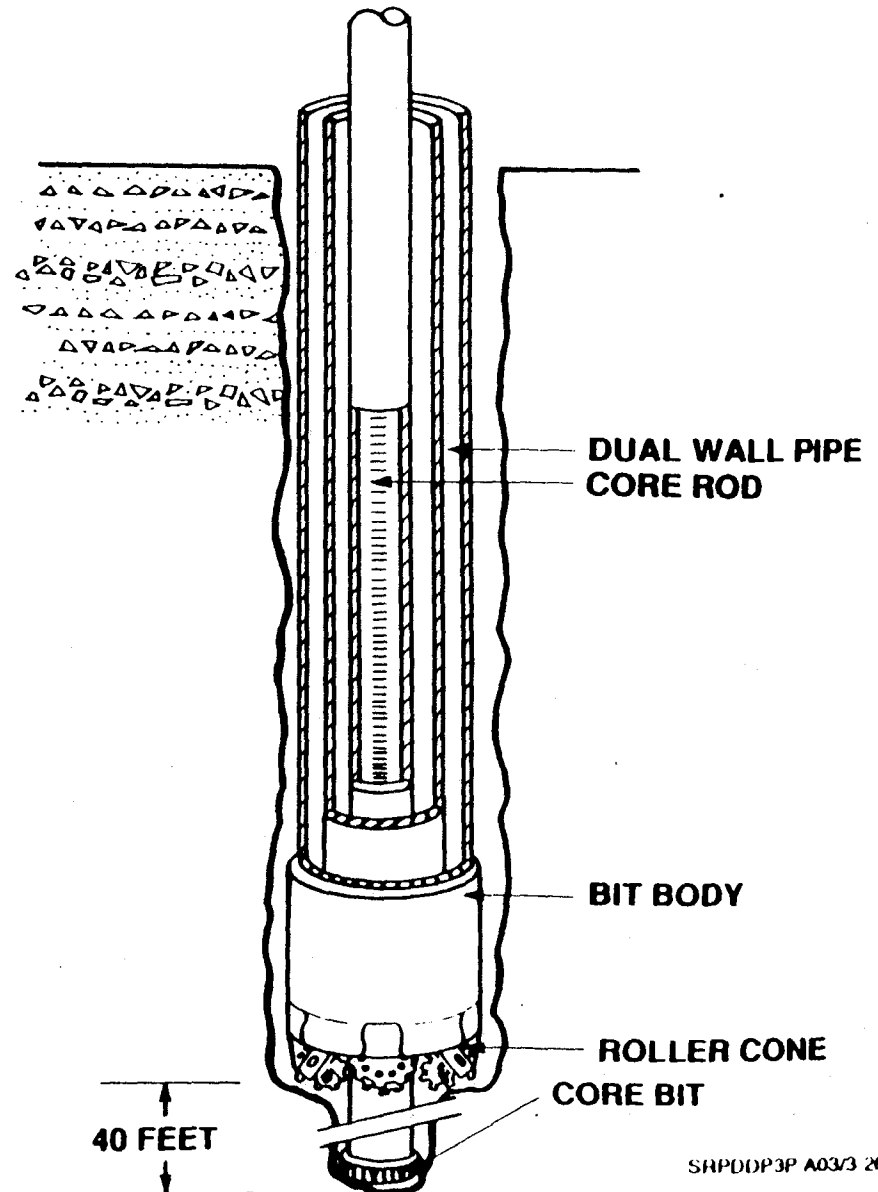
# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO. 2

THE CORE ROD IS RUN IN THE HOLE INSIDE THE DUAL WALL PIPE. THE DRILLPIPE ACTS AS A PROTECTIVE CASING TO PROTECT THE CORE ROD FROM THE FORMATION AND TO PROTECT THE FORMATION FROM THE HIGH PRESSURE AIR AND CUTTINGS PRODUCED BY THE CORING OPERATION. ARROWS INSIDE AND ADJACENT TO CORING ASSEMBLY INDICATE DIRECTION OF AIR FLOW DURING CORING OPERATIONS.



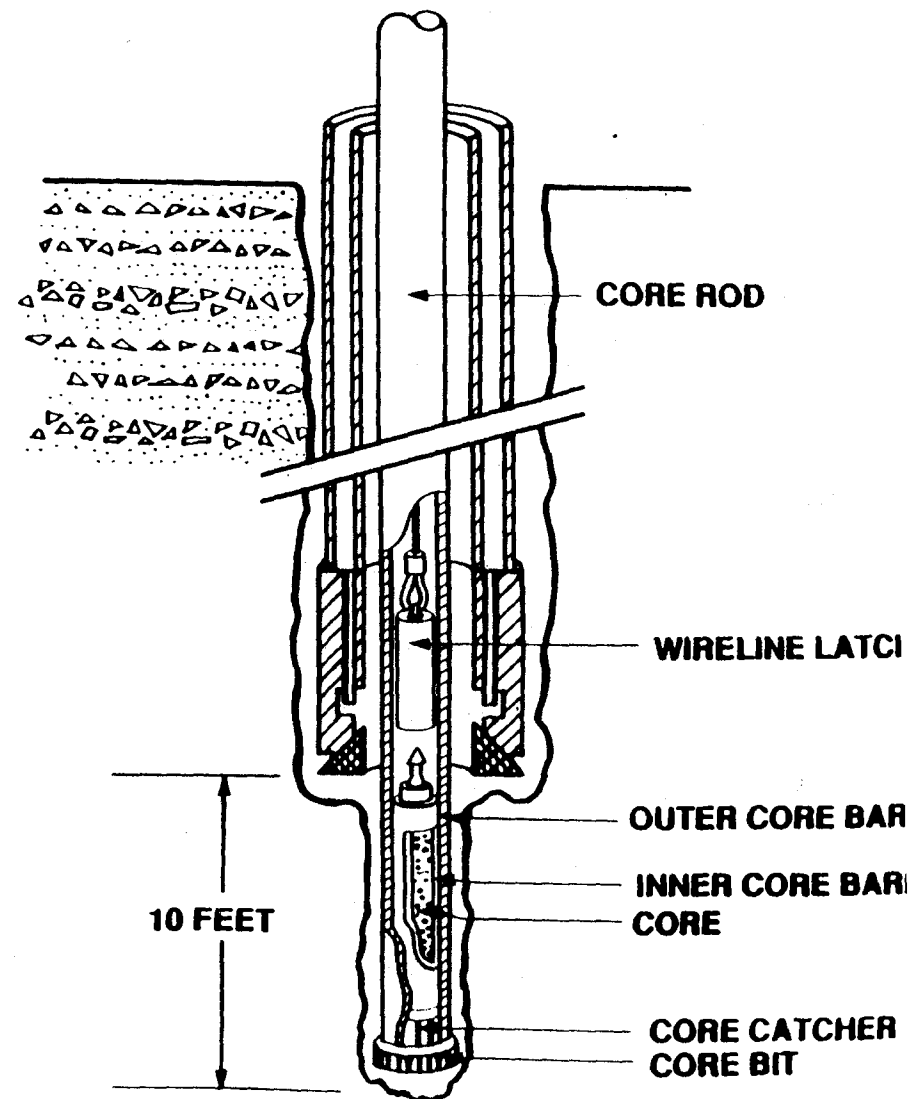
# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO. 3

CORING OPERATIONS ARE COMMENCED AND THE CORE ROD IS ADVANCED 40 FEET AHEAD OF THE DUAL WALL PIPE IN 10 FOOT INCREMENTS (10 FOOT CORES). THE CORES ARE RETRIEVED BY CONVENTIONAL WIRELINE WHILE THE CORE ROD IS LEFT IN THE HOLE FOR THE DURATION OF THE 40 FOOT CORE RUN. THE 40 FOOT LIMIT IS USED TO PREVENT THE MORE FLEXIBLE CORE ROD FROM INITIATING A DEVIATION IN THE BOREHOLE AND CAUSING THE DRILLPIPE TO FOLLOW A DEVIATED PATH RESULTING IN BINDING OF THE DUAL WALL PIPE.



# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO.4

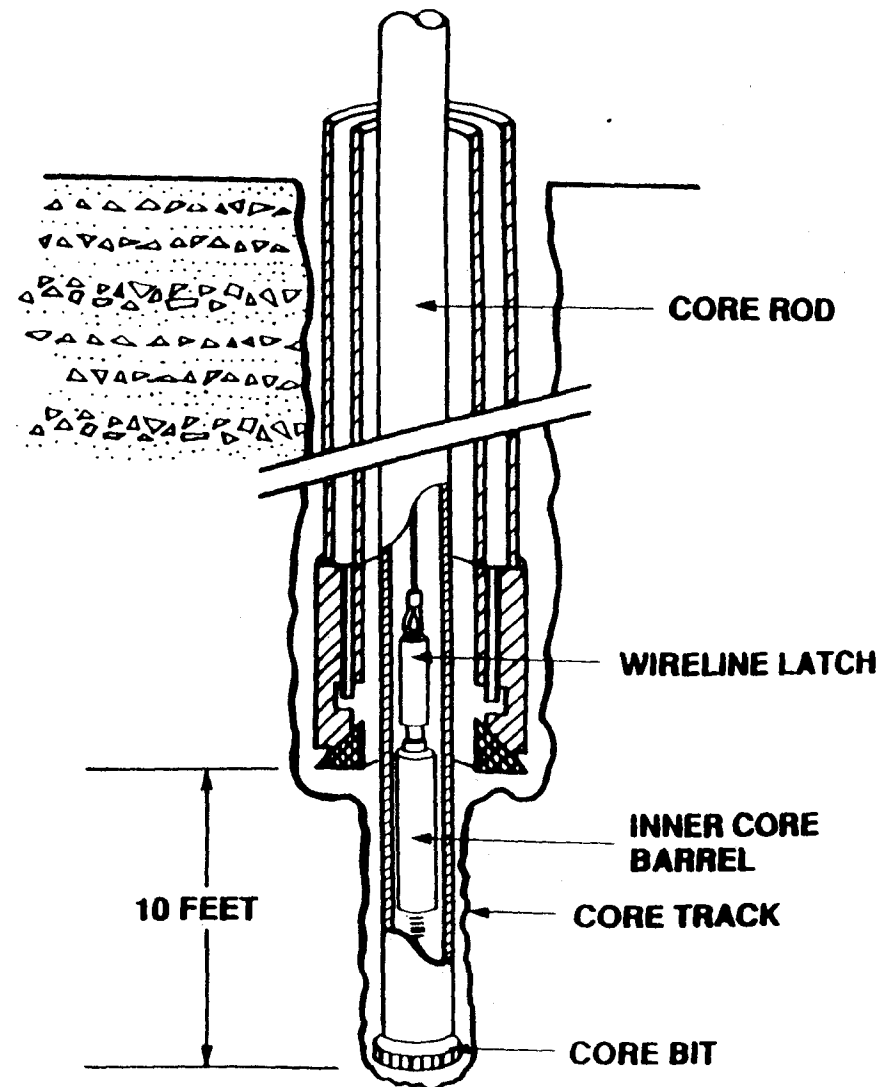
AT THE END OF EACH 10 FOOT  
CORED INTERVAL THE CORE ROD  
IS PICKED UP SLIGHTLY AND THE  
CORE IS BROKEN BY THE CORE  
CATCHER JUST ABOVE THE  
CORE BIT. THE CATCHER IS A  
DEVICE WHICH ALLOWS THE  
CORE TO ENTER THE INNER  
BARREL BUT PREVENTS IT FROM  
BACKING OUT. A WIRELINE  
LATCH (OVERSHOT) IS THEN RUN  
INSIDE THE CORE ROD AND THE  
TOP OF THE INNER BARREL IS  
"CAUGHT" WITH THE WIRELINE.





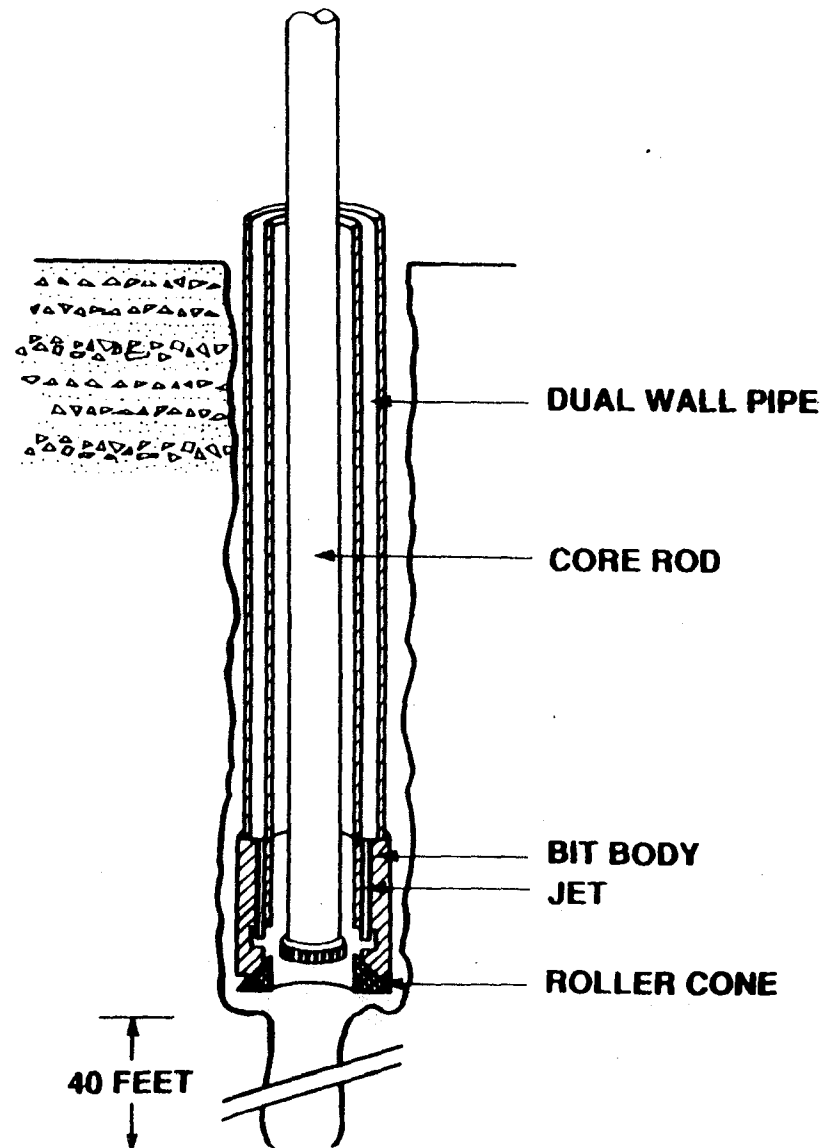
# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO. 5

**AFTER THE CORE IS BROKEN, THE INNER BARREL (WITH CORE HELD IN BY THE CORE CATCHER) IS PULLED OUT OF THE HOLE BY WIRELINE. A NEW (EMPTY) INNER BARREL IS THEN RUN IN HOLE, LATCHED INTO THE OUTER BARREL, AND THE WIRELINE IS REMOVED. THIS SEQUENCE IS REPEATED EACH TIME THE CORE TRACK IS ADVANCED 10 FEET.**



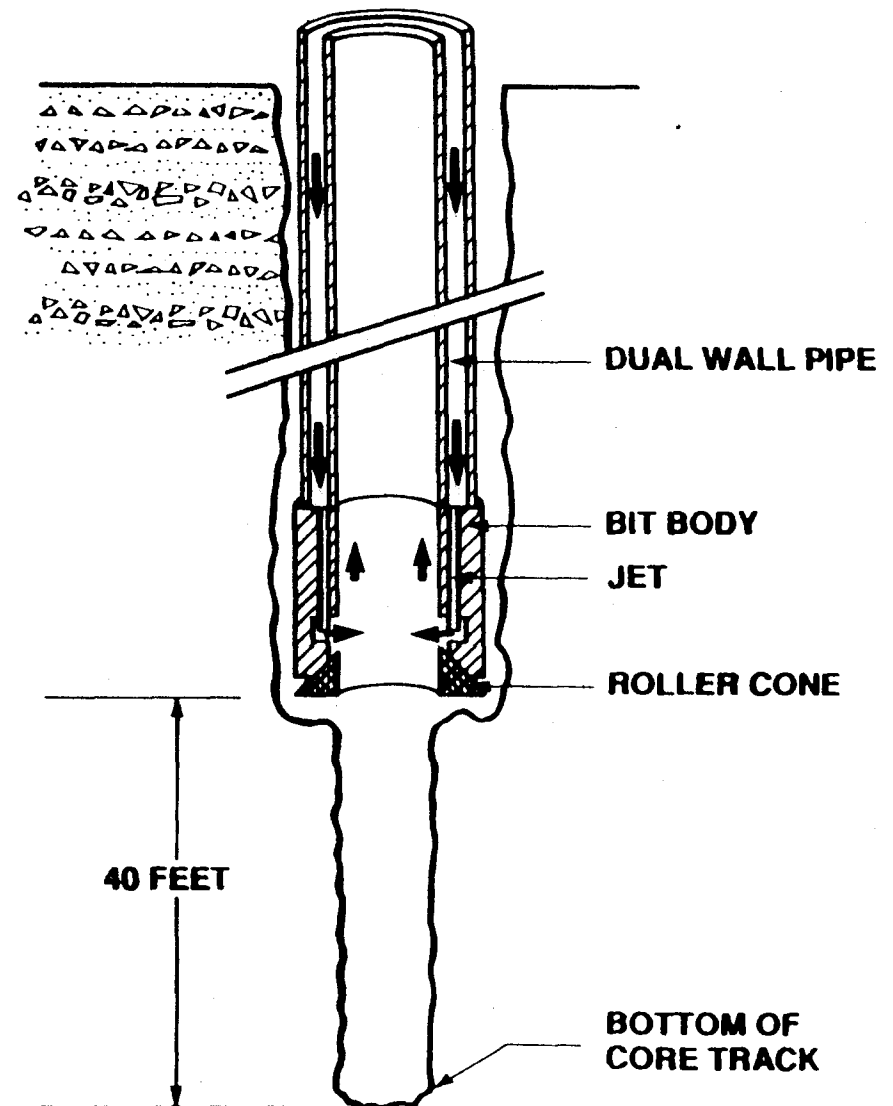
# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO. 6

THE CORING STRING IS PULLED  
OUT OF THE HOLE AT THE END  
OF THE 40 FOOT CORE RUN IN  
PREPARATION FOR REAMING  
DOWN THE CORE TRACK WITH  
THE DUAL WALL PIPE.



# DUAL WALL DRILLING/CORING SYSTEM DRAWING NO. 7

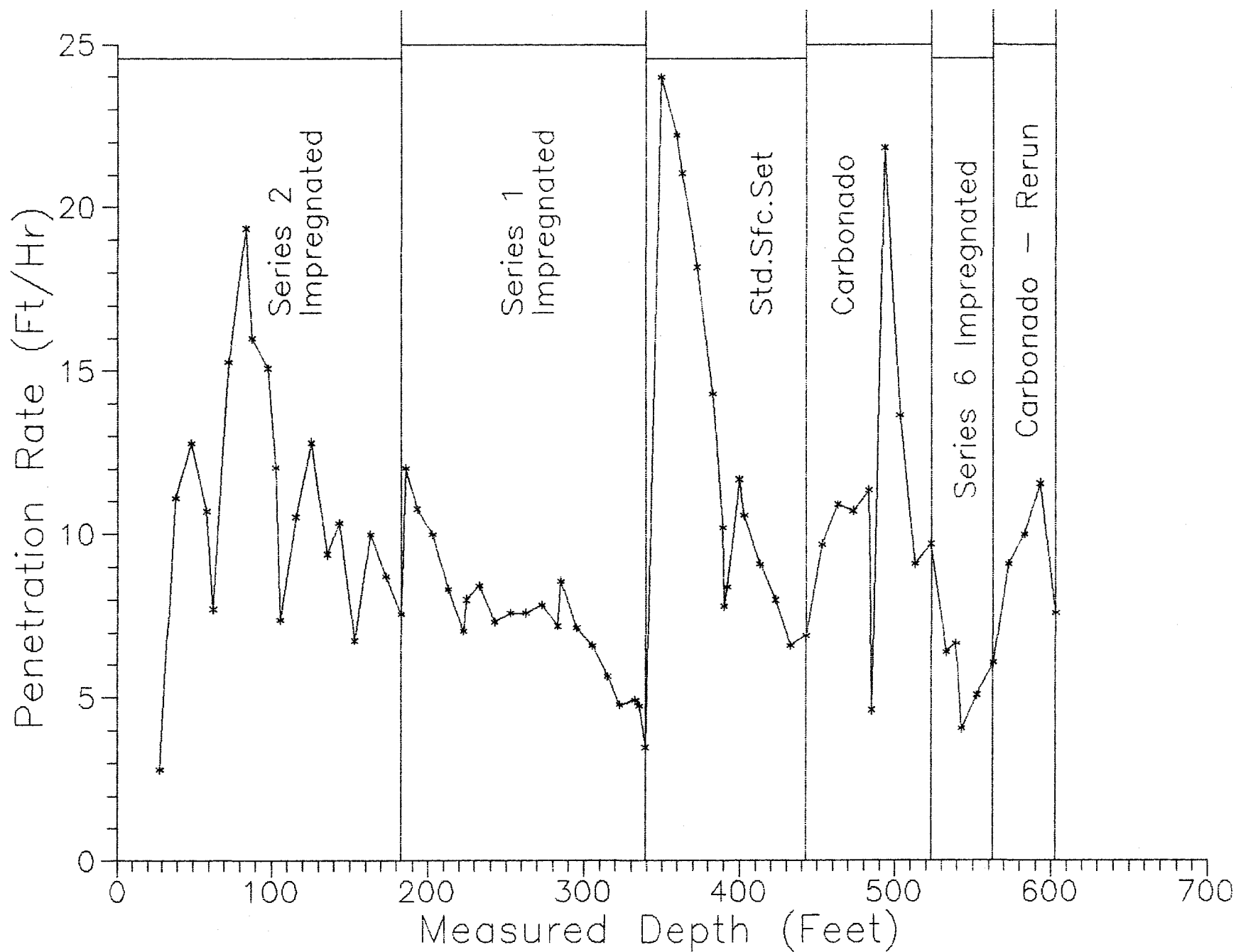
ONCE THE CORING ASSEMBLY IS OUT OF THE BOREHOLE, IT IS DRILLED/REAMED WITH THE DUAL WALL DRILL STRING TO THE BOTTOM OF THE CORE TRACK. THE FORMATION IS PROTECTED FROM CONTAMINATION NORMALLY ASSOCIATED WITH DRILLING BY CIRCULATING THE CUTTINGS UP THE CENTER OF THE DUAL WALL PIPE. CONTAMINATED FORMATION CAUSED BY THE CORING OPERATION IS REMOVED WHEN THE CORE TRACK IS REAMED DOWN. THE BOLD ARROWS INDICATE THE DIRECTION OF AIR FLOW DURING REAMING.

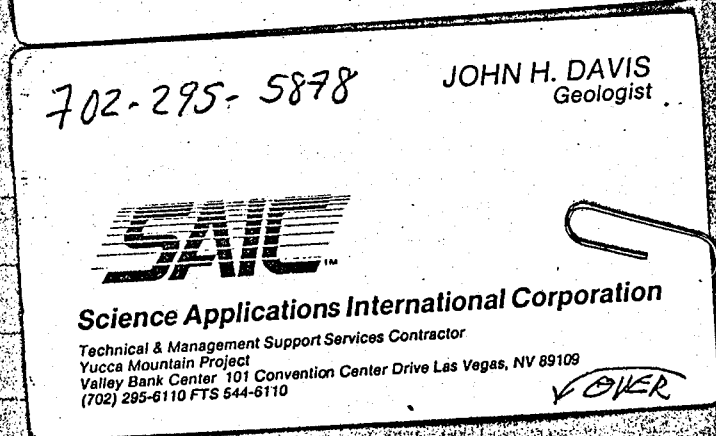
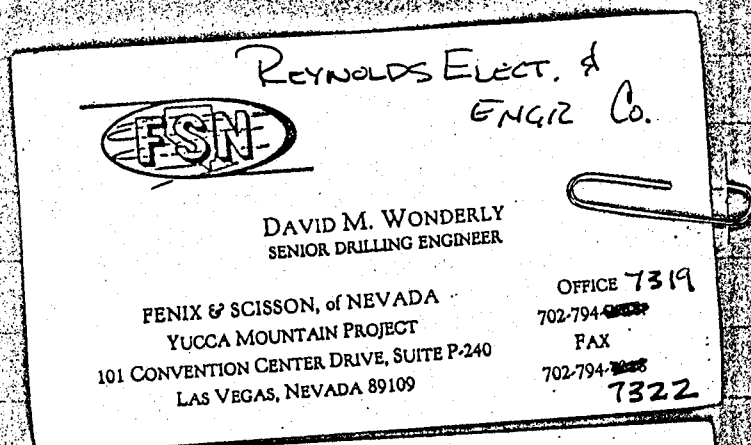
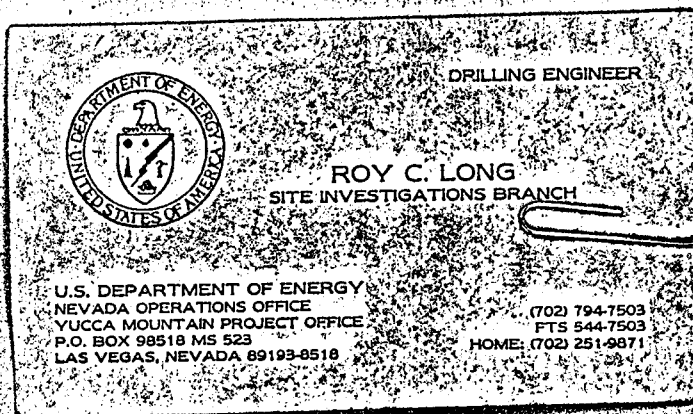


# **DRILLING/CORING SEQUENCE**

- 1. CORE 40' IN 10' INTERVALS USING WIRELINE CORE RETRIEVAL**
  - 2. REMOVE CORE ROD**
  - 3. REAM WITH 12 1/4" BIT THROUGH CORED INTERVAL  
(LEAVE 12 1/4" STRING IN HOLE)**
  - 4. RUN-IN HOLE WITH CORE ROD**
- RETURN TO STEP 1**

# CHD-134 CORE BIT PERFORMANCE - USW UZP4





other geologists:  
Jack K. Sepp  
Donna Seib





707 BOYD BOULEVARD / LaPORTE, INDIANA 46350 / PHONE & FAX: (219) 362-2191

May 18, 1990

Mr. James D. Sell  
ASARCO Inc.  
P.O. Box 5747  
Tucson, AZ 85703

ASARCO Incorporated

MAY 21 1990

SW Exploration

Dear Jim:

We appreciated receiving the invitation to quote on the core drilling near Superior, Arizona. We understand you want to reenter Hole A-16 at 2446 feet and drill on down to 5500 feet. Conditions at the site and water supply will be generally the same as prior years.

Please consider the following:

Mobilization (Includes rig and tools for 3500' NC) \$900.00/rig

Demobilization (Includes rig and tools for 3500' NC) \$900.00/rig

Extra Road Truck Trips (Includes drill rods and casing for reductions to NX and BX hole size) \$150.00/round trip

| <u>Core Drilling</u> | <u>NCE Wireline</u> | <u>NXE Wireline</u>          | <u>BXE Wireline</u> |
|----------------------|---------------------|------------------------------|---------------------|
| 2000 to 2500 Feet    | \$22.20/foot        | \$20.70/foot                 | \$20.50/foot        |
| 2500 to 3000 Feet    | \$24.40/foot        | \$22.90/foot                 | \$22.70/foot        |
| 3000 to 3500 Feet    | \$27.20/foot        | \$25.70/foot <sup>2.80</sup> | \$25.50/foot        |
| 3500 to 4000 Feet    |                     | \$29.20/foot <sup>3.50</sup> | \$29.00/foot        |
| 4000 to 4500 Feet    |                     | \$33.50/foot <sup>4.30</sup> | \$33.30/foot        |
| 4500 to 5000 Feet    |                     |                              | \$38.70/foot        |
| 5000 to 5500 Feet    |                     |                              | \$45.50/foot        |

Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$440.00 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$55.00 per hour plus bit and other in-hole supplies at actual cost.

Rig Time & Hourly Work

|   |  |
|---|--|
| Setting and Pulling Casing and Pipe<br>(two man crew)   | \$55.00/hour +<br>materials used                     |
| Cementing and/or Plugging Drill Holes<br>(two man crew). Includes all time<br>required to maintain good hole condi-<br>tions while drilling. Also includes<br>time required to close or complete<br>hole as required.                         | \$55.00/hour +<br>materials used                     |
| Reaming, if necessary (two man crew)  | \$55.00/hour +<br>materials used                     |
| Survey (two man crew)   | \$55.00/hour +<br>ASARCO Inc.<br>supplies instrument |
| Re-entering Previously Drilled Holes<br>(two man crew). Includes all time<br>worked entering previously drilled<br>hole until wireline core bit is cut-<br>ting in solid rock formation on true<br>bottom of hole. This will also<br>include: | \$60.00/hour +<br>materials used                     |
| (a) Time which is required to line<br>up drill over previously drilled<br>hole.   |  |
| (b) Time required to set casing in<br>predrilled hole before starting<br>to drill with wireline tools.  |  |
| (c) All time required to correct any<br>problems encountered with existing<br>casing or pipe in hole.   |  |
| Standby Time for Your Convenience   | \$50.00/hour   |
| Extra Labor authorized by ASARCO Inc.<br>(if required)  | \$25.00/man hour                                     |
| Overtime Premium in Excess of 88 Hours<br>per two week period   | \$6.00/man hour                                      |

Supplies

|  |    |                       |
|--|----|-----------------------|
| Casing Ordered Left in Place   | NX | \$10.00/foot          |
|  | BX | \$8.00/foot           |
| Casing Lost through Normal Drilling Operations                               |    | 70% of Above Price    |
| Diamond Bit Loss in Excess of \$2.50/foot                                    |    | At Actual Cost        |
| Drilling Mud and Additives   |    | At Jobsite Cost + 20% |
| Weather-treated Core Boxes which hold ten feet of core                       | NC | \$3.00 each           |
|  | NX | \$2.75 each           |
|  | BX | \$2.50 each           |
| Materials Used and Special Purchases authorized by ASARCO Inc. (if required) |    | At Cost + 20%         |

Water Pumping or Hauling

|  |                      |
|--|----------------------|
| Water Truck Usage                          | \$600.00/month       |
| Mileage                                    | \$.75/mile           |
| Full-time Water Truck Driver (if required) | \$25.00/man hour     |
| <u>Per Diem</u>                            | \$15.00/man/work day |

The above prices are based on our standard non-union wage rates and are firm if accepted within 60 days and will remain in effect until October 25, 1990. Our terms are Net 30 Days on invoices and with approved credit. In the event that payment is not made within this period, a late payment charge of 1½ percent per month, or the maximum amount permitted by law, whichever is less, will be charged, to be computed from the due date to the date payment is received by CBC, together with all costs and expenses incurred in collection, including reasonable Attorney fees and court costs.

We understand ASARCO Inc. will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to CBC Drilling. We further understand that ASARCO Inc. will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable CBC Drilling to carry out the specified work.

Mr. James D. Sell  
ASARCO Inc.

Page 4  
May 18, 1990

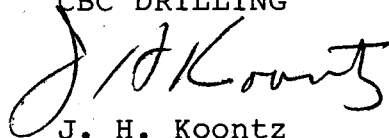
We propose doing this work with a truck mounted 22 drill and wireline equipment. We will probably work two shifts per day unless hole conditions warrant round the clock operation.

You should contact Nino Trujillo (602-884-5866) to discuss crew and equipment availability.

We would look forward to working with you on this project.

Yours very truly,

CBC DRILLING

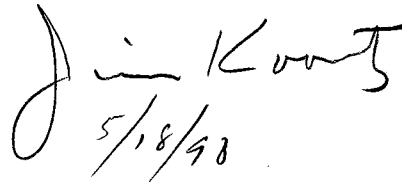


J. H. Koontz  
Vice President &  
General Manager

JHK/ts

JIM

I SHOULD HAVE BID  
ON PARAGONIA WORK  
ON THE DAY TO YOU  
BY MID WEEK OF  
5/21/90.



5/18/90

Superior East

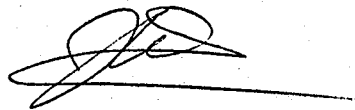
FROM: J. D. SELL

5-18-90

To: WDGay

Please submit your  
figures on \$ spent  
and \$ need to be spent  
for vesting in the  
Thunder Mtns Project  
&  
Ventura Project.

} attached



Amount Fund  
Year

[illegible]

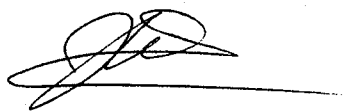


FROM: J. D. SELL

5-18-90

TO: WDGay

Please submit your  
figures on \$ spent  
and \$ need to be spent  
for nesting in the  
Thunder Mtn Project  
&  
Ventura Project.



May 29, 1990


W.D. Gay

Superior East Project  
EA-0010  
Drill Hole A-16 reentered  
Pinal County, Arizona

Write a letter to the Globe Forest Service and tell them Asarco plans to reenter drill hole A-16 and continue coring.

Also, fill out a form Notice of Intention to Drill for the ADWR for reentering A-16. Present depth: 2446', final depth  $\pm 5500'$ , contractor: CBC Drilling, DWR License 75, etc.

JDS:mek

  
James D. Sell

cc: W.L. Kurtz

6/7/90



ASARCO, INC.  
P O BOX 5747  
TUCSON AZ 85703

ASARCO Inc.

JUN 8 1990

SW Exploration

ARIZONA  
DEPARTMENT  
OF WATER  
RESOURCES

Rose Mofford, Governor  
N. W. Plummer  
Director

RE: Registration No. 55-528454

File No. D(1-13) 23ccc

Dear Well Owner:

15 South 15th Avenue  
Phoenix, Arizona 85007

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a well which was recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. §45-596. Your designated driller has been mailed, separately, a Well Drilling Card which he is required to have in his possession before commencing to drill the well.



Since this well is being drilled as a monitor well, or for cathodic protection, grounding, geotechnical or piezometer purposes, our standard driller report form is also being furnished to the driller which he is required to complete and return to the Department within 30 days after the completion of drilling. A Completion Report form is being furnished for monitor wells where pump equipment is authorized to be installed as part of this packet so that you may submit the report within 30 days after the installation of the pumping equipment on a monitor well as required by A.R.S. §45-600.

DEEPEN 55-518290



This well is authorized to be ~~drilled~~ for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion Report is being furnished you for each hole to be drilled. You are required to submit this Project Completion Report within 30 days after completion of drilling.

For monitor, geotechnical, cathodic protection, grounding and piezometer wells, you should obtain the written permission of the Department of Water Resources before proceeding with the drilling in the event that you determine it necessary to change the location of the proposed well. A properly signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location than originally authorized.

For your future use, a Change of Well Information form is enclosed should it become needed. Per A.R.S. §45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, including abandonment, in order to keep the well registration file current and accurate.

Sincerely,

R. A. Gessner  
Chief, Operations Division

WDGAX  
JDSell

RAG:ba  
Enclosures  
DWR-55-50-3/90

ARIZONA DEPARTMENT OF WATER RESOURCES  
OPERATIONS DIVISION  
15 SOUTH 15TH AVENUE  
PHOENIX, ARIZONA 85007

CHANGE OF WELL INFORMATION

Well Registration No. 55- 528454 File No. D(1-13)23ccc  
(location)

I/We request the following well information be changed: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_ Signature of Current Well Owner \_\_\_\_\_

(DO NOT CUT THIS FORM IN HALF)

STATEMENT OF CHANGE OF WELL OWNERSHIP

I, \_\_\_\_\_, state that I am (no longer) the (new)  
(please print)  
owner of the well described below:

Township \_\_\_\_\_ Range \_\_\_\_\_ Section \_\_\_\_\_; \_\_\_\_\_  $\frac{1}{4}$  \_\_\_\_\_  $\frac{1}{4}$  \_\_\_\_\_  $\frac{1}{4}$

Well Registration No. 55- \_\_\_\_\_ File No. \_\_\_\_\_  
(location)

PRINT Previous Owner's Name \_\_\_\_\_

PRINT New Owner's Name \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Dated: \_\_\_\_\_ Signature of New Owner \_\_\_\_\_

**NOTE:** A.R.S. §45-593.C. requires that the Department be notified of change of well ownership and that the well owner is required to keep the Department's Well Registration records current and accurate. Well data and ownership changes must be submitted within thirty (30) days after changes take place.

SAVE THIS FORM TO REPORT FUTURE CHANGES IN OWNERSHIP, CHANGES IN ADDRESS, OR CHANGE IN WELL DATA SUCH AS PUMP CAPACITY, CORRECTION OF LEGAL DESCRIPTION, CHANGE OF WELL DRILLER AND AMENDING INFORMATION PREVIOUSLY FILED.

STATE OF ARIZONA  
DEPARTMENT OF WATER RESOURCES  
15 SOUTH 15TH AVENUE  
PHOENIX, ARIZONA 85007

PROJECT COMPLETION REPORT FOR EXPLORATION DRILLING

This report must be prepared by the owner in all detail and filed with the Department within 30 days following completion of the well drilling project.

1. Owner: \_\_\_\_\_  
Name \_\_\_\_\_  
Address: \_\_\_\_\_  
Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

2. Lessee or Operator: \_\_\_\_\_  
Name \_\_\_\_\_  
Address: \_\_\_\_\_  
Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

3. Driller: \_\_\_\_\_  
Name \_\_\_\_\_  
Address: \_\_\_\_\_  
Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

4. Location: \_\_\_\_\_  
Township \_\_\_\_\_ Range \_\_\_\_\_ Section \_\_\_\_\_  $\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$  City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
WELL REGISTRATION NO. 55- \_\_\_\_\_  
(A REQUIREMENT)

DESCRIPTION OF WELL

5. Type of Casing (if installed): \_\_\_\_\_

6. Abandonment method and material used if abandoned: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. Construction details if completed for monitoring purposes, re-entry or conversion to water wells: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Date or period drilled: \_\_\_\_\_

LOG OF WELL

☐ Unconsolidated Formation

☐ Consolidated Formation

Depth to water in feet below land surface: \_\_\_\_\_  
(if encountered or detected)

|                            |          |
|----------------------------|----------|
| DO NOT WRITE IN THIS SPACE |          |
| OFFICE RECORD              |          |
| Registration No. 55-528454 |          |
| Received _____             | By _____ |
| Entered _____              | By _____ |
| File No. D(1-13) 23ccc     |          |

I state that this report is filed in compliance with A.R.S. § 45-600 and is complete and correct to the best of my knowledge and belief.

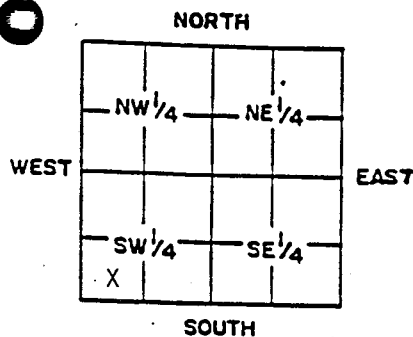
Owner's Signature \_\_\_\_\_ Date \_\_\_\_\_

FILING FEE \$10.00

**NOTICE OF INTENTION TO DRILL OR DEEPEN A WELL  
OUTSIDE OF AN ACTIVE MANAGEMENT AREA**

EXPLORATION WELL

Section 45-596, Arizona Revised Statutes, provides: In an area not subject to Active Management, a person may not drill or cause to be drilled any well or deepen an existing well without first filing a Notice of Intention to Drill with the Department.



INDICATE WELL LOCATION BY X  
(Above diagram represents one  
640 acre section.)

**WELL/LAND LOCATION:**

1. Township 1 N/S
2. Range 13 E/W
3. Section 23
4. SW 1/4, SW 1/4, SW 1/4  
10 acre subdivision
5. County Pinal
6. Owner of well:  
ASARCO Incorporated  
Name  
P.O. Box 5747  
Mailing address  
Tucson AZ 85703  
City State Zip  
Telephone (602) 792-3010
7. Owner of land:  
U.S. Dept. of Agriculture  
Forest Service  
Name  
Rt. 1, Box 33  
Mailing Address  
Globe AZ 85501  
City State Zip

**DESCRIPTION OF WELL:**

8. Diameter 3.0 inches
- Depth 2446 feet
9. Type of casing Steel
10. Design pump capacity:  
N/A gallons per minute
11. Estimate of total annual  
pumping: -0- acre feet
12. Principal use of water:  
None  
(Be Specific)
13. Other uses intended:  
None  
(Be Specific)
14. If for irrigation, state the  
number of acres to be irrigated:  
-0- acres
15. Construction will start about:  
June 1990  
Month Year

**PLACE OF USE:**

16. Township N/A N/S
17. Range N/A E/W
18. Section N/A
19. Legal description  
of land N/A
20. Type well:  
N/A Exempt  
N/A Non-Exempt
21. Action Requested:  
Drill Deepen X Replace  
55-518290
22. This notice filed by:  
Owner X  
Lessee \_\_\_\_\_  
ASARCO Incorporated  
Name  
P.O. Box 5747  
Address  
Tucson, AZ 85703  
City State Zip  
Telephone (602) 792-3010
23. Drilling Firm:  
Joy-CBC Drilling  
Name  
707 Boyd Blvd.  
Address P.O. Drawer 489  
La Porte, Indiana 46350  
City State Zip  
75  
DWR License Number

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

FILE NO. 001-13) 23ccc  
FILED 6-6-90 BY sk  
INPUT \_\_\_\_\_ BY \_\_\_\_\_  
DUPLICATE  
MAILED 6-7-90 BY sk  
REGISTRATION NO. 55-520454  
INA \_\_\_\_\_  
W/S \_\_\_\_\_ S/B \_\_\_\_\_

24. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials: Yes No X

**GENERAL INSTRUCTIONS**

1. Fill out this form in duplicate and send to ~~99 East Virginia, Suite 100, Phoenix, Az. 85004.~~
2. For specific instructions, limitations and conditions, see the reverse side of this form.
3. This form is to be used to drill, deepen or replace a well outside of an Active Management Area.
4. If the well is a replacement or deepening of an existing well, state the registration number of the existing well in Item 21.
5. Construction standards for new and replacement wells and the deepening and abandonment of existing wells shall be in accordance with Department Rules and Regulations.

I state that this Notice is filed in compliance with ARS §45-596 and is complete and correct to the best of my knowledge and belief and that I understand the limitations under which I must operate this well set forth on the reverse side of this form.

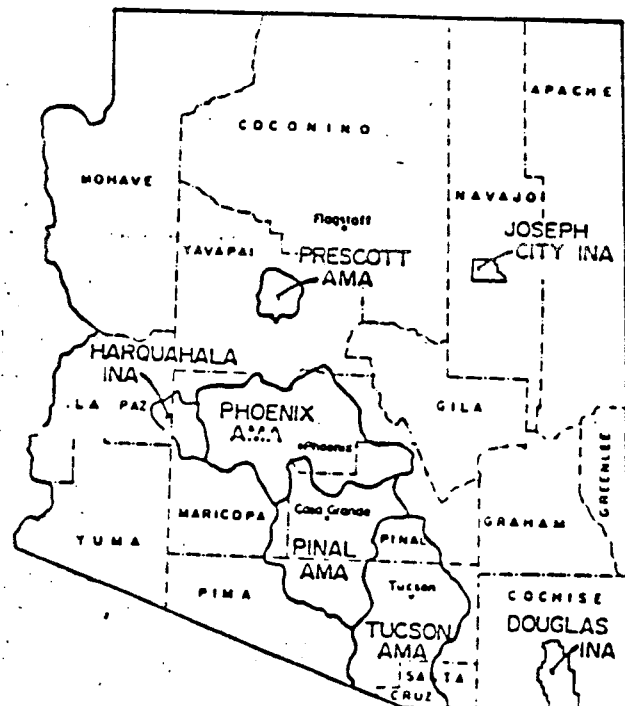
DATE 5-31-90Signature of Person Filing W. D. Gay

DWR-55-41-8/86B (Revised)

JUN 6 1990  
OPERATIONS DIV.

## SPECIFIC INSTRUCTIONS, LIMITATIONS AND CONDITIONS

1. Upon receipt of the return of this annotated Notice, the owner is authorized to proceed in drilling or deepening the well as set forth on this Notice.
2. An exempt well means a well having a pump with a maximum capacity of not more than thirty-five (35) gallons per minute and may include the application of water to less than two (2) acres of land to produce plants or parts of plants for sale, human consumption or for use as feed for livestock, range livestock or poultry.
3. Only one exempt well may be drilled or used to serve the same use at the same location.
4. A non-exempt well is any well which exceeds the limitations, as indicated in paragraph 2 above. However, water from a non-exempt well located in an Irrigation Non-Expansion Area, may not be withdrawn to irrigate any acres which are not eligible to be irrigated pursuant to ARS §45-434 or §45-437. Also, owners of non-exempt wells located in Irrigation Non-Expansion Areas, are subject to the measuring device and annual report requirements of ARS §45-437.
5. The drilling or deepening of this well shall be completed within one (1) year of the date of this Notice.
6. Within thirty (30) days after the installation of pumping equipment on this well, the registered well owner shall file the prescribed Completion Report. A form for this purpose will be furnished to the registered owner with the return of an annotated copy of this Notice.
7. The person to whom a well is registered shall notify the Department of a change in ownership or a change in data relating to this well. The prescribed form for these purposes will be furnished to the registered owner with the return of the annotated copy of this Notice.
8. A sketch map showing the general boundaries of the Active Management Areas and Irrigation Non-Expansion Areas is shown at the right. Maps of greater detail are available on request.





ASARCO, INC.  
P O BOX 5747  
TUCSON AZ 85703

STATE OF ARIZONA  
DEPARTMENT OF WATER RESOURCES  
OPERATIONS DIVISION  
15 S. 15TH AVENUE  
PHOENIX, ARIZONA 85007

RECEIPT

| KIND<br>ENTRY | FILE REFERENCE NO. |
|---------------|--------------------|
| 55            | 528454             |
|               | THRU               |

| ACCOUNT NO.    |        |         |      | INT.<br>ACCT. | ITEM DESCRIPTION                                    | RATE | \$ AMOUNT |
|----------------|--------|---------|------|---------------|---|------|-----------|
| FUND<br>SOURCE | AGENCY | CHAPTER | DIV. |               |   |      |           |
|                |        |         |      |               | FILING FEE FOR NOI TO <sup>DEEPEN</sup> EXIST. WELL |      | 10.00     |
|                |        |         |      |               | FILE#D(1-13) 23000 REG#55-528454                    |      |           |
|                |        |         |      |               |   |      |           |
|                |        |         |      |               |   |      |           |
|                |        |         |      |               |   |      |           |
|                |        |         |      |               |   |      |           |
|                |        |         |      |               |   |      |           |

6/7/90/ek  
CK#0033886

TOTAL \$ 10.00

cc WDGAX  
JDSELL

# ASARCO

Exploration Department  
Southwestern United States Division

May 31, 1990

Dept. of Water Resources  
State of Arizona  
15 South 15th Avenue  
Phoenix, AZ 85007

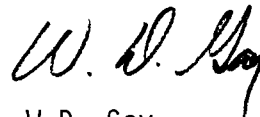
Superior East Project  
Pinal County, AZ

Gentlemen:

In compliance with drill hole regulations ASARCO Incorporated requests a drilling permit as described in the attached "Notice of Intention to Drill or Deepen a Well" form. A check for the \$10.00 filing fee is enclosed.

If you have any questions, please call or write to me or J.D. Sell, Manager, SWED.

Sincerely yours,



W.D. Gay  
Land Engineer, SWED

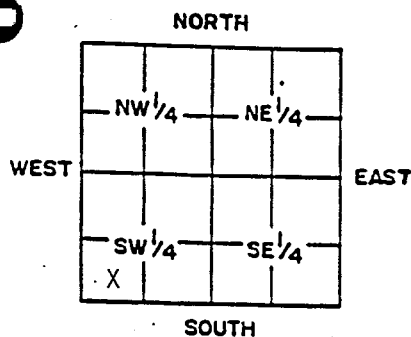
WDG:mek  
Att.

cc: W.L. Kurtz  
J.D. Sell  
C.L. Snow  
Joy-CBC Drilling

FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES (DWR)  
NOTICE OF INTENTION TO DRILL OR DEEPEN A WELL  
OUTSIDE OF AN ACTIVE MANAGEMENT AREA

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640 acre section.)

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Name  
P.O. Box 5747  
Mailing address  
Tucson AZ 85703  
City State Zip  
Telephone (602) 792-3010
7. Owner of land:  
U.S. Dept. of Agriculture  
Forest Service  
Name  
Rt. 1, Box 33  
Mailing Address  
Globe AZ 85501  
City State Zip

- DESCRIPTION OF WELL:
8. Diameter 3.0 inches
  - Depth 2446 feet
  9. Type of casing Steel
  10. Design pump capacity:  
N/A gallons per minute
  11. Estimate of total annual  
pumping: -0- acre feet
  12. Principal use of water:  
None  
(Be Specific)
  13. Other uses intended:  
None  
(Be Specific)
  14. If for irrigation, state the  
number of acres to be irrigated:  
-0- acres
  15. Construction will start about:  
June 1990  
Month Year

|                            |  |
|----------------------------|--|
| DO NOT WRITE IN THIS SPACE |  |
| OFFICE RECORD              |  |
| FILE NO. _____             |  |
| FILED _____ BY _____       |  |
| INPUT _____ BY _____       |  |
| DUPLICATE _____            |  |
| MAILED _____ BY _____      |  |
| REGISTRATION NO. _____     |  |
| INA _____                  |  |
| W/S _____ S/B _____        |  |

- PLACE OF USE:
16. Township N/A N/S
  17. Range N/A E/W
  18. Section N/A
  19. Legal description  
of land N/A

20. Type well:  
N/A Exempt  
N/A Non-Exempt
21. Action Requested:  
Drill Deepen X Replace  
55-518290
22. This notice filed by:  
Owner X  
Lessee \_\_\_\_\_  
ASARCO Incorporated  
Name  
P.O. Box 5747  
Address  
Tucson, AZ 85703  
City State Zip  
Telephone (602) 792-3010
23. Drilling Firm:  
Joy-CBC Drilling  
Name  
707 Boyd Blvd.  
Address P.O. Drawer 489  
La Porte, Indiana 46350  
City State Zip  
75  
DWR License Number

24. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials: Yes No X

GENERAL INSTRUCTIONS

1. Fill out this form in duplicate and send to ~~99 East Virginia, Suite 100, Phoenix, Az. 85004.~~
2. For specific instructions, limitations and conditions, see the reverse side of this form.
3. This form is to be used to drill, deepen or replace a well outside of an Active Management Area.
4. If the well is a replacement or deepening of an existing well, state the registration number of the existing well in Item 21.
5. Construction standards for new and replacement wells and the deepening and abandonment of existing wells shall be in accordance with Department Rules and Regulations.

I state that this Notice is filed in compliance with ARS 345-596 and is complete and correct to the best of my knowledge and belief and that I understand the limitations under which I must operate this well set forth on the reverse side of this form.

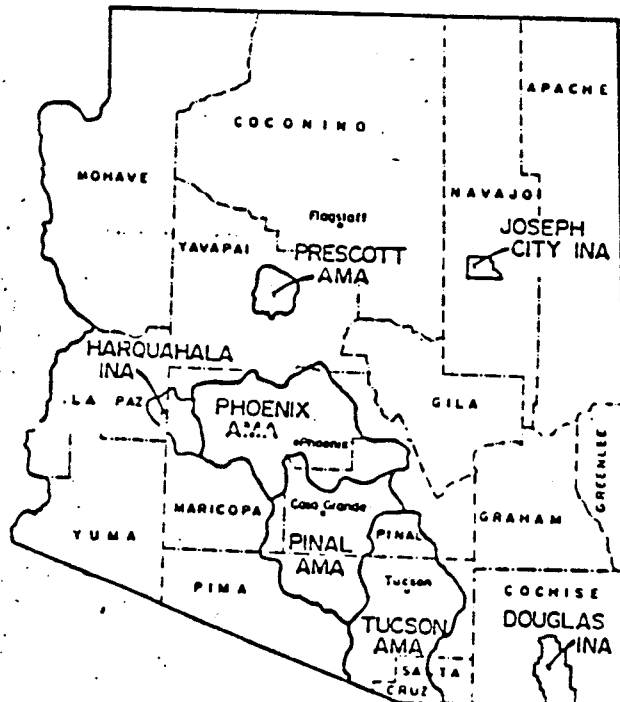
DATE 5-31-90

Signature of Person Filing

*W. H. Gay*

SPECIFIC INSTRUCTIONS, LIMITATIONS AND CONDITIONS

1. Upon receipt of the return of this annotated Notice, the owner is authorized to proceed in drilling or deepening the well as set forth on this Notice.
2. An exempt well means a well having a pump with a maximum capacity of not more than thirty-five (35) gallons per minute and may include the application of water to less than two (2) acres of land to produce plants or parts of plants for sale, human consumption or for use as feed for livestock, range livestock or poultry.
3. Only one exempt well may be drilled or used to serve the same use at the same location.
4. A non-exempt well is any well which exceeds the limitations, as indicated in paragraph 2 above. However, water from a non-exempt well located in an Irrigation Non-Expansion Area, may not be withdrawn to irrigate any acres which are not eligible to be irrigated pursuant to ARS §45-434 or §45-437. Also, owners of non-exempt wells located in Irrigation Non-Expansion Areas, are subject to the measuring device and annual report requirements of ARS §45-437.
5. The drilling or deepening of this well shall be completed within one (1) year of the date of this Notice.
6. Within thirty (30) days after the installation of pumping equipment on this well, the registered well owner shall file the prescribed Completion Report. A form for this purpose will be furnished to the registered owner with the return of an annotated copy of this Notice.
7. The person to whom a well is registered shall notify the Department of a change in ownership or a change in data relating to this well. The prescribed form for these purposes will be furnished to the registered owner with the return of the annotated copy of this Notice.
8. A sketch map showing the general boundaries of the Active Management Areas and Irrigation Non-Expansion Areas is shown at the right. Maps of greater detail are available on request.



*lost for JWS*

*FILE*

TAKE  
PRIDE IN  
AMERICA  
*Superior  
East  
Project,  
Pinal Co,  
AZ*



# United States Department of the Interior

## GEOLOGICAL SURVEY

Branch of Igneous and Geothermal Processes, MS-910  
345 Middlefield Road, Menlo Park, California 94025

July 12, 1990

ASARCO Inc.

JUL 16 1990

SW Exploration

James D. Sell  
ASARCO Inc.  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

I want to let you know about the latest episode in the life of the ASARCO drill core of the Apache Leap Tuff that you turned over to me 10 these many years ago. It was about 1987 that I had to move it from the Magnetic Observatory because they were going to use the space for other purposes. Our administrators found some space in the yard at the USGS Water Resource Division's warehouse in Tucson, so on one of my trips down there some of their guys helped me move it to a garden-type storage shed that I bought. I think I told you about that move.

Last winter I got a call from them; their warehouse was being eliminated, and I would have to either find a new place for the core or let it be discarded. I investigated several possible leads but came up empty. One of the best possibilities was a research core library in Salt Lake City, but neither they nor our Branch had sufficient funds to pay for the moving. But finally a solution emerged; I talked with Steve Reynolds and learned that the State would be interested in having it. They had to hustle around and find a place for it, but they have solved the problem. The WRD people helped them move it, and it now has a new home in a leased warehouse in Tucson. Enclosed for your information is a copy of my letter to Larry Fellows. I am assuming that ASARCO continues to have an interest in any use that is made of this core; let me know if this changes.

Meanwhile I continue to plan further studies on it. I have fairly representative samples here that I want to work on, and if I get everything else done (ha!) there are some further things I'd like to do with the big collection.

This perhaps is a good time to raise a question we've talked about before; do you think ASARCO would be willing to release the figures on the thicknesses of the various Tertiary volcanic and sedimentary units and the depth of the contact at the base of the Tertiary section in those holes? I have long been intrigued by the implications, which are of great regional significance in the genesis of the volcanic rocks. And from my (perhaps naive) outlook, I would think that the above information would not compromise any proprietary information about mineral resources. As you well know, I'm staying strictly clear of probing for such information; I'm just trying to decipher the volcanic story.

My suggestion would be that you could contribute a paper to, say, the Arizona Geological Society Digest containing the pertinent information and numbers. It could be either a simple, factual account, or it could include any interpretations with which you would like to embellish it. If ASARCO is willing to give out the information but you don't want to be saddled with writing a paper, I would be glad to work with you on it and, if appropriate, give you (and other ASARCO people?) full authorship. You should definitely be the guy to get the credit and the recognition. Following its release, I am hoping to use the information to help put the volcanic story together. Let me know if you think there is any possibility of this happening.

I was sorry to miss you in March when we were in Tucson for the Cordilleran Section meeting of the GSA. You probably got messages both at your office and from Mark at home that I had called. It was a good set of meetings and it was nice to see lots of old friends. I didn't have a field season this spring so we just quickly bounced down there and back, but I'm hoping to have a good full session this fall in the Superstitions. One of these times I'm going to get 'em figured out!

Best regards to the whole family!

Sincerely,

A handwritten signature in dark ink, appearing to read 'Don', enclosed within a large, loopy circular flourish.

Donald W. Peterson



# United States Department of the Interior

## GEOLOGICAL SURVEY

Branch of Igneous and Geothermal Processes, MS-910  
345 Middlefield Road, Menlo Park, California 94025

July 12, 1990

Dr. Larry D. Fellows, Director  
Arizona Geological Survey  
845 North Park Avenue, #100  
Tucson, AZ 85719

ASARCO Incorp.

JUL 16 1990

SW Exploration

Dear Larry:

Thanks very much for your note, and thanks especially to you, Steve Reynolds, Tom McGarvin, and any other involved individuals for making it possible to move the ASARCO drill core to a new and happy home. I think that drill core is a real treasure trove of information and a valuable resource for all kinds of future research, and I am very gratified that it has found a safe haven where it will be accessible to investigators.

Through the years that it has been in my custody, several people from the university have contacted me to take samples, and I've always been glad to grant permission with the proviso that they also advise ASARCO. If any of their results are to be published, I've asked them to clear it with ASARCO. James D. Sell of the Tucson office has always been my point of contact. I would recommend that this same courtesy be continued by future investigators. Further, I myself would be interested in hearing about projects by such investigators just to keep up with current work being done on the Apache Leap Tuff. I will certainly be glad to supply any background information that I can about the rock and the general geologic setting. Further, I am hoping that my own work will shape up so that I can do some more work on the core; I have a lot of questions that still need answers!

Again, thanks and best wishes.

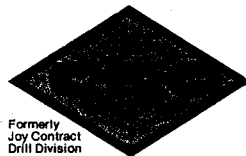
Sincerely,

Donald W. Peterson

✓ cc: J.D. Sell, ASARCO







707 BOYD BOULEVARD / LaPORTE, INDIANA 46350 / PHONE & FAX: (219) 362-2191

ASARCO Incorporated

DEC 13 1990

SW Exploration

December 10, 1990

Mr. Jim Sell  
Asarco Inc.  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

Hole A-16 falls under the "Bad Rock" clause from 2704' to 2777' which runs into next month. I've attached the work sheet also.

Yours truly,

CBC DRILLING

J. H. Koontz  
Vice President &  
General Manager

JHK/ts  
attachment:

**CBC DRILLING**

Formerly Joy Contract Drill Division

707 BOYD BLVD. ASARCO Incorp  
LA PORTE, IN 46350**ORIGINAL****PLEASE REMIT TO**  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130**DEC 13 1990**

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03964              |                         |                            | 03-0964-24          |

**SOLD TO**ATTN: MR. JIM SELL  
ASARCO INC.  
P.O. BOX 5747  
TUCSON, AZ 85703TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM**INVOICE NO.** AZ1334**INVOICE DATE** 12/10/90**SHIPPED TO**

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130**DATE SHIPPED**ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-362-2191**SHIPPED VIA****P. O. ADDRESS****MARKS****REQUESTED ROUTING****SHIPPED FROM**

For 314.' of drilling near Superior, Arizona for period from November 1, 1990 to November 25, 1990 as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COS |
|---------------------|------|-------|-------|------------|-----------|-----------|
| A-16 (90°)          | NC   | 2446. | 2500. | 54.        | 22.20     | 1,198.80  |
|                     | NC   | 2500. | 2724. | 224.       | 24.40     | 5,465.60  |
|                     | NC   | 2724. | 2760. | 36.        | Bad Rock  | -         |
|                     |      |       |       | 314.       |           | 6,664.40  |

(586-1004) BAD ROCK DRILLING (SEE ATTACHED WORK SHEET)

|      |         |                         |          |
|------|---------|-------------------------|----------|
| A-16 | Nov. 20 | 10 Hours (Third Shift)  |          |
|      | Nov. 21 | 20 Hours                |          |
|      |         | 30 Hours @ \$55.00/hour | 1,650.00 |

(586-1007) REENTRY

|      |        |                         |          |
|------|--------|-------------------------|----------|
| A-16 | Nov. 2 | 16 Hours                |          |
|      | Nov. 5 | 20 Hours                |          |
|      | Nov. 6 | 18 Hours                |          |
|      |        | 54 Hours @ \$60.00/hour | 3,240.00 |

(587-1101) MUD AND ADDITIVES

|    |                                 |        |
|----|---------------------------------|--------|
| 3  | 5 Gallon EZ Mud @ \$131.04 each | 393.12 |
| 1  | Mud Seal @ \$18.90 each         | 18.90  |
| *1 | 55 Gallon Sol. Oil              | -      |

412.02

\*To be invoiced next month when details available.

FORM  
INV.-89-1F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED  
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE  
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS  
OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

**CBC DRILLING**

Formerly Joy Contract Drill Division

**ORIGINAL**

SOLD TO ATTN: MR. JIM SELL ASARCO INC.

PAGE NO. 2

INVOICE NO.  
AZ1334(586-1008) WATER HAUL

November 2 through November 25, 1990

|                                  |             |
|----------------------------------|-------------|
| 1 Truck @ \$600.00/month (24/30) | 480.00      |
| 5 Miles @ \$.75/mile             | <u>3.75</u> |

483.75

(586-1009) PER DIEM

|           |                |
|-----------|----------------|
| Sellars   | 14 Days        |
| Taylor    | 14 Days        |
| McConnell | 13 Days        |
| Vanover   | <u>13 Days</u> |

54 Days @ \$15.00/day

810.00

(586-1005) MOBILIZATION

Rig 9132

900.00

TOTAL INVOICE: \$14,160.17



APPROVED FOR PAYMENT

By: James K. Sell

(Signature)

Superior East  
EA-0010

# BAD ROCK WORK SHEET

BAD ROCK RATE ( ) =

CONTRACT ASAPCO SUPERIOR #10

DATE 12/7/90

BY K0007Z

| DATE                  | DRILL HOURS  | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK | DATE  | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK |
|-----------------------|--------------|--------------|-----------------|---------------|------------------|----------|-------|-------------|--------------|-----------------|---------------|------------------|----------|
| 11/1                  | 6 1/2<br>MDS |              |                 | 19.8          |                  | 2        | 11/1  | 440.00      | NC           | (2000-2500)     |               |                  |          |
| 11/2                  | 8<br>REIN    |              |                 |               |                  |          | 11/2  | 22.20       |              |                 |               |                  |          |
| 11/5                  | 8<br>REIN    |              |                 |               |                  |          |       |             |              |                 |               |                  |          |
| 11/6                  | 8<br>REIN    |              |                 |               |                  |          |       |             |              |                 |               |                  |          |
| 11/7                  | 2            | 4            | 16.0            |               | 8                |          |       |             |              |                 |               |                  |          |
| 11/8                  | 8            | 22           | 22.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/8                  | 10<br>REIN   |              |                 |               |                  |          |       |             |              |                 |               |                  |          |
| 11/9                  | 5            | 8            | 12.8            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/12                 | 10           | 25           | 20.0            |               |                  |          | 11/12 | 440.00      | NC           | (2500-3000)     |               |                  |          |
| 11/12                 | 8            | 20           | 20.0            | 18.0          |                  |          | 11/12 | 24.40       |              |                 |               |                  |          |
| 11/13                 | 6            | 15           | 20.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/14                 | 8            | 20           | 20.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/15                 | 8            | 14           | 14.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/15                 | 6 1/2        | 15           | 18.5            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/16                 | 8            | 21           | 21.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/16                 | 8<br>REIN    |              |                 |               |                  |          |       |             |              |                 |               |                  |          |
| 11/19                 | 8            | 15           | 15.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/20                 | 10           | 5            | 4.0             |               |                  |          |       |             |              |                 |               |                  |          |
| 11/20                 | 10           | 9            | 7.2             |               |                  |          |       |             |              |                 |               |                  |          |
| 11/20                 | 10           | 25           | 20.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/21                 | 10           | 20           | 16.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/21                 | 10           | 16           | 12.8            |               |                  |          |       |             |              |                 |               |                  |          |
| END OF MONTH (NOV 90) |              |              |                 |               |                  |          |       |             |              |                 |               |                  |          |
| 11/26                 | 7            | 10           | 11.4            |               | 1                |          |       |             |              |                 |               |                  |          |
| 11/27                 | 8            | 7            | 7.0             |               |                  |          |       |             |              |                 |               |                  |          |
| 11/27                 | 4            | 0            | 0.0             |               |                  |          |       |             |              |                 |               |                  |          |
| 11/28                 | 8            | 0            | 0.0             |               |                  |          |       |             |              |                 |               |                  |          |
| 11/28                 | 8            | 23           | 23.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/29                 | 8            | 20           | 20.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/29                 | 8            | 10           | 10.0            |               |                  |          |       |             |              |                 |               |                  |          |
| 11/29                 | 8            | 20           | 20.0            |               |                  |          |       |             |              |                 |               |                  |          |

BAD ROCK

*Using to verify 1/7/91*

# CBC DRILLING

Formerly Joy Contract Drill Division

707 BOYD BLVD.  
LA PORTE, IN 46350

*Superior EAST*  
**DUPLICATE** *JDS*

**PLEASE REMIT TO**  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03964              |                         |                            | 03-0964-24          |

SOLD  
TO

ATTN: MR. JIM SELL  
ASARCO INC.  
P.O. BOX 5747  
TUCSON, AZ 85703

TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

INVOICE NO. AZ1345

INVOICE DATE 1/3/91

SHIPPED  
TO

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

DATE SHIPPED

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-382-2181

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

For 500.' of drilling near Superior, Arizona for period from November 26, 1990 to December 25, 1990 as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COST |
|---------------------|------|-------|-------|------------|-----------|------------|
| A16 (90°)           | NC   | 2760. | 2777. | 17.        | Bad Rock  | -          |
|                     | NC   | 2777. | 3000. | 223.       | 24.40     | 5,441.20   |
|                     | NX   | 3000. | 3260. | 260.       | 25.70     | 6,682.00   |
|                     |      |       |       | 500.       |           | 12,123.20  |

(586-1004) BAD ROCK DRILLING (SEE ATTACHED WORKSHEET)

|     |         |                         |          |
|-----|---------|-------------------------|----------|
| A16 | Nov. 26 | 15 Hours                |          |
|     | Nov. 27 | 12 Hours                |          |
|     |         | 27 Hours @ \$55.00/hour | 1,485.00 |

(586-1007) SETTING AND PULLING CASING

|     |         |                         |          |
|-----|---------|-------------------------|----------|
| A16 | Dec. 12 | 11 Hours                |          |
|     | Dec. 13 | 14 Hours                |          |
|     |         | 25 Hours @ \$55.00/hour | 1,375.00 |

(586-1007) CEMENTING, PLUGGING, HOLE CONDITIONING AND CLOSING HOLES

|     |         |                       |       |
|-----|---------|-----------------------|-------|
| A16 | Nov. 26 | 1 Hour @ \$55.00/hour | 55.00 |
|-----|---------|-----------------------|-------|

ASARCO Incorporated

**JAN 9 1991**

SW Exploration

FORM  
INV-89-1

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED  
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE  
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS  
OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).



**CBC DRILLING**

Formerly Joy Contract Drill Division

**DUPLICATE**

SOLD TO ATTN: MR. JIM SELL

ASARCO INC.

PAGE NO. 2

INVOICE NO.  
AZ1345(586-1009) SURVEY

A16

Dec. 11 3 Hours

Dec. 12 5 Hours

8 hours @ \$55.00/hour

440.00

(587-1100) MUD AND ADDITIVES

4 5 Gallon EZ Mud @ \$131.04 each 524.16

\*1 55 Gallon Sol. Oil @ \$264.44 each 264.44

788.60

\*Used in November but not included on AZ1234.

(586-1008) WATER HAUL

November 26 through December 25

1 Truck @ \$600.00/month 600.00

12 Miles @ \$.75/mile 9.00

609.00

(586-1009) PER DIEM

Sellars 20 Days

Taylor 20 Days

McConnell 17 Days

Vanover 17 Days

74 Days @ \$15.00/day

1,110.00

(586-1005) MOBILIZATION

2 Truck Trips (NX Casing &amp; NX Rods) @ \$150.00/trip

300.00

TOTAL INVOICE: \$18,285.80

THANK  
YOU

ASARCO Incorporated

JAN 9 1991

SW EXPIRATION

# BAD ROCK WORK SHEET

BAD ROCK RATE ( ) = \_\_\_\_\_ = \_\_\_\_\_

CONTRACT HSARCO SUPPLY TO

DATE 1/2/91

BY KINSE

| DATE  | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK | DATE | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK |
|-------|-------------|--------------|-----------------|---------------|------------------|----------|------|-------------|--------------|-----------------|---------------|------------------|----------|
| 11/26 | 7           | 10           | 11.4            | 18.0          | 1                | ↑        |      |             |              |                 |               |                  |          |
|       | 8           | 7            | 7.0             |               |                  | ↓        |      |             |              |                 |               |                  |          |
| 11/27 | 4           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 0            | 0.0             |               |                  | ↓        |      |             |              |                 |               |                  |          |
| 11/28 | 8           | 23           | 23.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 20           | 20.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 11/29 | 8           | 10           | 10.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 20           | 20.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 11/30 | 8           | 20           | 20.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 15           | 15.0            |               |                  | ↑        |      |             |              |                 |               |                  |          |
| 12/3  | 10          | 20           | 16.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 10          | 3            | 2.4             |               |                  |          |      |             |              |                 |               |                  |          |
| 12/4  | 8           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 12/5  | 4           | 5            | 10.0            |               |                  | ↓        |      |             |              |                 |               |                  |          |
|       | 10          | 27           | 21.6            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/6  | 10          | 15           | 12.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/7  | 0           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 12/10 | 8           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 10           | 10.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/11 | 8           | 20           | 20.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 5           | 15           | 24.0            |               | 3                |          |      |             |              |                 |               |                  |          |
| 12/12 | 0           | 0            | 0.0             |               | 8                |          |      |             |              |                 |               |                  |          |
|       | 0           | 0            | 0.0             |               | 8                |          |      |             |              |                 |               |                  |          |
| 12/13 | 0           | 0            | 0.0             |               | 6                |          |      |             |              |                 |               |                  |          |
|       | 0           | 0            | 0.0             |               | 8                |          |      |             |              |                 |               |                  |          |
| 12/14 | 8           | 30           | 30.0            | 17.1          |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 30           | 30.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/17 | 10          | 30           | 24.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 10          | 32           | 25.6            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/18 | 10          | 48           | 38.4            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 10          | 35           | 28.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/19 | 10          | 20           | 16.0            |               |                  |          |      |             |              |                 |               |                  |          |
|       | 10          | 35           | 28.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 12/20 | 10          | 0            | 0.0             |               |                  | ↑        |      |             |              |                 |               |                  |          |
|       | 5           | 0            | 0.0             |               |                  | ↓        |      |             |              |                 |               |                  |          |
| 12/21 | 12          | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
|       | 8           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 12/22 | 3           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |

INVOICED CONTINUATION FROM LAST MONTH

NOT INVOICED DRILL PROBLEM

NOT INVOICED STUCK RODS WERE USE PROBLEM

# CBC DRILLING

Formerly Joy Contract Drill Division

707 BOYD BLVD.  
LA PORTE, IN 46350

*JDS*  
**DUPLICATE**

**PLEASE REMIT TO**

P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

CBC Account Number

03964

Customer's Order Number

Customer's Contract Number

CBC Contract Number

03-0964-24

**SOLD  
TO**

ATTN: MR. JIM SELL  
ASARCO INC.  
P.O. BOX 5747  
TUCSON, AZ 85703

ASARCO INC.

FEB 1 1991

SW Exploration

TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-362-2191

**INVOICE NO.** AZ1358

**INVOICE DATE** 1/30/91

**DATE SHIPPED**

**SHIPPED VIA**

**SHIPPED  
TO**

SUPERIOR, ARIZONA

**P. O. ADDRESS**

**MARKS**

**REQUESTED ROUTING**

**SHIPPED FROM**

For 949.' of drilling near Superior, Arizona for period from <sup>12</sup>11/26/90 to 1/25/91  
as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST           | TOTAL COST |
|---------------------|------|-------|-------|------------|---------------------|------------|
| A16 (90°)           | NX   | 3260. | 3500. | 240.       | 25.70               | 6,168.00   |
|                     | NX   | 3500. | 4000. | 500.       | 29.20               | 14,600.00  |
|                     | NX   | 4000. | 4079. | 79.        | 33.50               | 2,646.50   |
|                     | NX   | 4079. | 4155. | 76.        | Badrock             | -          |
|                     | NX   | 4155. | 4209. | 54.        | 33.50               | 1,809.00   |
|                     |      |       | 949.  |            | <i>plus 8.46/hr</i> | 25,223.50  |

(586-1004) BAD ROCK DRILLING (SEE ATTACHED WORKSHEET)

|     |         |                         |          |
|-----|---------|-------------------------|----------|
| A16 | Dec. 21 | 8 Hours                 |          |
|     | Dec. 22 | 24 Hours                |          |
|     | Dec. 23 | 24 Hours                |          |
|     | Dec. 24 | 13 Hours                |          |
|     |         | 69 Hours @ \$55.00/hour | 3,795.00 |

(586-1009) SURVEY

|     |         |                         |        |
|-----|---------|-------------------------|--------|
| A16 | Dec. 21 | 2½ Hours @ \$55.00/hour | 137.50 |
|-----|---------|-------------------------|--------|

(587-1101) MUD AND ADDITIVES

|    |                                 |        |
|----|---------------------------------|--------|
| 1  | CC-16 @ \$25.39 each            | 25.39  |
| 3  | Dextrid @ \$87.19 each          | 261.57 |
| 3  | Soda Ash @ \$26.84 each         | 80.52  |
| 6  | 5 Gallon EZ Mud @ \$131.04 each | 786.24 |
| 21 | Starch @ \$22.05 each           | 463.05 |

FORM  
INV.-89-1

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

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

# CBC DRILLING

Formerly Joy Contract Drill Division

## DUPLICATE

SOLD TO ATTN: MR. JIM SELL ASARCO INC.

PAGE NO. 2

INVOICE NO.  
AZ1358

(587-1101) MUD AND ADDITIVES (CONTINUED)

Mud Surcharge (detail attached -  
includes 5% tax and 20% handling) 37.33

1,654.10

(586-1008) WATER HAUL

December 26 through January 25

1 Truck @ \$600.00/month 600.00  
23 Miles @ \$.75/mile 17.25

617.25

(586-1009) PER DIEM

Sellars 23 Days  
Taylor 23 Days  
McConnell 23 Days  
Vanover 23 Days  
Johnson 15 Days  
Figueroa 15 Days

122 Days @ \$15.00/day

1,830.00

TOTAL INVOICE: \$33,257.35

THANK  
YOU

# Invoice



Baroid Drilling Fluids, Inc.  
P.O. Box 1675, Houston, TX 77251  
Phone: (713) 987-5900

## PLEASE REMIT TO:

Baroid Drilling Fluids, Inc.

P.O. BOX 100874  
HOUSTON TX 77212

Please quote our invoice number.

SOLD TO  
JOY-CBC DRILLING  
ATTN: N TRUJELLO  
750 E EVANS BLVD  
TUCSON

AZ 85713

(SAME AS "SOLD TO" UNLESS OTHERWISE SHOWN)

SHIP TO  
JOY-CBC DRILLING

#03-1964-24

Marco Superior #10

| DATE     | INVOICE NUMBER | PAGE |
|----------|----------------|------|
| 01/10/91 | N6273102       | 1    |

CUSTOMER REFERENCE NUMBER

WELL CODE

CUSTOMER NO.

TERMS

SHC

COPIES

NONE GIVEN

4533020

NET 30 DAYS

1

| PRODUCT NUMBER                 | DESCRIPTION | QUANTITY SHIPPED       | PRICING QUANTITY | UNIT PRICE | PR UNIT | AMOUNT |
|--------------------------------|-------------|------------------------|------------------|------------|---------|--------|
| SHIP DOC N6273102              |             | SHIP DT 12/24/90       |                  |            |         |        |
| FOR WAREHOUSE                  |             | FROM GLOBE AZ          |                  |            |         |        |
| VIA                            |             | FRT TRM COLLECT/CHARGE |                  |            |         |        |
| 000430050BAGDEXTRIN EX         |             | 500                    | 500              | 69 20      | BAG     | 553 60 |
| 001770005CANE Z MUD            |             | 500                    | 500              | 104 00     | CAN     | 520 00 |
| 000610050BAGCC-16              |             | 100                    | 100              | 19 52      | BAG     | 19 52  |
| 00070100BAGSODA ASH            |             | 100                    | 100              | 21 30      | BAG     | 21 30  |
| 002900050BAGYELLOW STARCH      |             | 400                    | 400              | 17 50      | BAG     | 70 00  |
| 099920001EA SURCHARGE (2 1/2%) |             | 100                    | 100              | 29 63      | EA      | 29 63  |
| SALES TAXES:                   |             |                        |                  |            |         |        |
| STATE OF ARIZONA               |             |                        |                  | 5 000%     |         | 60 71  |
| TAXABLE                        |             | TAX CHARGES            | NON TAXABLE      |            |         |        |
| 1,214.00                       |             | 60.71                  | 6.00             |            |         |        |

21629  
708  
321  
934

TOTAL

1 274 76

Seller represents and warrants that all of the goods or materials herein specified and/or the performance of the services covered by this invoice have been produced and/or furnished in full compliance with the Federal Labor Standards Act of 1938 as amended.

REMITTANCE

# BAD ROCK WORK SHEET

BAD ROCK RATE ( ) = \_\_\_\_\_ = \_\_\_\_\_

CONTRACT ASAP 20 SUMMER

DATE 1/21/91

BY KUON52

| DATE  | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK          | DATE | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK |
|-------|-------------|--------------|-----------------|---------------|------------------|-------------------|------|-------------|--------------|-----------------|---------------|------------------|----------|
| 12/26 | 8           | 0            | 0.0             | 17.1          |                  | ↑ calc<br>penalty | 1/18 | 2           | 5            | 20.0            |               |                  |          |
|       | 8           | 7            | 7.0             |               |                  | ↓                 |      | 8           | 10           | 10.0            |               |                  |          |
| 12/27 | 6           | 16           | 21.3            |               |                  |                   |      | 8           | 25           | 25.0            | 13.1          |                  |          |
|       | 8           | 22           | 22.0            |               |                  |                   | 1/19 | 8           | 20           | 20.0            |               |                  |          |
| 12/28 | 8           | 20           | 20.0            |               |                  |                   |      | 8           | 14           | 11.0            |               |                  |          |
|       | 8           | 15           | 15.0            |               |                  |                   |      | 8           | 9            | 9.0             |               |                  |          |
| 12/31 | 10          | 0            | 0.0             |               |                  |                   | 1/21 | 3 1/2       | 0            | 0.0             |               | 2 1/2            |          |
|       | 10          | 37           | 29.6            |               |                  |                   |      | 8           | 16           | 16.0            |               |                  |          |
| 1/2   | 10          | 27           | 21.6            |               |                  |                   |      | 8           | 11           | 11.0            |               |                  |          |
|       | 10          | 26           | 20.8            |               |                  |                   | 1/22 | 8           | 11           | 11.0            |               |                  |          |
| 1/3   | 10          | 14           | 11.2            |               |                  |                   |      | 8           | 13           | 13.0            |               |                  |          |
|       | 10          | 26           | 20.8            |               |                  |                   |      | 8           | 9            | 9.0             |               |                  |          |
| 1/4   | 10          | 25           | 20.0            |               |                  |                   | 1/23 | 8           | 12           | 12.0            |               |                  |          |
|       | 10          | 25           | 20.0            | 15.1          |                  |                   |      | 8           | 9            | 9.0             |               |                  |          |
| 1/7   | 8           | 20           | 20.0            |               |                  |                   |      | 8           | 2            | 2.0             |               |                  |          |
|       | 8           | 18           | 18.0            |               |                  |                   | 1/24 | 5           | 0            | 0.0             |               |                  |          |
| 1/8   | 8           | 18           | 18.0            |               |                  |                   |      | 8           | 9            | 9.0             |               |                  |          |
|       | 8           | 24           | 24.0            |               |                  |                   |      | 8           | 15           | 15.0            |               |                  |          |
|       | 8           | 18           | 18.0            |               |                  |                   | 1/25 | 8           | 15           | 15.0            |               |                  |          |
| 1/9   | 4           | 7            | 14.0            |               |                  |                   |      | 8           | 14           | 14.0            |               |                  |          |
|       | 8           | 25           | 25.0            |               |                  |                   |      | 8           | 10           | 10.0            |               |                  |          |
|       | 8           | 16           | 16.0            |               |                  |                   |      |             |              |                 |               |                  |          |
| 1/10  | 8           | 24           | 24.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 18           | 18.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 6           | 16           | 21.3            |               |                  |                   |      |             |              |                 |               |                  |          |
| 1/11  | 8           | 10           | 10.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 29           | 29.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 14           | 14.0            |               |                  |                   |      |             |              |                 |               |                  |          |
| 1/14  | 6           | 8            | 10.7            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 4            | 4.0             |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 0            | 0.0             |               |                  |                   |      |             |              |                 |               |                  |          |
| 1/15  | 8           | 29           | 29.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 25           | 25.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 22           | 22.0            |               |                  |                   |      |             |              |                 |               |                  |          |
| 1/16  | 8           | 27           | 27.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 15           | 15.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 28           | 28.0            |               |                  |                   |      |             |              |                 |               |                  |          |
| 1/17  | 5           | 17           | 27.2            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 18           | 18.0            |               |                  |                   |      |             |              |                 |               |                  |          |
|       | 8           | 10           | 10.0            |               |                  |                   |      |             |              |                 |               |                  |          |

INVOICED

JAK 1/24/91



To JDS  
Date 2/11 Time 9:00 ☐ AM ☒ PM

**WHILE YOU WERE OUT**

M. Nine Trujillo  
of \_\_\_\_\_

Phone ( ) 884-5865  
Area Code Number Extension

|                   |                                     |                 |                                     |
|-------------------|-------------------------------------|-----------------|-------------------------------------|
| TELEPHONED        | <input checked="" type="checkbox"/> | PLEASE CALL     | <input checked="" type="checkbox"/> |
| CALLED TO SEE YOU | <input type="checkbox"/>            | WILL CALL AGAIN | <input type="checkbox"/>            |
| WANTS TO SEE YOU  | <input type="checkbox"/>            | URGENT          | <input type="checkbox"/>            |

A-16 RETURNED YOUR CALL ☐

Message At 4545 in porch  
good rock, but heavy tool  
weight. Thumbs are credit  
to reduce. Will put old  
coming in bottom, new rock  
(warming) above 300 (present coming)  
x 50 bx to bottom.



Operator Chad Jones  
JDS

REORDER  
#23-000



## Exploration Department

R. L. Brown  
Vice President

February 28, 1991

FAX

Mr. J.D. Sell  
Tucson Office

Dear Mr. Sell:

Please stop the diamond drill hole now drilling at Superior East immediately. Please leave 20 feet or so of casing in the BX portion of the hole.

Please acknowledge receipt of this fax.

R.L. Brown

RLB/lj

cc: W.L. Kurtz - Fax

*2/28 reins contacted, sending up cutters.  
 ± 4850. Have old NX casing in hole from ± 3000 to  
 4545. New casing on top. As 3" (NX) casing is  
 down to 3000', they'll cut their  
 new NX & leave the old NX  
 Thus hole will be "cased" from  
 surface to 4545. BX hole full of heavy mud.*

ASARCO Incorp

FEB 28 1991

SW Exploration

NOTE:

3/1/91

After all said & done, RSB voiced to continue A-14 altho the end result may be that so costs in 1991 will be taken out of the overall SWED Budget.

So now where I can and hope for a turn around around June.



*on sheet*  
Billing Not paid to 3/1/91 depth of 4935.

|  | Dullings | Stuff | Assay |
|--|----------|-------|-------|
| Dec 26 - Jan. 25 3240-4209 = 949'  | 33,000   | 1000  | 200   |
| NA 3240-3500 = 240 @ 25.70 = 6,200<br>3500-4000 = 500 @ 29.20 = 14,600<br>4000-4209 = 209 @ 33.50 = 7,000<br>27,800<br>(29.26 av/ft) |          |       |       |
| Billing 33,300 total<br>- 27,800 dulling, footer<br>5,500 / 949 = 5.80 or 6.00 est/ft<br>add all costs                               |          |       |       |
| Jan. 26 - Feb. 12 4209-4545 = 336'   |          |       |       |
| NX 4209-4500 = 291 @ 33.50 = 9,750<br>4500-4545 = 45 @ 38.50 = 1,740<br>plus 336' @ 6/ft = 2,020<br>\$ 13,510 est.                   | 13,500   | 1000  | 400   |
| Feb 13 - March 1 4545-4935 = 390'  |          |       |       |
| BX 390' @ 38.50 = 15,015<br>plus 390 x 6/ft = 2,340<br>17,355 est.   | 17,500   |       |       |
|  | 44,000   | 2000  | 600   |

### OPTIONS

1) Continue coring to 5400'

$$\begin{aligned}
 \text{BX } 4935-5000 &= 65' @ 38.70 = 2,500 \\
 5000-5400 &= 400 @ 45.50 = 18,200 \\
 \text{plus } 465 \times 6/\text{ft} &= 2,800 \\
 &= 23,500
 \end{aligned}$$

2) CBC option: Stop 3/1, cap hole, work away

rent \$53,472 worth of casing in hole

at 5¢/mo = \$2674/month (2700/mo)

$$\times 10 \text{ mo} = 27,000$$

(Have Surf-3000 NX casing = 3000' @ 10 ft  
 (Have Surf-4545 BX casing (Surface-2990 good) = 2990 @ 8.00/ft  
 (2990-4545 poor = 1545) @ 6.00/ft

480

- 3) CBC option. Purchase lower BX, ~~rent~~ by cutting at 2990 & salvaging top BX. Rent NX. This leaves hole protected.

$$\text{Purchase } \overset{\text{lower}}{\text{BX}}, 2990 - 4545 = 1545' @ 6\%/\text{ft} = 9330$$

$$\text{Rent NX}, 3000 \times \$10/\text{ft}$$

$$\begin{aligned} \$30,000 \times 5\%/\text{mo} &= 1500/\text{month, rental} \\ &= \$24,330 \quad \times 10 \text{ mo} \end{aligned}$$

- 4) CBC Option Salvage top BX, but rent NX & lower BX.

$$\begin{aligned} \text{also leaves hole protected. } 30,000 + 9330 &= 39,330 \times 5\%/\text{mo} \\ &= 1967/\text{mo. rental} \\ &= 19,700 \quad \times 10 \end{aligned}$$

Possible cutting cost:

$$3 \text{ days } (16 \text{ hrs} \times 3 \text{ days} \times 55/\text{hr}) = 2640 \quad (3000)$$

Possible loss of casing: at total end of coring:

$$? \text{ on NX, might lose } 200' \times 10. = 2000 + 150/\text{day} \quad \text{men}$$

$$\begin{aligned} ? \text{ on lower BX, } " " 1000 \times 6 &= 6000 + \\ &\times 70\% \end{aligned}$$

Koventy 3/1/91

Sept 4935

A-16

Surf. 3000' NX casing ~~day~~ \$10/ft.

Culter, 2990 BX → 4545

(2934 <sup>800/ft.</sup> good NX wireline) → 2934 → 4545 is older material \$8.00/ft. 1555

5%/month

1)  $\frac{\$53,472}{26.7\%/month. \times ? months}$  Walk away bet

2) \$9330 by lower BX  
(30,000 × 5% = 1500/mo rent NX  
10

2700

3) rent ~~all~~ except  
39,330 × 5% ~~1000~~ 1967/mo.  
20000

4700 300 × 39

500 × 40

32,800

4935



Not sent

FAX

3/1

FT Graybeal

NY Office.

Options: Completion of  
A-14 at Loggerhead East

Closed down as of 3/1/91 at depth of 4935'

3 Options:

1. Pull as much casing as possible,  
fill hole w/ heavy mud.

Expect to lose 200' of NX @ 10 = 2000

Expect to lose 1000' of BX @ 6 = 6000

Cost of cutting, pulling, etc 5 day x 24 hrs x \$5/hr = 6,600

\$14,600

Not a viable option with pieces of isolated casing in hole, extremely doubtful hole could be reentered and AX coring resumed. Loose interval of mineralization.

2. Save hole by cutting and recovering portion of BX casing setting inside NX casing and reentering remainder for 10 months.

$NX 3000' \times 10'/ft \times 5\% \text{ per month} = 1500 \times 10 = 15,000$

$BX 1545' \times 6'/ft \times 5\% \text{ per month} = 4635 \times 10 = 4,635$

Cutting cost est for top portion = 16 hrs x 3 days x \$55/hr = 2640

\$22,275

(Note: in 1992 hole would be reentered and coring completed, with final salvage of casing as in option 1.)

3. Continue coring from 4935 to 5400, estimated  
T.D. Recover available casing.

Estimated coring costs of = 23,500

Estimated cost of salvage (opt. 1)  $\frac{14,600}{\$38,100}$

Mr. Kuntz + I believe the monies should  
be found for option #3. Complete the  
coring, recover the mineral interest,  
assign interest later, and recover  
the available casing. Note that the  
salvage cost could be 50% low or higher.

James W. Seel

# CBC DRILLING

Formerly Joy Contract Drill Division

707 BOYD BLVD.  
LA PORTE, IN 46350

JDS  
**DUPLICATE**

**PLEASE REMIT TO**  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03964              |                         |                            | 03-0964-24          |

**SOLD TO**

ATTN: MR. JIM SELL  
ASARCO INC.  
P.O. BOX 5747  
TUCSON, AZ 85703

TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

**INVOICE NO.** AZ1367

**INVOICE DATE** 3/8/91

**SHIPPED TO**

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

**DATE SHIPPED**

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-382-2191

**SHIPPED VIA**

**P. O. ADDRESS**

**MARKS**

**REQUESTED ROUTING**

**SHIPPED FROM**

For 629.' of drilling near Superior, Arizona for period from 1/26/91 to 2/25/91 as per agreement.

| (586-1004) | HOLE NO.   | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COST |
|------------|------------|------|-------|-------|------------|-----------|------------|
|            | A-16 (90°) | NX   | 4209. | 4500. | 291.       | 33.50     | 9,748.50   |
|            |            | NX   | 4500. | 4545. | 45.        | 38.90     | 1,750.50   |
|            |            | BX   | 4545. | 4838. | 293.       | 38.70     | 11,339.10  |
|            |            |      |       |       | 629.       |           | 22,838.10  |

(586-1007) SETTING AND PULLING CASING

|      |         |                         |          |
|------|---------|-------------------------|----------|
| A-16 | Feb. 11 | 20 Hours                |          |
|      | Feb. 12 | 24 Hours                |          |
|      | Feb. 13 | 8 Hours                 |          |
|      |         | 52 Hours @ \$55.00/hour | 2,860.00 |

(587-1101) MUD AND ADDITIVES

|    |                                 |        |          |
|----|---------------------------------|--------|----------|
| 3  | Soda Ash @ \$26.84 each         | 80.52  |          |
| 13 | Starch @ \$22.05 each           | 286.65 |          |
| 5  | 5 Gallon EZ Mud @ \$131.04 each | 655.20 |          |
| 2  | Dextrid @ \$87.19 each          | 174.38 |          |
|    |                                 |        | 1,196.75 |

(586-1008) WATER HAUL

|                                |        |        |
|--------------------------------|--------|--------|
| January 26 through February 25 |        |        |
| 1 Truck @ \$600.00/month       | 600.00 |        |
| 30 Miles @ \$.75/mile          | 22.50  |        |
|                                |        | 622.50 |

FORM  
INV.-89-1

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED  
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE  
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS  
OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

**CBC DRILLING**

Formerly Joy Contract Drill Division

**DUPLICATE**

SOLD TO ATTN: MR. JIM SELL ASARCO INC.

PAGE NO. 2

INVOICE NO.  
AZ1367(586-1005) TRUCK TRIPS TO MOBILIZE EQUIPMENT

|         |                    |                     |              |
|---------|--------------------|---------------------|--------------|
| Feb. 11 | BX Casing and Rods | 1 Trip (Road Truck) | 150.00       |
| Feb. 12 | BX Rods            | 1 Trip (Road Truck) | 150.00       |
| Feb. 13 | BX Core Boxes      | 1 Trip (Pickup)     | <u>75.00</u> |

375.00

(587-1104) CORE BOXES

25 Boxes @ \$2.50 each

62.50

(586-1009) PER DIEM

|           |                |
|-----------|----------------|
| Sellars   | 21 Days        |
| Taylor    | 21 Days        |
| McConnell | 22 Days        |
| Vanover   | 22 Days        |
| Johnson   | 22 Days        |
| Figueroa  | <u>21 Days</u> |

129 Days @ \$15.00/day

1,935.00

TOTAL INVOICE: \$29,889.85



# INVOICE



Baroid Drilling Fluids, Inc.  
P.O. Box 1675, Houston, TX 77251  
Phone: (713) 987-5900

## PLEASE REMIT TO:

Baroid Drilling Fluids, Inc.

P.O. BOX 1675  
HOUSTON TX 77212

Please quote our invoice number.

SOLD TO  
JOY-CDC DRILLING  
ATTN: M TROJELLO  
760 E EVANS BLVD  
TUCSON

AZ 85710

(SAME AS "SOLD TO" UNLESS OTHERWISE SHOWN)

SHIPPED TO  
JOY-CDC DRILLING

#103-0964-24

Baroid Super #10

| DATE     | INVOICE NUMBER | PAGE |
|----------|----------------|------|
| 01/22/91 | N6273300       | 1    |

CUSTOMER REFERENCE NUMBER

WELL CODE

CUSTOMER NO.

TERMS

SHC

COPIES

ONE

4533020

NET 30 DAYS

1

| PRODUCT NUMBER           | DESCRIPTION | QUANTITY SHIPPED | PRICING QUANTITY | UNIT PRICE | PR UNIT | AMOUNT |
|--------------------------|-------------|------------------|------------------|------------|---------|--------|
| 00410050BAGCC-16         |             | 100              | 100              | 19 52 BAG  |         | 19 52  |
| 02900050BAGYELLOW STARCH |             | 1000             | 1000             | 17 50 BAG  |         | 175 00 |
| ALSO TAXES:              |             |                  |                  |            |         |        |
| TAX OF ARIZONA           |             |                  |                  | 0 000%     |         | 0 73   |
| COUNTY/PARISH OF ILLA    |             |                  |                  | 0 000%     |         | 0 98   |
| TAXABLE                  |             |                  |                  |            |         |        |
| TAX CHARGED              |             |                  |                  |            |         |        |
| NON TAXABLE              |             |                  |                  |            |         |        |

28029  
203  
501  
924

EPB  
B

TOTAL

205 23

Seller represents and warrants that all of the goods or materials herein specified and/or the performance of the services covered by this invoice have been produced and/or furnished in full compliance with the Federal Labor Standards Act of 1938 as amended.

REMITTANCE

# INVOICE



Baroid Drilling Fluids, Inc.  
P.O. Box 1675, Houston, TX 77251  
Phone: (713) 987-5900

PLEASE REMIT TO:

Baroid Drilling Fluids, Inc.

P.O. BOX 100874  
HOUSTON TX 77212

Please quote our invoice number.

SOLD TO: JOY-CCC DRILLING  
ATTN: R. TRUJELLO  
7300 EVANS BLVD  
TUCSON

AZ 85713

(SAME AS "SOLD TO" UNLESS OTHERWISE SHOWN)

SHIP TO: JOY-CCC DRILLING

*1103-0904-24*  
*Baroid Super 10*

| DATE     | INVOICE NUMBER | PAGE |
|----------|----------------|------|
| 01/22/91 | N6273900       | 1    |

CUSTOMER REFERENCE NUMBER

WELL CODE

CUSTOMER NO.

TERMS

SHC

COPIES

ONE

4633020

NET 30 DAYS

1

| PRODUCT NUMBER        | DESCRIPTION | QUANTITY SHIPPED | PRICING QUANTITY | UNIT PRICE | PR UNIT | AMOUNT |
|-----------------------|-------------|------------------|------------------|------------|---------|--------|
| 09170100846500A       | ASH         | 200              | 200              | 21.30      | BAG     | 42.60  |
| SALES TAXES:          |             |                  |                  |            |         |        |
| STATE OF ARIZONA      |             |                  |                  | 5.000%     |         | 2.13   |
| COUNTY/PARISH OF GILA |             |                  |                  | 0.500%     |         | 0.21   |
| TAXABLE               |             |                  |                  |            |         | 2.34   |
| TAX CHARGED           |             |                  |                  |            |         | 0.00   |
| NON TAXABLE           |             |                  |                  |            |         |        |

*28029*  
*70P*  
*501*  
*924*

|       |       |
|-------|-------|
| TOTAL | 44.94 |
|-------|-------|

Seller represents and warrants that all of the goods or materials herein specified and/or the performance of the services covered by this invoice have been produced and/or furnished in full compliance with the Federal Labor Standards Act of 1938 as amended.

REMITTANCE

4





**Baroid Drilling Fluids, Inc.**  
P.O. Box 1675, Houston, TX 77251  
Phone: (713) 987-5900

S  
O L D J O Y - C B C   D R I L L I N G  
D A T T N :   N   T R U J E L L O  
T 7 5 0   E   E V A N S   B L V D  
O T U C S O N

AZ 65713

(SAME AS "SOLD TO" UNLESS OTHERWISE SHOWN)

H  
I  
P JOY-CBC DRILLING

#03-0964-24

Attaced Submarine #10

**PLEASE REMIT TO:**

**Baroid Drilling Fluids, Inc.**

P.O. BOX 106874  
HOUSTON TX 77212

**Please quote our invoice number.**

| DATE     | INVOICE NUMBER | PAGE |
|----------|----------------|------|
| 01/22/91 | N6274000       |      |

| CUSTOMER REFERENCE NUMBER | WELL CODE | CUSTOMER NO. | TERMS       | SHC | COPIES |
|---------------------------|-----------|--------------|-------------|-----|--------|
|                           |           | 4431020      | NET 30 DAYS |     | 1      |

| PRODUCT NUMBER  | DESCRIPTION   | QUANTITY SHIPPED   | PRICING QUANTITY | UNIT PRICE  | PR<br>UNIT | AMOUNT |
|---|---------------|--|------------------|-------------|------------|--------|
| 41P DEC N6274000<br>09 WAREHOUSE<br>1A  |               | SHIP DT 01/17/91<br>FROM GLOBE AZ<br>EST TRM PREPAID/ALLOW |                  |             |            |        |
| 029000508A  | YELLOW STARCH | 1000   | 1000             | 17.50       | BAG        | 175.00 |
| SALES TAXES:  |               |  |                  |             |            |        |
| STATE OF ARIZONA  |               |  |                  | 5.000%      |            | 8.75   |
| COUNTY/PARISH OF GILA   |               |  |                  | 0.500%      |            | 0.88   |
| <div style="text-align: center;"> <p>25029</p> <p>708</p> <p>31</p> <p>924</p> </div> |               |  |                  |             |            |        |
| TAXABLE   |               | TAX CHARGED  |                  | NON TAXABLE |            |        |
| 175.00  |               | 0.88   |                  | 0.00        |            |        |

Seller represents and warrants that all of the goods or materials herein specified and/or the performance of the services covered by this invoice have been produced and/or furnished in full compliance with the Federal Labor Standards Act of 1938 as amended.

|       |     |    |
|-------|-----|----|
| TOTAL | 184 | 63 |
|-------|-----|----|

REMITTANCE

4

EA-0010

| Period             | From    | To      | to<br>be<br>Spent | Year      | should<br>be<br>Spent | amount<br>spent | Spent<br>Actually<br>Spent |
|--------------------|---------|---------|-------------------|-----------|-----------------------|-----------------|----------------------------|
| Amount Fwd<br>Year | —       | —       | —                 | 3-25-1988 | —                     | —               | 3,843,565                  |
|                    | 3-25-88 | 3-25-89 | 50,000            | 1988-1989 | \$975,000             | 22,301          | 3,865,866                  |
|                    | 3-25-89 | 3-25-90 | 50,000            | 1989-1990 | 1,025,000             | 45,593          | 3,911,459                  |
|                    | 3-25-90 | 3-25-91 | 50,000            | 1990-1991 | 1,075,000             |                 |                            |
|                    | 3-25-91 | 3-25-92 | 50,000            | 1991-1992 | 1,125,000             |                 |                            |
|                    | 3-25-92 | 3-25-93 | 50,000            | 1992-1993 | 1,175,000             |                 |                            |
|                    | 3-25-93 | 3-25-94 | 50,000            | 1993-1994 | 1,225,000             |                 |                            |

SUPERIOR EAST  
 EA-0010

A

A-2W  
collar 4340'

S.16°20'E 1155'

Tertiary Dacite  
3010  
Tertiary Earlier Volcanics  
2320  
Tertiary Whitetail Congl.A-14  
collar 4694'

N.16°20'W S.53°57'E 701'

Tertiary Dacite  
3042  
Tertiary Earlier Volcanics  
2405  
Tertiary Whitetail Congl.  
Crossed by fault 2135A-8  
collar 4671'

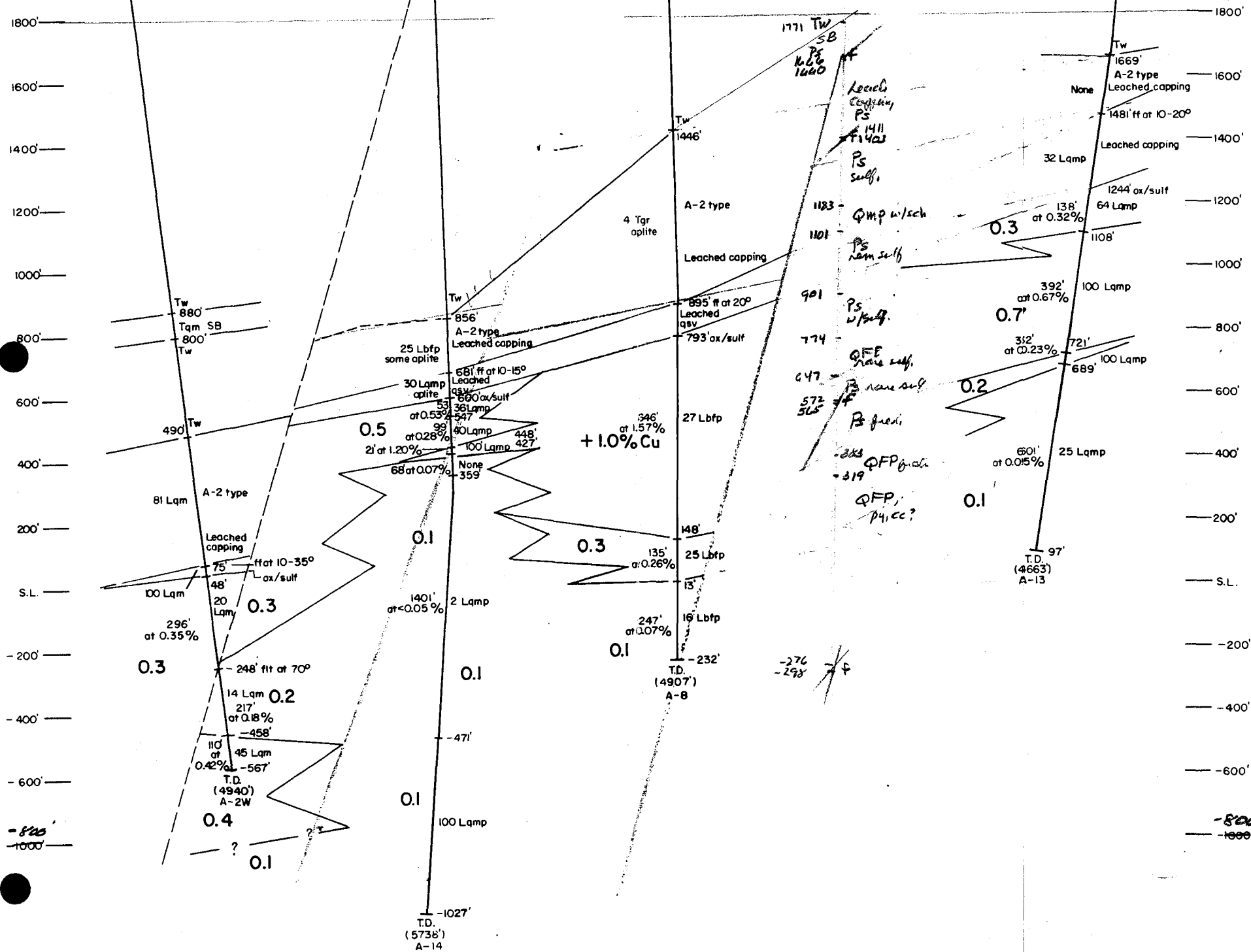
N.53°57'W S.57°30'E

Tertiary Dacite  
3088  
Tertiary Earlier Volcanics  
Crossed by fault 2786  
Tertiary Earlier Volcanics  
2458  
Tertiary Whitetail Congl.

A'

A-13  
collar 4728'

N.57°30'W

Tertiary Dacite  
3148  
Tertiary Earlier Volcanics  
2692  
Tertiary Whitetail Congl.

incomplete:

$$3880 - 4000 = 120' @ \frac{38.94}{120} = 0.32^{45}$$

$$4150 - 4250 = 100' @ \frac{39.94}{100} = 0.3994 = 0.40$$

$$\& \text{ within } 4200 - 4240 = 40' @ \frac{29.36}{40} = 0.73$$

$$3880 - 4200 \quad 320' @ \approx 0.20$$

$$4200 - 4240 \quad 40' @ 0.73$$

$$4470 - 5212 \quad 742' @ < 0.126 \text{ with } 20' \text{ zone } + 0.2 - 0.1$$

NC rods 330  
NA 1000  
BX 732



707 BOYD BOULEVARD / LaPORTE, INDIANA 46350 / PHONE & FAX: (219) 362-2191

April 3, 1991

Mr. Jim Sell  
ASARCO Inc.  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

Nino and I reviewed the drill reports and our notes in preparing this invoice. It contains some "bad rock" and "standby". The BX casing is at the \$6.00 per foot price offered and adjusted for lost.

Please call if there are any questions.

Yours truly,

CBC DRILLING

A handwritten signature in dark ink, appearing to read "J. H. Koontz".

J. H. Koontz  
Vice President &  
General Manager

JHK/ts  
enclosure:

ASARCO Incorporated

APR 5 1991

SW Exploration

**CBC DRILLING**

Formerly Joy Contract Drill Division

707 BOYD BLVD.  
LA PORTE, IN 46350**DUPLICATE**PLEASE REMIT TO  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03964              |                         |                            | 03-0964-24          |

SOLD  
TOATTN: MR. JIM SELL  
ASARCO, INC.  
P.O. BOX 5747  
TUCSON, AZ 85703TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

INVOICE NO. AZ1374

INVOICE DATE 4/3/91

SHIPPED  
TO

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

DATE SHIPPED

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-382-2191

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

For 374.' of drilling near Superior, Arizona for period from 2/26/91 to 3/25/91  
as per agreement.

| (586-1004) HOLE NO. | SIZE | FROM  | TO    | TOTAL FEET | UNIT COST | TOTAL COST |
|---------------------|------|-------|-------|------------|-----------|------------|
| A-16 (90°)          | BX   | 4838. | 5000. | 162.       | 38.70     | 6,269.40   |
|                     | BX   | 5000. | 5119. | 119.       | 45.50     | 5,414.50   |
|                     | BX   | 5119. | 5141. | 22.        | Bad Rock  | -          |
|                     | BX   | 5141. | 5198. | 57.        | 45.50     | 2,593.50   |
|                     | BX   | 5198. | 5212. | 14.        | Bad Rock  | -          |
|                     |      |       |       | 374.       |           | 14,277.40  |

(586-1004) BAD ROCK DRILLING (SEE ATTACHED WORKSHEET)

|      |         |          |                          |          |
|------|---------|----------|--------------------------|----------|
| A-16 | Mar. 11 | 8 Hours  |                          |          |
|      | Mar. 12 | 24 Hours |                          |          |
|      | Mar. 13 | 24 Hours |                          |          |
|      | Mar. 14 | 8 Hours  |                          |          |
|      | Mar. 15 | 8 Hours  |                          |          |
|      | Mar. 18 | 24 Hours |                          |          |
|      | Mar. 19 | 10 Hours |                          |          |
|      | Mar. 20 | 4 Hours  |                          |          |
|      |         |          | 110 Hours @ \$55.00/hour | 6,050.00 |

(586-1007) SETTING AND PULLING CASING

|      |         |          |                         |          |
|------|---------|----------|-------------------------|----------|
| A-16 | Mar. 24 | 13 Hours |                         |          |
|      | Mar. 25 | 24 Hours |                         |          |
|      |         |          | 37 Hours @ \$55.00/hour | 2,035.00 |

FORM  
INV.-89-1F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED  
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE  
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS  
OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).



**CBC DRILLING**

Formerly Joy Contract Drill Division

**DUPLICATE**

SOLD TO ATTN: MR. JIM SELL

ASARCO, INC.

PAGE NO. 2

INVOICE NO.  
AZ1374(586-1009) SURVEY

A-16

Mar. 23 4 Hours  
Mar. 24 6 Hours

10 Hours @ \$55.00/hour

550.00

(586-1009) STANDBY

A-16

Feb. 28 12 Hours (Stop Hole-Shown as Dismantle)  
Mar. 1 6½ Hours (Stop Hole-13 Man Hours)  
Mar. 4 24 Hours (Restart Hole-Shown as Setup)  
Mar. 5 11½ Hours (Restart Hole-Shown as Bit Changed)  
Mar. 23 9 Hours (Includes 4 Other & Dismantle)  
Mar. 24 7 Hours (Shown as 8 Other)

70 Hours @ \$50.00/hour

3,500.00

(587-1101) MUD AND ADDITIVES2 50# Mudgel @ \$5.67 each 11.34  
3 Dextrid @ \$87.19 each 261.57  
1 Soda Ash @ \$26.84 each 26.84  
9 Starch @ \$22.05 each 198.45  
3 5 Gallon EZ Mud @ \$131.04 each 393.12  
2 Torq Trim @ \$121.11 each 242.22

1,133.54

(586-1008) WATER HAUL

February 26 through March 25

1 Truck @ \$600.00/month 600.00  
22 Miles @ \$.75/mile 16.50

616.50

(587-1104) CORE BOXES

6 Boxes @ \$2.50 each

15.00

(586-1009) PER DIEMSellars 21 Days  
Taylor 20 Days  
McConnell 17 Days  
Vanover 17 Days  
Johnson 19 Days  
Figueroa 19 Days

113 Days @ \$15.00/day

1,695.00

# CBC DRILLING

Formerly Joy Contract Drill Division

ADDITIONAL

SOLD TO ATTN: MR. JIM SELL

ASARCO, INC.

PAGE NO. 3

INVOICE NO. AZ1374

(587-1103) CASING MATERIAL

732' BX Casing @ \$6.00/foot  
LESS 30% LOST:

4,392.00  
(1,317.60)

3,074.40

TOTAL INVOICE: \$32,946.84



# BAD ROCK WORK SHEET

BAD ROCK RATE ( ) = \_\_\_\_\_ = \_\_\_\_\_

CONTRACT ASARCO SUPERIOR #10

DATE 4/2/91

BY JC 10052

| DATE | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK | DATE | DRILL HOURS | FEET DRILLED | 8 HR. PEN. RATE | BAD ROCK RATE | OTHER HOURS PAID | BAD ROCK |
|------|-------------|--------------|-----------------|---------------|------------------|----------|------|-------------|--------------|-----------------|---------------|------------------|----------|
| 2/26 | 8           | 15           | 15.0            | 11.4          |                  |          | 3/5  | 7           | 15           | 15.0            | 9.7           |                  |          |
|      | 8           | 15           | 15.0            |               |                  |          |      | 8           | 14           | 14.0            |               |                  |          |
|      | 8           | 19           | 19.0            |               |                  |          |      | 8           | 0            | 0.0             |               |                  |          |
| 2/27 | 8           | 15           | 15.0            |               |                  |          | 3/8  | 8           | 0            | 0.0             |               |                  |          |
|      | 8           | 5            | 5.0             |               |                  |          |      | 8           | 0            | 0.0             |               |                  |          |
|      | 8           | 12           | 12.0            |               |                  |          |      | 8           | 7            | 7.0             |               |                  |          |
| 2/28 | 8           | 14           | 14.0            |               |                  |          | 3/9  | 8           | 7            | 7.0             |               |                  |          |
|      | 4           | 2            | 4.0             |               | 4                |          |      | 2           | 0            | 0.0             |               |                  |          |
|      |             |              |                 |               | 8                |          | 3/20 | 4           | 0            | 0.0             |               |                  |          |
| 3/1  |             |              |                 |               | 6 1/2            |          |      |             |              |                 |               |                  |          |
| 3/4  |             |              |                 |               | 8                |          |      |             |              |                 |               |                  |          |
|      |             |              |                 |               | 8                |          |      |             |              |                 |               |                  |          |
|      |             |              |                 |               | 8                |          |      |             |              |                 |               |                  |          |
| 3/5  |             |              |                 |               | 8                |          |      |             |              |                 |               |                  |          |
|      | 4 1/2       | 7            | 12.4            |               | 3 1/2            |          |      |             |              |                 |               |                  |          |
|      | 8           | 15           | 15.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 3/6  | 8           | 14           | 14.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 10           | 10.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 4            | 4.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 3/7  | 8           | 9            | 9.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 12           | 12.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 14           | 14.0            | 9.7           |                  |          |      |             |              |                 |               |                  |          |
| 3/8  | 8           | 21           | 21.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 9            | 9.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 12           | 12.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 3/9  | 8           | 12           | 12.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 16           | 16.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 10           | 10.0            |               |                  |          |      |             |              |                 |               |                  |          |
| 3/11 | 8           | 8            | 8.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 11           | 11.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 6           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 3/12 | 5           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 9            | 9.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 5            | 5.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 3/13 | 8           | 3            | 3.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 1            | 1.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 0            | 0.0             |               |                  |          |      |             |              |                 |               |                  |          |
| 3/14 | 8           | 5            | 5.0             |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 13           | 13.0            |               |                  |          |      |             |              |                 |               |                  |          |
|      | 8           | 15           | 15.0            |               |                  |          |      |             |              |                 |               |                  |          |

INVOICE  
JAL 4/2/91

# Invoice



Baroid Drilling Fluids, Inc.  
P.O. Box 1675, Houston, TX 77251  
Phone: (713) 987-5900

SOLD TO  
CBC DRILLING  
ATTN: N TRUJELLO  
750 E EVANS BLVD  
TUCSON AZ 85713

PLEASE REMIT TO:  
Baroid Drilling Fluids, Inc.

P.O. BOX 100874  
HOUSTON TX 77212

Please quote our invoice number.

(SAME AS "SOLD TO" UNLESS OTHERWISE SHOWN)

SHIP TO  
CBC DRILLING  
#03-0964-24  
United Superior #10

| DATE     | INVOICE NUMBER | PAGE |
|----------|----------------|------|
| 02/18/91 | N6274800       | 1    |

| CUSTOMER REFERENCE NUMBER |               | WELL CODE              | CUSTOMER NO.     | TERMS       | SHC     | COPIES |
|---------------------------|---------------|------------------------|------------------|-------------|---------|--------|
| NONE                      |               |                        | 4533020          | NET 30 DAYS |         | 1      |
| PRODUCT NUMBER            | DESCRIPTION   | QUANTITY SHIPPED       | PRICING QUANTITY | UNIT PRICE  | PR UNIT | AMOUNT |
| SHIP DOC N6274800         |               | SHIP DT 01/31/91       |                  |             |         |        |
| FCS WAREHOUSE             |               | FROM GLOBE AZ          |                  |             |         |        |
| VIA                       |               | FRT TRM COLLECT/CHARGE |                  |             |         |        |
| 002900050BAG              | YELLOW STARCH | 1000                   | 1000             | 17.50       | BAG     | 175.00 |
| 001770005CAN              | 2 MUD         | 400                    | 400              | 104.00      | CAN     | 416.00 |
| 004170100BAG              | SODA ASH      | 200                    | 200              | 21.30       | BAG     | 42.60  |
| SALES TAXES:              |               |                        |                  |             |         |        |
| STATE OF ARIZONA          |               |                        |                  | 5.000%      |         | 31.68  |
| COUNTY/PARISH OF GILA     |               |                        |                  | 0.500%      |         | 3.17   |
| TAXABLE                   |               | TAX CHARGED            | NON TAXABLE      |             |         |        |
| 633.60                    |               | 34.85                  | 0.00             |             |         |        |

Seller represents and warrants that all of the goods or materials herein specified and/or the performance of the services covered by this invoice have been produced and/or furnished in full compliance with the Federal Labor Standards Act of 1938 as amended.

TOTAL

REMITTANCE

4

# Invoice



Baroid Drilling Fluids, Inc.  
P.O. Box 1675, Houston, TX 77251  
Phone: (713) 987-5900

PLEASE REMIT TO:

Baroid Drilling Fluids, Inc.

P.O. Box 100874  
HOUSTON TX 77212

Please quote our invoice number.

SOLD TO  
CBC DRILLING  
ATTN: N TRUJELLO  
750 E EVANS BLVD  
TUCSON

AZ 85713

(SAME AS "SOLD TO" UNLESS OTHERWISE SHOWN)

SHIP TO  
CBC DRILLING

#03-0964-24  
Marco Superior #10

| DATE     | INVOICE NUMBER | PAGE |
|----------|----------------|------|
| 03/08/91 | N6275300       | 1    |

| CUSTOMER REFERENCE NUMBER |               | WELL CODE             | CUSTOMER NO.     | TERMS       | SHC     | COPIES |
|---------------------------|---------------|-----------------------|------------------|-------------|---------|--------|
|                           |               |                       | 4533020          | NET 30 DAYS |         | 1      |
| PRODUCT NUMBER            | DESCRIPTION   | QUANTITY SHIPPED      | PRICING QUANTITY | UNIT PRICE  | PR UNIT | AMOUNT |
| SHIP DOC N6275300         |               | SHIP DT 02/26/91      |                  |             |         |        |
| DOC WAREHOUSE             |               | FROM GLOBE AZ         |                  |             |         |        |
| VIA                       |               | FRT TRM PREPAID/ALLOW |                  |             |         |        |
| 002900050BAG              | YELLOW STARCH | 600                   | 600              | 17 50       | BAG     | 105 00 |
| 001400005CAN              | CONDDET       | 100                   | 100              | 38 00       | CAN     | 38 00  |
| 004170100BAG              | SODA ASH      | 100                   | 100              | 21 30       | BAG     | 21 30  |
| 001770005CAN              | E 2 MUD       | 400                   | 400              | 104 00      | CAN     | 416 00 |
| SALES TAXES:              |               |                       |                  |             |         |        |
| STATE OF ARIZONA          |               |                       |                  | 5 000%      |         | 29 02  |
| COUNTY/PARISH OF GILA     |               |                       |                  | 0 500%      |         | 2 91   |
| TAXABLE                   |               | TAX CHARGED           | NON TAXABLE      |             |         |        |
|                           |               | 31.03                 | 0.00             |             |         |        |

*copy to SB*

Seller represents and warrants that all of the goods or materials herein specified and/or the performance of the services covered by this invoice have been produced and/or furnished in full compliance with the Federal Labor Standards Act of 1938 as amended.

TOTAL 612 23

4

REMITTANCE

April 8, 1991

J.D. Sell

Abandoned Casing in Hole A-16  
Superior East, EA-0010  
Pinal County, Arizona

Casing left in hole A-16 is at the following depths:

| <u>Beginning<br/>depth (ft.)</u> | <u>Ending<br/>depth (ft.)</u> | <u>Length of Casing<br/>left in place (ft.)</u> | <u>Type</u> |
|----------------------------------|-------------------------------|---|-------------|
| 1670                             | 2000                          | 330   | NC rods     |
| 2000                             | 3000                          | 1000  | NX casing   |
| 3813                             | 4545                          | 732   | BX casing   |

JJM:mek

  
J.J. Malusa



JDS



707 BOYD BOULEVARD / LaPORTE, INDIANA 46350 / PHONE & FAX: (219) 362-2191

April 12, 1991

ASARCO Incorporated

APR 15 1991

SW Exploration

Mr. Jim Sell  
ASARCO Inc.  
P.O. Box 5747  
Tucson, AZ 85703

Dear Jim:

Attached is the final invoice for Hole A-16 at Superior.  
The following notes may help in reviewing the invoice:

1. The time spent recovering the BXWL rods on March 30 and March 31 is not invoiced.
2. The base price of the NX casing from 2000'-3000' is reduced from \$10.00/foot to \$8.00/foot similar to what we did with the BX casing.
3. Some of the casing recovery effort was done with a three man crew with the third man invoiced as extra labor.

Should there be any questions I'll be in Tucson with Nino next week from April 17 through April 19.

Yours truly,

CBC DRILLING

J. H. Koontz  
Vice President &  
General Manager

JHK/ts

ASARCO Incorporated

**CBC DRILLING**

Formerly Joy Contract Drill Division

**ORIGINAL****APR 15 1991**

SW Expiration

707 BOYD BLVD.  
LA PORTE, IN 46350**PLEASE REMIT TO**  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

| CBC Account Number | Customer's Order Number | Customer's Contract Number | CBC Contract Number |
|--------------------|-------------------------|----------------------------|---------------------|
| 03964              |                         |                            | 03-0964-24          |

SOLD  
TOATTN: MR. JIM SELL  
ASARCO INC.  
P.O. BOX 5747  
TUCSON, AZ 85703TERMS NET 30 DAYS  
NO CASH DISCOUNT  
PAST DUE ACCTS. SUBJECT  
TO 18% PER ANNUM

INVOICE NO. AZ1378

INVOICE DATE 4/12/91

SHIPPED  
TO

SUPERIOR, ARIZONA

PLEASE REMIT TO  
CBC DRILLING  
P.O. BOX 30777  
SALT LAKE CITY, UTAH 84130

DATE SHIPPED

ANY QUESTIONS ON INVOICE  
PLEASE CALL 219-362-2191

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

For work near Superior, Arizona for period from 3/26/91 to 4/5/91 as per agreement

(586-1007) SETTING AND PULLING CASING

|      |         |                         |          |
|------|---------|-------------------------|----------|
| A-16 | Mar. 26 | 8 Hours                 |          |
|      | Mar. 27 | 8 Hours                 |          |
|      | Mar. 29 | 4 Hours                 |          |
|      | Apr. 1  | 16 Hours                |          |
|      | Apr. 2  | 16 Hours                |          |
|      | Apr. 3  | 16 Hours                |          |
|      |         | 68 Hours @ \$55.00/hour | 3,740.00 |

(586-1007) EXTRA LABOR SETTING CASING (THIRD MAN ON CREW)

|      |         |                                 |        |
|------|---------|---------------------------------|--------|
| A-16 | Mar. 29 | 4 Hours (Day Shift)             |        |
|      | Apr. 1  | 8 Hours (Night Shift)           |        |
|      | Apr. 2  | 16 Hours (Both Shifts)          |        |
|      | Apr. 3  | 8 Hours (Night Shift)           |        |
|      |         | 36 Man Hours @ \$25.00/man hour | 900.00 |

(586-1007) HOLE CLOSURE

|      |        |                         |       |
|------|--------|-------------------------|-------|
| A-16 | Apr. 5 | 1 Hour (Cement Top 20') |       |
|      |        | @ \$55.00/hour          | 55.00 |

FORM  
INV.-89-1

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED  
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE  
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS  
OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(a).

APR 15 1991

## CBC DRILLING

Formerly Joy Contract Drill Division

ORIGINAL

SW EXPLORATION

SOLD TO ATTN: MR. JIM SELL ASARCO INC.

PAGE NO. 2

INVOICE NO. AZ1378

(586-1008) WATER HAUL

March 26 through April 5

|                                |             |
|--------------------------------|-------------|
| 1 Truck @ \$600.00/month(8/30) | 160.00      |
| 2 Miles @ \$.75/mile           | <u>1.50</u> |

161.50

(587-1102) CEMENT

3 Sacks @ \$6.41 each

19.23

(586-1009) PER DIEM

APPROVED FOR PAYMENT

By: signed 4/15/  
((Signature),

|           |               |
|-----------|---------------|
| Sellars   | 11 Days       |
| Taylor    | 11 Days       |
| Johnson   | 9 Days        |
| Figueroa  | 8 Days        |
| McConnell | 8 Days        |
| Vanover   | <u>8 Days</u> |

55 Days @ \$15.00/day

825.00

(586-1005) TRUCK TRIPS TO RETURN NX & BX RODS & CASING TO TUCSON

|         |               |               |
|---------|---------------|---------------|
| Mar. 26 | Johnson       | 1 Trip        |
|         | Vanover       |               |
|         | (Tucson Shop) | 1 Trip        |
| Mar. 30 | Sellars       | 1 Trip        |
| Apr. 1  | Johnson       | <u>1 Trip</u> |

4 Trips @ \$150.00/trip

600.00

(587-1104) EXCESS BIT COST

Bit Cost did not exceed \$2.50/foot

-

(587-1105) CASING MATERIAL

|                               |                 |
|-------------------------------|-----------------|
| 1000' NX Casing @ \$8.00/foot | 8000.00         |
| Less 30% Lost:                | (2400.00)       |
| 330' NX Casing @ \$10.00/foot | 3300.00         |
| Less 30% Lost:                | <u>(990.00)</u> |

7,910.00

(586-1005) DEMOBILIZATION

Rig 9152

900.00

TOTAL INVOICE:

\$15,110.73

NOTE: Hole Log for Hole A-16 was sent directly to the Arizona DWR (copy attached).



ASARCO

APR 15 1991

SW

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue  
Phoenix, Arizona 85007

DUPLICATE

WELL ABANDONMENT COMPLETION REPORT

A.R.S. §45-594; R12-15-816: The owner or operator of the well shall notify the Department, in writing, no later than thirty days after the abandonment has been completed.

1. Well Registration No.: 55- 528454
2. Well location: 1S N/S 13E E/W 23 SW SW SW  
Township Range Section 1/4 1/4 1/4
3. Owner of the land: Name ASARCO INC.  
P.O. BOX 5747 TUCSON AZ 85703  
Address City State Zip
4. Well Description: 5212' | 2 3/8" | 4" T&C Pipe Hole A-16  
Hole Depth Diameter Type of Casing
5. Reason for abandonment: MINERAL EXPLORATION HOLE COMPLETED
6. Prior to abandonment, did the well have 20' of steel surface casing AND 20' of grout in the annular space surrounding the surface casing?  
Yes X No
7. If the answer to No. 6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes        No X
8. Identify the materials and methods used to abandon the well:  
THE HOLE WAS FILLED WITH HEAVY MUD AND THE TOP 20' WAS  
CEMENTED.
9. How deep does the cement plug extend below land surface? 0'-20'
10. Was the well backfilled above the cement plug? Yes        No X
11. Date abandonment completed: 4/5/91
12. Drilling firm:  
Firm Name: CBC DRILLING DWR License No. 75  
Address: 750 E. EVANS BLVD. City TUCSON State AZ Zip 85713

DATE: 4/12/91

SIGNATURE OF WELL DRILLER

J. H. KOONTZ

DWR 55-58-7/90

# ASARCO

JDS

Exploration Department  
Southwestern United States Division  
James D. Sell  
Manager

June 11, 1991

Mr. Tom McGarvin  
Arizona Geological Survey  
845 N. Park Avenue, Suite 100  
Tucson, AZ 85719

Superior Area Core  
Pinal County, AZ

Dear Tom:

In response to your question about core from drill holes A-13, AI-2, and DC-2, which was given to you by Dr. D.W. Peterson, and/or Dr. Daniel D. Evans, I send an amended letter similar to one sent on May 15, 1986 to Dr. Daniel D. Evans, Dept. of Hydrology & Water Resources.

Our records show that the following core was turned over to Dr. D.W. Peterson of the USGS. All core is of the NC core size (2½" diameter) and is in boxes 15" wide by 25" long x 3" high. Each box weighs 60-80 pounds. All boxes originally had wooden core blocks with the footage depth indicated.

The core is placed in the box from front face left corner and ends at the back end right corner. "Front" being the imprinted information. Thus, when the boxes are laid out left to right, and one walks backward along the front of the boxes, the core can be scanned in the same manner as reading this page of text. The box numbers and footage should run consecutively from start to final depth interval. Some pieces have been removed for skeleton collections by Asarco.

The three holes should have different Project names as well as numbers.

Hole A-13, Surface to 1610' depth

Location: SW 1/4 SW 1/4 SE 1/4 SW 1/4, Sec. 23, T1S, R13E  
Collar start dated: March 6, 1980  
Collar elevation: 4728'  
Approximately 180 boxes

The face of the A-13 boxes should read:

|                           |                      |
|---------------------------|----------------------|
| Project <u>SE</u>         | Hole No. <u>A-13</u> |
| From <u>X</u> to <u>Y</u> | Box No. <u>Z</u>     |

Hole AI-2, Surface to 1497' depth

Location: NW 1/4 SE 1/4 SW 1/4 SE 1/4, Sec. 23, T1S, R13E

Collar start date: March 28, 1980

Collar elevation: 4715'

Approximately 165 boxes

The face of AI-2 boxes should read:

|                               |                      |
|-------------------------------|----------------------|
| Project <u>Rawhide</u>        | Hole No. <u>AI-2</u> |
| From Box <u>X</u> to <u>Y</u> | Box No. <u>Z</u>     |

Core from hole DC-2 may have been sent from Asarco as we have skeleton core from the hole. However, the hole was drilled by Quintana Minerals, and may have been disposed of by them.

Hole DC-2, from 1138' to 1889' depth

Location: SE 1/4 NW 1/4 NE 1/4 SW 1/4, Sec. 7, T2S, R14E

Collar start date: Probably in 1976 or 1977

Collar elevation: ±3275'

Approximately 90 boxes

The face of the DC-2 boxes should read:

|                                 |                      |
|---------------------------------|----------------------|
| Project <u>DC or Devils Cny</u> | Hole No. <u>DC-2</u> |
| From <u>X</u> to <u>Y</u>       | Box No. <u>Z</u>     |



Mr. Tom McGarvin

June 11, 1991  
Page 3

All core should be from the Apache Leap dacite sheet located east and southeast of Superior, Arizona.

I'm pleased to see that the AGS will be collecting core and other material as a depository for future study.

Sincerely,

  
James D. Sell

JDS:mek

cc: W.L. Kurtz

# ASARCO

JDS

Exploration Department  
Southwestern United States Division

James D. Sell  
Manager

May 15, 1986

Dr. Daniel D. Evans  
Dept. of Hydrology and Water Resources  
The University of Arizona  
Tucson, Arizona 85721

Apache Leap Core  
East of Superior  
Pinal County, Arizona

Dear Dr. Evans:

In answer to your inquiry by phone on May 14, 1986, our records show that the following core was turned over to Dr. D.W. Peterson of the U.S.G.S. All core is of the NC core size (2½" diameter) and in boxes 15" wide by 25" long x 3" high. Each box weights 60-80 pounds. All boxes originally had wooden core blocks with the footage depth interval indicated.

The core is placed in the box to start from front face left corner and ends at the back end right corner. "Front" being the imprinted information. Thus, when the boxes are laid out left to right, and one walks backward along the front of the boxes, the core can be scanned in the same manner as reading this page of text. The box numbers and footage should run consecutively from surface to final depth interval.

Hole A-13, Surface to 1610' depth.

Approximately 180 boxes.

Location: SE¼ SW¼, Sec. 23, T1S, R13E.

The faces of the A-13 boxes should read:

SW¼ SW¼ SE¼ SW¼  
Started March 6, 1980  
Collar Elev. 4728'

|         |    |          |      |
|---------|----|----------|------|
| Project | SE | Hole No. | A-13 |
| From    | X  | to       | Y    |
|         |    | Box No.  | Z    |

Dr. Daniel D. Evans

May 15, 1986

Page 2

Hole AI-2, Surface to 1497' depth.

Approximately 165 boxes

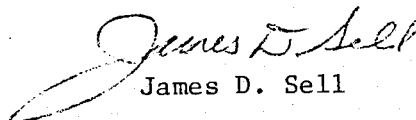
Location: SW $\frac{1}{4}$  SE $\frac{1}{4}$ , Sec. 23, T1S, R13E

The face of the AI-2 boxes should read:

NW $\frac{1}{4}$  SE $\frac{1}{4}$  SW $\frac{1}{4}$  SE $\frac{1}{4}$   
Started March 28, 1980  
Collar Elev. 4715'

|                           |                      |
|---------------------------|----------------------|
| Project Rawhide           | Hole No. <u>AI-2</u> |
| From <u>X</u> to <u>Y</u> | Box No. <u>Z</u>     |

Sincerely,

  
James D. Sell

JDS:mek

cc: W. L. Kurtz  
Dr. Donald W. Peterson, U.S.G.S.  
Volcanological Survey of Indonesia  
Jalan Diponegoro 57  
Bandung 40122, Indonesia

Volcanological Survey of Indonesia  
Jalan Diponegoro 57  
Bandung 40122, Indonesia  
April 27, 1986

Dr. Daniel D. Evans  
Department of Hydrology and Water Resources  
The University of Arizona  
Tucson, Arizona 85721, U.S.A.

Dear Dr. Evans:

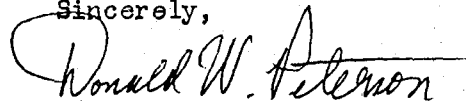
Thanks for your letter of April 8 inquiring about the drill core samples of Apache Leap Tuff. I will be happy to give you my permission to look at the core and take samples in the manner you propose, but with the condition that you also obtain the concurrence of Asarco. It was they who drilled the holes and through their courtesy that James D. Sell, project geologist, was able to turn the core over to me. Hence I intend to clear my future work on the core, particularly anything done for publication, through them. So I think it appropriate that they give their OK to your work on their core. If you desire to know the location of the drillholes, Asarco would also be the proper source for this information. I am sending a copy of this letter to Jim Sell at Asarco--of course, it may have been through him that you were able to trace me down, and that you've already received their concurrence.

The core is stored at the Magnetic Observatory, now operated by the USGS, near the eastern edge of Tucson. I don't have the address or phone here, but you likely know the place. At the time I was given the core, Leo Davis was the man in charge of the observatory. He was willing to have it stored in an unused building on the observatory grounds. Before I had a chance to work on it, Mount St. Helens took control of my activities, and subsequently the core has been collecting scorpions and black widows. I seem to remember hearing that Leo is no longer at the observatory, and I don't know who is presently in charge. However, I will assume that a copy of this letter that you present will be sufficient for you to gain access to the core.

A year or two ago, I received a call from Linda Like, the Administrative Officer with the USGS in Menlo Park, that the old building at the observatory was falling apart. What would I like done with the core when the building was demolished? I related that one of my first ambitions when I return to work in Arizona is to systematically study the core, so I requested that they please erect a temporary structure for storing it. I suspect by this time that the individual core boxes have been thoroughly shuffled during the multiple handling that they have received, though I hope that the labels and footage markers within each box are still intact. I have been anticipating quite a challenge when I tackle this task, so you will inadvertently be running interference for me as you attempt to find some order in what is likely to be a chaotic situation. I'll greatly appreciate hearing about how you make out with this quest, and also I'll appreciate receiving whatever information you are free to give me on the results of your project.

As you have already learned, I expect to be returning to Vancouver in July, and I have hopes for a fall field season in Arizona. Checking on this core is one of my objectives. Good luck as you take on this task, and be careful of the arthropods!

Sincerely,



Donald W. Peterson  
Geologist

Alternate address:  
American Embassy  
Box 1 (ECON)  
APO San Francisco 96356-0006



THE UNIVERSITY OF ARIZONA  
TUCSON, ARIZONA 85721

COLLEGE OF ENGINEERING

DEPARTMENT OF HYDROLOGY AND WATER RESOURCES  
TEL. (602) 621-3131

April 8, 1986

Dr. Don Peterson  
% American Embassy  
Box 1 ECON APO  
San Francisco, CA 96356-0006

Dear Dr. Peterson:

For the last four years, we have had a project funded by the Nuclear Regulatory Commission examining flow and transport through unsaturated, fractured rock. The study is related to the possible disposal of high level radioactive waste is such a medium, especially a welded tuff at the Nevada Test Site. NRC does not allow us to work at the NTS, so we are using the Apache Leap tuff near Superior. We have made field studies in the haulage tunnel, the old highway tunnel, and in boreholes near the number 9 shaft.

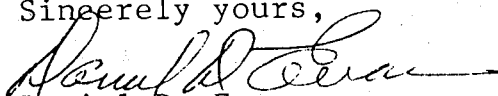
Your dissertation and papers have been of great assistance. They gave us a good starting base.

We would like to do additional geochemical studies of the tuff from different depths. Magma Copper gave us some rock matrix samples, collected when no. 9 shaft was dug. We understand that you have some cores stored with USGS which came from boreholes close to the shaft. With your permission, we would like to have a look at them and perhaps take a few samples for analysis. The samples would be of fracture fillings and of the rock matrix close to the sampled fillings. The samples would be small and taken from about 10 depths. We would note specifically what and where samples were removed.

I understand you will not be back to the States until July. As usual, we would like to proceed as rapidly as possible so we would appreciate a response as early as possible.

I hope all is going well for you at your present location.

Sincerely yours,

  
Daniel D. Evans  
Professor

Beach Canyon Pits (Quaternary)

DC-2

Core started @ 577'

prod. 1976-77

Gulu Cof <sup>577-</sup> 1030

collen = 3275'

Td 1030 - 1902

1138

1889

SE 1/4 NW 1/4 NE 1/4 SW 1/4 Sec. 7 T2S. R14E



845 N Park Ave Suite 100  
85719

|   |   |
|---|---|
| To <u>JDS</u>   |   |
| Date <u>6/3</u>   | Time <u>2:03</u> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM |
| <b>WHILE YOU WERE OUT</b>   |   |
| M <u>Tom McGowan</u>  |   |
| of <u>AZ Geological Survey</u>  |   |
| Phone ( ) <u>882-4795</u>   |   |
| Area Code   | Number Extension  |
| TELEPHONED <input checked="" type="checkbox"/>                                      | PLEASE CALL <input checked="" type="checkbox"/>                                     |
| CALLED TO SEE YOU <input type="checkbox"/>  | WILL CALL AGAIN <input type="checkbox"/>  |
| WANTS TO SEE YOU <input type="checkbox"/>   | URGENT <input type="checkbox"/>   |
| RETURNED YOUR CALL <input type="checkbox"/>   |   |
| Message <u>Re some Superior</u><br><u>core - he has some</u><br><u>questions on</u> |   |
| <u>Mary</u><br>Operator   |   |



over

REORDER  
#23-000

# ASARCO

Exploration Department  
Southwestern United States Division

July 10, 1991

State of Arizona  
Dept. of Water Resources  
15 South 15th Avenue  
Phoenix, Arizona 85007

*Superior East*  
*A-16*

Exploration Drill Hole  
55-528454

Gentlemen:

Enclosed is a Project Completion Report for Drill Hole 55-528454 as requested in your letter to us dated July 2, 1991.

Very truly yours,

WDG:mek  
Enc.

*William D. Gay*  
William D. Gay  
Land Engineer, SWED

cc: J.D. Sell

DEPARTMENT OF WATER RESOURCES  
15 SOUTH 15TH AVENUE  
PHOENIX, ARIZONA 85007

PROJECT COMPLETION REPORT FOR EXPLORATION DRILLING

This report must be prepared by the owner in all detail and filed with the Department within 30 days following completion of the well drilling project.

1. Owner: ASARCO Incorporated
- | Address:           |  | Name | City   | State   | Zip   |
|--------------------|--|------|--------|---------|-------|
| 1150 N. 7th Avenue |  |      | Tucson | Arizona | 85703 |
| Street             |  |      | City   | State   | Zip   |
2. Lessee or Operator: N/A
- | Address: |  | Name | City | State | Zip |
|----------|--|------|------|-------|-----|
|          |  |      |      |       |     |
| Street   |  |      | City | State | Zip |
3. Driller: CBC Drilling
- | Address:           |  | Name | City   | State   | Zip   |
|--------------------|--|------|--------|---------|-------|
| 750 E. Evans Blvd. |  |      | Tucson | Arizona | 85713 |
| Street             |  |      | City   | State   | Zip   |
4. Location: 1S | 13E | 23 | SW | SW | SW | WELL REGISTRATION NO. 55-528454
- | Township | Range | Section | Quarter | Quarter | Quarter | WELL REGISTRATION NO. |
|----------|-------|---------|---------|---------|---------|-----------------------|
| 1S       | 13E   | 23      | SW      | SW      | SW      | 55-528454             |
- (A REQUIREMENT)

DESCRIPTION OF WELL

5. Type of Casing (if installed): 4" T&C Pipe
6. Abandonment method and material used if abandoned: Hole was filled with heavy mud and the top 20 ft. was cemented.
7. Construction details if completed for monitoring purposes, re-entry or conversion to water wells: N/A
8. Date or period drilled: Started 6/23/87, Completed 4/5/91

LOG OF WELL

- ☐ Unconsolidated Formation
- ☒ Consolidated Formation
- Depth to water in feet below land surface: Unknown  
(if encountered or detected)

|                                   |          |
|-----------------------------------|----------|
| DO NOT WRITE IN THIS SPACE        |          |
| OFFICE RECORD                     |          |
| Registration No. <u>55-528454</u> |          |
| Received _____                    | By _____ |
| Entered _____                     | By _____ |
| File No. <u>D(1-13)23ccc</u>      |          |

I state that this report is filed in compliance with A.R.S. § 45-600 and is complete and correct to the best of my knowledge and belief.

W. H. Day | 7/10/91  
Owner's Signature | Date

# Arizona State University

*Superior East*

Department of Zoology  
Tempe, Arizona 85287-1501  
602/965-3571

ASARCO

AUG 16 1991

Mr. William Gay  
Exploration Division  
ASARCO Incorporated  
P.O. Box 5747  
Tucson Az 85703

SW Exploration

13 August 1991

Dear Mr. Gay;

Per our phone conversation of August 13, 1991, I would like to reiterate that the mining claim KAY 14 east of Superior, Arizona, Pinal County lies within our long-term biological research site. I and my students have been studying the dynamics of insect populations on Emory oak trees in this area for the past ten years. My research is funded by the National Science Foundation and permission to conduct research has been granted by Larry Widner, District Ranger of the US Forest Service.

This study site is invaluable for our present and future research. I appreciate your understanding and cooperation in minimizing disturbance through mining activities. I also understand your company's mining claims to this area and hope we can work together for a mutually beneficial solution. I respectfully request that you contact me before annual drilling so that a site can be chosen that will not disturb our study trees. I would appreciate as much advance notice as possible should your company decide to develop this site beyond a drill hole.

Again, I thank you for your assistance in this matter. If you have any questions, feel free to call or write.

Sincerely,

*Stan Faeth*

Stanley H. Faeth, Professor of Zoology  
(Phone - 602-965-4120)

# ASARCO

JDS  
Southwestern Exploration Division

October 9, 1991

W.L. Kurtz

Underlying Royalty  
Superior East  
Pinal County, AZ

Mr. Jay E. Fuller, Tucson, 602/325-1505 called on 10-8-91 to inquire if Asarco wished to buy out his share of the royalty on the Margaret claims, Superior East. He mentioned that others in Salt Lake City might also be ready for a buy out.

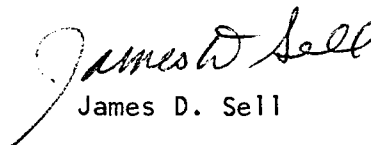
Article 12(c)(2) "All royalties payable to any third party" which apparently refers to CanUS, Ltd., a Colorado Limited Partnership, c/o Kirby C. Coryell. Although Jay did not mention CanUS, I would believe he may be a part of that partnership.

Exhibit A-1, Article 4, Royalty puts \$20 million as the payment cap, while Article 5 says a 3% net smelter return as the royalty amount.

I asked Jay what his share was and he said he didn't have the papers in front of him, but he thought it was around one quarter of the total royalty.

Is Asarco interested in buy out of any of the royalty at this time?

JDS:mek

  
James D. Sell

**ASARCO**

FTG/RLB — }

JDS

Southwestern Exploration Division

October 9, 1991

~~W.L. Kurtz~~

Underlying Royalty  
Superior East  
Pinal County, AZ

Mr. Jay E. Fuller, Tucson, 602/325-1505 called on 10-8-91 to inquire if Asarco wished to buy out his share of the royalty on the Margaret claims, Superior East. He mentioned that others in Salt Lake City might also be ready for a buy out.

Article 12(c)(2) "All royalties payable to any third party" which apparently refers to CanUS, Ltd., a Colorado Limited Partnership, c/o Kirby C. Coryell. Although Jay did not mention CanUS, I would believe he may be a part of that partnership.

Exhibit A-1, Article 4, Royalty puts \$20 million as the payment cap, while Article 5 says a 3% net smelter return as the royalty amount.

I asked Jay what his share was and he said he didn't have the papers in front of him, but he thought it was around one quarter of the total royalty.

Is Asarco interested in buy out of any of the royalty at this time?

JDS:mek

*James D. Sell*  
James D. Sell

**ASARCO**

Southwestern Exploration Division

October 30, 1991

File Note

Underlying Royalty  
Superior East  
Pinal County, AZ

In regard to my memo to W.L. Kurtz of October 9, 1991, on the subject, the New York Office has telephoned to say that they will not consider a buy-out of the royalty at this time.

I will call Mr. Jay E. Fuller.

325-1505 done 11/4/91

JDS:mek

*James D. Sell /mek*

James D. Sell

cc: W.L. Kurtz



# ASARCO

Exploration Department  
Southwestern United States Division

January 22, 1992

Mr. B. M. Apker  
Apker, Apker, Haggard & Kurtz, P.C.  
P.O. Box 10280  
Phoenix, AZ 85064-0280

Gila River Adjudication


Dear Mr. Apker:

Enclosed are the documents pertaining to our JI Ranch that you requested today.

Please call if you need additional information.

Sincerely,

WDG:mek  
Encs.

  
William D. Gay  
Land Engineer, SWED

cc: W.L. Kurtz  
J.D. Sell

JDS

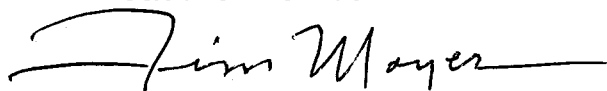
James D. Sell  
Southwest Exploration Division  
ASARCO Incorporated  
1150 North 7th Avenue  
Tucson, AZ 85703

9 April 1992

Corehole reports, Apache Leap.

With apologies for the long delay we are forwarding under seperate cover copies of the Sample Management geologic logs and discussions from the coreholes USW UZP-4 and 5 drilled in the Oak Flats area near Apache Leap. Also included is the REEco/ Raytheon/ DOE engineering report and sets of photographs of the core as boxed for shipment back to Nevada. The cores are presently stored at the Sample Management Facility at Yucca Mountain.

Please don't hesitate to call if we can be of further help.



(702) 295-4298

ASARCO Inc.

APR 20 1992

SW Exploration

# ASARCO

Exploration Department  
Southwestern United States Division  
James D. Sell  
Manager

April 27, 1992

Mr. Jim Moyer  
SAIC  
Valley Bank Center  
101 Convention Center Drive  
Suite 407  
Las Vegas, NV 89109

Apache Leap Core Report  
Pinal County, Arizona

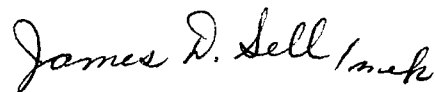
Dear Jim:

Thanks for the two reports and the pile of photographs of the core.

It is nice that you do the reporting and publishing of results so we can all learn things.

When and if I get through Las Vegas, I'll call and see if any tours are available.

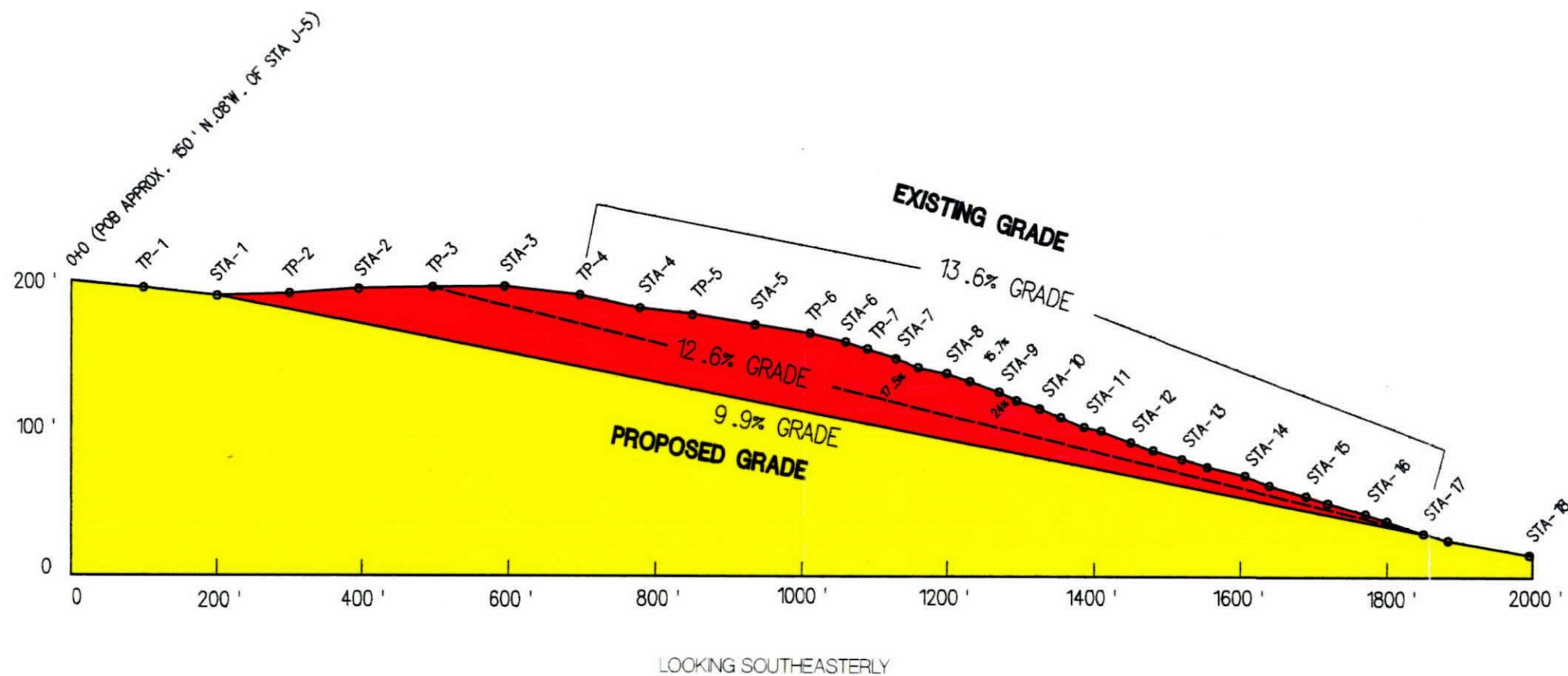
Sincerely,



James D. Sell

JDS:mek

cc: W.L. Kurtz

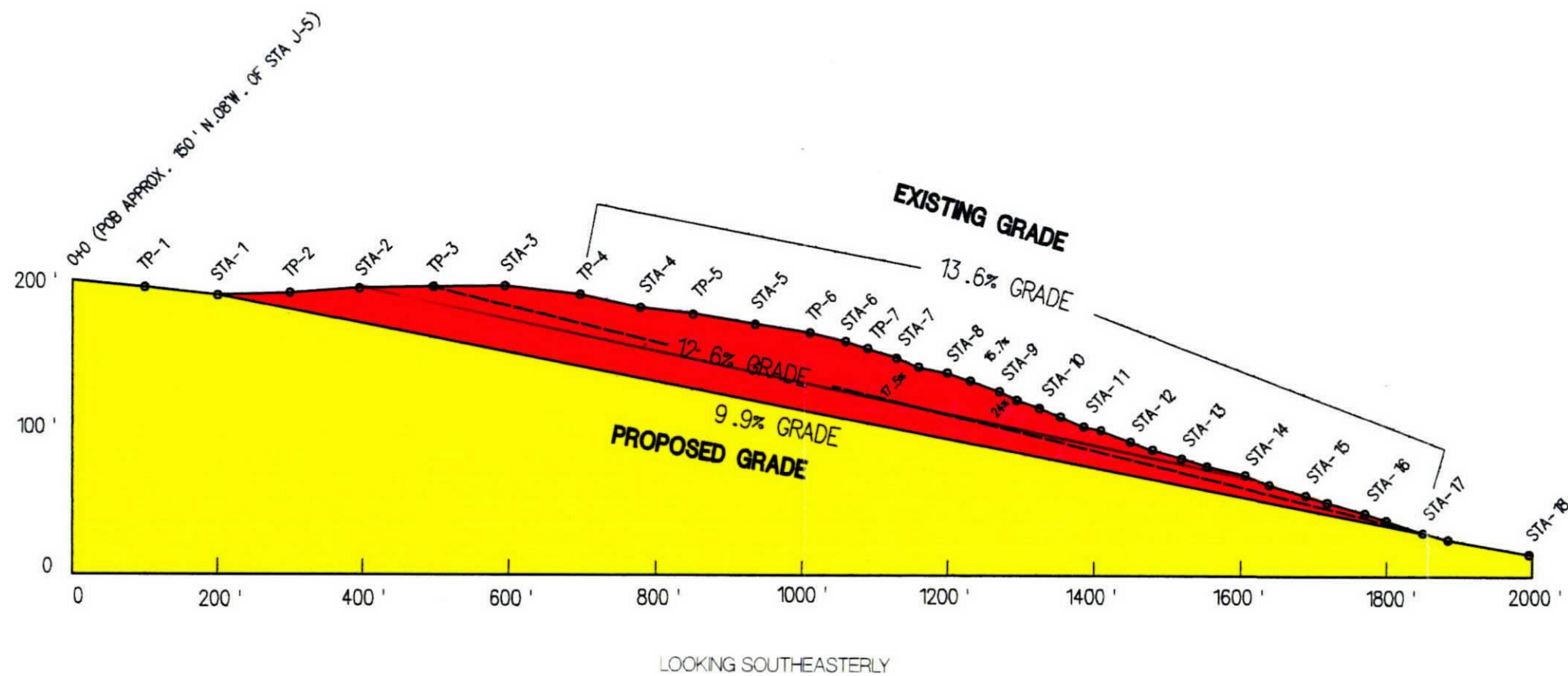


**ASARCO** SOUTHWESTERN  
EXPLORATION

**SUPERIOR EAST PROJECT  
PROPOSED GRADE IMPROVEMENT  
USFS 2461  
PINAL CO., ARIZONA**

JDS/WDG/DAM

05/92

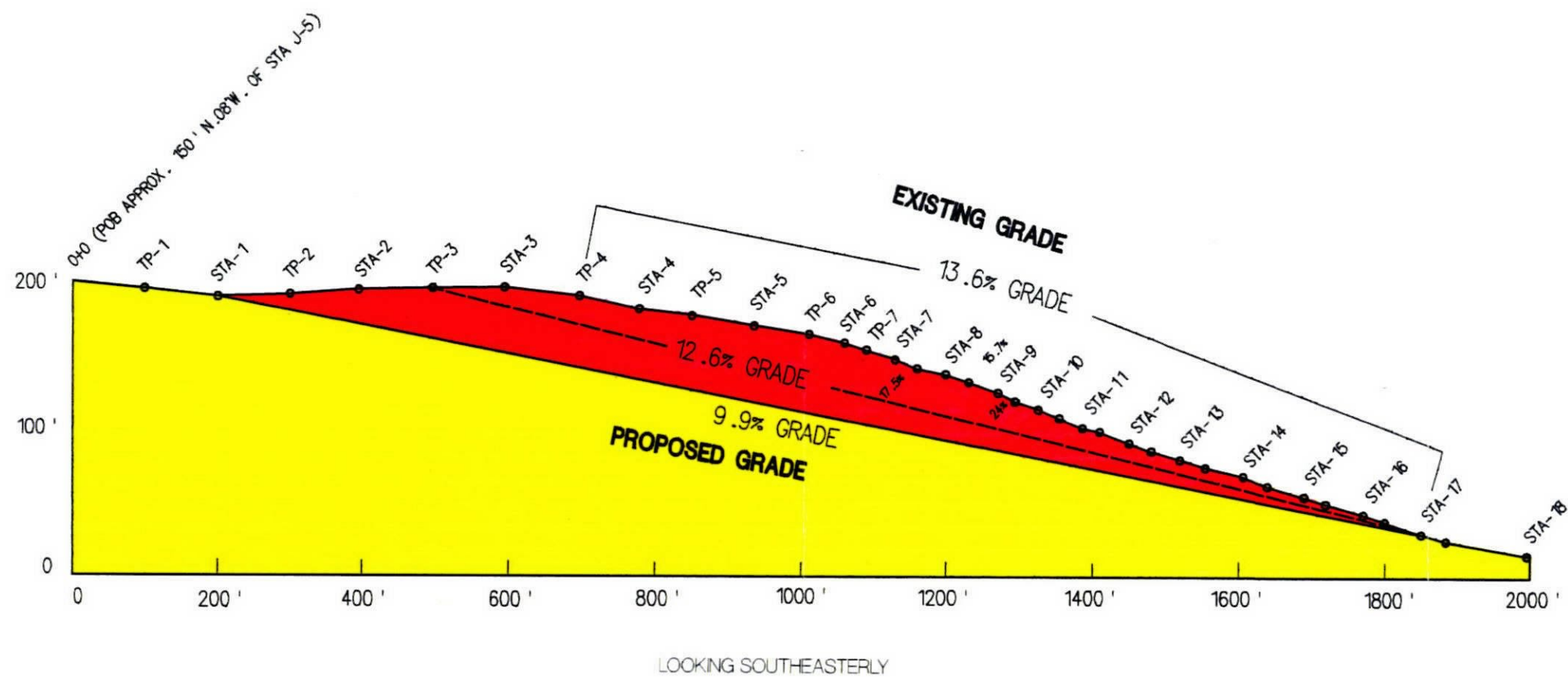


**ASARCO** SOUTHWESTERN  
EXPLORATION

**SUPERIOR EAST PROJECT  
PROPOSED GRADE IMPROVEMENT  
USFS 2461  
PINAL CO., ARIZONA**

JDS/WDG/DAM

05/92

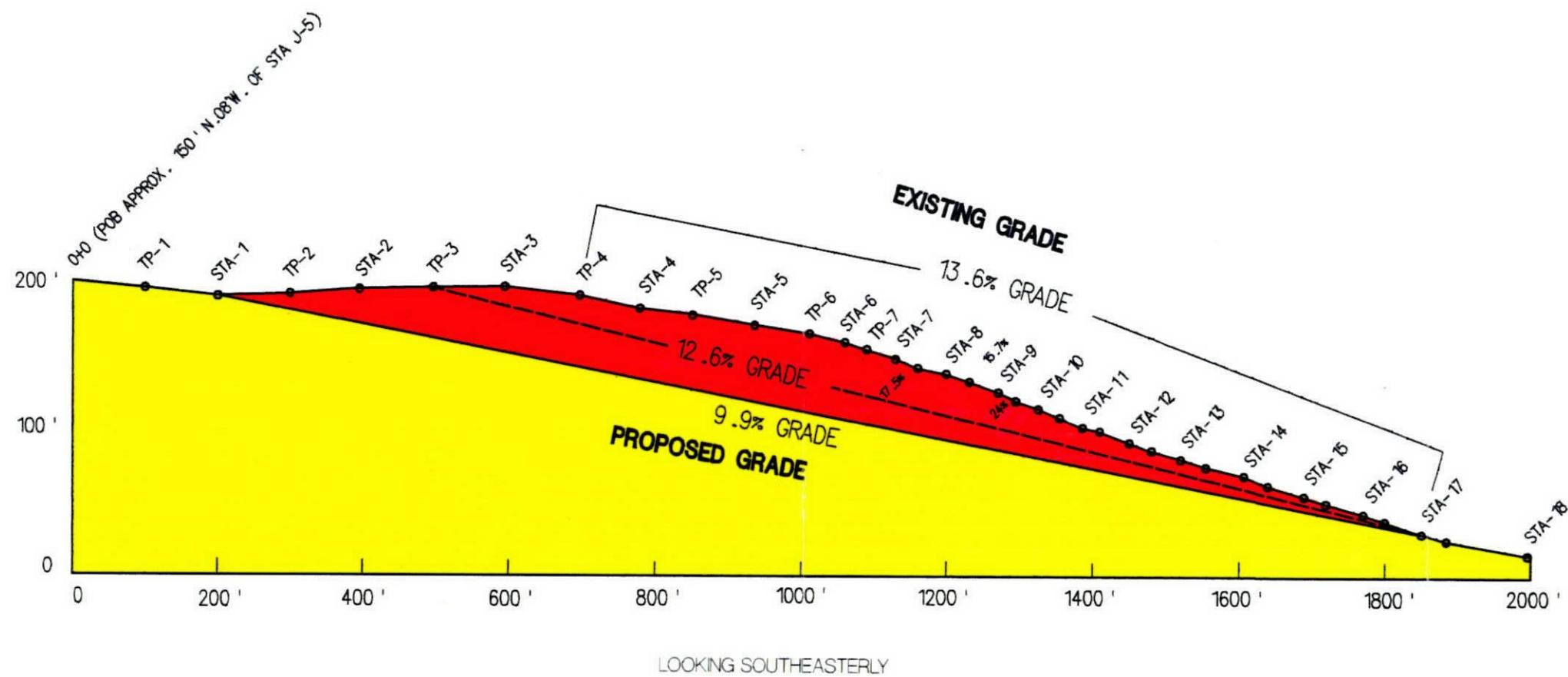


**ASARCO** SOUTHWESTERN  
EXPLORATION

**SUPERIOR EAST PROJECT  
PROPOSED GRADE IMPROVEMENT  
USFS 2461  
PINAL CO., ARIZONA**

JDS/WDG/DAM

05/92



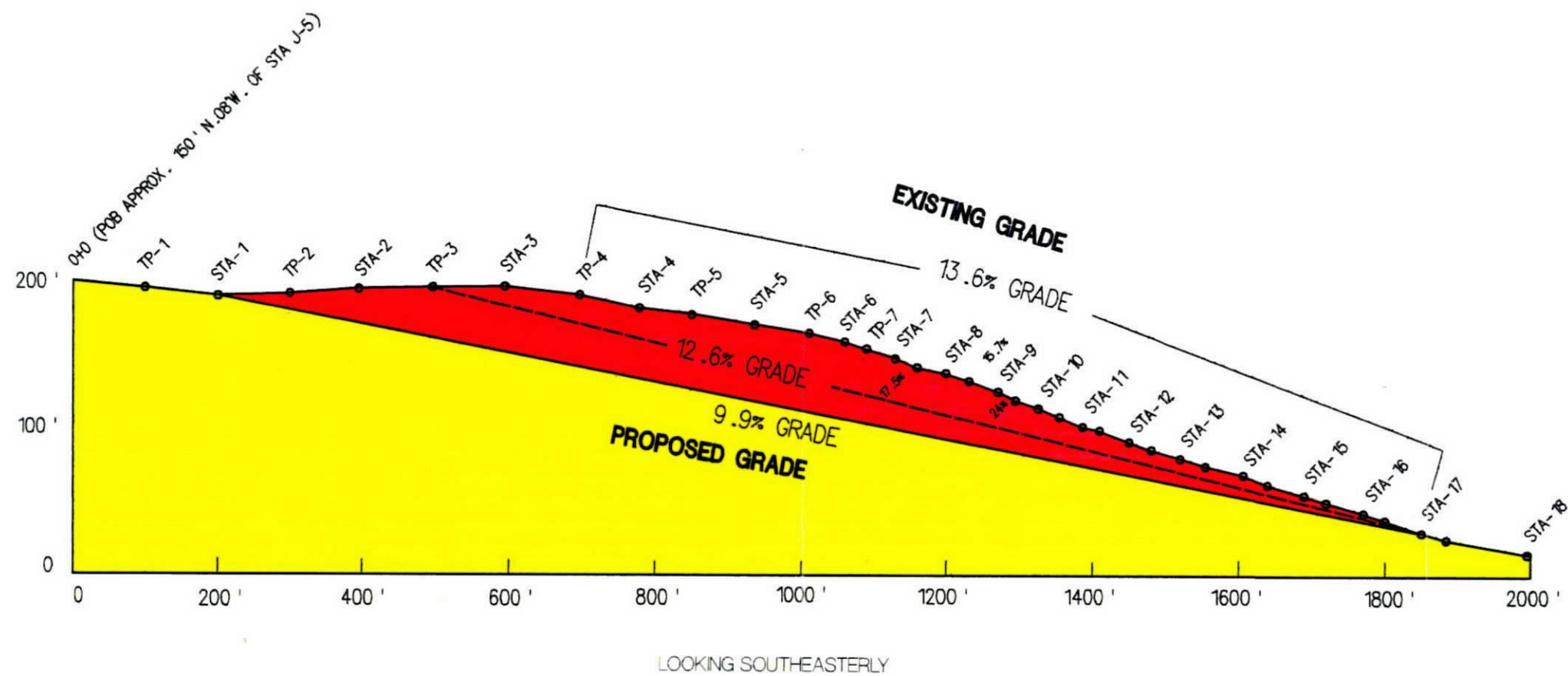
**ASARCO** SOUTHWESTERN  
EXPLORATION

**SUPERIOR EAST PROJECT  
PROPOSED GRADE IMPROVEMENT  
USFS 2461  
PINAL CO., ARIZONA**

JDS/WDG/DAM

05/92





**ASARCO** SOUTHWESTERN  
EXPLORATION

**SUPERIOR EAST PROJECT  
PROPOSED GRADE IMPROVEMENT  
USFS 2461  
PINAL CO., ARIZONA**

JDS/WDG/DAM

05/92



# ASARCO

Exploration Department  
Southwestern United States Division

June 24, 1992

Department of Water Resources  
State of Arizona  
15 South 15th Avenue  
Phoenix, AZ 85007

Notice of Intention to  
Drill Exploration Wells  
Superior East  
Pinal County, AZ

Gentlemen:

In compliance with drill hole reporting requirements, ASARCO Incorporated requests a drilling permit for one hole which is described on the attached Form DWR 55-47-7/90, in Section 23, T1S, R13E.

A check for the \$10.00 filing fee is enclosed.

Sincerely,

JDS:mek  
Atts.

James D. Sell  
Manager, SWED

cc: W.L. Kurtz  
W.D. Gay  
C.L. Snow

VOUCHER NO. 6-252

DATE Jun 1992

ASARCO INCORPORATED  
TUCSON OFFICE  
TUCSON, ARIZONA 85703

Notice of Intention to Drill one (1) Exploration Hole

\$10.00

DETACH BEFORE PRESENTING FOR PAYMENT

**ASARCO**

**THE VALLEY NATIONAL BANK OF ARIZONA**  
Tucson, Arizona 85702

ASARCO Incorporated  
Tucson Office  
Tucson, Arizona 85703

91-2  
1221

Check

June 26 19 92

08580

PAY  
TO THE ORDER OF

The sum of \$10 and 00 Cts Dollars \$10.00

ASARCO Incorporated

ARIZONA DEPARTMENT OF WATER RESOURCES  
15 South 15th. Ave.  
Phoenix, AZ 85007

*C. L. Shaw*  
*S. Myers*

⑈008580⑈ ⑆122100024⑆

2000⑈0673⑈

EXPLORATION WELL(s)

FILING FEE \$10.00

## ARIZONA DEPARTMENT OF WATER RESOURCES

15 SOUTH 15TH AVENUE

PHOENIX, ARIZONA 85007

## NOTICE OF INTENTION TO DRILL EXPLORATION WELL(s)

EXPLORATION WELL(s)

FILING FEE \$10.00

Section §45-596, Arizona Revised Statutes, and Rule 12-15-817 provide: Prior to drilling one or more exploration wells, the well owner, or exploration firm shall file a Notice of Intention to Drill on a form provided by the Department.

## WELL/LAND LOCATION

1. Township 1 N/S Range 13E Section 23

In the case of a single well,  
list 10-acre subdivision.

NE  $\frac{1}{4}$  NW  $\frac{1}{4}$  SW  $\frac{1}{4}$   
10 ACRE 40 ACRE 160 ACRE

2. County Pinal

ASARCO Incorporated

3. Applicant Name  
P.O. Box 5747  
Address  
Tucson AZ 85703  
City State Zip

4. W.D. Gay  
Name of Contact Person  
Phone (602) 792-3010

5. Owner of Well  
ASARCO Incorporated  
Name  
P.O. Box 5747  
Address  
Tucson AZ 85703  
City State Zip

6. Purpose of well(s) drilled pursuant to this Notice:

Mineral Exploration X  
Geotechnical \_\_\_\_\_  
Cathodic Protection \_\_\_\_\_  
Grounding \_\_\_\_\_

7. Number of wells 1  
(See Condition 4 on reverse side)

8. Owner of Land: US Dept. of Agriculture  
Forest Service  
Name  
Route 1, Box 33  
Address  
Globe AZ 85501  
City State Zip

9. DESCRIPTION OF THE WELL  
Diameter 6 3/4 inches  
Depth 1000 feet  
Type of casing. If none,  
state: None

10. Construction will start  
8 1 92  
Month Day Year

11. Drilling Firm:  
CBC Drilling  
Name

707 Boyd Blvd.  
Address  
LaPorte IN 46350  
City State Zip  
75  
DWR License Number  
A-4076386  
ROC License Category

12. Period well will remain in use: None months

DO NOT WRITE IN THIS SPACE  
OFFICE RECORD

File No. \_\_\_\_\_  
Filed \_\_\_\_\_ By \_\_\_\_\_  
Input \_\_\_\_\_ By \_\_\_\_\_

DUPLICATE  
Mailed \_\_\_\_\_ By \_\_\_\_\_  
Registration 55- \_\_\_\_\_  
AMA/INA \_\_\_\_\_  
W/S \_\_\_\_\_ S/B \_\_\_\_\_

13. Proposed method of abandonment of well(s) after project is completed: Back fill with rotary cuttings after drilling and concrete to 20' of hole. Well will be open for future re-entry and will then be cased and capped in accordance with R12-15-811, R12-15-812, & R12-15-822.
14. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials or a petroleum storage area and tanks?  
Yes \_\_\_\_\_ No X

## GENERAL INSTRUCTIONS

- Fill out this form in DUPLICATE and send WITH \$10.00 FEE to 15 South 15th Avenue, Phoenix, AZ 85007.
- For specific instructions, limitations and conditions, see the reverse side of this form.

I state that Notice is filed in compliance with Rule R12-15-809 and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

June 24, 1992

Date

DWR 55-43-7/90 (Rev.)

W. D. Gay  
Signature of Applicant/Owner

## CONDITIONS

1. Construction and abandonment standards for all wells shall be in accordance with A.A.C. Rules R12-15-811 and R12-15-816.
2. Drilling of the well(s) shall be completed within one (1) year after the date of Notice.
3. Mineral exploration, geotechnical, cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these well(s), then the well(s) must be properly abandoned in accordance with Condition 1 above.
4. More than one well may be drilled under a single notice for mineral exploration, geotechnical, cathodic protection and grounding purposes, so long as they are located within a single section.
5. A Project Completion Report must be filed for each mineral exploration hole within thirty (30) days of completion of drilling. A Well Driller Report for each hole drilled, must be filed by the well driller within thirty (30) days of completion of drilling for geotechnical, cathodic protection and grounding wells.
6. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic protection or grounding purposes.
7. Special construction standards required pursuant to R12-15-821: \_\_\_\_\_

JDS



4446 West 1730 South  
P.O. Box 30777 / Salt Lake City, Utah 84130

Phone: 801-974-0690 / Fax: 801-972-6769

July 28, 1992

**ASARCO, INC.**  
P.O. Box 5747  
Tucson, AZ 85703

Attention: James Sell

**RE: Core Drilling Agreement  
Superior, Arizona**

Gentlemen:

We are in receipt of two signed copies of the above referenced agreement. We have executed both copies and are returning one copy for your files.

We appreciate the award of this agreement and look forward to working with your firm towards its successful completion.

If you should have any questions, or if we may be of further assistance, please do not hesitate to contact Nino Trujillo of our Tucson, Arizona office at (602) 884-5866.

Very truly yours,

Bob Johnson  
Contracts Administrator

BJ/ks

enclosures

cc: Nino Trujillo

asrcor.com

cc: W.D. Gay (7/30/92)

ASARCO Incorporated

JUL 30 1992

SW Exploration



CBC DRILLING  
750 E. EVANS BLVD.  
TUCSON, ARIZONA 85713

602-884-5866  
602-622-0866 FAX

ASARCO Incorpn.

JUL 23 1992

SW Exploration

July 16, 1992

Mr. James D. Sell  
ASARCO, Inc.  
P. O. Box 5747  
Tucson, AZ 85703

BID #CBC-13

Dear Jim:

Thank you for the invitation to quote on your core drilling project near Superior, AZ.

Please consider the following:

|  |          |          |
|--|----------|----------|
| Mobilization   | Per Rig  | \$750.00 |
| Demobilization   | Per Rig  | \$750.00 |
| Extra road truck trips (includes<br>drill rods and casing for reductions<br>to NX and BX hole size if necessary) | Per Trip | \$150.00 |

| <u>Core Drilling:</u> | <u>NCE Wireline</u> | <u>NXE Wireline</u> | <u>BXE Wireline</u> |
|-----------------------|---------------------|---------------------|---------------------|
| 0 - 500 Feet          | \$17.90/Foot        | \$16.20/Foot        | \$16.00/Foot        |
| 500 - 1000 Feet       | \$18.60/Foot        | \$17.00/Foot        | \$16.80/Foot        |
| 1000 - 1500 Feet      | \$19.20/Foot        | \$17.70/Foot        | \$17.50/Foot        |
| 1500 - 2000 Feet      | \$20.50/Foot        | \$19.00/Foot        | \$18.80/Foot        |
| 2000 - 2500 Feet      | \$22.20/Foot        | \$20.70/Foot        | \$20.50/Foot        |
| 2500 - 3000 Feet      | \$24.40/Foot        | \$22.90/Foot        | \$22.70/Foot        |

Bad Rock Clause - If footage drilled per shift (excluding chargeable time) times the appropriate footage rate drops below \$440.00 per eight-hour shift revenue for five or more consecutive shifts, drilling prices will revert from a per-foot rate to an hourly rate of \$55.00 per hour plus bit and other in-hole supplies at actual cost.

Mr. James D. Sell  
ASARCO, Inc.  
BID #CBC-13  
July 16, 1992  
Page Two

Rig Time & Hourly Work:

|   |          |   |
|---|----------|---|
| Setting & Pulling Casing & Pipe<br>(two man crew)   | Per Hour | \$ 55.00<br>Plus Materials<br>Used                        |
| Cementing and/or Plugging Drill Holes<br>(two man crew). Includes all time<br>required to maintain good hole condi-<br>tions while drilling. Also includes<br>time required to close or complete<br>hole as required.                         | Per Hour | \$ 55.00<br>Plus Materials<br>Used                        |
| Reaming, if necessary (two man crew)  | Per Hour | \$ 55.00<br>Plus Materials<br>Used                        |
| Survey (two man crew)   | Per Hour | \$ 55.00<br><u>ASARCO, INC.</u><br>Supplies<br>Instrument |
| Re-entering Previously Drilled Holes<br>(two man crew). Includes all time<br>worked entering previously drilled<br>hole until wireline core bit is cut-<br>ting in solid rock formation on true<br>bottom of hole. This will also<br>include: | Per Hour | \$ 60.00<br>Plus Materials<br>Used                        |
| a. Time which is required to line<br>up drill over previously drilled<br>hole.  |          |   |
| b. Time required to set casing in<br>pre-drilled hole before starting<br>to drill with wireline tools.  |          |   |
| c. All time required to correct any<br>problems encountered with exist-<br>ing casing or pipe in hole.  |          |   |

Mr. James D. Sell  
ASARCO, INC.  
BID #CBC-13  
July 16, 1992  
Page Three

|   |              |          |
|---|--------------|----------|
| Standby Time for Your Convenience                             | Per Hour     | \$ 50.00 |
| Extra Labor authorized by <u>ASARCO</u><br>(if required)      | Per Man Hour | \$ 25.00 |
| Overtime premium in excess of 88<br>hours per two week period | Per Man Hour | \$ 6.00  |

Materials:

|  |          |    |                             |
|--|----------|----|-----------------------------|
| Casing Ordered Left in Place   | Per Foot | NX | \$ 10.00                    |
|  | Per Foot | BX | \$ 8.00                     |
| Casing Lost through Normal Drilling<br>Operations  |          |    | 70% of List<br>Price        |
| Diamond Bit Loss in Excess of \$2.50/foot  |          |    | At Actual Cost              |
| Drilling Mud & Additives   |          |    | At Jobsite<br>Cost Plus 20% |
| Weather-treated Core Boxes which<br>hold ten feet of core                                  | Each     | NC | \$ 3.00                     |
|  |          | NX | \$ 2.75                     |
|  |          | BX | \$ 2.50                     |
| Materials Used and Special Purchases<br>authorized by <u>ASARCO, INC.</u><br>(if required) |          |    | At Cost Plus<br>20%         |

Water Pumping Or Hauling:

|   |              |          |
|---|--------------|----------|
| Water Truck Usage (Two Wheel Drive)           | Per Month    | \$600.00 |
| Mileage (Two Wheel Drive)                     | Per Mile     | \$ .75   |
| Full-time Water Truck Driver (if<br>required) | Per Man Hour | \$ 25.00 |

Mr. James D. Sell  
ASARCO, INC.  
BID #CBC-13  
July 16, 1992  
Page Four

Per Diem: (Excluding Local Help)

Per Man Per Day \$ 20.00

The above prices are based on our standard non-union wage rates and are firm if accepted within 60 days and will remain in effect until SEPTEMBER 15, 1992. Our terms are Net 30 Days on invoices and with approved credit. In the event that payment is not made within this period, a late payment charge of 1 1/2 percent per month, or the maximum amount permitted by law, whichever is less, will be charged, to be computed from the due date to the date payment is received by CBC, together with all costs and expenses incurred in collection, including reasonable Attorney fees and court costs.

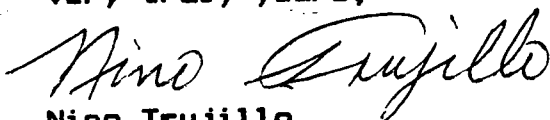
We understand ASARCO, INC. will build and maintain all-weather or passable access roads, level drill sites, dig mud pits and provide water, on surface, free of cost to CBC Drilling. We further understand that ASARCO, INC. will secure and maintain all necessary and required permits and will provide all rights of ingress and egress to all lands that may be required to enable CBC Drilling to carry out the specified work.

We propose doing this work with a JOY 22 TRUCK MOUNT DRILL and wireline equipment. We will work one or two shifts per day on a mutually agreeable schedule. You should contact Nino Trujillo at 602-884-5866 on starting date and work schedule.

If this is acceptable to you, please sign and return both copies, at which time we will sign and return one copy for your file.

We look forward to working with you on this project.

Very truly yours,



Nino Trujillo  
District Manager  
CBC Drilling

Mr. James D. Sell  
ASARCO, INC.  
BID #CBC-13  
July 16, 1992  
Page Five

ACCEPTED:

ASARCO, INC.:

James D. Sell  
Mr. SWEED  
TITLE

DATE: July 23, 1992

CBC DRILLING:

Clark Hirschi  
Vice President  
TITLE

DATE: July 28, 1992

CBC-13

Superior East A-1417

Started coring 8-10-92

Set casing.

NC 560-590 lost all water (cemented off zone)

820 T.D. left hole for reentry 8-27-92

# ASARCO

JDS

## Exploration Department

G.D. Van Voorhis  
Vice President

December 30, 1992

R.J. Kupsch

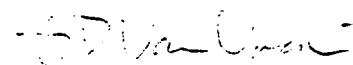
Re: Superior East Project and the J1 Ranch

As we discussed on December 18, responsibility for the Superior East Prospect and the J1 Ranch would best be handled by the Ray Complex. This being the case, we would like to make a transfer as soon as possible. The Exploration Department will be pleased to assist in future evaluation of the Superior East project.

This transfer should be straightforward as Bill Gay currently handles matters concerning both the ranch and the prospect.

This memorandum will provide notice to the Controllers Department that, as of the beginning of 1993, accounting for the Superior East Project and the J1 Ranch should be handled by the Ray Complex.

It also notifies the Personnel Department that Walter Lockhart, ranch manager, should be transferred to the Ray Complex payroll.



G.D. Van Voorhis

GDV/lj

cc: K. Morano  
R. O'Keefe  
R. Hildebrand  
W. Gay  
W. Kurtz ✓

RECEIVED

JAN 4 1993

EXPLORATION DEPARTMENT



# TAB

Structural BASIN

STRUCTURAL BASIN STUDY  
SUPERIOR EAST PROJECT  
PINAL COUNTY, ARIZONA

INTRODUCTION

With the increased control supplied by six ASARCO drill holes and Magma's No. 9 shaft penetration, it is now possible to reconstruct the basin area beneath the dacite cover of the Superior East Project area with additional validity. The information supplements that from previous drill holes <sup>of</sup> on a relatively shallow nature.

Surface control was secured from the published and unpublished geologic mapping in the district. The base map is the Plan Map and Generalized Geology, ASARCO Map Number 2271, submitted in most all of the previous reports on the project area.

Three maps have been prepared: (1) Structural contours on the top of the Whitetail Conglomerate; (2) Structural contours on the top of the Pre-mineral Units; and (3) An Isopach of the thickness of the Whitetail Conglomerate. It should be emphasized that these maps are based on interpreted ratios between outcrop and the various drill holes and are only approximate in the areas distant from any control. No attempt has been made on the drafting of the contours to separate good data from more distant data other than changing the weight of the line in outcrop areas.

Basically the area under the volcanic cover can be separated into five blocks separated by faults. (A) The northwest block bounded by the Conley Spring Fault (south and the northern segment of the Devils Canyon Fault (east); (B) The southwest block bounded by the Conley Spring Fault (north) and the southern segment of the Devils Canyon Fault (east); (C) The northeast block bounded by an erosional cutoff (south) and the northern segment of the Rawhide Canyon-Devils Canyon Fault (west); (D) The southeast block bounded by an erosional cutoff (north) and the southern segment of the Rawhide Canyon-Devils Canyon Fault (west); and (E) The central block bounded by the split of the Devils Canyon Fault (west) and the Rawhide Canyon Fault (east).

Based on the interpreted thickness of the Whitetail Conglomerate it is possible to suggest some areas of depositional <sup>P</sup> layout of the conglomerate, and based on rock unit contacts other areas have obviously undergone post-depositional erosion of the conglomerate.

The major faults which influenced the deposition trends, thickness, and bedrock units are also shown.

The map showing the structural contours on top of the Whitetail Conglomerate is <sup>shown</sup> ~~drawn~~ on Attachment A. In addition to the features discussed above, a line showing the southern limit of Earlier Volcanic deposition is also <sup>marked.</sup> ~~shown~~. North of this line both Dacite and Earlier Volcanics overlies the Whitetail whereas south of the line only Dacite overlies Whitetail.

The contouring suggests continued development of the east-west synclinal structure, with the axis being along the trace of the Conley Spring Fault, with the major outlet being to the south along the southern extension of the Devils Canyon Fault into the Ray District. The narrow trough contoured in the southern part of the northwest block and continuing into the central block may be caused by additional faulting parallel to the <sup>northeasterly border trend of the Schuette Granite.</sup> ~~developed trend.~~

The map showing the structural contours on top of the premineral rock units is shown on Attachment B. Less control is available with less penetrations by drilling. Contouring suggests the synclinal development west of the Devils Canyon Fault with a deep wedge preserved in the northeast corner of the southwest block (A-4 drill hole location). East of the Devils Canyon Fault is a sloping surface dipping toward the fault. The uplifted area in the southeast corner of the southeast block is a resistant section of Apache Group sediments and diabase which appears to have been involved in late uplift to allow the deep stripping of the Whitetail Conglomerate deposition in that area.

Bedrock outcrops and intercepts show a strong differential tilting of blocks prior to Whitetail deposition. The area east of the Devils Canyon Fault has been entirely stripped of the Paleozoic cover and left only the small Apache Group and diabase remnant on the southeast. Elsewhere the units were stripped to the basement Pinal Schist and the intrusion of the granitic mass. West of the Devils Canyon Fault, the Paleozoic section is preserved but shows the tilting of the northwest and southwest blocks. Within the northwest block, the exposed units on the west are predominantly Devonian limestone on the north with Mississippian limestone in the middle and

Pennsylvanian limestone on the far south. Eastward, within the block, the drilling shows a moderate amount of Pennsylvanian limestone on the north with a probable increase in thickness to the south with a minor amount of Permian redbeds on the south.

(Note: this is the first reported occurrence of Permian redbeds south of the Salt River Canyon in the central part of the State.) This implies that erosion was leveling the units from east to west early in the cycle as the block was finally settled.

In contrast, the southwestern block has a thick section of Pennsylvanian rocks exposed entirely along the western outcrop (with perhaps the thickest being on the north adjacent to the Conley Spring Fault). Unfortunately, the only subsurface control in the block is A-4 where Mississippian rocks are the first premineral unit. This suggests a leveling of units from west to east in the southwestern block prior to its being tilted into the present configuration.

The third map submitted (Attachment C) is compiled from the previous two and is an isopach of the vertical thickness of the Whitetail Conglomerate. Overall, the trends suggest a <sup>P</sup>layout of the conglomerate deposition all across the north, west, and southwest sides with some moderate sized areas removed by post-depositional erosion. Similarly, the northeast side shows near basin edge <sup>P</sup>layout condition with some post-depositional erosion. In contrast, the outside edges of the southeastern block indicates substantial thickness of conglomerate up to the bounding fault on the east. This suggests that most of the transport of material dumped into the basin originated south of the present Schultze Granite mass and from the vicinity of the Pinal Mountains to the east.

The patterns further suggest a clean infilling of the southwestern block as it subsided into the present positions. The northwest block suggests one large fan deposition influx on the northcentral and a smaller fan on the south. The northeast block shows an eroded remnant of the large fan. The southeast block shows a rapid increase in thickness to the north suggesting a buildup along the unnamed northeast-trending fault; however, note that no basement configuration would account for this buildup and thus it must be one of the influx transport areas for the entire basin. The southeastern part of the southeastern block shows the thinning of the unit over the Apache Group block as well as the post-depositional erosion in the same area.

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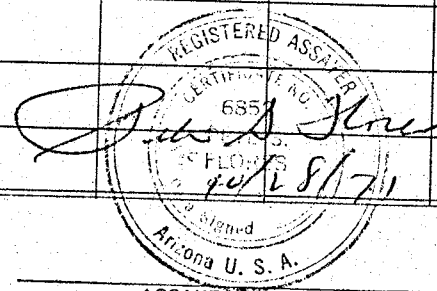
SAMPLE SUBMITTED BY American Smelting & Refining Company

DATE October 28, 1971

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K.V.D.S.

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| SAMPLE MARKED   | ANALYSIS  | CHARGES                        |
|---|---|--------------------------------|
| A-1-a, A-1-c, A-1-d, M-1-a,<br>M-1-b, N-1-c, A-4-b, A-4-d,<br>Su-1, Su-2, Su-3,<br>11 Samples | Geo Chem Cu, Zn, Mo<br>Creamic Plates<br><br>Total      | \$49.50<br>5.50<br>\$55.00     |
|   | <i>Approved for<br/>Payment.<br/>JH Sel<br/>MA-0010</i> | <i>N.V.D.S.<br/>NOV 1 1971</i> |

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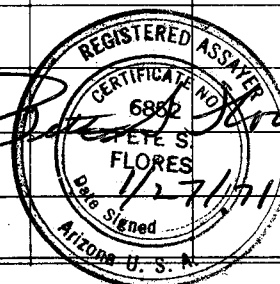
SAMPLE SUBMITTED BY American Smelting & Refining CompanyDATE Jan. 27, 1971

| SAMPLE MARKED | GOLD<br>OZ./TON | SILVER<br>OZ./TON | PPM                          | PERCENT<br>LEAD | PPM                        | PPM                              | PERCENT<br>IRON |
|---------------|-----------------|-------------------|------------------------------|-----------------|----------------------------|----------------------------------|-----------------|
|               |                 |                   | <del>PERCENT</del><br>COPPER |                 | <del>PERCENT</del><br>ZINC | <del>PERCENT</del><br>MOLYBDENUM |                 |
| SK - 1        |                 |                   | 14 (24)                      |                 | 40 (50)                    | 3                                | W. G. K.        |
| 2             |                 |                   | 23                           |                 | 38                         | 5                                | FEB 1 1971      |
| 3             |                 |                   | 42                           |                 | 79                         | 24                               |                 |
| 4             |                 |                   | 40                           |                 | 98                         | 9                                |                 |
| 5             |                 |                   | 54                           |                 | 102                        | 8                                |                 |
| 6             |                 |                   | 15 (14)                      |                 | 22 (30)                    | 2                                |                 |
| CC- 1         |                 |                   | 230                          |                 | 145                        | 8                                |                 |
| 2             |                 |                   | 118                          |                 | 509                        | 3                                |                 |
| 3             |                 |                   | 187 (165)                    |                 | 133 (113)                  | 9                                |                 |
| 4             |                 |                   | 335                          |                 | 121                        | 14                               |                 |
| ET - 1        |                 |                   | 174                          |                 | 65                         | 14                               |                 |
| WT - 1        |                 |                   | 24                           |                 | 45                         | 11                               |                 |
| 2             |                 |                   | 20                           |                 | 19                         | 9                                |                 |
| 3             |                 |                   | 40                           |                 | 108                        | 28                               |                 |
| 4             |                 |                   | 440                          |                 | 169                        | 19                               |                 |
| 5             |                 |                   | 183 (164)                    |                 | 123 (107)                  | 2                                |                 |
| 6             |                 |                   | 48                           |                 | 61                         | 7                                |                 |
| 7             |                 |                   | 130                          |                 | 129                        | 7                                |                 |
| 8             |                 |                   | 161                          |                 | 80                         | 36                               |                 |
| 9             |                 |                   | 91                           |                 | 40                         | 16                               |                 |
| 10            |                 |                   | 120                          |                 | 148                        | 13                               |                 |
| BC - 1        |                 |                   | 100                          |                 | 230                        | 14                               |                 |
| 2             |                 |                   | 315                          |                 | +2000                      | 19                               |                 |
| 3             |                 |                   | 67                           |                 | 845                        | 7                                |                 |

Invoice # 5899

CHARGES \$ 108.00

pencil: double sized sample.



ASSAYER - CHEMIST



## Whitetail Conglomerate (6 Retated) Sample.

on map

✓

### WT-Series:

WT-1. Matrix sample.

NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 8, T. , R.

Outcrop area approximately 3 x 20 feet in roadcut and near Dm-Tr contact on map. Very tuffaceous matrix with dump appearance, no bedding, with fragments from  $\frac{1}{4}$ " to one foot, with 2"-4" most common of larger sizes. Mosaic of limestone & Mesozoic basalt most common clast, with minor quartzite & fossiliferous (Dm?) limestone. No diabase or schist.

Poorly sorted, poorly developed. Inclined facets suggest westerly trend to stream direction but have some reversals suggesting lateral movement.

✓

WT-2. Matrix sample.

SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 8, T. , R.

Outcrop area approx. 6 x 10 feet in creek bed on side hill. Predom. a limestone congl. with calcareous cement, minor tuff cement. Mostly crystalline, fossiliferous limestone light grey (Me) with few black limestones, minor Balsa quartzite. Conspicuous large fragments (3'-6') of dark green, fresh, porphyritic diorite. Mainly subangular fragments with semblance of bedding. Restored trend suggest stream flow in S 75° W direction. (Note: The cgl resemble Glauconite rather than Whitetail!). Matrix becomes more tuffaceous (but still minor) to the north.

2/

WT-3. Rock Sample.

Same location as WT-2.

Sample of only the diorite porphyry.

WT-4. thru WT-7.

SE  $\frac{1}{4}$ , SW  $\frac{1}{4}$ , Sec. 25, T. , R. (North of Green Creek Ten

Oatrop area 20 by 40 feet. Dominant trend direction is  $N70^{\circ}W$  to  $N90^{\circ}W$ , with few reversal dips. to east. Rare schist fragments, minor dipping, Spring gneiss in top part but increasing toward bottom.

WT-4. Matrix Sample.

Sample site as above. Top 3 feet. Plus 80% is clast material of  $\frac{1}{2}$ "-3" size, dominantly diorite, some bleached and containing pseudos after pyrite, others have hematite staining also of mescol limestone. One fragment of copper-coral granite (p.e. aspect), unaltered. Several hornblende diorite or granodiorite clasts with some Fe stain but no alteration.

WT-5. Matrix Sample.

Sample site as above. 20 foot cut. Dominant silt-sand tuff matrix with bands of clasts (smaller sizes, i.e.  $\frac{1}{8}$ " to 1") of perhaps 80% clasts.

WT-6. Rock Sample

Clasts of hornblende diorite - granodiorite, relatively fresh, unaltered, with some iron stain.

WT-7. Rock Sample

altered and mineralized diorite clasts with few epidote

WT- 8 thru 10.

Just SE of center of Sect. 36, along ridge crest, T. , R.

Exposure is approx. 10 x 10 feet, composed of three sections. Sampled area approx 30 feet above base of WT. Poorly developed trend suggest  $535^{\circ}\text{E}$  transport direction. Very fine character suggests backwater deposition.

WT- 8. Matrix sample.

Sample site as above; top, 4 feet. Matrix is coarse sand volcanic tuff with minor quartz and schist (1), sandstone, all coarse sand size. Very few  $\frac{1}{2}$ " size clasts.

WT- 9. Rock Sample.

Sample site as above; middle, 1 foot. Band of  $\frac{1}{4}$ " to 1" clasts with some  $1\frac{1}{2}$ " - 2", making up 30-40% of unit, with matrix of fine to coarse sand size tuff and fine fragments (60-70% of unit). Clasts are predominantly quartzite, all angular, with minor sandy limestone, diabase, and schist. Quartzite has iron coating but are probably unaltered and unmineralized.

WT-10. Matrix sample.

Sample site as above; lower, 5 foot. Matrix is silt, very fine to medium coarse sand tuff with occasional fragment of quartzite and schist scattered throughout.

Elsewhere along outcrop area, found one piece of fresh

granite (p.e.) and one fresh, dark colored, granodiorite (ordiorite). Also remains of unit is similar sand size tuff material with few clasts except in 6"-1 1/2" thick bands. The cobble-boulder bands are planar units, non-scouring on base, and near top often have large cobble-boulders (6"-8") of subangular to subrounded clasts of quartzite, diabase, and fossiliferous limestone (Dm). Trend direction still poor. Suggested SE trend with few westerly. Unit becomes more blocky toward top (indurated by heat from Td?). Lower portion is finer grained & has mud ball development.

### CC - Series:

#### Cross Canyon

Starting at upper contact and working down. Contact with white biotite tuff (which contains some red-black diabase) is unconformable (cgl - 15° to 20°) (schistosity - 10° E) with some change in strike direction. Upper part of Tw is composed of pebble bands (+ 80% pebbles, 1/2"-2") predominantly red-black diabase, some dark green diabase, schist, minor limestone and quartzite, all semiangular. Predominant transport direction is northward, some westerly component. Also 30° E trend on few fragments. Bands set in dacitic tuff matrix and alternate with dacitic-tuff layers with few fragments. Possible 50% pebble - 50% tuff bands. One epidotized Silver King quartz-diorite fragment. Very rare weathered-altered fragments, except for the red-black diabase.



5/

cc-1. Matrix sample.

Location site as noted, top area.

Basaltic tuff matrix sample.

cc-2. Rock sample.

Location site same as cc-1.

Altered (?), weathered red block, iron rich, diabase clasts.

cc-3. Matrix sample.

Sample site 50-70 feet below top.

Unit has lost pebble bands. Now massive sand-granular tuff with few diabase-limestone pebble clasts.

cc-4. Matrix sample

?

Sample site 130-150 feet below top.

Massive sand-granular tuff matrix now has waterlain characteristics different from cc-3. Sample taken in fine foot zone of pebble in matrix of tuff-diabase debris. Clasts are quartzite, green diabase, red diabase, minor limestone, minor schist.

Lower contact (approx. 180 feet below top) of cgl with underlying limestone is not exposed. Lowest poorly exposed unit continues to be tuffaceous, some cobble-boulder beds of quartzite, limestone, diabase, minor schist. Poorly developed trend direction shows all directions, suggesting dumping area.

6/  
ET- Series

On Canyon Tributary (North).

Top of Tw in contact with white, biotite, tuff under  
vitrophyre. Under ~~vitrophyre~~ <sup>white tuff</sup> is a 10' section (not sampled)  
of massive laeitic tuff, somewhat welded.

ET-1. Matrix sample.

Location:

Matrix of laeitic tuff with abundant clasts of fossiliferous  
limestone and pink shale (Tnaco) with lesser amounts of  
crystalline limestone (Me) and quartzite. Poor, scattered  
exposures and all have unsorted, dumped appearance.  
Limestone makes up 70% of clasts & clasts are 80% of  
cgl unit, except for top massive laeitic tuff. Total thickness  
of 50-60 ft. Resting on Naco Limestone.

SK- Series

Location:

Tw rests on ~~poor~~ medium-granular quartz diorite unconformably.  
Basal zone of Tw is 80+% cobbles to boulder sized clasts,  
predominantly limestone (Tn and Me) with minor quartzite &  
shales. Conspicuous fragment of medium-granular quartz  
diorite (SK-type), usually more silicified, some kaolinitic  
alteration. Also few diorite fragments (magma type) all set  
in granular sized quartz-feldspar-limestone detritus with  
minor amounts of tuff sand material (increases in amount  
upward). Imbrication suggests westward direction of  
movement in fragment transport. Some altered limestone

7/  
(epidote & specularite), also minor alteration of quartz diorite porphyry. SK-1 thru 3 cut in basal zone (lower 50 feet).

SK-1 Rock Sample.

Fresh, unmineralized SK quartz diorite under Tw.

SK-2 Matrix sample

Granular matrix of Tw.

SK-3 Rock sample.

Altered fragments found in SK-2.

SK-4 Matrix sample.

Sample taken in middle of exposure. More buff matrix, more hornblende diorite and coarse quartz diorite; also diabase and schist clasts.

SK-5. Matrix sample.

Sample taken 50'  $\pm$  below top of unit, but above three limestone bands of 2', 4', & 1 1/2' thickness with conglomerate in between.  $\pm$  40% fragment size 1"-6" clasts, predominant diabase debris with buff, some quartz diorite, limestone, schist, and quartzite. Matrix predominantly diabase debris with buff; dark brown "soil" horizons as lenses.

SK-6 Rock sample

Iron sulfate or copper stain? on diabase gangue, quartzite, and basalt. Fragment bands ( $\pm$  20%) in a

dark gray-green volcanic matrix ( $\pm 80\%$ ) & water-lain tuff volcanic. Grades upward into white, breccia, crystal tuff also water-lain, with few cobbles dolomite, quartzite, limestone bands. Predominantly direction is westerly but have few strong NW & SE component trends.

### BC- Series

### Belmont Canyon

#### Location:

Unit is approximately 40-45 ft thick resting on Naco limestone and overlain by thin (2-3 ft) of white, breccia, tuff overlain by 20 feet of vitrophyre. Unit is 80-90% clasts, primarily Naco limestone and siltstone of  $\frac{1}{2}$ " to 10", mostly subangular. Lower portion contains abundant Fe-Mn altered and replaced limestone fragments, with rare quartzite. Upper part has sparse quartzite, with some Om limestone and ~~Eschsch~~ (Me) limestone types. Matrix is muddy brown tuff, does not break down readily. Some crude stratification but mostly dumped appearance. No well defined trend direction; but suggested westerly trend. Lower portion has numerous large, altered & mineralized <sup>Fe-Mn</sup> slabs from underlying Naco; probable short transport.

#### BC-1 Matrix sample.

Sample cut in top 8 feet. Tuff matrix contains abundant small limestone clasts & debris. Very tough, does not pulverize.

9/

BC-2. Rock sample.

Sample in lower 20 feet. Sample only of the Fe-Mn ~~is~~ altered & replaced fragment of silicified cherty limestone.

BC-3. Matrix sample.

Same area as BC-2. Tuff matrix with some fresh and altered fragments as fine debris.

GS-Series. Goose Spring (Inspiration Wood Area)  
~~to~~ GS-1 thru 3 location:

Draw of rounded hill slopes, no areas showing cross section for bedding etc. No transport direction available. Area contains abundant diabase clasts up to 1 1/2 feet; median around 2"-4". Also abundant Barnes, Whipping Spring, Troy (?), with lesser amount of limestone on south side of draw compared to abundant on north side of draw. Angular to subangular fragments. No schist nor granitoid fragments found.

GS-1. Matrix sample.

Diabase, weathered, submatric, clayey, soil development with fine diabase, feldspar, & quartzite fragments. May be similar to SK-5 "soil" development. (In upper part of exposures the Barnes & Whipping Spring clasts become more dominant.) Sample is somewhat moist & does not break down readily.

## GS-2. Rock Sample.

Same location as GS-1. Diabase fragment with reddish oxidation(?) - Fe breakdown(?), containing abundant hard hematite "laths". Perhaps is altered, with clay development, but is spotty. No mineralized veins.

## GS-3. Matrix sample.

Located on north side (sunny) of draw. Clast are same as GS-1 ~~and~~ with abundant Barrois, Wiggins, Spring, Troy, & Diabase. Matrix is clay, tuffaceous, & looks sandy, & is unbedded. (Typical?).

## GS-4. Matrix sample.

Location:

Sample very similar to GS-1 both in matrix & clast type & distribution.

## GS-5 Matrix sample.

~~Same~~ location for GS-5 & 6:

Area is in roadcut with excellent exposure. Cut by faulting (near Pn-Tw fault contact). Has tuff diabasic matrix somewhat sandy texture with clumped appearance. Contains abundant subrounded clasts of diabase, quartzite, & limestone. Clast 2"-6" with some large 2 ft <sup>sub-</sup> rounded clasts. Clast = 50%, matrix = 50%.

## GS-6 Rock sample.

Sample in GS-5, of weakly altered, epidote-hematite, ...

GS-7 & 8 Gila Conglomerate Cover above  
mapped QTh flows. Location:

GS-7. Matrix sample.

Sandy, alkalai, tuff with QTh & Td fragments  
plus dolares, quartzite, limestone and igneous  
(a quartz-rich, plagioclase granite).

GS-8. Rock sample.

Sample of quartz-rich, plagioclase granite showing  
only weak clay, insipient alteration.

D-Series Drill Hole Cuttings - Pinto Creek.

D-1. NW  $\frac{1}{4}$ , SE  $\frac{1}{4}$ , Sec. 33, T1N, R14E Unsurveyed.

Heavy Fe and clay w/ gty-sericite. No visible Cu. (MCC).

D-2. NW  $\frac{1}{4}$ , SE  $\frac{1}{4}$ , Sec. 33, T1N, R14E Unsurveyed

Quartz-sericite, highly leached, no visible copper. Home St.

D-3. SW  $\frac{1}{4}$ , NE  $\frac{1}{4}$ , Sec. 33, T1N, R14E Unsurveyed.

Schist with alteration (sericite), minor vol clay, outcrop, no  
visible copper (MCC?).

HC-Series SW  $\frac{1}{4}$  Sec 18, T2S, R13E

HC-1 Possible soil development on PNoce with abundant Trays & Bds.  
Rare dolares - No outcrops - only slope material

HC-2 More sandy-tuffaceous regolith w/ similar fragments.

Lucerne dolares (reddish-black), schist, & few  
DMatrix fragments. Most clasts in HC-1 & HC-2 are

$\frac{1}{4}$ "-3" with some 6"-10". Apparent Lucerne size

toward HC-2. Still no CC for local direction

No TPNoce or M Escal. in either loc. all mag. direction for



HC-2 continued

with minor rounded conch.

HC-3 1000 sample - taken from across  
sand. med. silt & lens of TP Nacc with  
some Koba & Troy type quartzite in anays.  
Banks of soil-tuff along anays well contain  
locally frequent. No trends regular fac.

A-1 Series Drill hole A-1, located

Whole rock-matrix sample  
A-1a. 1532 depth. <sup>11</sup> Reddish-brown matrix (50%) with  
1/8" - 1/4" <sup>8</sup> subangular fragments, predominantly bleached  
limestone with minor quartz (from granitoid) and schist.  
~~12~~

A-1b. 1540-1550 depth. Whole rock-matrix sample.  
Water-bleen lithic loess, light gray-green-tan coloration.  
Assayed as sample A-1-11, with Cu = 0.02%, Zn = 0.01%,  
~~12~~ Mo = 0.0003%, and Pb = trace.

A-1c. 1565 depth. Matrix sample (-60 mesh fraction).  
Tuffaceous sand matrix (90%) with minor schist  
clast (10%). Nearby are quartzite clasts.

A-1d. 1565 depth. Intermediate matrix sample.  
(-3/8", +60 mesh fraction from sample A-1c).

M-1A Series Drill hole M-1A, located

M-1Aa. 2430 depth. Whole rock-matrix sample.  
Very fine-grained, mudstone-sandstone siltstone  
tuffaceous matrix, water-bleen with sand-grit clast  
of granitic (?) derived ~~material~~ fragments. Elsewhere,  
nearby, are 1/8" fragments of granitoid and schist.

M-1Ab. 2447 depth. Modified whole rock-matrix sample.  
Very sandy-gritty, predominantly granitoid fragments with

few large schistose granite clasts; all with tuffaceous matrix. Sample crushed and large fragments removed.

M-1A-c. 2893 depth. Whole rock-matrix sample. Muddy, "shaley" with internal slickensides, mudstone and minor siltstone, red-brown, with minor tuffaceous beds and lenses.

A-4 Series. Drill hole A-4, located

A-4 a. 2708-2716 depth. Whole rock-matrix sample. Marlstone in early part of run, then typical gritty matrix with abundant  $\frac{1}{4}$ " subangular clasts of ~~granite~~ altered porphyry, granite, and schist. (Assayed as sample ~~A-4C1~~ A-4C1, with Cu = 0.05%.)

A-4 b. 3606 depth. Modified whole-rock-matrix sample. Reddish-brown gritty matrix (40%) with large  $\frac{1}{2}$ " - 2" clasts of granite and schist. Minor native copper on shear plane surfaces. (Sample crushed to  $\frac{3}{8}$ " and large clasts ~~removed~~ removed).

A-4 c. 5100-5120 depth. Whole rock-matrix sample. Very gritty, dark brown to red-brown matrix (40%) tuff-clasts with large angular to subangular clasts (40%) of diabase, quartzite, and schist. Visible native copper. (Assayed as sample A-4C8, with Cu = 1.17%.)

# A-4d. 6321 depth. Modified whole rock-matrix sample.

Sandy, red-brown fragmental matrix (30%) with large 1"-2" clasts of diabase, quartzite, and schist. No native copper visible. (Sample crushed and sieved to  $-3/8"$ , large fragments removed).

~~Magma Company~~

Su - Series. Workings of Magma Copper Company.

Su-1 and -2 from new tunnel area ~~just~~ west of #6 shaft position. (~~Su-3 from #9 shaft~~). Su-3

from #9 shaft (~~or dumped,~~). Most of exposure show no trends, but some short imbrication has east transport direction suggestions.

Su-1. 4830 ft east of portal in Never Sweat tunnel. Whole rock-matrix sample.

Very sandy tuff matrix material with minor fragments of diabase and schist.

Su-2. 4250 feet east of portal in Never Sweat tunnel. Whole rock-matrix sample.

Same as in Su-1 with slightly more gritty texture.

Su-3 2300 depth below collar of #9 shaft. Whole rock-matrix sample.

Sandy to gritty tuffaceous matrix with minor clasts of diabase and schist.

PG- Series.

at NW corner of Sec. 1, T 15, R 13 E.

PG-1, Matrix sample, sandy tuff w/ clasts of Barre cgl, schist, diabase, quartzite, & limestone. Sieved sample.

PG-2. Diabase fragment 1 1/2 ft diameter, black <sup>oxidized</sup> zones but no native copper visible. No trend evident in area.

NE 1/4 NE 1/4, Sec. 36, T 1 N, R 13 E.

PG-3 Sandy, gneiss matrix, mainly granitic diabase with act. schist & few diabase fragments. Matrix sample. No trend evident.

the most reactive rocks in the district, and it is inconceivable that the copper could have traveled through these rocks for more than a few hundred feet without being precipitated. The presence of Paleozoic limestones in the downfaulted block east of the Castle Dome ore body practically eliminates the possibility that ground water could have transported the copper from that deposit.

### STRUCTURAL CONTROL

In the detailed study of the Globe-Miami district, one is greatly impressed by the prevalence of northeastward structural trends, particularly those related to such deep-seated phenomena as igneous intrusion and mineralization. All the productive mineral deposits of the district, as well as those of the Pioneer (Superior) district a few miles to the southwest, are distributed along a northeastward-trending belt about 6 miles wide (fig. 14). Within this narrow belt, there are 14 mines whose past production and known reserves are valued at more than \$1 million for each mine. Of this number,

2 of the mines have already produced more than \$5 million each, 4 have or will produce more than \$1 million each, and 2 others have produced more than \$1 million each. There are many smaller deposits that have yielded from a few thousand to several hundred thousand dollars in metals. The total production of the Globe-Miami district recently passed the billion-dollar mark, and the Pioneer district has produced about \$230 million in copper, silver, gold, and zinc.

The northeastward continuation of the belt includes the small but rich silver mines of the Richmond district with a total production of a little more than \$1 million. The southwestward extension takes in several small silver, lead, and zinc deposits of the Reynolds, Martinez Canyon, and Mineral Hill districts, which probably have a total production of about \$1 million.

The outcrop of the mineral belt is interrupted in the Globe Valley area between Globe and Miami by a thin cover of Gila conglomerate that is younger than the period of primary copper mineralization. Tertiary volcanic rocks, which also are postmineralization,

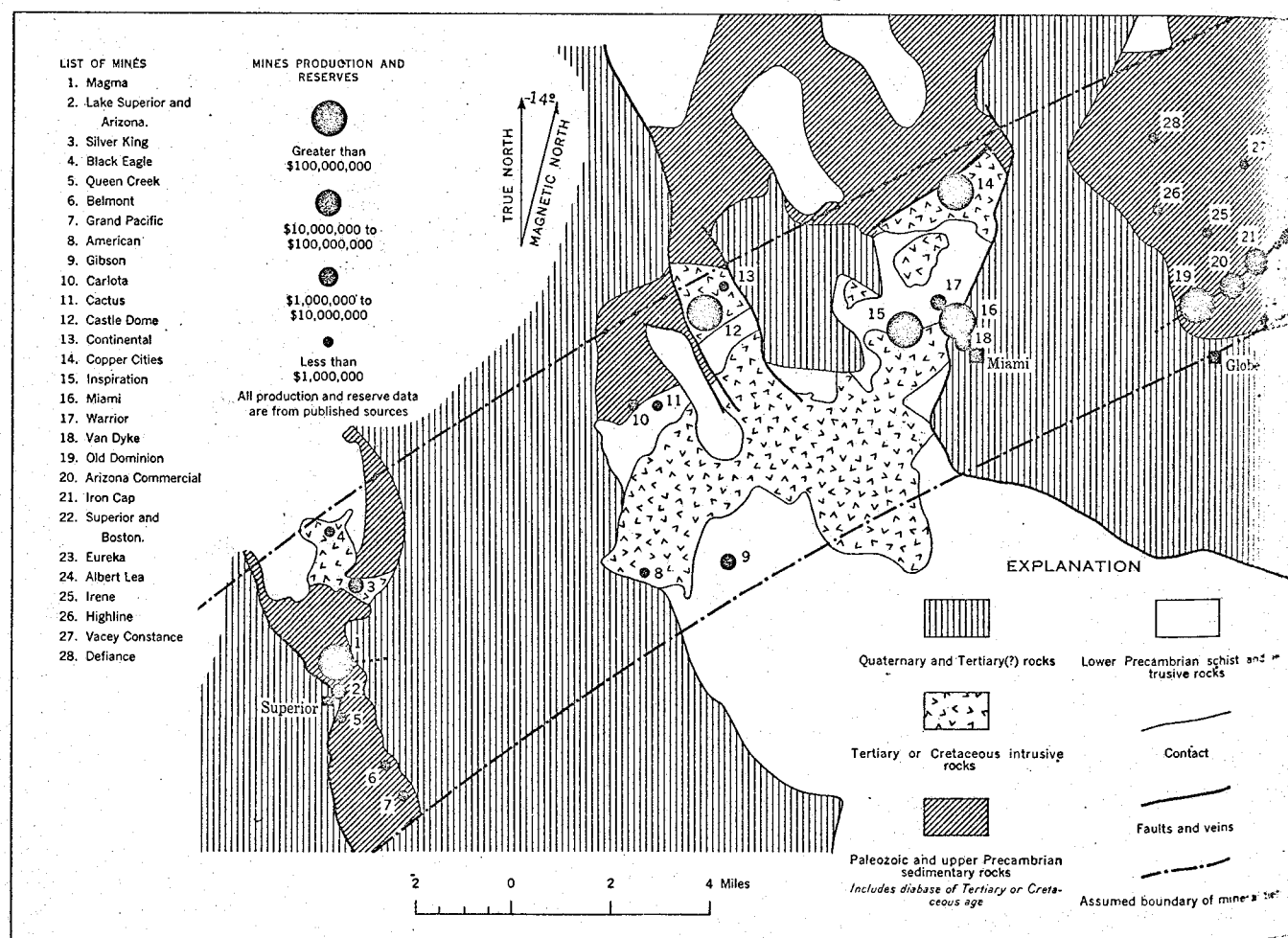


FIGURE 14.—Index map of the Globe-Miami and Pioneer districts showing assumed limits of the mineral belt and the location of the productive deposits.

TABLE

Sample Numbers, Type of Sample, Cu-Zn-Mo ppm Value, and Clast Notation

| Sample Number | Sample Type* | ppm Value |        |      | Clast Notation<br>(+) Abundant; (-) Minor               |
|---------------|--------------|-----------|--------|------|---|
|               |              | Cu        | Zn     | Mo   |   |
| A-1-a         | W            | 73        | 38     | 4    | (+) granitoid, schist                                   |
| A-1-b         | W            | (2000)    | 100    | 3    | lithic tuff (A-1-1 assay).                              |
| A-1-c         | M            | 62        | 69     | 2    | -60 mesh material; (-) gtyls, schist                    |
| A-1-d         | M            | 48        | 40     | 2    | - $\frac{3}{8}$ " + 60 mesh material; Same as A-1-c.    |
| A-4-a         | W            | (500)     | -      | -    | (+) granite, porphyry, schist. (A-4C1 assay)            |
| A-4-b         | W            | (1870)    | (413)  | (18) | (+) granite, schist. (Crushed & large frag. removed)    |
| A-4-c         | W            | (4000)    | -      | -    | (+) gtyls, diabase, schist (A-4C8 assay).               |
| A-4-d         | W            | (579)     | (249)  | (51) | (+) gtyls, dl., schist. (Crushed - large frag. removed) |
| BC-1          | M            | 100       | (230)  | (14) | (+) Mnco; (-) quartzite                                 |
| BC-2          | C            | (315)     | (2000) | (19) | Silic. lms, alt., mineralized in BC-3.                  |
| BC-3          | M            | 67        | (845)  | 7    | (+) Silic lms, alt. & mineralized.                      |
| CC-1          | M            | (230)     | 145    | 8    | (-) lms, dl., gtyls, schist.                            |
| CC-2          | C            | 118       | (509)  | 3    | Weathered, mineralized, Fe-rich dl. in CC-1.            |
| CC-3          | M            | (187)     | 133    | 9    | Massive tuff; (-) lms, dl.                              |
| CC-4          | M            | (335)     | 121    | (14) | (+) gtyls, dl.; (-) lms, schist.                        |
| D-1           | W            | (588)     | 10     | (85) | Cuttings; (+) Fe & clay in gtyl. series.                |
| D-2           | W            | (403)     | 63     | 2    | Cuttings; (+) heavily local gtyl. series                |
| D-3           | W            | 74        | 49     | (14) | Cuttings; (+) Schist; (-) alteration, series            |

|        |   |       |       |      |   |
|--------|---|-------|-------|------|---|
| ET-1   | M | (174) | 65    | (14) | (+) Mace; (-) Escabrosa, gtzite.                    |
| { GS-1 | M | 132   | (392) | 4    | (+) quartzite, diabase                              |
| { GS-2 | C | 62    | 99    | 2    | oxidized, weathered diabase in GS-1.                |
| GS-3   | M | 95    | (282) | 4    | (+) quartzite, diabase                              |
| GS-4   | M | 75    | 152   | 4    | (+) quartzite, diabase                              |
| { GS-5 | M | 76    | (404) | 2    | (+) quartzite, diabase, limestone.                  |
| { GS-6 | C | (358) | (385) | 2    | weakly altered diabase in GS-5.                     |
| { GS-7 | M | 37    | 120   | 1    | <u>GILA CONGLOMERATE</u>                            |
| { GS-8 | C | 121   | 69    | 3    | weakly alt. granite in GS-7.                        |
| HC-1   | M | 143   | 168   | 2    | Regolith; (+) Mace, Bolso, Troy; (-) diabase        |
| HC-2   | M | 63    | 133   | 2    | Regolith; (+) Mace, Bolso, Troy; (-) diabase        |
| HC-3   | M | 28    | 70    | 3    | dry sand, perhaps Regolith on Tar.                  |
| M-1A-a | W | 77    | (182) | 4    | mudstone; (-) granite, schist                       |
| M-1A-b | W | (522) | 133   | 1    | (+) granite   |
| M-1A-c | W | (330) | (201) | (13) | mudstone-siltstone-tuff.                            |
| PG-1   | M | 108   | (236) | 5    | (+) quartzite, limestone, diabase, schist           |
| PG-2   | C | 62    | 51    | 4    | oxidized, black, diabase clasts.                    |
| PG-3   | M | (335) | 64    | (23) | (+) granite; (-) diabase, schist.                   |
| SK-1   | C | 14    | 40    | 3    | Unmin. Silver King quartz diorite bedrock.          |
| { SK-2 | M | 23    | 38    | 5    | (+) Mace, Escabrosa, diorite; (-) quartzite, shale. |
| { SK-3 | C | 42    | 79    | (24) | Weakly altered fragments in SK-2.                   |
| SK-4   | M | 40    | 98    | 9    | (+) Diorite, gtz diorite; (-) diabase, schist.      |
| { SK-5 | M | 54    | 102   | 8    | (+) diabase; (-) gtz diorite, lms, gtzite, schist   |
| { SK-6 | C | 15    | 22    | 2    | Fe silicate in SK-5.                                |

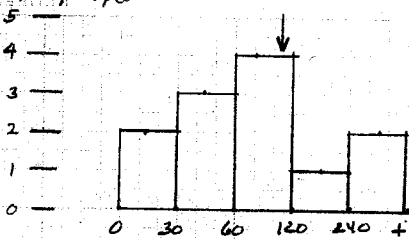


|       |   |       |      |      |  |
|-------|---|-------|------|------|--|
| SU-1  | W | 108   | 57   | 3    | (-) dl, xh.; 500 level Magma tunnel, <sup>contact.</sup> upper |
| SU-2  | W | 124   | 12.3 | 2    | (-) dl, xh, more gnt; same, lower contact.                     |
| SU-3  | W | (383) | 170  | 5    | (+) dl, xh.; "1900 level", Magma Shaft No. 9                   |
| WT-1  | M | 24    | 45   | 11   | (+) Mescol, basalt; (-) Matrix, gtzite.                        |
| WT-2  | M | 20    | 19   | 9    | (+) Mescol?, Escabrosa; (-) Bolon, diorite porphy              |
| WT-3  | C | 40    | 108  | (28) | Diorite porphyry in WT-2.                                      |
| WT-4  | M | (440) | 169  | (19) | (+) Diabase, Mescol; (-) diorite-granodiorite                  |
| WT-5  | M | (183) | 123  | 2    | (-) diabase, Mescol, diorite-granodiorite                      |
| WT-6  | C | 48    | 61   | 7    | diorite-granodiorite in WT-5                                   |
| WT-7  | C | 130   | 129  | 7    | diabase and epid. lens in WT-5                                 |
| WT-8  | M | (141) | 80   | (36) | Sand size material, mainly, tuff                               |
| WT-9  | C | 91    | 40   | (16) | (+) gtzite; (-) lens, dl, xh. in WT-8.                         |
| WT-10 | M | 120   | 148  | (13) | (-) gtzite, xh. in WT-8.                                       |

\* M, Matrix sample

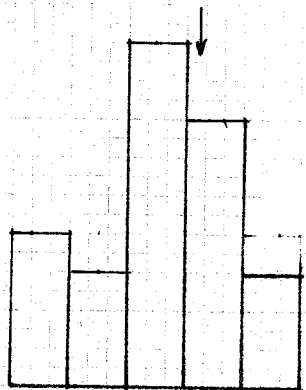
C, Clast sample

W, Whole Rock-Matrix sample.



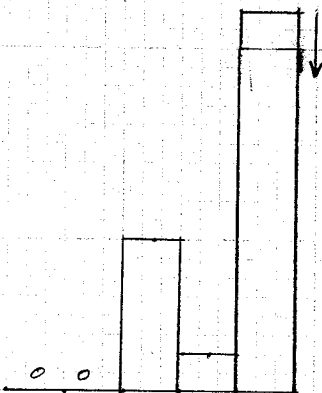
arith ave = 108

Cu in Clasts



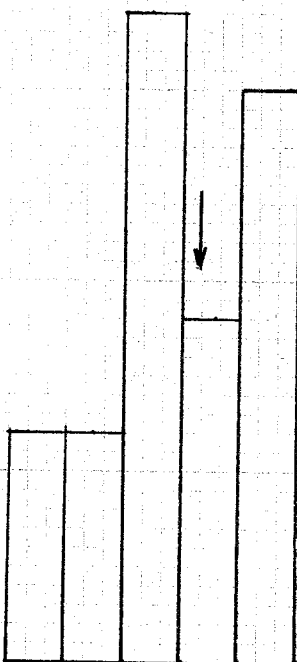
arith ave = 128

Cu in Matrix



ave 545

Cu in Whole Rock



ave 150

Cu in All Samples

Ca R 0-30 4, 15, (2)

31-60 42, 40, 48, (3)

61-120 118, 91, 62, 62, (4)

121-240 130, (1)

+ 315, 358, (2)

$$\begin{array}{r} 108 \leftarrow \\ 12 \overline{) 1295} \end{array}$$

Ca M 0-30 23, 24, 20, 28, (4)

31-60 40, 54, 48, (3)

61-120 120, 100, 67, 95, 75, 76, 43, 62, 108, (9)

121-240 230, 187, 174, 183, 161, 132, 143, (7)

+ 335, 440, ~~579~~, 335

(3)

$$\begin{array}{r} 145 \leftarrow \\ 27 \overline{) 3902} \\ 24 \overline{) 128} \leftarrow \\ 3323 \end{array}$$

Ca W 0-30 (0)

31-60 ~~71, 78~~, (0)

61-120 74, 73, 77, 108, (4)

121-240 124, (1)

+ 588, 403, 2000, 522, 330, 500, 1270, 10000, 323, <sup>579</sup> (10)

$$14 \overline{) 17052}$$

$$\begin{array}{r} 545 \leftarrow \\ 14 \overline{) 7631} \\ 70 \\ \hline 63 \\ 56 \\ \hline 71 \end{array}$$

$$\begin{array}{r} 543 \leftarrow \\ 13 \overline{) 7052} \end{array}$$

$$\begin{array}{r} 236 \leftarrow \\ 52 \overline{) 12,249} \end{array}$$

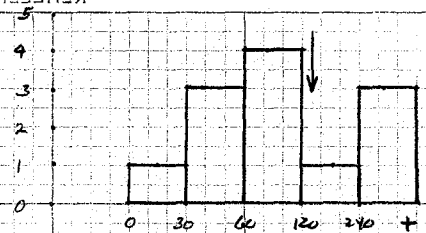
6

6

17

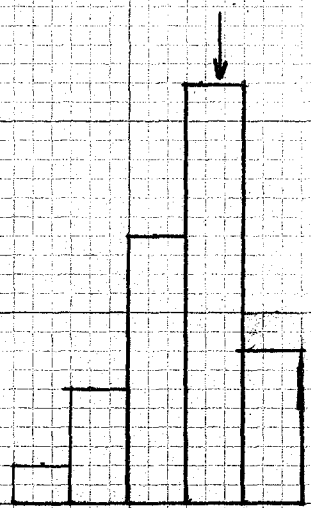
9

15



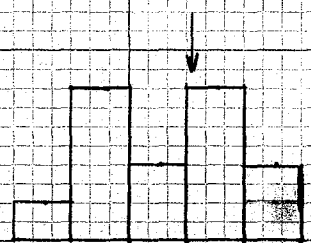
ave = 138

Zn in Chert



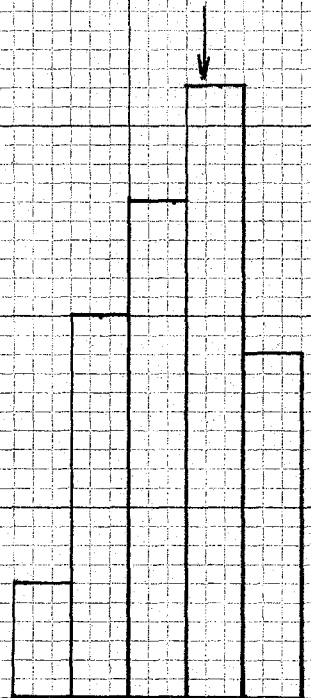
ave 108

Zn in Matrix



ave 136

Zn in Whole Rock



ave 150

Zn in All Samples

Zn R 0-30 22, ①

31-60 40, 40, 51, ③

61-120 79, 108, 61, 99, ④

121-240 129, ①

+ 509, 2000, 385, ③

12  $\overline{) 352.3}$  or 11  $\overline{) 1523}$  138

Zn M 0-30 19, ①

31-60 38, 45, 40, ③

61-120 98, 102, 65, 80, 70, 69, 64 ⑦

121-240 145, 133, 121, 169, 123, 148, 230, 152, 168, 133, 236, ⑪

+ 845, 392, 282, 404, ~~249~~ ④

193 ←  
27  $\overline{) 4820}$   
249

Zn W 0-30 10, ①

31-60 63, 49, 38, 57, ④

61-120 100, 113, ②

121-240 182, 201, 123, 170, ④

+ 413, 249 ②

26  $\overline{) 3371}$  = 168 ←  
268  
177  
156  
211  
208

~~127~~ 136 ←  
12  $\overline{) 1519}$  13  $\overline{) 1768}$   
128  
138  
150 ←  
51  $\overline{) 7642}$

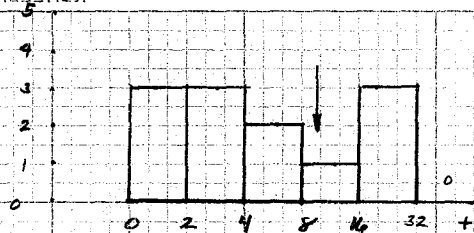
3

10

13

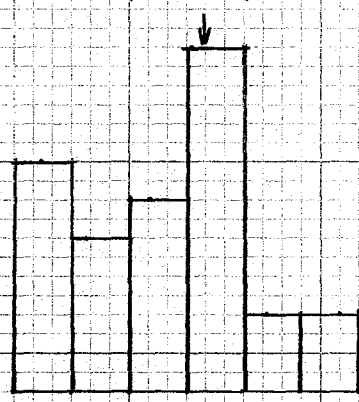
16

9



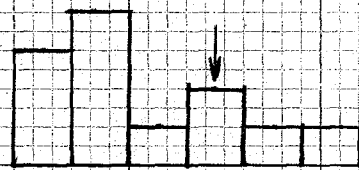
ave = 10

Mo in Platts



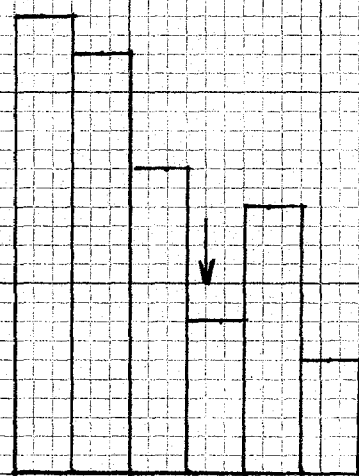
ave = 9

Mo in Matrix



ave = 10

Mo in Whole Rock



ave = 11

Mo in Total Samples

|      |       |             |     |
|------|-------|-------------|-----|
| Mo R | 0-2   | 2, 2, 2,    | (3) |
|      | 3-4   | 3, 3, 4,    | (3) |
|      | 5-8   | 7, 7,       | (2) |
|      | 9-16  | 16,         | (1) |
|      | 17-32 | 24, 28, 19, | (3) |
|      | +     |             |     |

10 ←  
12) 117

|      |       |                              |     |
|------|-------|------------------------------|-----|
| Mo M | 0-2   | 2, 2, 2, 2, 2, 2,            | (6) |
|      | 3-4   | 4, 4, 4, 3,                  | (4) |
|      | 5-8   | 5, 8, 8, 7, 5,               | (5) |
|      | 9-16  | 9, 9, 14, 14, 11, 9, 13, 14, | (8) |
|      | 17-32 | 19, 23,                      | (2) |
|      | +     | 36, <del>51</del>            | (1) |

10 ←  
27) 282  
9 ←  
24) 231  
234

|      |       |             |     |
|------|-------|-------------|-----|
| Mo W | 0-2   | 2, 1, 2,    | (3) |
|      | 3-4   | 4, 3, 4, 3, | (4) |
|      | 5-8   | 5,          | (1) |
|      | 9-16  | 14, 13,     | (2) |
|      | 17-32 | 18,         | (1) |
|      | +     | 85, 51      | (2) |

13 ←  
12) 154  
16 ←  
13) 205  
13  
75  
78

11 ←  
51) 553

12

11

8

4

7

3



Molybdenum

12 ppm  
threshold

15 ppm

Anomalous

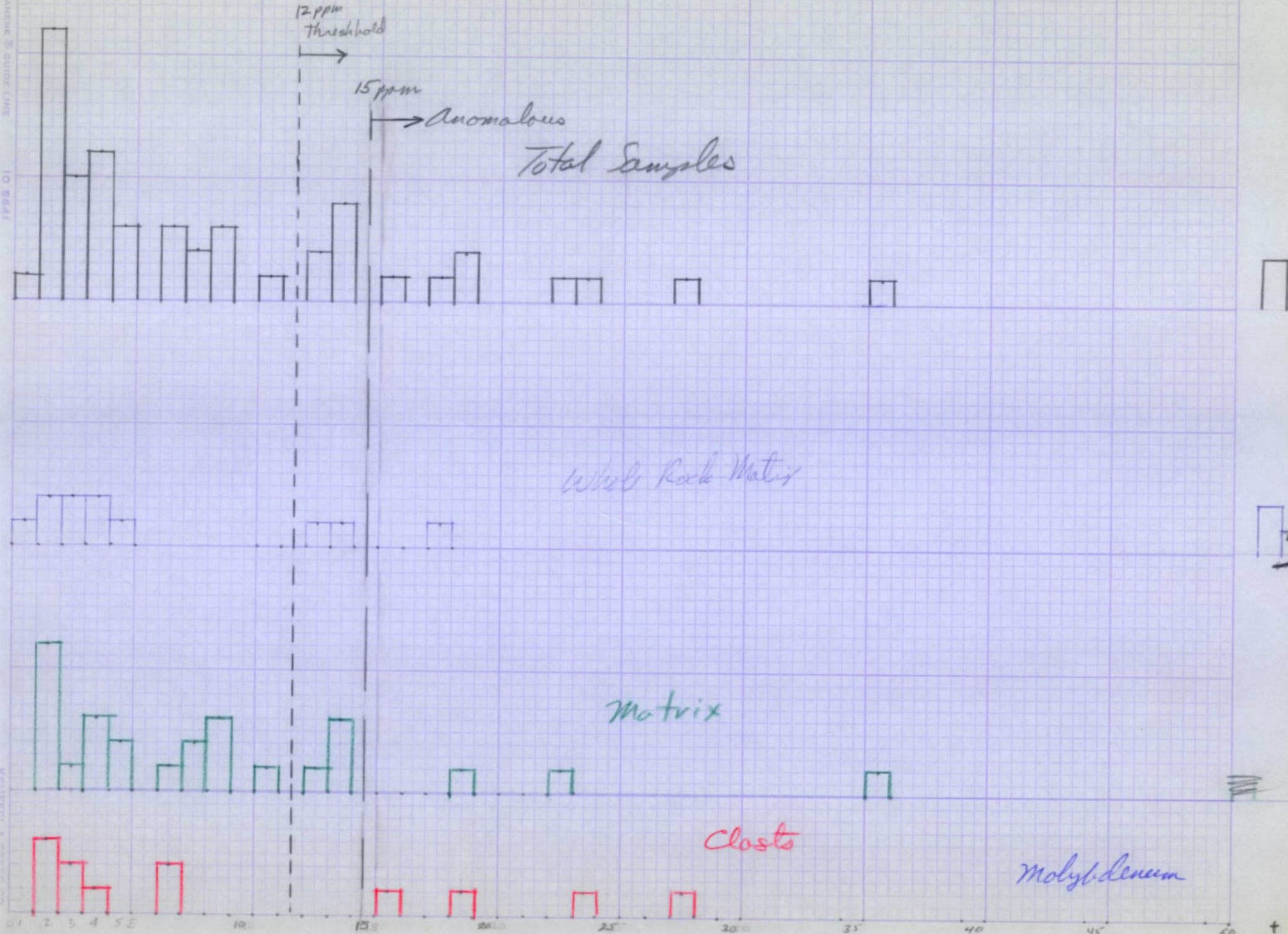
Total Samples

Whole Rock Matrix

Matrix

Clasts

Molybdenum





ZINC

170 ppm  
Threshold

200 ppm

→ Anomalous

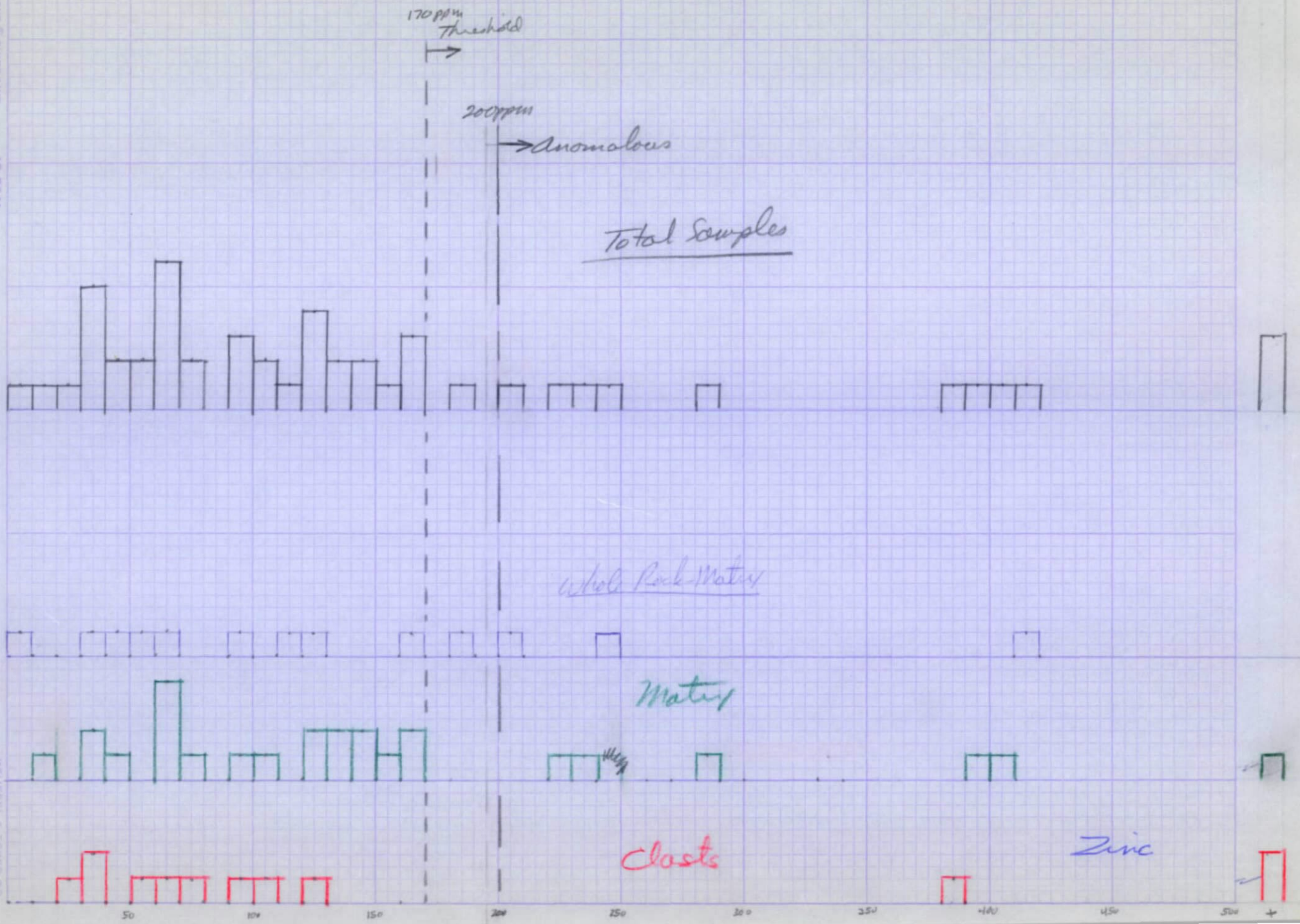
Total Samples

Whole Rock Matrix

Matrix

Clasts

Zinc





Copper

150 ppm  
Threshold  
→

200 ppm  
→ Anomalous

Total Samples

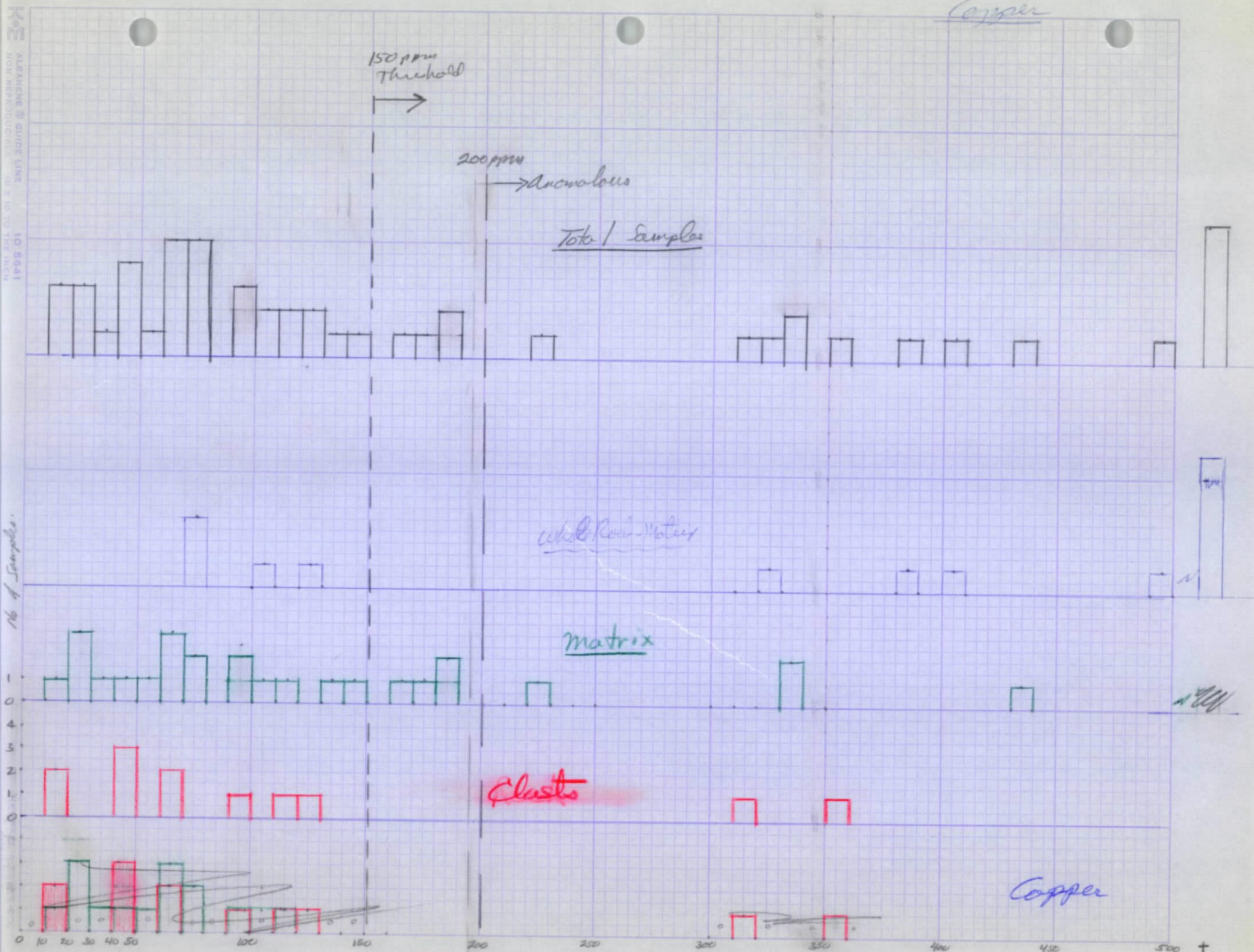
Whole Rock Matrix

matrix

Clasts

Copper

No. of Samples





## Jewell Hill Whitetail Sample:

JH-1. Matrix sand, lacitic tuffaceous with abundant diabase debris. ~~Sieved~~ <sup>screened</sup> sand (-1/4").

JH-2. Same location. Only alt. db fragments, ~~alt.~~ with abundant Fe. Crushed & screened to -1/4". Area 1 & 2 is dumped zone with predom db fragments, thin gtyls, minor lms. Most clast below 6" sig.

JH-3 Matrix sand, ~~lacitic~~ lacitic tuffaceous & diabase debris. Screened - 1/4".

JH-4. Pred. diabase frags, somewhat alt & mineralized. Crushed & screened to -1/4".

Area 3-4 is also dumped area with weak westerly trend. Fragment pred. db, less gtyls, & few lms; also conspicuous pink (Keweenaw?) brownish grains (maybe garnetiferous? from db.?). Area is about 1/2 large frag (+1 foot) & 1/2 smaller fragments (-5").

Down below JH-3 & 4 area, in saddle just east of round hill of gp island, the trend is weakly to S 45° W. However, no gp in Tm visible.





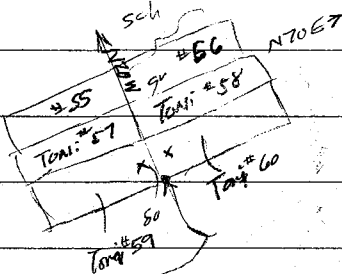


Wood 2x2 w/ fresh orange flagging.

{SE Corner of CORK 103; SW Cor 104; NE Cor 105; NW Cor 106.

east side of lower creek road downhill from Peak north of gr canyon.

Approx. 300' to North is two loc. man. w/.



Toni

21 May 1971

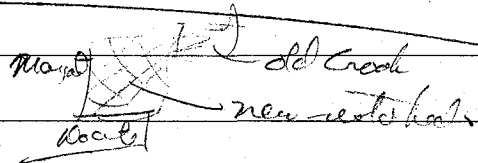
Noander incorporated

PO Box 50326

H. Kent Mochel, agent.

Peris G. 1 to 2 miles distance  
from Tambien Spring, Gila Co.

ICC marked 57 Creek down



Whitetail Sample

at wt-sch area of grasshopper on Eder grass.

PG-1 Motus, buff sandy w/ clasts of bones cgl, sh,  
sh, quartz & lms. (Seined).

PG-2 Ribbed frag 1 1/2' dia, blk spot zone, no  
notus is visible No head evident

PG-3 at FTG turned Sudy grass motus, mainly g. d. sh &  
few sh frag. Highly shaded No trend.

MW sup. DPH south to 710' where lost in out of 3000  
station in #9 shaft. Has mined which they are available to  
check.

**TAB**

Superior east water

during the gravity studies

As Neumont overran much of land claimed by AAPAC ~~land~~  
After several discussions of the matter, Neumont (Tueson) turned  
over the gravity data to AAPAC. This information is presently  
with the AAPAC Solidity lab for review and possible  
interpretation.

Severe rainfall during Superior  
year 1962 <sup>thru</sup> 1971

plus indiv months for 1962  
• 1971

AMERICAN SMELTING AND REFINING COMPANY  
Tucson Arizona

March 30, 1972

MEMORANDUM

TO: W. L. Kurtz

FROM: J. D. Sell

Water from Queen Creek  
Arizona Water Company  
Superior, Arizona

In verbal conversation with Mr. William Delbridge, Manager, Arizona Water Company, Superior, the following items are of interest. Superior picks up in Queen Creek, at three separate points, available water during runoff seasons. In 1962 through 1970 they averaged 25-30 million gallons per year, whereas in 1971 they collected only 12.7 million gallons.

The Magma haulage tunnel was completed to the new No. 9 shaft and the shaft completed to a lower depth during the summer of 1971. The tunnel cuts under Queen Creek and is in dacite all the way from #6 to #9 shaft. A spring just north of #9 shaft dried up last summer, and no water now runs in Queen Creek except in excessive runoff periods.

Mr. Delbridge also stated that generally the December-January snow-rain runoff is sufficient to keep water in Queen Creek up into April. However, this year the flow stopped in less than a month. In 1971 the runoff in April was 0.4 million gallons versus 4.0 million gallons in 1962.

Mr. Delbridge strongly feels that Magma's new workings have created a new drainage level for the water table, in that part of the volcanics and thus the water in the formation does not surface in Queen Creek, but instead is tapped out by the workings. He reports that #9 shaft is presently pumping 80 gallons per minute, but that Magma needs some three times that for operations in the cooling towers and related operations being put in at #9.

The following table gives the approximate gallons of water trapped in Queen Creek for the years 1962, 1971, and 1972, plus the water pumped from the valley wells during 1971. As can be seen, the Queen Creek catchment contributed approximately ten percent of the water during 1971 (and this must be a considerable drop from previous years).



TABLE 1\*

| <u>Month</u> | <u>Millions of Gallons<br/>from Queen Creek</u> |             |             | <u>Millions of<br/>Gallons from<br/>Valley</u> |
|--------------|---|-------------|-------------|--|
|              | <u>1962</u>                                     | <u>1971</u> | <u>1972</u> | <u>1971</u>                                    |
| January      | None  | 2.3         | Minor       | 8.5  |
| February     | 4.0   | 1.0         | None        | 7.5  |
| March        | 5.0   | 1.4         | None        | 8.0  |
| April        | 4.0   | 0.4         |             | 12.3   |
| May          | 1.0   | None        |             | 14.5   |
| June         | 1.0   | None        |             | 15.4   |
| July         | 0.6   | None        |             | 19.4   |
| August       | 0.3   | None        |             | 12.7   |
| September    | 1.0   | 0.1         |             | 15.7   |
| October      | 2.0   | 4.4         |             | 6.0  |
| November     | 2.0   | 1.5         |             | 7.2  |
| December     | 2.0   | 1.6         |             | 8.9  |
|              | 22.9  | 12.7        | Minor       | 136.1  |

\*Verbal, March 28, 1972, Mr. W. Delbridge.

*James D. Sell*  
J. D. Sell

JDS:lad

RBC, JPS

I know there was some good MS at 1000  
- happy!! RBC- got problem with dam - by the way  
a chance of using Colorado PB water



AMERICAN SMELTING AND REFINING COMPANY  
EXPLORATION DEPARTMENT

120 BROADWAY, NEW YORK, N.Y. 10005

RECEIVED

FEB 28 1974

S. W. U. S. EXPL. DIV.

Any chance dam is Devils Canyon?

JOHN J. COLLINS  
DIRECTOR OF EXPLORATION

AIR MAIL

February 25, 1974

Mr. W. L. Kurtz  
Southwestern Division  
Tucson Office

Arizona  
Water Farms

Dear Mr. Kurtz:

Your exchange of correspondence with Mr. Osborne on this subject prompts me to ask about our knowledge of a water supply for Superior East. We have spent a million dollars there already with some encouragement, so the subject of a water supply deserves a preliminary appraisal and recommendations.

In view of the shortage in Arizona, I think water supply should be the subject of comment in most every request for a sizable drilling project, to be expanded when mineralization is found in the Southwest.

Very truly yours,

John J. Collins

In talking w/ H.L. since USFS, he has mentioned several times that Ray Mino approached their dam idea somewhat wrong in that it is merely a constant flow structure and can not be used for storage. This is based on water users downstream protesting. However, some felt that had they worked thru the FS, Recreation Dept, Fish & Wildlife then they could have inaugurated the water & utilized it by keeping a "minimum" wildlife amount of water. The present dam will back water to just above the jet of Devils Canyon - ~~Devils Canyon~~ & Mineral Creek. (JPS)

AMERICAN SMELTING AND REFINING COMPANY  
TUCSON ARIZONA

February 28, 1974

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

Superior East  
Water Farm

Dear Mr. Osborne:

We have recognized that finding water for a large-scale mining operation at Superior East will be a major problem. Mr. Crist has been looking into possible supplies, but has not yet completed his study.

Very truly yours,

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

WLK:1b

cc: RBCrist  
JDSell ✓



copy for JDS, NPW  
WIK

# Water Development Corporation

CONSULTANTS IN WATER RESOURCES

3938 SANTA BARBARA AVENUE  
TUCSON, ARIZONA 85711

April 12, 1974

PHONE: 602-326-1133  
CABLE: WADEVCO, TUCSON

## MEMORANDUM REPORT

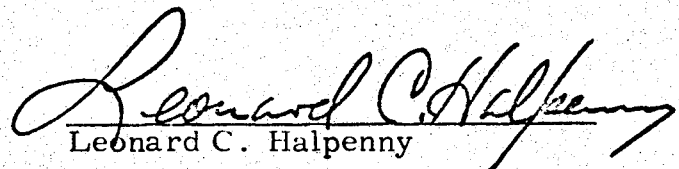
To: R. B. Crist

Re: Preliminary water-supply investigation for "Superior East" Project

We have made a brief reconnaissance of the general area of the "Superior East" project, and a brief review of some of the available literature for the purpose of determining potential areas for development of a ground-water supply.

As of this date we have the following comments and observations to make:

1. In order to exhaust all possibilities within the immediate area of the project, consideration should be given to the potential that may be developed from the Gila conglomerate, dacite, and Whitetail conglomerate. It may at least be possible to develop a partial supply, and present and future drillhole information such as intercepts penetrated, water encountered, structures cut, fluid levels in the holes, drilling problems encountered, etc., will be useful to evaluate the area. To date, this source is not promising (J. Sell, oral communication, April 9, 1974).
2. A more promising source is Dripping Springs Valley, approximately 6 airline miles southeast of the extreme southeast corner of the "Superior East" group of claims. Several thousands of feet of gravels, conglomerate, and conglomerate have been intercepted by drilling east of the margin of the Dripping Spring Mountains in this area. A determination as to the land situation in this area would be useful at this stage.
3. A third, and obvious source would be in the vicinity of the Gila River (Ray-Kelvin area). Disadvantages related to this source are pipeline distance, lift, and potential legal entanglements.

  
Leonard C. Halpenny

April 12, 1974  
Date



# Water Development Corporation

CONSULTANTS IN WATER RESOURCES

3938 SANTA BARBARA AVENUE  
TUCSON, ARIZONA 85711

February 20, 1978

CABLE: WADEVCO, TUCSON  
PHONE: 602-326-1133

Mr. R. B. Crist  
ASARCO, Incorporated  
Post Office Box 5747  
Tucson, Arizona 85703

Re: Potential Ground-Water Supply - Slash S Ranch

Dear Mr. Crist:

On January 25, 1978 I visited the Slash S Ranch with Jim Sell of your office. In the field we visited seven of the stock and domestic wells and two springs accompanied by Walt Lockhart and Foster Bailey, ranch manager. Of primary interest, of course, are the eight wells located within the inner basin or valley away from bedrock, which would include the three wells at the ranch headquarters, Lower Cedar well, Stone Cabin well, Lower Well, and Skunk Camp Wells 1 and 2. All of these wells are sealed and to measure current water levels would require cutting holes in the plates over the well casings. According to Mr. Bailey the Old Pasture Well and Upper Cedar Well can be measured but these are shallow dug wells located in bedrock. The springs are also either in bedrock or quite close to the bedrock-conglomerate contact.

The eight wells referred to above as being in the inner basin or valley are located on what has been mapped and described by the U.S. Geological Survey as surficial and conglomeratic materials. In local terminology these conglomeratic materials are generally referred to as the Gila Conglomerate. Available data from Mr. Bailey for these particular wells are tabulated on a page attached to this letter. Maximum depth to water and maximum penetrated saturated thickness is for Skunk Camp Well No. 1. Minimum depth to water is for the Lower Cedar Well.

The drainage divide between Mineral Creek and Dripping Spring Wash is a little over a mile northwest of the ranch headquarters. Lower Cedar Well is located about 1.5 miles northwest of this divide and is in the Mineral Creek drainage basin. The other seven wells are in the Dripping Spring Wash drainage basin. Water level data for these seven wells

indicate a south-southeast gradient on the water table. Between the Headquarters No. 1 Well and the Lower Well this gradient amounts to 86 feet per mile.

Discharge-drawdown data, such as bailing tests during drilling, are not available nor are driller's logs describing the materials encountered. If the reported cased depths are correct it would indicate the materials are fairly competent and not prone to caving in.

Favorable evidence related to the range of total thickness of the materials these wells are bottomed in is furnished by the U. S. G. S. geologic map of the Sonora Quadrangle. A diamond drill hole 800 feet east of bedrock located at (D-2-14) 20 cad is reported to have been drilled to a depth of 2,919 feet in Pliocene and possibly older conglomerate without encountering bedrock. This hole is in the Mineral Creek drainage basin about three miles northwest of the ranch headquarters. In addition a churn drill hole 900 feet east of bedrock located at (D-3-14) 24 bbb was bottomed in gravel at a depth of 1,470 feet. This hole is in the Dripping Spring drainage basin about 3.6 miles southeast of the ranch headquarters. Based on these holes and their field mapping the U. S. G. S. interpretation is that a steep normal fault with more than 2,900 feet of displacement, downdropped to the east, bounds the west margin of Dripping Spring Valley. From this maximum thickness the conglomeratic materials are projected to gradually thin to zero to the northeast and east at their contact with bedrock.

A rough estimate of the total volume of ground water in storage in the conglomerate within the Slash S Ranch area was made as follows:

1. The southwestern boundary of the area conforms to the fault as mapped on the U. S. G. S. Sonora Quadrangle geologic map, extending northwest-southeast through Secs. 20, 29, 32, and 33, T. 2 S., R. 14 E., and Secs. 4 and 10 of T. 3 S., R. 14 E.;
2. The northeastern boundary of the area was sketched in at the approximate contact between conglomerate and bedrock and extends northwest-southeast through Secs. 22, 27, and 35 of T. 2 S., R. 14 E., and Secs. 2 and 1 of T. 3 S., R. 14 E.;
3. Using the northwest and southeast limits of the ranch lease area for the remaining boundaries the area within these limits was planimetered. The area in the Mineral Creek drainage basin amounts to 1,600 acres and in the Dripping Spring drainage basin amounts to 4,000 acres giving a total

of 5,600 acres underlain by conglomerate;

4. Thickness of conglomerate along the southwest margin of this rectangular area was assumed to be 3,000 feet and along the northeast margin zero. Assuming a uniform slope along the base of the conglomerate from the southwest upwards to bedrock exposures at the northeast average thickness would be 1,500 feet;

5. Depths to water levels along the axis of the valley, which roughly is the same as the alignment of the major fault, were 50 feet for Lower Cedar Well, 172 feet for Headquarters No. 1 Well and 74 feet for Lower Well. An average depth of 100 feet to water was assumed along the southwest side of the area. Depth to water would increase to the northeast but water level data are not available. Average depth to water for the area is estimated to be in the range of 300 feet giving an average saturated thickness of 1,200 feet.

Based on the above assumptions and estimates the total volume of saturated conglomerate within the planimetered area would amount to 6,720,000 acre feet. Assuming the materials are relatively tight, as possibly indicated by the casing records for the existing stock and domestic wells and applying a storage coefficient of 5% the volume of ground water in storage would be in the range of 336,000 acre feet. It would not be possible, of course, to withdraw this total volume but to give some indication of the magnitude of this volume in terms of ground-water pumpage, it would require pumping at a rate of 3,000 gpm for about 70 years to produce an equivalent amount of water.

In summary, we consider that this area has considerable potential for a ground-water supply especially in view of the apparent thick section of saturated conglomerate along the southwest margin. Also, to our knowledge, this appears to be the only area reasonably close to your exploration drilling which has this potential. The critical unknown is the rate at which the materials would yield water to deep, large diameter wells, and a program of test drilling would be necessary to determine this. The initial phase of the test drilling should consist of drilling two to four small diameter holes preferably with core rigs, but at least with rotary rigs which could take spot cores every 50 to 100 feet. These holes should be drilled to bedrock and down-the-hole geophysical logs should be run on each hole. The second phase would be construction and testing of a water well. Location and depth to drill this well would depend on data from the small diameter holes. All of the test drilling should be done on deeded land.

Mr. R. B. Crist

Page 4

February 20, 1978

If you have any questions or comments please call.

Sincerely yours,

*Donald K. Greene*

Donald K. Greene - Vice President  
Water Development Corporation

DKG/cim

178



Attachement to Letter of February 20, 1978  
 Letter addressed to R. B. Crist - ASARCO Inc.

| <u>Well<br/>Location</u> | <u>Well<br/>Name</u> | <u>Depth<br/>Drilled<br/>(ft)</u> | <u>Depth<br/>Cased<br/>(ft)</u> | <u>Water Level<br/>and<br/>(ft)</u> | <u>Date</u> | <u>Saturated Thickness<br/>Based on Depth Drilled<br/>(ft)</u> |
|--------------------------|----------------------|-----------------------------------|---------------------------------|-------------------------------------|-------------|--|
| (D-2-14) 20 cdd          | Lower Cedar          | 200                               | -                               | 50                                  | 07-45       | 150  |
| (D-3-14) 3 adc           | Stone Cabin          | 300                               | 50                              | 165                                 | 04-47       | 135  |
| (D-3-14) 4 aca           | Headquarters No. 1   | 400                               | 70                              | 172                                 | 05-43       | 228  |
| (D-3-14) 4 aca           | Headquarters No. 2   | 400                               | -                               | 231                                 | 08-41       | 169  |
| (D-3-14) 4 aca           | Headquarters No. 3   | 392                               | -                               | 175                                 | 05-43       | 217  |
| (D-3-14) 10 ddc          | Lower Well           | 250                               | 250                             | 74                                  | 05-40       | 176  |
| (D-3-14) 11 abc          | Skunk Camp No. 1     | 565                               | 43                              | 315                                 | 1951        | 250  |
| (D-3-14) 11 abd          | Skunk Camp No. 2     | 400                               | 75                              | 200                                 | 1959        | 200  |

4/21/78

## Hole Status & Water

hole JI-46  
(A-7)

15" hole from surf to 22'  
9" hole from 22' - 1400'  
6 1/4" hole from 1400' - 2420' } } 7" OD casing  
4 1/2" OD casing  
1<sup>st</sup> water @ 340'  
water continues to  $\pm 1475'$ .

hole JI-18  
(M-1A)

5 3/4" (?) hole from surface - 2400'  $\pm$ . 4 1/2" OD casing  
making water @ 1077'.

hole JI-29  
(OF-1A)

6 1/4" hole from surface - 2000'  $\pm$ .  
water may be @  $\pm 550'$ , otherwise may be  
air to 1860'.

hole JI-52  
(A-4)

9 7/8" hole from surf - 253'  
9" hole from 253' - 1082'  
6" hole from 1082' - 2077' } } 7" OD casing.  
4 1/2" OD casing  
water at  $\pm 400'$  to 1500'  $\pm$ .

4/21/78

# Holt Status & Water

hole JI-46

15" hole from surf to 22'  
9" hole from 22' - 1400'  
6 1/4" hole from 1400' - 2420'

} } 7" OD casing  
} } 4 1/2" OD casing

1<sup>st</sup> water @ 340'  
water continue to ± 1475'

hol JI-18

5-3/4" (?) hd. from surface - 2400 ±. 4 1/2" OD casing  
making water @ 1077'.

heli JI-29

6 1/4" hole from surface - 2000' ±.  
water may be @ ± 550', otherwise may be  
air to 1840'.

Vol II-52

$9\frac{7}{8}$ " hole from surf - 283' } } 7" OD casing.  
 9" hole from 283' - 1082' }  
 6" hole from 1082' - 2077' } } 4½" OD casing

water at  $\pm 400'$  to  $1500' \pm$ .

The runoff curve number rainfall-runoff relationship for a lumped watershed is reconciled with a uniform loss rate ( $\phi$  index) through temporal variation in rainfall intensity. The necessary intensity-duration distribution is given by  $i = (P/T)[(7.5/1+24t/T) - 1.5]$ , where  $P$  is total storm rainfall (inches),  $T$  is storm duration (hours), and  $i$  is intensity (in/hr) at time  $t$  (hours). Using this as a standard for comparison, inferences may be drawn on the effect of storm rainfall intensity and distribution and runoff curve number.

2:45-3:00 THE COMPARTMENTED RESERVOIR, EFFICIENT WATER STORAGE FOR ARIZONA

C. Brend Cluff (University of Arizona, Tucson, Arizona)

The compartmented reservoir is an efficient method of storage of water in areas having a relatively flat terrain where there is a significant water loss through evaporation.

The paper will demonstrate that larger water losses through evaporation in flat terrain can be reduced by compartmentalizing shallow impervious reservoirs and concentrating water by systematic pumping from one compartment to another. Portable low-head high-capacity pumps are commercially available to make the method practical for small reservoirs as well as large systems.

Examples will be presented to demonstrate the Compartmented Reservoir Optimization Program as well as the potential of the use of the method in Arizona.

3:00-3:15 EFFECTIVENESS OF SEALING SOUTHEASTERN ARIZONA STOCK PONDS WITH SODA ASH

Herbert B. Osborn, J. Roger Simanton and R. B. Koehler (USDA, ARS, Tucson, Arizona)

The increasing water requirements of Arizona cities and industries mean farm and ranch interests must make more efficient use of available surface water supplies. One relatively simple method of providing more water for the rancher is to seal the bottoms of watering ponds to reduce water loss by seepage. In most areas, seepage from stock ponds does not reach groundwater, so decreasing percolation would not reduce available subsurface water supplies. Beginning in 1967, soda ash has been used to affect partial sealing of several stock watering ponds on the USDA, ARS Walnut Gulch Experimental Watershed in Southeastern Arizona. Both laboratory and field tests showed that the sealing effectiveness of soda ash depends upon the clay fraction in the pond sediment. Seasonal water level changes were compared before and after soda ash application. Results indicated that the usefulness of many ponds could be effectively extended using soda ash for a sealant.

*Mud-gel. 50#, #3 75*

3:15-3:30 COFFEE BREAK

*Soda ash. 100#, #16 70*

3:30-3:45 SIMPLE TIME-POWER FUNCTIONS FOR RAINWATER INFILTRATION AND RUNOFF

R. M. Dixon, J. R. Simanton and L. J. Lane (USDA, ARS, Tucson, Arizona)

JDS

15 APR '80

JAMES :

SUPERIOR EAST - RAWHIDE

WHY DON'T WE DISCUSS THE WATER  
WELL YOU MENTIONED EARLIER THIS  
YEAR, LAST YEAR, THE YEAR BEFORE THAT,  
ETC...?

MAYBE THE AGE IS UPON US, I HAVE  
A FEELING WE COULD FIND OURSELVES  
WITH TWO THIRSTY DRILLS AND A LOT  
OF THIRSTY CATTLE ONE OF THESE DAYS.

ISN'T FTG PLANNING TO WRITE A NEW  
SUPPLEMENTAL EA REQUEST?

NPW)