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

The following file is part of the

James Doyle Sell Mining Collection

ACCESS STATEMENT

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

CONSTRAINTS STATEMENT

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

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

QUALITY STATEMENT

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

Geological Association of Canada
Association géologique du Canada
Department of Earth Sciences
Memorial University of Newfoundland
St. John's, Newfoundland A1B 3X5

Mineralogical Association of Canada
Association minéralogique du Canada
Royal Ontario Museum
100 Queen's Park
Toronto, Ontario M5S 2C6

ABSTRACT FORM/*FORMULAIRE DE RÉSUMÉ*

Exact format shown on instruction sheet *must* be followed
Prière de vous conformer aux directives ci-jointes

Abstracts will be reviewed prior to acceptance
Les résumés seront évalués avant d'être acceptés

CLASSIFICATION
SPÉCIALITÉS

Please specify one. If more tha one category is appropriate, indicate your order of preferen Be specific.

Indiquez par ordre du priorité la (les) spécialité(s).

Applied Mineralogy
Bibliographic Data
Crystal Chemistry
Crystallography
Geochemistry
Geochronology
Geology
- archeological
- coal
- economic
- educational
- engineering
- environmental
- extraterrestrial
- general
- glacial
- historical
- history of
- marine
- mathematical
- petroleum
- Precambrian
- Quaternary
- regional
- structural
- teaching

Geomorphology
Geophysics
Geoscience Information
Hydrogeology
Mineralogy
Numerical Data Bases
Paleontology-Paleobotany
Petrology
- experimental
- igneous
- metamorphic
- sedimentary

Remote Sensing
Sedimentology
Stratigraphy
Tectonics
Volcanology
Waste Disposal
Well-Log Retrieval
Others (specify)

CHEMISTRY AND PETROGENESIS OF THE APACHE LEAP TUFF, ARIZONA

Clifford, P.M., Department of Geology, McMaster University, Hamilton, Ontario, L8S 4M1; Peterson, D.W., U.S. Geological Survey, MS-910, 345 Middlefield Road, Menlo Park, CA 94025

The Apache Leap Tuff [ALT] of Miocene age in south-central Arizona is an ash-flow tuff that had an erupted volume of about 400 km^3; it originally covered about 2,600 km^2 and locally attains a maximum thickness of 600 m. It constitutes a single cooling unit with a densely welded center grading both upward and downward into partially- and non-welded zones at the top and base. Chemically it is remarkably homogeneous, with no sign of vertical variation in either major, trace, or RE elements; it is calc-alkaline, relatively enriched in REE, with only a small Eu anomaly. Discrimination diagrams suggest a volcanic arc or syn-collisional setting, neither of which obviously correlate with the location of ALT near the transition between Colorado Plateau and Basin-and-Range structural provinces. Variation, discrimination, and REE diagrams suggest little or no high-level differentiation of the magma, and the small Eu anomaly precludes substantial plagioclase fractionation. Studies by others, using O and Sr isotopes, imply derivation from a deep crustal source, with little contamination by rocks of the upper crust. The chemical uniformity suggests that either the magma chamber was homogeneous or, if layered, was evacuated very selectively. The relations between ALT and the volcanic rocks of the Superstition Mountains [SMC] 8-30 km to the west are not yet adequately established. The ash-flow tuffs of SMC broadly resemble ALT chemically but nevertheless show appreciable diversity, suggesting sources that are related but distinct.

Published in: Geological Association of Canada, Montreal 89, Program with Abstracts, V. 14, p. A 35.

Speaker
Conférencier Paul M. Clifford

Student
Étudiant ☐

☐ Oral
Présentation orale

☒ Poster
Affiche

☐ Either
L'un ou l'autre

Title of symposium or special session
Titre du symposium ou séance spéciale File # 230

Is the speaker a member of GAC ☒ and/or MAC ☐ ?

Le conférencier est-il membre de AGC ☐ et/ou AMC ☐ ?

Percentage of paper previously presented
Indiquez dans quelle proportion l'article a déjà été publié

The speaker is willing to serve as co-chairman for a technical session on or concerning
Le conférencier est disposé à être co-président d'une séance technique se rapportant au sujet suivant:

Address and telephone number where speaker can be contacted
Adresse et numéro de téléphone où le conférencier peut être contacté

Dept. of Geology, McMaster University
Hamilton, Ont. L8S 4M1 ; (416) 525-9140 ext 4190

Return completed abstract form and 4 copies no later than January 16, 1989
Remettez l'original du résumé (plus 4 copies) avant le 16 janvier 1989
Geoscience Canada

to / à
GAC-MAC MONTREAL 89
Rm. 238, 3450 University St.
Montréal, QC, Canada
H3A 2A7

D. W. Peterson

Bulletin 131

New Mexico Bureau of Mines & Mineral Resources

A DIVISION OF
NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY

CONTINENTAL MAGMATISM

ABSTRACTS

International Association of Volcanology and Chemistry of the Earth's Interior

GENERAL ASSEMBLY
Santa Fe, New Mexico, USA
June 25–July 1, 1989

SOCORRO, 1989

PROGRESS ON INTERPRETATION OF NEW CHEMICAL STUDIES OF VOLCANIC ROCKS OF THE SUPERSTITION MOUNTAINS, ARIZONA

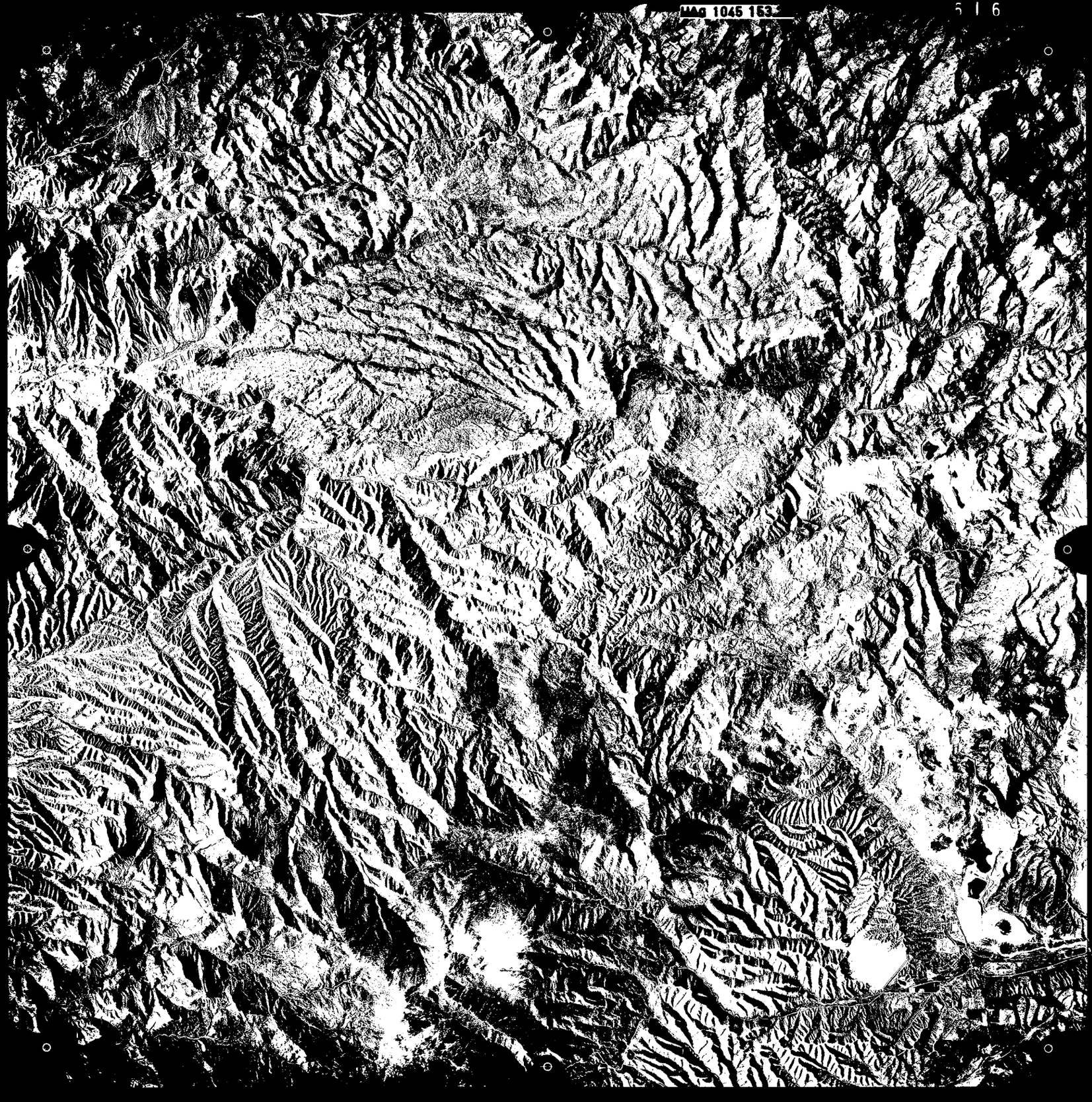
CLIFFORD, Paul M., McMaster University, 1280 Main Street W., Hamilton, Ontario L8S 4M1, Canada, and PETERSON, Donald W. U.S. Geological Survey, MS-910, Menlo Park, California 94025, USA

New major- and minor-element analyses have been made for several Miocene volcanic units from the Superstition Mountains. The units are here designated, from older to younger, lower ash-flow tuff (LAT), middle rhyodacite and rhyolite lava (MRL), upper ash-flow tuff (UAT), and upper rhyolite lava (URL). Field relations and geochemical characteristics both suggest that the rocks have been derived from a single evolving magma chamber. Available radiometric dates, however, are equivocal and have not been utilized in the current studies.

All the units are calc-alkaline, and they contain from 69.3% to 75.2% SiO_2 (water-free). As SiO_2 increases, the Al_2O_3, TiO_2, and Zr decline. REE patterns for LAT and UAT are virtually identical, but some for MRL are relatively slightly depleted. With increasing SiO_2, the Eu anomalies become increasingly negative. These characteristics are compatible with fractionation of feldspar and sphene. Samples of the youngest lavas, URL, are relatively depleted in Al_2O_3, TiO_2, Ba, La, La/Lu, Eu, Sr, and Zr and enriched in Nb and SiO_2 relative to most samples of the older rocks. URL thus represents the most extreme fractions erupted from the magma chamber. On discrimination diagrams, some rocks plot in the within-plate field, whereas others plot in the volcanic-arc field. This dichotomy suggests that tectonic discrimination diagrams may be applied only with difficulty to evolved silicic volcanic rocks.

Isotopic studies by others have suggested that the magma may be derived by partial melting of the amphibolitic lower crust, and this is compatible with the current whole-rock chemistry. The rocks are metaluminous, suggesting little assimilation of the schistose rocks (metapelite) widely exposed in the upper crust of the region.

MAg 1045 153



MAG 1045 1E
6 | 6

ASARCO Hackberry Water Hole
(Formerly Magma's M-B7.)

From Drill Reports by V.J. England, using Joy 22HD. # 9384.

10/16/81. Moving On & Setting Up. 5 hrs move time
3 hrs casing time.

10/17/81 Broke out 1632 feet of BX ~~drill~~ casing (NX drill pipe), partially into 9' sections. 8 hrs casing time

10/18/81 Sunday

10/19/81 Completed breaking out NX drill pipe. Backed out 345 feet of 3" pipe. 8 hrs casing time.

10/20/81 Lowered float on wire line (where ~~water~~ water level?) to check water level. Broke down left handed rods etc and started loading rods and equipment on truck 8 hrs casing time.

10/21/81 Moving drill & equipment to Tucson
5 hrs moving time

RECAP

Moving on & off ($500 each) ✓	=	1000.00
Casing Time, 27 hrs @ 56.00/hr	=	1512.00
Est. mileage 250 miles @ 0.75	=	187.50
Est truck rental 5/25 @ 600.00	=	120.00
ESTIMATED	=	$2,632.00

Not charged — invoice 2400,1502 11/11/81

Recovered 3" = 345 feet; usable =

Recovered NX drill pipe = 1632 feet; usable =

Estimated Value of 1632 feet of BX casing
@ Joy March 13, 1981 price of $6.50/foot at
70% of cost = $4.55 per foot useable.
say 1600' @ 4.55 = $7280.00
3" may have no resale value ??
(Note: on the Joy billing will also probably
be a water truck driver (3rd crew member)
at 5/25 of $2000.00 = $400.00

+ 2632.00

∴ Estimate $3032.00)

Form 26 - Rev. 12-79

ev. 1

JOY MANUFACTURING COMPANY

707 BOYD BLVD. • • P.O. DRAWER 489 • • LA PORTE, INDIANA 46350
TELEPHONE 362-2191 • AREA CODE 219 • TWX 810-296-3984-5 • TELEX 233129

DAILY DRILL REPORT

Contract: ASARCO - Superior #5

Location Superior, Ariz.

DATE 10-16 19 81

HOLE NO. ?

ANGLE OF HOLE 90°

DRILL SHOP NO. 9384

TYPE DRILL 22HD

T. M. or SKID Tim.

SIGNATURE: FOREMAN OR LEAD OPERATOR W. J. England

HOURS WORKED: FROM 7-Am TO 3-Pm

TOTAL HOURS THIS DATE 8

DEPTH OF HOLE AT END OF DAY

DEPTH OF HOLE AT BEGINNING OF DAY

TOTAL FOOTAGE DRILLED THIS DATE

CORE BOXES USED THIS DATE QTY. SIZE

REAMING: FROM TO

SIZE PIPE SET IN HOLE FT.

SIZE CASING SET IN HOLE FT.

SIZE CASING LOST/LEFT / FT.

DRILLING & CORING RECORD

Shift	FROM	TO	TOTAL	NO. OF RUNS	CORE RE-COVERED	ROCK TYPE OR MATERIAL DRILLED	BIT SIZE
I							
II							
III							

HOURLY RECORD (SHOW HOURS IN COLUMNS BELOW TO EQUAL TOTAL HOURS WORKED)

Shift	Drill	Bit changes	Ream	Casing	Cement-ing	Plugg-ing	Survey-ing	Standby Delays	Dis-mantle	Move	Set Up	Re-Entry	Repairs	Other	Total Hours
I				3						5					8
II															
III															

SHIFT	DRILL CREW-HOURS WORKED		REMARKS TO CLARIFY HRS. WORKED OR HOLE CONDITIONS FROM ABOVE
I	DRILLER W. J. England	8	Moved drill, rods + other equipment from Tucson to Oak Flats. Left on location at 12:1 noon. Unloaded rods + set up drill.
	HELPER R. R. Steadman	8	
	HELPER A. E. McGill	8	
II	DRILLER		
	HELPER		
III	DRILLER		
	HELPER		

MUD & ADDITIVES

50 # BAG MUD

100 # BAG MUD

CALSEAL

CAUSTIC SODA

CC 16

CEMENT

CELLEX

DEXTRID

MUD SEAL

KWIK SEAL

SODA ASH

OTHER

BIT CHANGES

SIZE	SERIAL #	DEPTH ON

(NOTE: USE REVERSE SIDE FOR ADDITIONAL INFORMATION IF REQUIRED)

Form 26 - Rev. 12-79

JOY MANUFACTURING COMPANY

707 BOYD BLVD. • • P.O. DRAWER 489 • • LA PORTE, INDIANA 46350
TELEPHONE 362-2191 • AREA CODE 219 • TWX 810-296-3984-5 • TELEX 233129

DAILY DRILL REPORT

Contract: ASARCO-Superior #5
Location Superior, Ariz.

DATE 10-19 19
HOLE NO. 7
ANGLE OF HOLE 90°

DRILL SHOP NO. 9384
TYPE DRILL 22HD
T. M. or SKID T.M.

SIGNATURE: FOREMAN OR LEAD OPERATOR W. A. England

HOURS WORKED: FROM 7-Am TO 3-Pm

TOTAL HOURS THIS DATE

DEPTH OF HOLE AT END OF DAY
DEPTH OF HOLE AT BEGINNING OF DAY
TOTAL FOOTAGE DRILLED THIS DATE
CORE BOXES USED THIS DATE QTY. SIZE

REAMING: FROM TO
SIZE PIPE SET IN HOLE FT.
SIZE CASING SET IN HOLE FT.
SIZE CASING LOST/LEFT / FT.

DRILLING & CORING RECORD

Shift	FROM	TO	TOTAL	NO. OF RUNS	CORE RE-COVERED	ROCK TYPE OR MATERIAL DRILLED	BIT SIZE
I						Broke out 1330 ft. BX casing.	
						Backed out 345 ft. 3" pipe	
						with left hand rods!	
II							
III							

HOURLY RECORD (SHOW HOURS IN COLUMNS BELOW TO EQUAL TOTAL HOURS WORKED)

Shift	Drill	Bit changes	Ream	Casing	Cement-ing	Plugg-ing	Survey-ing	Standby Delays	Dis-mantle	Move	Set Up	Re-Entry	Repairs	Other	Total Hours
I				8											8
II															
III															

SHIFT	DRILL CREW-HOURS WORKED		REMARKS TO CLARIFY HRS. WORKED OR HOLE CONDITIONS FROM ABOVE
I	DRILLER W. A. England	8	
	HELPER D. R. Steadman	8	
	HELPER G. E. McGill	8	
II	DRILLER		
	HELPER		
III	DRILLER		
	HELPER		

MUD & ADDITIVES

	CC 16	KWIK SEAL	
50 # BAG MUD	CEMENT	SODA ASH	
100 # BAG MUD	CELLEX	OTHER	
CALSEAL	DEXTRID		
CAUSTIC SODA	MUD SEAL		

BIT CHANGES

SIZE	SERIAL #	DEPTH ON

(NOTE: USE REVERSE SIDE FOR ADDITIONAL INFORMATION IF REQUIRED)

JOY MANUFACTURING COMPANY
707 BOYD BOULEVARD
DRAWER 489
LA PORTE, INDIANA 46350

V. J. ENGLAND
BOX 758
GLOBE, ARIZ. 85501

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

ASARCO Incorpo
OCT 23 1981
... Exploration

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

October 16, 1981

Mr. Jim Sells
ASARCO, Incorporated
1150 N. 7th Avenue
P. O. Box 5747
Tucson, Arizona 85703

Dear Mr. Sells:

We understand you want to do some work on a Magma hole No. MV-7 to make it useable as a water supply. This work can be handled as follows:

Mobilization	$500.00/rig
Demobilization	$500.00/rig
Rig Time for All Cleanout and Re-entry, Handling Casing, etc.	$56.00/hour + materials used

Any other items such as water truck, standby, etc. will be handled under your existing order T-161-1 for the current work at Superior.

Yours truly,

JOY MANUFACTURING COMPANY

J. H. Koontz - M.R.

J. H. Koontz, General Manager
Contract Drill Division

JHK:js

10/14/81

Telephone call to Jack Lloyd, Joy, 884-5865 10/13/81
for cleaning of Hackberry Canal drill hole.

Magma's hole M-B7 (1978)

They Magma have no interest in any recovered rods

Joy will sent proposal.

33' of 7" ID pipe surface
1430' of 3" ID pipe
2219' of NX drill rods used as casing.

Bx rods 18' from bottom, stuck, mill bit, core barrel, etc.
Top of Bx string at 2122'.

Earlier report by B Greene, 7/15/81
said 901' of NX drill rod still in hole.

? Is this ~~from~~ 901' = to = 1118-2219' ??
if so, then probably no recoverable NX left in hole.

So only may need to recover 3" ID pipe.
Suggest ~~backing~~ cutting only once or twice, then back off from top if cutting is not successful.

If NX drill string is still in from surface, then suggest cutting at 1000' etc and/or backing off from surface.

JES

JOY MANUFACTURING COMPANY
707 BOYD BOULEVARD
P.O. DRAWER 489
LA PORTE, INDIANA 46350

GARY, IND.
4 PM
16 OCT
1981

ASARCO Incorporated
OCT 20 1981
SW Exploration

Mr. Jim Sells
ASARCO, Incorporated
1150 N. 7th Avenue
P. O. Box 5747
Tucson, Arizona 85703

Mobil 0 $500 each way
On Site 50.00/hr + material

Plug

473

3410

To Mr. Sell

Date 10/14 Time 1:20

WHILE YOU WERE OUT

Mr. Jim Koontz

of Joy

Phone 219 362 2191

Area Code Number Extension

TELEPHONED		PLEASE CALL	X
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		URGENT	
RETURNED YOUR CALL			

1984

Message BOOK

re: Water Well in Superior

pls. call before 3:00 pm today.

EG

Operator

EFFICIENCY® LINE NO. 2725 AN AMPAD PRODUCT 60 SHEETS

JDS

10/20/81

Hackberry well

1600' NE - will be stored in 9' sections at Ranch Hdqrs.

345' - 3" casing

- from the top

- 3-4 section at a time

Told them to stop.

JDS

10/13/81

MAGMA DRILL HOLE —

HACKBERRY M-B7

Greene expressed no
interest in Drill rod.

884-5865
Jack Lloyd

Note to Lockhart from Ben Greene.
Magma Copper Co drill hole at
Hackberry Canal, JI Ranch. 7/15/81

33' of 7" ID pipe

1430' of 3" ID pipe — water cemented at 130'.
2219 of NX Casing.
3020' T.D.
3041'

901' of NX drill steel in hole.
97' of AX (?) rod on top of drill steel.

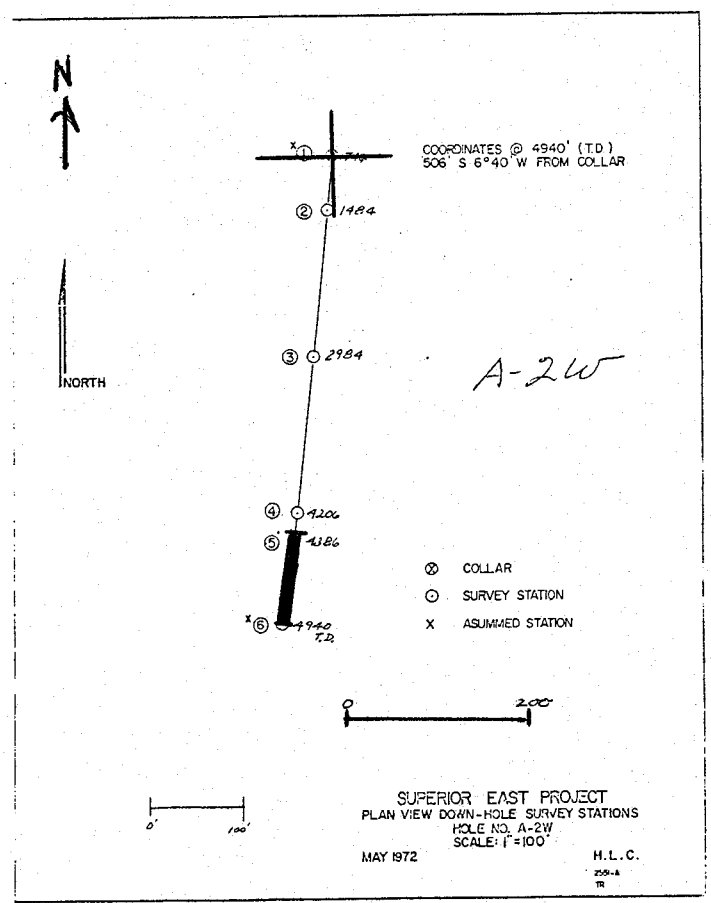
BX 18' from bottom

2122 top of BX

2219

45
80
90

100

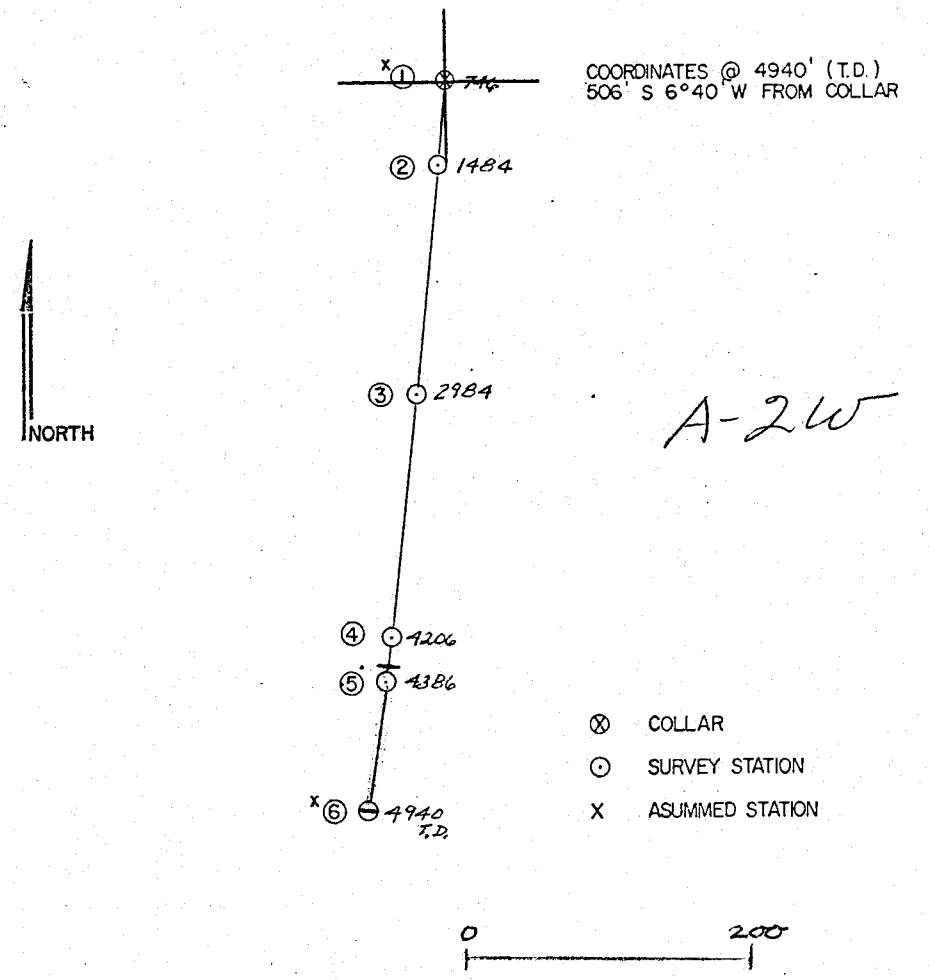


X1 X2

A-2
A-2W

1" = 200'

≅ 205'



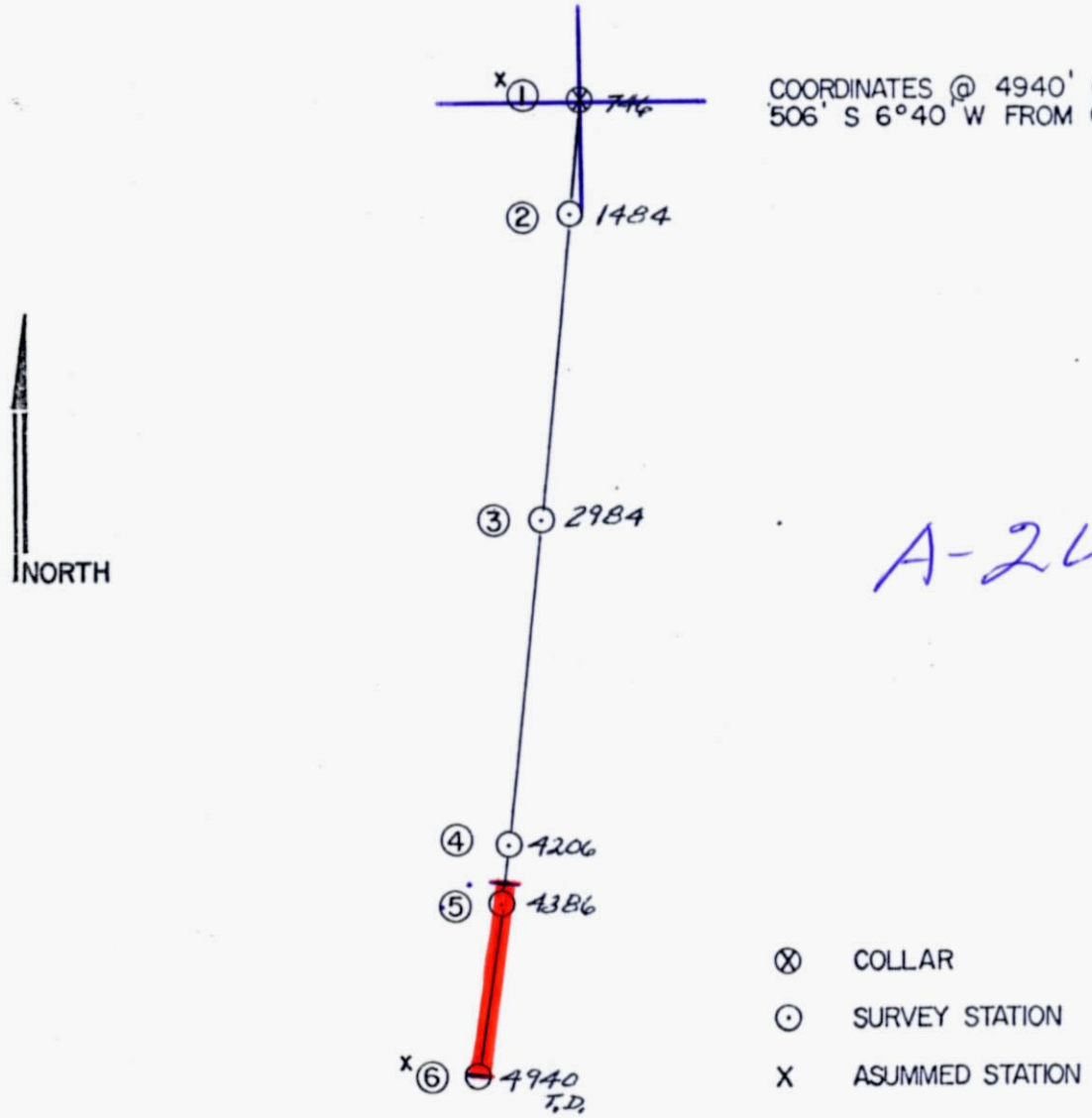
SUPERIOR EAST PROJECT
PLAN VIEW DOWN-HOLE SURVEY STATIONS
HOLE NO. A-2W
SCALE: 1" = 100'

MAY 1972

H.L.C.

2551-A
TR

X1

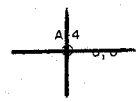


SUPERIOR EAST PROJECT
PLAN VIEW DOWN-HOLE SURVEY STATIONS
HOLE NO. A-2W
SCALE: 1" = 100'

MAY 1972

H.L.C.

2551-A
TR



COORDINATES @ 6500'
~~3961' S 54° 40' W from collar~~
409' S 5° W @ 6664'

1 3620

2 4740

A-4

5760

6664

0 200

⊗ Collar

○ Survey Station

* Projected Position @ ~~6500'~~ 6664'
(reading not taken)

1" = 200'
≅ 205'

X2 ↑

SUPERIOR EAST PROJECT

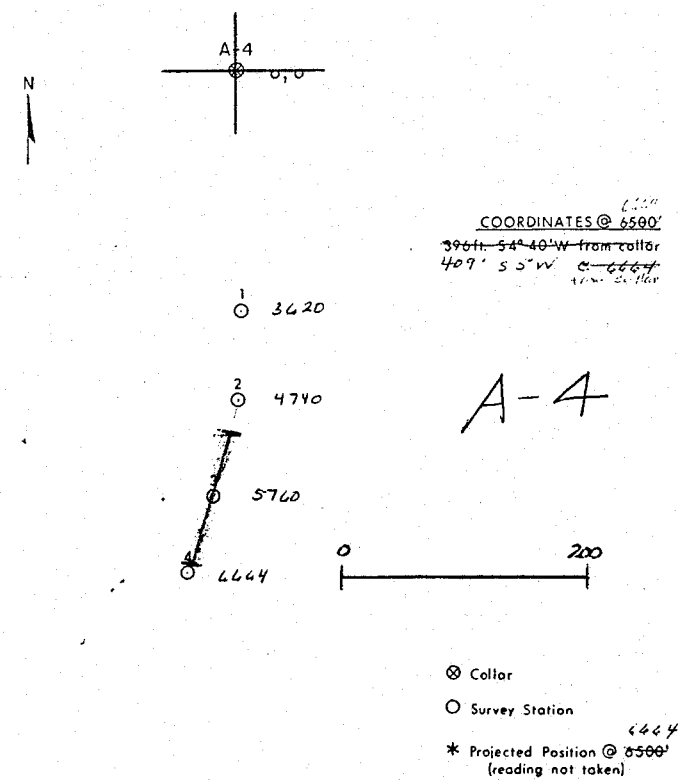
Plan View down-hole survey stations

Hole no. A-4

Oct. 1971

H.L.E.

SCALE 1" = 100'



X2

SUPERIOR EAST PROJECT

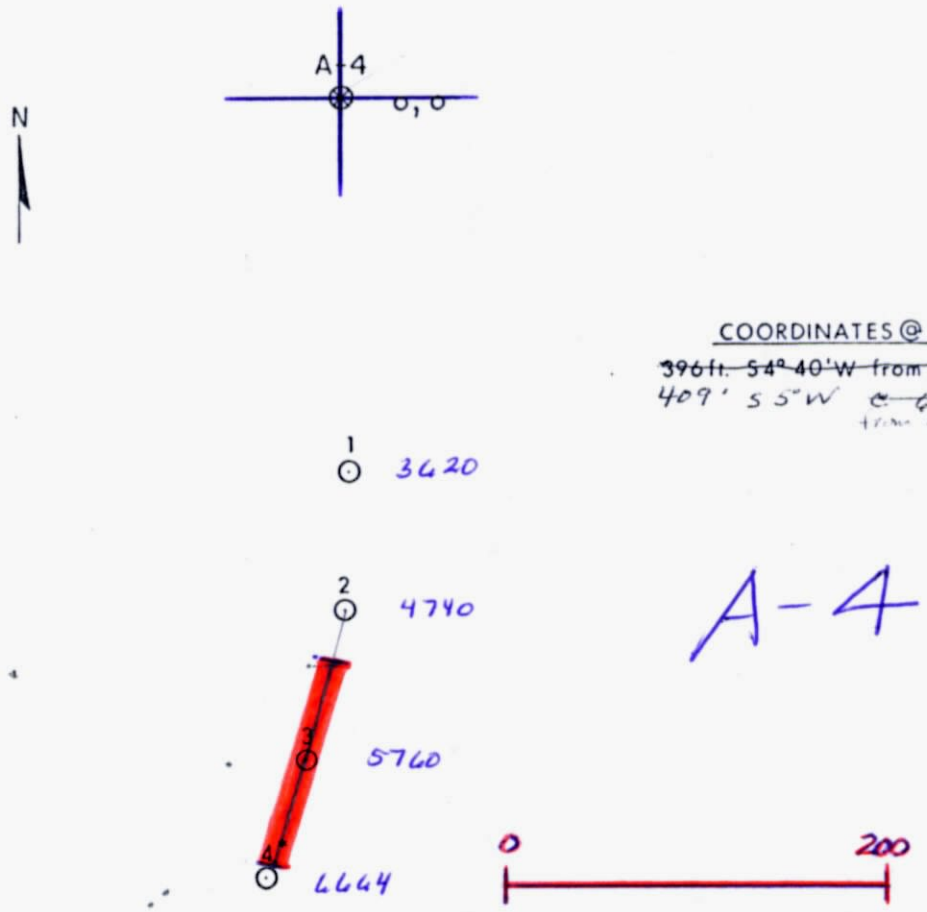
Plan View down-hole survey stations

Hole no. A-4

Oct. 1971

H.L.C.

SCALE 1" = 100'



COORDINATES @ ~~6500'~~ 6644'

~~396ft. 54° 40' W from collar~~

409' S 5° W ~~@ 6664~~ from collar

⊗ Collar

O Survey Station

* Projected Position @ ~~6500'~~ 6664
(reading not taken)

SUPERIOR EAST PROJECT

Plan View down-hole survey stations

Hole no. A-4

Oct. 1971

H.L.C.

SCALE 1" = 100'

A-7

1" = 200'
≅ 180'

N

100

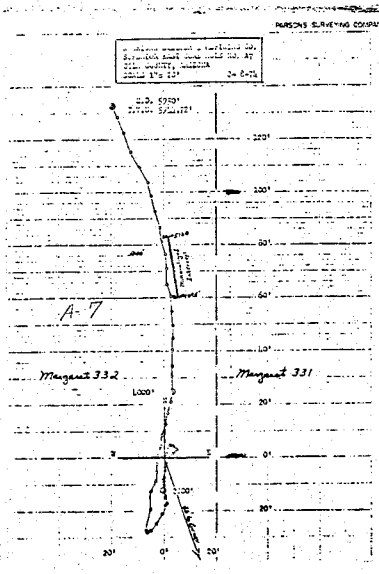
0

X2

X2 X2

2x 2x

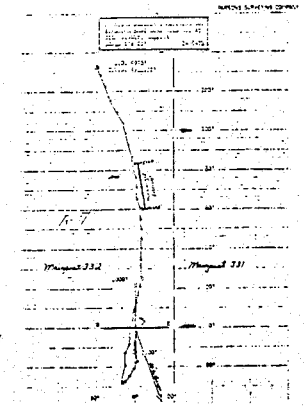
2x 2x


PARSONS SURVEYING COMPANY
A-7
Margaret 332
Margaret 331
1020'
20'
0'
20'

x2 x2

x2

1" = 100'

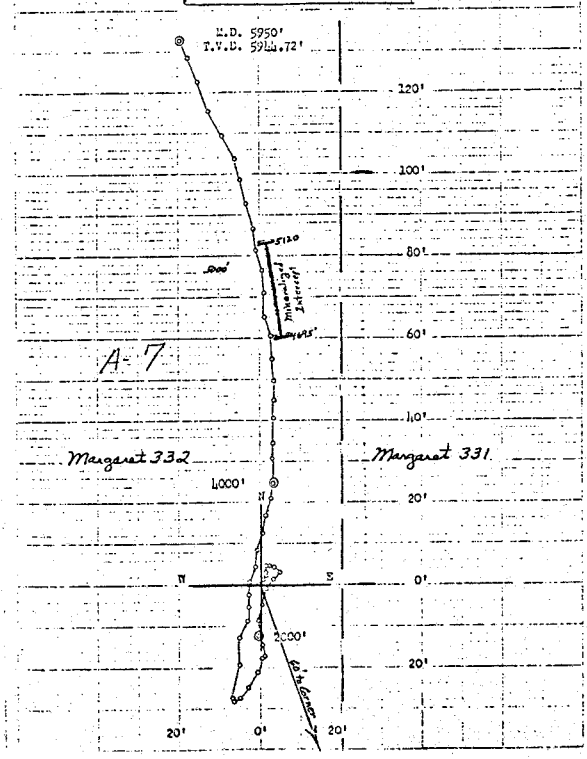


x2 x2

x2 x1

PARSONS SURVEYING COMPANY

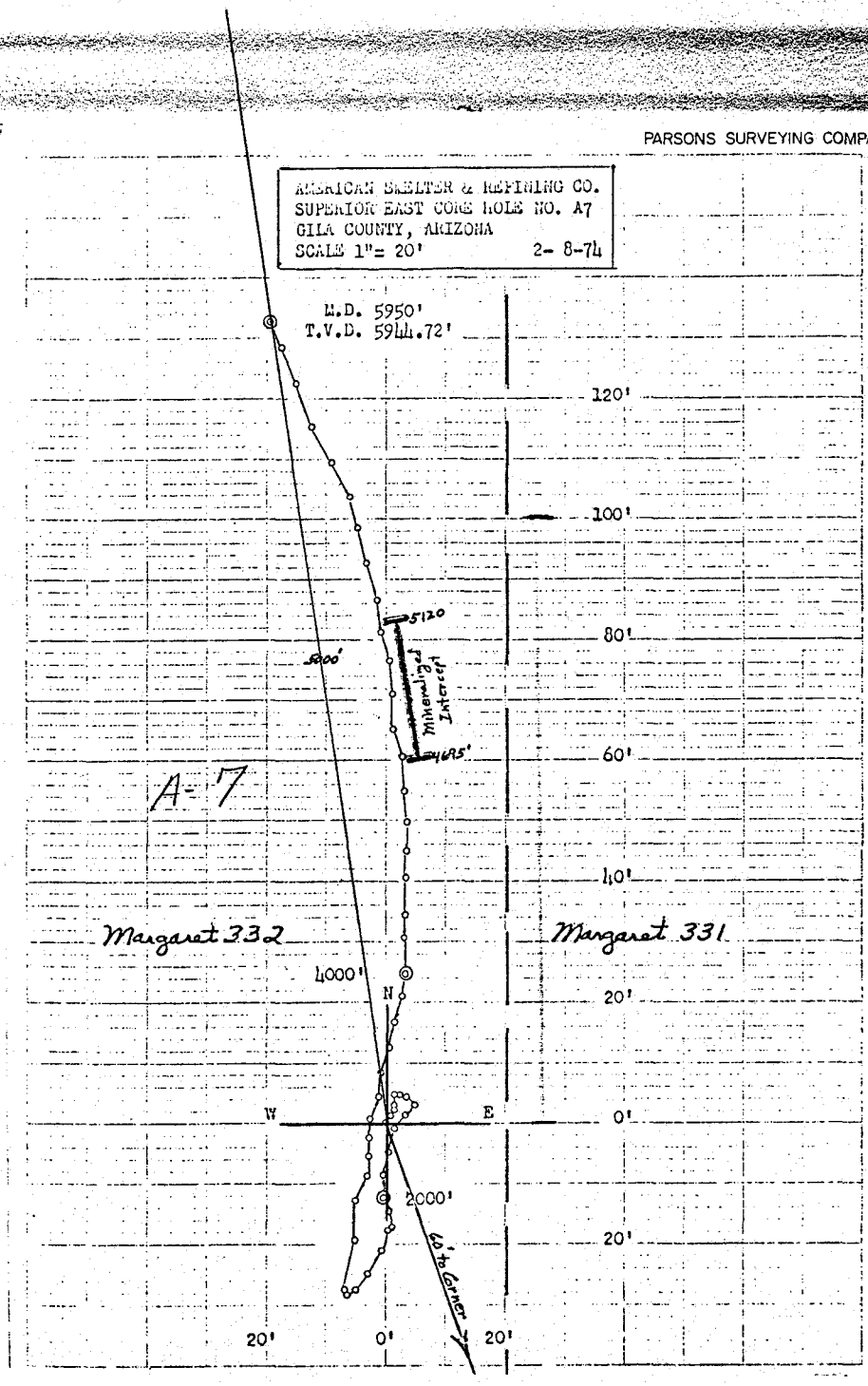
AMERICAN SMELTER & REFINING CO.
SUPERIOR EAST CORE HOLE NO. A7
GILA COUNTY, ARIZONA
SCALE 1"= 20' 2- 8-74



X2 X2

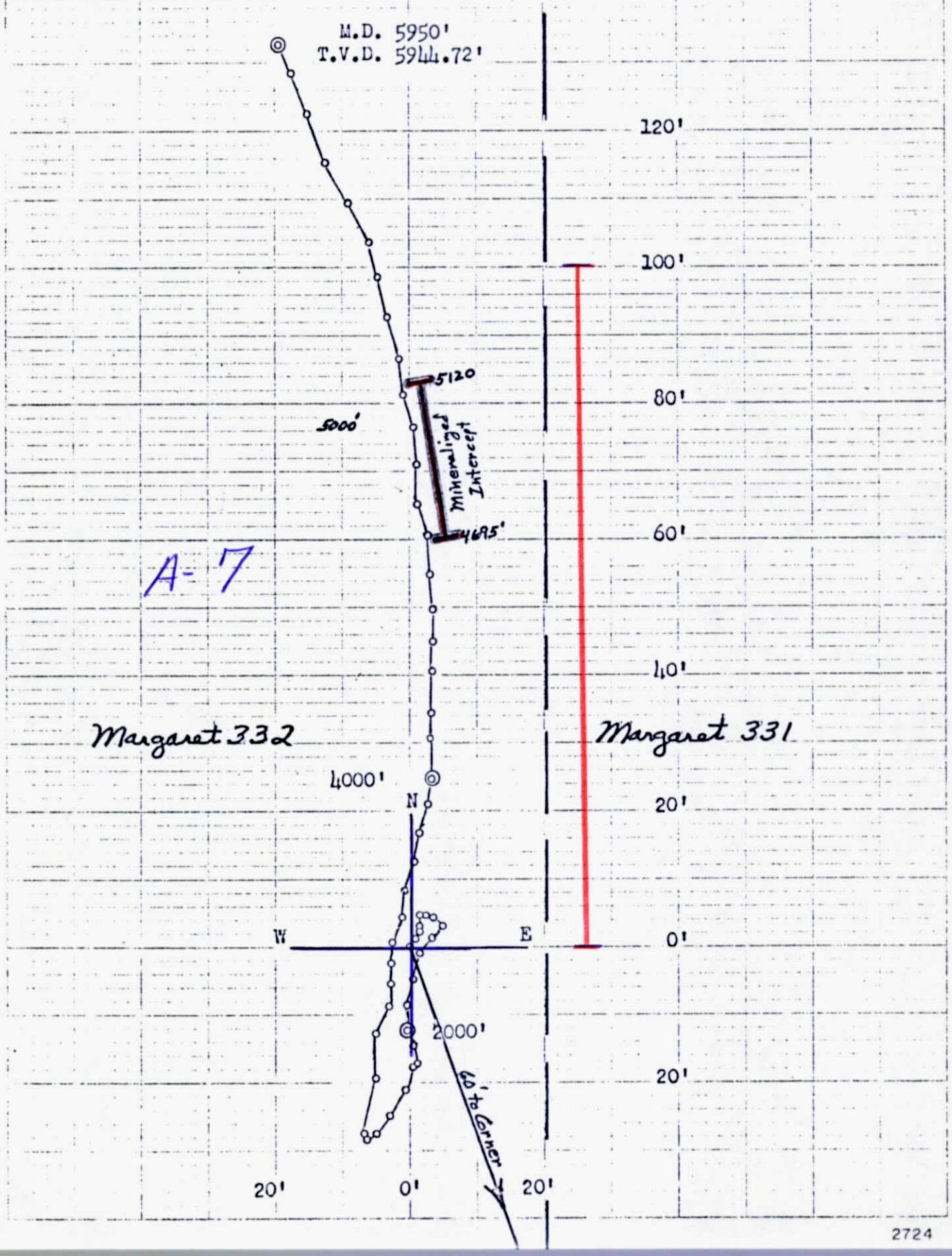
PARSONS SURVEYING COMPANY

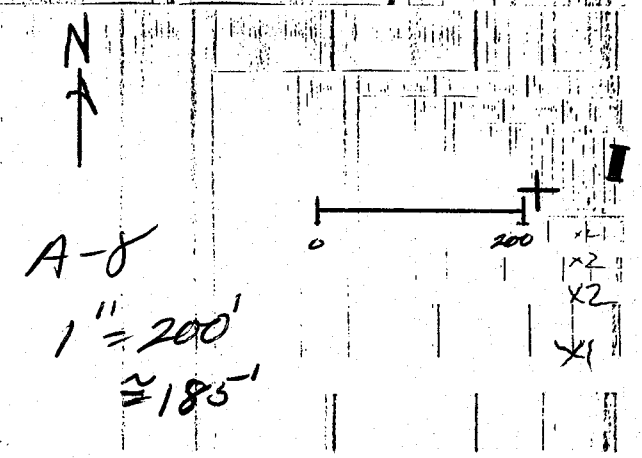
AMERICAN SMELTER & REFINING CO.
SUPERIOR EAST CORE HOLE NO. A7
GILA COUNTY, ARIZONA
SCALE 1"= 20' 2- 8-74

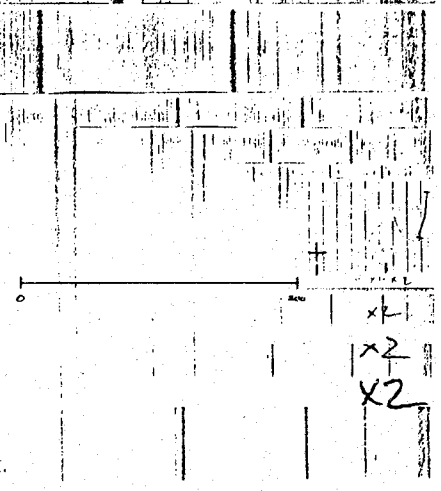


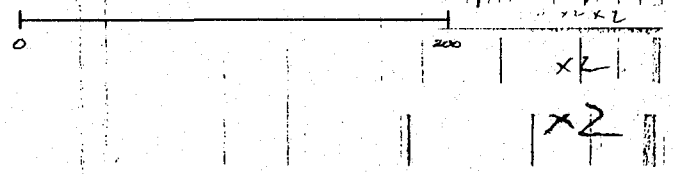
X2

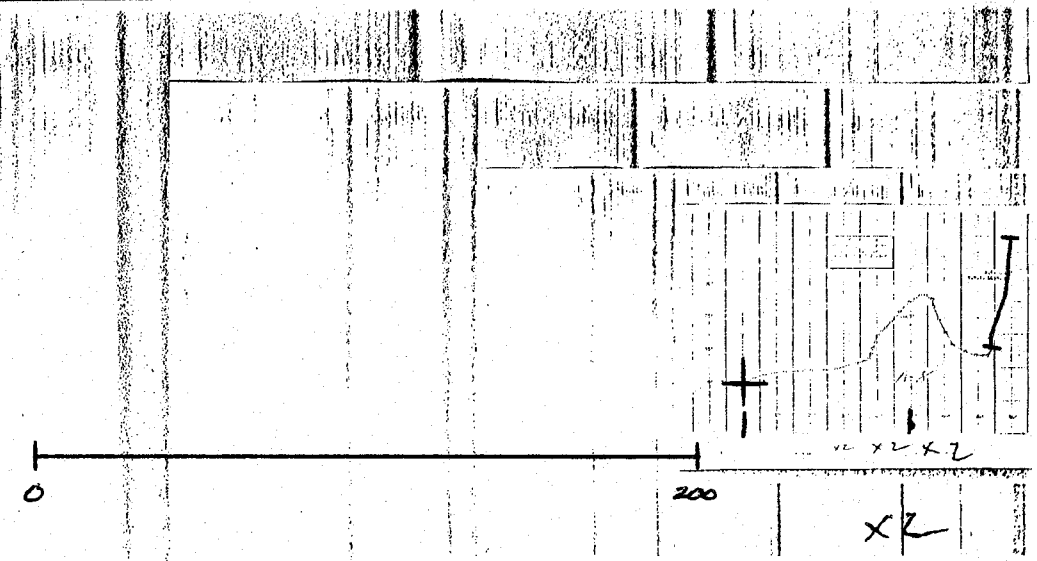
AMERICAN SMELTER & REFINING CO.
SUPERIOR EAST CORE HOLE NO. A7
GILA COUNTY, ARIZONA
SCALE 1"= 20' 2- 8-74

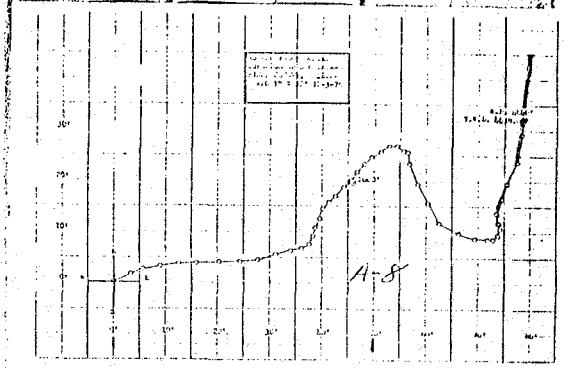



N
0
200
X2
X1
A-8
1" = 200'
≅ 185'

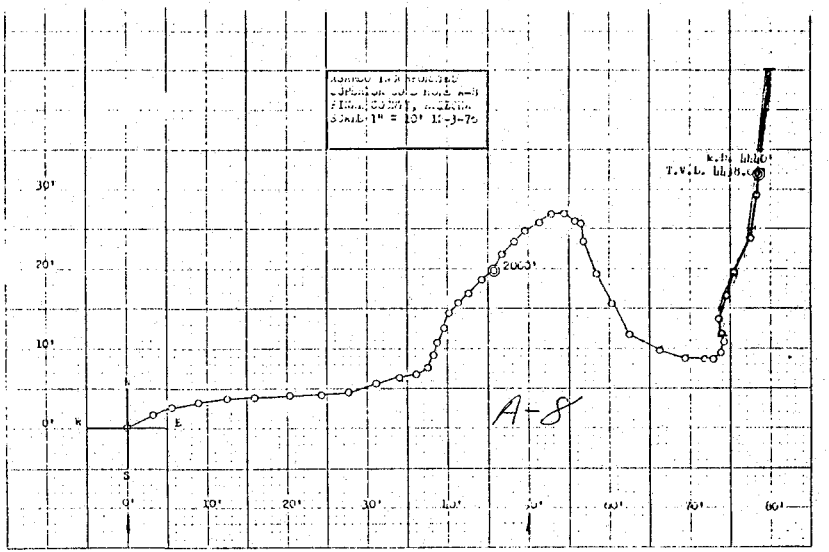

0
×1
×2
×2


0
200


0
200
x2

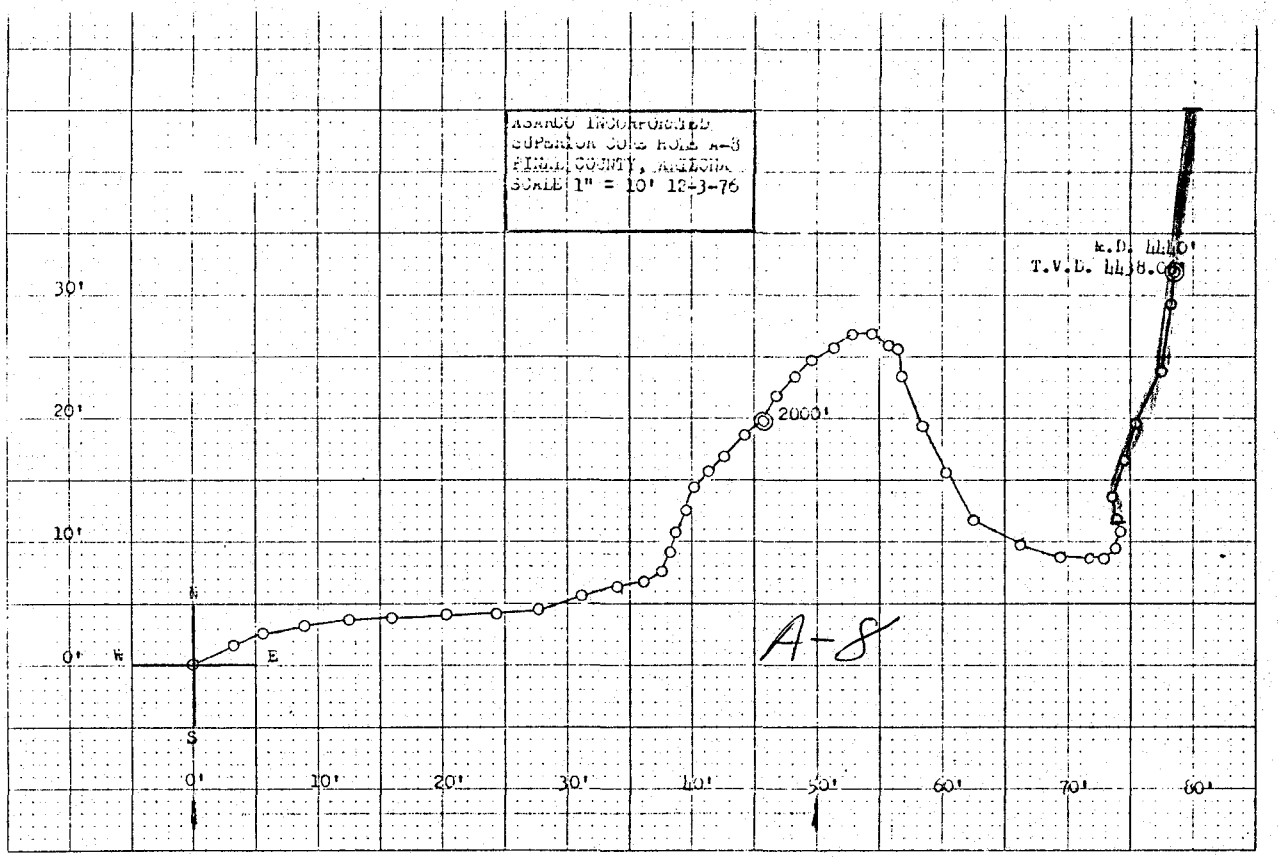


x2 x2 x2



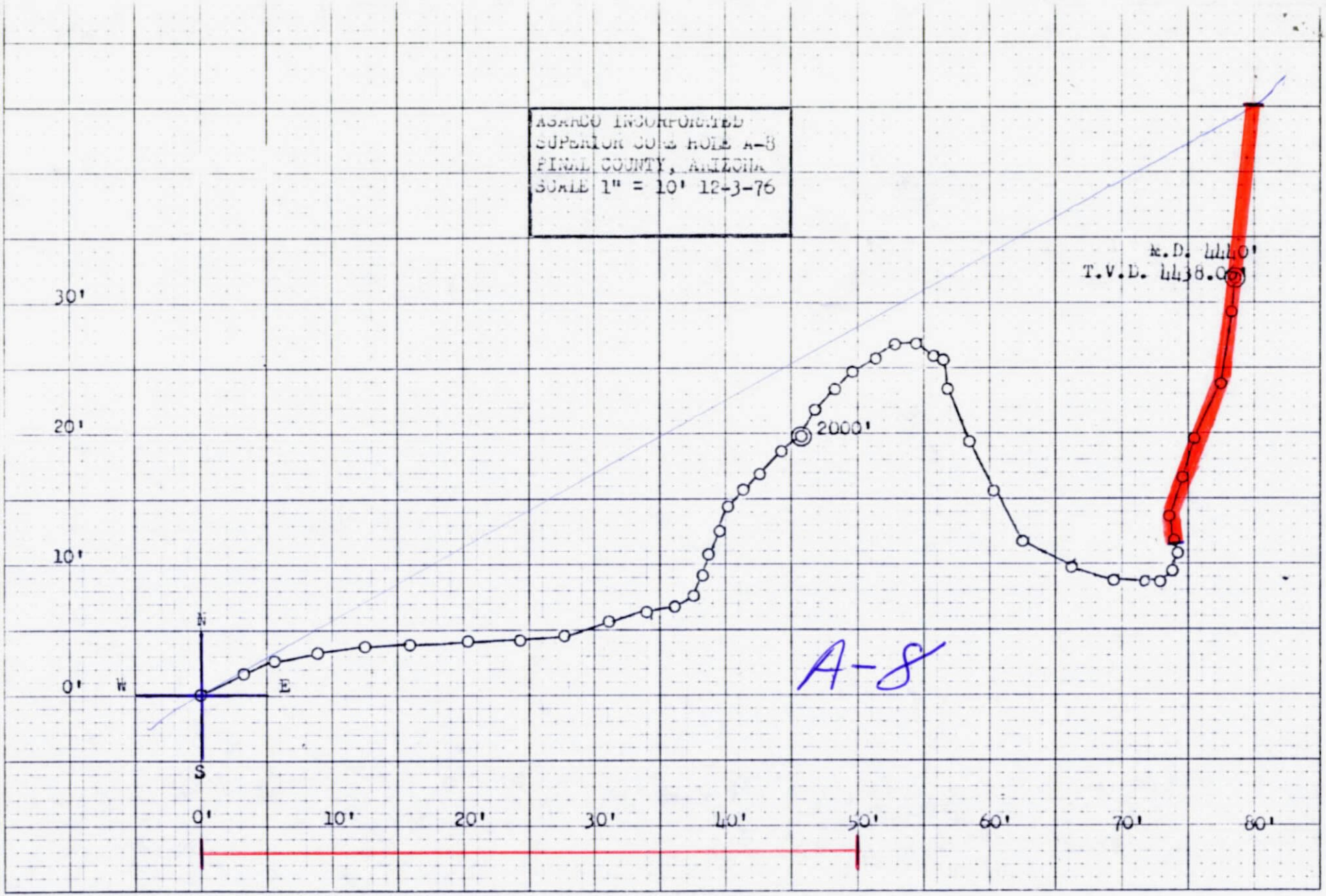
XZ X Z

46 0780


ASARCO INCORPORATED
SUPERIOR COPPER HOLE A-8
PINAL COUNTY, ARIZONA
SCALE 1" = 10' 12-3-76
M.D. 4440'
T.V.D. 4438.0'
2000'
30'
20'
10'
0'
N
E
S
0'
10'
20'
30'
40'
50'
60'
70'
80'
A-8

XZ

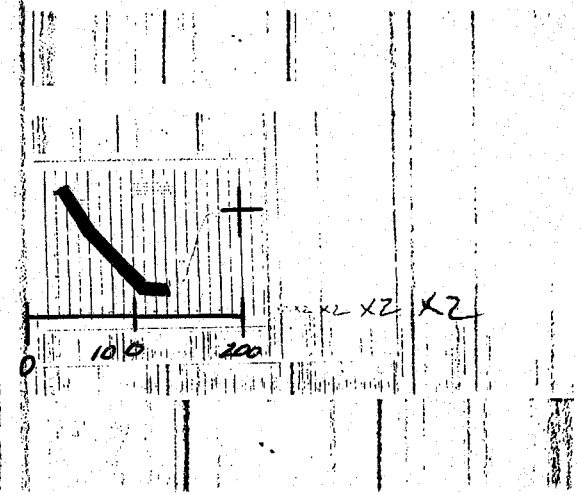
46 0780



46 0780
K&E 10 X 10 TO THE INCH
KEUFFEL & ESSER CO.

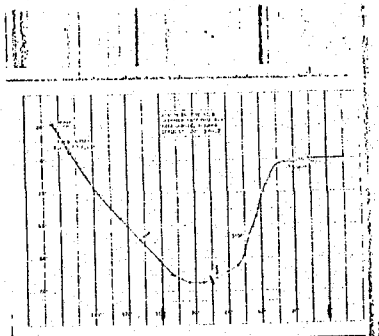
N

A-9

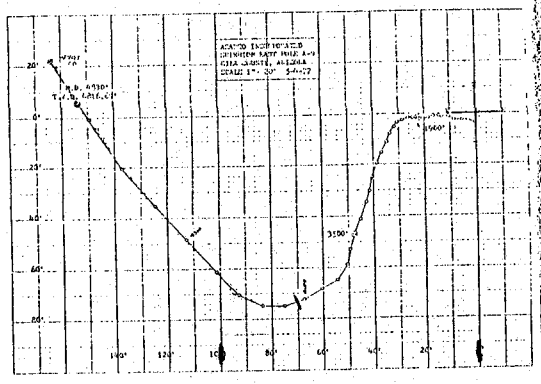


1" = 200'

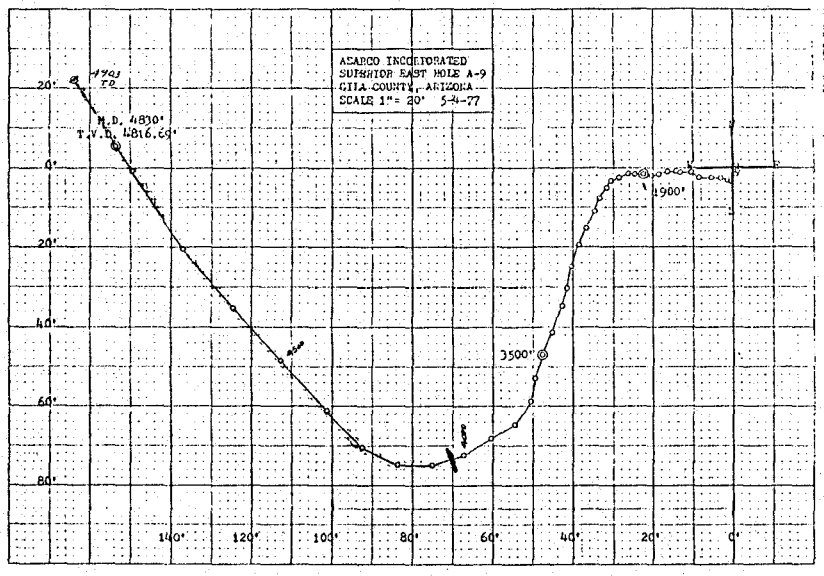
≅ 180'



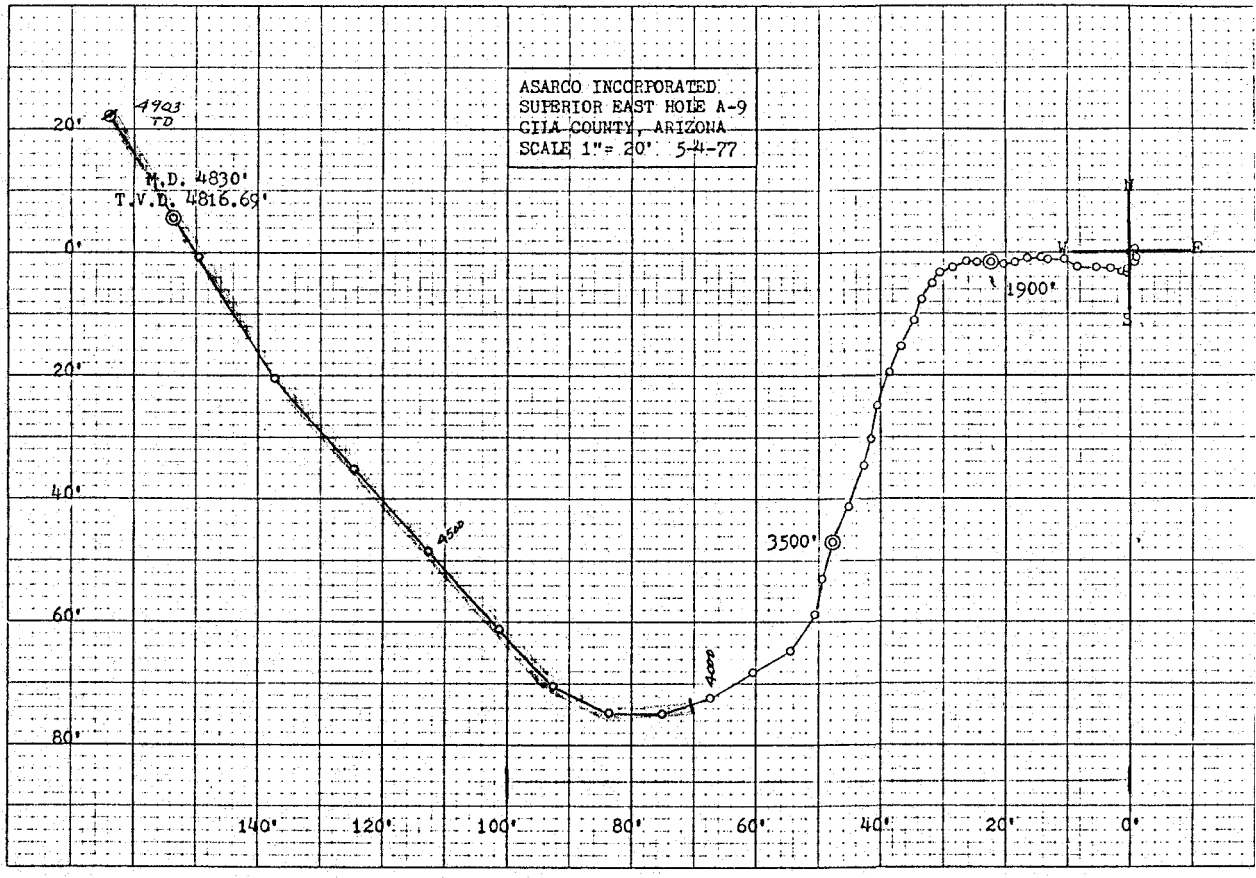
$x^2 \times 2 \times 2 \quad \times 2$

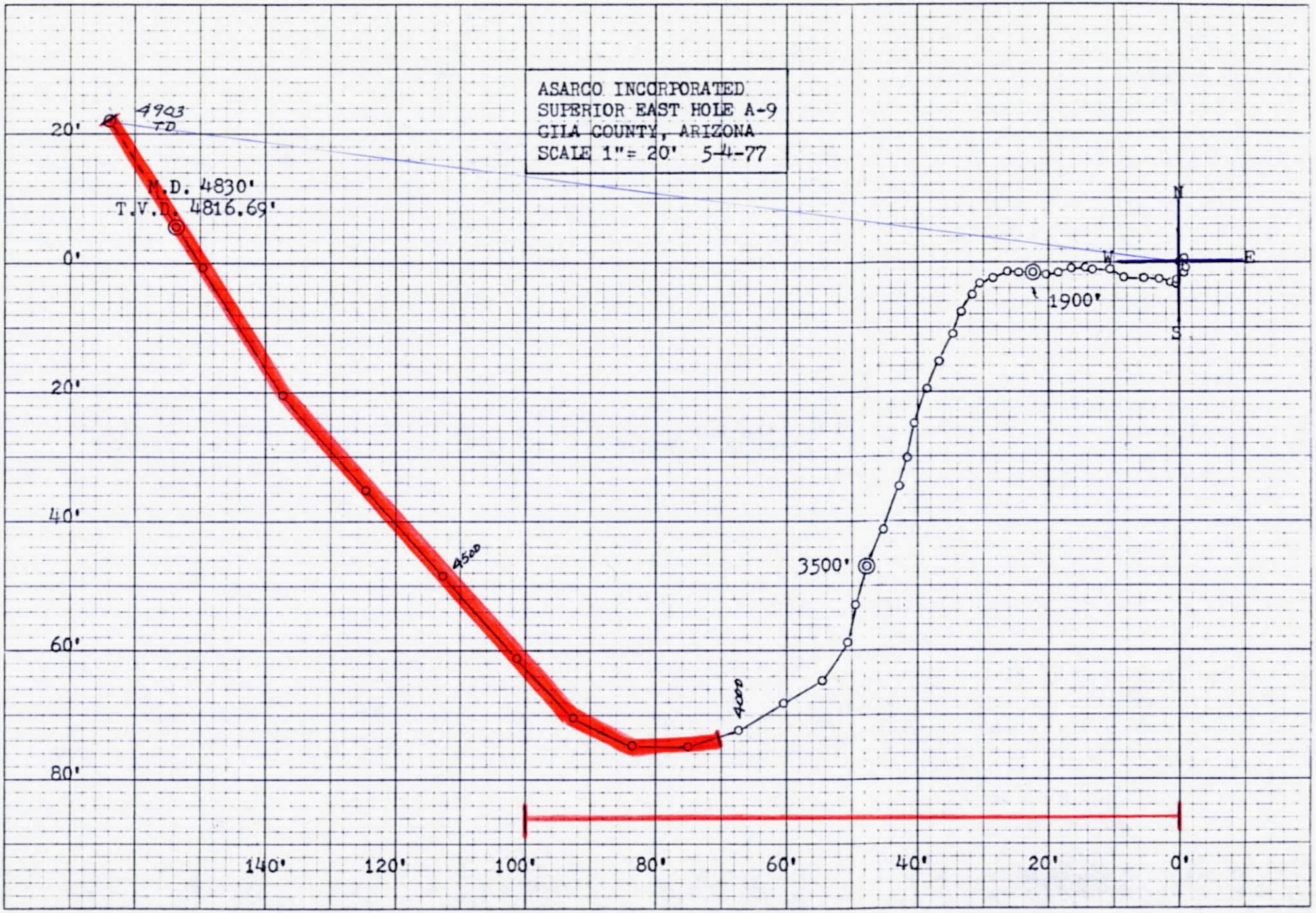


x2 x2 x2

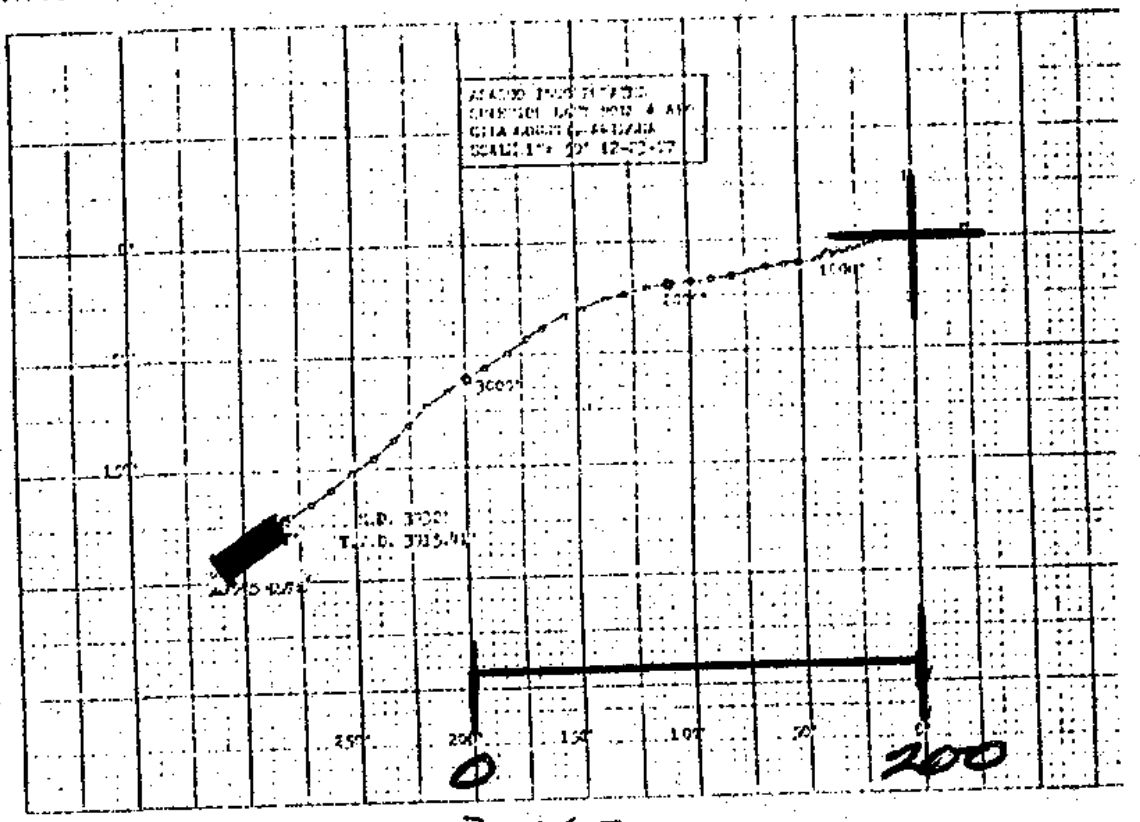

ASARCO INCORPORATED
SUPERIOR EAST HOLE A-9
GILA COUNTY, ARIZONA
SCALE 1" = 20' 5-4-77
M.D. 4830'
T.V.D. 4816.69'
1900'
3500'
20'
0'
20'
40'
60'
80'
140'
120'
100'
80'
60'
40'
20'
0'

X2-X2


ASARCO INCORPORATED
SUPERIOR EAST HOLE A-9
GILA COUNTY, ARIZONA
SCALE 1"= 20' 5-4-77
4923
TD
M.D. 4830'
T.V.D. 4816.69'
4500
4000
3500'
1900'
N
W
E
S
20'
0'
20'
40'
60'
80'
140'
120'
100'
80'
60'
40'
20'
0'


ASARCO INCORPORATED
SUPERIOR EAST HOLE A-9
GILA COUNTY, ARIZONA
SCALE 1"= 20' 5-4-77
4903
TD
M.D. 4830'
T.V.D. 4816.69'
4500
4000
3500'
1900'
N
S
E
W
20'
0'
20'
40'
60'
80'
140'
120'
100'
80'
60'
40'
20'
0'

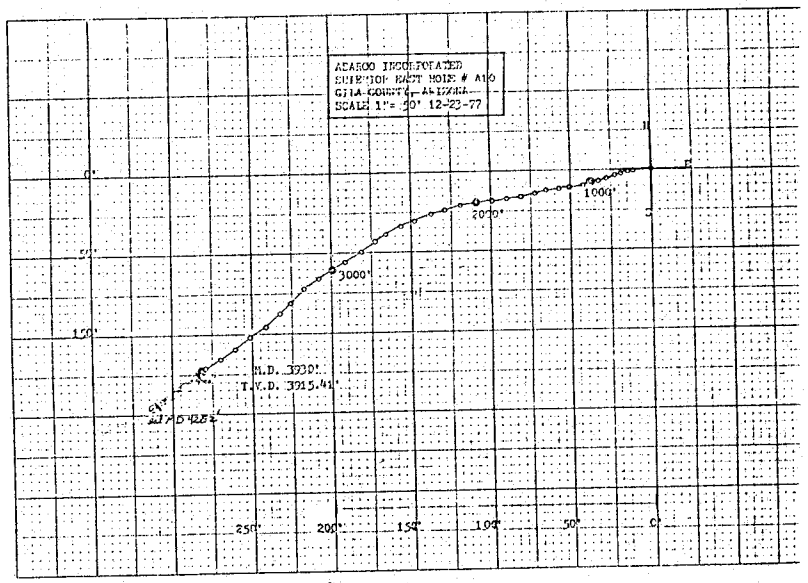
A-10



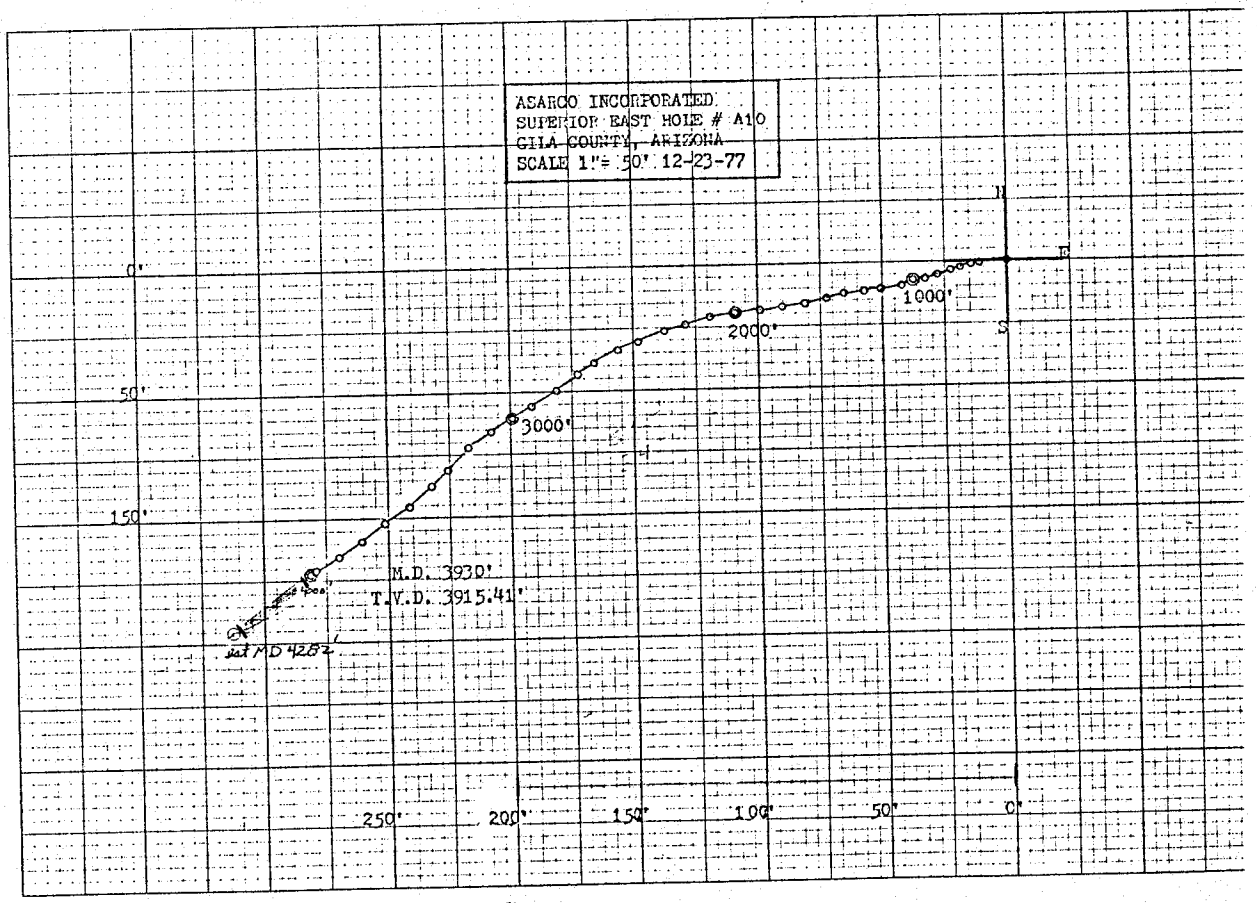
2 X 2 X 2

N

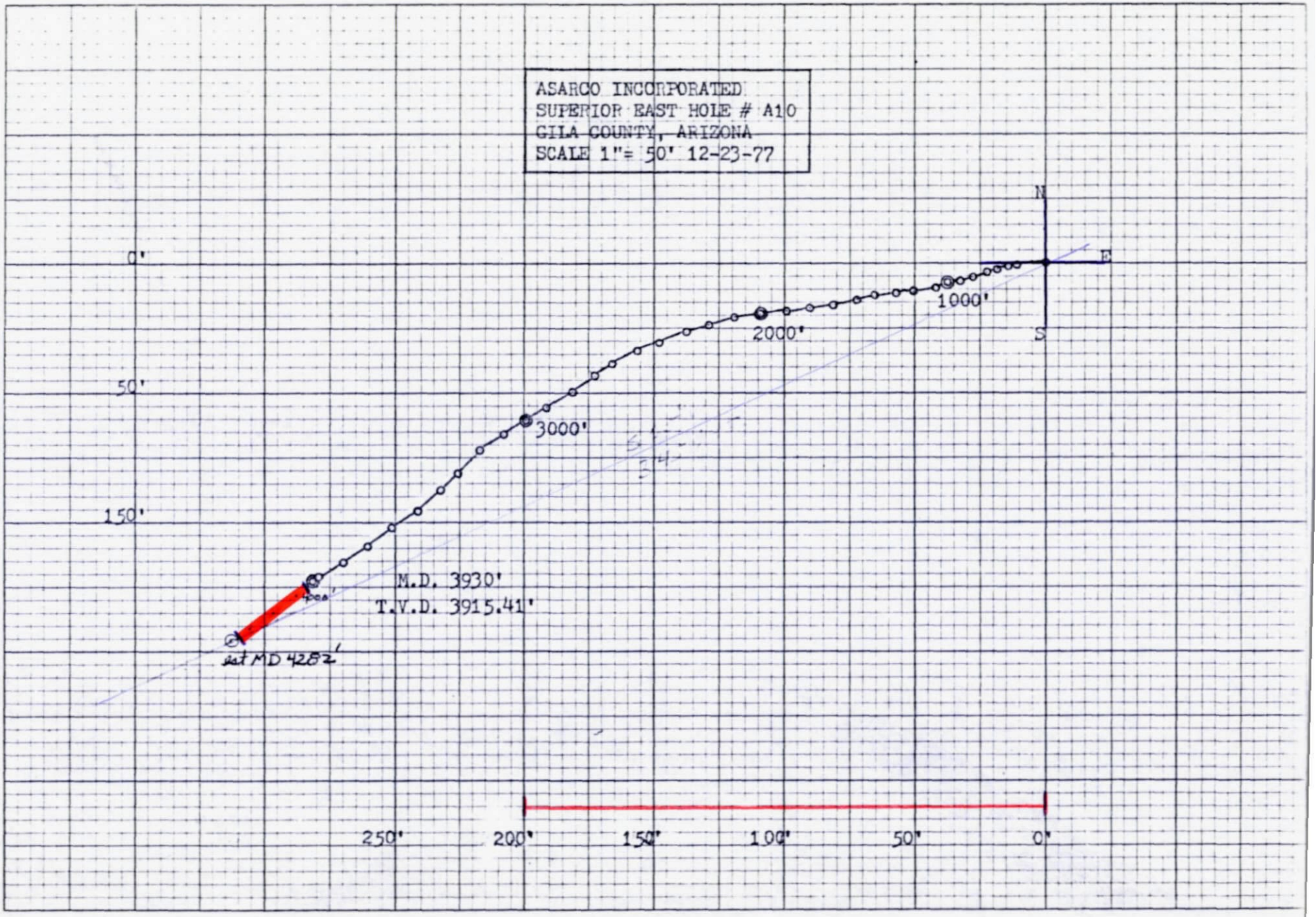
1" = 200' ≅ 215'


ACARCO INCORPORATED
SUPERIOR EAST HOLE # A10
GILA COUNTY, ARIZONA
SCALE 1"= 50' 12-22-77
1000'
2000'
3000'
M.D. 3930'
T.V.D. 3915.41'
250'
200'
150'
100'
50'
0'

2 X 2


ASARCO INCORPORATED
SUPERIOR EAST HOLE # A10
GILA COUNTY, ARIZONA
SCALE 1"= 50' 12-23-77
N
E
S
0'
50'
150'
1000'
2000'
3000'
M.D. 3930'
T.V.D. 3915.41'
set MD 4282
250'
200'
150'
100'
50'
0'

2

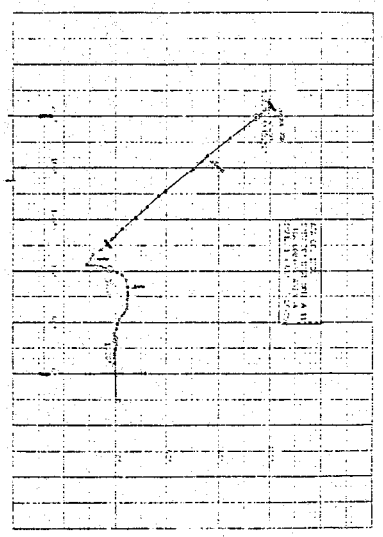

ASARCO INCORPORATED
SUPERIOR EAST HOLE # A10
GILA COUNTY, ARIZONA
SCALE 1"= 50' 12-23-77
N
E
S
0'
50'
150'
1000'
2000'
3000'
M.D. 3930'
T.V.D. 3915.41'
est MD 4282'
250'
200'
150'
100'
50'
0'

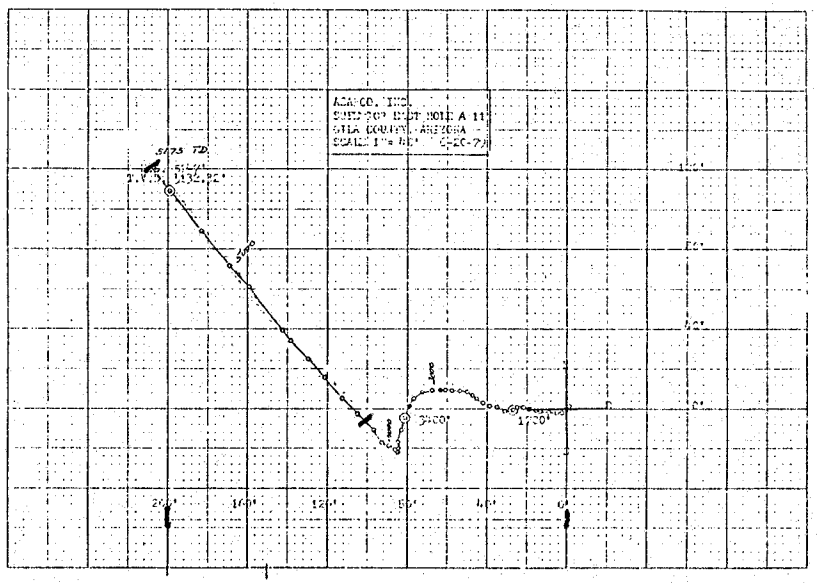
A-11 1" = 200'

2x

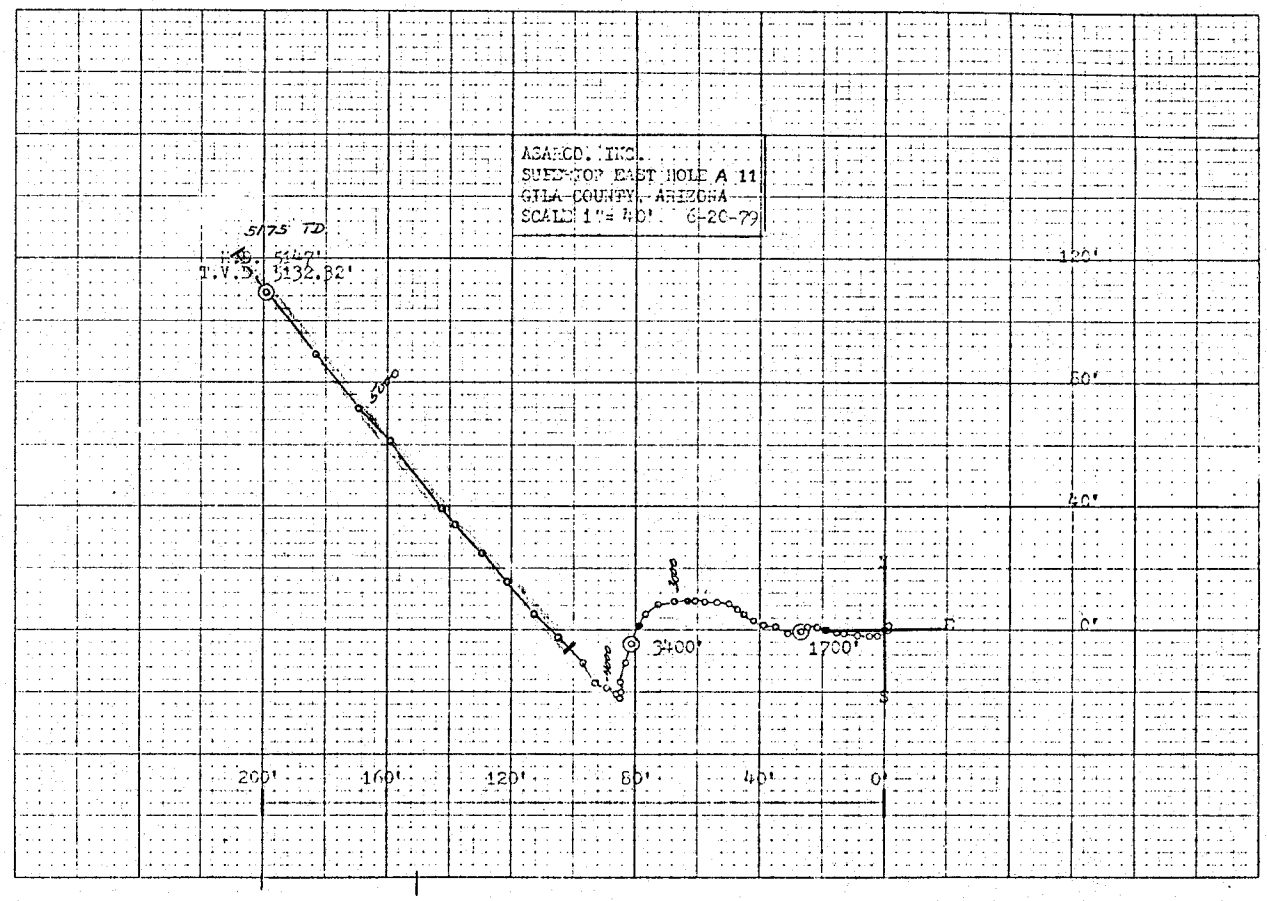
2x

7x

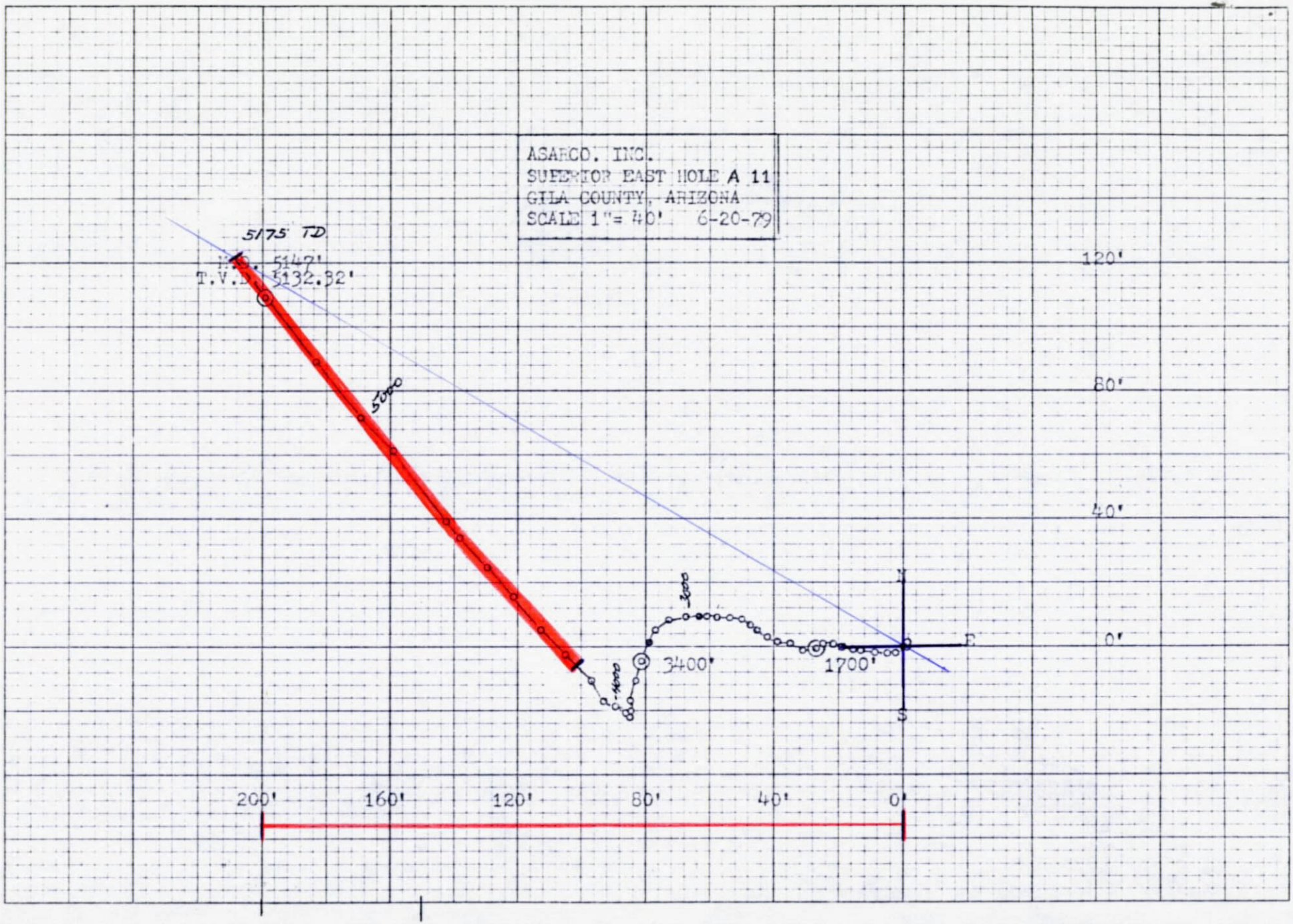



ACRA CO. INC.
SANTA COUNTY, ARIZONA
5475 FD
5000'
3500'
1700'
20'
16'
12'
8'
4'
0'

2x 2x


ASARCO, INC.
SUPERTOP EAST HOLE A 11
GILA COUNTY, ARIZONA
SCALE 1" = 40' 6-20-79
5175 TD
T.V.D. 5132.82'
500'
3400'
1700'
200'
160'
120'
80'
40'
0'
120'
80'
40'
0'

72


ASARCO, INC.
SUPERIOR EAST HOLE A 11
GILA COUNTY, ARIZONA
SCALE 1"= 40' 6-20-79
5175 TD
M.D. 5147'
T.V.D. 5132.32'
5000
3400'
1700'
N
E
S
120'
80'
40'
0'
200'
160'
120'
80'
40'
0'

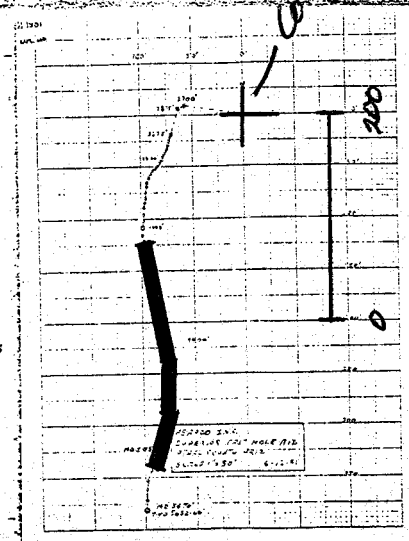
N

Collar of Hole A-11

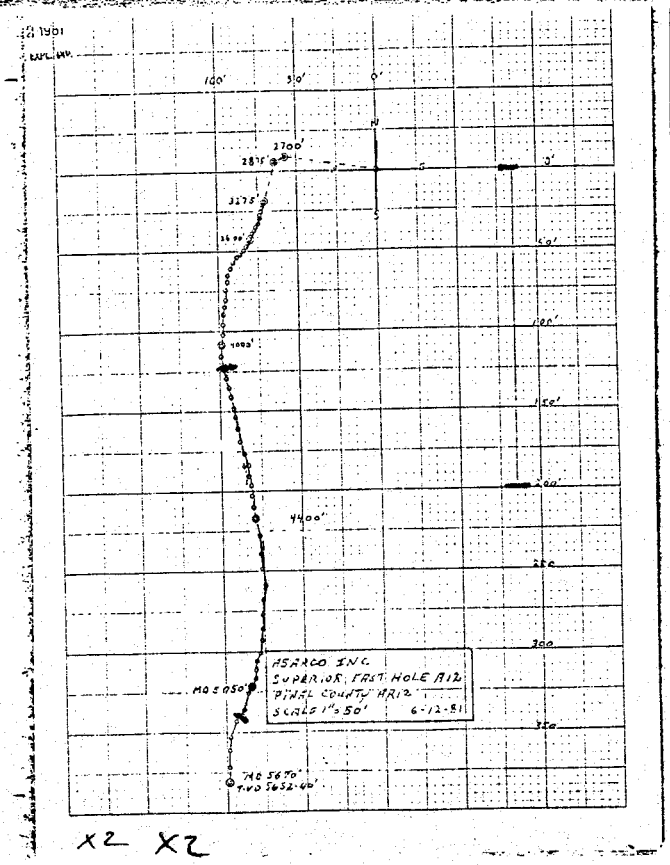
A-12

1" = 200'

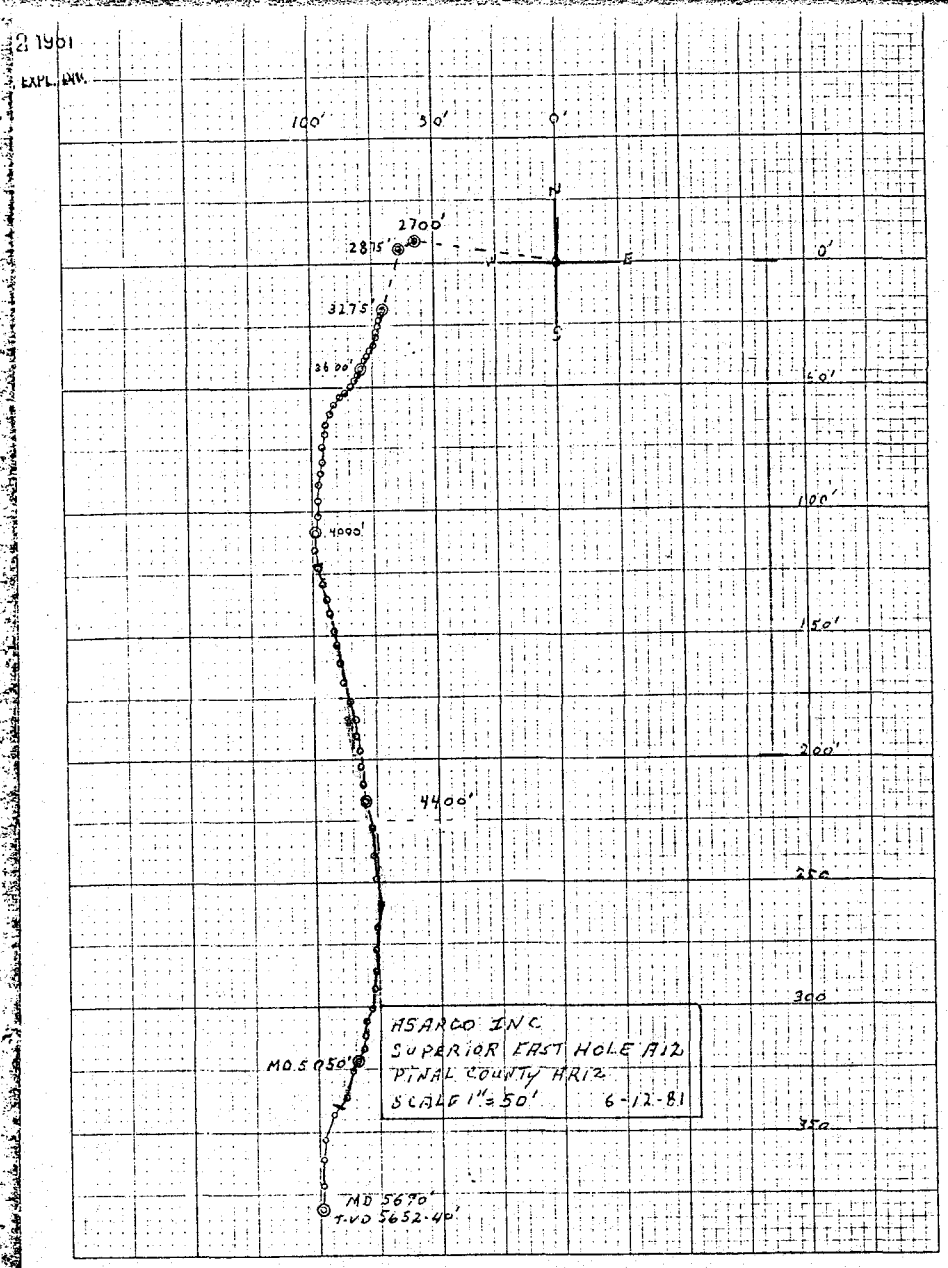
≅ 185'



X2 X2 X2


1901
100'
300'
0'
N
2700'
2817'
3275'
4400'
MD 5050'
TMD 5670'
TVD 5652.60'
ASARCO INC
SUPERIOR, FEST HOLE #12
PINAL COUNTY ARIZ
SCALE 1"=50'
6-12-81

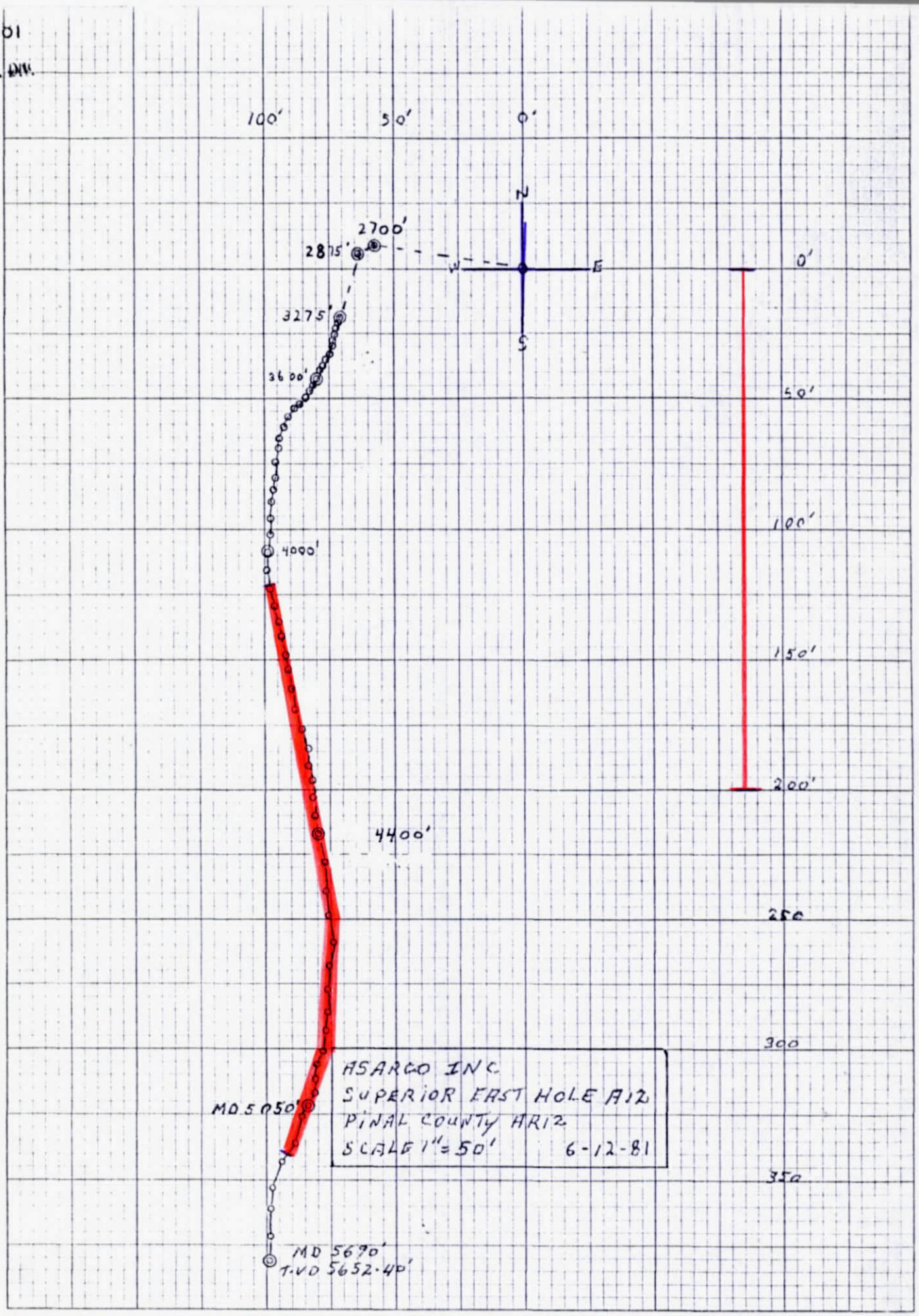
X2 X2

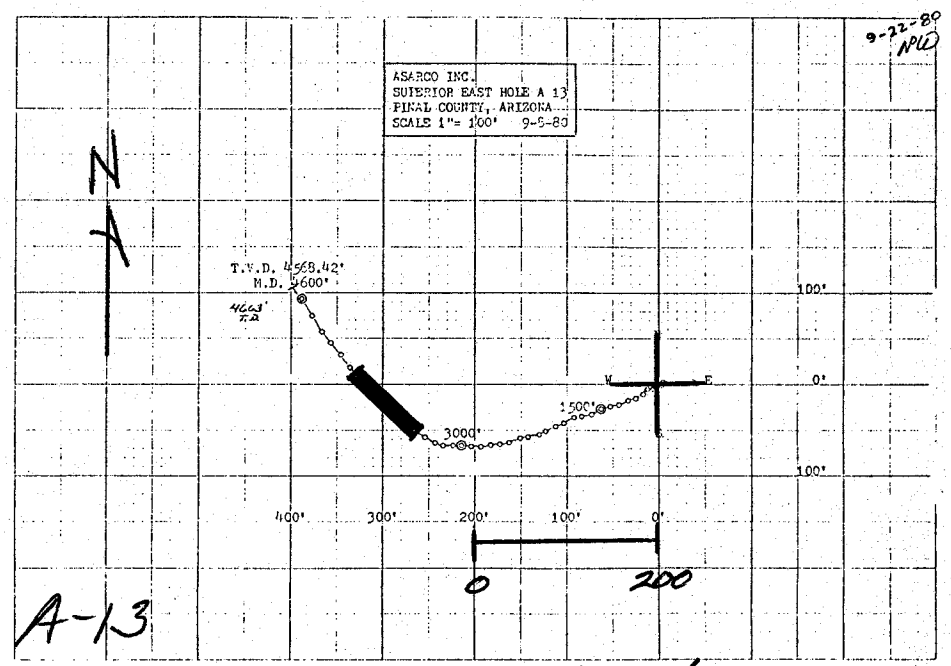

EXPL. DIV.
100'
50'
0'
N
W
E
S
2700'
2875'
3175'
2600'
4000'
4400'
MD 5050'
MD 5670'
TVD 5652.40'
0'
50'
100'
150'
200'
250
300
350
ASARCO INC
SUPERIOR EAST HOLE A12
PINAL COUNTY ARIZ
SCALE 1" = 50'
6-12-81

X2

2-1961

EXPL. DIV.



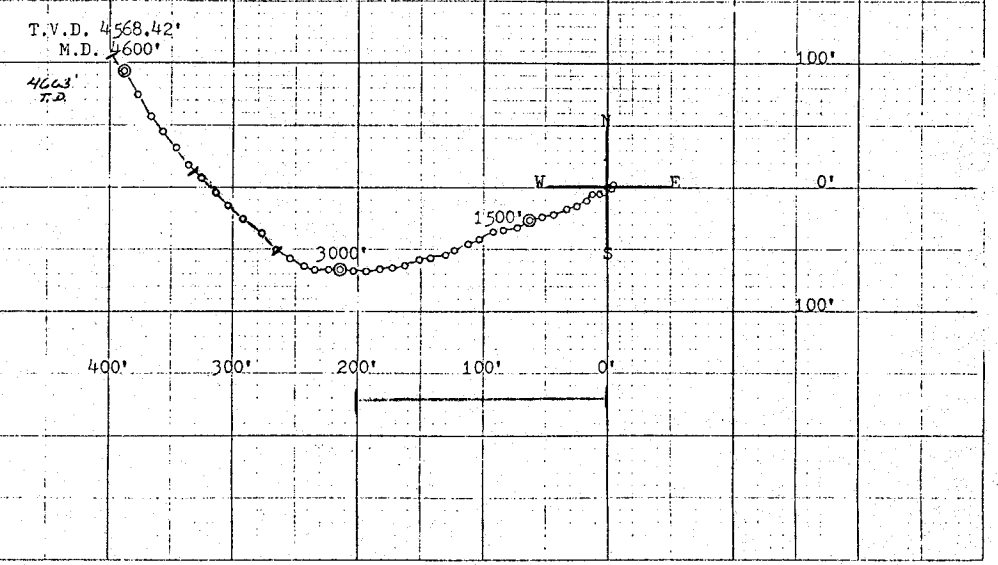


1" = 200 ≅ 205'

X2 X1

9-22-80
NPC

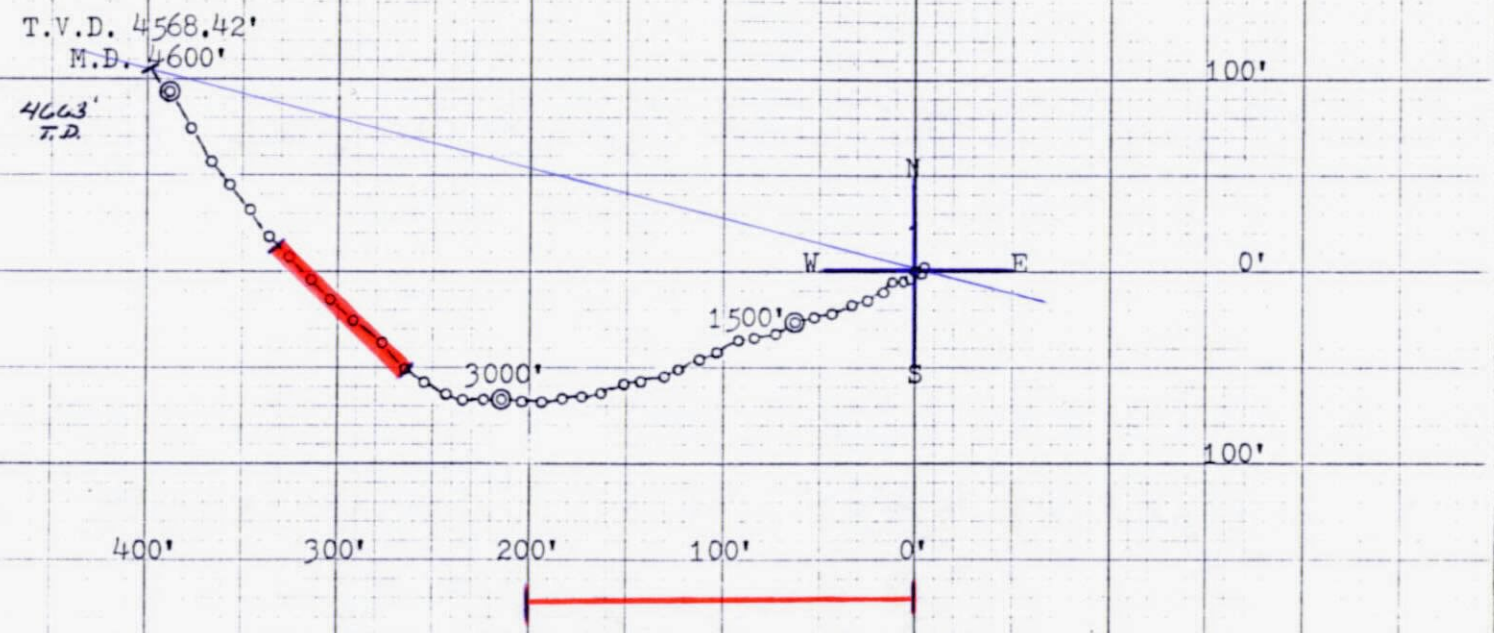
ASARCO INC.
SUPERIOR EAST HOLE A 13
PINAL COUNTY, ARIZONA
SCALE 1"= 100' 9-8-80

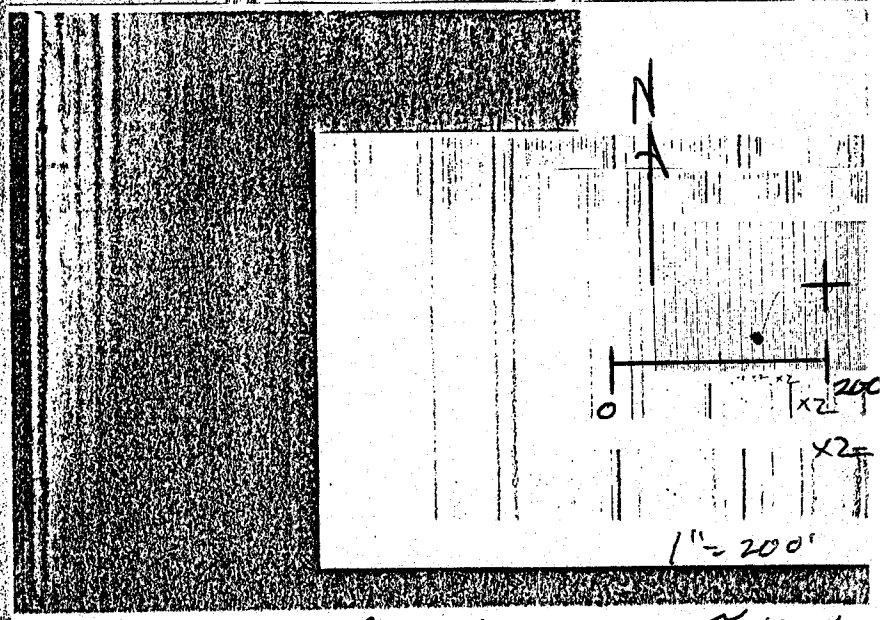


X2

9-22-80
NPD

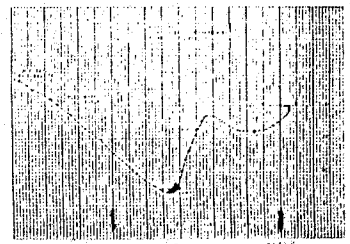
ASARCO INC.
SUPERIOR EAST HOLE A 13
PINAL COUNTY, ARIZONA
SCALE 1"= 100' 9-8-80





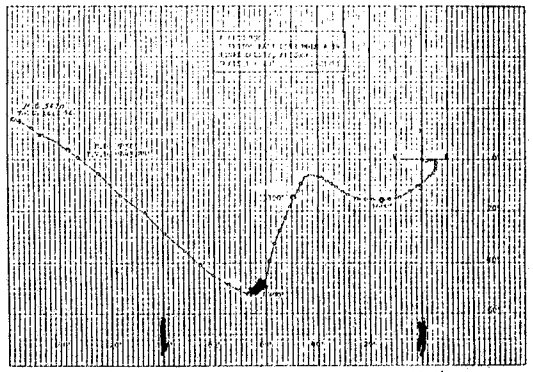
A-14

≅ 180'

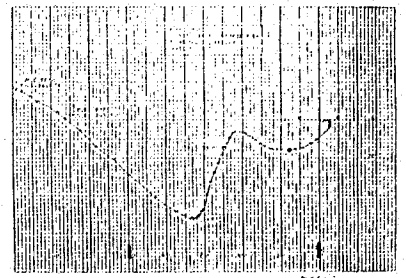


x_2 x_2 x_2

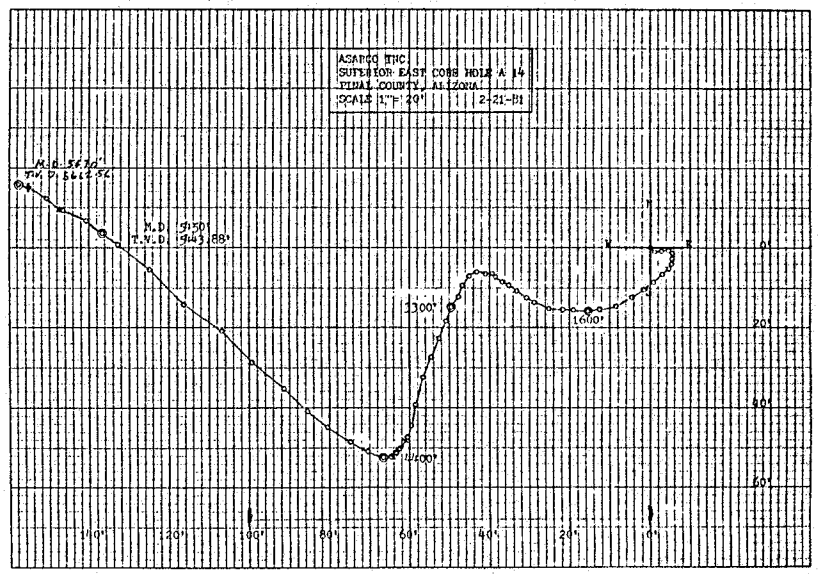
x_2



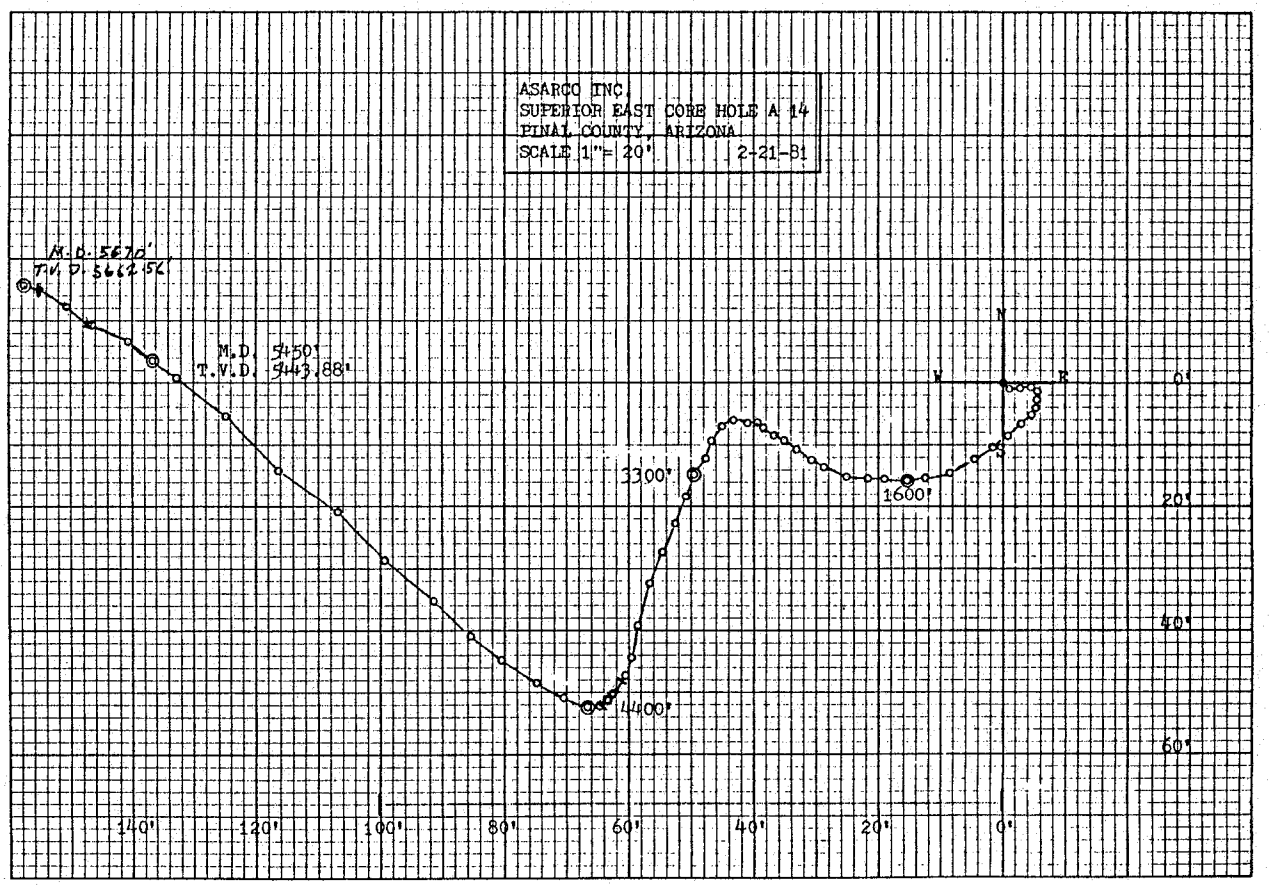
x2 x2 x2



1" = 100'

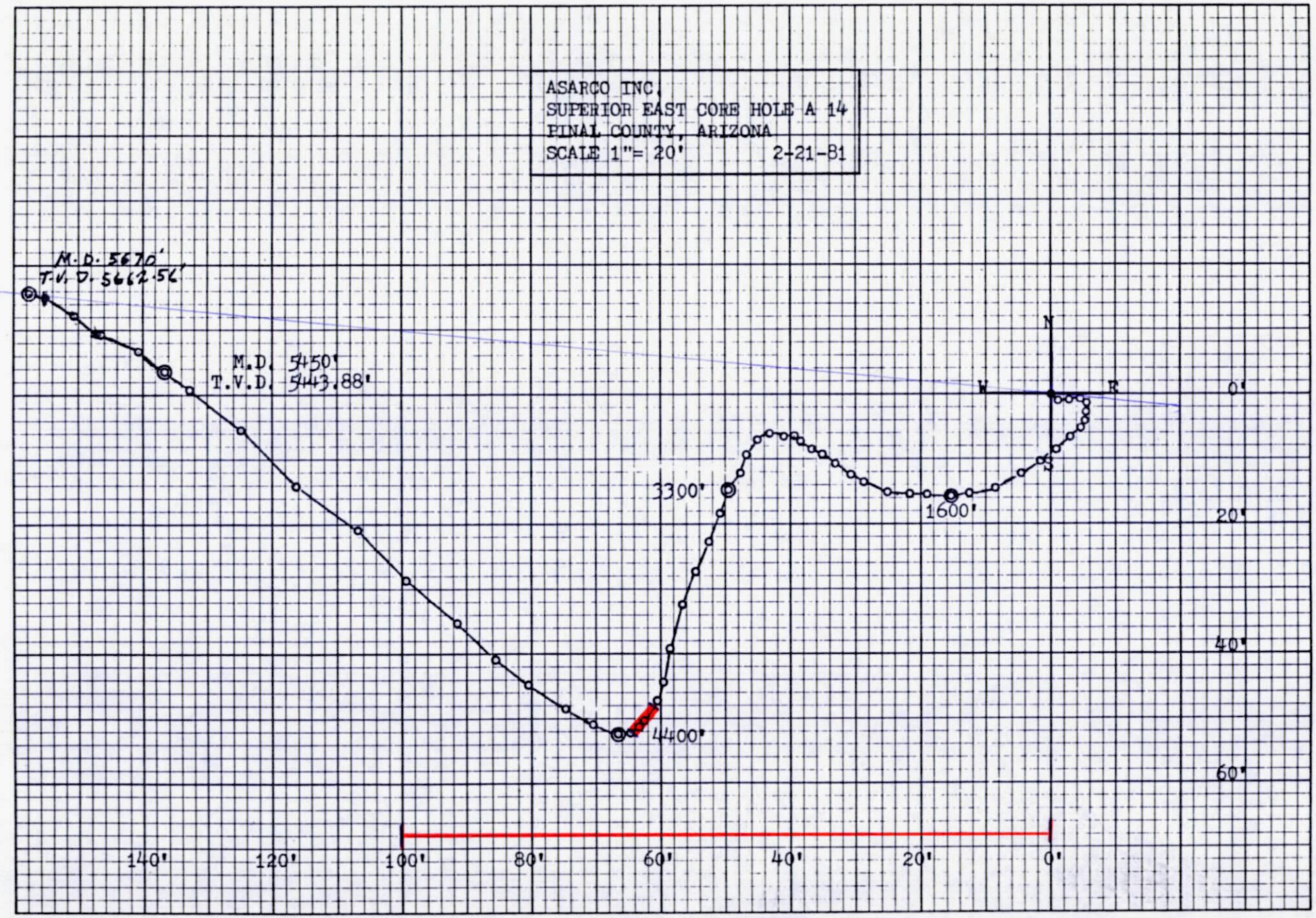

ASARCO INC.
SUPERIOR EAST COBB HOLE A 14
PINAL COUNTY, ARIZONA
SCALE 1" = 20'
2-21-81
M.D. 5650'
T.V.D. 5612.56'
M.D. 5750'
T.V.D. 5643.88'
1300'
1600'
4400'
140'
120'
100'
80'
60'
40'
20'
0'
0
20'
40'
60'

X2 X2



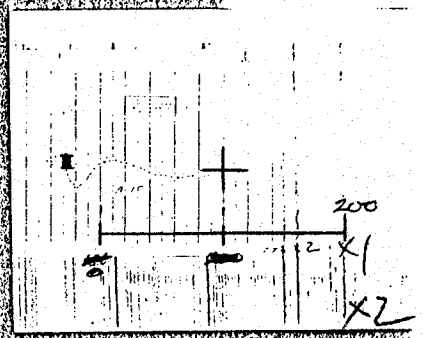
X2

Total Hole


ASARCO INC.
SUPERIOR EAST CORE HOLE A 14
PINAL COUNTY, ARIZONA
SCALE 1"= 20'
2-21-81
M.D. 5670'
T.V.D. 5662.56'
M.D. 5450'
T.V.D. 5443.88'
3300'
1600'
4400'
N
W
E
S
0'
20'
40'
60'
140'
120'
100'
80'
60'
40'
20'
0'

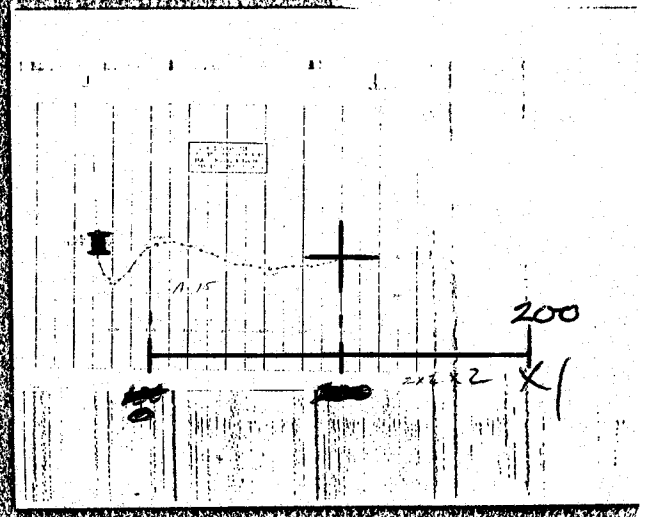
Total Hole

N
200
X1
X2
X1
A-15
1" = 200'
= 190'

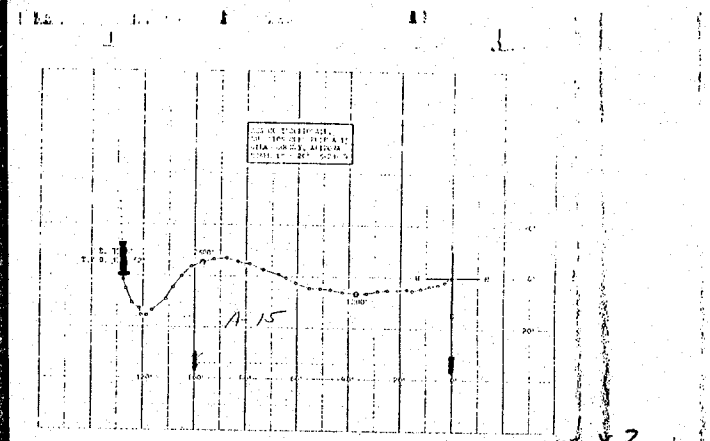


A-15

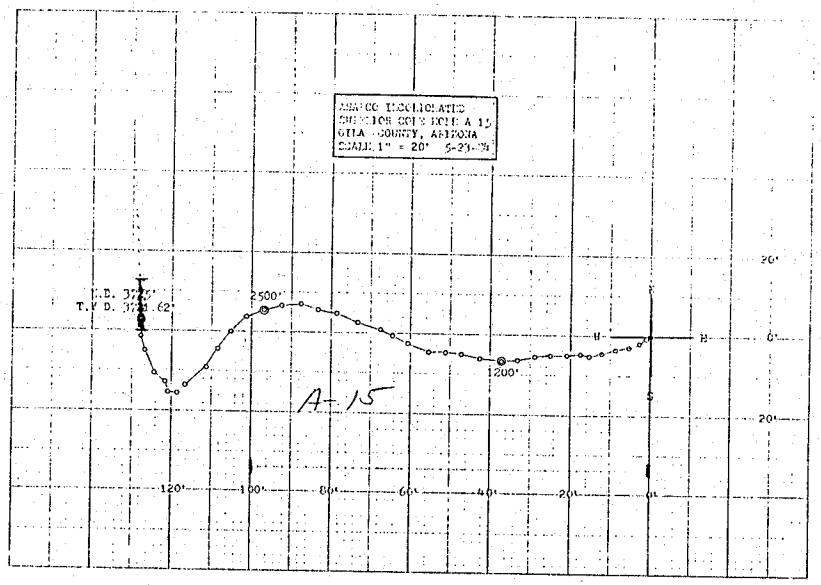
1" = ~~200'~~ 100'



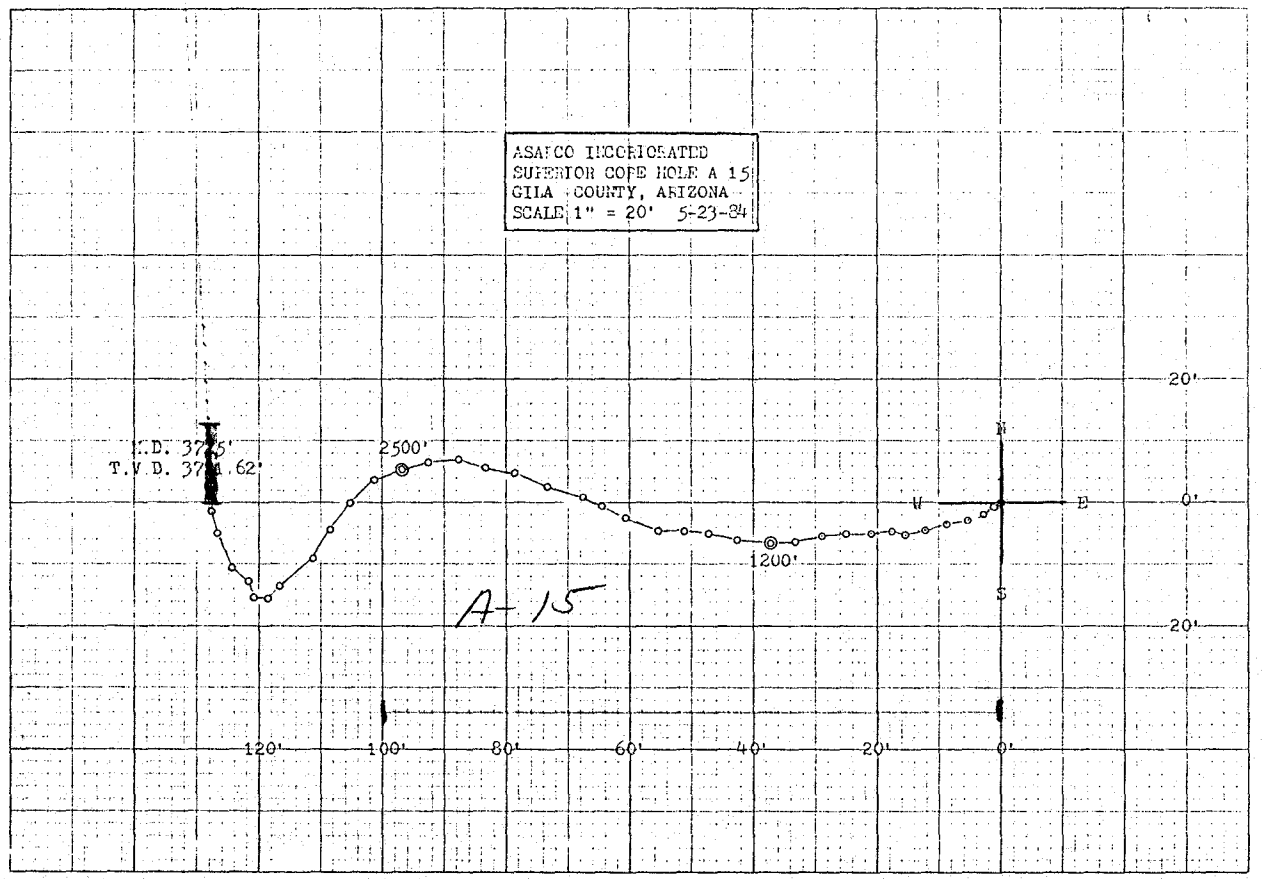
A-15 1" = ~~200'~~ 100'



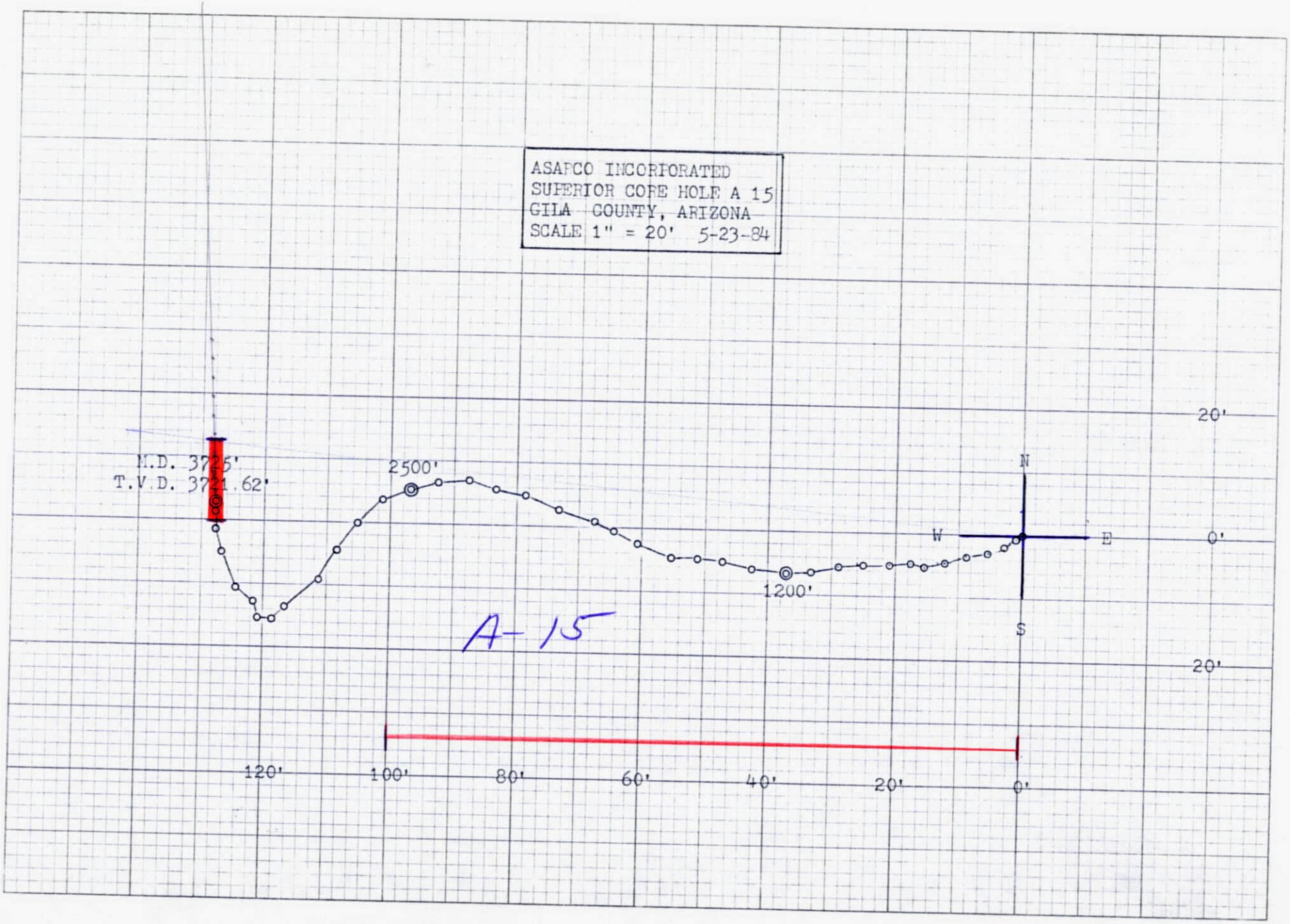
2x2 X 2

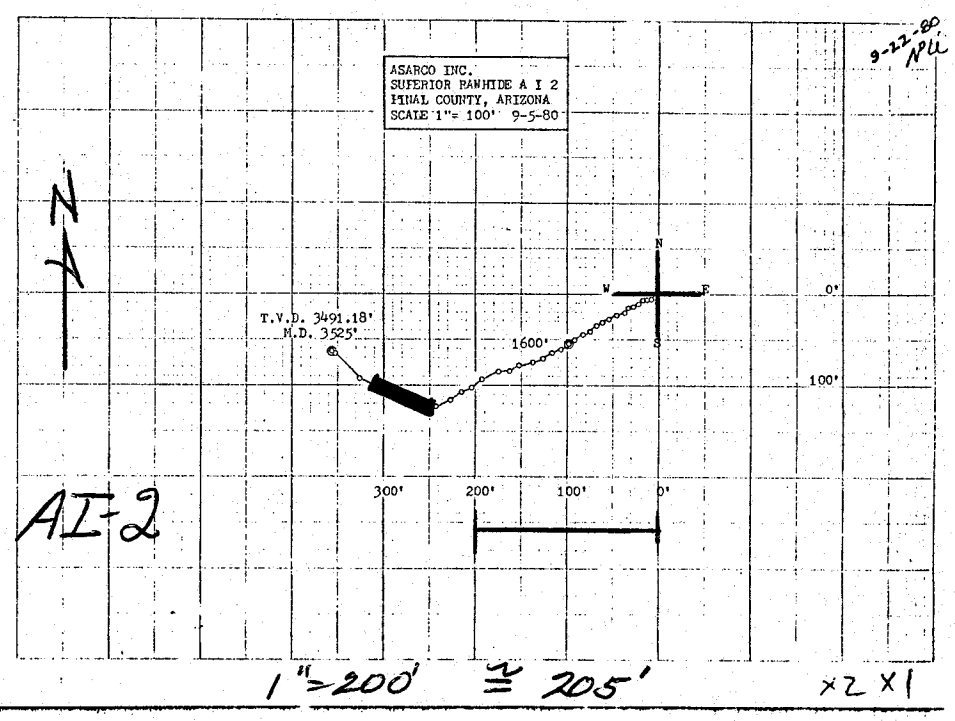

GILA COUNTY, ARIZONA
SCALE 1" = 20'
2500'
1200'
120'
100'
80'
60'
40'
20'
0'
20'
A-15

2 X 2


ASARCO INCORPORATED
SUPERIOR CORE HOLE A 15
GILA COUNTY, ARIZONA
SCALE 1" = 20' 5-23-84
M.D. 3725'
T.V.D. 3711.62'
2500'
1200'
N
W
E
S
20'
0'
20'
120'
100'
80'
60'
40'
20'
0'
A-15

2


ASARCO INCORPORATED
SUPERIOR CORE HOLE A 15
GILA COUNTY, ARIZONA
SCALE 1" = 20' 5-23-84
M.D. 3725'
T.V.D. 3721.62'
2500'
1200'
N
W
E
S
A-15
20'
0'
20'
120'
100'
80'
60'
40'
20'
0'



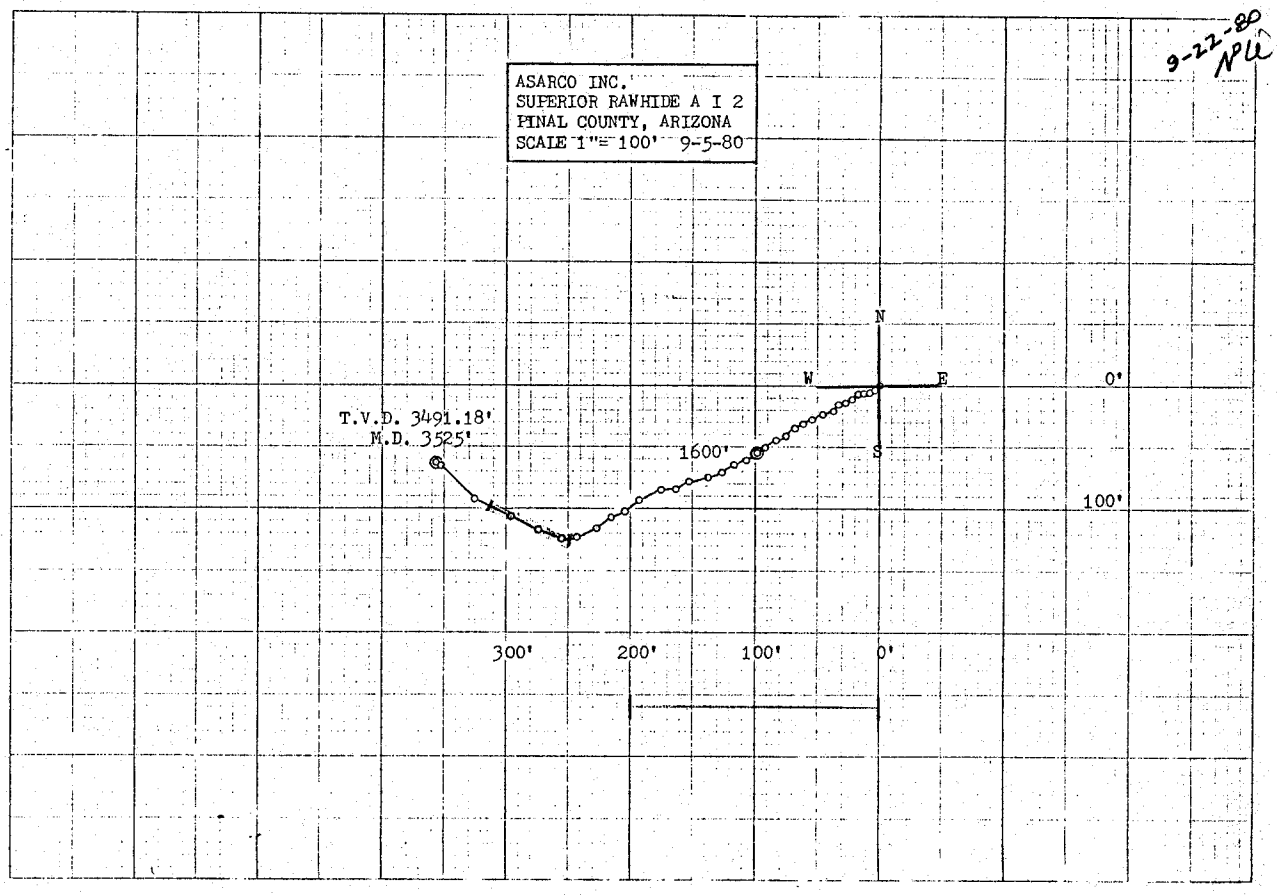
9-22-80 APU

AI-2

1" = 200' ≅ 205'

x2 x1

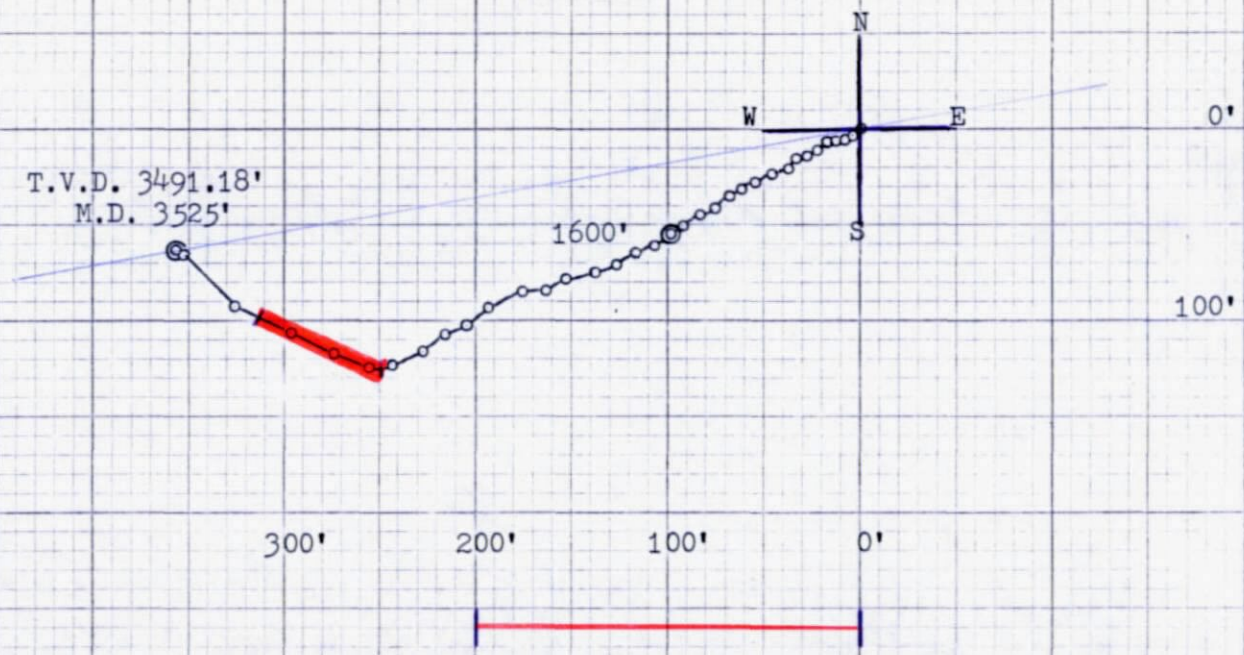
9-22-80
NCU


ASARCO INC.
SUPERIOR RAWHIDE A I 2
PINAL COUNTY, ARIZONA
SCALE 1"= 100' 9-5-80
N
W
E
S
0'
100'
T.V.D. 3491.18'
M.D. 3525'
1600'
300'
200'
100'
0'

x2

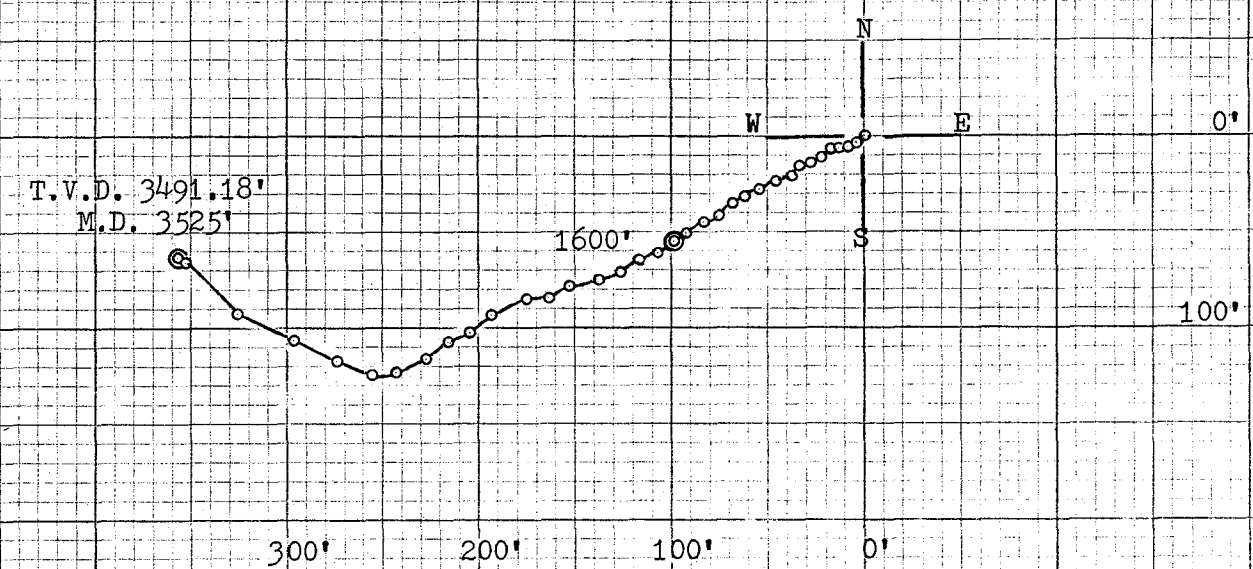
9-22-80
NPW

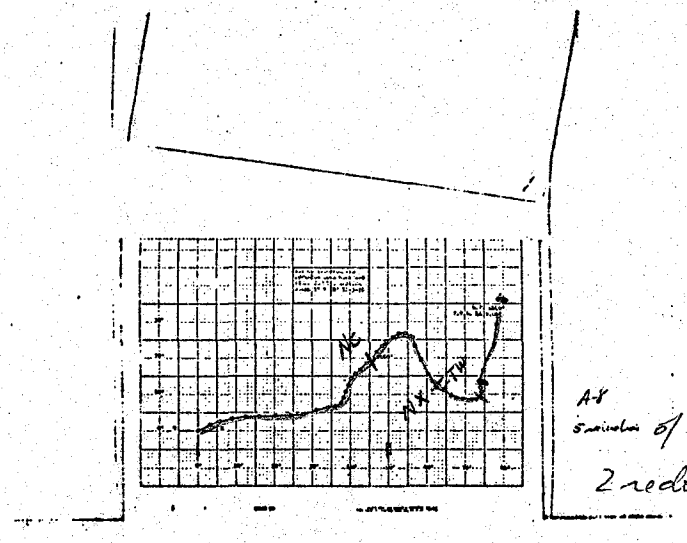
ASARCO INC.
SUPERIOR RAWHIDE A I 2
PINAL COUNTY, ARIZONA
SCALE 1"= 100' 9-5-80



9-22-80
NPU

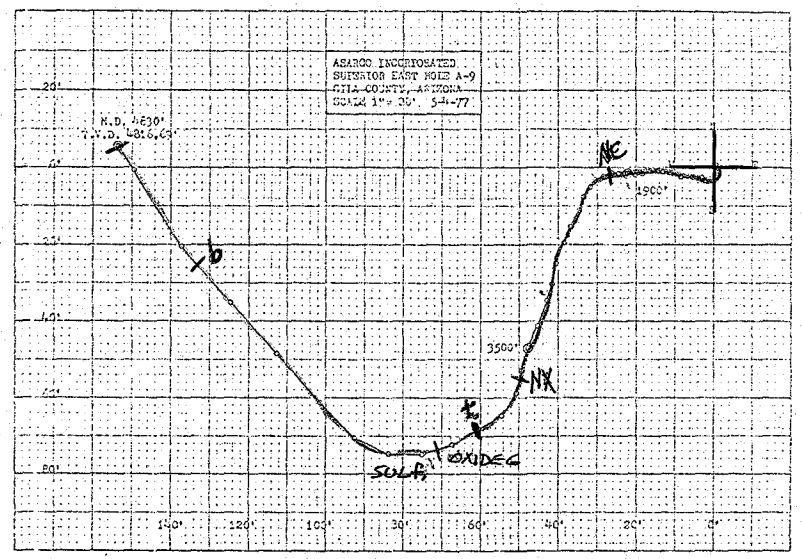
ASARCO INC.
SUPERIOR RAWHIDE A I 2
PINAL COUNTY, ARIZONA
SCALE 1"= 100' 9-5-80





A-8
2 reduction of
5 reduction of 5 reduction

1" = 50'

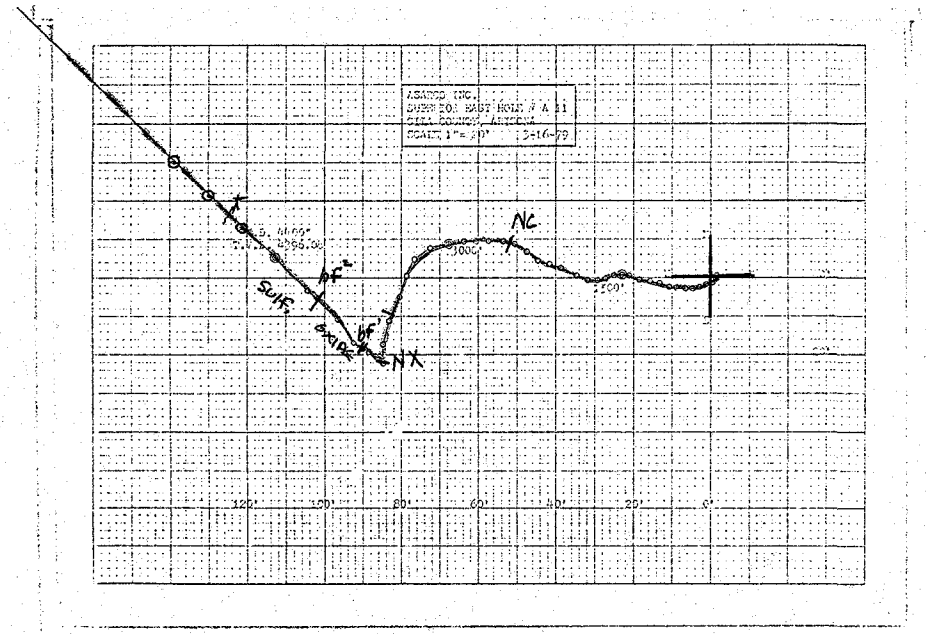


A-9

1" = 50'

5 reduction

4 reduction of 5 reduction

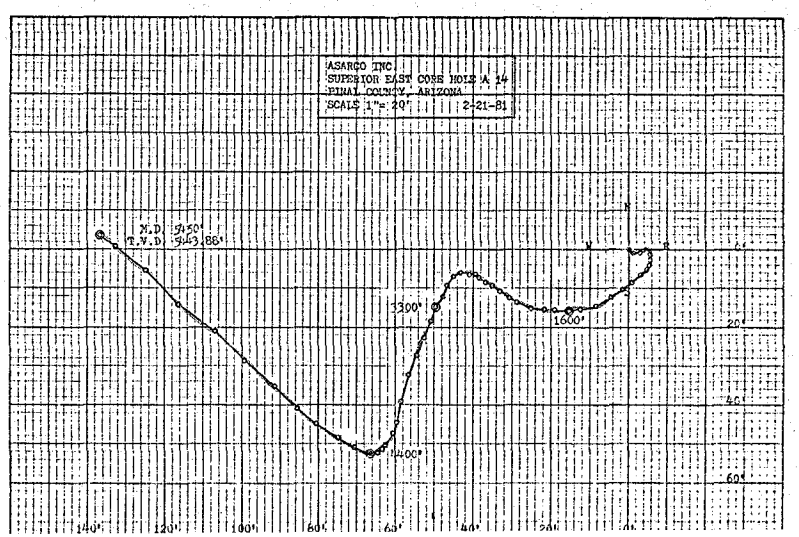


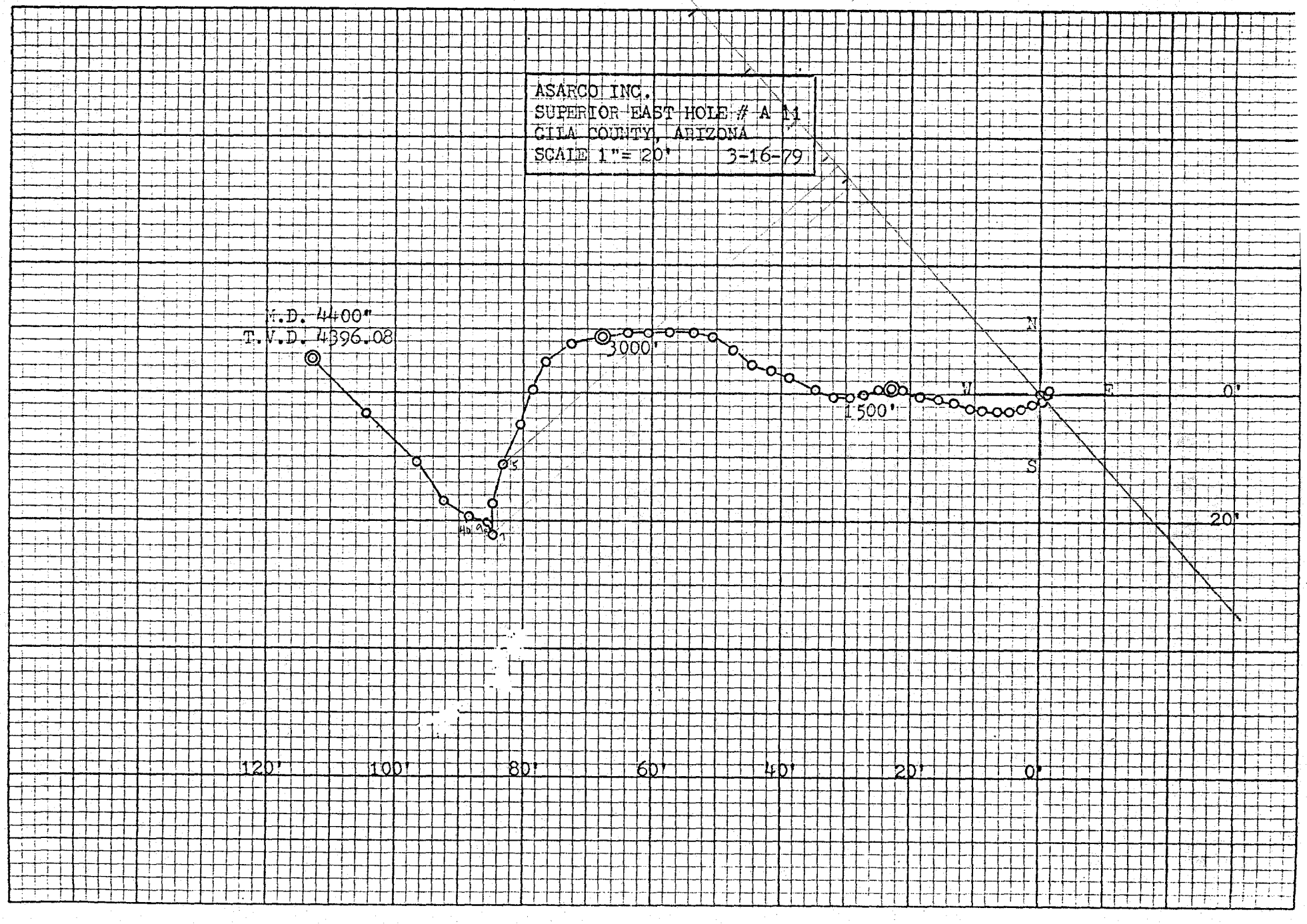
A-11

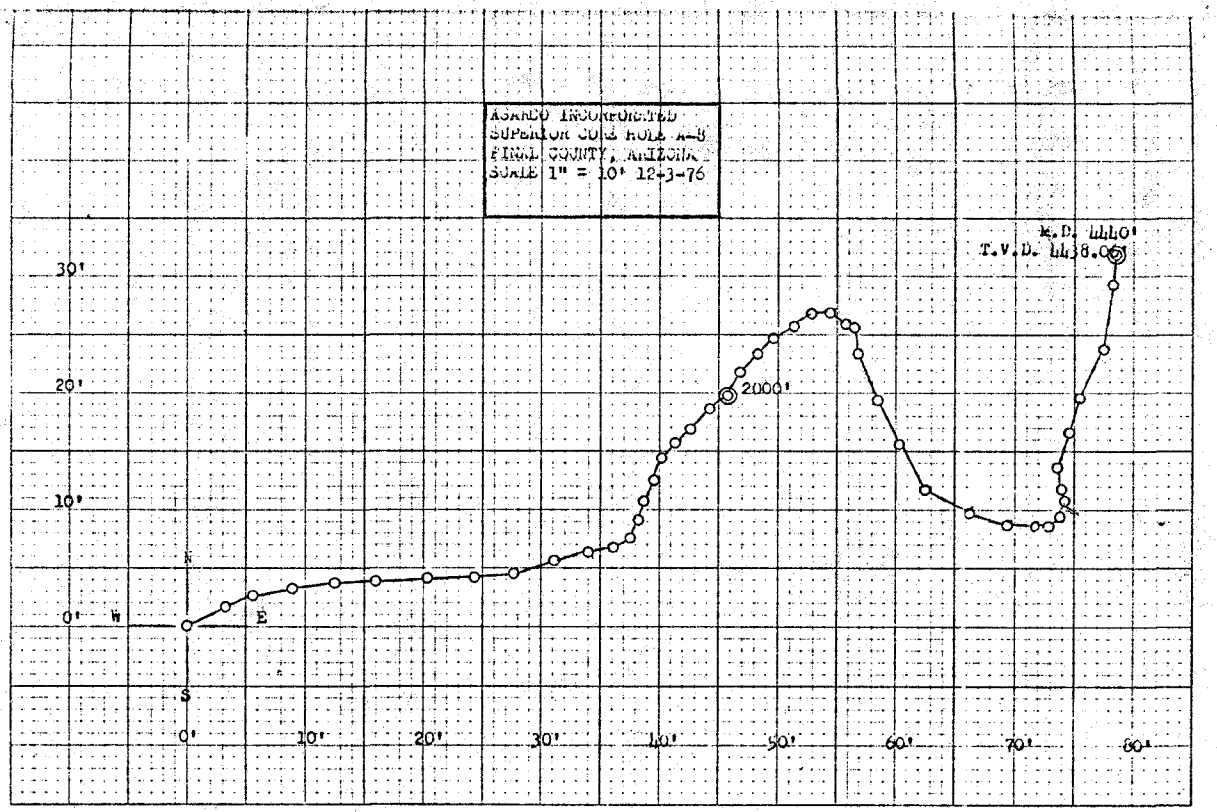
1" = 50'

4 reductions from 5 reductions.

ASARCO INC.
SUPERIOR EAST CORE HOLE A 14
PINAL COUNTY, ARIZONA
SCALE 1"= 20' 2-21-81



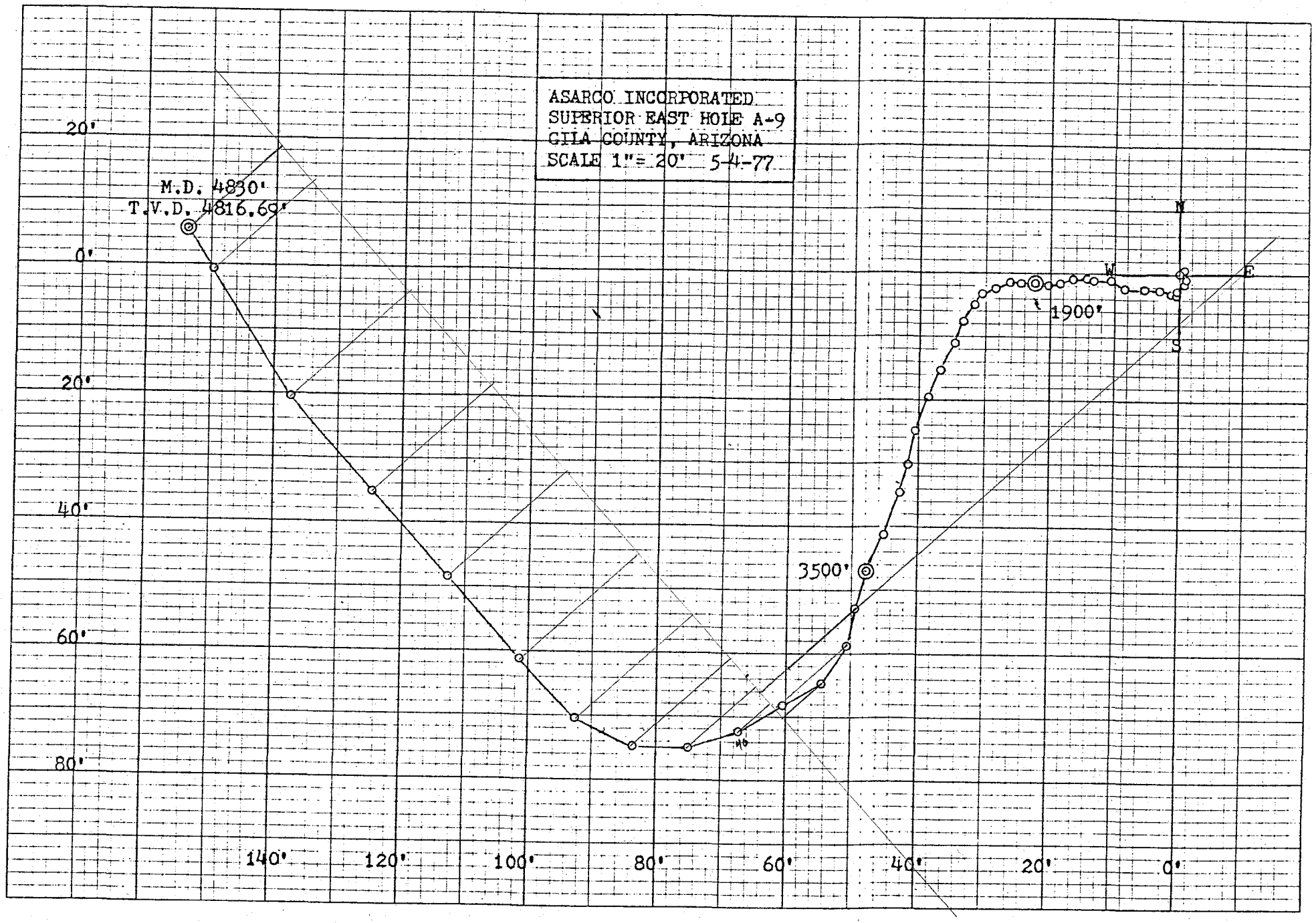

ASARCO INC.
SUPERIOR EAST HOLE # A-11
GILA COUNTY, ARIZONA
SCALE 1" = 20'
3-16-79
M.D. 4400'
T.V.D. 4396.08
3000'
1500'
N
W
E
S
0'
20'
120'
100'
80'
60'
40'
20'
0'

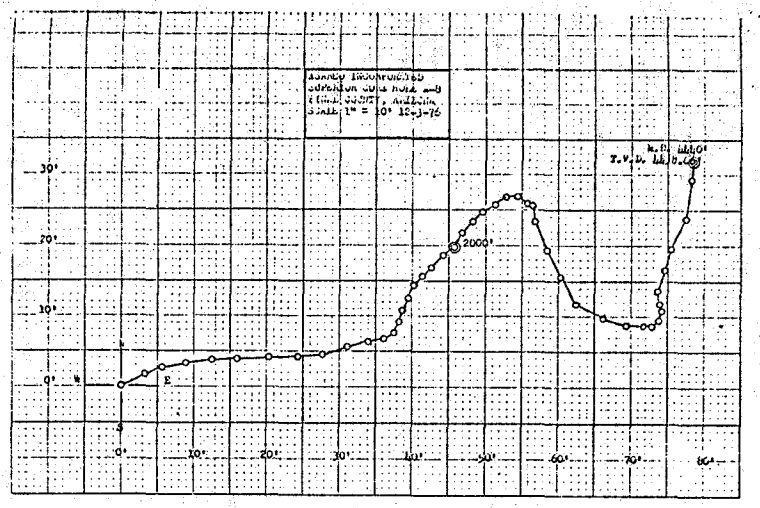


A-8

5 reduction

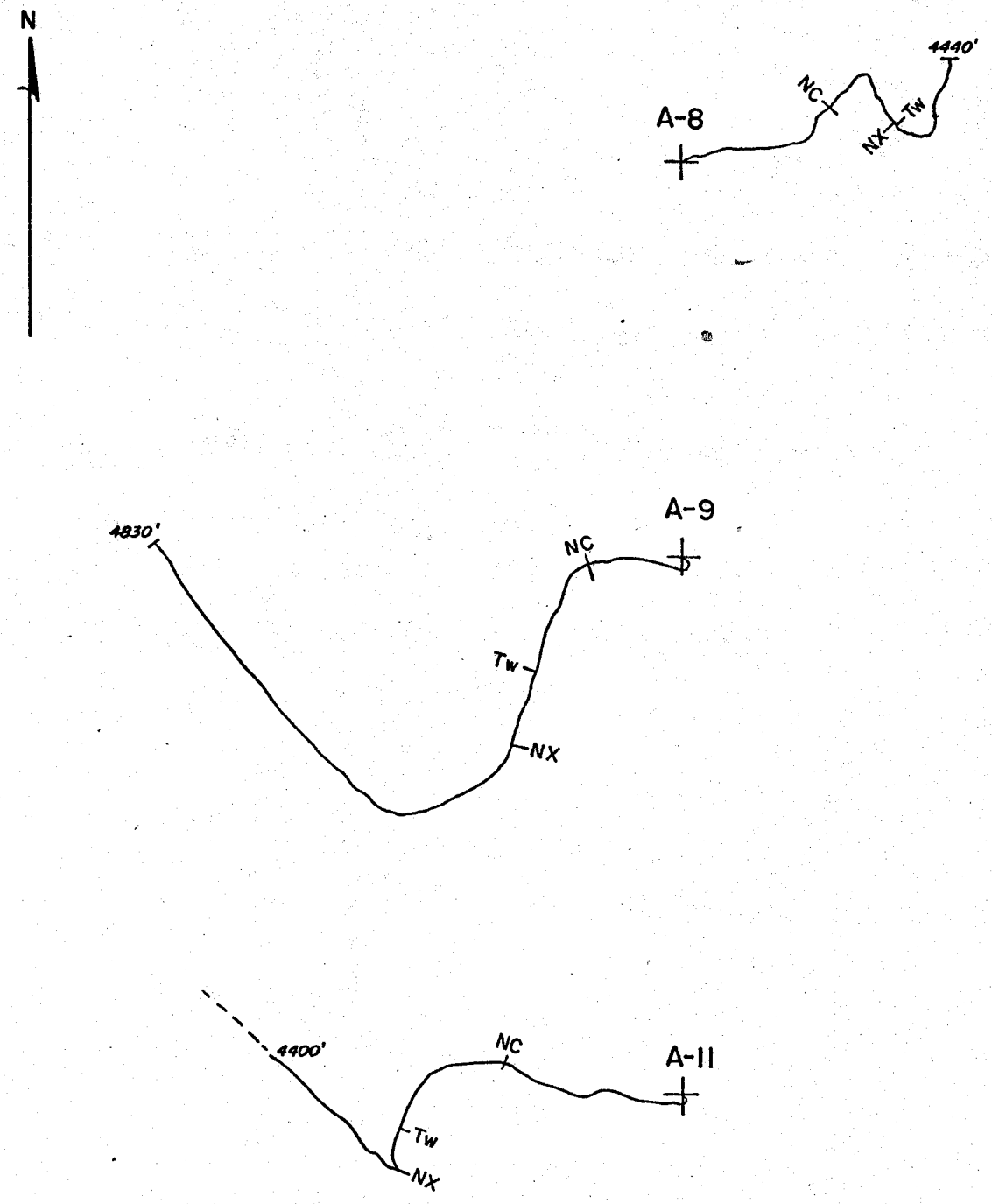
46 0780
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.


ASARCO INCORPORATED
SUPERIOR EAST HOLE A-9
GILA COUNTY, ARIZONA
SCALE 1" = 20' 5-4-77
M.D. 4830'
T.V.D. 4816.69'
3500'
1900'
N
W
E
S
20'
0'
20'
40'
60'
80'
140'
120'
100'
80'
60'
40'
20'
0'



A-8

5 miles of 5



EXPLANATION

+ Collar of Hole With Number

NC Base of NC Core

NX Base of NX Core

Tw Base of Whitetail Conglomerate

Plan of Deviation of Drill Holes

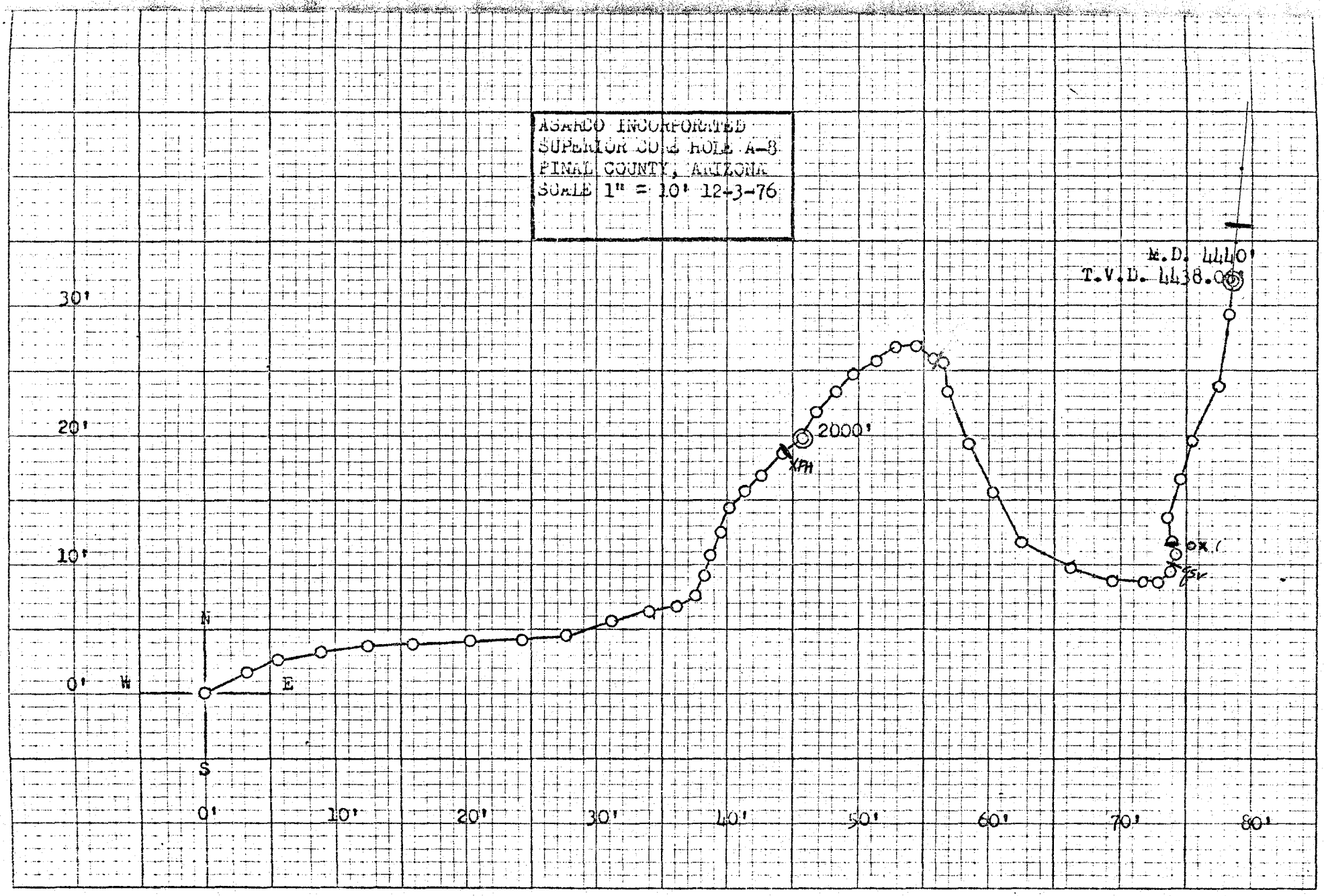
SUPERIOR EAST PROJECT

GILA & PINAL COUNTIES
ARIZONA

SCALE: 1" = 50'

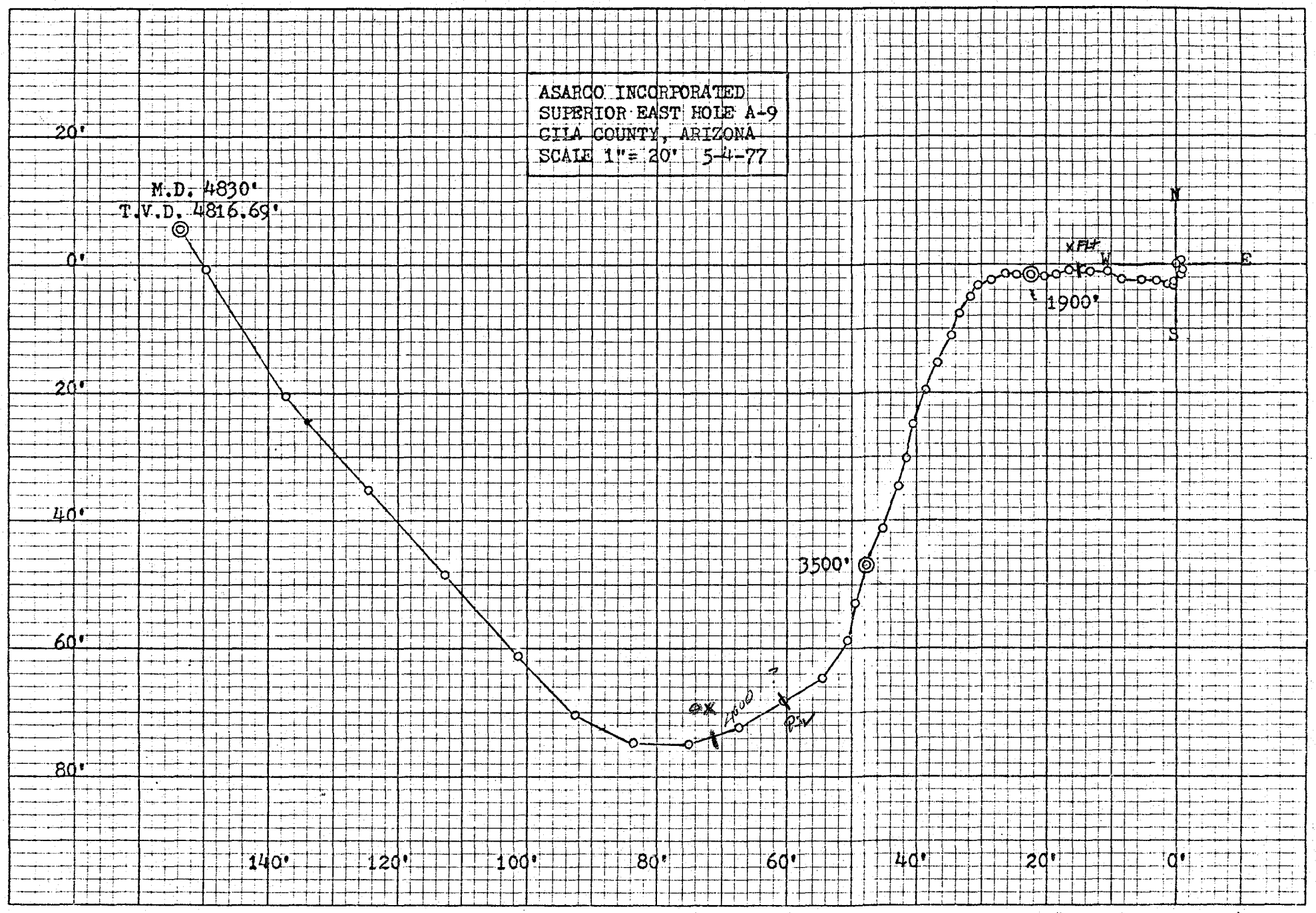
J.D. Sell April, 1979

MVK 5094



need 2 of 5 of 5 of 5
for 1" = 50'

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 0780

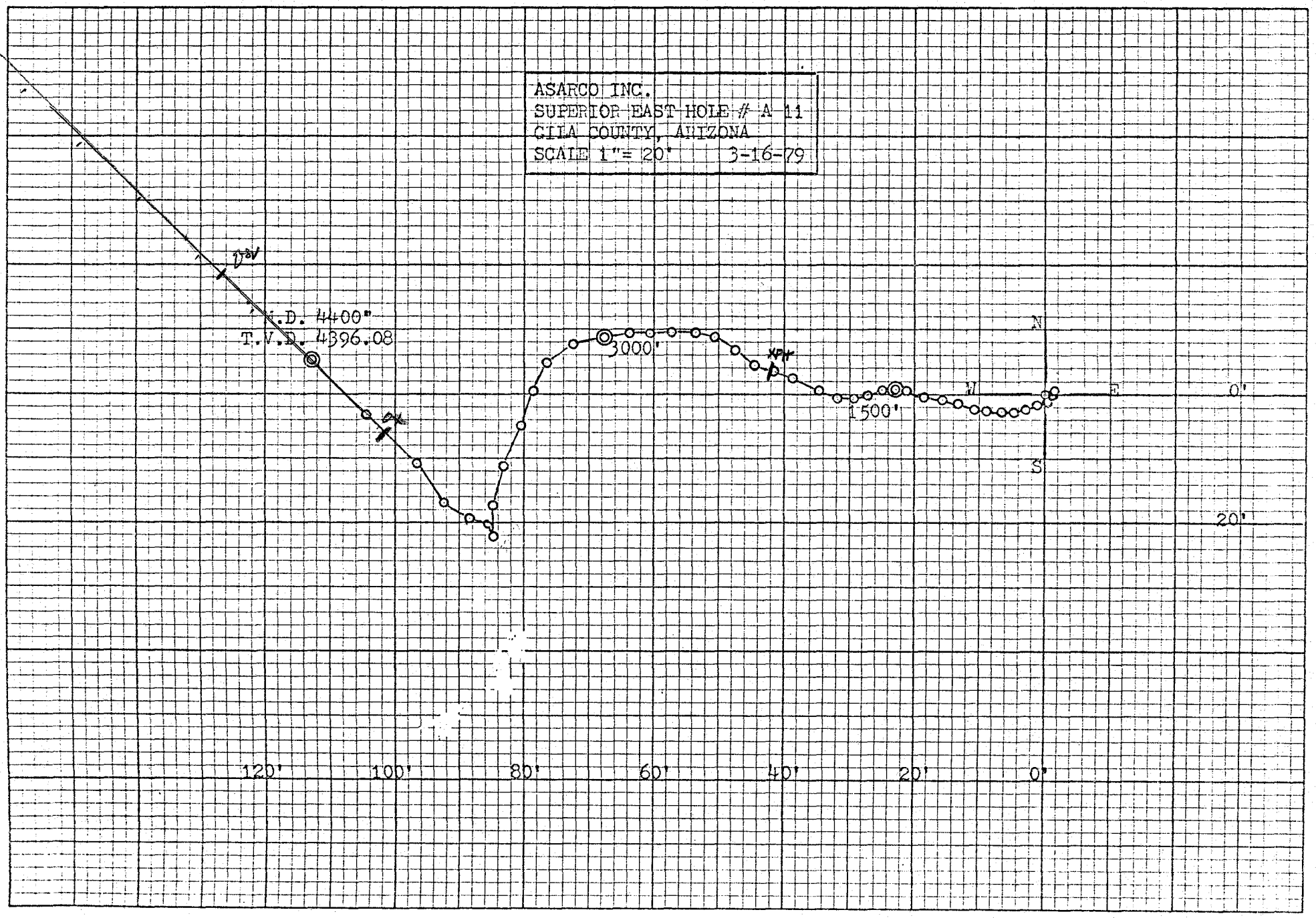


need 4 of 5 for 1"=50'

R+5

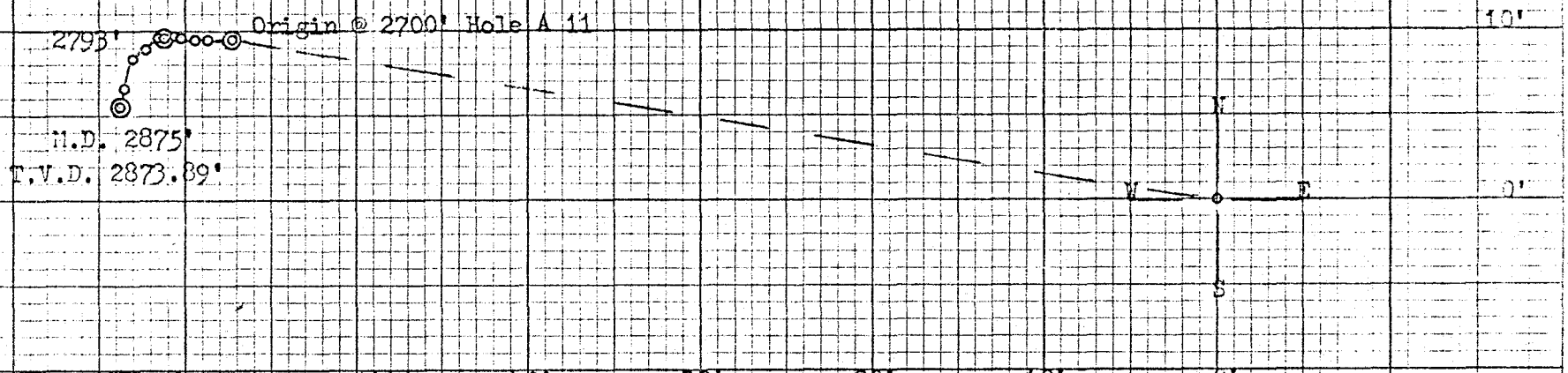
5000 est.

ASARCO INC.
SUPERIOR EAST HOLE # A-11
GILA COUNTY, ARIZONA
SCALE 1"= 20' 3-16-79



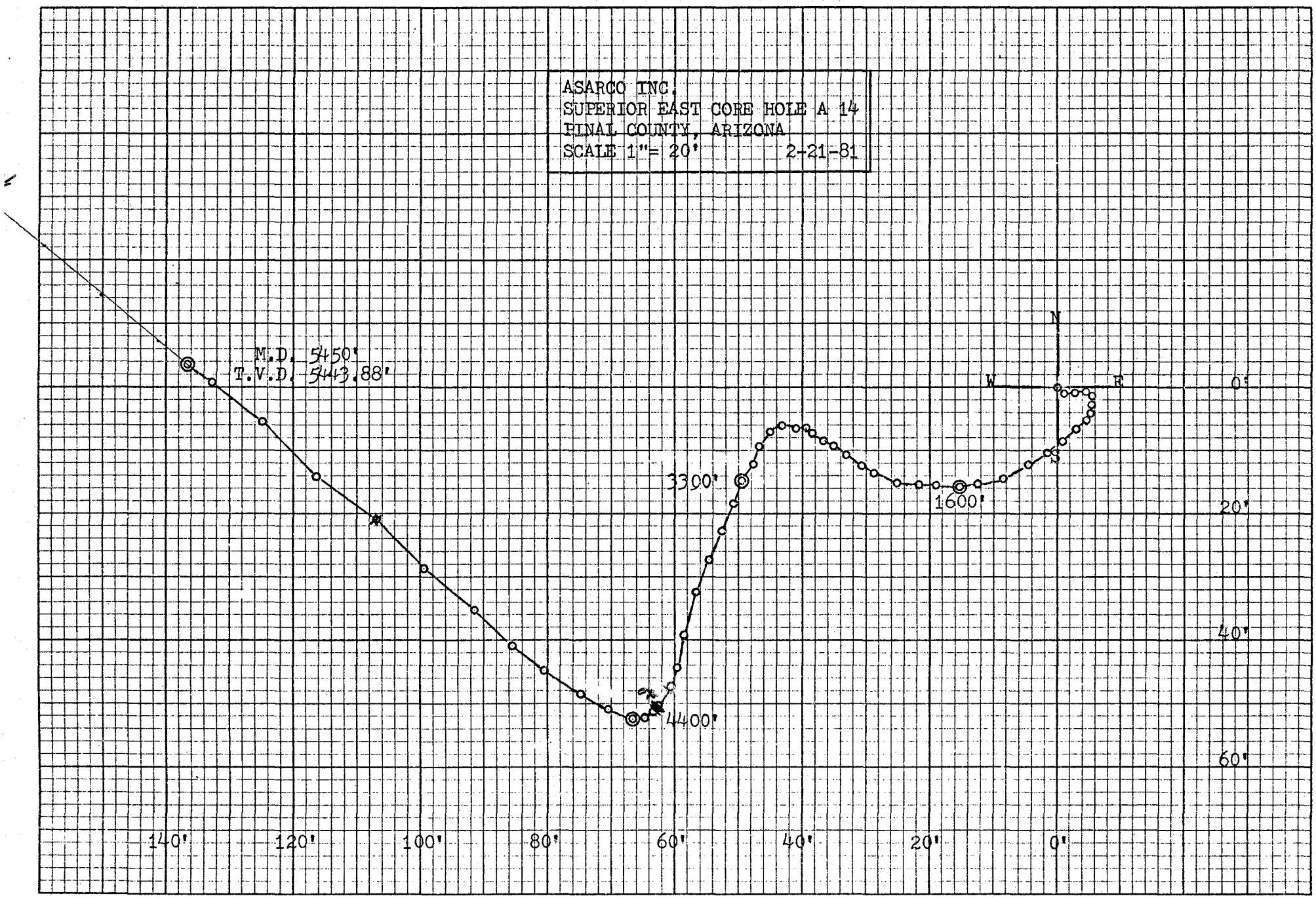
need 4 of 5 for 1"=50'

ASARCO INC.
SUPERIOR EAST HOLE A 12
GILA COUNTY, ARIZONA
SCALE 1"=10' 2-27-80

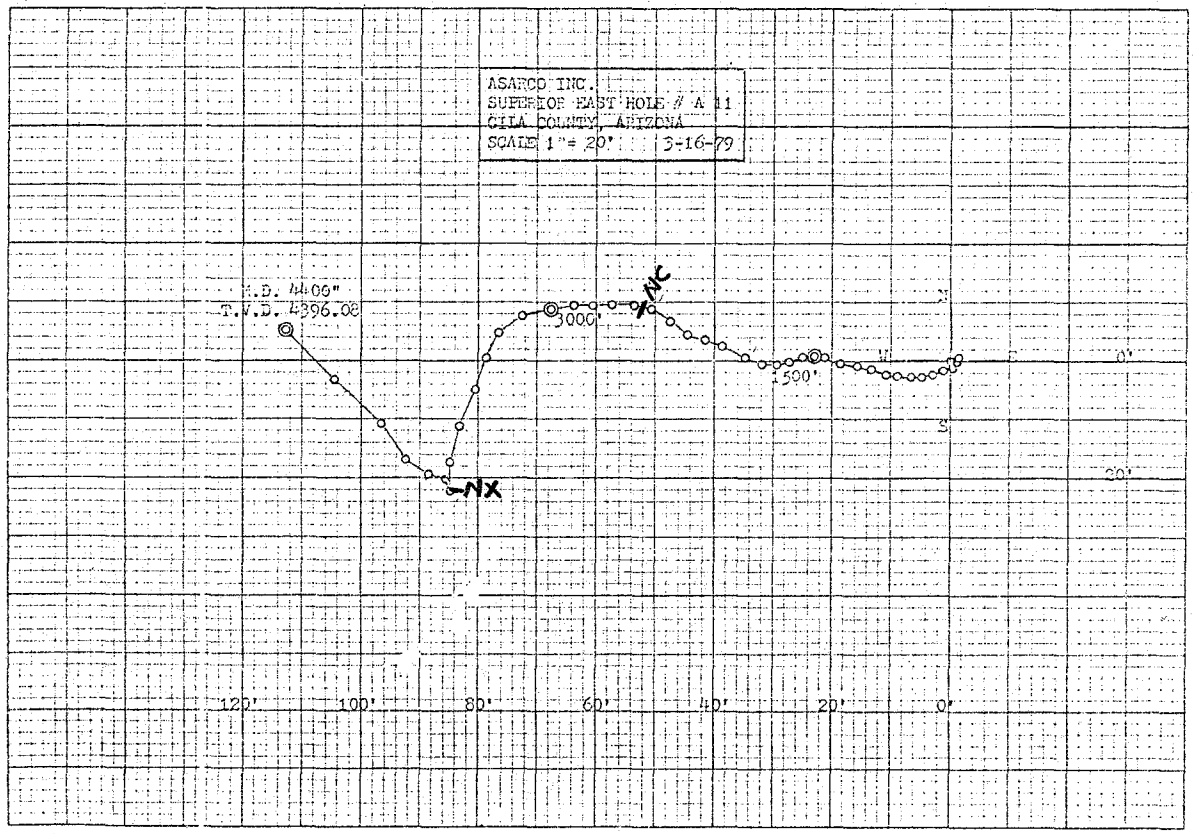


3-19-80 CMW

need 2 of 5 of 5 of 5 for 1"=50'



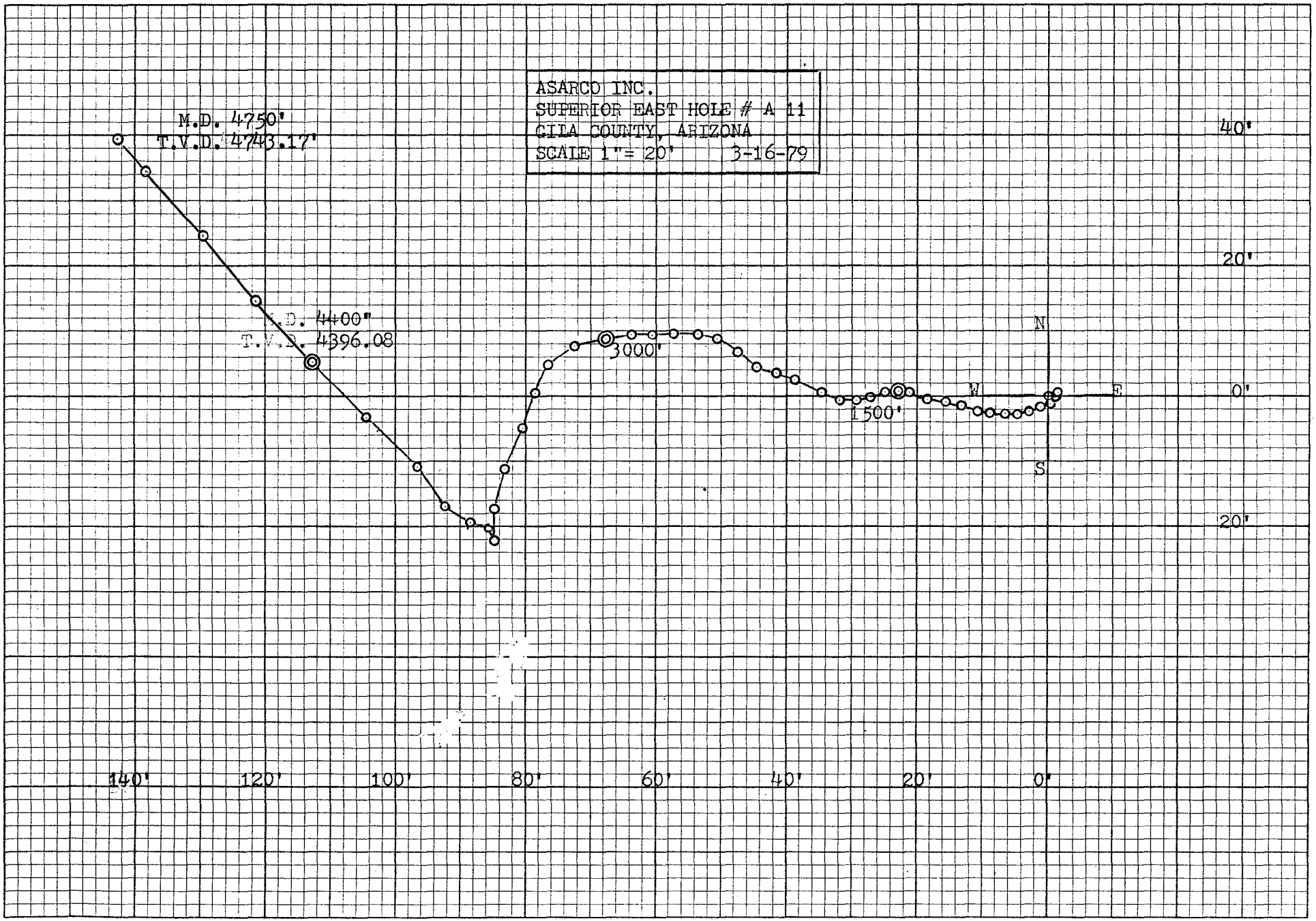
need 4 of 5 for 1"=50'

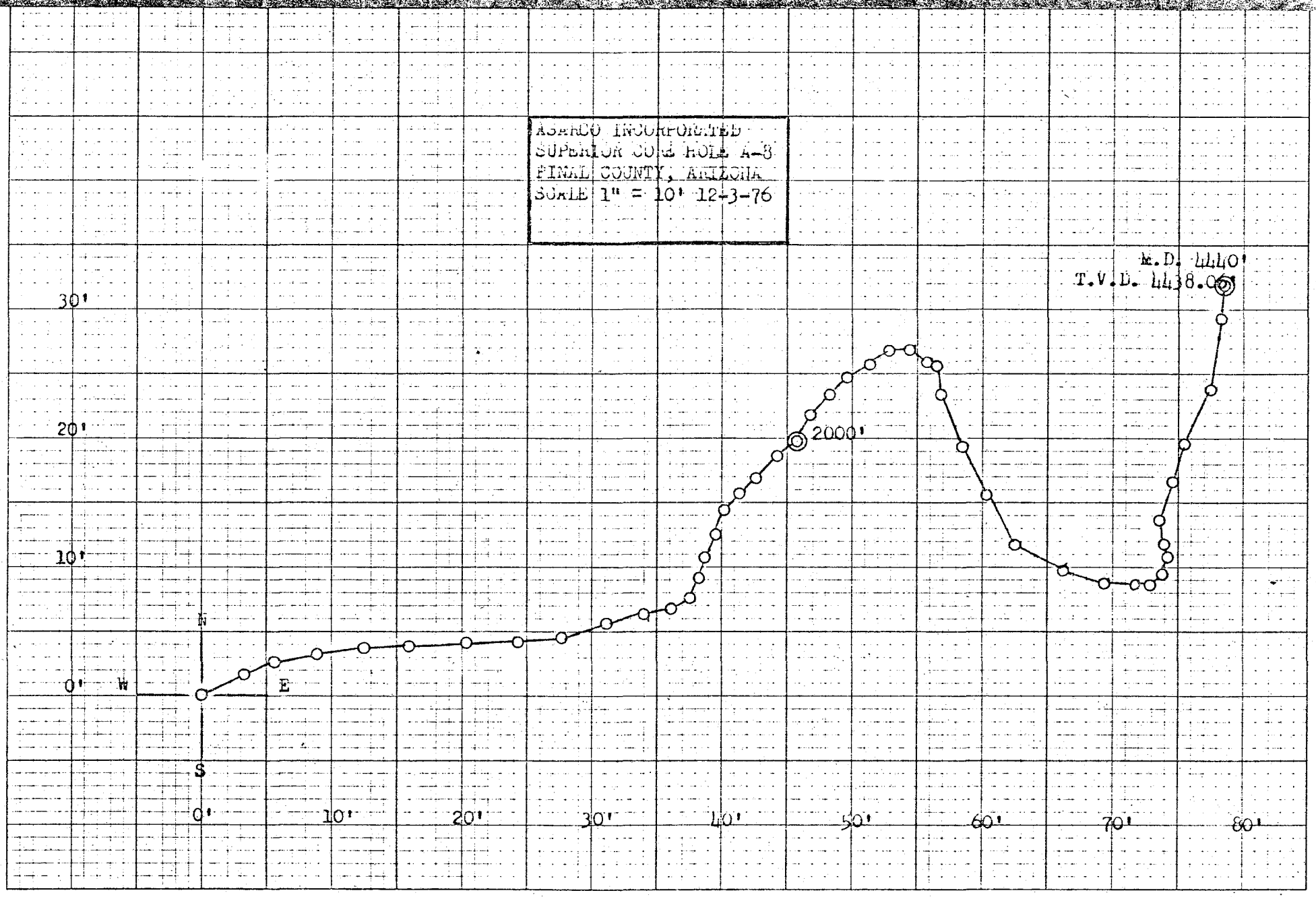

ASARCO INC.
SUPERIOR EAST HOLE # A 11
GILA COUNTY, ARIZONA
SCALE 1" = 20'
3-16-79
M.D. 4400'
T.V.D. 4396.08
3000'
NC
1500'
NX
120'
100'
80'
60'
40'
20'
0'

5 reduction

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

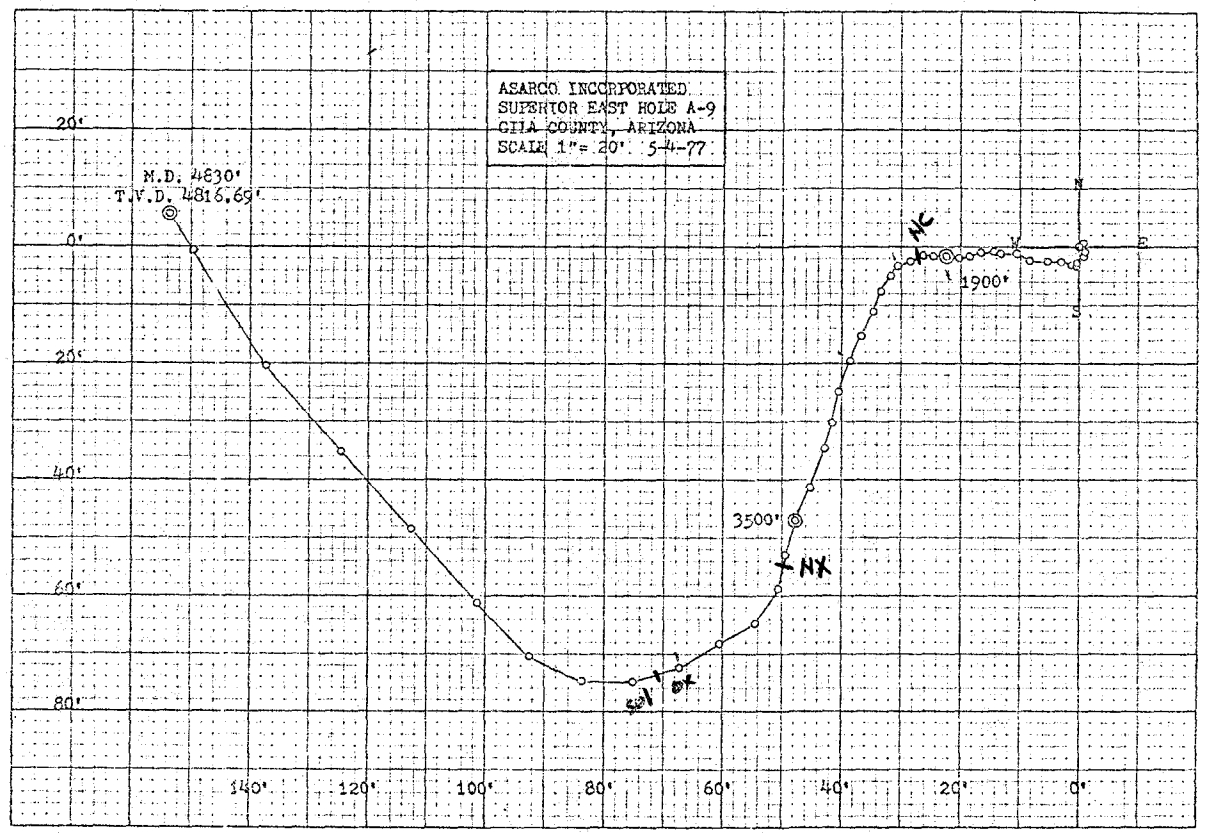
46 0780





46 0780

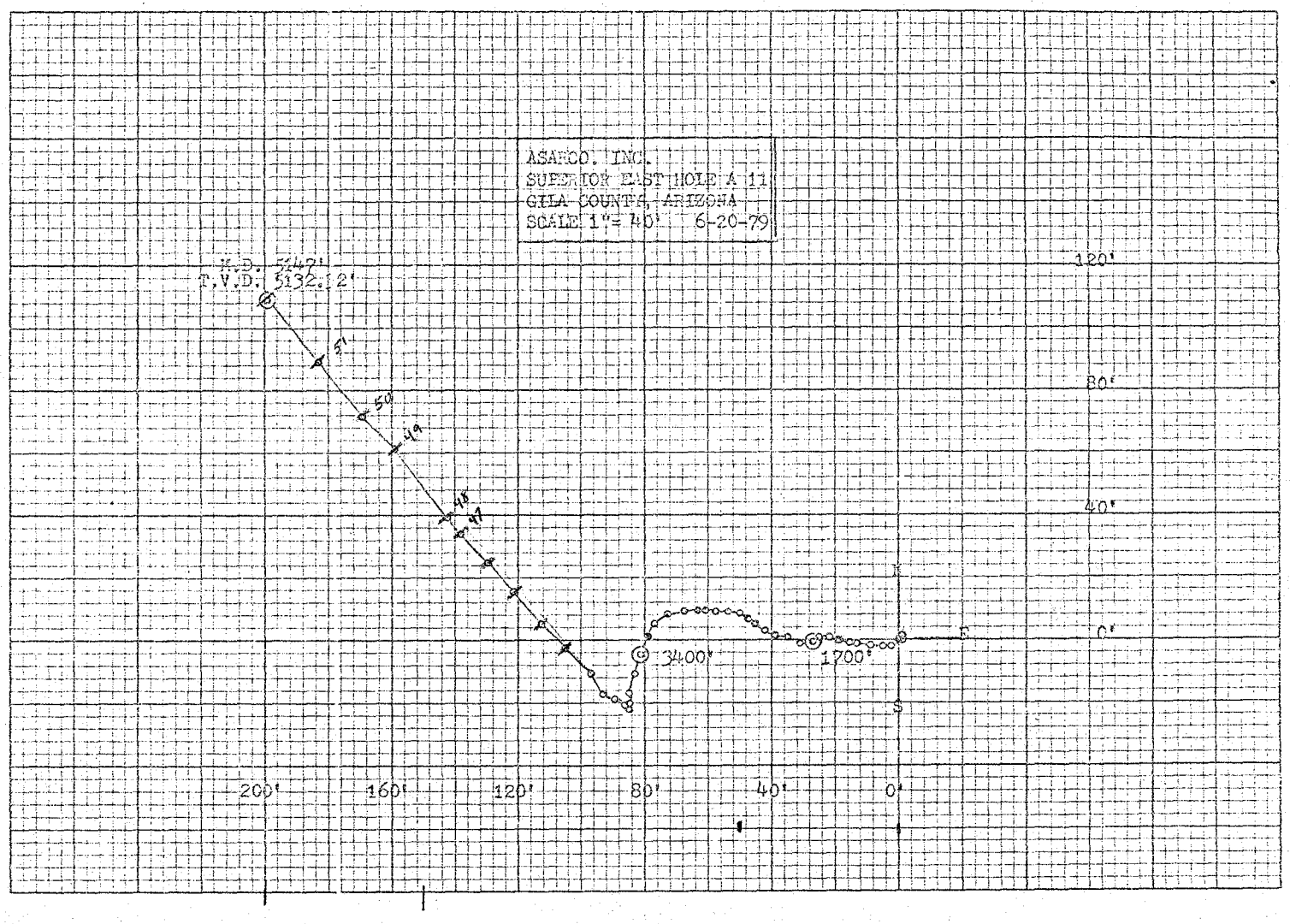
K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.


ASARCO INCORPORATED
SUPERIOR EAST HOLE A-9
GILA COUNTY, ARIZONA
SCALE 1"= 20' 5-4-77
M.D. 4830'
T.V.D. 4816.69'
20'
0'
20'
40'
60'
80'
140'
120'
100'
80'
60'
40'
20'
0'
3500'
1900'
NX
NC
N
E
S

5 reduction

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0780



1" = 50'

Jim:

I'll pick up the file Copy later this week for up date

Thanks

Mol

IMPORTANT MESSAGE

FOR JAS

DATE 6/25 TIME 10:40 A.M. P.M.

WHILE YOU WERE OUT

M. Mr Mollenhauer

OF

PHONE No. Area Code Number Extension

TELEPHONED	✓	PLEASE CALL	
CALLED TO SEE YOU		WILL CALL AGAIN	✓
WANTS TO SEE YOU		URGENT	
	RETURNED YOUR CALL		

MESSAGE Jerry: Man on Nordhill sick; Has problem on orienting & keeping it on line. Prob. No chance for use in near future.

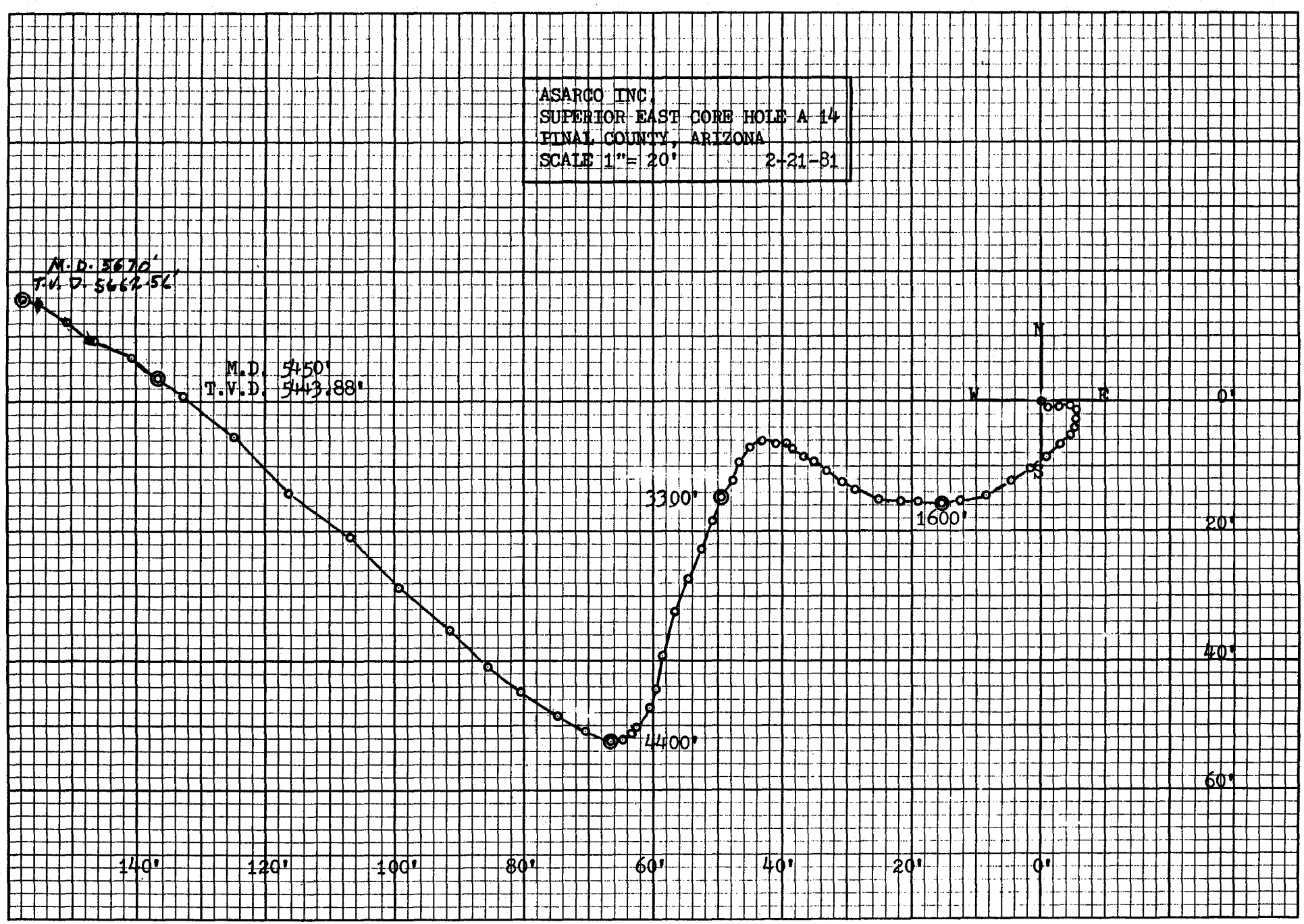
Dynadrill option still open JAS 6/27/80

SIGNED Lois

No.149P VIKING OFFICE PRODUCTS

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0780



MOLLEN-HAUER SURVEYING COMPANY

COMPANY Asarco Inc JOB NO. 61894 PAGE OF

PROSPECT NO. A 14 LOCATION Superior East DATE 2-21-81

STATION NO.	MEASURED DEPTH	COURSE LENGTH	DRIFT ANGLE	VERTICAL DEPTH	TRUE VERTICAL DEPTH	SECTION	COURSE DEVIATION	DRIFT DIRECTION	COORDINATE DIFFERENCES NORTH	SOUTH	EAST	WEST	RECTANGULAR COORDINATES NORTH	SOUTH	EAST	WEST
	5100	100	6 1/2	99 36	5095 99			N 43 W	8 28			7 72		20 49		106 89
	5200		7	99 25	5195 24			N 51 W	7 67			9 47		12 82		116 33
	5300		6 1/4	99 41	5294 65			N 49 W	7 14			8 22		5 68		124 55
	5400	100	5 3/4	99 50	5394 15			N 51 W	6 31			7 79	63			132 34
	5450	50	6	49 73	5443 88			N 56 W	2 93			4 34	3 56			136 68
5903	5500	50	6 1/4	49 71	5493 59			N 56 W	3 05			4 52	6 61			141 20
	5550		6 3/4	49 66	5543 25			N 59 W	3 03			5 04	9 64			146 24
	5600		6	49 73	5592 98			N 63 W	2 38			4 66	12 02			150 90
	5650	50	6 1/4	49 71	5642 69			N 63 W	2 47			4 85	14 49			155 75
	5670	20	6 1/2	19 87	5662 56			N 64 W	99			2 03	15 48			157 78

Scalloper

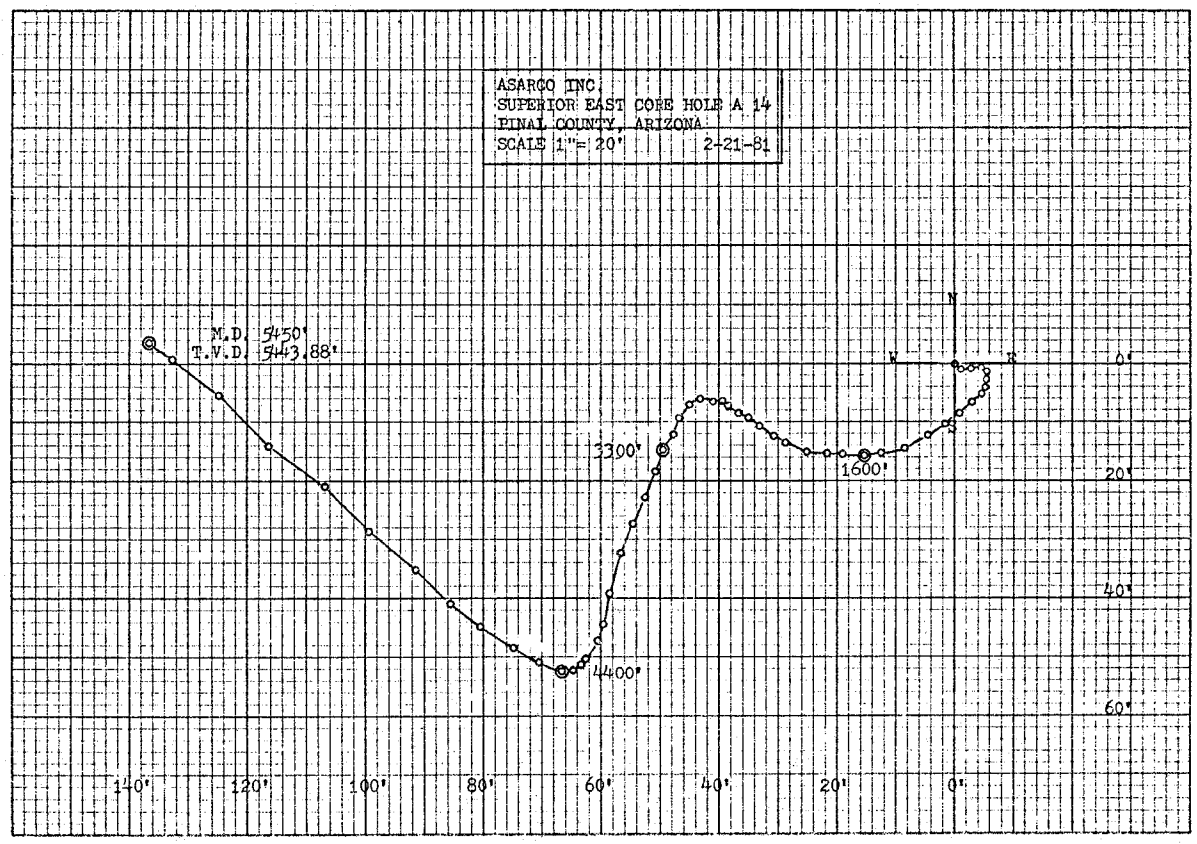
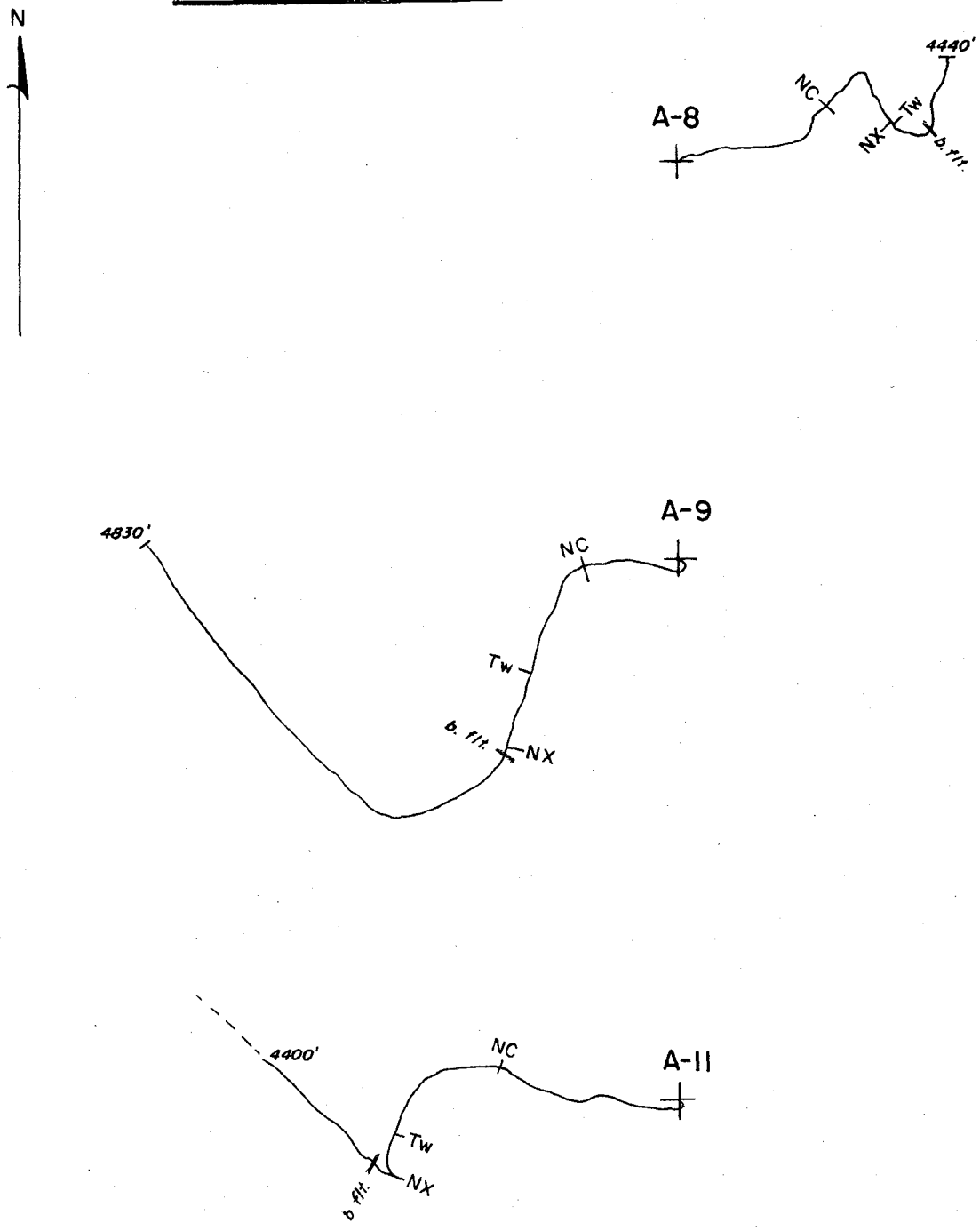

ASARCO INC.
SUPERIOR EAST CORE HOLE A 14
PINAL COUNTY, ARIZONA
SCALE 1"= 20'
2-21-81
M.D. 5450'
T.V.D. 5443.88'
3300'
1600'
4400'
N
W
E
0'
20'
40'
60'
140'
120'
100'
80'
60'
40'
20'
0'

Fig. 1

TO ACCOMPANY File Memo

DATED 4/6/79

BY J.D. Sell



EXPLANATION

+	Collar of Hole With Number
NC	Base of NC Core
NX	Base of NX Core
Tw	Base of Whitetail Conglomerate
b. flt.	Basal Fault

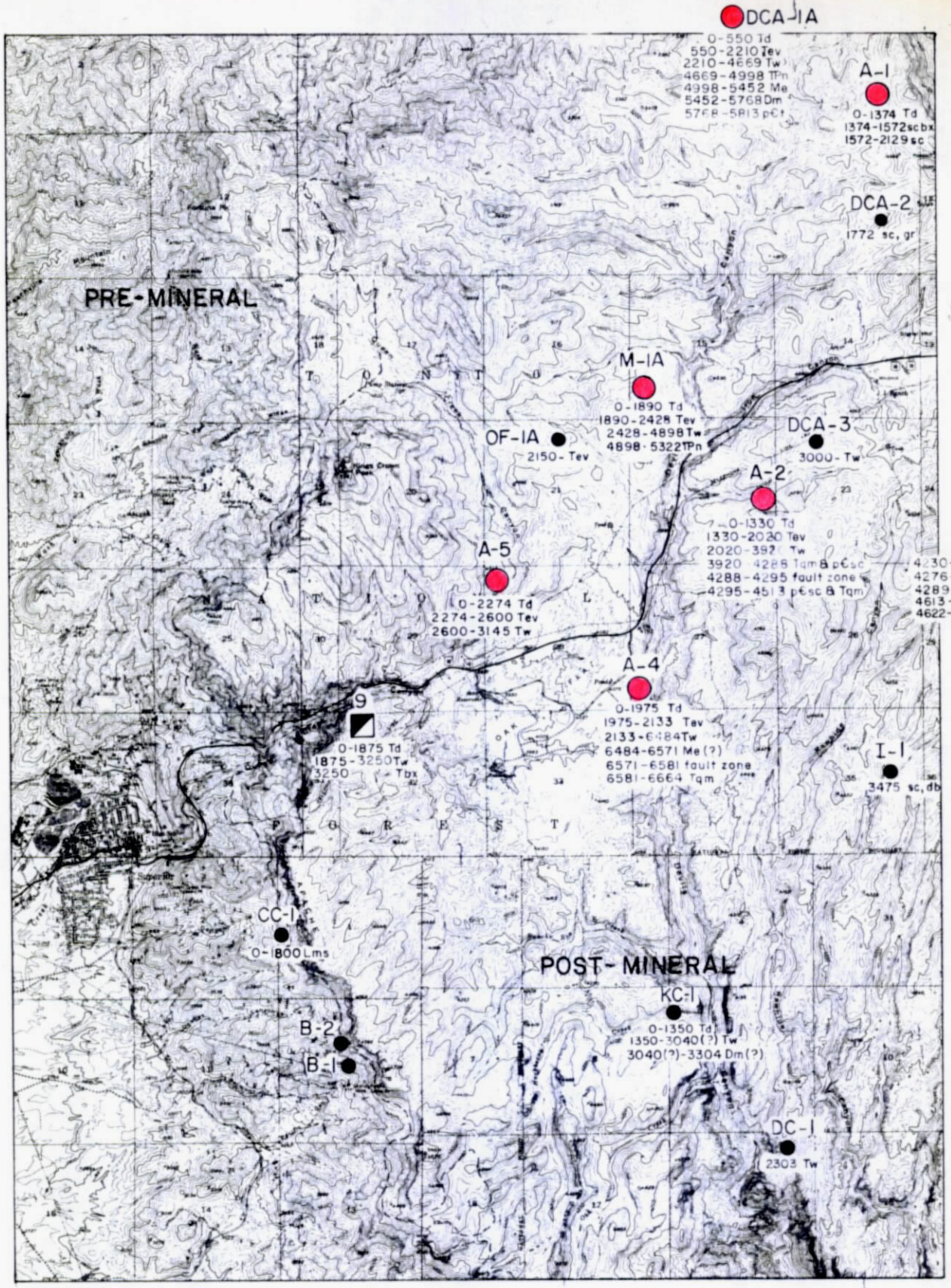
Plan of Deviation of Drill Holes

SUPERIOR EAST PROJECT

GILA & PINAL COUNTIES
ARIZONA

0 25' 50' 75' 100'
1" = 50'

J.D. Sell April, 1979



EXPLANATION

- Previous drill hole
- ASARCO drill hole
- Magma's #9 shaft
- DCA-1 (hole designation)
- 4011 Tw — Rock type; Bottom hole depth
- P — Proposed drill site

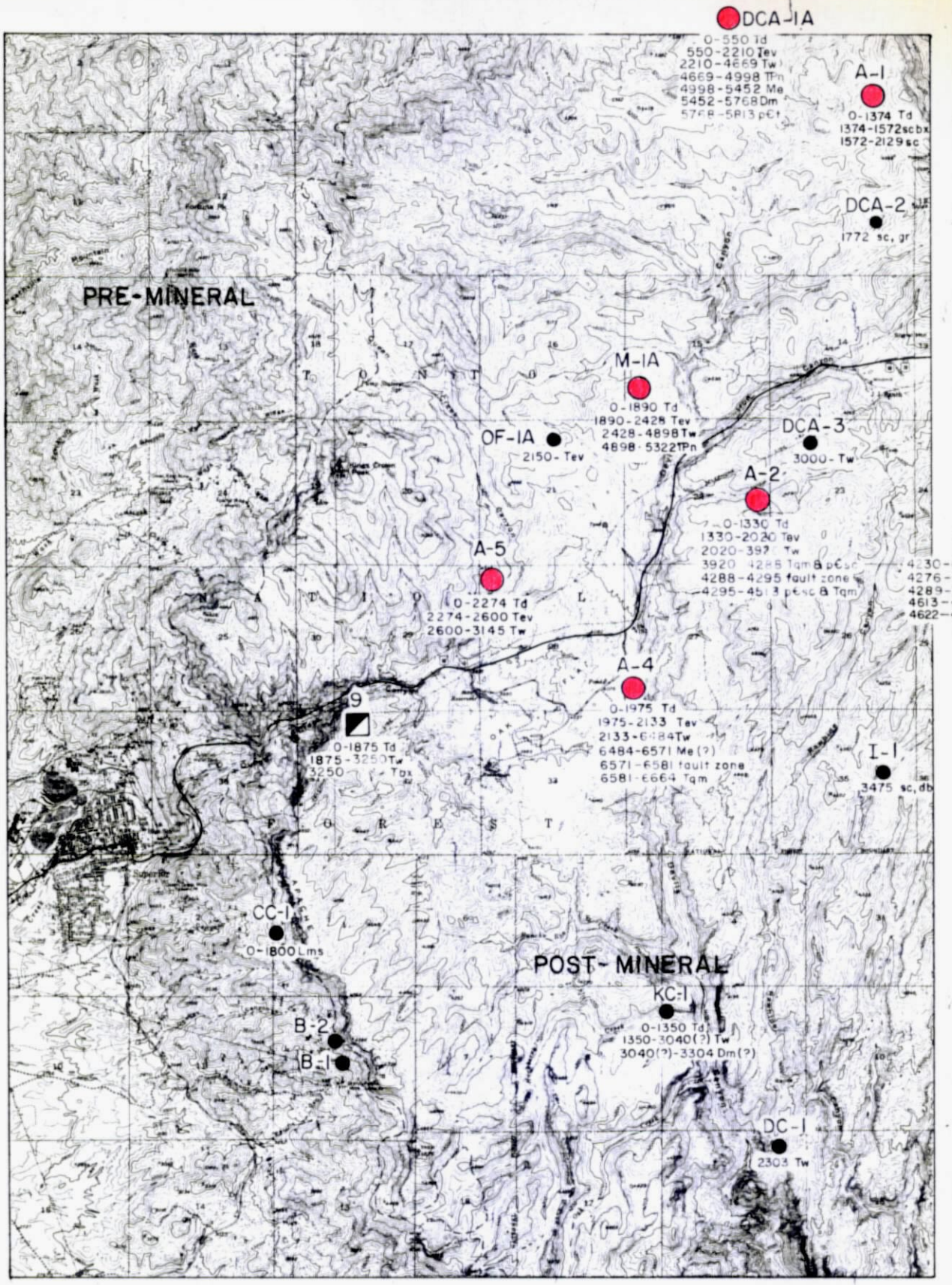
POST-MINERAL ROCK UNIT

Td - Dacite
Tev - Early volcanics
Tw - Whitetail

PRE-MINERAL ROCK UNIT

Tbx - Breccia
Tqm - Quartz Monzonite
Tgr - Granite
TPn - Naco limestone
Me - Escabrosa limestone
Dm - Martin lms
p€t - Troy qtz
p€db - Diabase
p€sc - Schist

DRILLING PROGRESS MAP
for the month of February 1973
SUPERIOR EAST
GILA & PINAL COUNTY, ARIZONA
SCALE: 1" = 1 mile
J.D.S.
2463



EXPLANATION

- Previous drill hole
- ASARCO drill hole
- Magma's #9 shaft
- DCA-1 (hole designation)
- 4011 Tw — Rock type; Bottom hole depth
- P — Proposed drill site

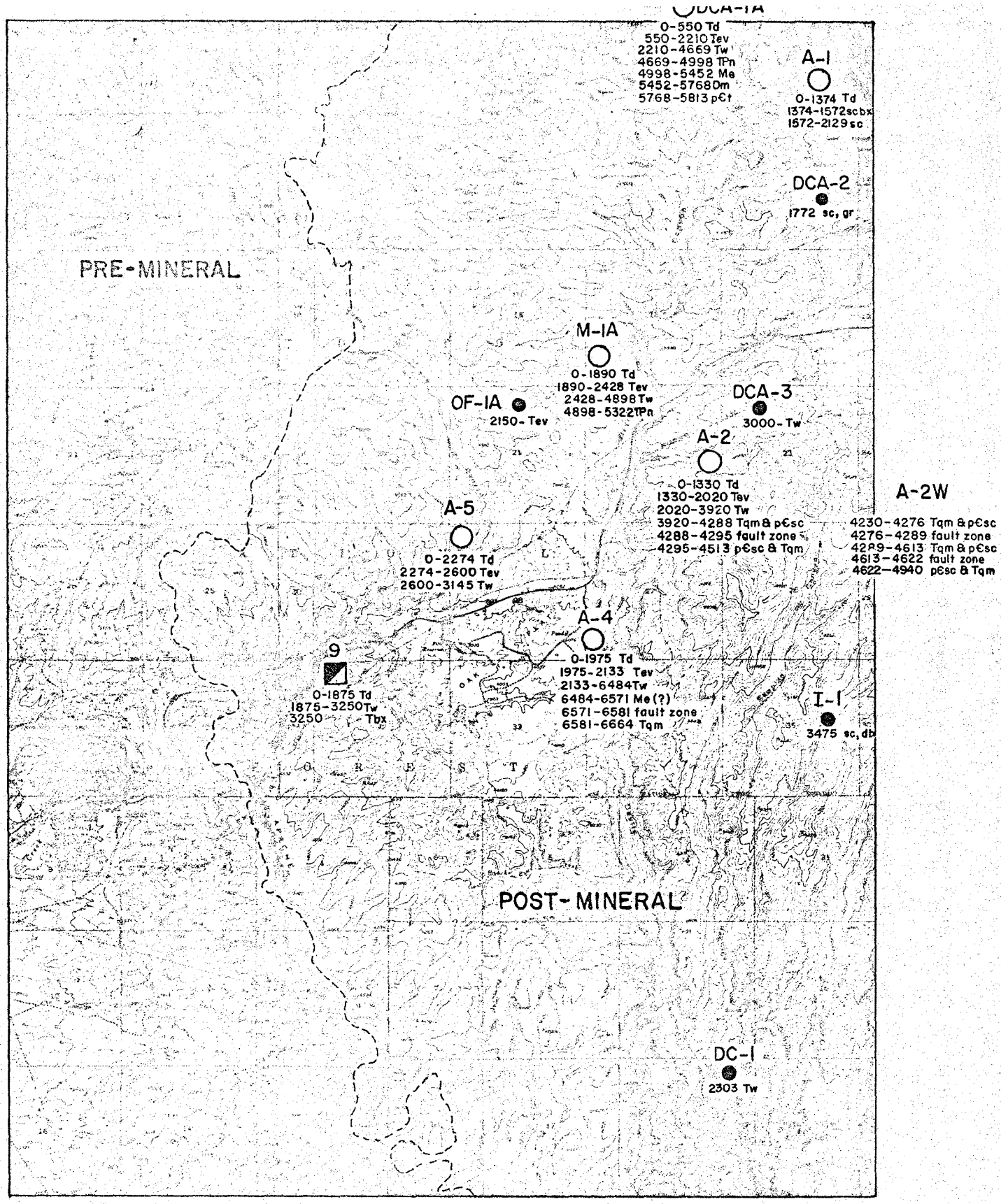
POST-MINERAL ROCK UNIT

Td - Dacite
Tev - Early volcanics
Tw - Whitetail

PRE-MINERAL ROCK UNIT

Tbx - Breccia
Tqm - Quartz Monzonite
Tgr - Granite
TPn - Naco limestone
Me - Escabrosa limestone
Dm - Martin lms
pЄt - Troy qtz
pЄdb - Diabase
pЄsc - Schist

DRILLING PROGRESS MAP
for the month of February, 1973
SUPERIOR EAST
GILA & PINAL COUNTY, ARIZONA
SCALE: 1" = 1 mile J.D.S.
2463



EXPLANATION

- Previous drill hole
- ASARCO drill hole
- Magma's #9 shaft
- DCA-1 (hole designation)
- 4011 Tw
  - Rock type
  - Bottom hole depth
- P Proposed drill site

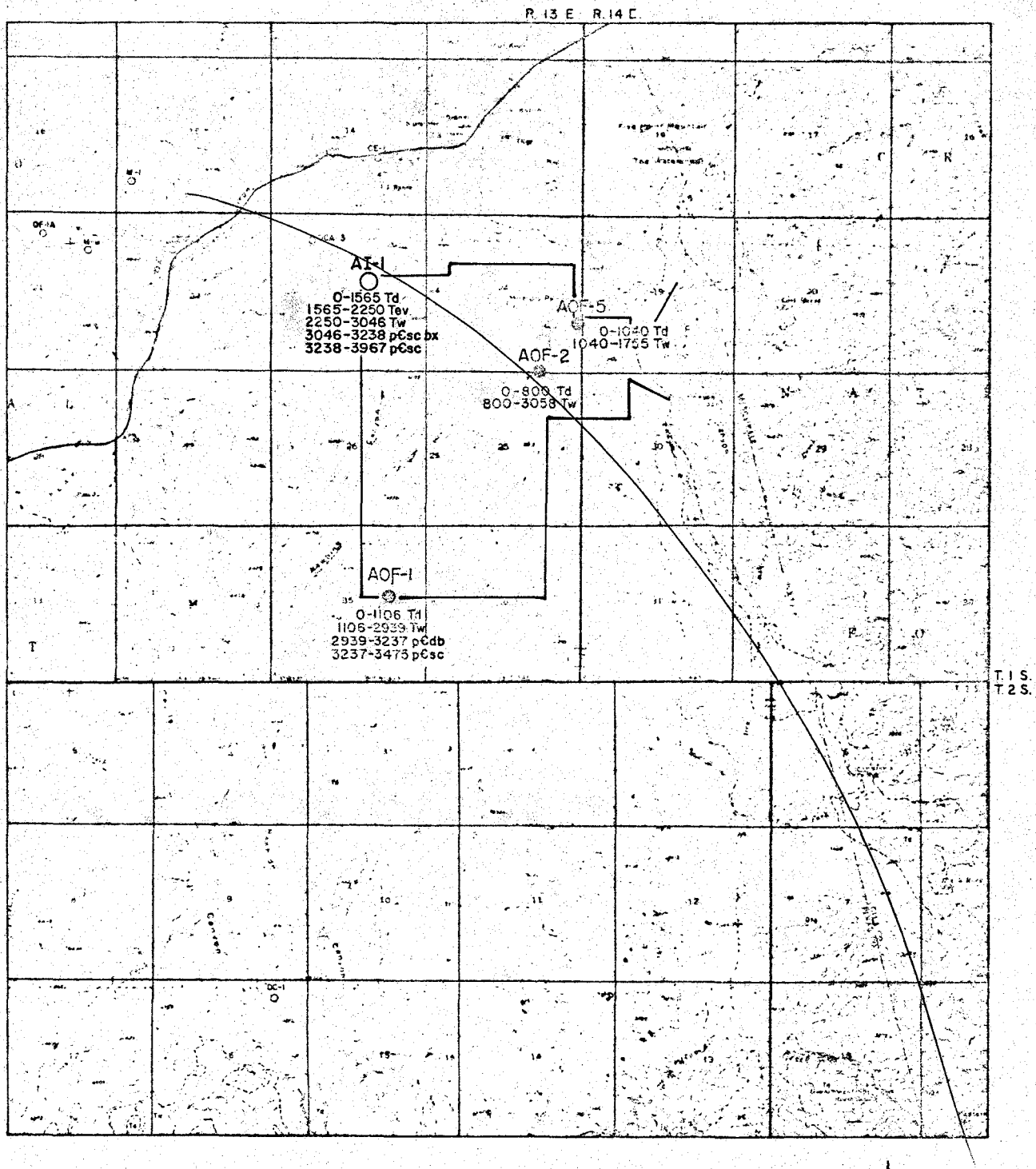
POST-MINERAL ROCK UNIT

Td - Dacite
Tev - Early volcanics
Tw - Whitetail

PRE-MINERAL ROCK UNIT

Tbx - Breccia
Tqm - Quartz Monzonite
Tgr - Granite
TPn - Naco limestone
Me - Escabrosa limestone
Dm - Martin lms
p€t - Troy qtz
p€db - Diabase
p€sc - Schist

DRILLING PROGRESS MAP
for the month of _____
SUPERIOR EAST
GILA & PINAL COUNTY, ARIZONA
SCALE: 1" = 1 mile J.D.S.
2463



EXPLANATION

- Previous drill hole
- ASARCO drill hole
- AOF-1 (hole designation)
- 3475 p€sc — Rock type; Bottom hole depth
- AI — Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite
Tev - Early volcanics
Tw - Whitetail

PRE-MINERAL ROCK UNIT

Tqm - Quartz Monzonite	Dm - Martin lms
Tgr - Granite	p€t - Troy qtz
TPn - Naco limestone	p€db - Diabase
Me - Escabrosa limestone	p€sc - Schist

N

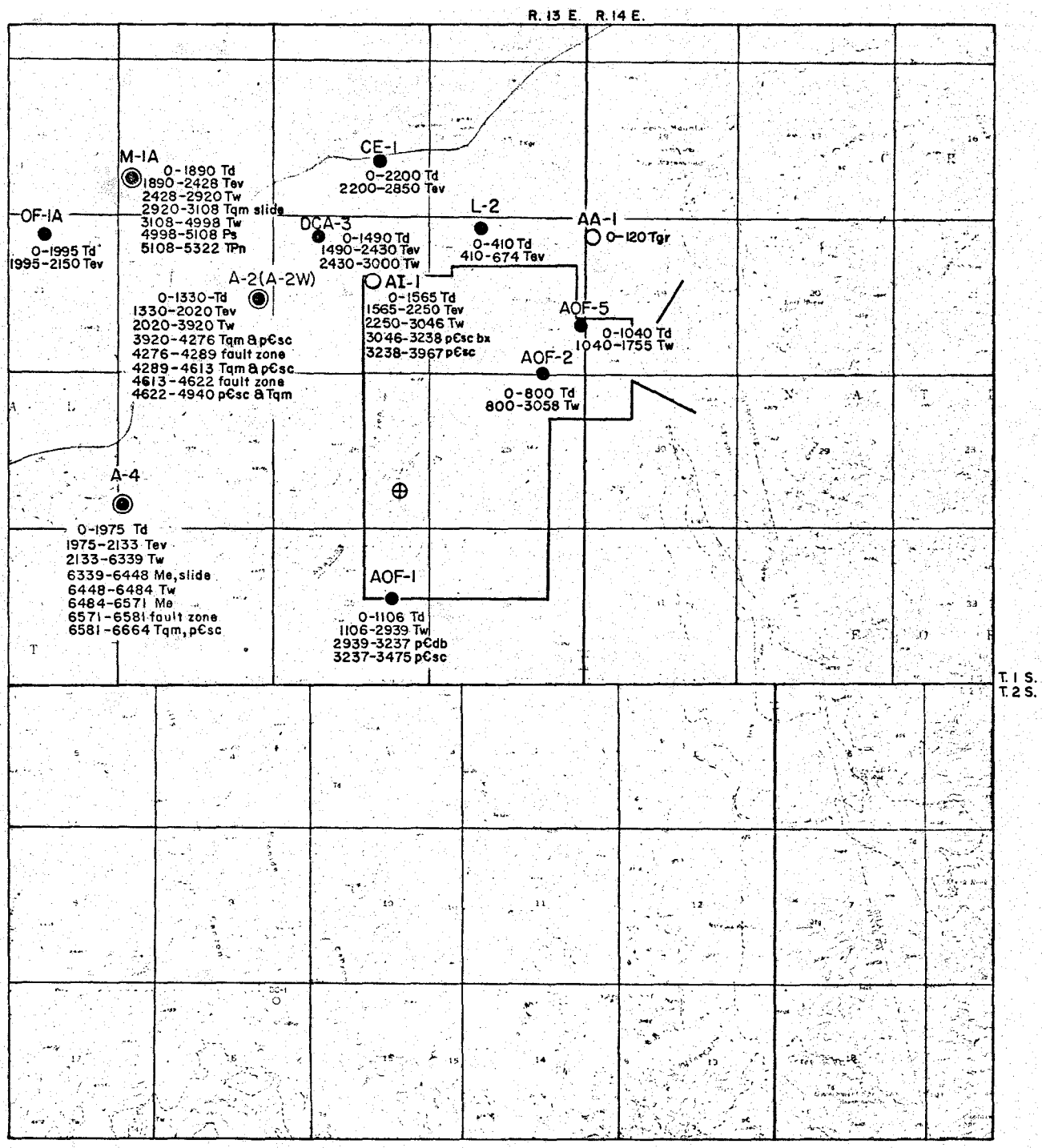
DRILLING PROGRESS MAP
for the quarter of_____

ASARCO - ICC
Joint Venture
RAWHIDE PROJECT

GILA & PINAL COUNTY, ARIZONA
SCALE: 1" = 1 mile
J.D.S.

Dec 73

MVK 2562-A



EXPLANATION

- ● Previous drill hole
- ○ ASARCO drill hole
- AOF-1 (hole designation)
- 3475 p€sc — Rock type / Bottom hole depth
- AI ⊕ Proposed drill site

POST-MINERAL ROCK UNIT

Td - Dacite
Tev - Early volcanics
Tw - Whitetail

PRE-MINERAL ROCK UNIT

Tqm - Quartz Monzonite
Tgr - Granite
TPn - Naco limestone
Me - Escabrosa limestone
Dm - Martin lms
p€t - Troy qtz
p€db - Diabase
p€sc - Schist

N

DRILLING PROGRESS MAP
for the month of_____

ASARCO - ICC
Joint Venture

RAWHIDE PROJECT

GILA & PINAL COUNTY, ARIZONA
SCALE: 1" = 1 mile
J.D.S.

Dec '73

MVK 2562

Bureau of Geology & Mineral Technology.

JDSell

(1)

Quintana Cou.

They should suffice for both holes

DC-1 NW¼ NW¼ NW¼, Sec. 21, T 2S, R 14E

OK — FTG

485-1212 Gila Cgl.

1212-1458 diabase

T.D.

DC-2 NW¼ NE¼ SW¼, Sec. 7, T 2S, R 14E.

557-1030 Gila Cgl.

1030-1902 Dacite (1886-1901 Vitrophyre).

1902-2622 Whitetail Cgl.

2622-2640 diabase

2640-2739 Pinal Schist

T.D.

DC-3 Not drilled.

DC-4 SE¼ NE¼ SE¼, Sec. 15, T 2S, R 13E.

1245-3997 Whitetail Cgl.

T.D.

Suggested Zones: 1245-1500

1500-2010

2010-3400

3400-3997 T.D.

Bureau of Geology & Mineral Technology

(2

ASARCO Core.

QDC-5 NW¼ NW¼ SW¼, Sec. 18, T25, R14E.

Surface to 123'	rock bit & few cores.
123-327	Dripping Spring Quartzite
327-820½	diabase
820½-859	Pioneer Shale
859-1804½	Pinal Schist
1804½-1856	Pinal Schist & diorite porphyry.
1856-4409	Pinal Schist w/dio. porp @ 2720 & 2800.

T.D.

JDSell

Is the skeletonizing complete? SUPERIOR E

Have all ore rejects been moved?

What is the status of the FTG. skeletonizing of core and moving of ore-grade rejects to Tucson?

FTG.

A-2	have been scanned
A-2W	w/scintillator &
A-4	no readings found.
A-7	Skeleton & reject
A-8	moved to Tucson.
A-9	

HMS report 3/30/78

H. Stone
3/30/78

Superior East
Rejects Stored at Tucson
Exploration warehouse

A-2W	Samples	10	thru	71			
A-2-C	Samples	26	thru	46			
A-4-C	Samples	4	thru	115			
A-7	Samples	23	thru	65			
A-8	Samples	12	thru	76	and 92	thru	95
A-9	Samples	8	thru	106			

Superior East Project

Skeleton Sample Sheet of .

CAN W/ 7TH
PEAR TV-1A

Hole No. A-2 Total Boxes 2

MILLIMETER	Footage	COUNTS/MIN	Footage	Footage
0	4078	0	4420	
0	4080	0	4430	
0	4085	0	4439	
0	4099	0	4450	
0	4107	0	4460	
0	4120	0	4470	
0	4130	0	4480	
0	4140	0	4490	
0	4148	0	4500	
0	4157	0	4510	
0	4170	0	4513 End	
0	4180			
0	4190			
0	4199			
0	4210			
0	4220			
0	4229			
0	4240			
0	4250			
0	4260			
0	4270			
0	4278			
0	4289			
0	4300			
0	4310			
0	4320			
0	4330			
0	4340			
0	4348			
0	4360			
0	4370			
0	4380			
0	4390			
0	4410			

Superior East Project

Skeleton Samples

Sheet 1 of 4.

SCAN WITH McPHAR TU-1A MULTILOMETER

Hole No. A-4

Total Boxes .....

COUNTS/MIN	Footage	COUNTS/MIN	Footage	COUNTS/MIN	Footage
0	2713	0	3881	0	4193
0	2717	0	3889	0	4200
0	3094	0	3896	0	4212
0	3596	0	3905	0	4219
0	3605	0	3910	0	4229
0	3613	0	3925	0	4233
0	3624	0	3930	0	4241
0	3633	0	3942	0	4251
0	3645	0	3952	0	4261
0	3654	0	3960	0	4271
0	3663	0	3970	0	4281
0	3675	0	3982	0	4289
0	3682	0	3989	0	4298
0	3693	0	4007	0	4304
0	3703	0	4020	0	4310
0	3709	0	4030	0	4326
0	3719	0	4040	0	4331
0	3729	0	4049	0	4341
0	3733	0	4057	0	4351
0	3742	0	4065	0	4361
0	3752	0	4073	0	4370
0	3762	0	4081	0	4380
0	3772	0	4089	0	4387
0	3782	0	4098	0	4393
0	3791	0	4109	0	4407
0	3800	0	4120	0	4417
0	3810	0	4130	0	4421
0	3820	0	4137	0	4434
0	3831	0	4143	0	4441
0	3843	0	4153	0	4451
0	3851	0	4163	0	4460
0	3861	0	4173	0	4468
0	3871	0	4183	0	4479

Superior East Project

Skeleton Samples

Sheet 2 of 4.

SCAN WITH McPHAR TV-1A ANTILLOMETER

Hole No. A-4

Total Boxes .....

COUNTS/MIN	Footage	COUNTS/MIN	Footage	COUNTS/MIN	Footage
0	4485	0	4784	0	5100
0	4497	0	4790	0	5114
0	4502	0	4801	0	5120
0	4508	0	4810	0	5130
0	4521	0	4822	0	5137
0	4532	0	4830	0	5142
0	4540	0	4840	0	5149
0	4550	0	4849	0	5160
0	4558	0	4858	0	5168
0	4565	0	4867	0	5177
0	4577	0	4875	0	5184
0	4585	0	4884	0	5195
0	4590	0	4889	0	5203
0	4600	0	4900	0	5210
0	4609	0	4907	0	5219
0	4620	0	4918	0	5227
0	4629	0	4935	0	5235
0	4638	0	4943	0	5246
0	4647	0	4950	0	5254
0	4654	0	4961	0	5261
0	4662	0	4970	0	5272
0	4671	0	4980	0	5279
0	4678	0	4989	0	5287
0	4688	0	4997	0	5296
0	4695	0	5007	0	5305
0	4704	0	5014	0	5314
0	4709	0	5028	0	5321
0	4724	0	5039	0	5332
0	4734	0	5050	0	5340
0	4743	0	5059	0	5352
0	4751	0	5069	0	5359
0	4756	0	5079	0	5369
0	4769	0	5090	0	5378
0	4778	0	5096	0	5387

Superior East Project

Skeleton Samples

Sheet 3 of 4.

SCAN WITH McPHAR TV-1A ANTILLOMETER

Hole No. A-4

Total Boxes .....

COUNTS/MIN.	Footage	COUNTS/MIN.	Footage	COUNTS/MIN.	Footage
0	5396	0	5701	0	6028
0	5404	0	5710	0	6038
0	5412	0	5717	0	6048
0	5422	0	5728	0	6056
0	5431	0	5737	0	6066
0	5439	0	5745	0	6072
0	5449	0	5752	0	6090
0	5458	0	5762	0	6083
0	5468	0	5768	0	6093
0	5476	0	5778	0	6104
0	5486	0	5787	0	6117
0	55494	0	5798	0	6126
0	5504	0	5806	0	6133
0	5513	0	5819	0	6143
0	5520	0	5831	0	6152
0	5530	0	5840	0	6162
0	5539	0	5849	0	6171
0	5546	0	5859	0	6180
0	5557	0	5869	0	6189
0	5565	0	5878	0	6196
0	5575	0	5890	0	6205
0	5584	0	5898	0	6215
0	55 94	0	5910	0	6225
0	5602	0	5920	0	6232
0	5611	0	5929	0	6242
0	5621	0	5940	0	6251
0	5630	0	5950	0	6261
0	5639	0	5967	0	6270
0	5645	0	5972	0	6279
0	5655	0	5984	0	6287
0	5664	0	5994	0	6295
0	5675	0	6000	0	6309
0	5683	0	6011	0	6317
0	5690	0	6019	0	6328

Superior East Project

Skeleton Samples

Sheet 4 of 4.

CAW WITH
M. PNAR TV-1A
SAMITLLOMETER
COUNTS/min

Hole No. A-4

Total Boxes 15

Footage	Footage	Footage
6338		
6347		
6356		
6365		
6373		
6383		
6393		
6405		
6415		
6425		
6432		
6442		
6451		
6460		
6470		
6479		
6488		
6497		
6505		
6515		
6520		
6529		
6537		
6548		
6556		
6565		
6574		
6581		
6587		
6591 End		

Superior East Project

Skeleton Samples

Sheet 1 of 5.

1-11-78 **Hole No.** A-3 **Total Boxes** .....

SCAN WITH McPHAR TV-1A ANTILLOMETER

COUNTS PER MIN	Footage	COUNTS PER MIN	Footage	COUNTS PER MIN	Footage
0	1941	0	2252	0	2532
0	1953	0	2261	0	2540
0	1963	0	2271	0	2550
0	1972	0	2281	0	2558
0	1982	0	2290	0	2568
0	1992	0	2300	0	2578
0	2002	0	2310	0	2593
0	2010	0	2317	0	2599
0	2018	0	2327	0	2610
0	2028	0	2337	0	2619
0	2039	0	2347	0	2629
0	2048	0	2354	0	2636
0	2057	0	2361	0	2646
0	2064	0	2370	0	2655
0	2075	0	2379	0	2664
0	2084	0	2385	0	2673
0	2095	0	2392	0	2682
0	2103	0	2402	0	2691
0	2110	0	2410	0	2700
0	2122	0	2417	0	2709
0	2130	0	2426	0	2719
0	2140	0	2433	0	2727
0	2150	0	2442	0	2737
0	2159	0	2450	0	2747
0	2169	0	2459	0	2755
0	2179	0	2469	0	2764
0	2188	0	2477	0	2774
0	2197	0	2486	0	2782
0	2202	0	2495	0	2792
0	2210	0	2502	0	2801
0	2223	0	2510	0	2809
0	2233	0	2516	0	2820
0	2243	0	2524	0	2830

Superior East Project

Skeleton Samples

Sheet 2 of 5.

Hole No. A-3

Total Boxes .....

CAN WITH McPHAR TV-1A SCANTILLATOR

COUNTS/MIN	Footage	COUNTS/MIN	Footage	COUNTS/MIN	Footage
0	2837	0	3145	0	3456
0	2846	0	3154	0	3465
0	2857	0	3164	0	3476
0	2866	0	3172	0	3484
0	2875	0	3182	0	3494
0	2885	0	3191	0	3510
0	2894	0	3200	0	3523
0	2902	0	3216	0	3532
0	2910	0	3219	0	3541
0	2922	0	3228	0	3550
0	2931	0	3237	0	3559
0	2941	0	3246	0	3568
0	2950	0	3256	0	3577
0	2959	0	3265	0	3585
0	2968	0	3274	0	3595
0	2978	0	3283	0	3610
0	2987	0	3293	0	3623
0	2996	0	3297	0	3632
0	3003	0	3310	0	3641
0	3010	0	3321	0	3651
0	3024	0	3330	0	3660
0	3034	0	3339	0	3670
0	3043	0	3347	0	3679
0	3052	0	3356	0	3689
0	3062	0	3367	0	3698
0	3070	0	3376	0	3710
0	3080	0	3385	0	3727
0	3090	0	3393	0	3735
0	3099	0	3410	0	3745
0	3110	0	3421	0	3755
0	3119	0	3430	0	3764
0	3128	0	3438	0	3773
0	3136	0	3448	0	3781

Superior East Project

Skeleton Samples

Sheet 3 of 5.

SCAN WITH McPHAR TV-1A SCANTILLATOR

Hole No. A-3

Total Boxes .....

Counts/min	Footage	Counts/min	Footage	Counts/min	Footage
0	3791	0	4118	0	4435
0	3800	0	4128	0	4445
0	3810	0	4137	0	4452
0	3818	0	4146	0	4463
0	3828	0	4155	0	4473
0	3846	0	4165	0	4482
0	3856	0	4173	0	4491
0	3867	0	4181	0	4498
0	3875	0	4193	0	4510
0	3884	0	4200	0	4518
0	3894	0	4210		4528
0	3898	0	4219		4537
0	3910	0	4227		4546
0	3925	0	4237		4555
0	3935	0	4246		4560
0	3944	0	4255		4575
0	3953	0	4265		4584
0	3962	0	4274		4592
0	3972	0	4283		4600
0	3979	0	4290		4610
0	3989	0	4300		4618
0	3998	0	4310		4627
0	4000	0	4320		4634
0	4010	0	4330		4646
0	4026	0	4340		4660
0	4031	0	4350		4672
0	4040	0	4362		4683
0	4053	0	4372		4692
0	4063	0	4381		4697
0	4073	0	4390		4710
0	4081	0	4399		4720
0	4091	0	4410		4729
0	4099	0	4418		4738
0	4110	0	4424		4747

Superior East Project

Skeleton Samples

Sheet 4 of 5.

SCAN WITH McPHAR TV-1A SCANTILLATOR

Hole No. A-3

Total Boxes .....

COUNTS/MIN	Footage	COUNTS/MIN	Footage	COUNTS/MIN	Footage
0	4752	0	5070	0	5370
0	4760	0	5081	0	5379
0	4771	0	5091	0	5398
0	4780	0	5100	0	5406
0	4789	0	5109	0	5410
0	4793	0	5115	0	5415
0	4809	0	5126	0	5425
0	4825	0	5133	0	5434
0	4833	0	5142	0	5449
0	4843	0	5148	0	5452
0	4848	0	5160	0	5462
0	4858	0	5165	0	5471
0	4868	0	5177	0	5480
0	4875	0	5185	0	5489
0	4886	0	5195	0	5499
0	4893	0	5200	0	5504
0	4899	0	5207	0	5509
0	4908	0	5220	0	5514
0	4915	0	5231	0	5525
0	4935	0	5240	0	5532
0	4947	0	5250	0	5540
0	4960	0	5260	0	5551
0	4965	0	5267	0	5560
0	4973	0	5276	0	5568
0	4982	0	5286	0	5579
0	4992	0	5294	0	5587
0	4995	0	5300	0	5595
0	5010	0	5310	0	5600
0	5018	0	5321	0	5610
0	5027	0	5330	0	5622
0	5035	0	5336	0	5630
0	5044	0	5347	0	5637
0	5050	0	5352	0	5649
0	5059	0	5363	0	5657

Superior East Project

Skeleton Samples

Sheet 5 of 5.

SCAN WITH
Mc PHAR TV-1A
CANTILLATOR
COUNTS/MIN

Hole No. A-3

NQ 115

Total Boxes 19
NX Boxes - 335

COUNTS/MIN	Footage	COUNTS/MIN	Footage	Footage
0	5665	0	5952	
0	5677	0	5960	
0	5686	0	5969	
0	5694	0	5980	
0	5700	0	5989	
0	5713	0	6006	
0	5721	0	6008 End	
0	5729			
0	5739			
0	5746			
0	5756			
0	5765			
0	5771			
0	5782			
0	5792			
0	5799			
0	5810			
0	5815			
0	5827			
0	5835			
0	5844			
0	5849			
0	5862			
0	5867			
0	5879			
0	5890			
0	5898			
0	5904			
0	5910			
0	5915			
0	5926			
0	5934			
0	5943			

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MINERAL INVESTIGATIONS
FIELD STUDIES MAP MF-253

Base from U.S. Geological Survey topographic quadrangle: Superior, 7½', 1949

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C. #2248

Geology mapped 1958-61

PRELIMINARY GEOLOGIC MAP OF THE WESTERN PART OF THE SUPERIOR QUADRANGLE, PINAL COUNTY, ARIZONA

By
Donald W. Peterson

SCALE 1:12 000

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

1962

MINERAL INVESTIGATIONS
FIELD STUDIES MAP MF-253

EXPLANATION

QUATERNARY

Qt
Talus and landslide
Detrital accumulations on hillsides of loose, angular blocks

Qal
Alluvium
Sand and gravel deposits along beds of intermittent streams and in partly enclosed basins

UNCONFORMITY

TERTIARY AND QUATERNARY

QTb
Basalt
Medium- to dark-gray, aphanitic basalt, composed chiefly of plagioclase and pyroxene; locally olivine bearing; locally vesicular. In this area basalt is in small, irregular intrusive bodies, probably contemporaneous with deposition of the Gila Conglomerate

QTg
Gila Conglomerate
Fluvial deposits derived from all older rocks; composed of pebble- to boulder-sized, angular to sub-rounded fragments; arkosic sandstone matrix is well- to poorly-cemented, coarse-grained, and poorly-sorted. Several hundred feet thick

UNCONFORMITY

TERTIARY(?)

bp
Breccia pipes
Irregular bodies of breccia composed chiefly of angular fragments of schist in matrix of angular rock chips and mineral grains firmly bonded with dark-brown to reddish-brown ferruginous cement

qmp / qma
Quartz monzonite porphyry
qmp, porphyritic rock composed of 10 to 15 percent phenocrysts of quartz, K-feldspar, and plagioclase set in very fine grained groundmass of quartz, feldspar, and mafic minerals. Phenocrysts 1 to 3 mm in diameter
qma, aphanitic to very fine grained border facies

Td
Dacite
Ash-flow sheet; nonwelded tuff at the base grades upward to densely welded black vitrophyre that is overlain by densely welded tuff with cryptocrystalline groundmass. Progressively upward from the vitrophyre the welding gradually decreases, the amount of crystallization in the groundmass increases and the color changes from light brown to moderate red to very light gray. Phenocrysts consistently comprise about 40 percent of the rock in the approximate proportions three-fourths plagioclase, one-tenth quartz, one-tenth biotite, and one-twentieth sanidine, hornblende, magnetite, and accessories. Thickness, 500 to 2000 feet

Tr
Rhyolite
Lava flows composed of rhyolite and perlitic obsidian. Light- to medium-gray rhyolite composed of 1 to 5 percent phenocrysts of plagioclase, quartz, sanidine, and biotite set in an aphanitic groundmass. Generally prominent flow laminations, locally contorted. Perlitic obsidian generally forms top or bottom of rhyolite flows, and consists of 1 to 5 percent phenocrysts set in black to brown glass with well-developed perlitic cracks. Some obsidian fresh, but locally slightly to completely devitrified; by progressive devitrification obsidian grades to grayish yellow felsite. Includes minor deposits of tuff, tuff breccia, and flows of andesite and trachyte. Thickness, 0 to about 2000 feet. (Relative age of rhyolite in sec. 16, T. 2 S., R. 12 E., is uncertain; it may be younger than the dacite and contemporaneous with the Gila Conglomerate.)

Tw
Whitetail Conglomerate
Fluvial deposits composed of angular to subangular fragments derived from all older rocks, mainly from underlying or nearby rocks. Most fragments pebble size, some larger. Matrix is coarse-grained, poorly sorted arkosic to lithic sandstone, moderately well cemented; bedding planes poorly defined or absent. Thickness, 0 to about 350 feet

UNCONFORMITY

MESOZOIC OR TERTIARY

q
Quartz vein
White "bull" quartz, crops out prominently. No metallic minerals apparent

f
Felsite dike
Light-gray aphanitic rock largely altered to clay, mica, and calcite. Relict phenocrysts of plagioclase discernible. Crops out prominently

MESOZOIC(?)

dp
Diorite porphyry
Phenocrysts, 20 to 60 percent of rock, consist of plagioclase and locally hornblende set in aphanitic or very fine grained groundmass. Groundmass chiefly plagioclase, orthoclase, hornblende, biotite, and locally pyroxene; quartz generally absent but locally abundant. Partial to complete alteration to sericite, clay, and calcite. Disseminated pyrite near Silver King

qd
Quartz diorite
Medium to fine grained; generally hypidiomorphic granular, but locally ranges to panidiomorphic granular. Consists predominantly of euhedral to subhedral plagioclase, and variable amounts of euhedral hornblende, pyroxene, and biotite; interstitial anhedral quartz ranges from 15 percent to a trace. Two major varieties: (a) medium grained, containing 10 to 20 percent mafic minerals and 10 to 15 percent quartz; and (b) fine grained, containing 20 to 40 percent mafic minerals, and trace to 10 percent quartz. Near border and locally elsewhere rock becomes coarse grained and contains euhedral crystals of either hornblende or pyroxene from ½ to 4 cm long. Slight to moderate alteration of plagioclase to sericite and clay, and mafic minerals to uralite, epidote, biotite, and chlorite

UNCONFORMITY

PENNSYLVANIAN

IPn
Naco Limestone
Medium- to thin-bedded, light-gray to white to very pale blue limestone that locally contains light-brown irregular chert nodules and layers. Beds well defined by thin interbeds of calcareous shale and siltstone. Some beds contain many fossils of fusulinids, brachiopods, corals, bryozoa. Base of formation locally marked by a 15-foot bed of very dusky red to dusky-purple fissile shale. Similar shale is sporadically interbedded with limestone higher in section. In some other places thin beds of chert conglomerate locally mark base. Thickness, 0 to 1100 feet, changes due to pre-whitetail, pre-rhyolite, and pre-dacite erosion

CARBONIFEROUS

MISSISSIPPIAN

Me
Escabrosa Limestone
Thick- to thin-bedded, very light gray to dark-gray limestone. Top part of formation is light- to medium-gray, medium- to thin-bedded limestone that contains abundant chert and interbedded shale partings. Lower part is dark gray, thick to medium bedded, and is overlain by very light gray, thick-bedded limestone that forms a prominent and distinctive cliff. Moderately fossiliferous throughout with crinoid stems, brachiopods, and corals as most abundant forms. Thickness, about 500 feet

DEVONIAN

Dm
Martin Limestone
Consists of following units in descending order: 10 to 30 feet of gray to grayish-yellow, highly fissile, calcareous shale; 160 to 200 feet of alternating thin to medium beds of limestone, dolomite and a little sandstone and shale, gray to grayish yellow to grayish red; some of the limestone is crowded with fossils of brachiopods and crinoid stems; 150 to 200 feet of dark- to light-gray to grayish-yellow, thin-bedded, unfossiliferous dolomite with dense, uniform texture, locally one or more thin beds of medium-grained quartzite or sandstone may be interbedded; 10 to 30 feet of medium-bedded, dark-gray crystalline limestone that is the host rock for ore bodies in the Magma mine and is locally mineralized elsewhere in the district; 15 to 20 feet of grayish yellow limestone containing abundant medium-grained sand and dusky-red spheroidal spots. Total thickness, 350 to 450 feet

DISCONFORMITY

CAMBRIAN

Ꞓb | Ꞓbu / Ꞓbl
Cambrian rocks
Ꞓb, Cambrian rocks, undivided. Total thickness 0 to 360 feet, changes chiefly due to pre-Paleozoic relief
Ꞓbu, upper part, medium- to fine-grained quartzite and feldspathic quartzite, locally containing quartz granules. White to light gray on fresh fracture, grayish yellow to light brown on weathered surface. Bedding medium to thick, cross bedding common, bedding commonly emphasized by alternating color laminations; locally forms cliffs
Ꞓbl, lower part, poorly sorted, grayish- to reddish-brown mudstone, arkosic sandstone, pebble conglomerate, and graywacke, heavily iron stained; rock types are laterally highly variable. Beds crude to well defined, locally cross bedded

UNCONFORMITY

PRECAMBRIAN

Upper Precambrian

db
Diabase
Composed chiefly of subhedral and euhedral plagioclase and pyroxene, and lesser amounts of amphibole, biotite, and opaque oxides; commonly moderately altered. Dark gray to greenish black on fresh surface, dark shades of brown, green, and gray on weathered surface. Grain size ranges from coarse to aphanitic, but is generally medium. Texture is ophitic and subophitic. Some may be Mesozoic

p€t
Troy Quartzite
Upper member, medium-bedded, blocky-weathering, fine- to medium-grained quartzite and feldspathic quartzite; weathers white to light gray. Scattered quartz granules and small pebbles. Mostly even-bedded, but locally bedding shows slight waviness. Crossbedding inconspicuous to absent. Thickness, 545 feet
Lower member, alternating beds of conglomerate, poorly sorted coarse-grained feldspathic quartzite and arkose, and siltstone. All rock types highly lenticular, conglomerates decrease upward. Cross bedding and local Liesegang banding are common. Locally in the upper part, a medium-grained bed of poorly sorted feldspathic sandstone shows slump structure, expressed by sinuous and contorted bedding. Thickness, 185 feet
Total thickness, 0 to 730 feet, changes due to post-Troy-pre-Paleozoic deformation and erosion

DISCONFORMITY

p€b
Basalt
Dark gray to dusky brown, aphanitic, composed of microscopic plagioclase laths, considerably altered to clay and calcite, and pyroxene and olivine largely altered to opaque oxides, serpentine, carbonates, iddingsite, and other products. Locally vesicular and amygdaloidal. Some layers consist of volcanic breccia of angular basalt blocks in a basaltic matrix. Thickness, 0 to 320 feet, changes apparently due chiefly to post-Troy-pre-Paleozoic erosion

p€m
Mescal Limestone
White to medium-gray to light-brown, thin-bedded, fine-grained granular limestone and lesser amounts of dolomite. Black, brown, and variegated chert nodules and uneven layers range from abundant to sparse. Member near top is light-brownish gray, medium to thick bedded; containing wavy concentric structures believed to represent fossil algae. Thickness, 0 to 350 feet, changes apparently due chiefly to post-Troy-pre-Paleozoic erosion

p€ds
Dripping Spring Quartzite and Barnes Conglomerate at base
Consists of following units in descending order: about 570 feet of thin-bedded, very fine grained feldspathic quartzite, arkose, and siltstone that is light gray to light brown on fresh surface and strong shades of brown, red, and yellow on weathered surface, and that weathers to angular blocks and slabs; about 230 feet of light-brown to yellowish-gray to pale-reddish-brown, medium- to coarse-grained feldspathic quartzite and arkose in medium thick beds, some of which are crossbedded, and some of which are separated by siltstone partings; Barnes Conglomerate (shown on map by row of dots), 6 to 15 feet thick, composed of well-rounded pebbles and cobbles of vitreous quartzite, white vein quartz, and red jasper in a medium- to coarse-grained arkose matrix. Total thickness, 650 to 800 feet

p€ps
Pioneer Formation and Scanlan Conglomerate
Consists of following units in descending order: 135 feet of thin-bedded shale, siltstone, and fine-grained arkose that is mostly dusky red to dusky purple speckled by light-brown to greenish-yellow spots; 265 feet of light-brown to dark-brown to dusky red-purple, coarse- to fine-grained arkose and feldspathic quartzite, beds are separated by medium to thin beds of siltstone and shale containing scattered granules and pebbles; Scanlan Conglomerate, 1 to 4 feet thick, composed of well-rounded to subrounded pebbles of white quartz and angular pebbles and granules of schist, in grayish-red-purple, very coarse grained, poorly sorted matrix of rock chips and arkosic sandstone. Approximate total thickness, 400 feet

UNCONFORMITY

Lower Precambrian

p€pi
Pinal Schist
Quartz-muscovite schist and quartz-muscovite-chlorite schist, some feldspar, and locally andalusite and sillimanite. Foliation indistinct to very strong and from strongly to slightly contorted. Fresh and weathered surfaces light to dark gray and locally pale blue, in some places weather brown. Locally cut by white quartz veins; in some places hornfels and granulite are developed

Contact
Dashed where approximately located

Fault, showing dip
Dashed where approximately located; dotted where concealed

Vertical fault

Axis of overturned anticline

Axis of overturned syncline

Strike and dip of beds

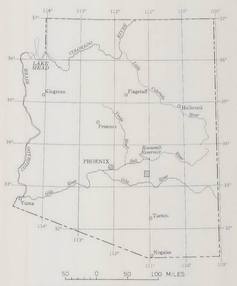
Strike and dip of overturned beds

Strike and dip of foliation in schist and of layered structures in volcanic rocks

Shaft

Adit

Small prospect pit



INDEX MAP SHOWING LOCATION OF THIS REPORT

For sale by U. S. Geological Survey, price 50 cents

For Kay's Info

Attachment C. (Included):

1) Evaluation and Rebuilding Report of Oak Flat and Devils Canyon Area, by Kerr-McGee, dated 1-15-65.
2) Proposed Assessment Work in the Devil's Canyon, by Kerr-McGee, dated 6-10-66.
3) Drill Log of Kerr-McGee's OF-1, terminated 11-15-64
4) Drill Log of Kerr-McGee's DC-1, terminated 12-17-64.
5) Drill Log of Miami-Superior's DCR-1, terminated 6-26-64.
6) Drill Log of Miami-Superior's DCR-2, terminated 7-7-64 (Note: The hole was deepened in 1965 (6-27 to 7-24) to a depth of 1772').
7) Map of Superior Area showing drill sites, roads, and claims of Kerr-McGee.
8) Overlay of area showing geophysical trends with the Plateau, by Kerr-McGee.

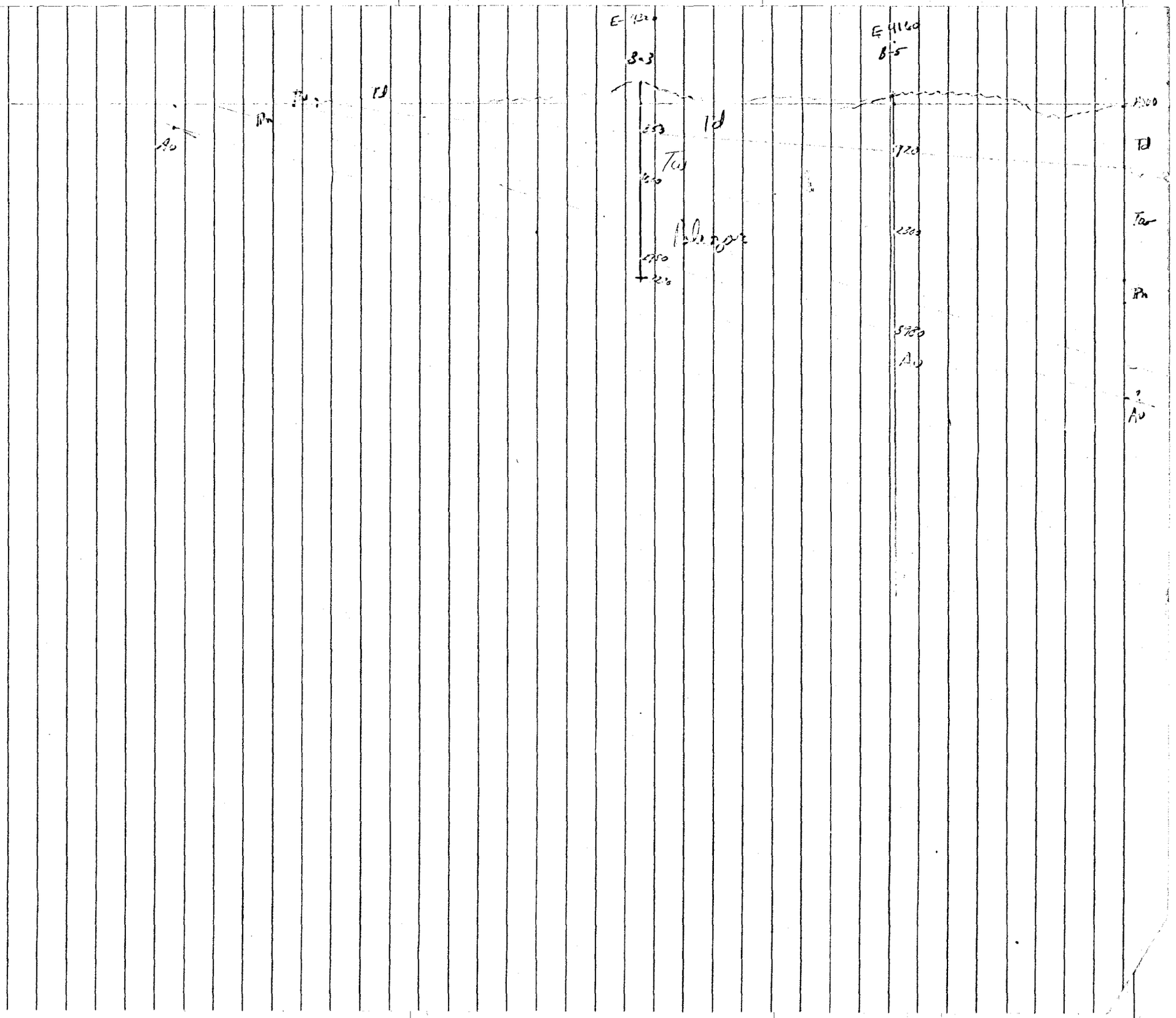
Kay:

Please retype Attach C-1 and C-2

Leave original from K-M with me on all these attachments.

Need 4 Xerox Copies for ~~[illegible]~~, NDS, ~~[illegible]~~, ~~[illegible]~~

GHC


E 4160
B-5
B-3
Td
Tw
Pn
Ad
Td
Tw
Pn
Ad

Samples from B-3

Numbers on piece of paper:

3230	990
2100	24—
1130	—

~~Remar~~: = 2100 Rotary
= 1200 Core
3300 round number

prob. 2100 ft rotary & casing
1130 ft core
3230 T.D.

Rotary cutting (L-2???)

On Site: Small sample bags with "WA-5" + footage

680-690	pЄ? gr.	weathered brown (granite) fresh feldspar & qtz.
720-730	pЄ gr.	
730-740	pЄ gr.	
740-750	pЄ gr.	
760-770	pЄ gr	some biotite
780-790	pЄ gr.	
790-800	pЄ gr.	
970-980	pЄ gr	somewhat clear crushed biotite

Best 00 ft

NX core chips recovered

50 ~~%~~ 24	Diabase, some serpentinized & sheared No mineral
20 %	frosted qtz blue cgl = basal Dm or Єb
10	fine-grained white-blue-gray-brownish lam. Pє tuff? or Dm?
10	fine dark green-black (basalt?) - Too soft not flow top of mesical-gr?
5	red brown & tan mica-rich mudstone. (Pennsylvanian?)
3	Beloit qtz type.
2	Pennsylvania shale type
2	cement.
	one coarse-grained lam (Mє?)

KC-1 Nov. 19, 1972

0 - 1350(±) Td

1350± - 1800 Tw.

Verbal Nov. 23rd P Bryant

2020' Tw

On site: Nov. 30th

2309 Tw

Verbal - Joe Rudlman Dec 1972 on site.

0 - 1010 Td !

1010 - 1900 Tw (consolidated)

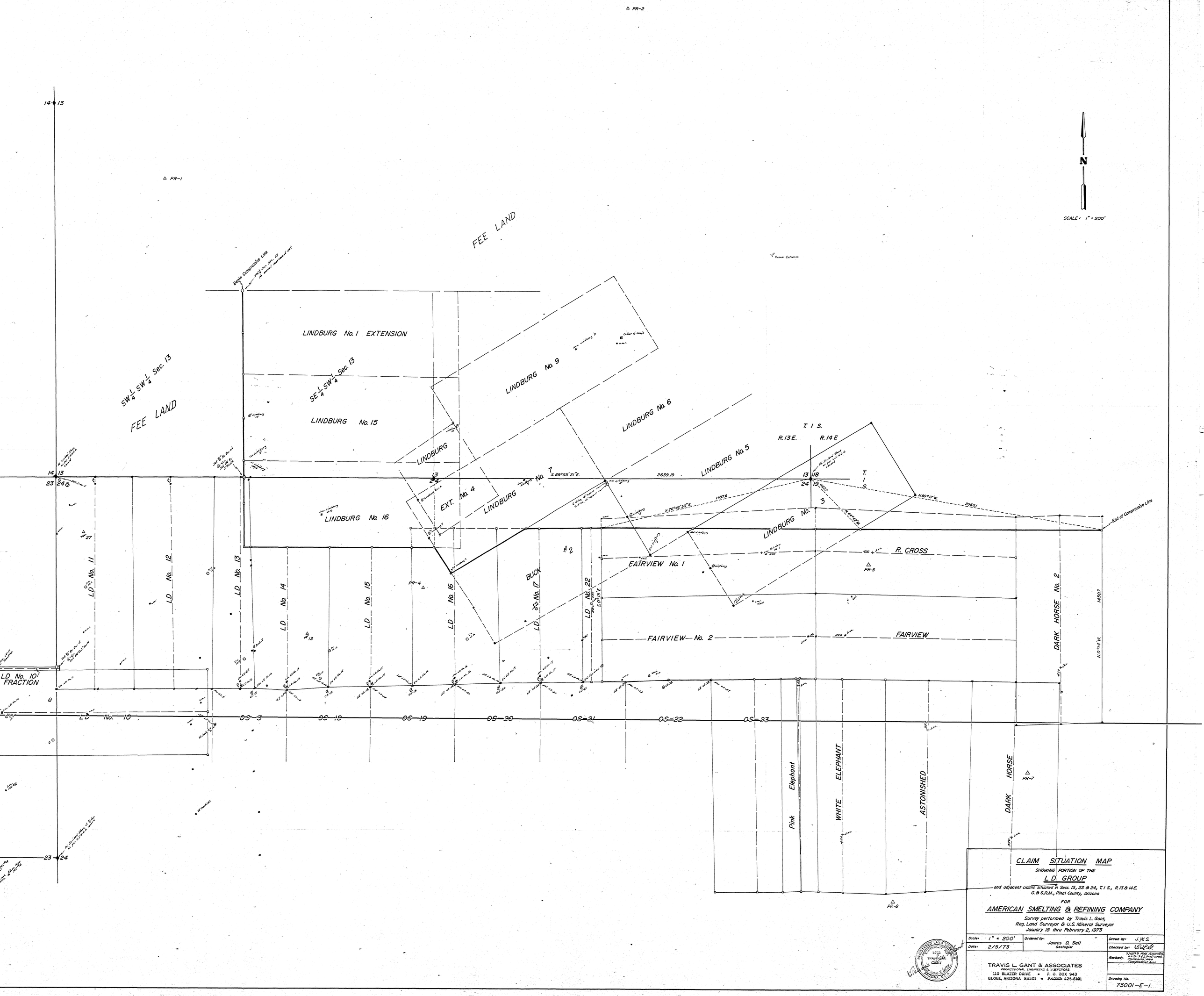
1900 - 2370 Tw (cased, Jan 22 moving on this date).

Jan 11 - John Reed, drilling foreman.

set BX casing @ ± 2970'

hole @ 3039. Weak rock. (settable?).

Maggie's CC-1 reported (Guy Foreman on KC-1) drilling @ 60° using slant rig — on Jan 23rd — @ 1260 feet.
Lots of drilling problem.



CLAIM SITUATION MAP

SHOWING PORTION OF THE

L.D. GROUP

and adjacent claims situated in Secs. 13, 23 & 24, T. 1 S., R. 13 & 14 E.
G. & S.R.M., Pinal County, Arizona

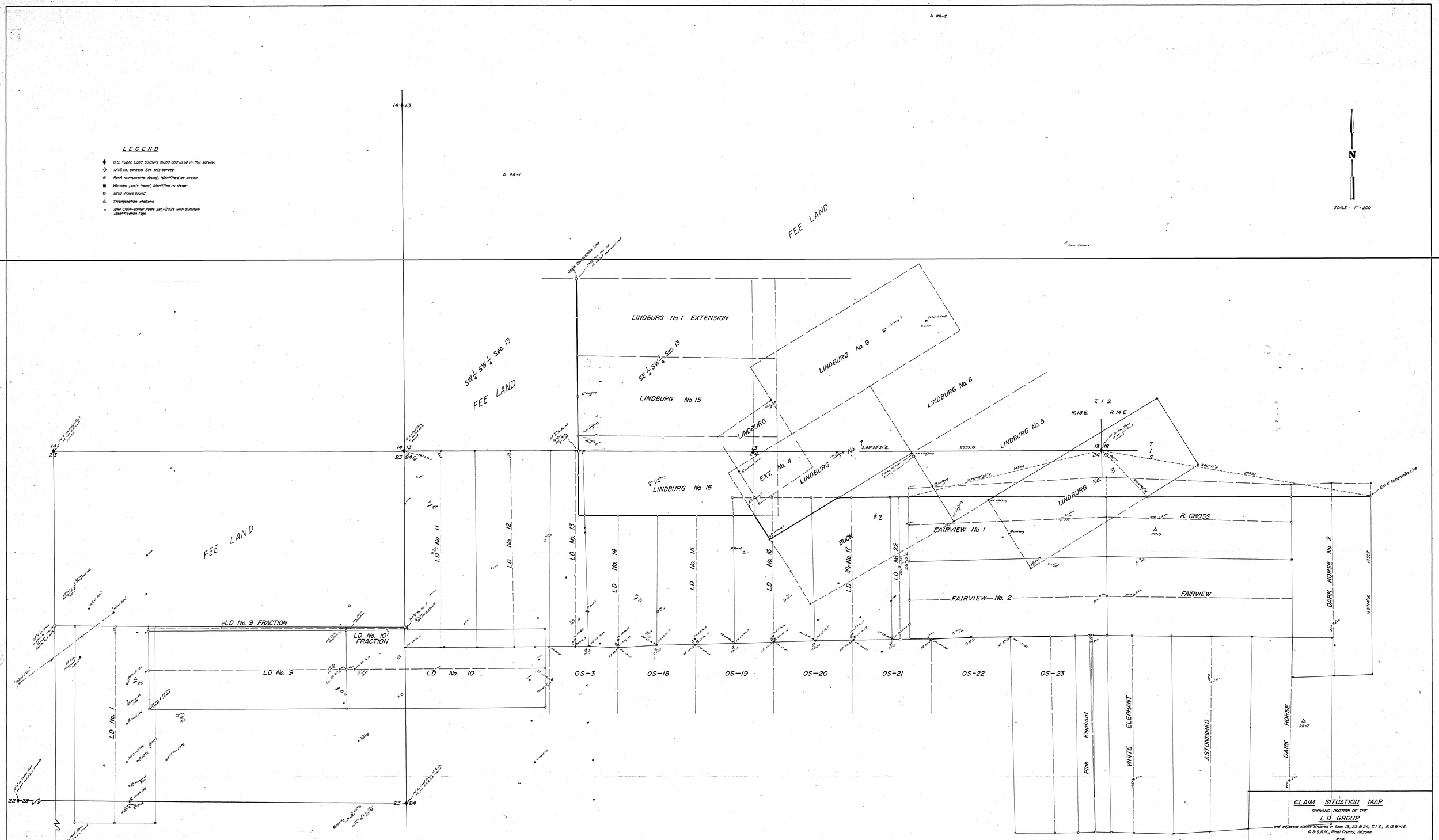
FOR

AMERICAN SMELTING & REFINING COMPANY

Survey performed by Travis L. Gant,
Reg. Land Surveyor & U.S. Mineral Surveyor
January 15 thru February 2, 1973

Scale: 1" = 200'	Drawn by: —	Drawn by: J.W.S.
Date: 2/5/73	James D. Sell, Geologist	Checked by:
		Revised: 1/30/73 Fnd. Corner Sec. 13 & 24 & 10 brass. Replaced. Add Compromise Line
TRAVIS L. GANT & ASSOCIATES, PROFESSIONAL ENGINEERS & SURVEYORS, 110 BLAZER DRIVE • P. O. BOX 943, GLOBE, ARIZONA 85501 • PHONE 425-0182		Drawing No. 73001-E-1

2625


LEGEND
U.S. Public Land Corners found and used in this survey.
1/16 th. corners Set this survey
Rock monuments found, identified as shown
Wooden posts found, identified as shown
Drill-holes found
Triangulation stations
New Claim-corner Posts Set,-2x2s with aluminum identification Tags
N
SCALE: 1" = 200'
FEE LAND
LINDBURG No. 1 EXTENSION
SW¼ SW¼ Sec. 13
SE¼ SW¼ Sec. 13
LINDBURG No. 15
LINDBURG No. 9
LINDBURG No. 6
LINDBURG No. 5
LINDBURG No. 7
LINDBURG No. 16
EXT. No. 4
LINDBURG
T. 1 S.
R. 13 E.
R. 14 E.
S.89°55'21"E.
2639.19
N.89°11'W.
2068.1
N.75°45'30"E.
1497.6
End of Compromise Line
LINDBURG No. 3
FAIRVIEW No. 1
R. CROSS
PR-5
BUCK
LD No. 11
LD No. 12
LD No. 13
LD No. 14
LD No. 15
LD No. 16
LD No. 17
LD No. 22
FAIRVIEW—No. 2
FAIRVIEW
DARK HORSE No. 2
N.0°14'W.
14507
LD No. 9 FRACTION
LD No. 10 FRACTION
LD No. 9
LD No. 10
LD No. 1
OS-3
OS-18
OS-19
OS-20
OS-21
OS-22
OS-23
Pink Elephant
WHITE ELEPHANT
ASTONISHED
DARK HORSE
PR-7
PR-8
PR-1
PR-2
PR-4
CLAIM SITUATION MAP
SHOWING PORTION OF THE
L.D. GROUP
and adjacent claims situated in Secs. 13, 23 & 24, T. 1 S., R. 13 & 14 E.
G. & S.R.M., Pinal County, Arizona
FOR
AMERICAN SMELTING & REFINING COMPANY
Survey performed by Travis L. Gant,
Reg. Land Surveyor & U.S. Mineral Surveyor
January 8, thru February 2, 1973
Scale: 1" = 200'
Ordered by: James D. Sell Geologist
Drawn by: J.W.S.
Date: 2/5/73
Checked by:
Revised: 1/10/74 Add Compromise Line, Add Lindburg Extension, Add Compromise Line
Drawing No. 73001-E-1
TRAVIS L. GANT & ASSOCIATES
PROFESSIONAL ENGINEERS & SURVEYORS
110 BLAZER DRIVE • P. O. BOX 943
GLOBE, ARIZONA 85501 • PHONE: 425-6182