Magnetoelectric Survey Histories

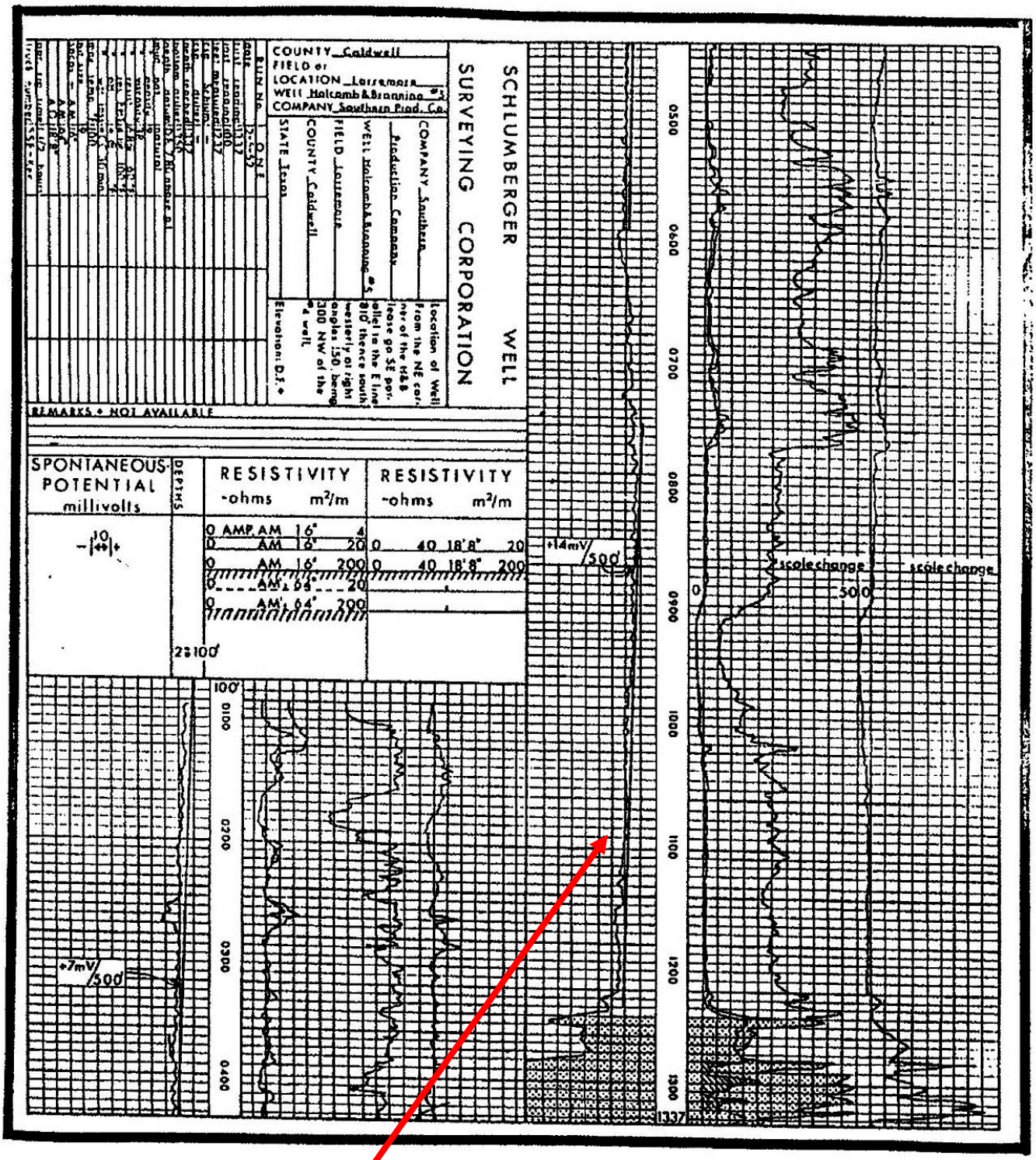
Varied Objectives

Oil and Gas Gradients
Indicated on Self Potential (SP) Baseline

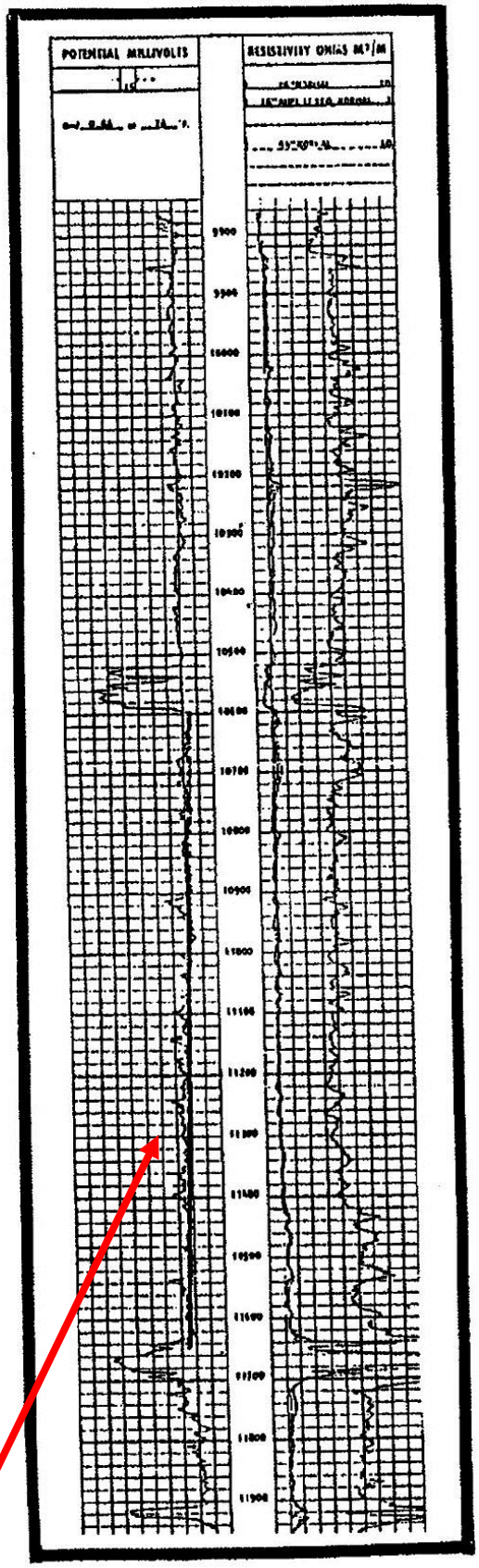
Gradient Drifts on Older Electric Logs

Oil Gradient drifts to right

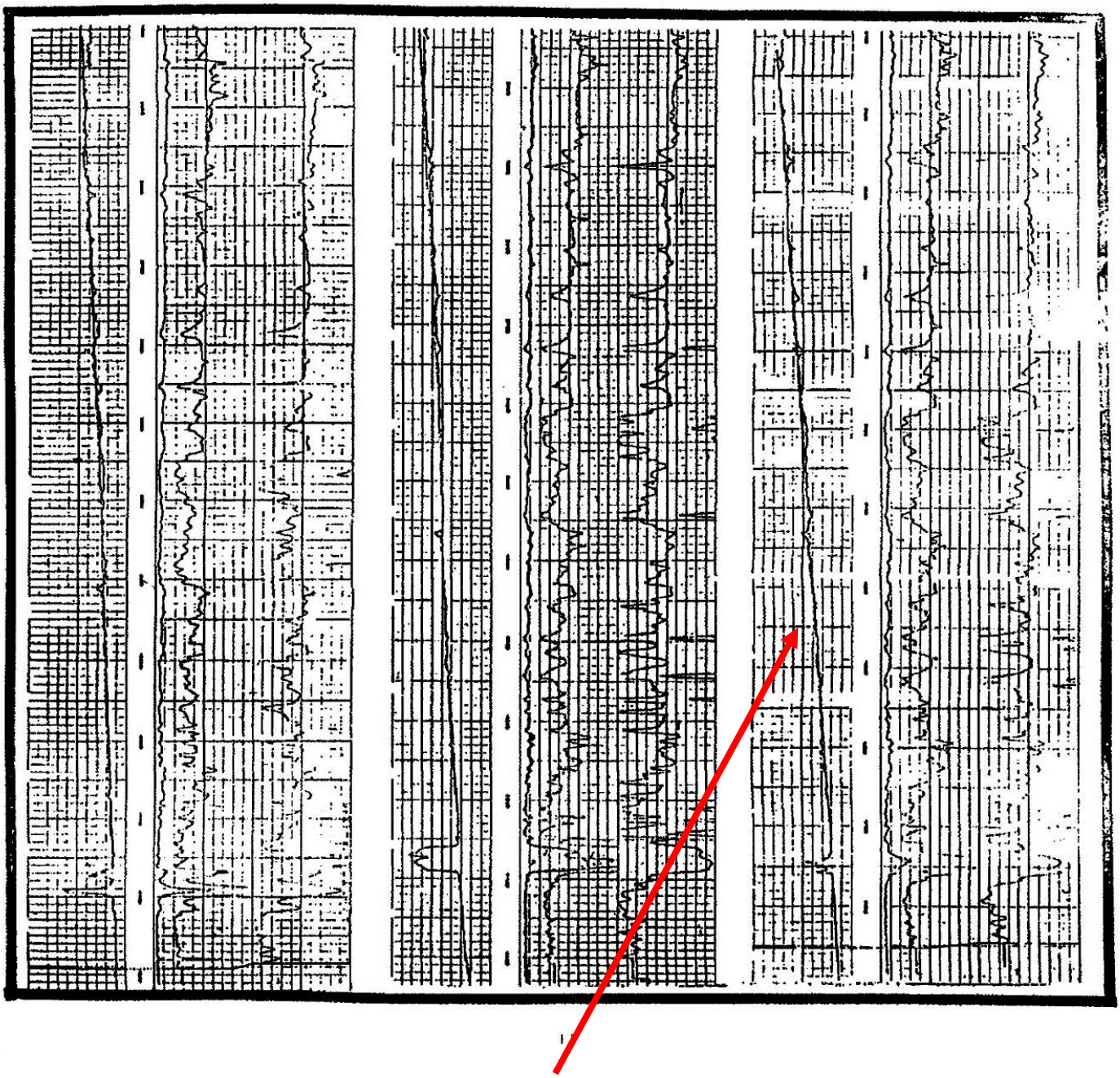
Water Gradient drifts to left



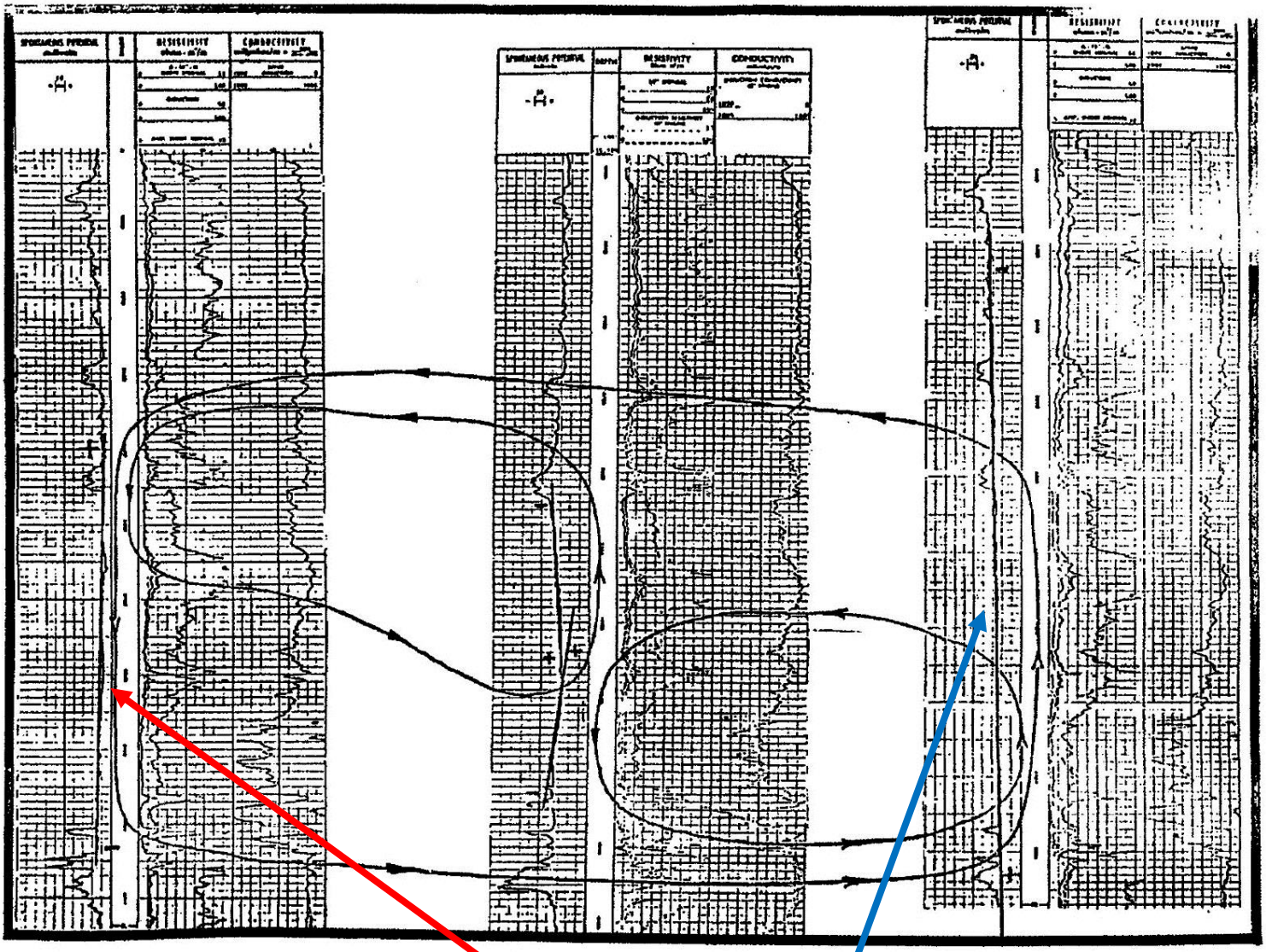
This electric log is from a well in the Larremore field, Caldwell County, Texas. It exhibits a drift to the positive or **oil gradient**. The well produces oil from the Edwards limestone at 1,250 ft.



This log in St. Mary's Parish, Louisiana, produces oil at 11,630-11,700 ft. and shows an oil gradient up to 10,600 ft.



This group of three logs from Montana (Bell Creek field area) exhibit strong drifts in the SP curve shale-base-line toward the negative or **water gradient.** The sands at 4,400 ft. to 4,500 ft. are all water-bearing and nonproductive of hydrocarbons.

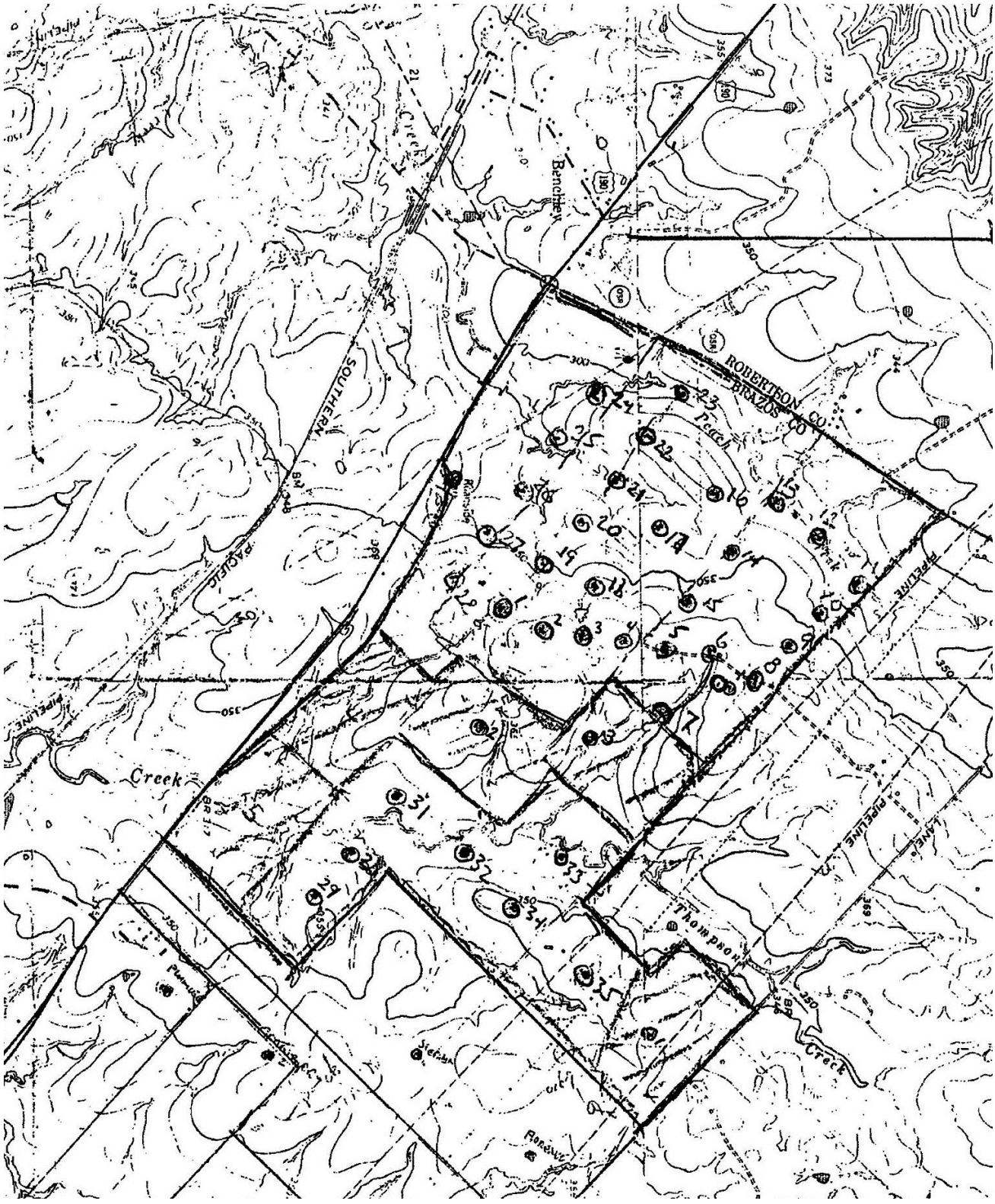


This group of three logs is from the Denver Julesburg basin in the vicinity of the Latigo field, Arapahoe County, Colorado. The well to the left is producing from the J sand and shows a well defined **oil gradient.** The well to the right is water-bearing in the J sand and shows a well defined **water gradient.** The center well exhibits a gradient which has been interpreted as a major and minor fuel cell distribution, but could possibly be the product of rectification.

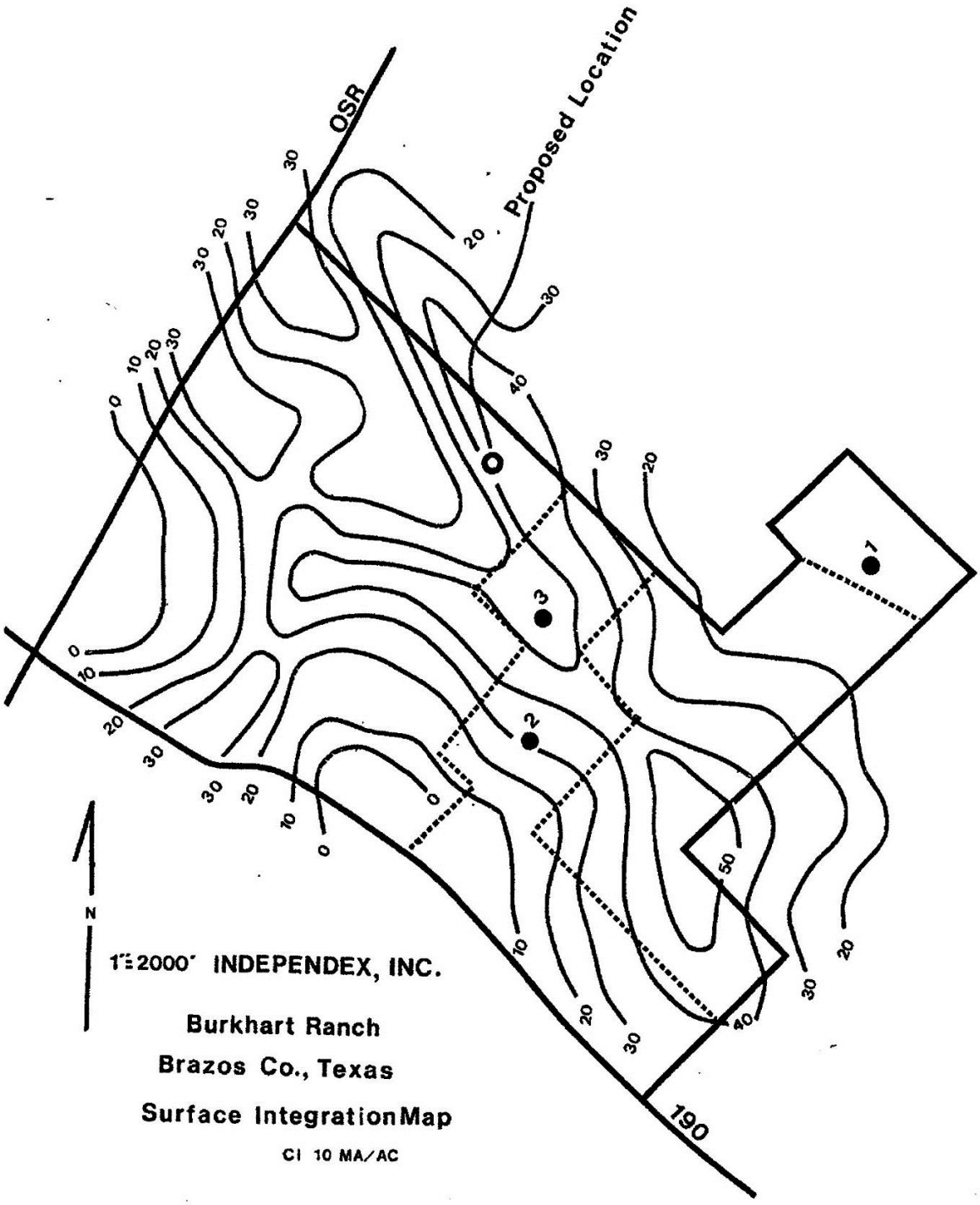
Magnetoelectric (ME) Histories

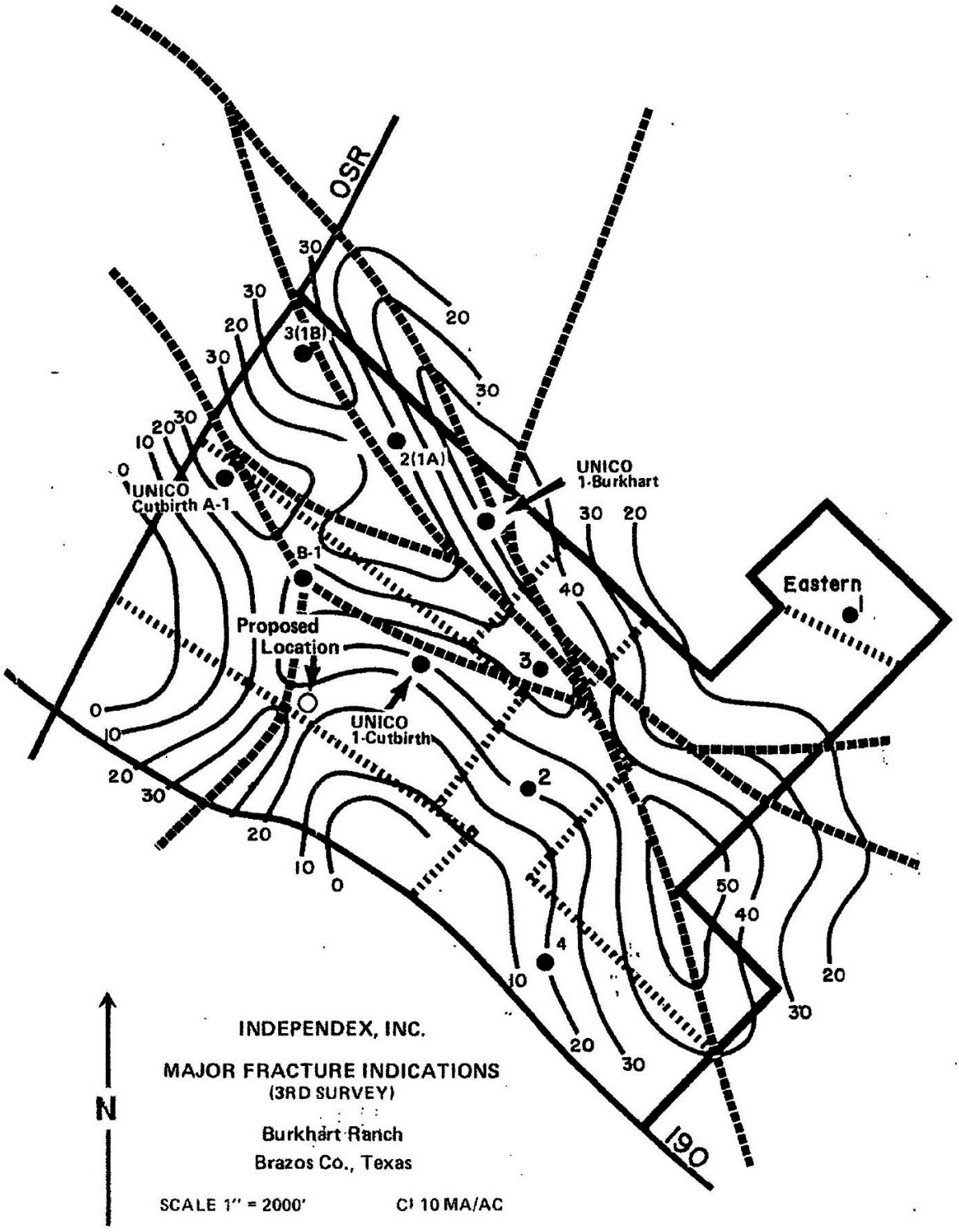
Varied Depositional Objectives

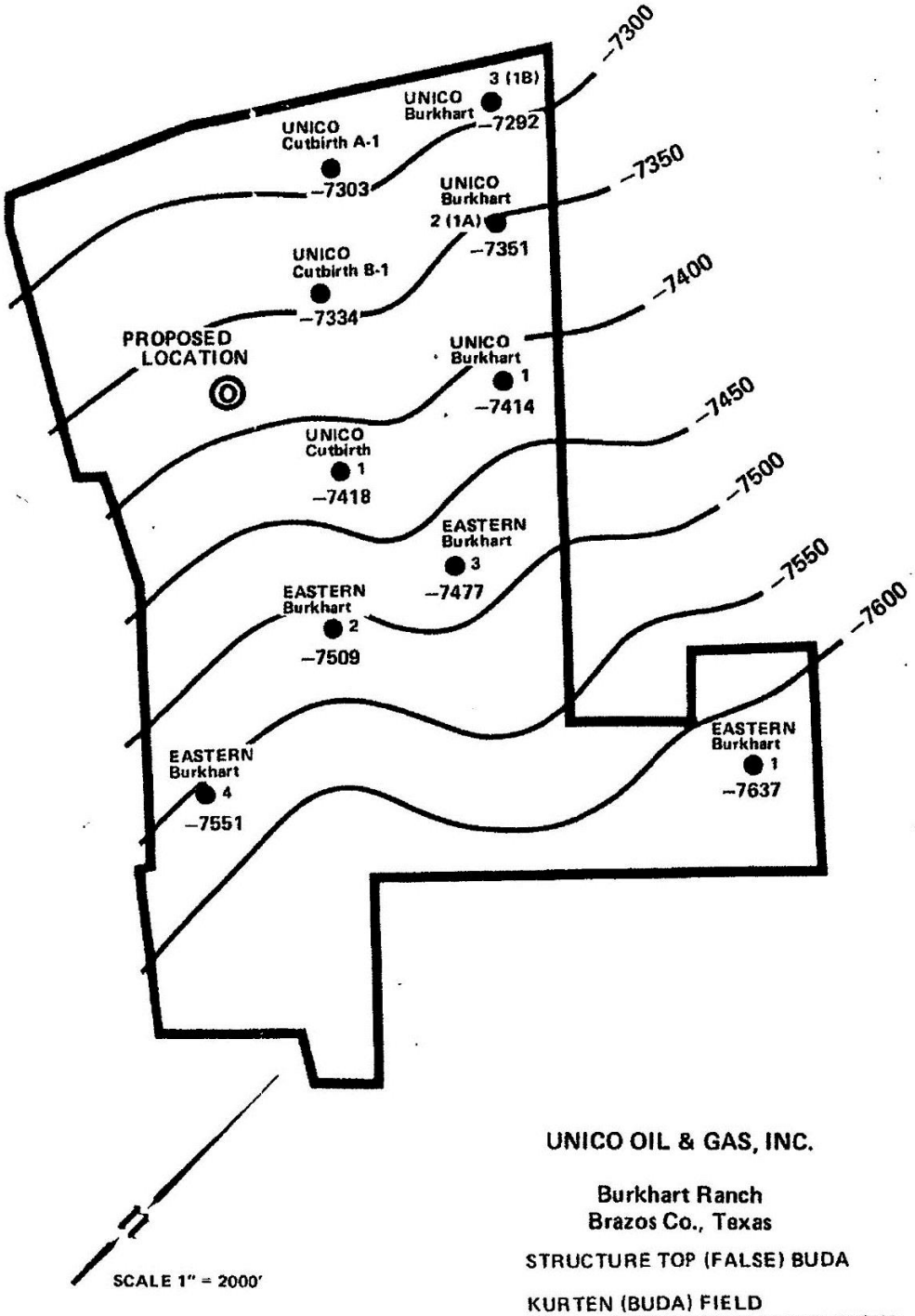
Fractured Reservoir



Ground Magnetic Station Layout
Brazos Co., Texas


OSR
Proposed Location
190
N
1"=2000' INDEPENDEX, INC.
Burkhart Ranch
Brazos Co., Texas
Surface Integration Map
CI 10 MA/AC


OSR
3(1B)
2(1A)
UNICO
1-Burkhart
UNICO
Cutbirth A-1
B-1
Proposed
Location
UNICO
1-Cutbirth
Eastern
3
2
4
190
INDEPENDEX, INC.
MAJOR FRACTURE INDICATIONS
(3RD SURVEY)
Burkhart Ranch
Brazos Co., Texas
SCALE 1" = 2000'
CI 10 MA/AC
N



SCALE 1" = 2000'

UNICO OIL & GAS, INC.

Burkhart Ranch
Brazos Co., Texas

STRUCTURE TOP (FALSE) BUDA

KURTEN (BUDA) FIELD
BUDA / GEORGETOWN FORMATIONS

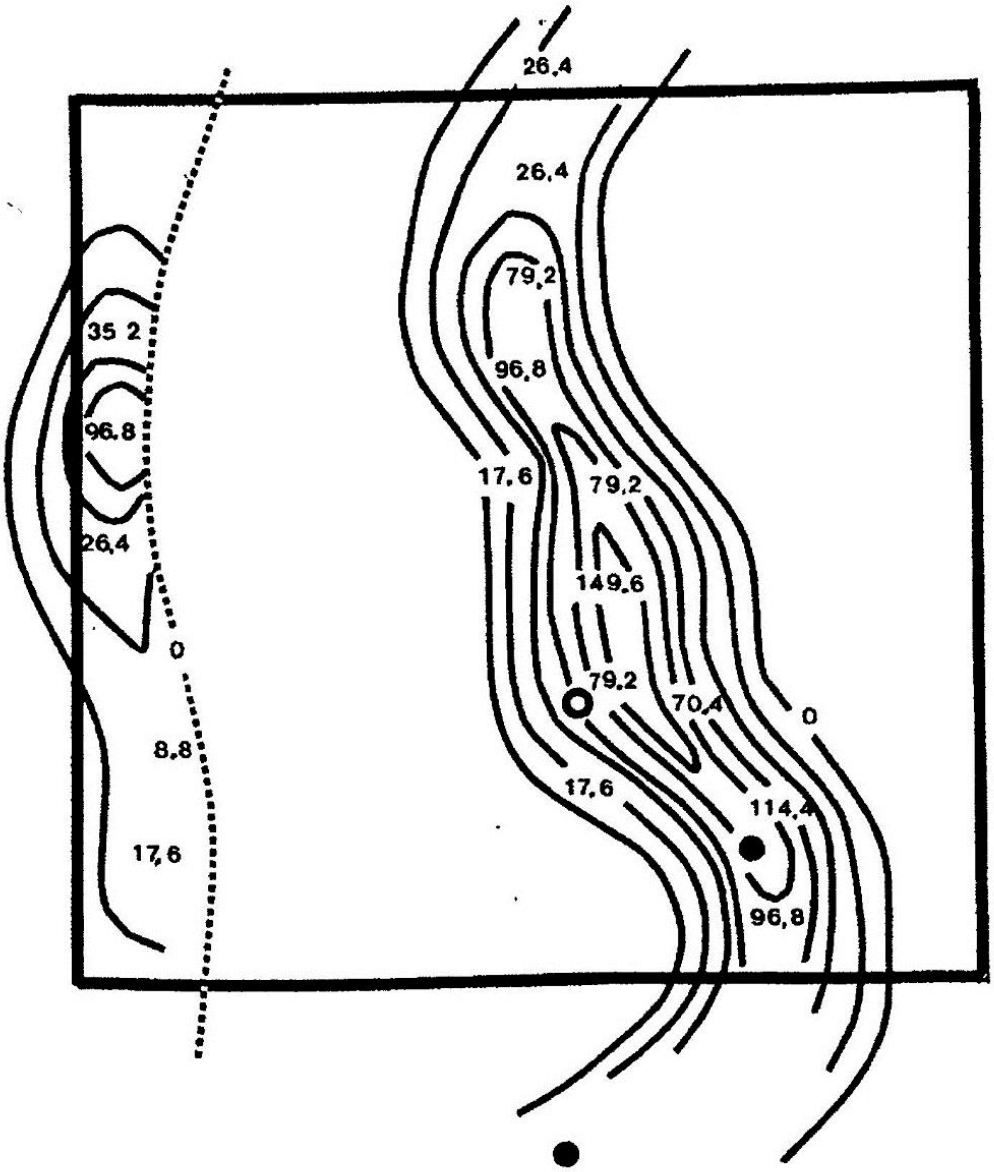
UNICO OIL & GAS, INC.
BURKHART RANCH PROJECT
BUDA/GEORGETOWN FORMATION
KURTEN (BUDA) FIELD
BRAZOS CO., TEXAS

AMTEX PETROLEUM, INC.
BARRELS OIL PER MONTH
RAILROAD COMMISSION OF TEXAS PRODUCTION DATA

PROJECT TOTAL PRODUCTION: 305198

CUM. PROD	96341	30667	45157	24224	41941	42825	24043
MONTH	BURKHART 1	BURKHART A1	BURKHART B1	CUTBIRTH 1	CUTBIRTH A1	CUTBIRTH B1	CUTBIRTH C1
OCT87	3805			773			
NOV	5603			2083			
DEC	5724			1988			
JAN88	6329	585		1168			
FEB	5643	3501		1251			
MAR	6436	4034		1067			
APR	5625	2226	244	717			
MAY	8051	1705	3794	259	3120		
JUN	5447	1924	5933	659	3705	72	
JUL	4589	933	3567	1055	3622	3893	
AUG	4166	742	2673	646	2474	3928	
SEP	2695	661	2644	1953	2103	3494	
OCT	1183	561	1799	1757	1740	2578	5280
NOV	2456	518	1470	1285	1534	2279	2980
DEC	1607	448	1261	841	1303	1990	825
JAN89	1358	417	1094	748	966	1594	1723
FEB	1322	344	1012	513	32	1707	1779
MAR	1246	327	942	364	1369	1620	1118
APR	1042	1238	880	306	1255	1418	836
MAY	1085	1276	772	196	1002	1355	655
JUN	907	1073	724	209	857	1360	578
JUL	904	762	622	215	403	1247	583
AUG	854	651	585	233	884	1100	485
SEP	754	553	609	122	979	557	120
OCT	446	562	570	131	286	335	289
NOV	338	200	62	254	772	67	0
DEC	0	0	320	49	707	0	578
JAN90	34	0	833	0	453	0	231
FEB	0	0	244	40	144	0	0
MAR	0	0	0	0	1023	402	153
APR	228	0	0	315	654	846	531
MAY	1638	0	0	244	626	933	527
JUN	1331	788	0	376	669	795	182
JUL	649	678	562	97	488	519	186
AUG	662	307	1559	73	383	471	217
SEP	509	251	1345	73	542	301	91
OCT	185	182	1121	118	106	260	65
NOV	498	402	469	121	593	38	15
DEC	209	164	124	106	527	21	10
JAN91	28	232	210	89	92	64	65
FEB	13	252	791	17	713	24	339
MAR	82	178	957	145	213	244	853
APR	383	228	330	46	482	346	187
MAY	1650	215	688	0	341	16	87
JUN	261	177	573	74	399	337	18
JUL	451	238	473	231	429	380	317
AUG	438	251	386	148	375	714	66
SEP	536	45	416	98	627	741	0
OCT	646	175	357				

Channel Sand Reservoir



Burke Project

SW 1/4 31 T18N R9E

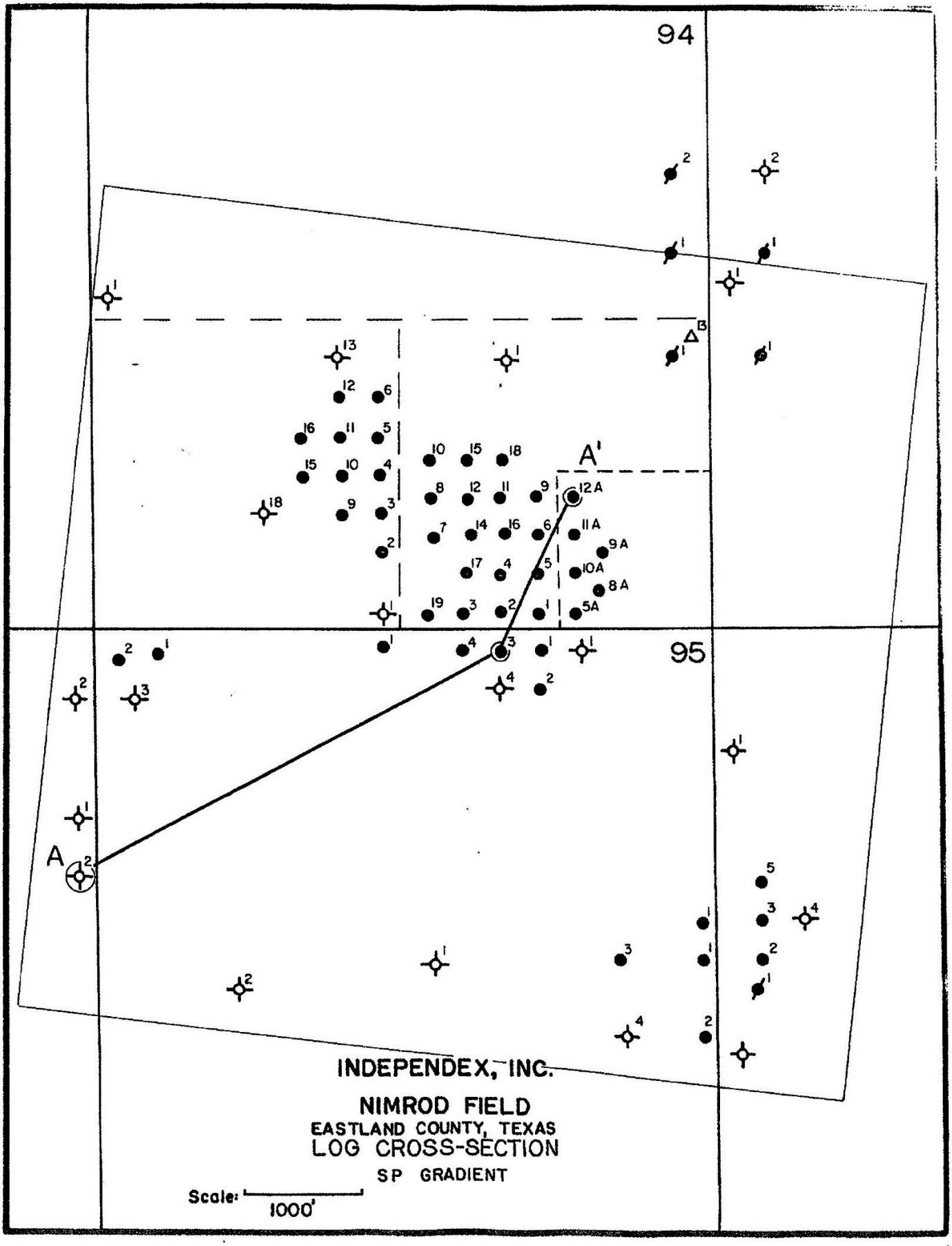
Creek Co., OK

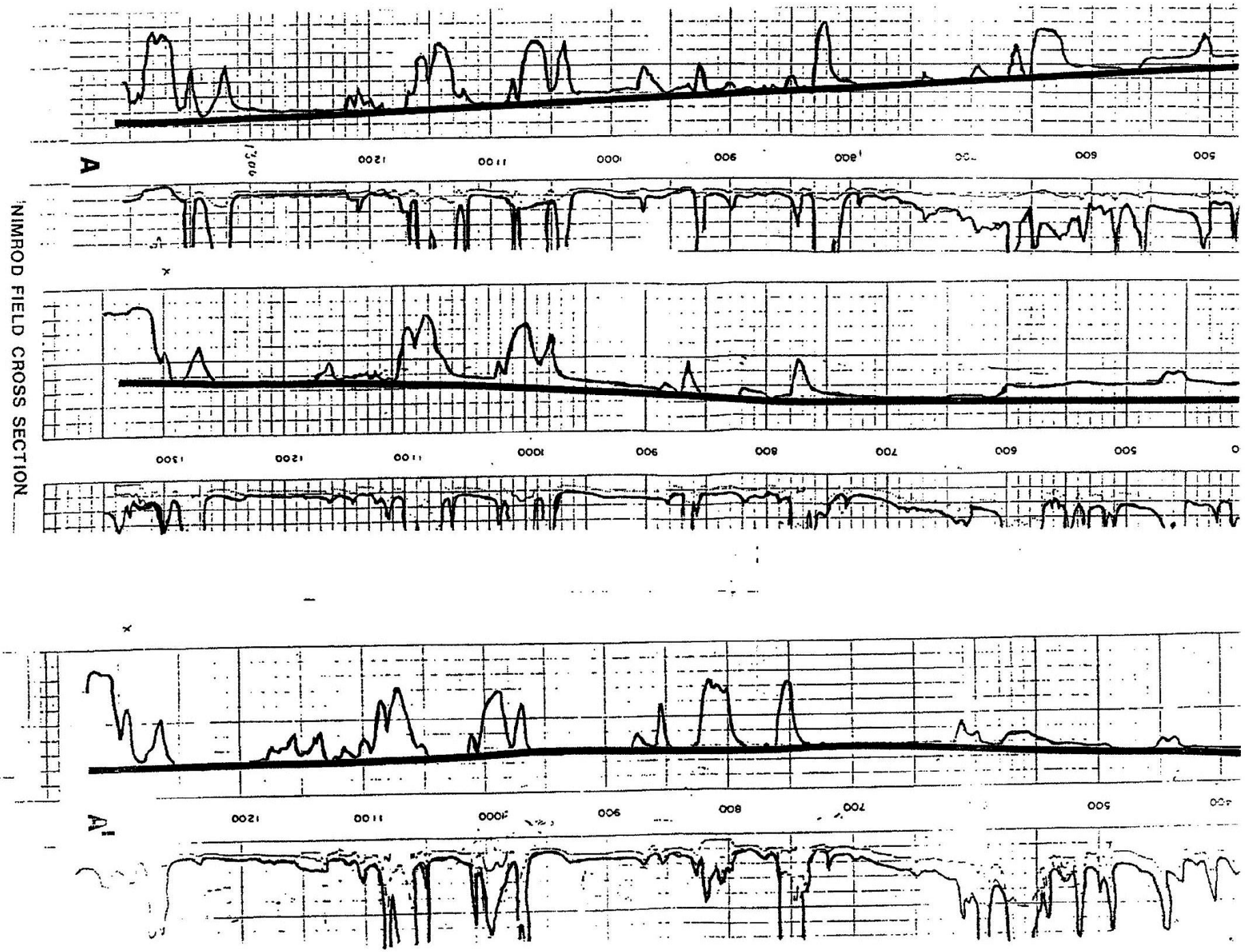
Surface Integration

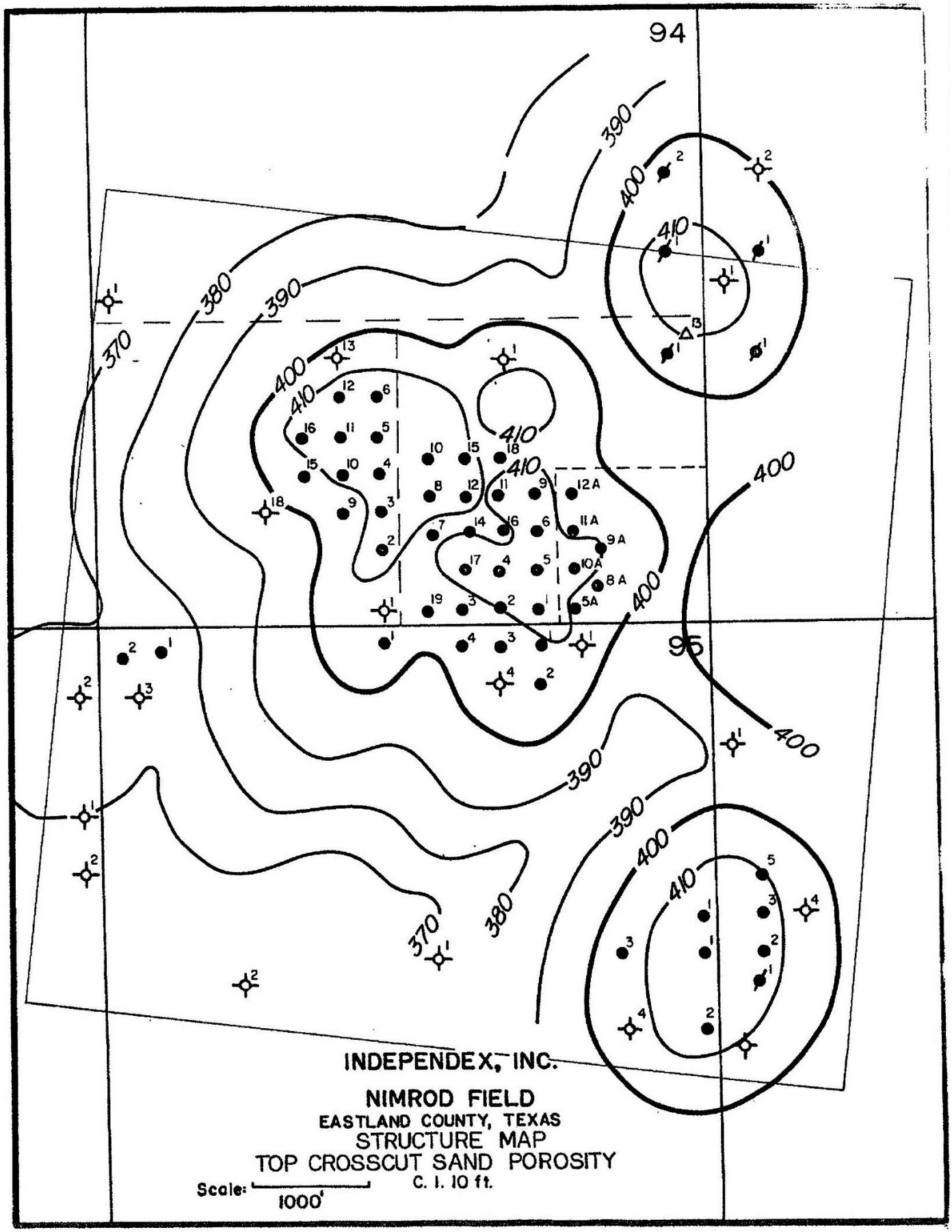
CI: 25 ma/ac

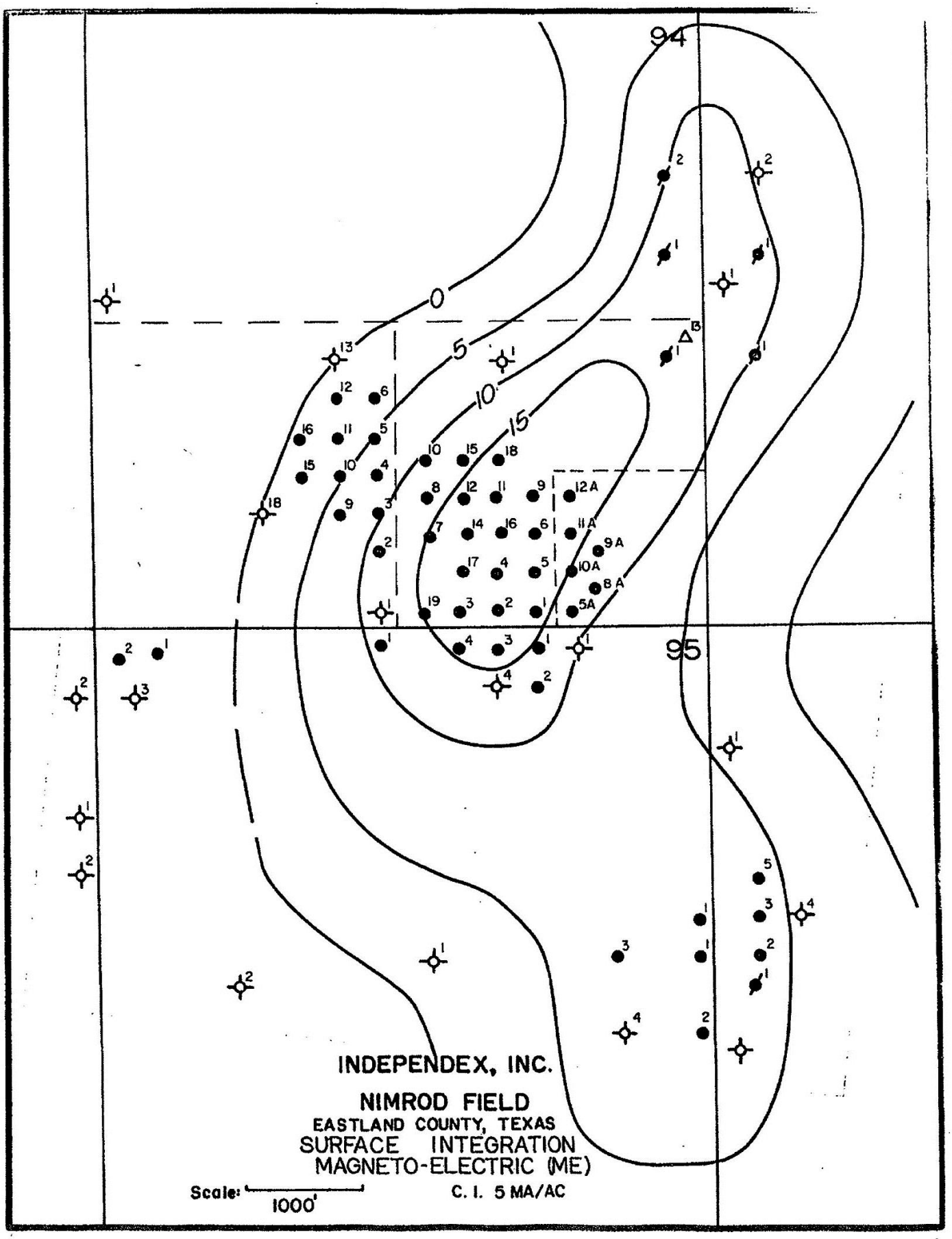
Producing Field
Nimrod Field
Eastland Co., Texas

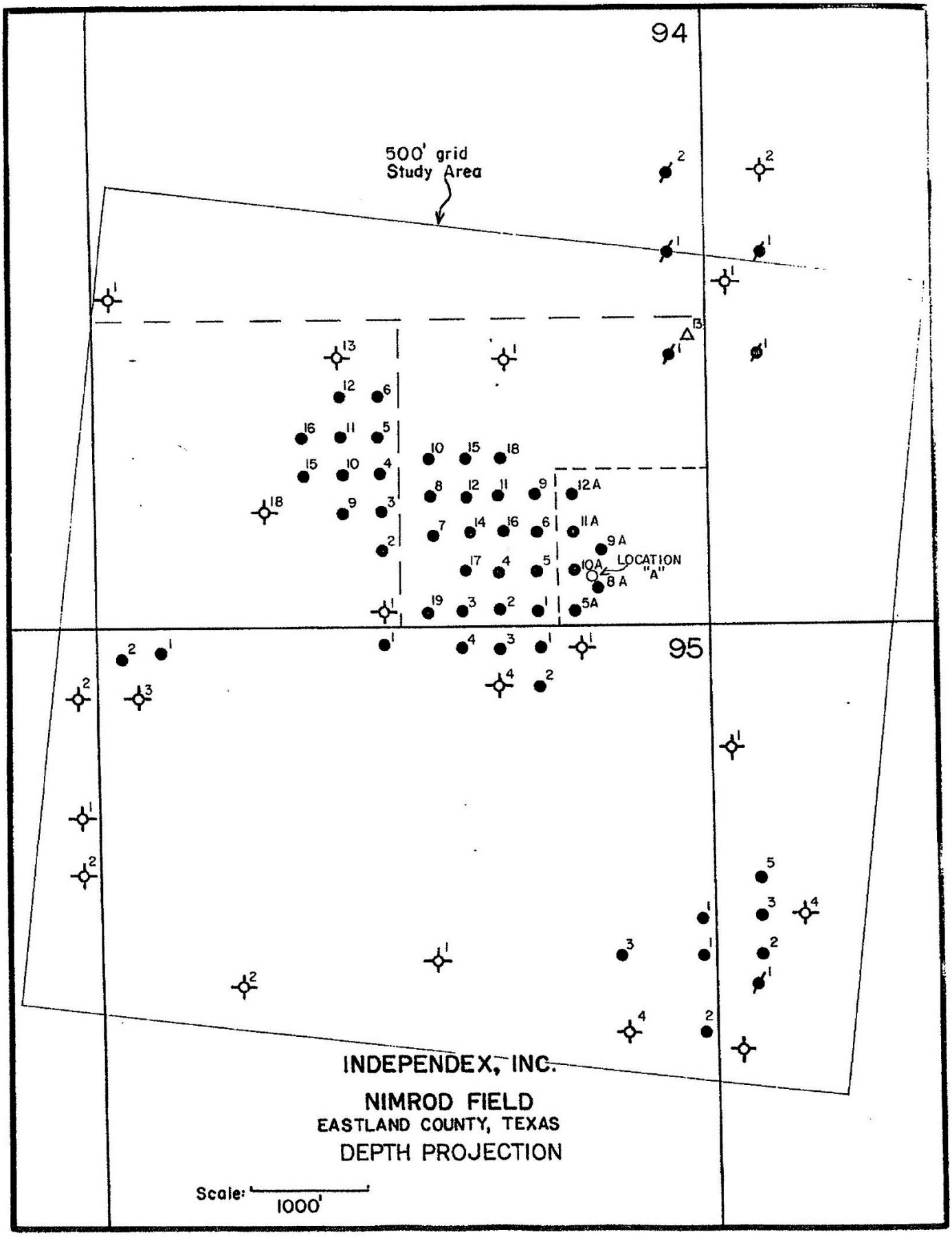
Crosscut Sand

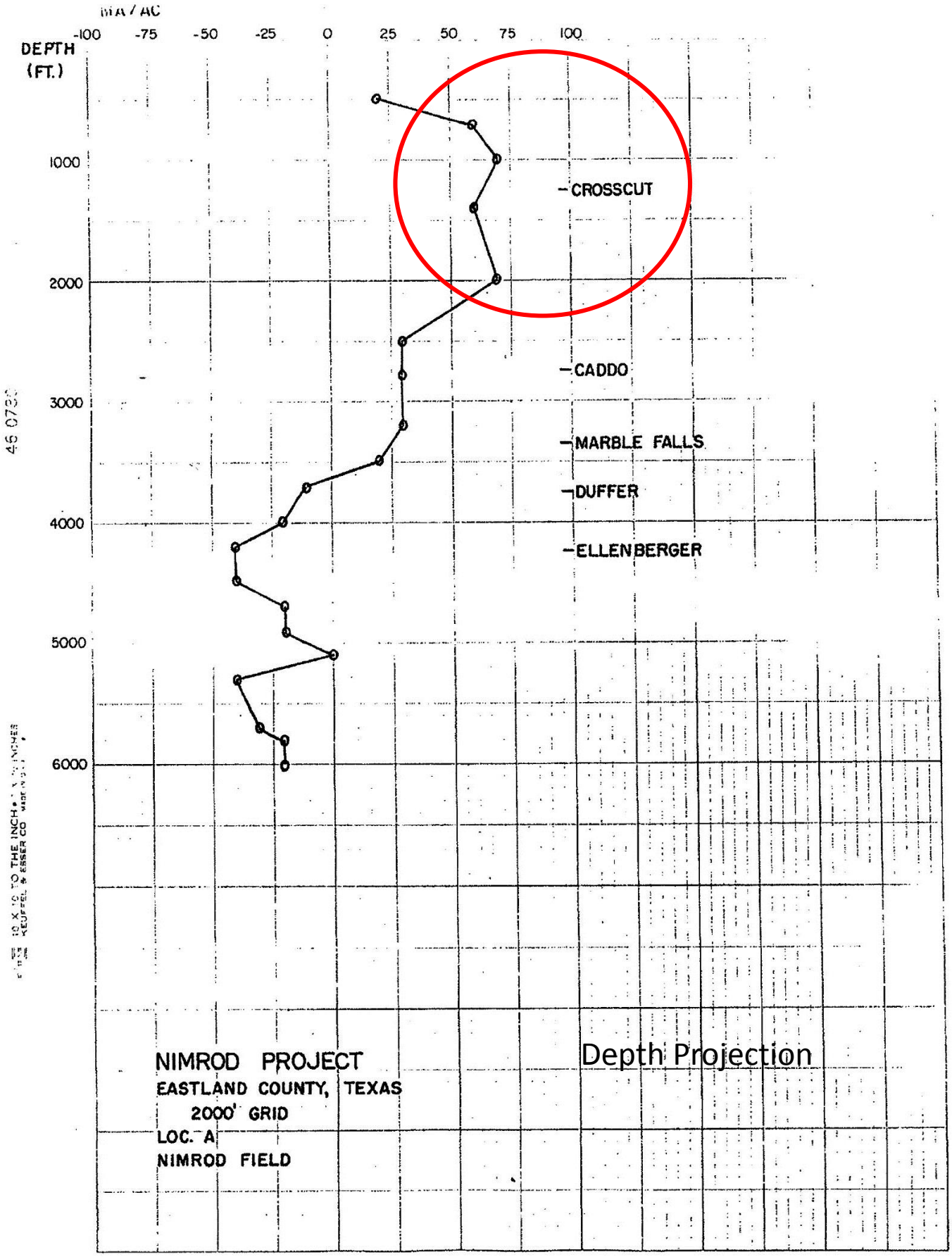

94
95
A
A'
INDEPENDEX, INC.
NIMROD FIELD
EASTLAND COUNTY, TEXAS
LOG CROSS-SECTION
SP GRADIENT
Scale: 1000'

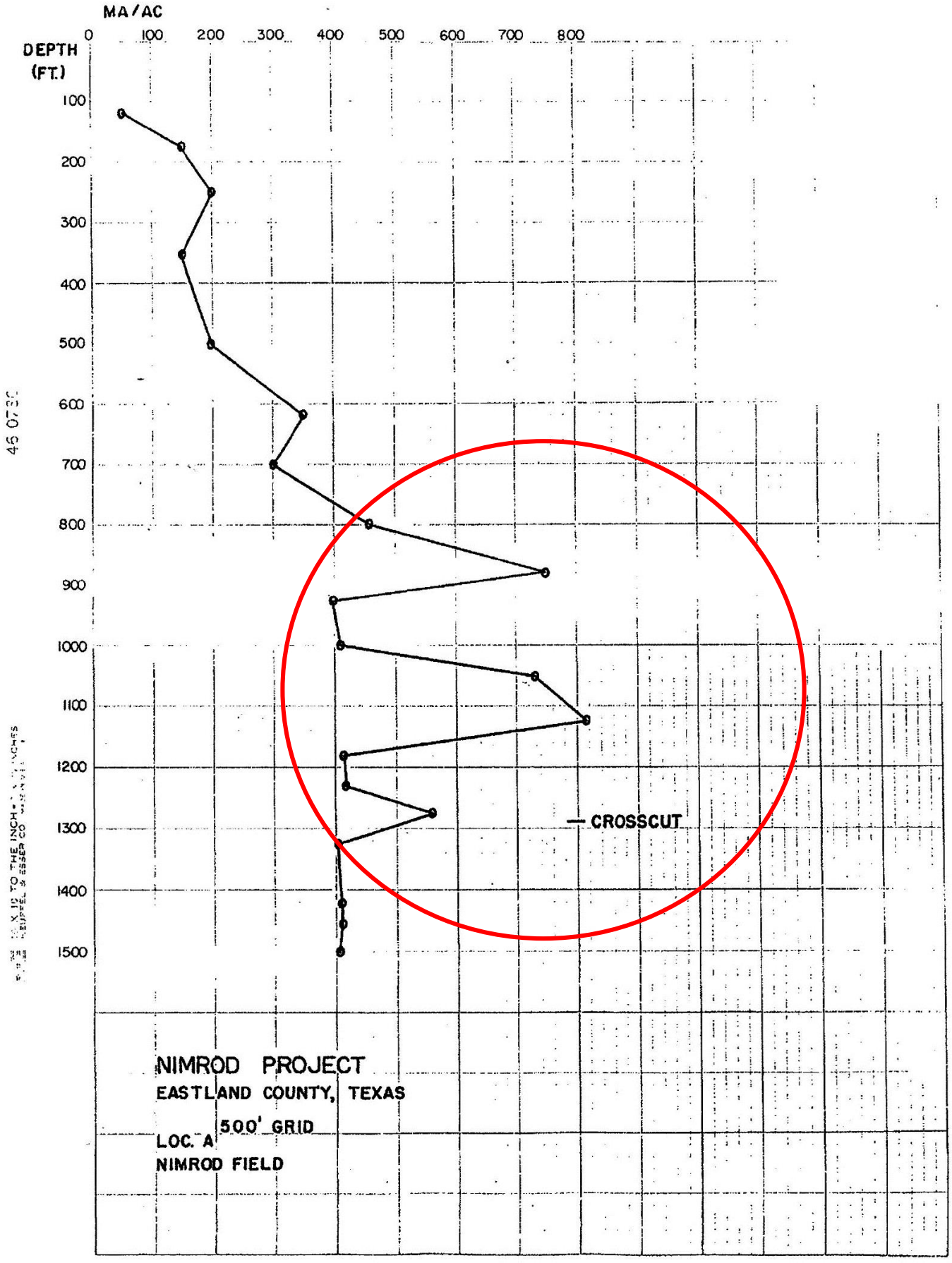

NIMROD FIELD CROSS SECTION
A
A'


94
95
390
400
410
380
370
INDEPENDEX, INC.
NIMROD FIELD
EASTLAND COUNTY, TEXAS
STRUCTURE MAP
TOP CROSSCUT SAND POROSITY
C. I. 10 ft.
Scale: 1000'


94
95
0
5
10
15
INDEPENDEX, INC.
NIMROD FIELD
EASTLAND COUNTY, TEXAS
SURFACE INTEGRATION
MAGNETO-ELECTRIC (ME)
Scale: 1000'
C. I. 5 MA/AC


94
500' grid
Study Area
LOCATION
"A"
95
INDEPENDEX, INC.
NIMROD FIELD
EASTLAND COUNTY, TEXAS
DEPTH PROJECTION
Scale:
1000'


MV / AC
-100
-75
-50
-25
0
25
50
75
100
DEPTH
(FT.)
1000
2000
3000
4000
5000
6000
CROSSCUT
CADDO
MARBLE FALLS
DUFFER
ELLENBERGER
NIMROD PROJECT
EASTLAND COUNTY, TEXAS
2000' GRID
LOC. A
NIMROD FIELD
Depth Projection

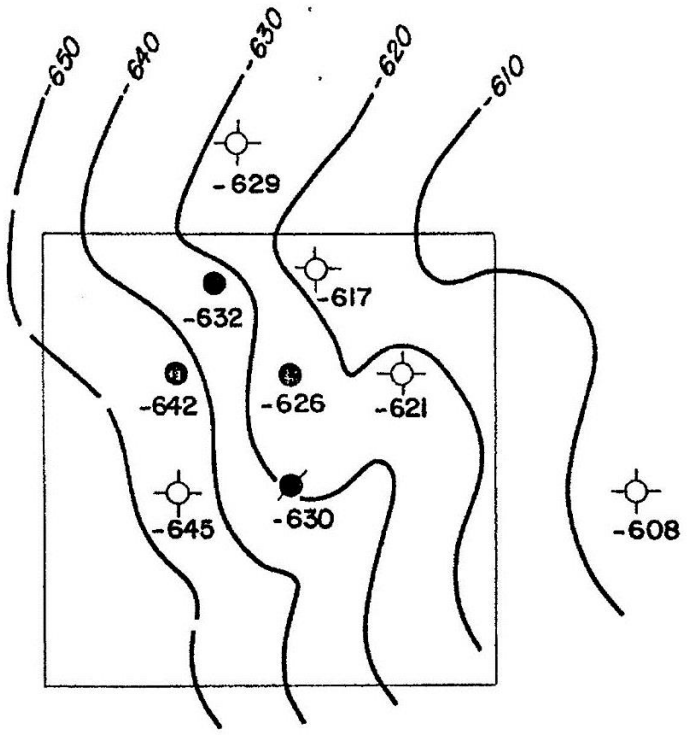

MA/AC
0
100
200
300
400
500
600
700
800
DEPTH
(FT.)
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
CROSSCUT
NIMROD PROJECT
EASTLAND COUNTY, TEXAS
500' GRID
LOC. A
NIMROD FIELD

Abandoned Field
Griffiths Field
Clay Co., Kansas

Mississippi Chat

Griffiths Field
Section 3, T9S R4E
Clay County, Kansas

Discovery Date	May 30, 1957
Operator	Pure Oil Company
Well	#1 F.L. Griffiths
Location	C NE NW Sec. 3-9S-4E
Producing Formation	Mississippian (Burlington-Keokuk) Chert
Initial Production	Pump 86.5 bbls oil/day 26 bbls water/day
Initial Reservoir Pressure	685 psi (DST)
Method of Discovery	Subsurface Geology
Nature of Trap	Stratigraphic Entrapment
Reservoir Thickness	22-29 ft.
Average Depth	1,920 ft.
Productive Zone Thickness	4 ft. plus fractures
Porosity (Log)	18% to 35% where porous and permeable
Water Saturation	Variable
Water Datum	-644 ft. (related to permeability more than structure)
Productive Area	Approximately 200 acres
Drive Mechanism	Inadequate water drive
Oil Character	27 degrees API @ 60 degrees F
Gas	Too Small To Measure
Completion Technique	Perforations
Treatment	Acidfrac; 6,000 gals frac acid, 6 gals Mar-flo, 6000# sand
Total Producers Drilled	4 wells; 1 abandoned, 8/1/59, (4,091 BO)
Cumulative Production	95,053 bbls oil
Year Field Abandoned	1981



N

INDEPENDEX, INC.

GRIFFITHS FIELD

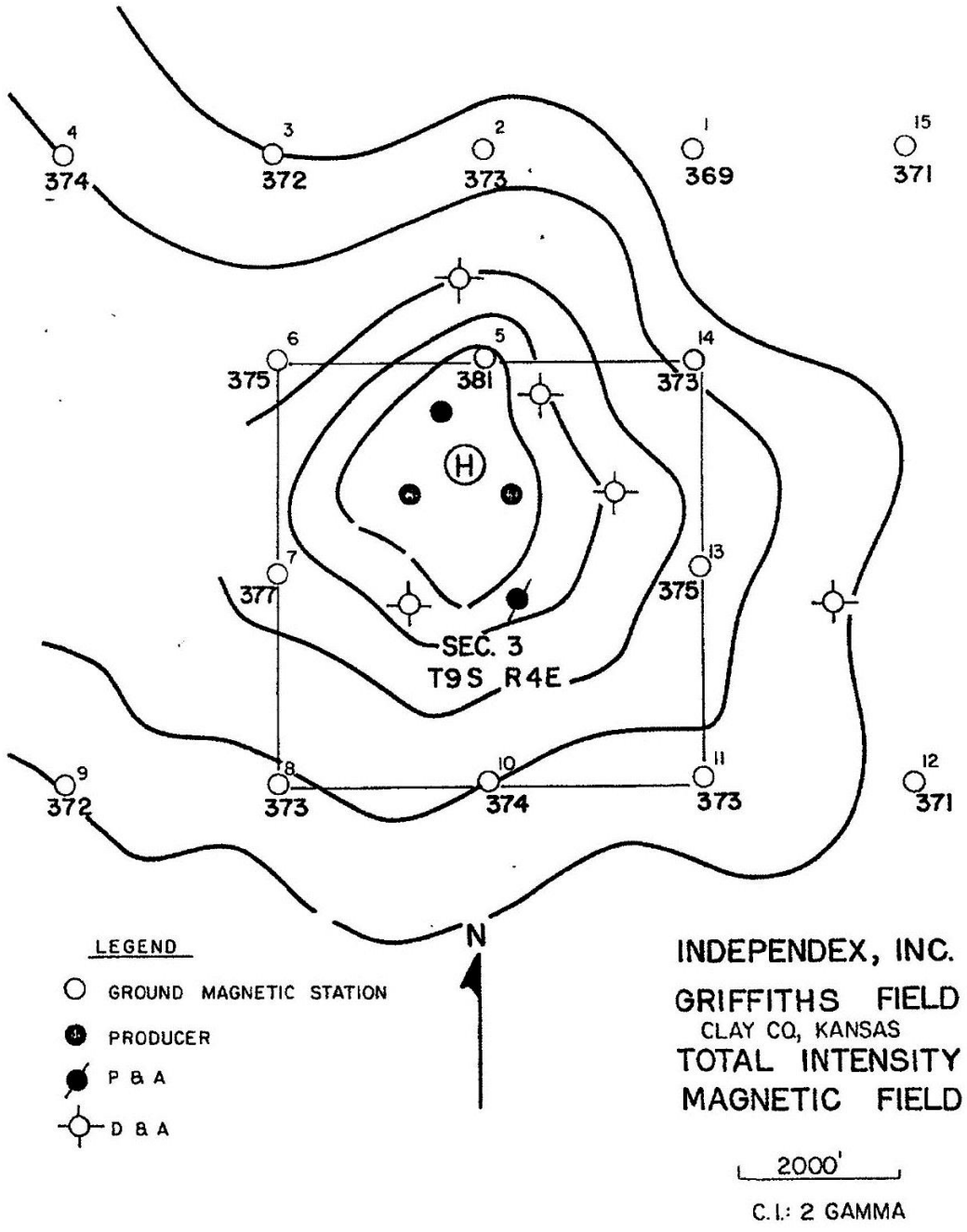
CLAY CO., KANSAS

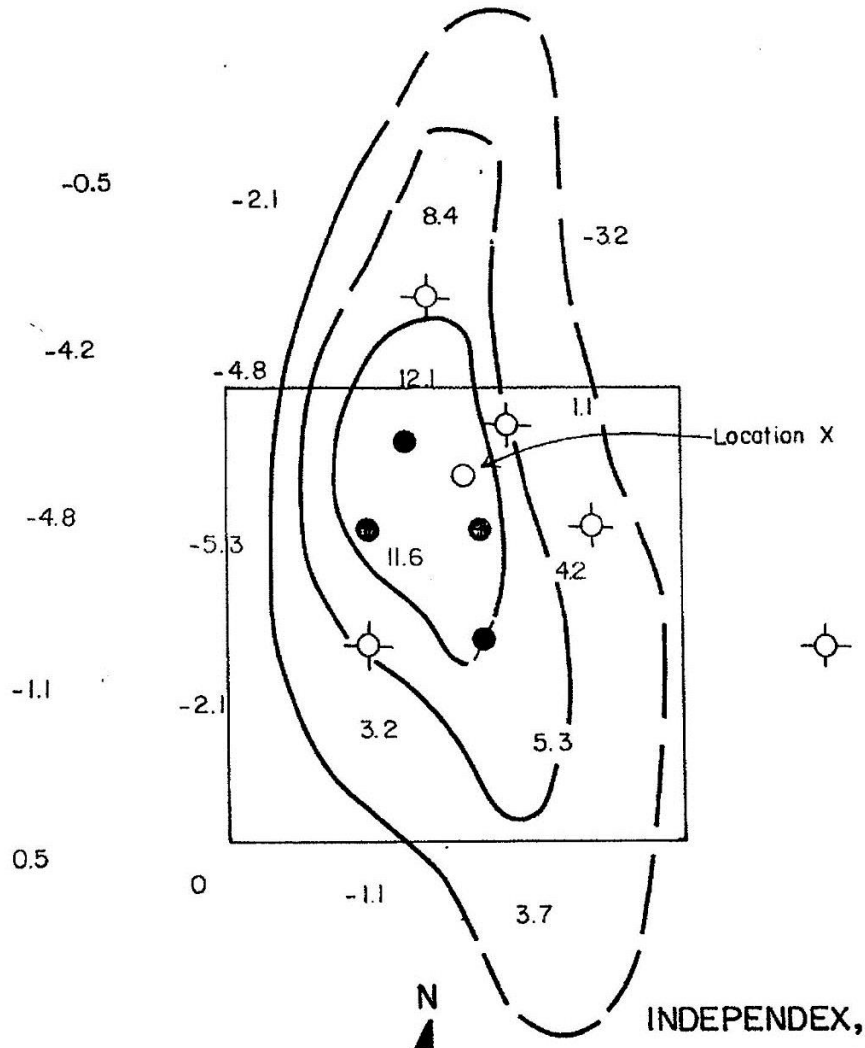
TOP MISS CHERT

PRODUCING HORIZON

C.I.=10'

2000'


4
374
3
372
2
373
1
369
15
371
6
375
5
381
14
373
7
377
13
375
H
SEC. 3
T9S R4E
9
372
8
373
10
374
11
373
12
371
N
LEGEND
GROUND MAGNETIC STATION
PRODUCER
P & A
D & A
INDEPENDEX, INC.
GRIFFITHS FIELD
CLAY CO, KANSAS
TOTAL INTENSITY
MAGNETIC FIELD
2000'
C.I.: 2 GAMMA



INDEPENDEX, INC.

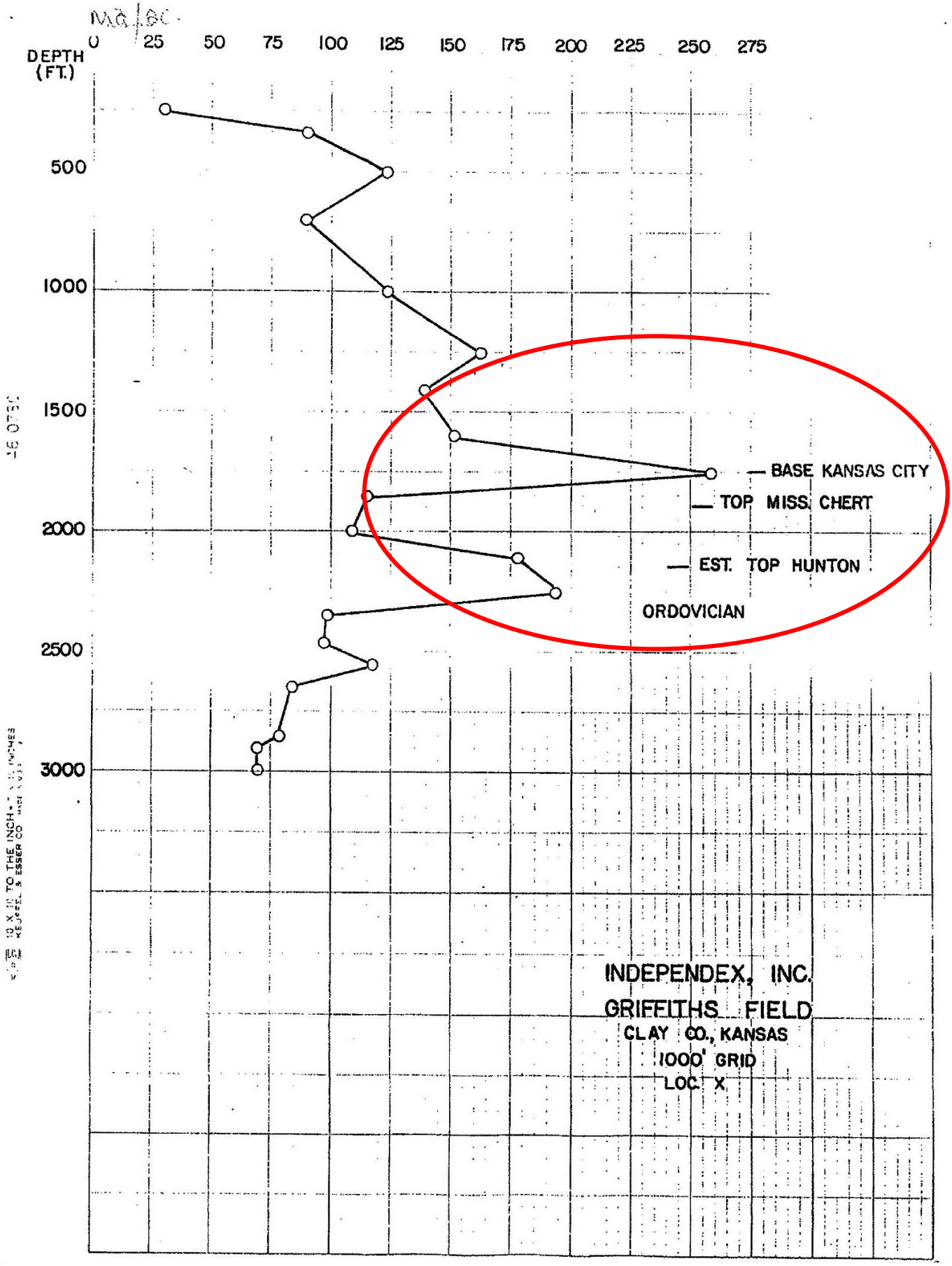
GRIFFITHS FIELD

CLAY CO., KANSAS

(ME) SURFACE INTEGRATION

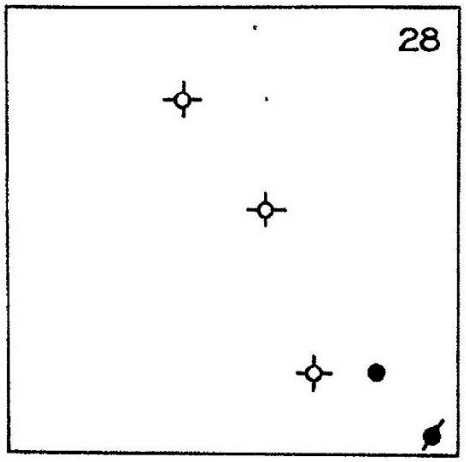
2000'

C.I.: 5 Ma/ac.


DEPTH (FT.)
0
25
50
75
100
125
150
175
200
225
250
275
500
1000
1500
2000
2500
3000
BASE KANSAS CITY
TOP MISS. CHERT
EST. TOP HUNTON
ORDOVICIAN
INDEPENDEX, INC.
GRIFFITHS FIELD
CLAY CO., KANSAS
1000' GRID
LOC. X

Pre-Development Wildcat
Edwards Co., Illinois

Mississippian Limestone



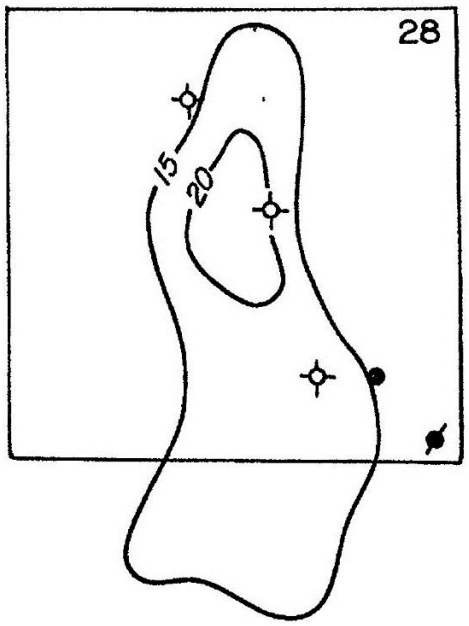
INDEPENDEX, INC.

N

SEC. 28 IN 10E
EDWARDS CO., ILLINOIS

DEVELOPMENT BEFORE
ME GROUND SURVEY

2000'



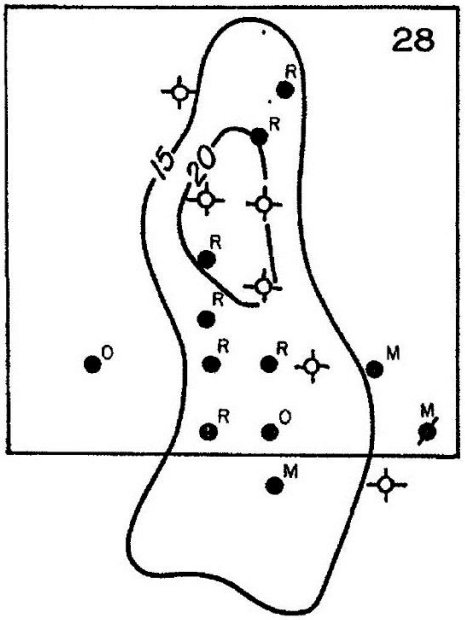
N

INDEPENDEX, INC.
MAPLE GROVE SOUTH
CONSOLIDATED FIELD
EDWARDS CO., ILLINOIS
SEC. 28 IN 10E

SURFACE INTEGRATION
MAGNETO-ELECTRIC (ME)

2000'

C.I.: 5 Ma/ac



LEGEND

R ROSICLAIRE (Miss)

O O'HARA

M McCLOSKY

D & A

P & A

N

INDEPENDEX, INC.
MAPLE GROVE SOUTH
CONSOLIDATED FIELD
EDWARDS CO., ILLINOIS
SEC. 28 IN 10E
ME ANOMALY
AND
FIELD DEVELOPMENT
C. I. = 5 Ma /ac

2000'