# Martin K. Dubois

Consulting Geologist

1321 East 11th Avenue • Winfield, Kansas 67156 • 316-221-4129


December 22, 1979

## GEOLOGICAL REPORT

Monarch Energy Corporation
#1 Mines
C-SE-NW Sec. 12-2S-30W
Decatur County, Kansas

| | |
|---|---|
| Elevations: | GL 2776<br>KB 2780<br>Measurements from KB |
| Contractor: | J&C Drilling |
| Spud: | 12/9/79 |
| Completed: | 12/21/79 |
| RTD/LTD | 4340/4337 |
| Surface Casing: | 8 5/8" @ 247' |
| Hole Size: | 7 7/8" from 247' to TD |
| Mud Up: | 3600' |
| Drill Time: | 1' drill time 2450-2580, 3200-TD |
| Samples: | 10' samples 3200 to TD |
| Geological Supervision: | 2800 to TD |
| Drill Stem Tests: | Four-Miller Testing |
| Electric Log Surveys: | Great Guns- Radiation Guard Log with Caliper |
| Mud Service: | Total Mud Services Inc. |
| Bits Run: | 256-1960 HT 3AJ<br>1960-2547 HT 3J<br>2547-3305 S 84 F (Rerun)<br>3305-4340 S 84 F |

Sample Quality:
3200-3780 poor
3780-4100 good
4100-4340 fair (cavings)

Pipe Strapped:
2547-Strap was 3' short to board
3305-Strap was 3' short to board, geolograph was adjusted here and uphole

Straight Hole Surveys:
2547-1/2 degree from vertical
3305-1/2 degree from vertical
3781-1/2 degree from vertical

MORNING DRILLING REPORTS:

12/9 Setting surface casing
12/10 Drilling @ 1220
12/11 Draworks bearing out 1960
12/12 Drilling @ 1960
12/13 Drilling @ 2485
12/14 Drilling @ 2890
12/15 Drilling @ 3279
12/16 Drilling @ 3540
12/17 Running DST #1 @ 3781
12/18 Running DST #2 @ 3875
12/19 Going in hole after DST #3 @ 3917
12/20 Drilling @ 4010
12/21 Conditioning hole to log @ 4340

FORMATION TOPS

| Formation | Monarch #1 Mines SE-NW 12-2S-30W Sample | Monarch #1 Mines SE-NW 12-2S-30W E-Log | Abercrombie #1 Mines NE-SE 11-2S-30W E-Log | Relation of Monarch to Abercrombie Well |
|---|---|---|---|---|
| Stone Corral | 2519 | 2514(+266) | 2457(+260) | +6 |
| Foraker | 3245 | 3245(-465) | 3184(-467) | +2 |
| Topeka | 3560 | 3559(-779) | 3497(-780) | +1 |
| Heebner | 3722 | 3723(-943) | 3657(-940) | -3 |
| Lansing | 3769 | 3768(-988) | 3704(-987) | -1 |
| Base Kansas City | 3996 | 3993(-1213) | 3928(-1211) | -2 |
| Cherokee | 4131 | 4121(-1341) | DNP | |
| Arbuckle | 4288 | 4297(-1517) | DNP | |
| Total Depth | 4340 | 4337 | 3948 | |

SHOWS AND DRILL STEM TESTS:

L-KC A Zone
Smpl 3769-76
E-Log 3768-72
Limestone, white, very fine grained, pellets and fine skeletal grains, chalky in part (pellet-skeletal packstone), fair intergranular porosity, slight show of free oil.

DST #1 3726-81
45-45-45-90
No blow, flushed tool, no blow, weakblow in 15 minutes, increased to fair blow on first open; fair blow throughout second open.
Recovered 120' gas in pipe, 50' of gassy oil, 60' of oil cut mud.
Flow pressures: 43-43, 65-65

Shut in pressures: 846-868
Hydrostatic pressures: 1909-1888
Bottom hole temperature: 107 degrees F

L-KC B Zone
Smpl 3806-09
E-Log 3802-05

Limestone, white, very finegrained, pellets and rounded skeletal grains (pellet-skeletal packstone), poor intergranular porosity, very slight show of free oil.

This interval was not tested.

L-KC C Zone
Smpl 3860-63
E-Log 3856-60

Limestone, tan, very fine grained, pellets (pellet packstone), fair to poor intergran. porosity, slight show of free oil.

DST #2 3824-75
30-30-30-30
No blow on first open; flushed tool, still no blow on second open.
Recovered 4' mud
Flow pressures: 65-65, 65-65
Shut in pressures: 65-65
Hydrostatic pressures: 1930-1909

L-KC D Zone
Smpl 3890-95
E-Log 3890-95

Limestone, tan, fine to medium grained, rounded skeletal grains, few pellets (skeletal packstone), fair to poor intergranular and moldic porosity, slight show of free oil.

DST #3 3872-3917
30-30-30-30
Weak blow that died on first open; flushed tool, no blow on second open.
Recovered 8' mud
Flow pressures: 76-76, 76-87
Shut in pressures: 1072-911
Hydrostatic pressures: 1993-1993

L-KC E Zone
Smpl 3824-30
E-Log 3822-28

Limestone, tan, medium to coarse grained, rounded skeletal grains (skeletal grainstone) fair to good intergranular porosity in upper part, poor porosity in lower part, fair show of free oil.

DST #4 3897-3935
45-45-45-90
Fair blow for 24 minutes, decreased to weak blow on first open; no blow on second open.
Recovered 80' slightly gas cut mud with scum of oil on top of the tool
Flow pressures: 87-87, 109-109
Shut in pressures: 218-240
Hydrostatic pressures: 2035-2014

RECOMMENDATIONS:

All shows of oil were drill stem tested except for that in the Lansing-Kansas City B Zone which appeared tight in the samples and on the log. Significant quantities of oil were found only in the A zone. The Radiation Guard Log indicates that the A zone has 2 feet of pay with 15% porosity and 35% saltwater saturation. All other zones are non-porous.

Nearest A zone production is 2 miles southwest of the Monarch #1 Mines in two wells at the south end of the Jording Pool. One of the wells, the Halliburton Jording #1 in the SW-NW Sec. 23-2S-30W produced approximately 17,000 barrels of oil in four years from the A zone. Total production figures on this individual well are not available because its production was combined with that from other wells on the Jording lease as they were drilled. The Jording #1 had 3 feet of pay in the A zone and drill stem test recoveries and pressures were similar to those of the Monarch #1 Mines.

Based on pay thickness, porosity, and comparison with the A zone in a similar, producing well, the Monarch Energy Corporation #1 Mines should have 8 to 10 thousand barrels of recoverable oil reserves in the A zone. On December 21, 1979, it was therefore recommended that production casing be run and a completion attempt be made in the Lansing-Kansas City A zone.

Respectfully submitted,

Martin K. Dubois

Martin K. Dubois
Consulting Geologist

MKD:td

Martin K. Dubois
Consulting Geologist
1321 East 11th Avenue • Winfield, Kansas 67156 • 316-221-4129

August 31, 1979

GEOLOGIC REPORT
SE Traer Prospect

A structurally favorable position and the proximity of oil production and good shows of oil in a nearby dry hole make Monarch's SE Traer proposed drilling location in the SE/4 NW/4 Sec. 12, T.2 S., R.30 W., Decatur County, Kansas, a geologically sound prospect.

The proposed location (see SE Traer Prospect Plat, prepared by V. Jean Taylor) is within a closed structural high situated on a southwest plunging anticline. This small anticline is associated with the Cambridge Arch, a major structural feature in the mid-continent (see attached Tectonic Map of Kansas). Oil production along this anticline was established in 1962 with the discovery of the Jording Pool and continues today from the Jording and Jording East Pools. Oil produced from these two pools comes from four separate limestones in the Lansing-Kansas City Group, a 220 foot thick rock unit consisting of alternating limestones and shales (see attached radioactivity log). Most oil produced comes from the B and E zones but some is produced from the A and C zones. The top of the Lansing is encountered at an average depth of approximately 3800 feet in the prospect area.

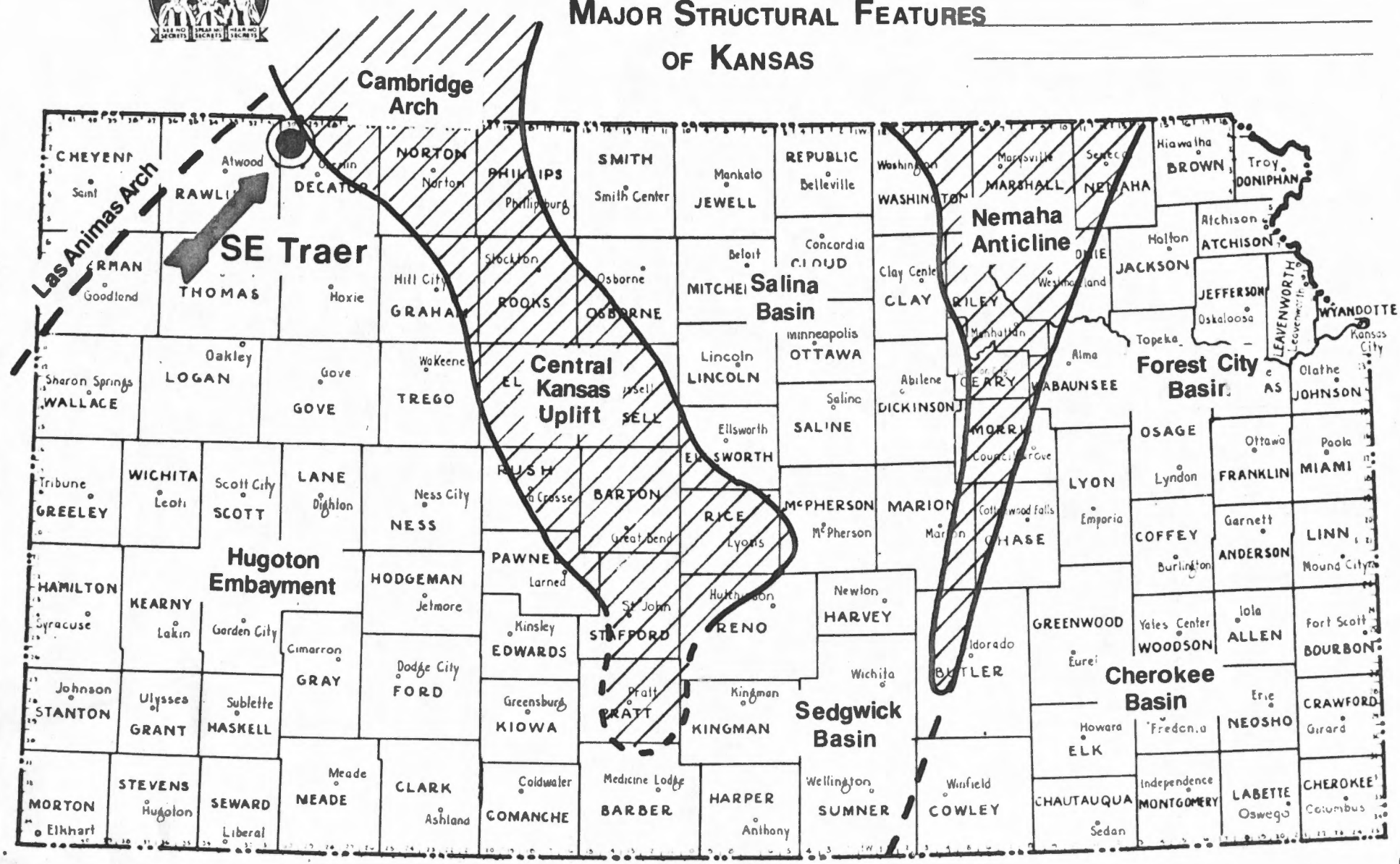
Structural position is important in this region but it is not the only factor in the determination of whether an area will or will not be productive. Many wells have been drilled in and around the Jording and Jording East pools, wells A, D, E, and K on Mr. Taylor's Prospect Plat are examples, that were as high or higher on top of the Lansing as nearby productive wells but were not commercially productive. In these wells porosity and permeability of sufficient quantities to be commercially productive was not encountered. Based on the examination of electric and radioactive well logs from wells on the prospect map, there is ample liklihood of encountering sufficiently porous and permeable limestones (especially the B and E zones) to merit a test well located at the proposed location.

The test well nearest the proposed location is the Abercrombie #1 Mines, well M on the SE Traer Prospect Plat,

REMARKS _____

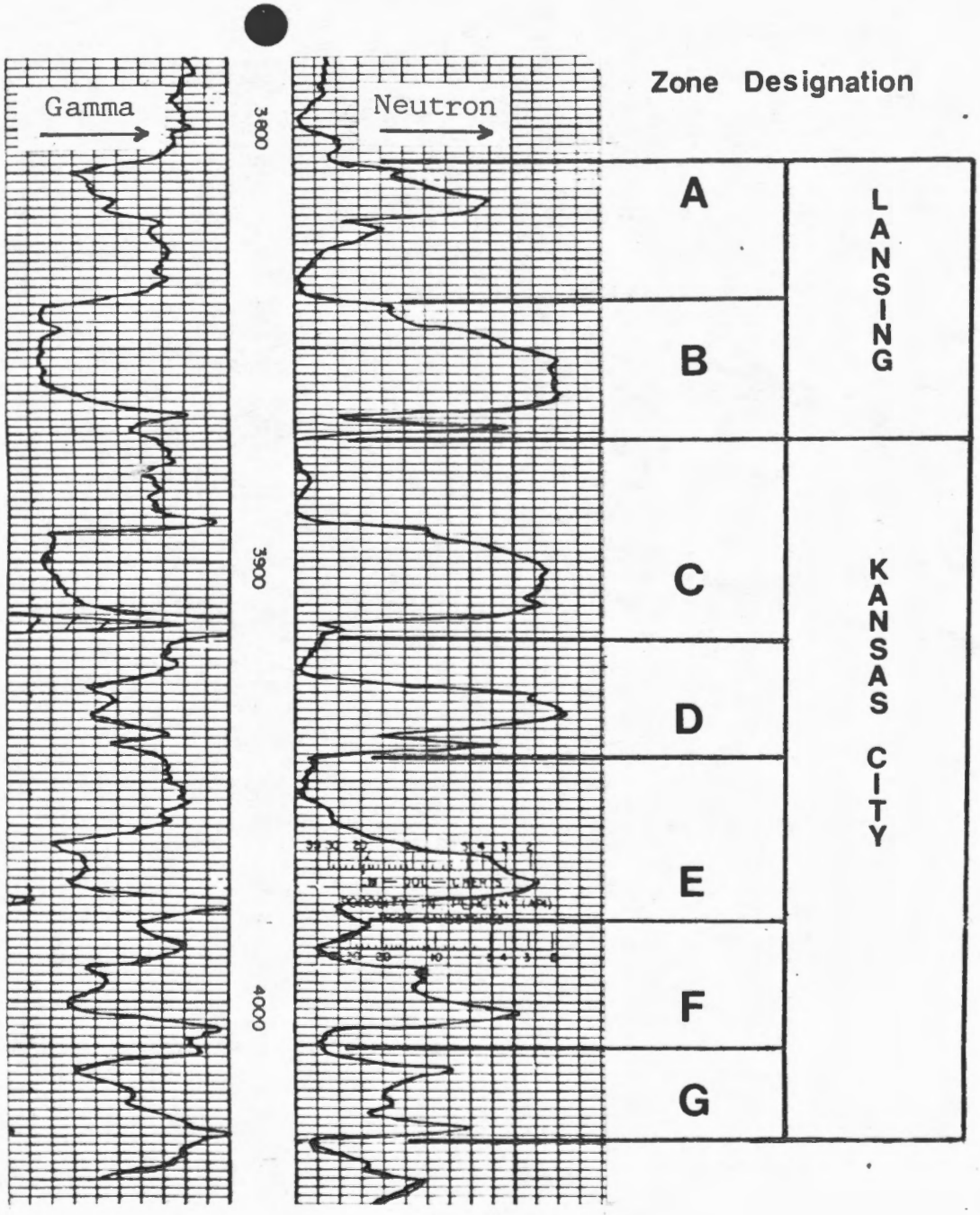


# MAJOR STRUCTURAL FEATURES OF KANSAS



# Lansing-Kansas City Zonation

**Halliburton Oil—No.1 Mines**
**nw-nw-se 14-2S-30W**



one-half mile southwest of the proposed location. This well encountered significant, yet non-commercial quantities of oil in the E zone and had a fair showing of oil in the B zone. Two drill stem test in the E zone had a combined recovery of 225 feet of oil and 279 feet of muddy oil. The B zone tested 40 feet of oil cut mud. At the proposed drilling location it is likely that the Lansing-Kansas City will be higher structurally than the Abercrombie #1 Mines and a good possibility that the porosity and permeability in the B and E zones will be better developed.

The proposed well location (SE/4 NW/4 Sec. 12, T.2 S., R.30 W., Decatur County, Kansas) is in a structurally favorable location. The Lansing top should be encountered at a structurally higher position than most wells in the Jording East and Jording Pools as well as the nearby Abercrombie #1 Mines test well. Significant shows of oil in the Abercrombie well may be indicative of a commercial oil reservoir nearby. In addition to the above there is sufficient liklihood of encountering Lansing-Kansas City limestones with adequate porosity and permeability to merit the drilling of the SE Traer Prospect.

Supplement to Geological Report

Table A: Information on Wells on SE Traer Prospect Plat*

| Letter on Plat | Operator-Lease | Completion Date | Total Depth | Well Status | Lansing-Kansas City DST shows and production ** zone(s)-IP or DST recovery |
|---|---|---|---|---|---|
| A | Okmar Oil-#2 Mines A | 12/11/69 | 3965 | Oil | B, C-50 BOPD+WTR |
| B | Okmar Oil-#1 Mines A | 5/1/69 | 4000 | Oil | B, C, E-59 BOPD+7% WTR |
| C | Gemini Corp.-#1-13 Mines | 2/3/77 | 2765 | D&A | No Tests |
| D | Okmar Oil-#3 Mines A | 3/26/70 | 4020 | D&A | C-10'M, slight show of oil |
| E | Okmar Oil-#4 Mines A | 10/22/70 | 3960 | D&A | B-1510' slightly OCW<br>C-90' OCM |
| F | Jones, etal.-#1 Jording | 8/30/57 | 4326 | D&A | E-180' Free oil, 30' oily mud |
| G | Halliburton Oil-#2 Mines | 1/18/68 | 4025 | Oil | E-96 BOPD+WTR |
| H | Halliburton Oil-#2 Jording B | 5/11/67 | 4025 | Oil | E-97 BOPD<br>B-1750' very slightly OGCW<br>C-15' OCM, 60' slightly OCM |
| I | Halliburton Oil-#1 Jording B | 3/16/67 | 4030 | Oil | B, E-71 BOPD<br>C-30' slightly OCM |
| J | Halliburton Oil-#1 Mines | 7/27/67 | 4050 | Oil | E-80 BOPD+trace WTR |
| K | Halliburton Oil-#1 Mines A | 5/15/69 | 3989 | D&A | B-1655' slightly OCW |
| L | Gemini Corp.-#1 Mines B | 12/7/78 | 4020 | D&A | E-65' very slightly OCM |
| M | Abercrombie-#1 Mines | 4/14/77 | 3948 | D&A | B-40' OCM<br>E-676' GIP, 72' clean oil 176' Muddy oil (50% oil)<br>E-(W/SP) 496' GIP, 153' clean gassy, oil, 103' muddy gassy oil |
| N | Okmar Oil-#1 Mines | 6/6/68 | 4320 | D&A | OWWO, perforated A through F zones tested mostly water |

Table A: Continued

| | | | | | |
|---|---|---|---|---|---|
| O | Thunderbird Drlg.-#1 Mines | 8/6/70 | 3940 | D&A | No Show |
| P | S & W Drlg. Co.-#1 May | 11/17/77 | 4005 | D&A | A-10' slightly OCM |
| Q | Rains & Williamson-#1 Reith | 2/13/64 | 4291 | D&A | NS |
| R | Jones, etal.-#1 Scott | 5/31/57 | 4223 | D&A | B-20' slightly OCM |
| S | Halliburton Oil-#1 Jording | 9/6/62 | 4104 | Oil | A-36 BOPD+1% WTR<br>E-300' OCWM, 1860' OCW |
| T | Halliburton Oil-#1 May | 1/17/63 | 4092 | D&A | E-12' OCM, 2' free oil |
| U | Halliburton Oil-#2 Jording | 11/10/66 | 4061 | Oil | B, C-145 BOPD+trace WTR<br>D-10' slightly OCM |
| V | Halliburton Oil-#3 Jording | 1/18/68 | 4070 | Oil | A-47 BO+16% WTR<br>B-130' M W/scum oil |
| W | Halliburton Oil-#1 Jording A | 1/26/67 | 4016 | D&A | A-25' slightly OCM, 60' highly OCM<br>A, B-75' slightly OCM, 1380' very slightly OCW |
| X | Okmar Oil-#1 May | 5/16/78 | 4058 | D&A | NS |
| Y | John P. Jennings-#1 Webber | 11/14/74 | 4214 | P&A | OWWO, perforated the E zone swabbed 5 B fluid PH(50% oil), well has Dakota WTR leak, operator cannot pump |
| Z | Abercrombie Drly.-#1 Kiger | 9/4/75 | 3910 | D&A | E-60' slightly OCM (8% O), 120'M with spots of oil |
| AA | John P. Jennings & Gasconade Co. #1 Weber | 10/14/76 | 3840 | D&A | A-140'M with few specks oil |
| BB | W.T. Waggoner Est.-#1 Helmkamp | 7/10/63 | 4444 | D&A | No Tests |

Key to abbreviations:

BOPD-barrels oil per day
D&A-dry & abandoned
P&A-pumped & abandoned
GIP-gas in pipe
IP-initial production
M-mud
OCM-oil cut mud
OCW-oil cut water
OWWO-old well worked over
WTR-water

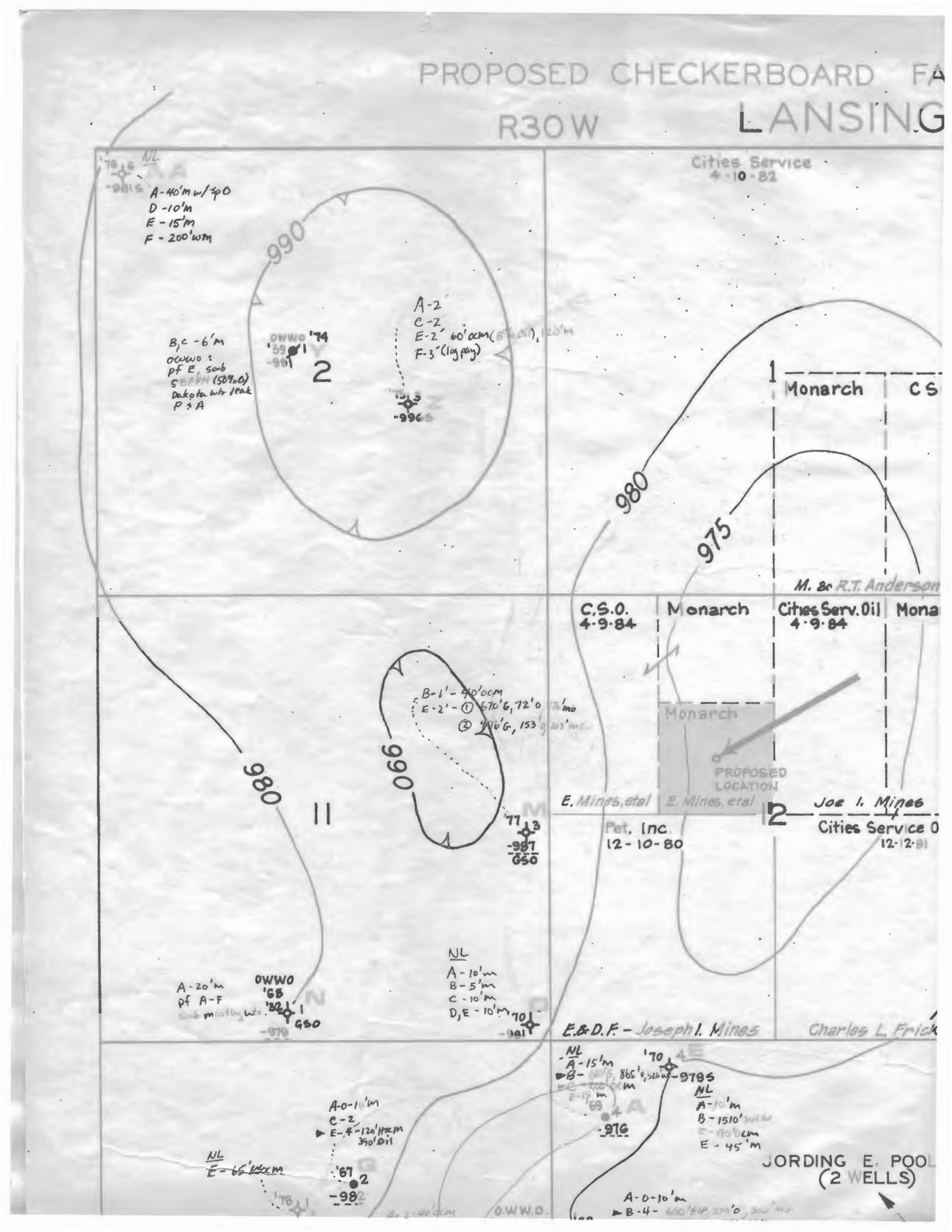
* Information was gathered from well completion cards on file at the Kansas Geological Society Library, Wichita, KS. Assignments of production and test information to specific Lansing-Kansas City zones are based on electric and radioactivity well log correlations.

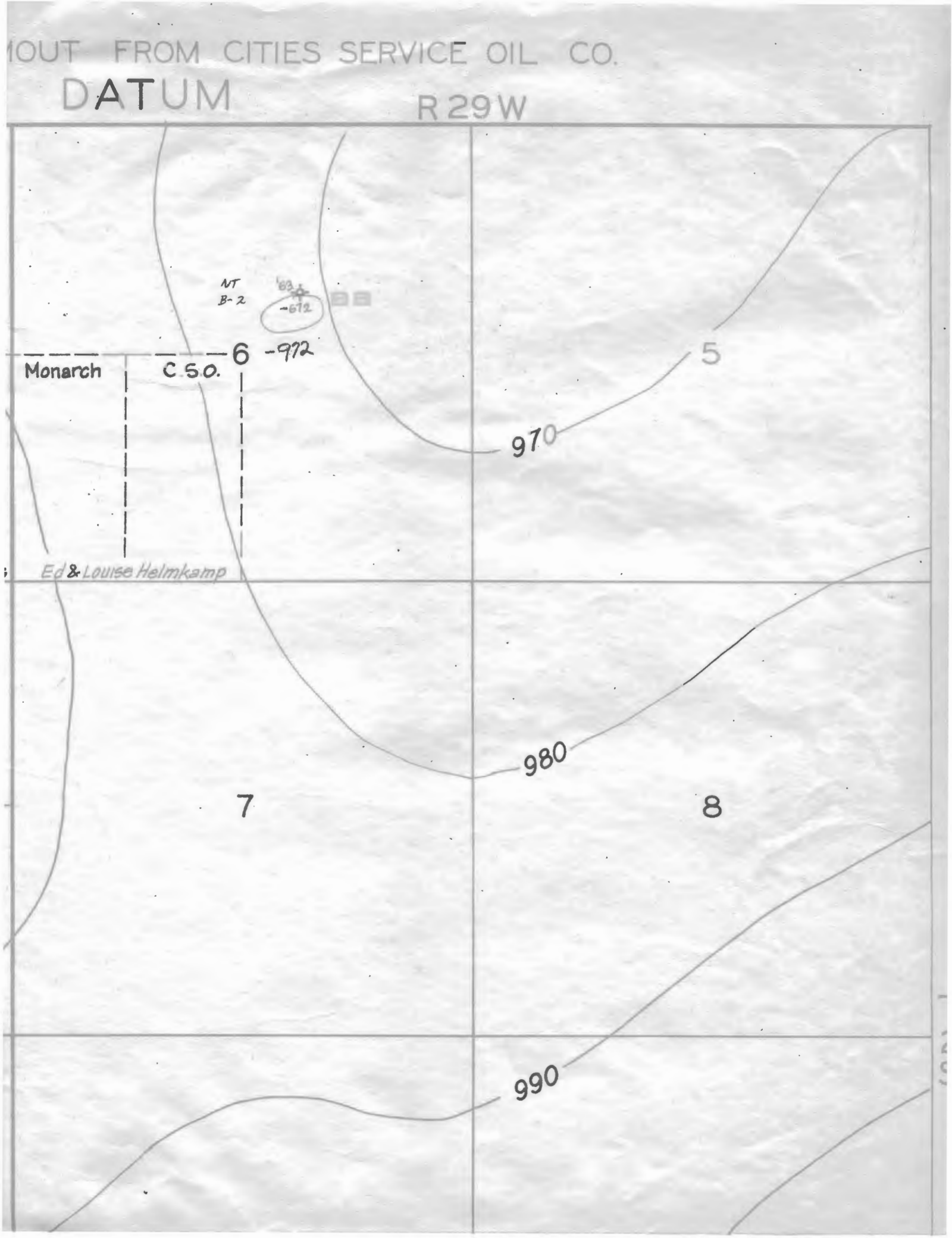
** Only drill stem tests with shows of oil are tabulated.

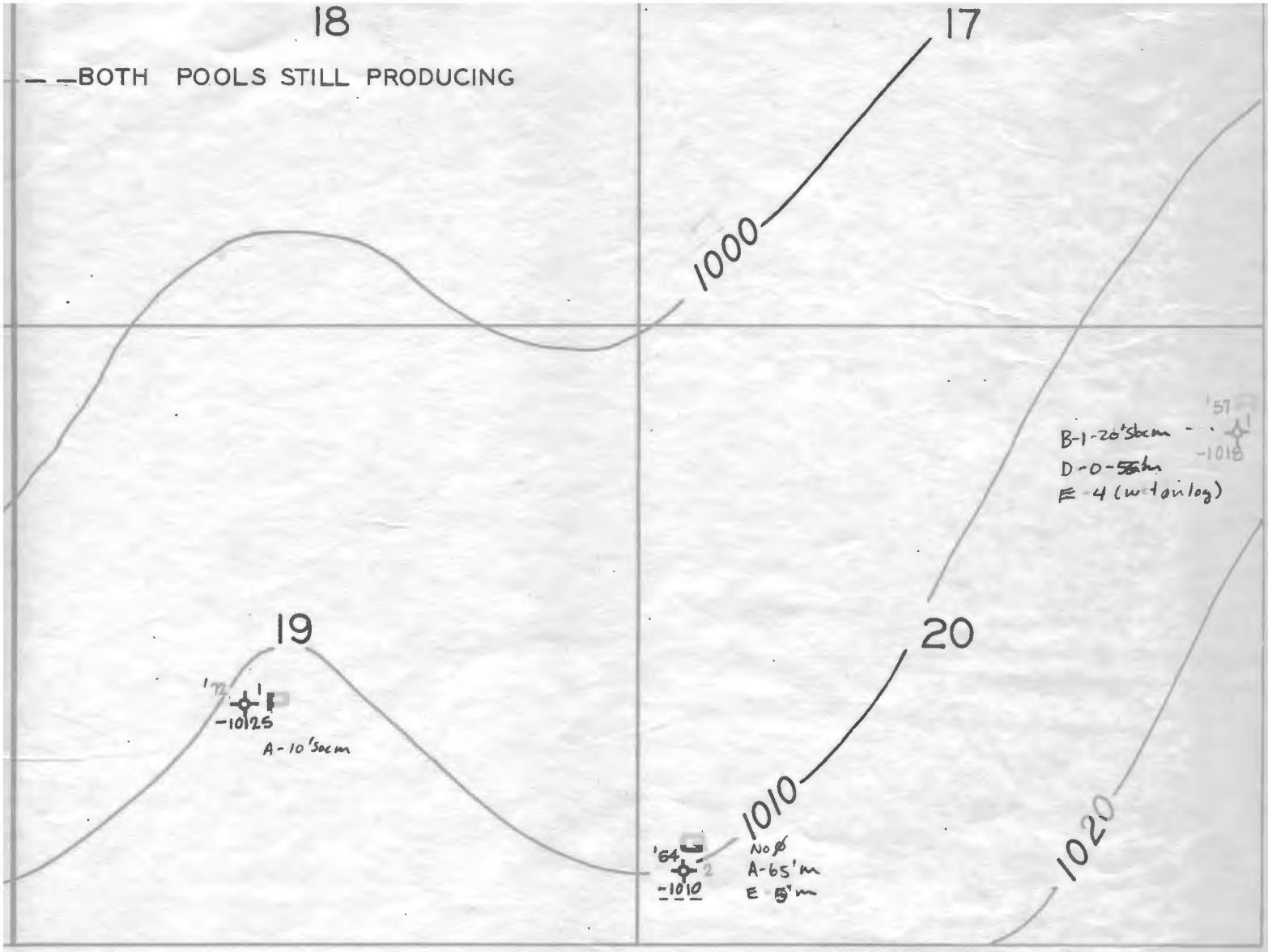
Table B: Production Figures for Wells on SE Traer Prospect Plat*

| Location | Operator-Lease | Date Disc. | Last Prod. | Wells | Dec. '78 Gross Runs | Daily Ave. | 1978 Prod. | Cum. Prod. |
|---|---|---|---|---|---|---|---|---|
| NW/4 13-2S-30W | Okmar Oil-Mines A | 1/69 | 12/78 | 2 | 412 | 13 | 7203 | 153,784 |
| SW/4 14-2S-30W | Halliburton Oil-Jording B | 3/67 | 12/78 | 1 | 217 | 7 | 5213 | 73,890 |
| E/2 14-2S-30W | Halliburton Oil-Mines | 7/67 | 12/78 | 3 | 361 | 12 | 4492 | 51,622 |
| NW/4 23-2S-30W | Halliburton Oil-Jording | 8/62 | 11/78 | 2 | 0 | 0 | 1610 | 83,251 |

* Production figures taken from Dwight's Production Reports for Kansas through December, 1978.

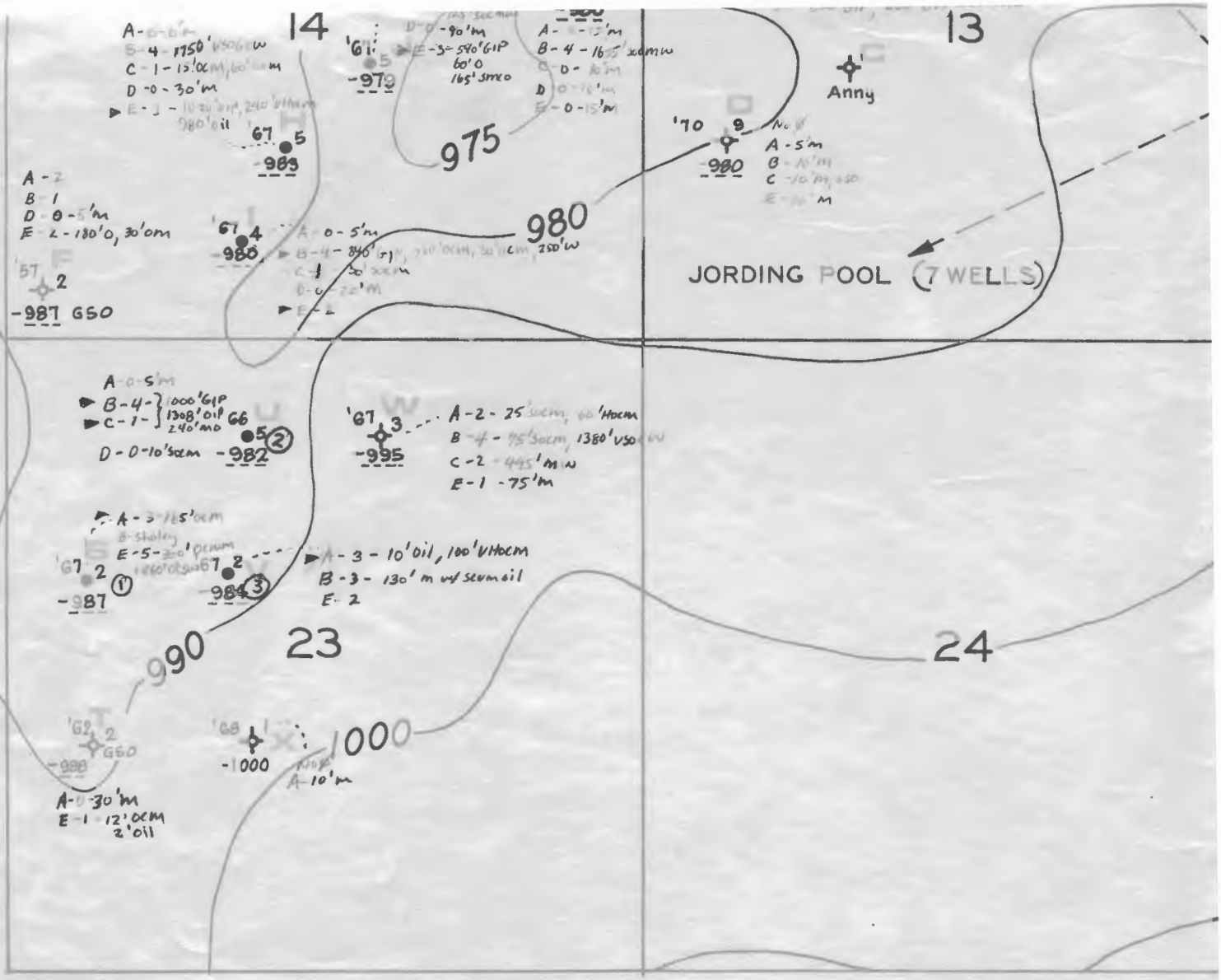

PROPOSED CHECKERBOARD FA
R30W
LANSING
Cities Service
4-10-82
NL
A-40'm w/spO
D-10'm
E-15'm
F-200'wtm
990
A-2
C-2
E-2' 60'ocm (8% oil), 120'm
F-3' (log pay)
B,c-6'm
ocwwo:
pf E sand
SBEPH (50%G)
Dakota wtr leak
P&A
OWWO '74
'59
-99
2
1
Monarch
CS
980
975
M. & R.T. Anderson
C.S.O.
4-9-84
Monarch
Cities Serv. Oil
4-9-84
Mona
B-1'-40'ocm
E-2'-① 670'G, 72'O
② 490'G, 153'O
980
990
11
Monarch
PROPOSED
LOCATION
E. Mines, etal
E. Mines, etal
12
Joe I. Mines
Cities Service O
12-12-81
Pet. Inc.
12-10-80
77
3
-987
GSO
A-20'm
pf A-F
OWWO
'68
'82
1
GSO
-979
NL
A-10'm
B-5'm
C-10'm
D,E-10'm
70
-981
E.&D.F. - Joseph I. Mines
Charles L. Frick
NL
A-15'm
B-
E-17'm
'70
-979S
NL
A-10'm
B-1510'
E-45'm
69
4
-976
A-0-10'm
C-2
E-4-120'Hocm
390'Oil
NL
E-65'wocm
'67
2
-982
'76
1
JORDING E. POOL
(2 WELLS)
A-0-10'm
B-4-
O.W.W.O.


OUT FROM CITIES SERVICE OIL CO.
DATUM
R 29 W
NT
B-2
'63
-672
6
-972
Monarch
C S O.
Ed & Louise Helmkamp
5
970
7
980
8
990




# SE TRAER PROSPECT

## DECATUR COUNTY, KANSAS




# LEGEND

SCALE: 4 INCHES = 1 MILE
C. I. = 10', 5'
G.S.O = FREE OIL BY DST
S = OIL SHOW BY DST
'77 ⊹ 4 = DRILLED IN '77 W/4 DSTS
⊹ = DRY HOLE
• = OIL WELL (PRODUCING)
⸗ = ABANDONED OIL WELL
D.S.T.= DRILL STEM TEST
O.W.W.D. = OIL WELL WASH DOWN
C. S. O. = CITIES SERVICE OIL CO.
PET. INC.= PETROLEUM, INC.
MONARCH = MONARCH ENERGY CORPORATION
C. I. = CONTOUR INTERVAL

'A' T 1 S
REMARKS Cahoj Pool R 34, 35 W
Rawlins Co.
'B' Lahos Pool T 6 S R 37 W
Sherman Co.
'C' Elrick Pool T 10 S R 25 W
Graham Co.
H-M Leases T 6 S R 33 W, Thomas Co., T 10 S R 28 W, Sheridan C

# Major Structural Features of Kansas

'A'
'B'
'C'
Cambridge Arch
Las Animas Arch
Western Kansas Basin
Central Kansas Uplift
Nemaha Anticline
Salina Basin
Forest City Basin
Sedgwick Basin
Pratt Anticline
Cherokee Basin

CHEYENNE, Saint Francis, Cheyenne Co., RAWLINS, Atwood, DECATUR, Oberlin, NORTON, Norton, PHILLIPS, Phillipsburg, SMITH, Smith Center, JEWELL, Mankato, REPUBLIC, Belleville, WASHINGTON, Washington, MARSHALL, Marysville, NEMAHA, Seneca, BROWN, Hiawatha, DONIPHAN, Troy
SHERMAN, Goodland, THOMAS, Colby, SHERIDAN, Hoxie, GRAHAM, Hill City, ROOKS, Stockton, OSBORNE, Osborne, MITCHELL, Beloit, CLOUD, Concordia, CLAY, Clay Center, RILEY, Manhattan, POTTAWATOMIE, Westmoreland, JACKSON, Holton, ATCHISON, Atchison, JEFFERSON, Oskaloosa, LEAVENWORTH, Leavenworth, WYANDOTTE, Kansas City
WALLACE, Sharon Springs, LOGAN, Oakley, GOVE, Wakeeney, TREGO, ELLIS, Hays, RUSSELL, LINCOLN, Lincoln, OTTAWA, Minneapolis, DICKINSON, Abilene, GEARY, Junction City, ABAUNSEE, Alma, SHAWNEE, Topeka, DOUGLAS, Lawrence, JOHNSON, Olathe
GREELEY, Tribune, WICHITA, Leoti, SCOTT, Scott City, LANE, Dighton, NESS, Ness City, RUSH, La Crosse, BARTON, Great Bend, ELLSWORTH, Ellsworth, SALINE, RICE, Lyons, MCPHERSON, McPherson, MARION, Marion, CHASE, Cottonwood Falls, LYON, Emporia, OSAGE, Lyndon, FRANKLIN, Ottawa, MIAMI, Paola
HAMILTON, Syracuse, KEARNY, Lakin, FINNEY, Garden City, HODGEMAN, Jetmore, PAWNEE, Larned, EDWARDS, Kinsley, STAFFORD, St John, HUTCHINSON, RENO, Hutchinson, HARVEY, Newton, BUTLER, El Dorado, GREENWOOD, Eureka, COFFEY, Burlington, ANDERSON, Garnett, LINN, Mound City
STANTON, Johnson, GRANT, Ulysses, HASKELL, Sublette, GRAY, Cimarron, FORD, Dodge City, KIOWA, Greensburg, PRATT, KINGMAN, Kingman, SEDGWICK, Wichita, HOWARD, Elk, WOODSON, Yates Center, ALLEN, Iola, BOURBON, Fort Scott
MORTON, Elkhart, STEVENS, Hugoton, SEWARD, Liberal, MEADE, Meade, CLARK, Ashland, COMANCHE, Coldwater, BARBER, Medicine Lodge, HARPER, Anthony, SUMNER, Wellington, COWLEY, Winfield, CHAUTAUQUA, Sedan, MONTGOMERY, Independence, NEOSHO, Erie, CRAWFORD, Girard, LABETTE, Oswego, CHEROKEE, Columbus

V. Jean Taylor