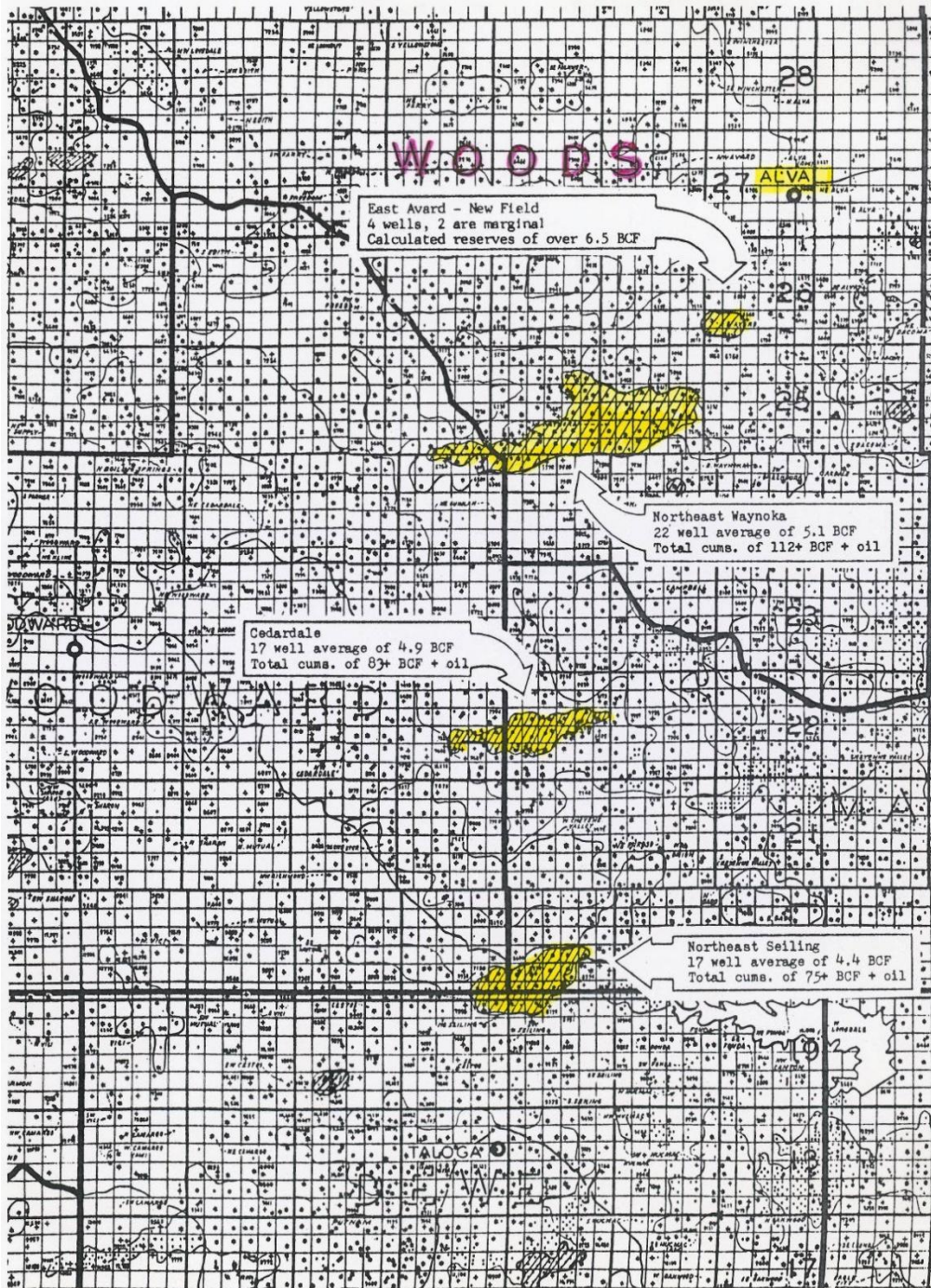


FROM FEAST TO FAMINE

East Avard Field Leads to South Alva
Non-Field, Woods County, Oklahoma



WOODS

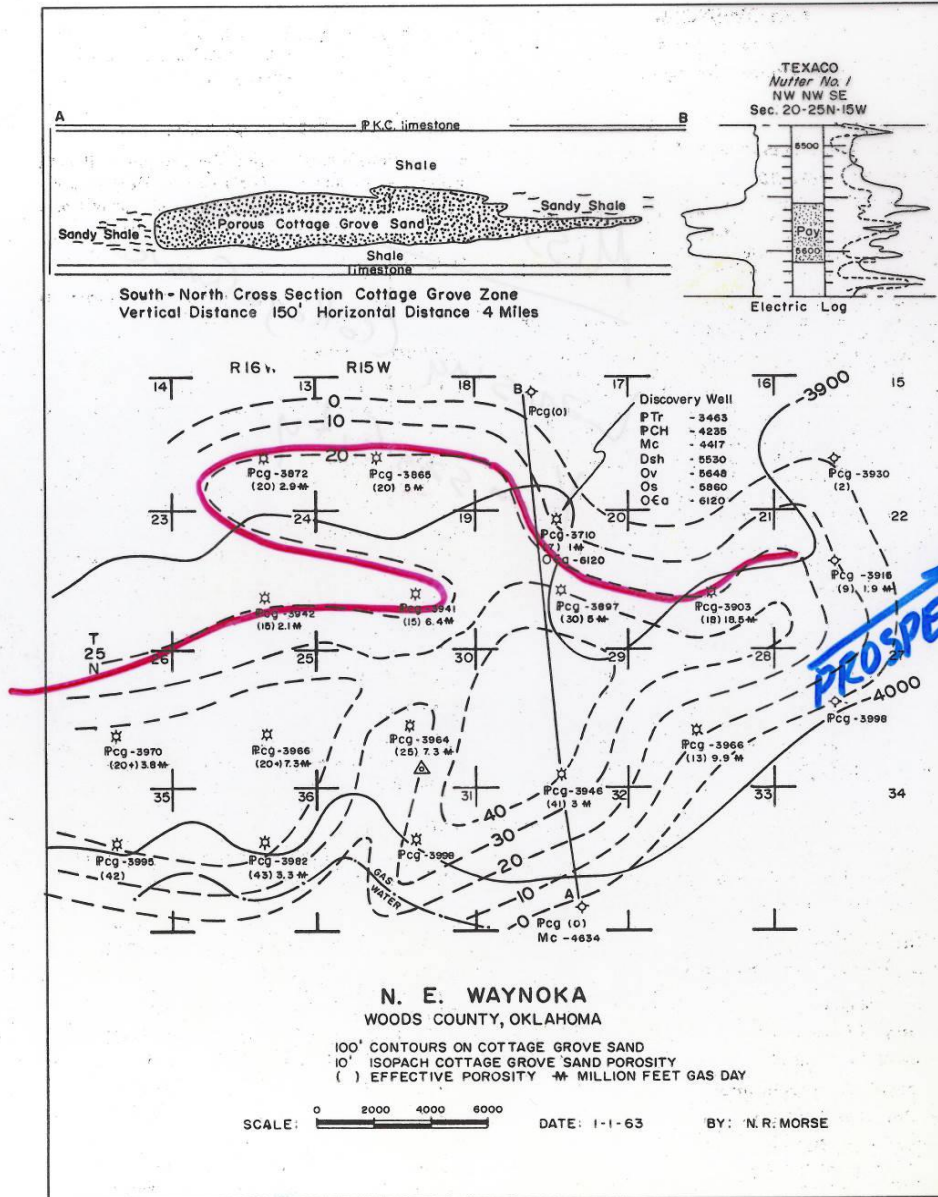
East Avar - New Field
4 wells, 2 are marginal
Calculated reserves of over 6.5 BCF

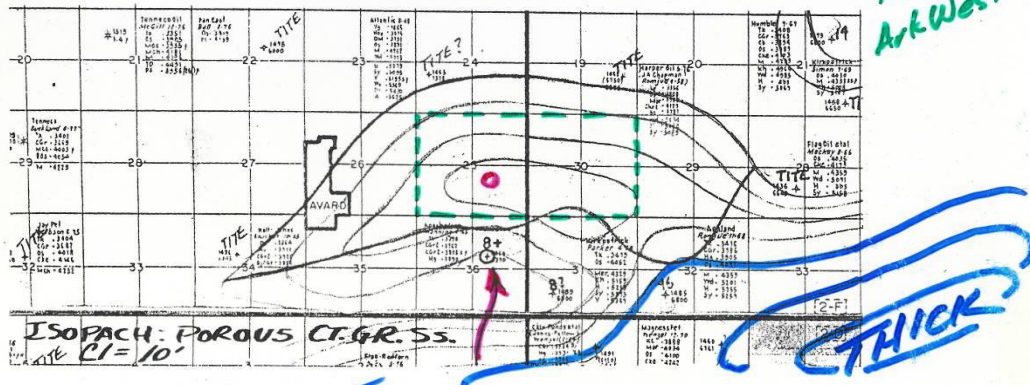
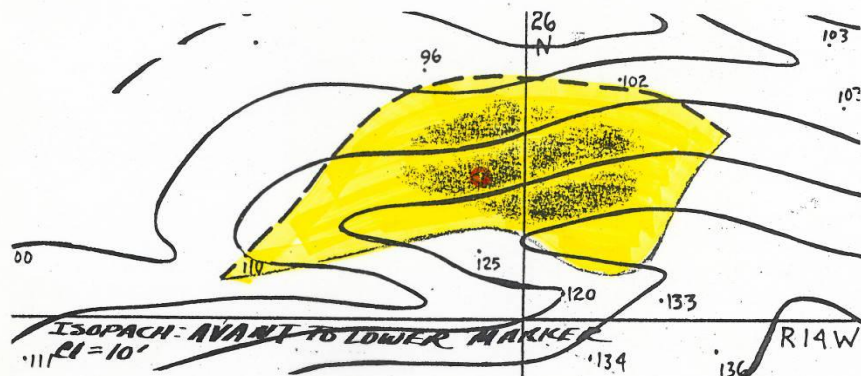
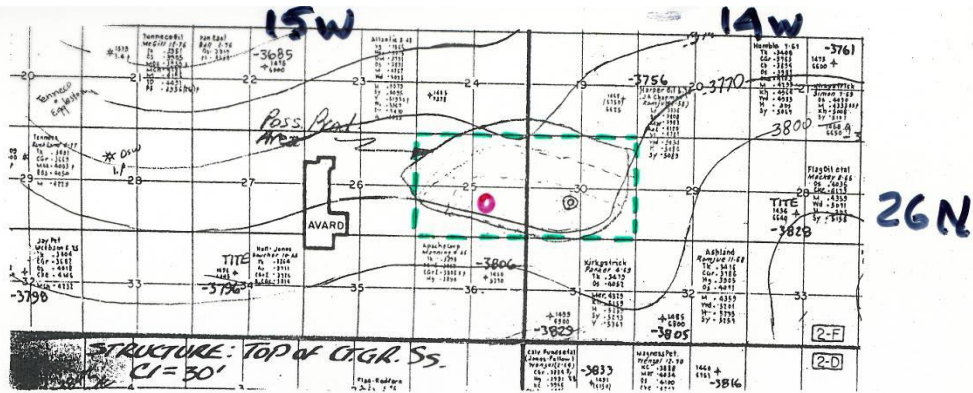
Northeast Waynoka
22 well average of 5.1 BCF
Total cums. of 112+ BCF + oil

Cedardale
17 well average of 4.9 BCF
Total cums. of 83+ BCF + oil

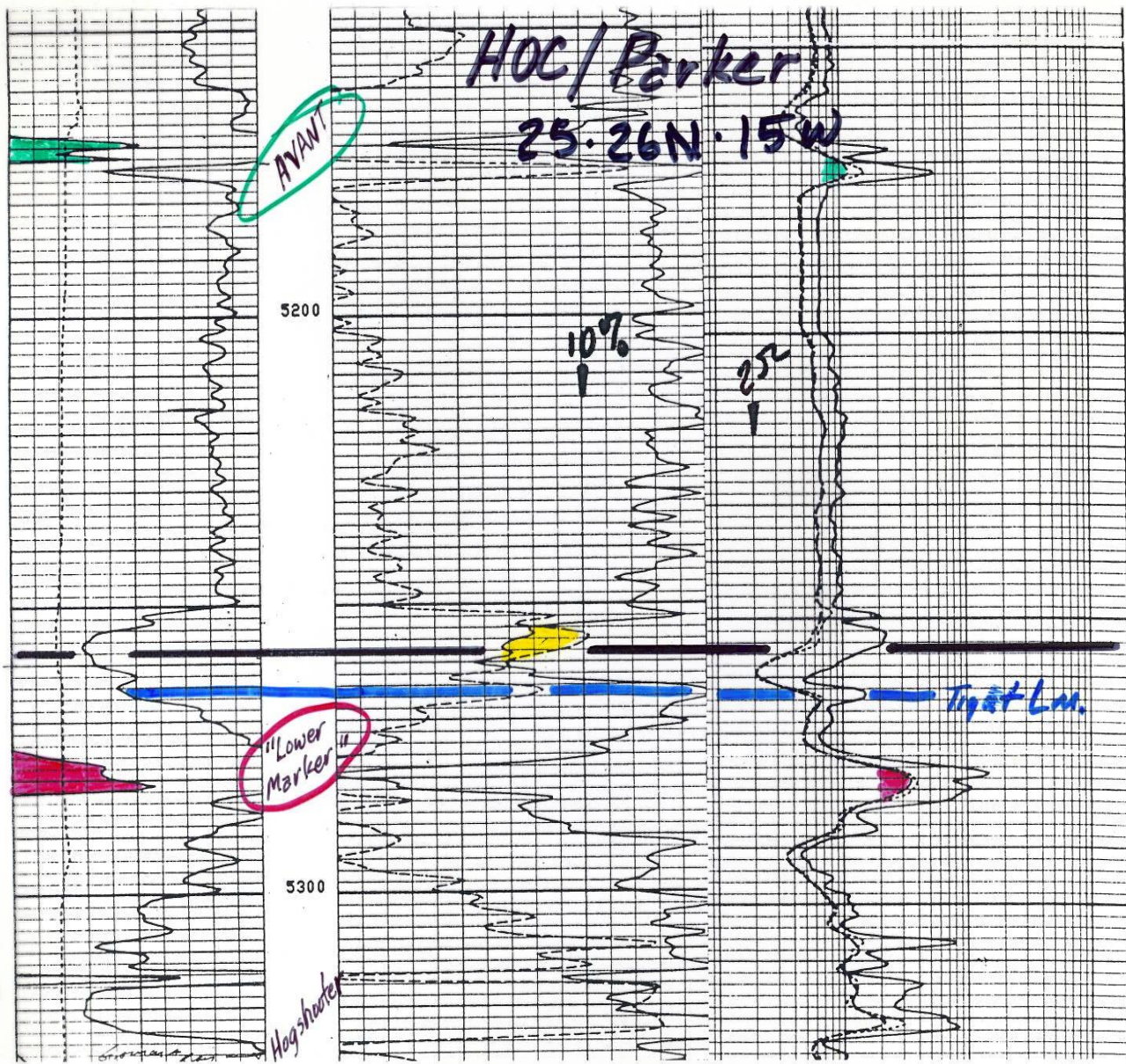
Northeast Sealing
17 well average of 4.4 BCF
Total cums. of 75+ BCF + oil

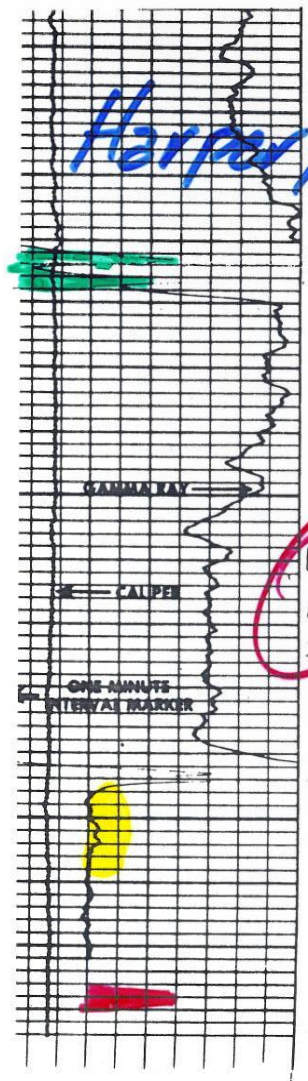
ANADARKO BASIN - 1963





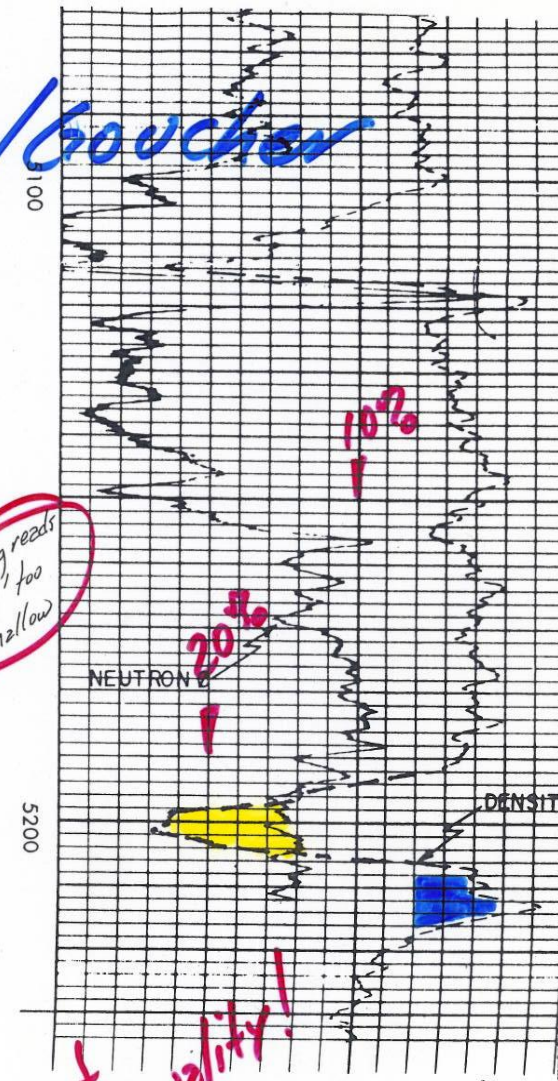
Waymoke Field EXHIBIT # | CIRCA 1977



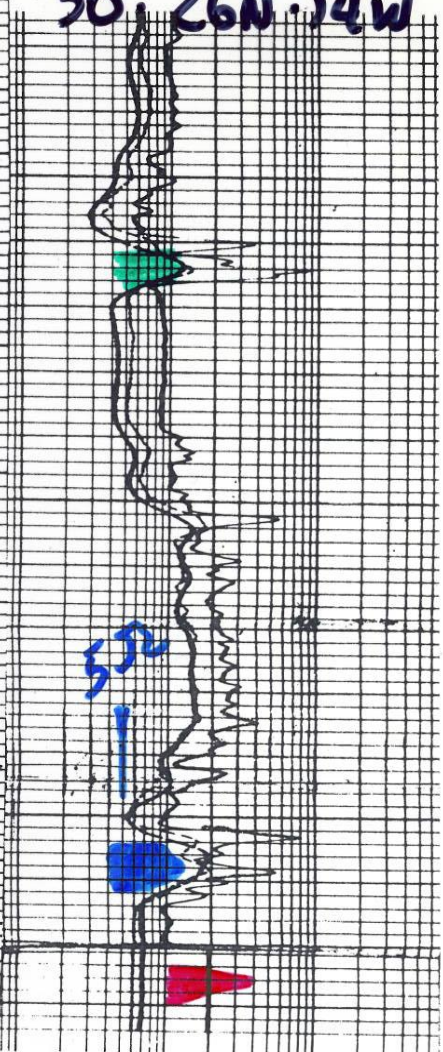


Harper/Goucher

*Log reads
18' too
shallow*



30.26N.14W



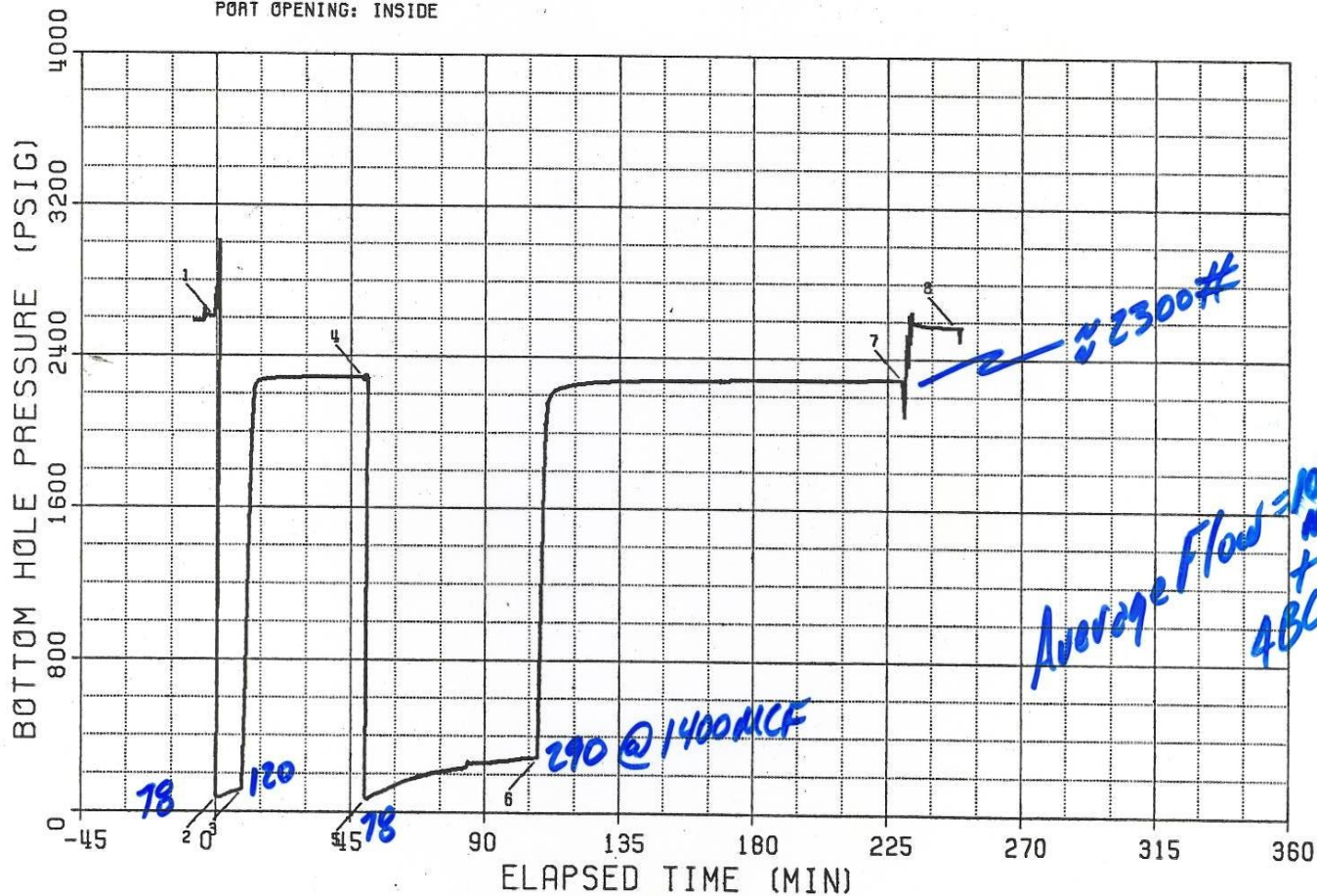
*Thin but
good quality!*

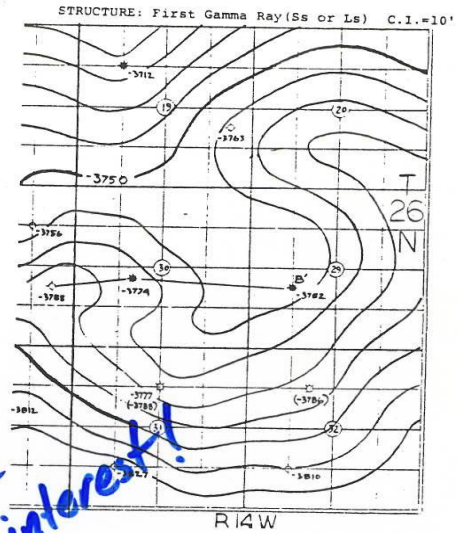
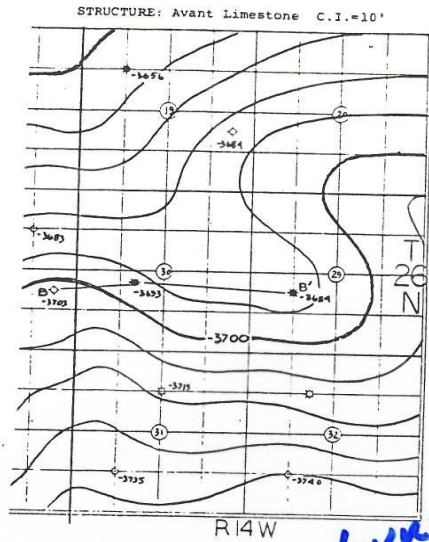
PRESSURE LOG

FIELD REPORT NO. 04640D

INSTRUMENT:

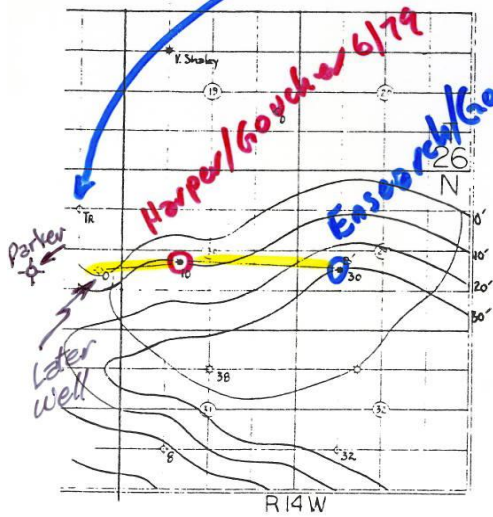
NUMBER: J-1337
CAPACITY: 6400 PSI
DEPTH: 5209 FT
PORT OPENING: INSIDE



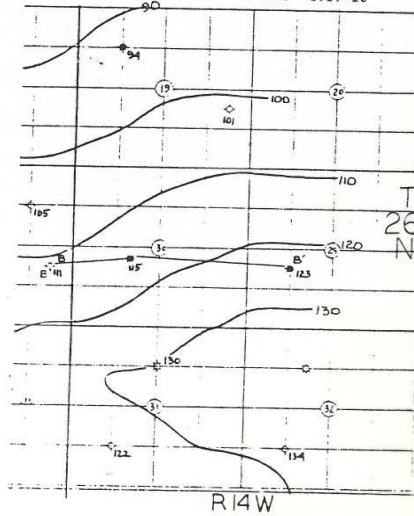


*2/80
Pan Eastern
Renewed interest!*

ISOPACH: Ct. G. Sandstone C.I.=10'



ISOPACH: Avant - Lwr Mkr C.I.=10'



NE SE
25

1462 KB

≈ NE SW
30

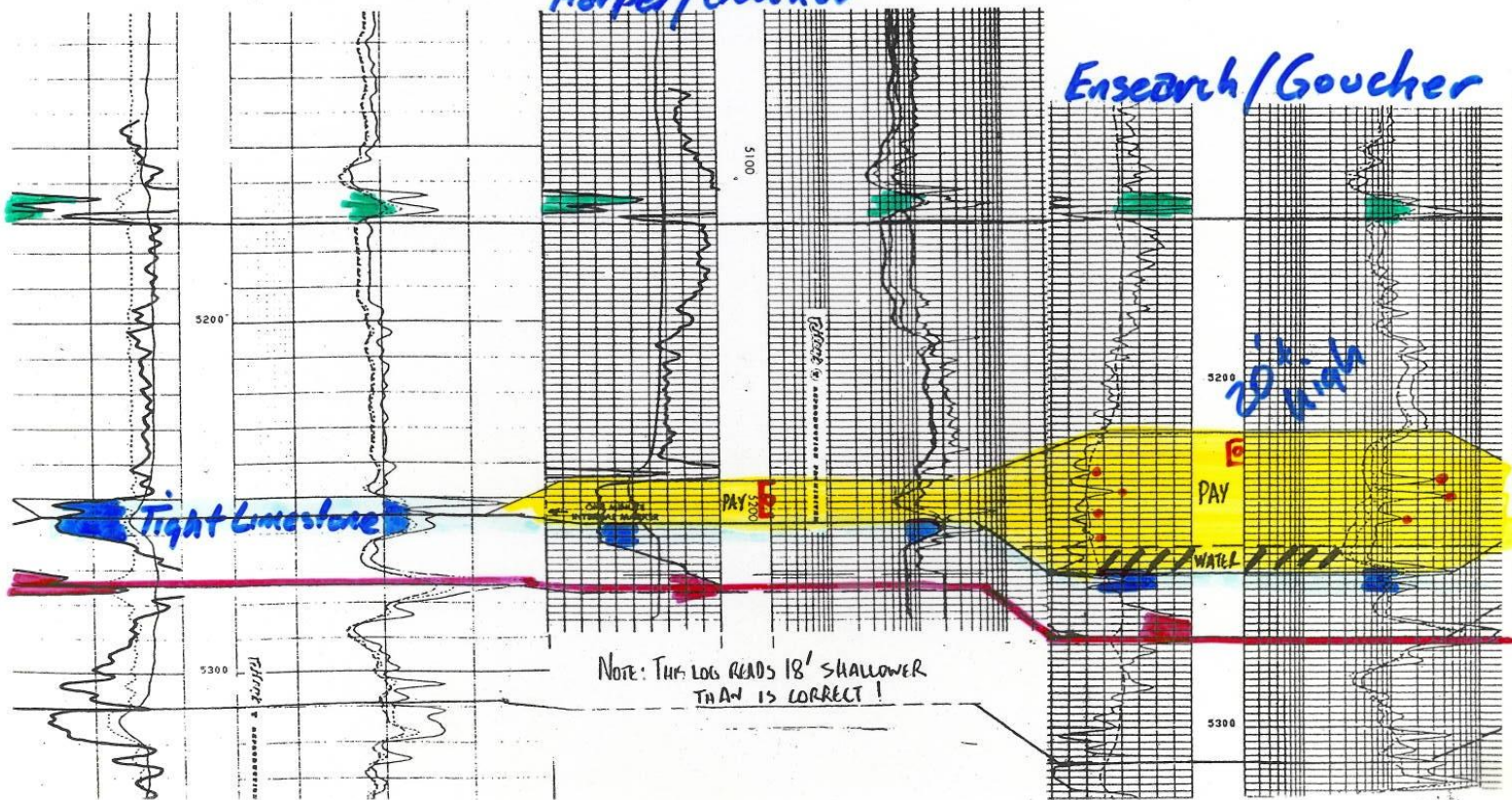
1437 KB

N/2 SW
29

1466 KB

Harper/Goucher

Ensearch/Goucher



Note: This log reads 18' shallower than is correct!

Rate/Time Graph

Project: C:\Program Files\IHS Energy\PowerTools v5.0\Projects\goucher.MDB

Date: 9/5/2002
Time: 11:03 AM

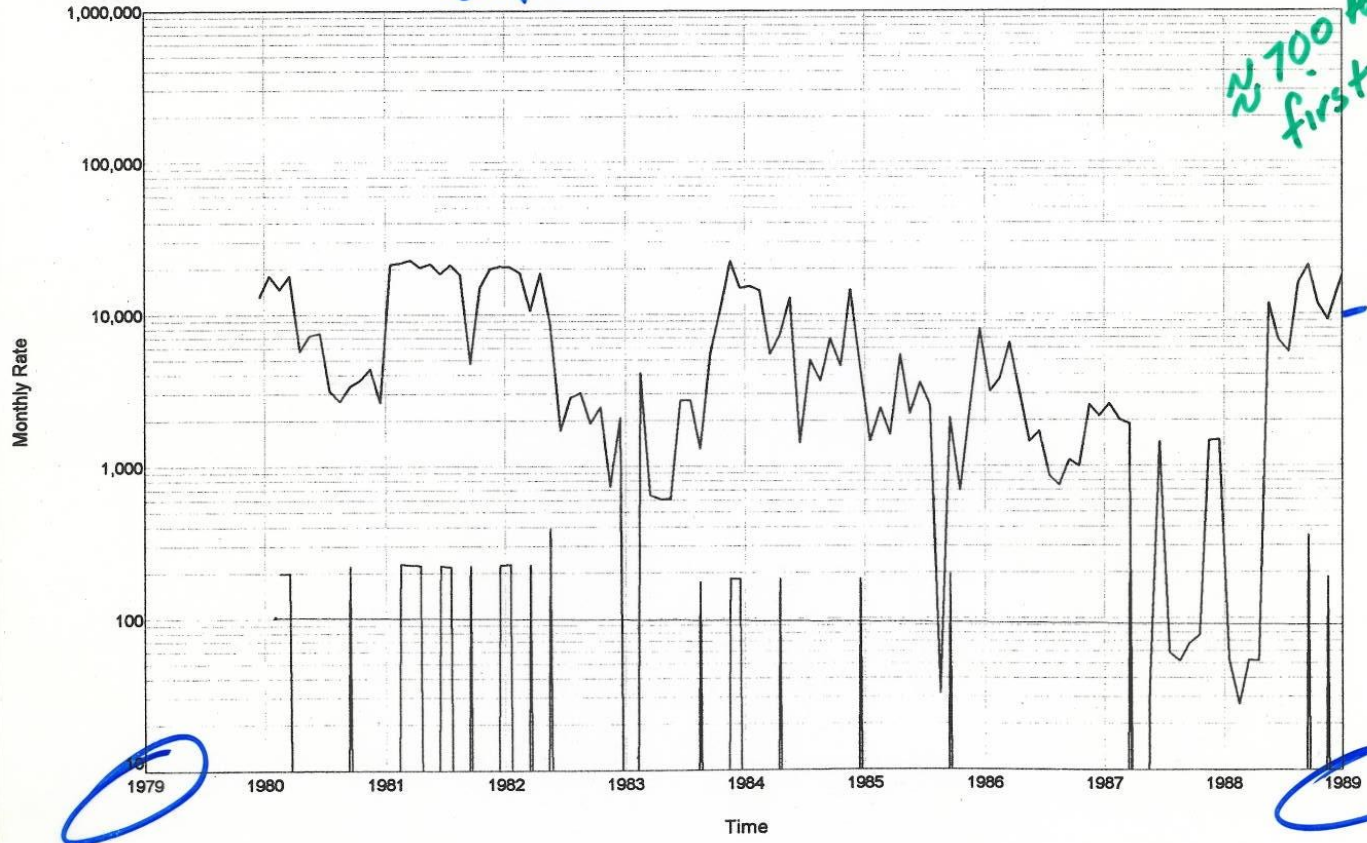
Lease Name: GOUCHER (1)
County, ST: WOODS, OK
Location: 30 26N 14W S2N2NESW

Operator: CHAPARRAL ENERGY INCORPORATED
Field Name: AVARD EAST

Harper GOUCHER - AVARD EAST *Disc. Well*

~ 700 MM in first ten years

- 353 MCF/D



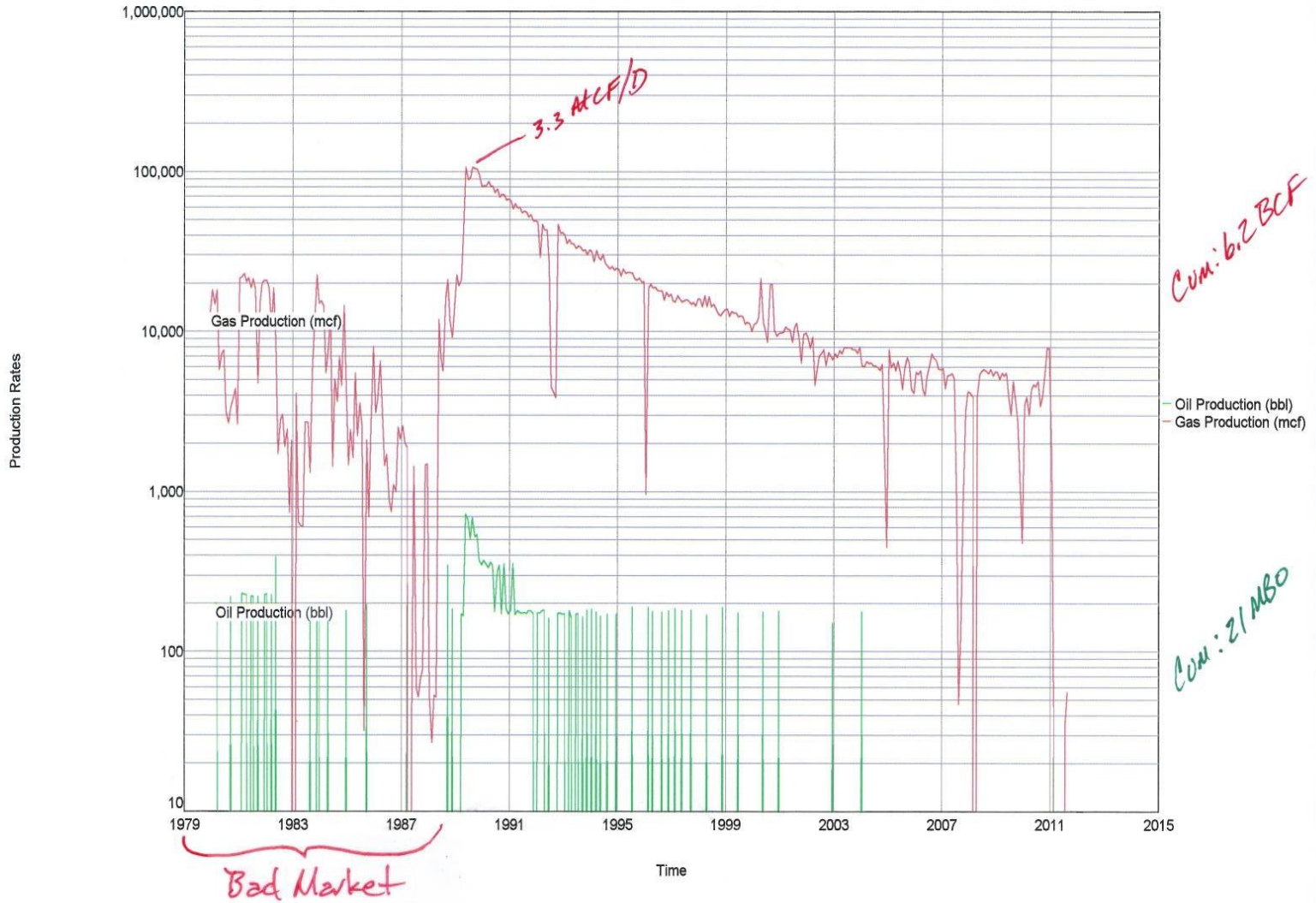
1979

1989

Lease Name: GOUCHER
County, State: WOODS, OK
Operator: CHAPARRAL ENERGY LIMITED LIABILITY C
Field: AVARD EAST
Reservoir: COTTAGE GROVE
Location: 30 26N 14W S2N2NESW

* 25% of a dry hole
"bought"
25% of 6.2 BCF
+ 22 MBO

GOUCHER - AVARD EAST



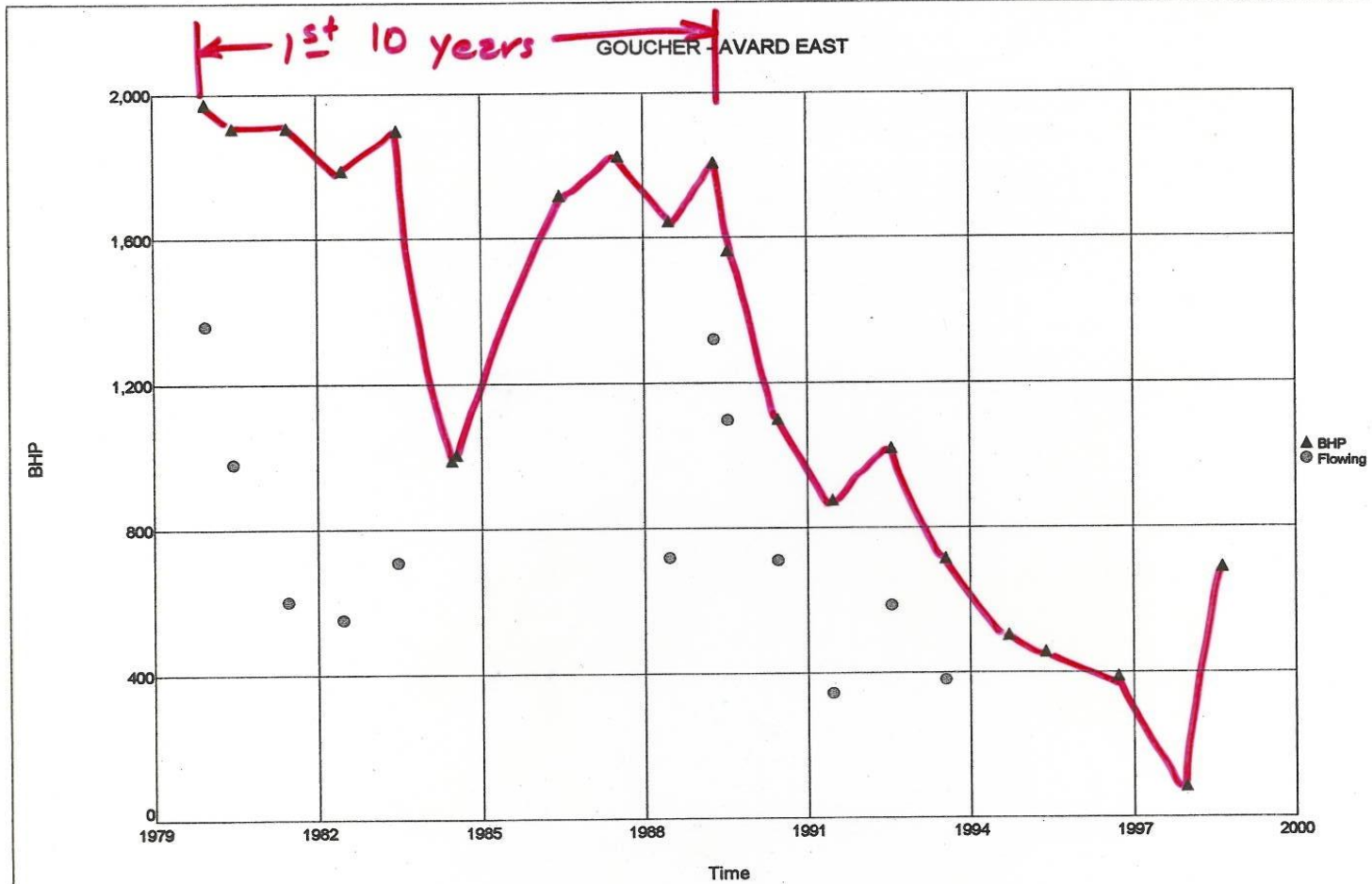
Pressure/Time Graph

Project: C:\Program Files\IHS Energy\PowerTools v5.0\Projects\goucher.MDB

Date: 9/5/2002
Time: 11:05 AM

Lease Name: GOUCHER (1)
County, ST: WOODS, OK
Location: 30 26N 14W S2N2NESW

Operator: CHAPARRAL ENERGY INCORPORATED
Field Name: AVARD EAST



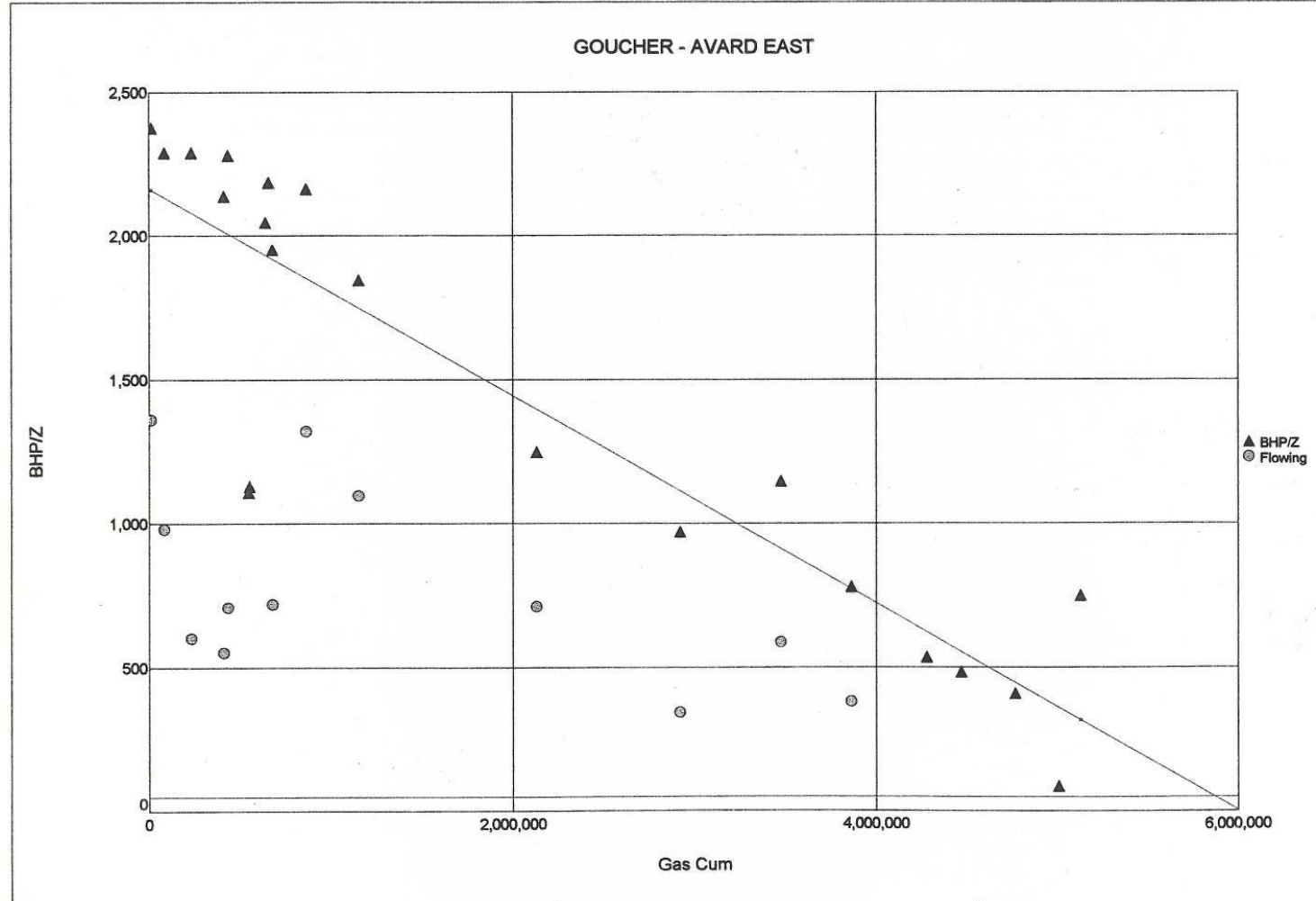
Pressure/Cum Graph

Project: C:\Program Files\IHS Energy\PowerTools v5.0\Projects\goucher.MDB

Date: 9/5/2002
Time: 11:05 AM

Lease Name: GOUCHER (1)
County, ST: WOODS, OK
Location: 30 26N 14W S2N2NESW

Operator: CHAPARRAL ENERGY INCORPORATED
Field Name: AVARD EAST



Rate/Time Graph

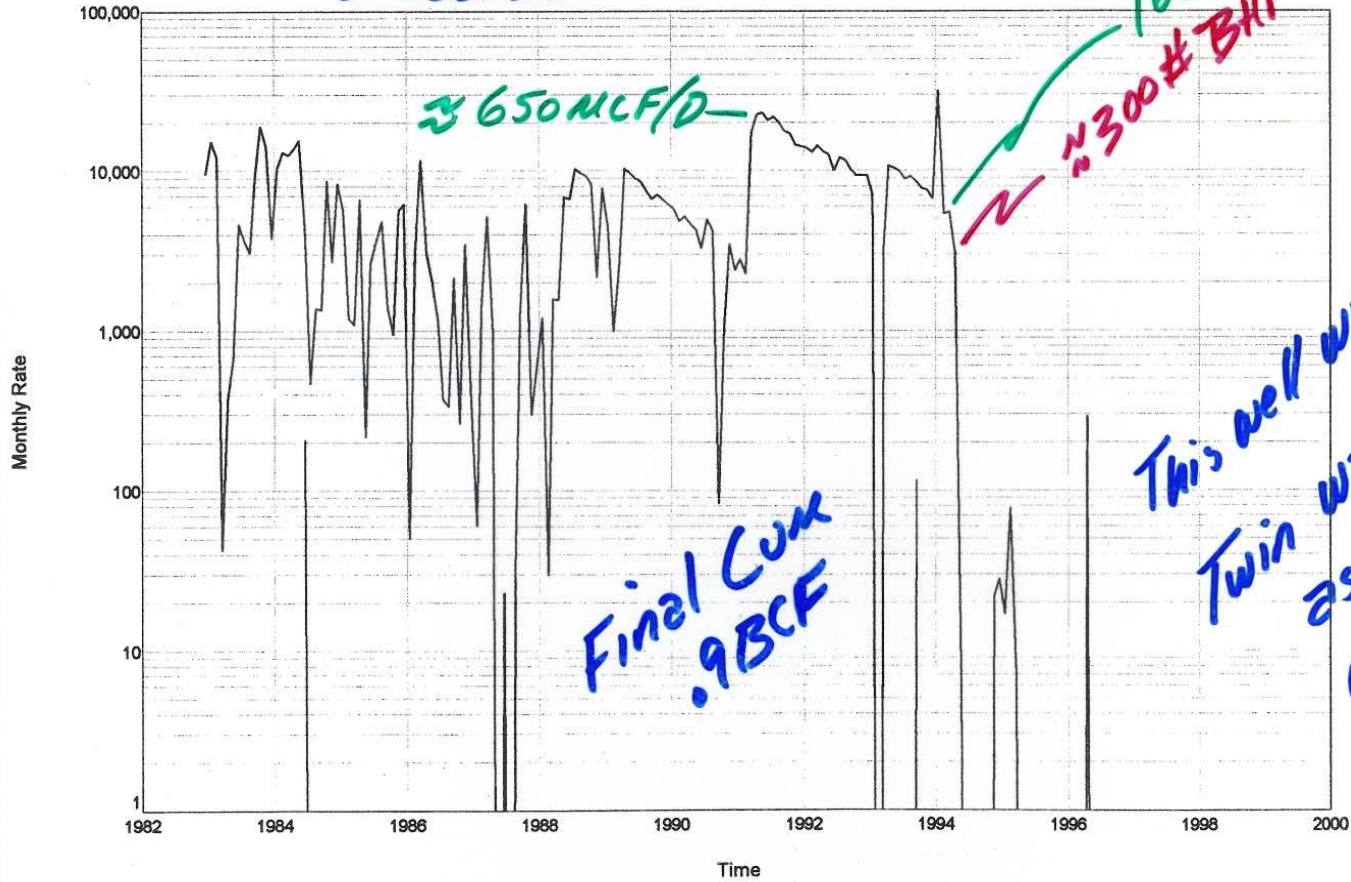
Project: C:\Program Files\IHS Energy\PowerTools v5.0\Projects\goucher.MDB

Date: 9/5/2002
Time: 11:05 AM

Lease Name: GOUCHER (1)
County, ST: WOODS, OK
Location: 29 26N 14W C N2 SW

Operator: ENSERCH OIL & GAS INCORPORATED
Field Name: AVARD EAST

Ensearch/ GOUCHER - AVARD EAST

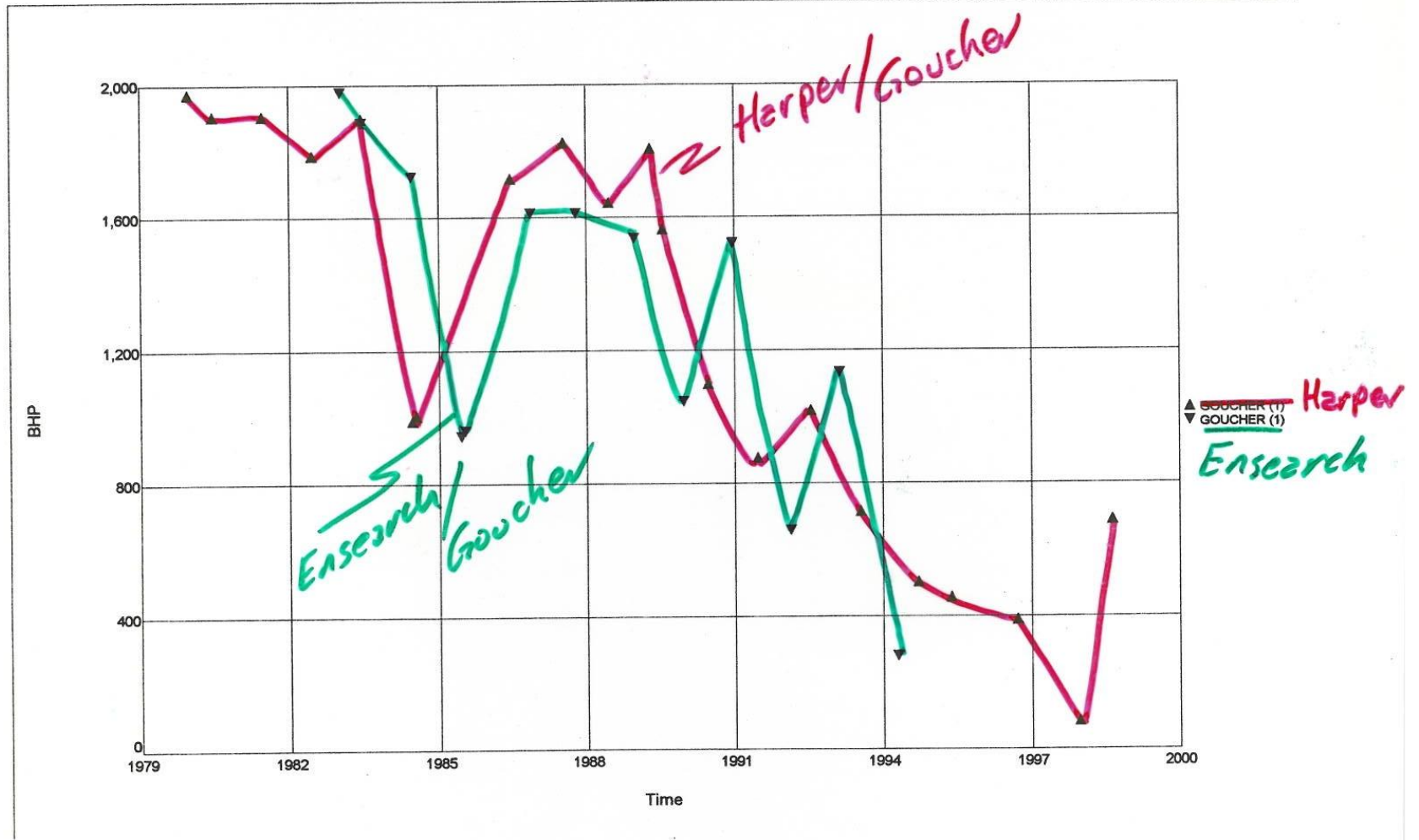


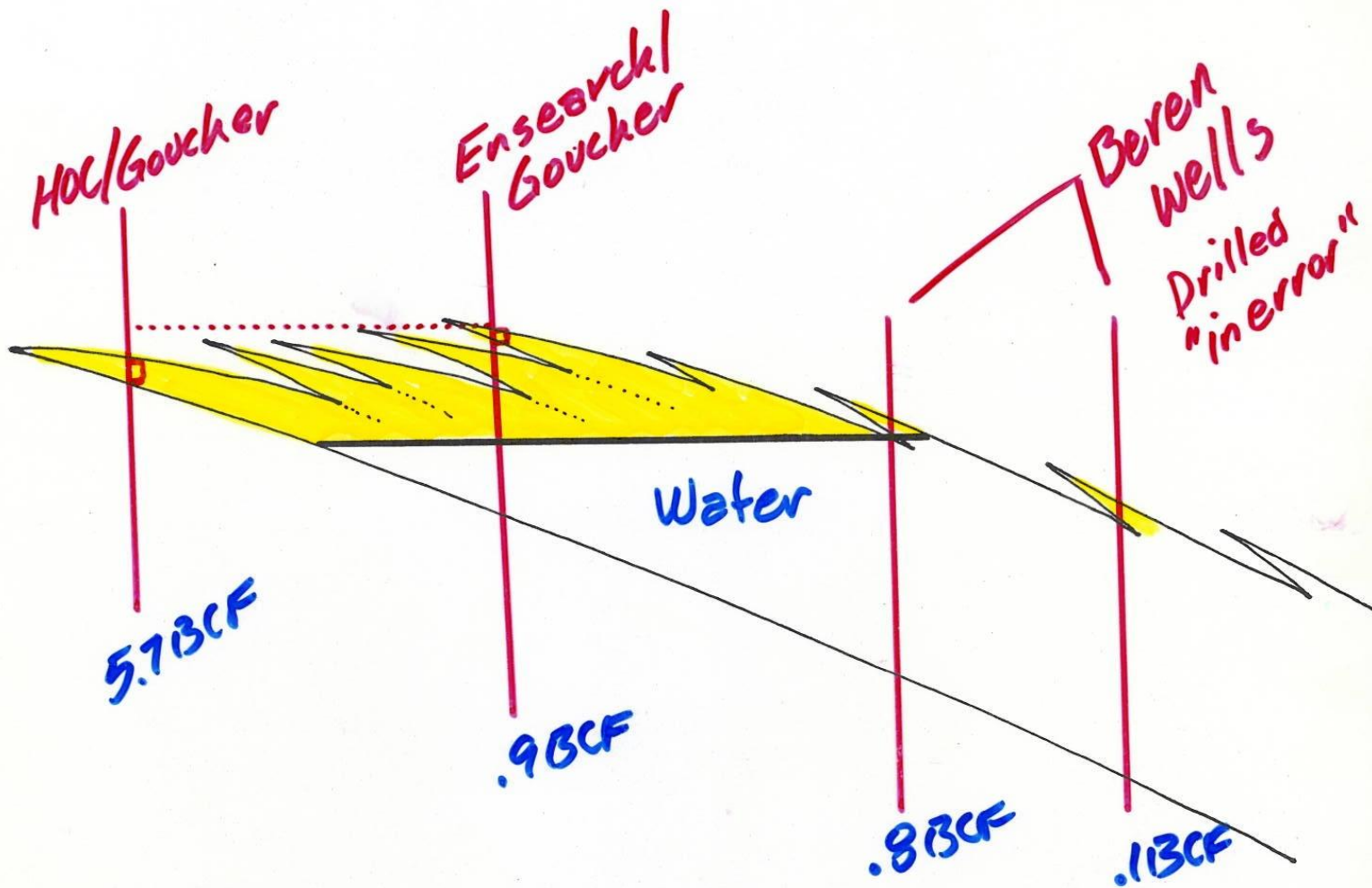
Pressure/Time Graph

Project: C:\Program Files\IHS Energy\PowerTools v5.0\Projects\goucher.MDB

Date: 9/5/2002
Time: 10:55 AM

Summary Lease Report





6.17 148x Phillips Pet Ward 10-66 New-14099x For -560 Or -2623	Texas O&G H&J 3-81 no info Gr 1520 C55	Wd -4881 M -4957 Sy -4973 1520 15800 Vd -4042 M -4110	Anadarko Varnum 10-69 Mch. 4115 M -4178 W -4957 Sy -4983	So -512	1501 6129	Irex Corp. Ewing 12-81 -40035f -42245s -4941x	Viersen & Coch. Peterman 11-85 Tk -3345 LKC -3403 OS -3943 M -4130 Sy -4991	Kirkpatrick Joseph 6-76 Dg -2553 Tk -3998 CGR -3660 Cke -4051	Sy -4856 V -4931
1512 6000 4.34	TK-32257 051-3914 1504 6000 OS-3870	Wheatland Oil Boggs 8-78 OS -3911 Mch -4096 M -4164 New -1513	1514 6537 21-dist/mil	1494 6510	1482 6000	Mch. 4146 M -4187 Wd -4273 M -4948 Sy -4971	1445 Gr 6550	Mer -4254 KH -4842 Wd -4858 M -485 Sy -4842	1456 6415
H -4963 Sy -4983 V -5069 SP -5275 Tf -5305 A -5504 TD -5715 PF -1503(67)	TK-32717 OS-3811 1479 6000	Tenneco Eastman 6-77 TK -3331 CGR -3656 MOS -3945 BOS -3991 M -4229	Anadarko Tanner 3-69 Mch. 4141 M -4215 M -5023 Sy -5027	1485 6088 14-dist/mil	1482 6000	Kennedy et al Rockenbach 1-79 no info	Pet. Inc. 1-81 Rockenbach OS -3941	Bonray Oil Pinegar 7-68 OS -3950 Cke -4087 Mch. 4254 M -4267	1465 6550
Tenneco Mason 3-77	TK -3334 CGR -3612 WOS -3938 M -4160	Pan East Bull 2-76 OS -3919 M -4189	Atlantic B-48 V -1845 W -3075 DM -3791 OS -3891 OS -4027 W -5003	1494 5999	1487 6610	Pet. Inc. Machev 7-80 M -5056 1411 6613 1.1A31-73x	Che. 4073 M -4247 KH -4846 Wd -4992 H -5037 Sy -5047	1491 6586	1465 6550
Tenneco Oil McGill 12-76	OS -3905 WOS -3955 Mch -4181 M -4196 TD -4491 PF -3956(26)	Pan East Jacobson 11-77 OS -3985	Kennedy et al Haltom 11-79 no info	1478 7378	1487 6610	Pet. Inc. Machev 7-80 M -5056 1411 6613 1.1A31-73x	Che. 4073 M -4247 KH -4846 Wd -4992 H -5037 Sy -5047	1491 6586	1465 6550
H H Gurooff Buck 8-78 OS -3948 Cke -4070 Mch -4204	1496 5345	Hall Jones Goucher 10-85 TK -3364 Av -3711 CGR -3726 B.CGR -3814	W -5079 Sy -5095 V -5195 W -5267 C -5430 A -5625	1465 7378	1487 6610	Pet. Inc. Machev 7-80 M -5056 1411 6613 1.1A31-73x	Che. 4073 M -4247 KH -4846 Wd -4992 H -5037 Sy -5047	1491 6586	1465 6550
1496 6800	1496 5345	Hall Jones Goucher 10-85 TK -3364 Av -3711 CGR -3726 B.CGR -3814	W -5079 Sy -5095 V -5195 W -5267 C -5430 A -5625	1465 7378	1487 6610	Pet. Inc. Machev 7-80 M -5056 1411 6613 1.1A31-73x	Che. 4073 M -4247 KH -4846 Wd -4992 H -5037 Sy -5047	1491 6586	1465 6550
1496 6800	1496 5345	Hall Jones Goucher 10-85 TK -3364 Av -3711 CGR -3726 B.CGR -3814	W -5079 Sy -5095 V -5195 W -5267 C -5430 A -5625	1465 7378	1487 6610	Pet. Inc. Machev 7-80 M -5056 1411 6613 1.1A31-73x	Che. 4073 M -4247 KH -4846 Wd -4992 H -5037 Sy -5047	1491 6586	1465 6550

12 wells drilled as 2 result of the discovery well!



AVARD

Disc.

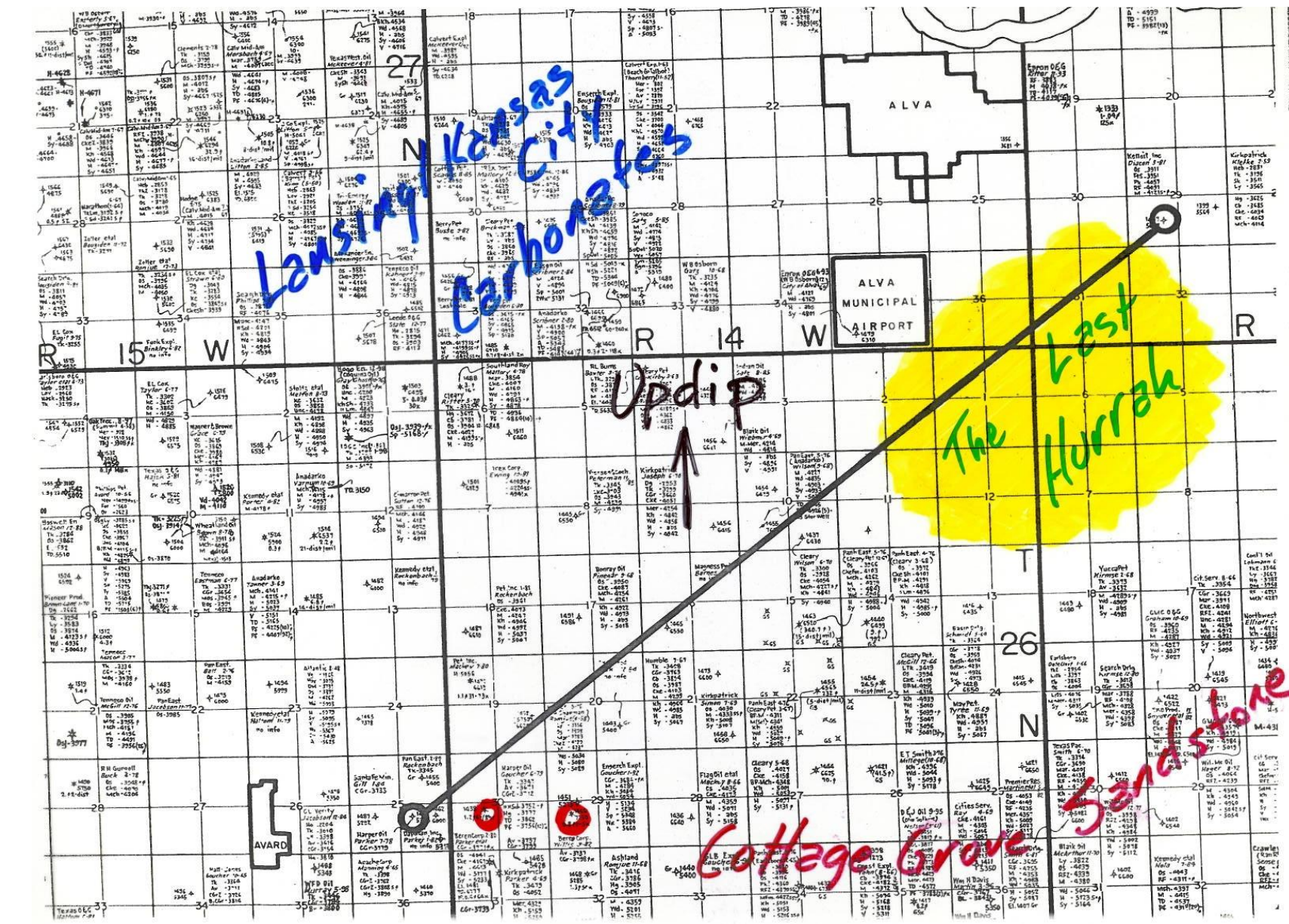
[2-F]

Norwalk
Lansing
Carbonates

Update

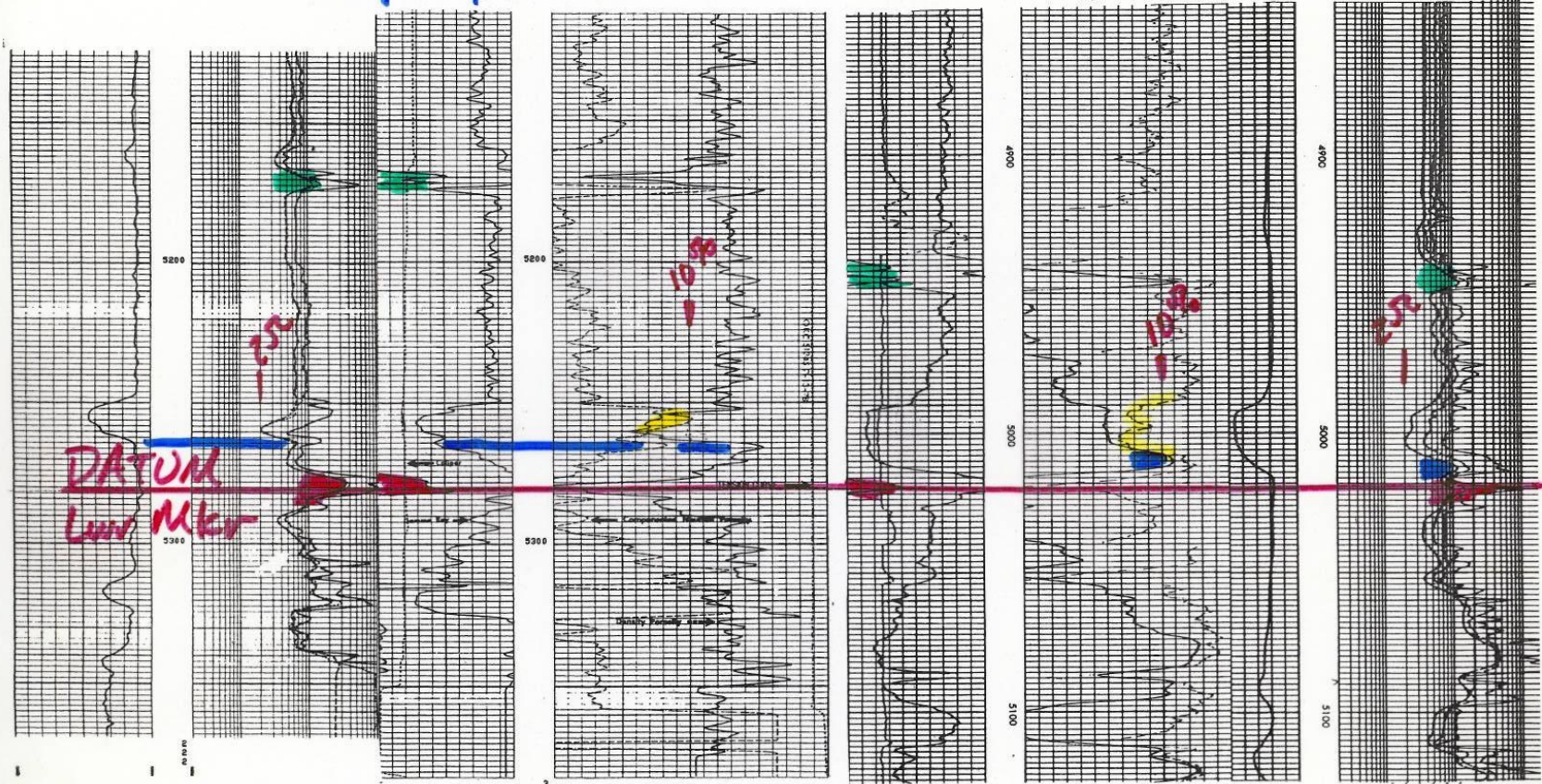
The Last Hurrah

College Grove



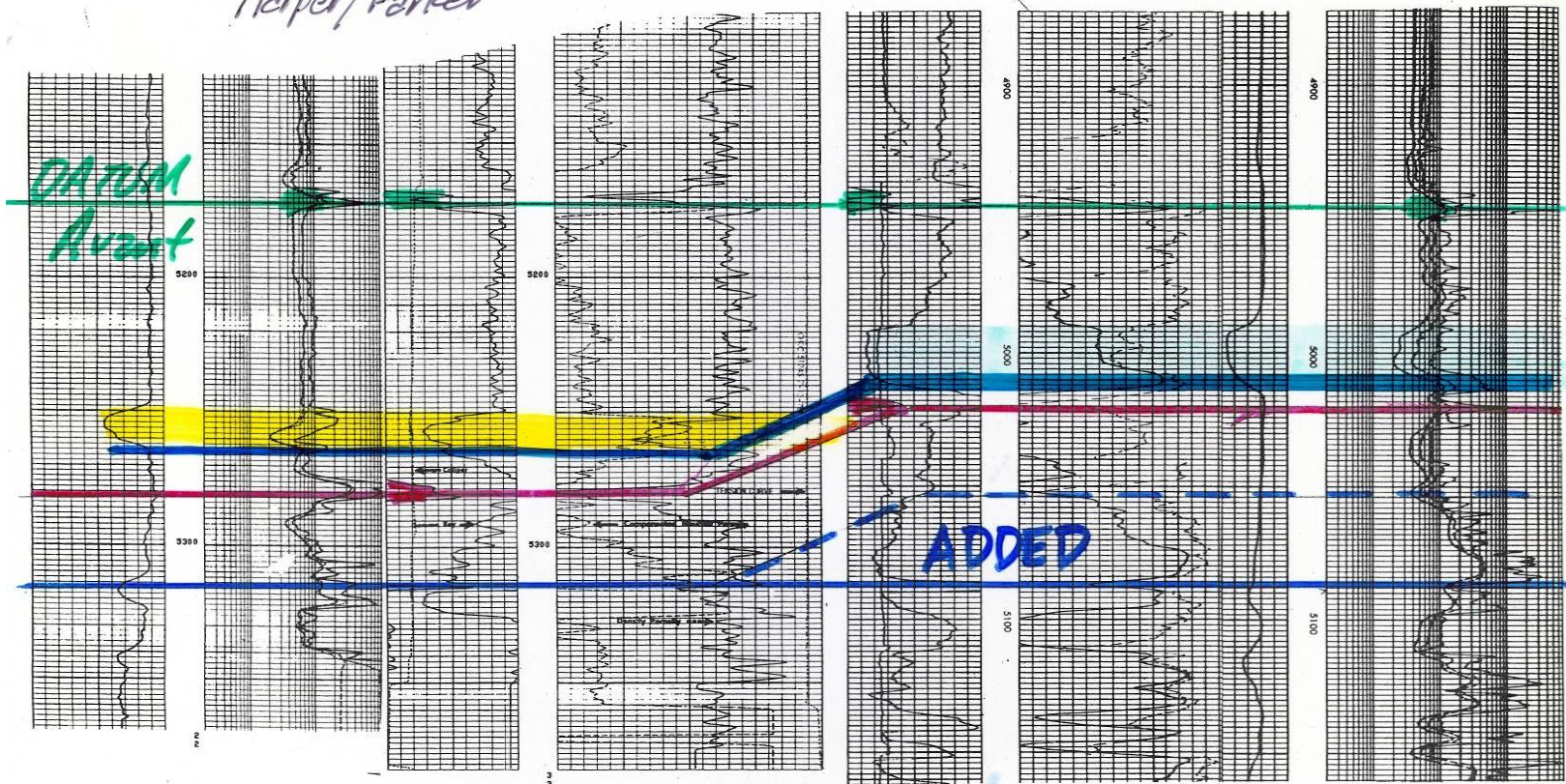
Harper/Parker

Section 29



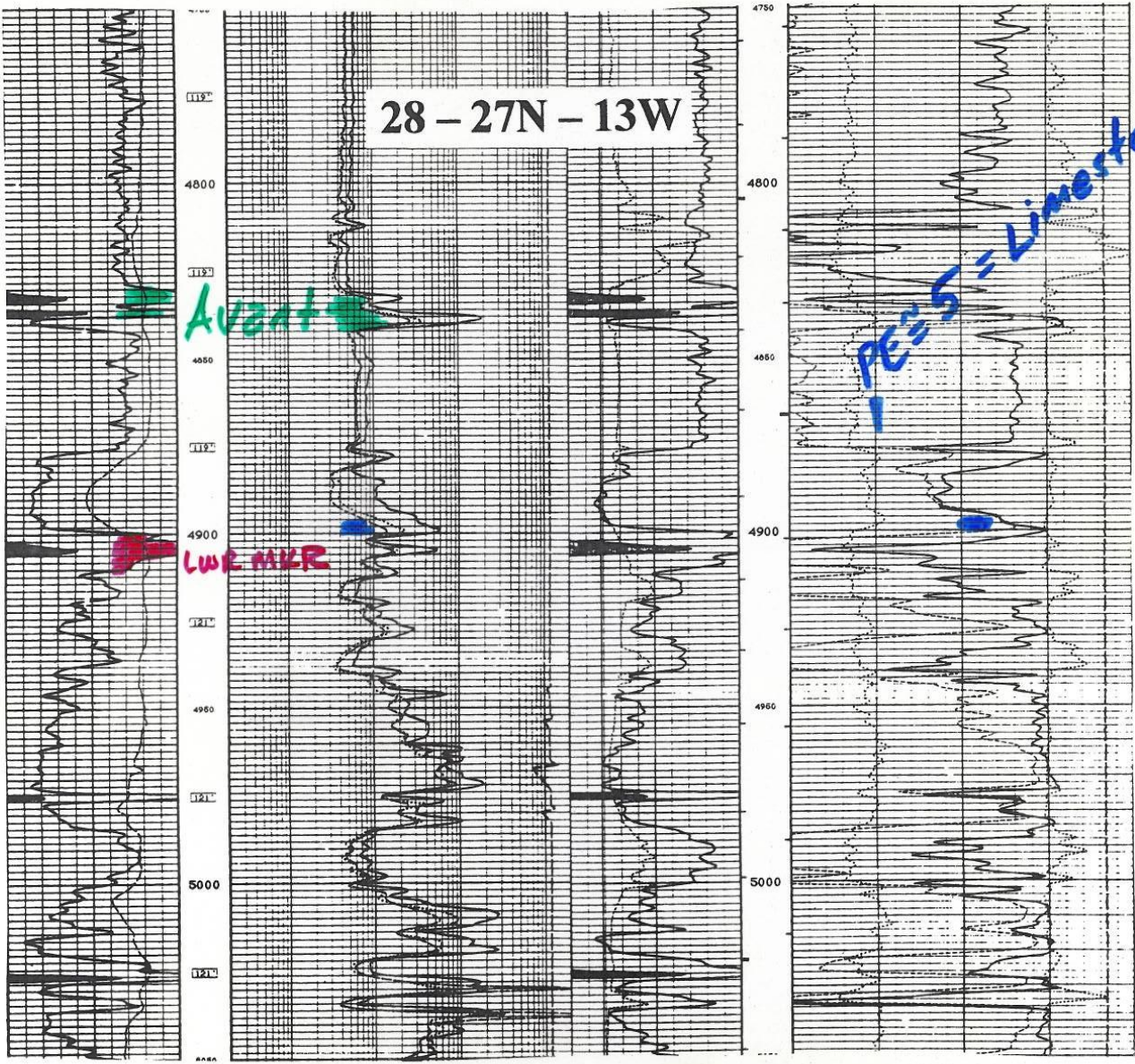
Harper/Parker

Section 29



→ Carbonate Buildups
of the
Lansing/Kansas City

28 - 27N - 13W

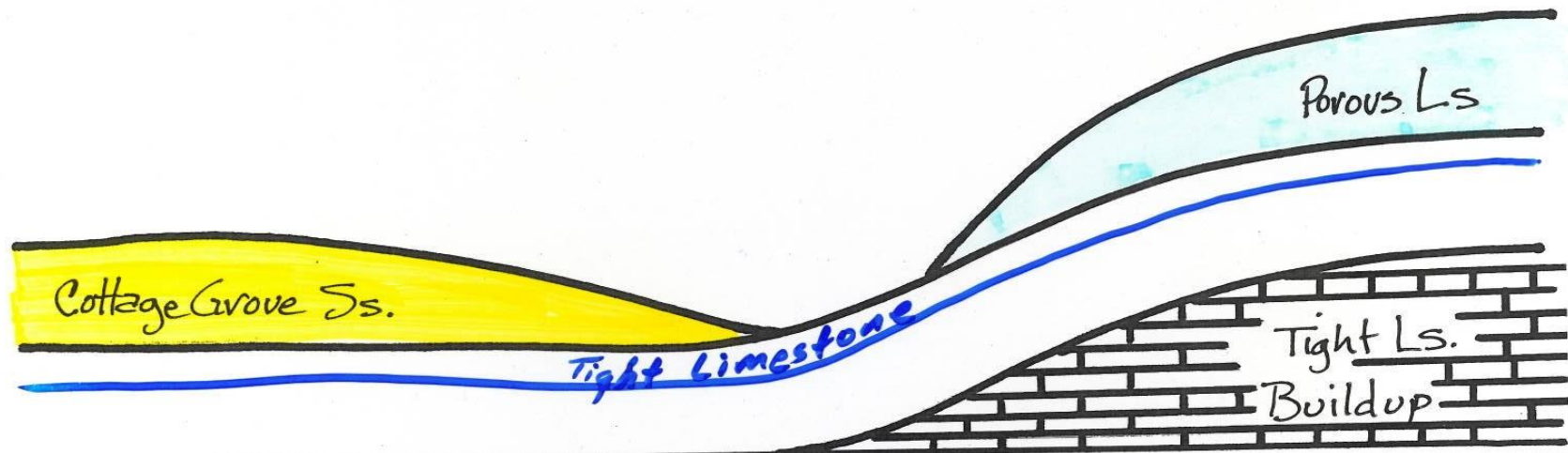


Avzat

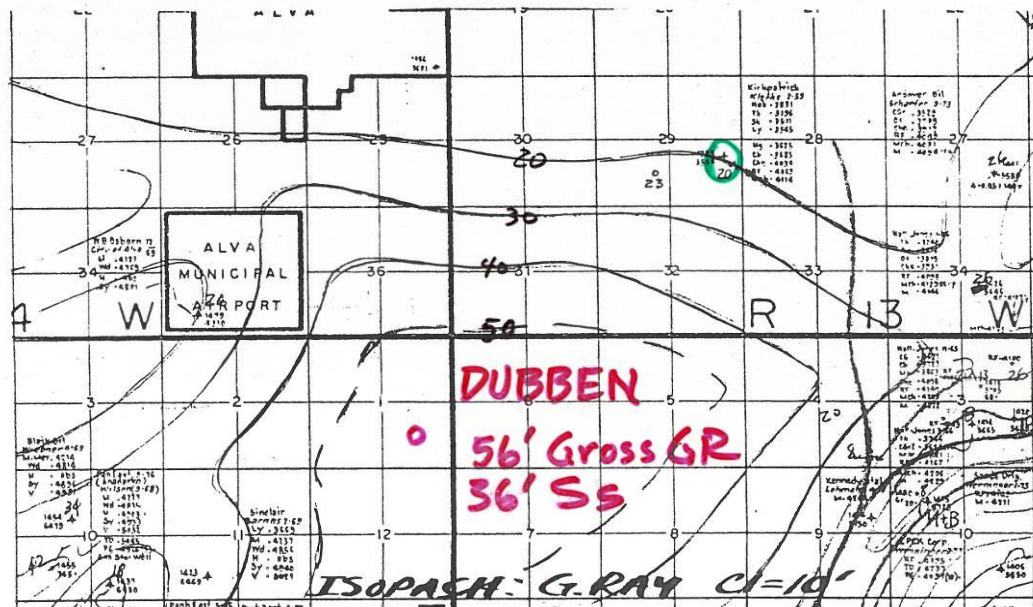
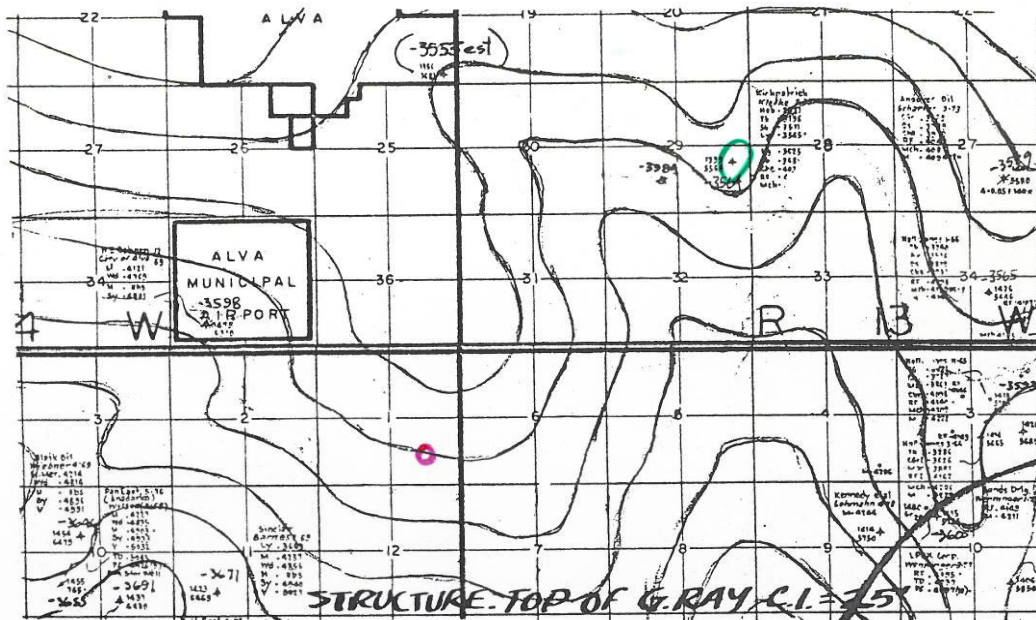
LWR MKR

PE=5 = Linertone

Avant



Hogshooter



1979



Dual Induction Focused Log



NO. _____

COMPANY: SOUTHWESTERN ENERGY COMPANY

WELL: Dubben #1

FIELD: INDIANA

COUNTY: INDIAN STATE: INDIANA

LOCATION: C SE/4 Other Services _____

SEC. 1 TWP. 26N RGE. 14W

Instrument Datum: CI Elev. 1432

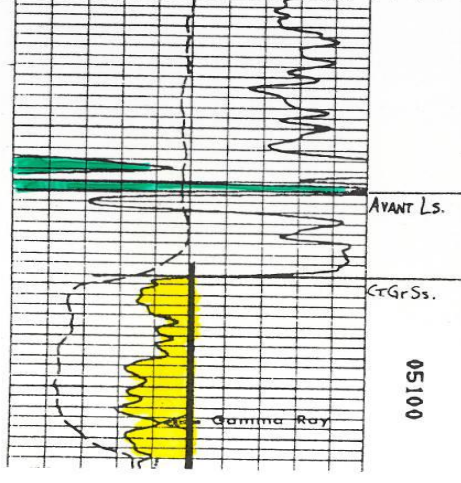
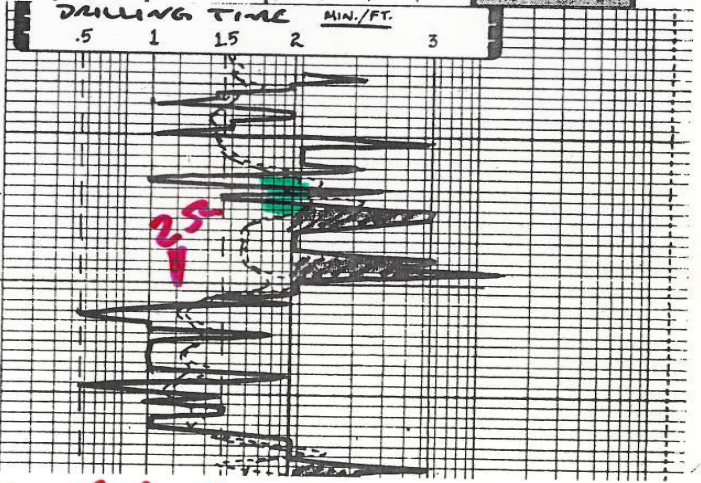
Measured from: KB, 10 Ft. Above Permanent Datum

g Measured from: KB Elev. 1462

DF 1461

GI 1432

0. Order	ONE				
a Order	21011				
- Order	5158				
- Logger	5124				
n Logged Interval	5116				
ogged Interval	850				
1 - Driller	R 5/8 @ 850	@	@	@	@
1 - Logger	850				
e	7 7/8				
Fluid in Hole	CHL. CLHM				
ity and Viscosity	9.2	65			
nd Fluid Loss	9.5	254 cc			
ze of Sample	FLUID LINE				cc
j Meas. Temp.	.33 @ 80 * F	@	@	@	* F
@ Meas. Temp.	.25 @ 80 * F	@	@	@	* F
@ Meas. Temp.	.41 @ 80 * F	@	@	@	* F
ze of Fluid and Rhnc	N N	@	@	@	* F
j BHT	.22 @ 121 * F	@	@	@	* F
ince Circ:	7 IN.				
ec Temp. Deg. F:	121 * F				* F
No. and Location	0243 (KIND)				* F
ed By	STEINMETZ				* F



05100

No ϕ tool run



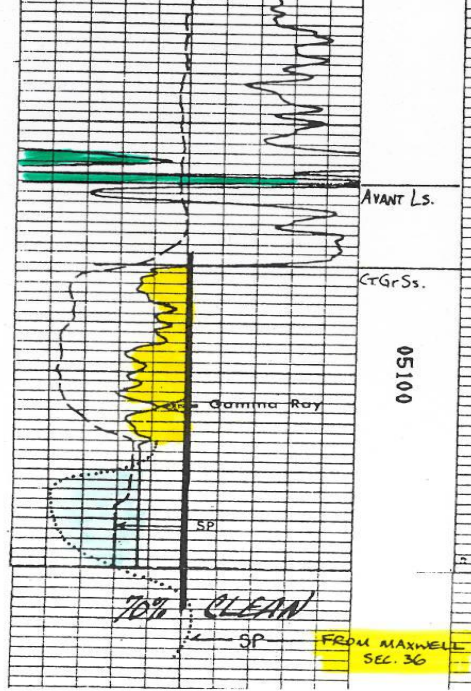
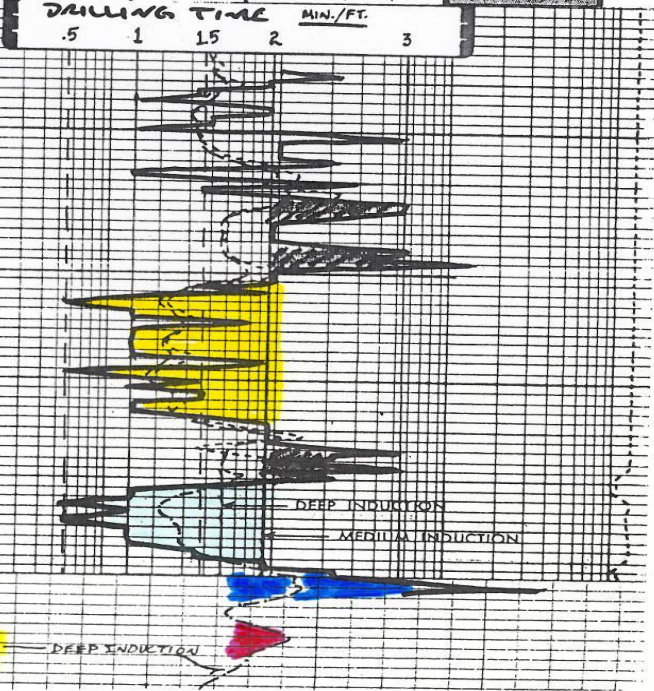
Dual Induction Focused Log

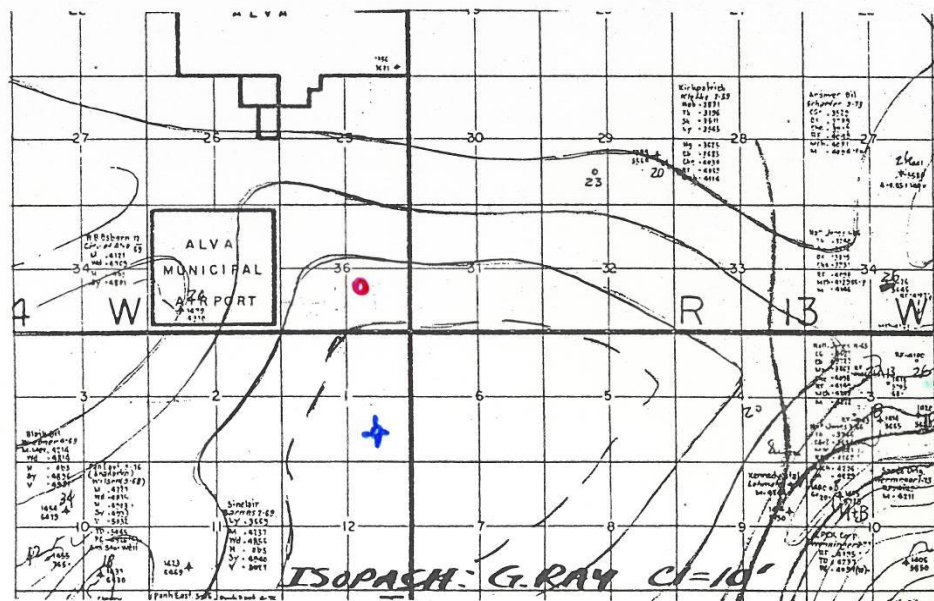
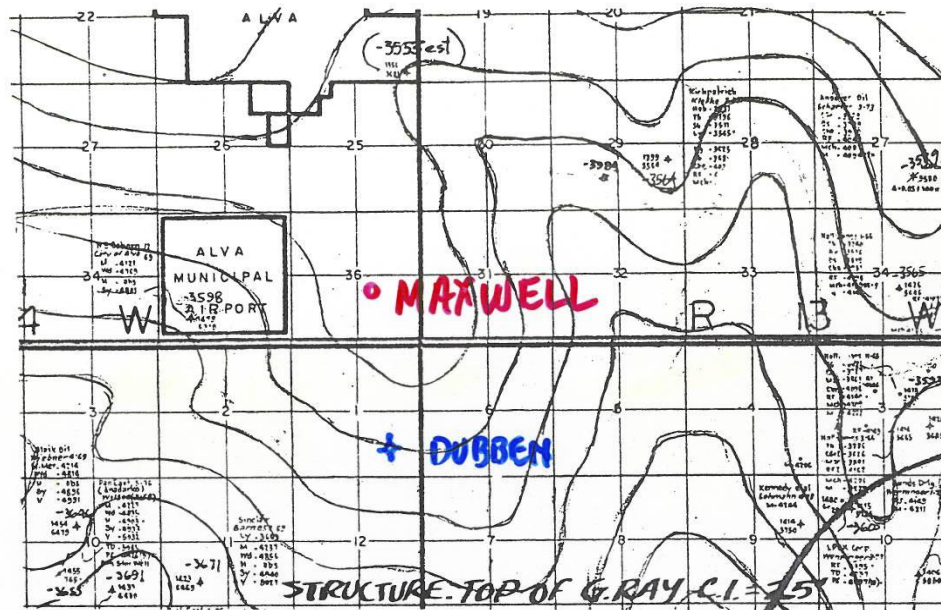


COMPANY: SOUTHWESTERN ENERGY COMPANY
 WELL: Dubben #1
 FIELD: INDORA
 COUNTY: INDOS STATE: OKLAHOMA
 LOCATION: C SE/4 Other Services: _____
 SEC 1 TWP 26N RGE 14W

Went Datum: CL Elev. 1452
 asured from: KB 10 Ft. Above Permanent Datum Elev. 1462
 Measured from: FB Elev. 1461 DF 1452 GL 1452

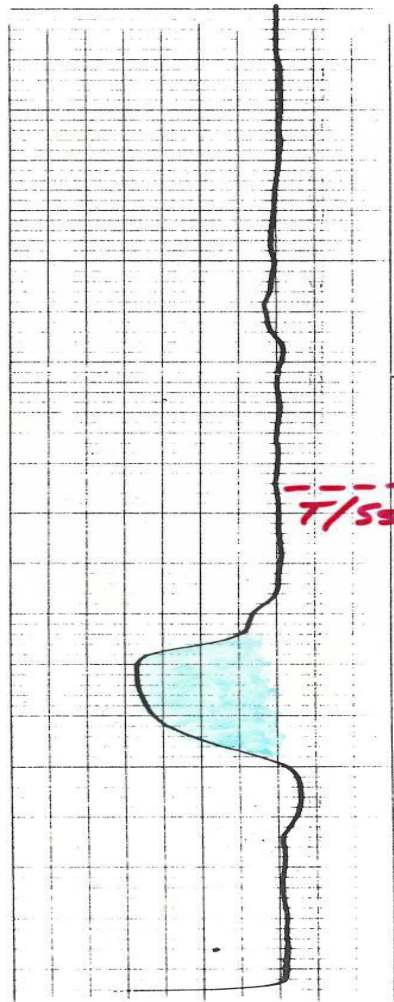
Order	ONE				
Order	21011				
Order	5158				
Order	5124				
Logged Interval	5116				
Logged Interval	850				
Driller	8 5/8 @ 850	@		@	
Logger	850				
Drill Hole	7 7/8				
Fluid Viscosity	CHI. CHEN				
Fluid Viscosity	9.2	65			
Fluid Loss	9.5	254 cc	cc		
of Sample	FLUID LINE				cc
Meas. Temp.	1.1 @ 80°F	@	°F	@	°F
Meas. Temp.	.25 @ 80°F	@	°F	@	°F
Meas. Temp.	.41 @ 80°F	@	°F	@	°F
of fluid and frac	N N	N	°F	@	°F
BH	.72 @ 21°F	@	°F	@	°F
ice Circ.	7 HRS.				
Temp. Deg. F	1.1 °F	°F		°F	°F
o and Location	0241 (NWD)				
By	STEINMETZ				





MAXWELL 1468'

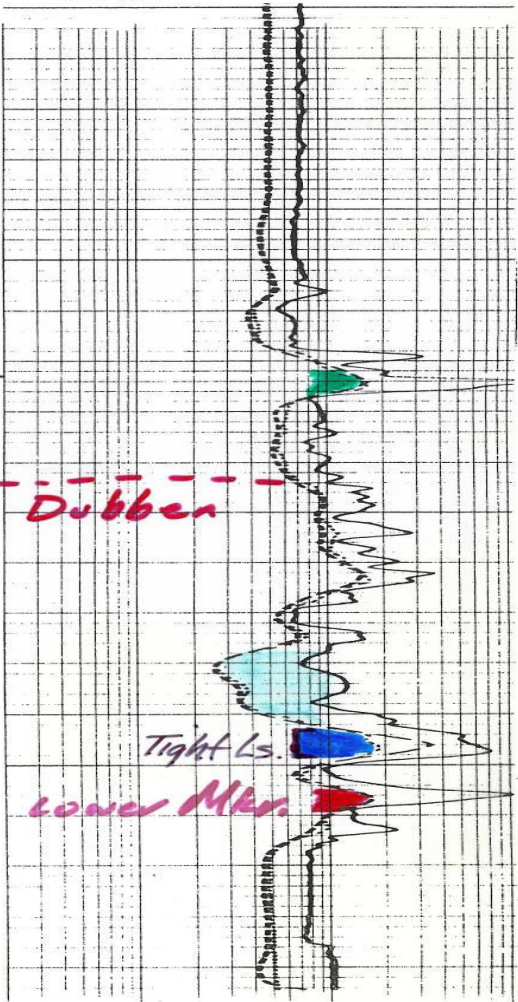
REPEAT



500
-3555
AVANT

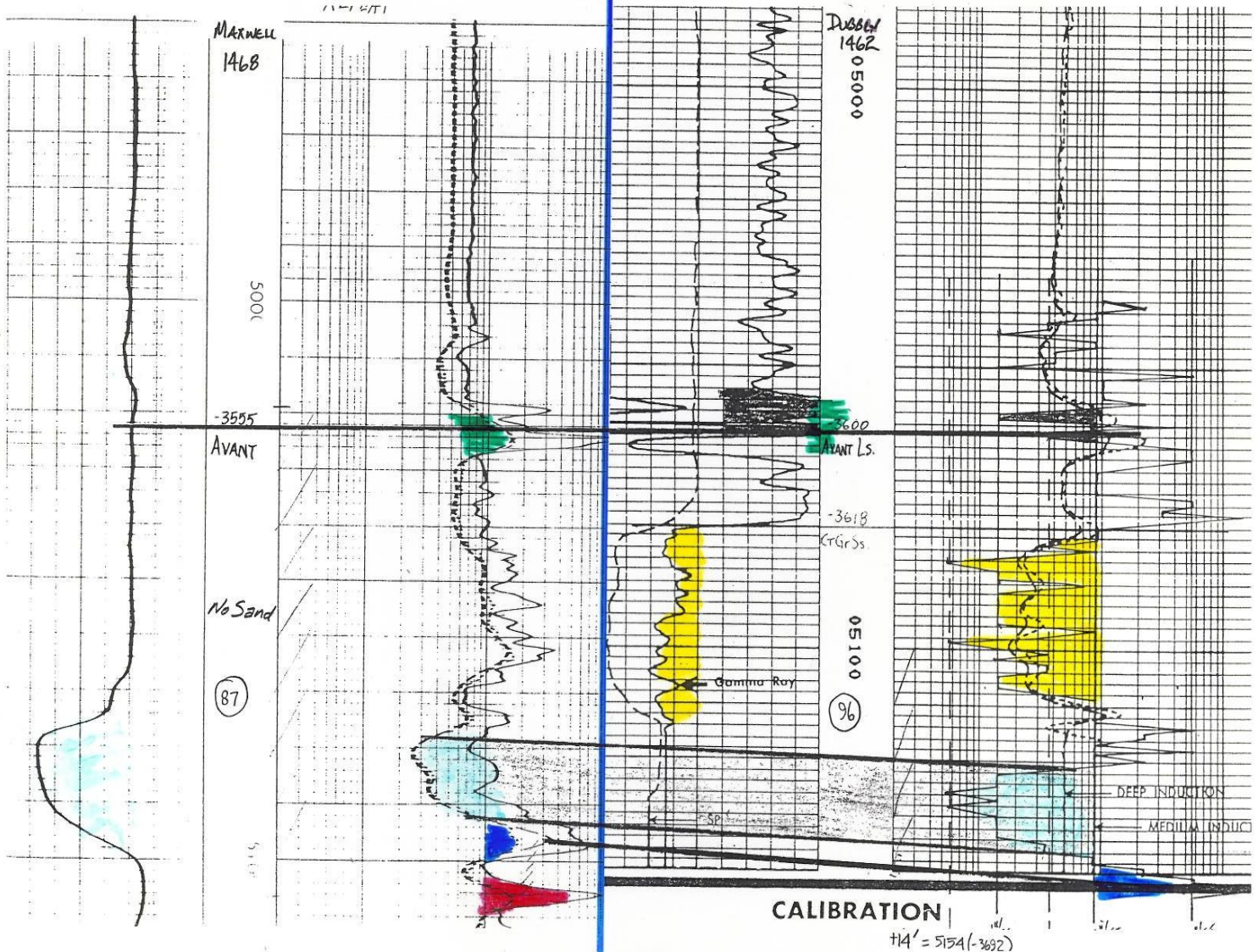
T/ss. in Dubben

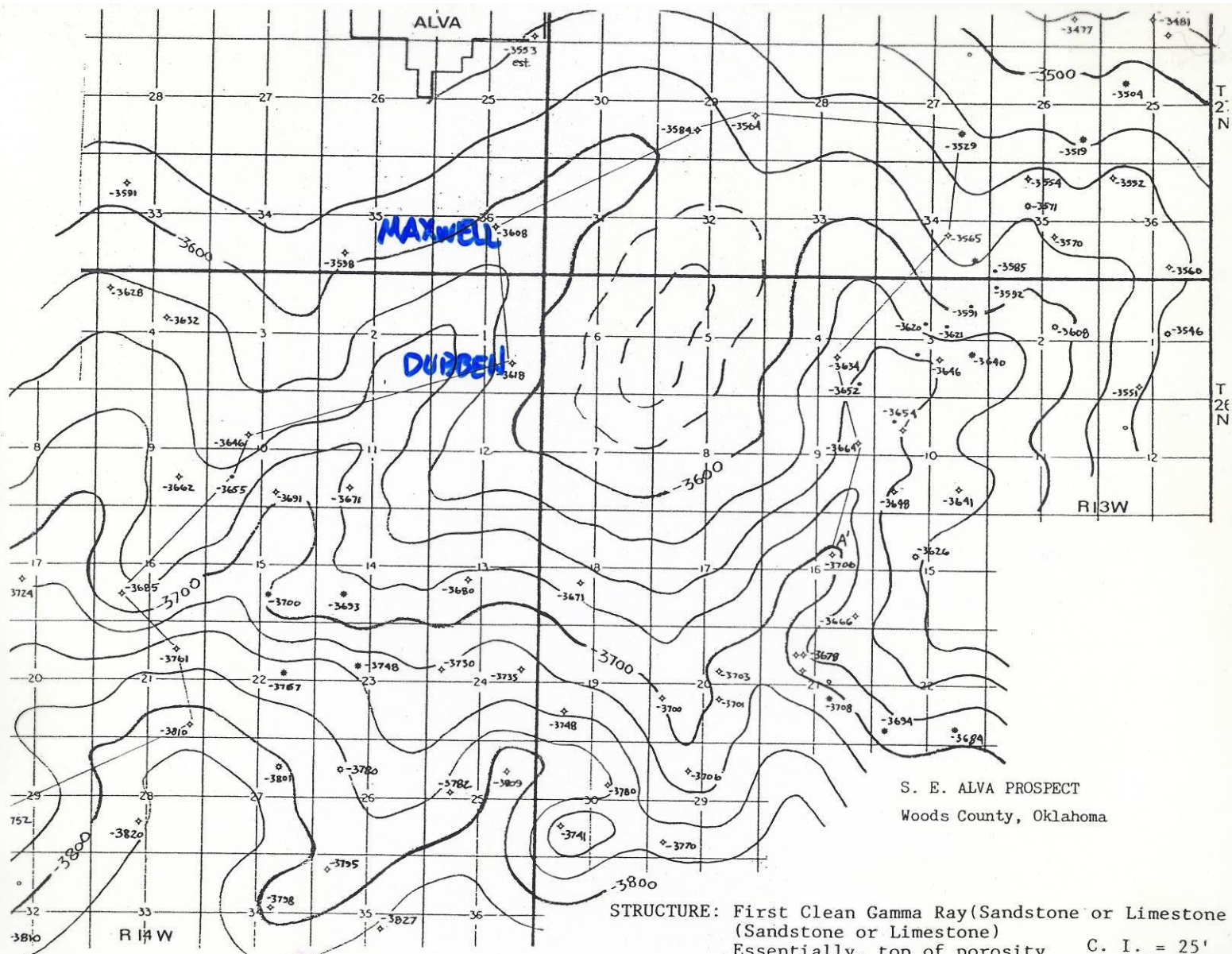
510'

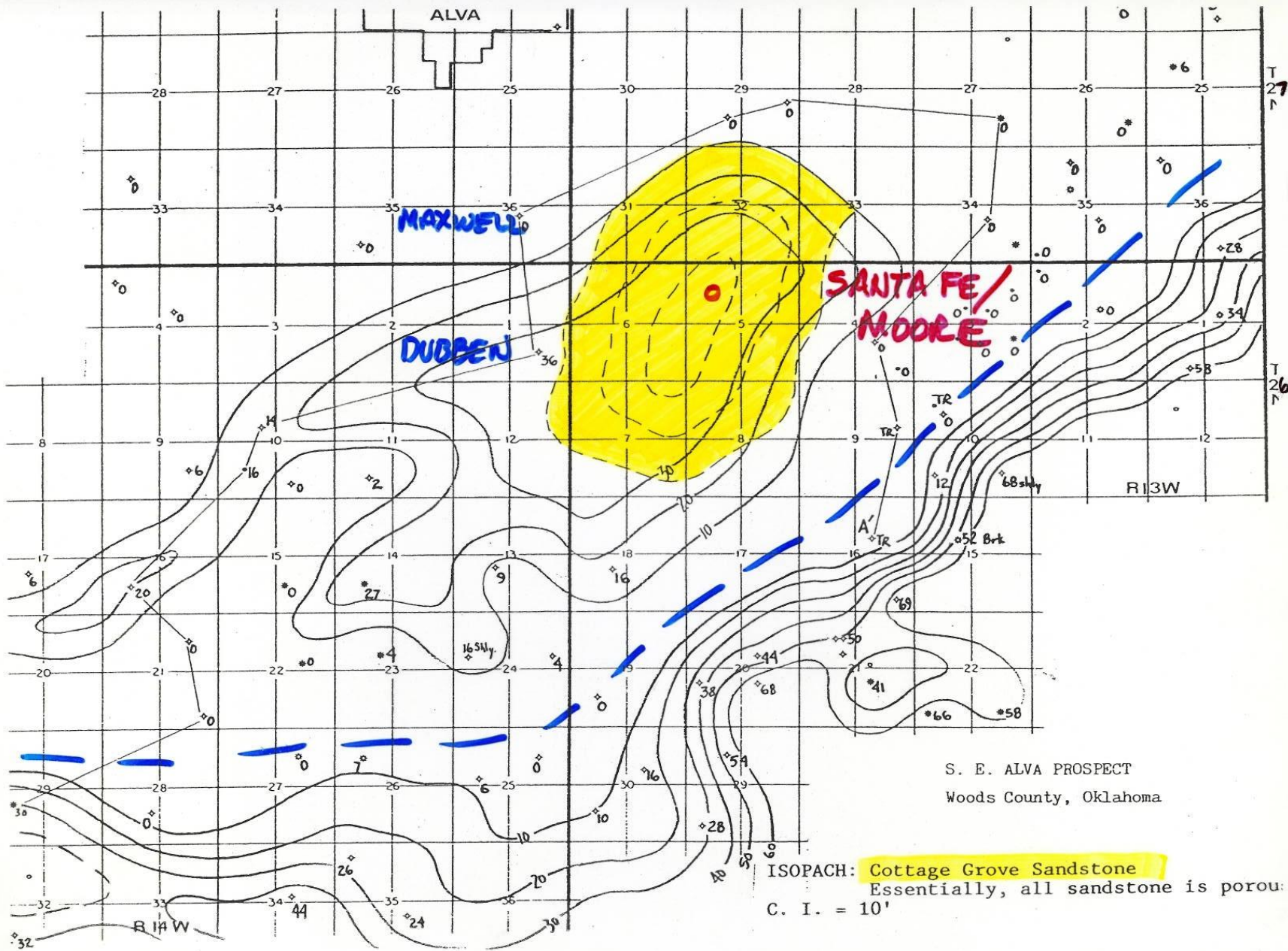


Tight Ls.

Lower Mem.



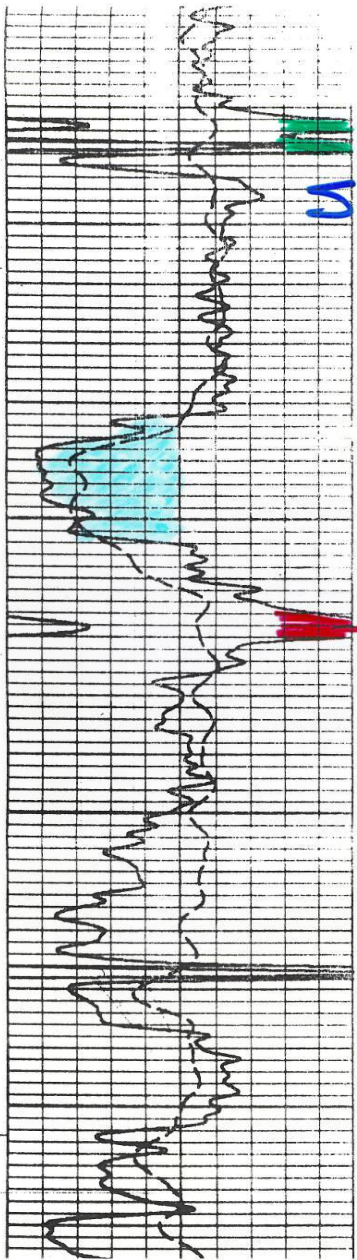




S. E. ALVA PROSPECT
 Woods County, Oklahoma

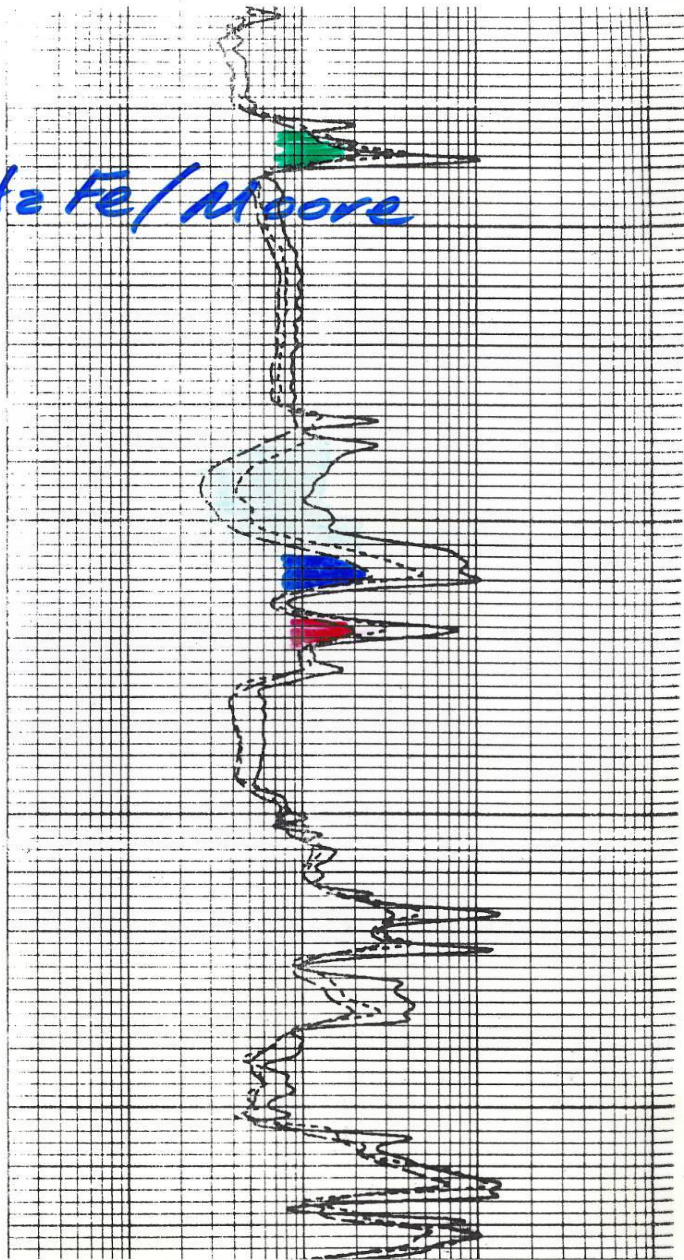
ISOPACH: Cottage Grove Sandstone
 Essentially, all sandstone is porous.
 C. I. = 10'

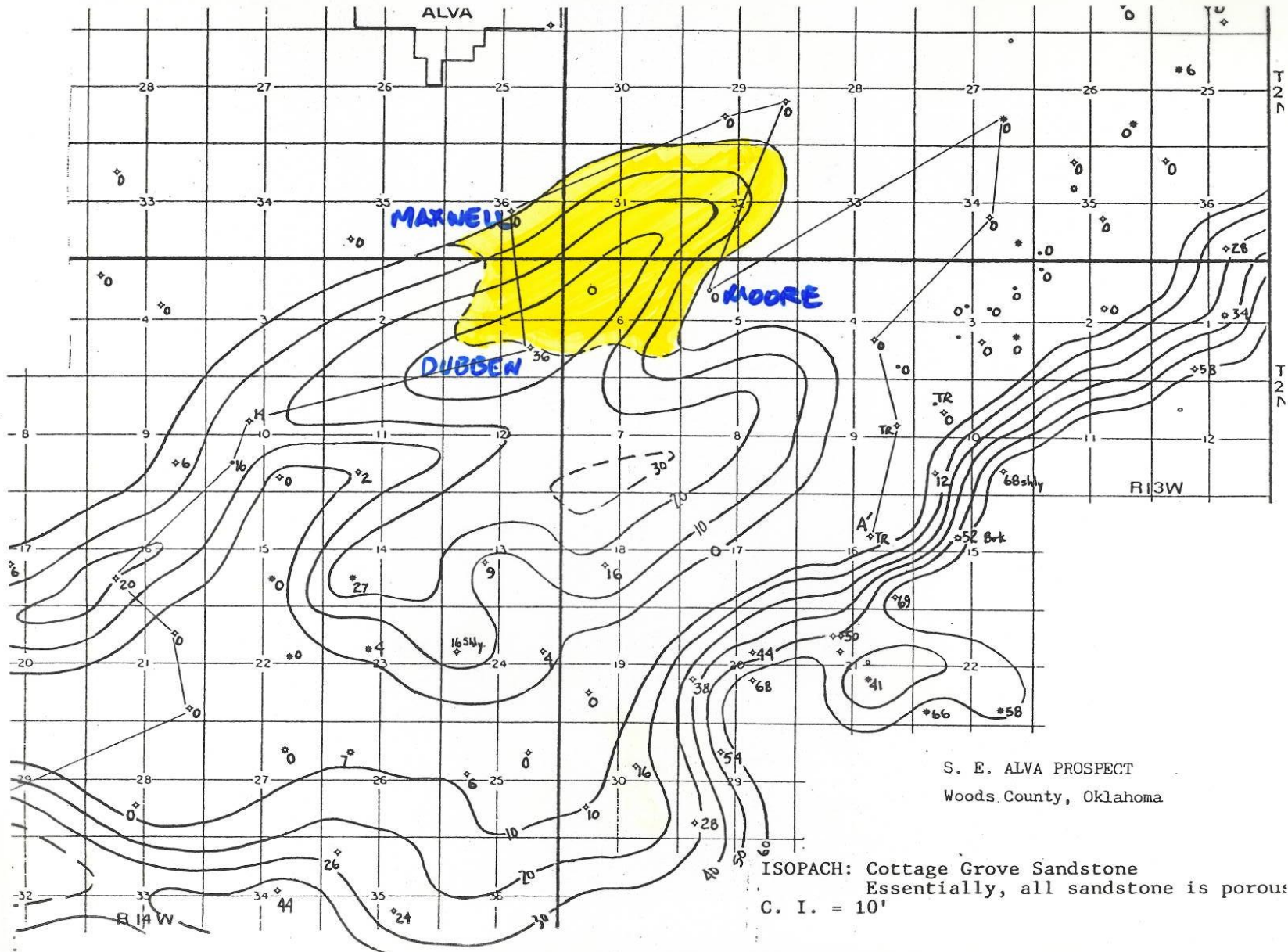
Santa Fe/Moore



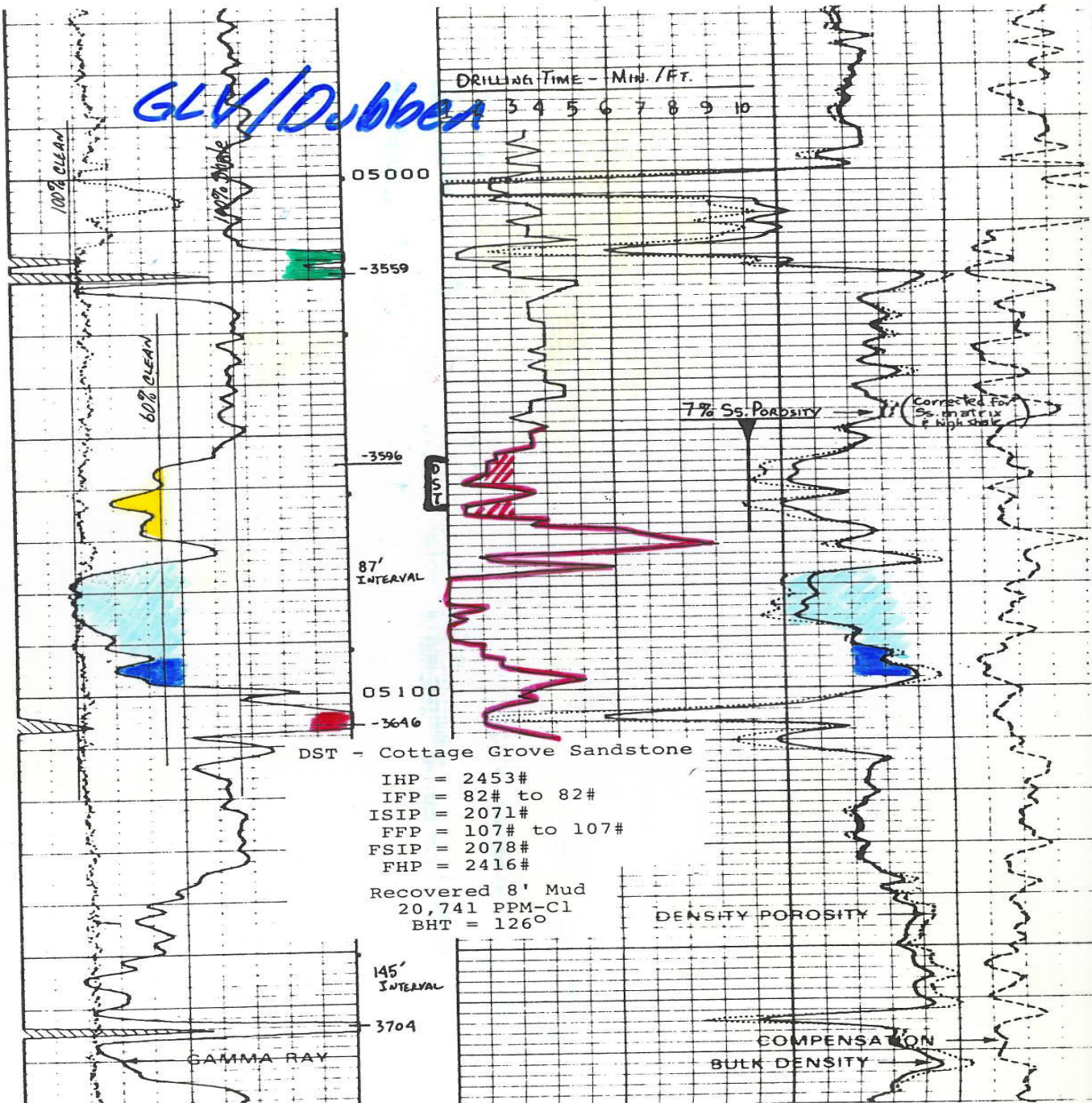
05100

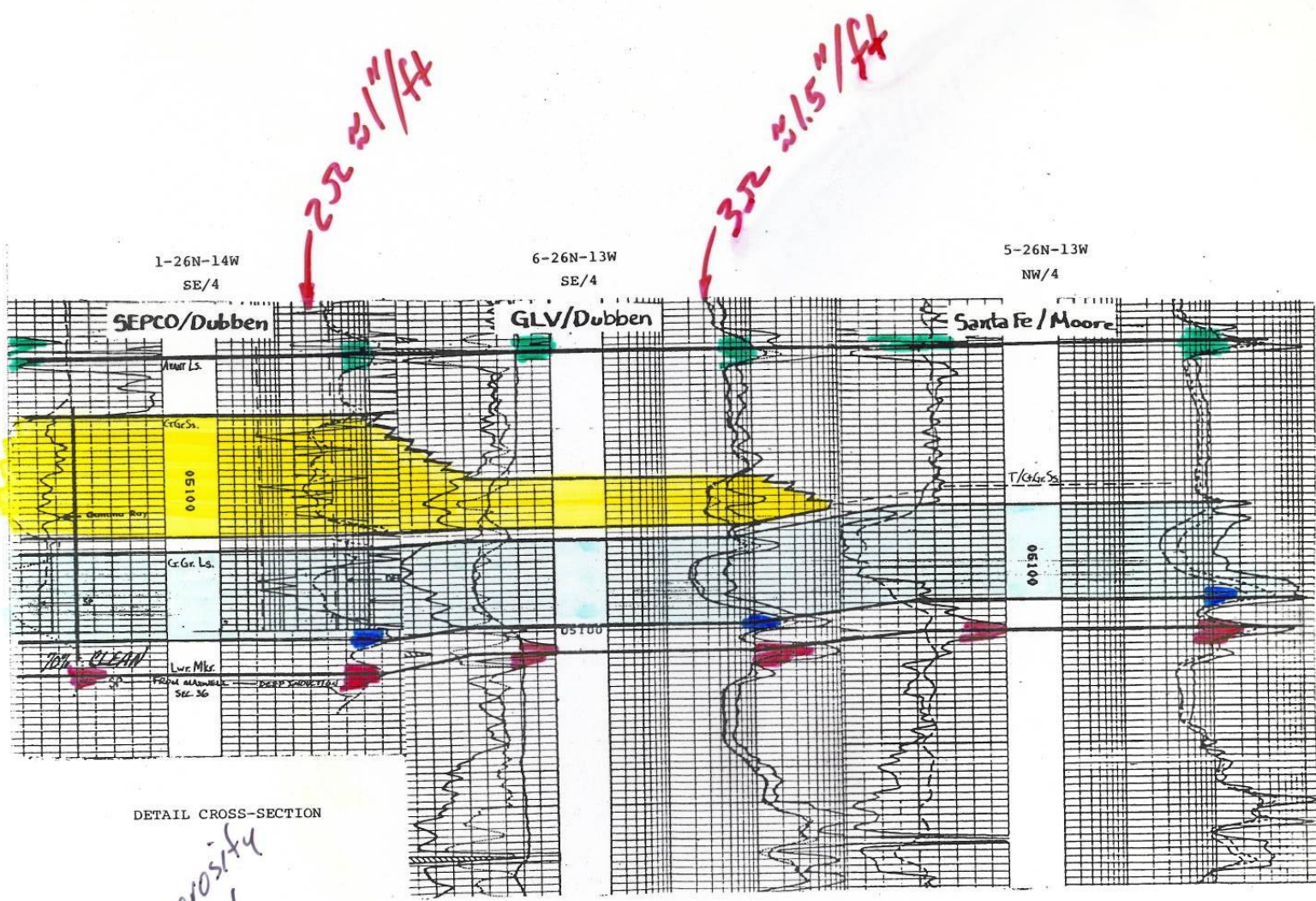
05200





GLV/Dubber





252 ~ 1 1/4 ft

352 ~ 1.5 ft

*No porosity
tool*

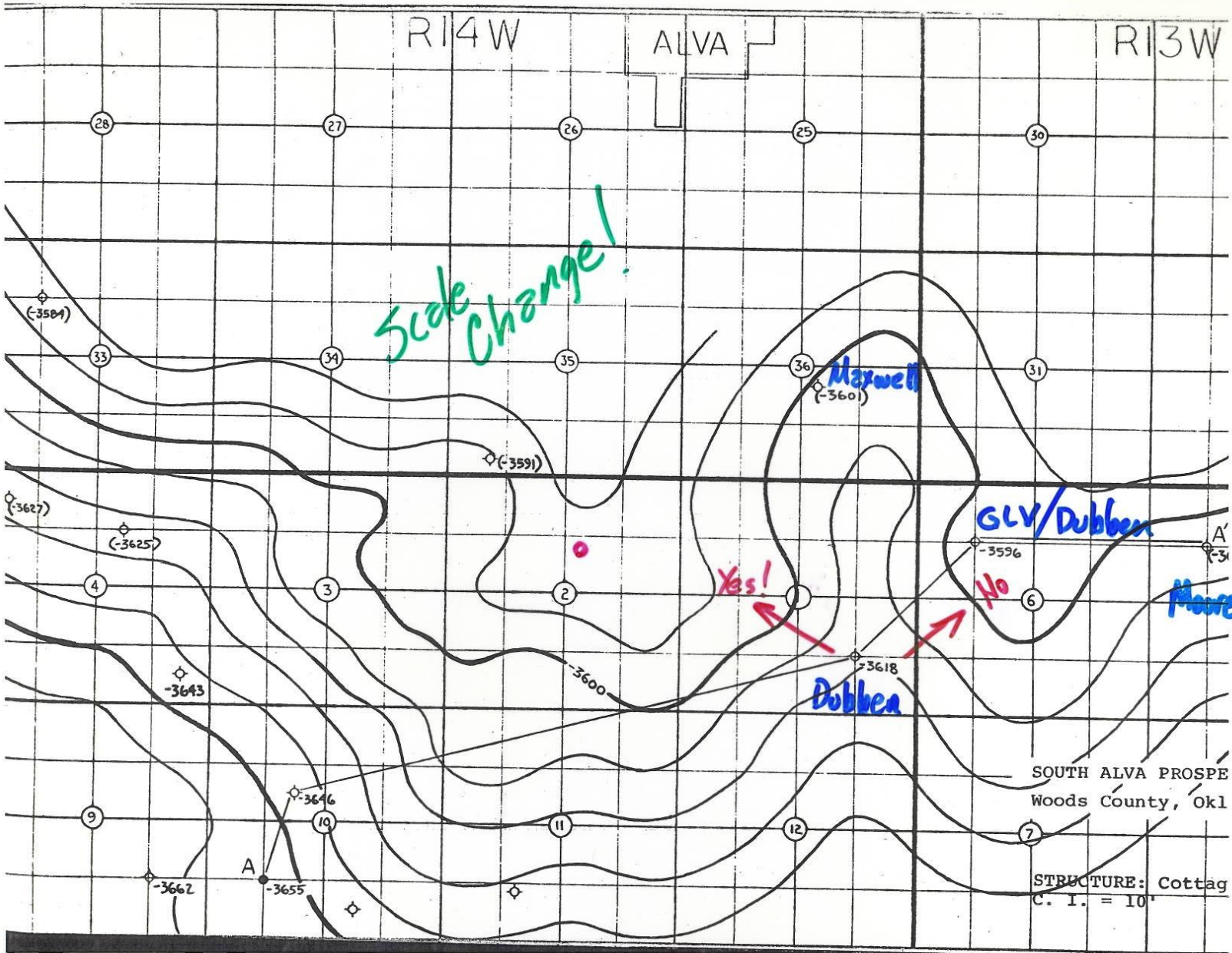
*tight/
no perm*

R14W

ALVA

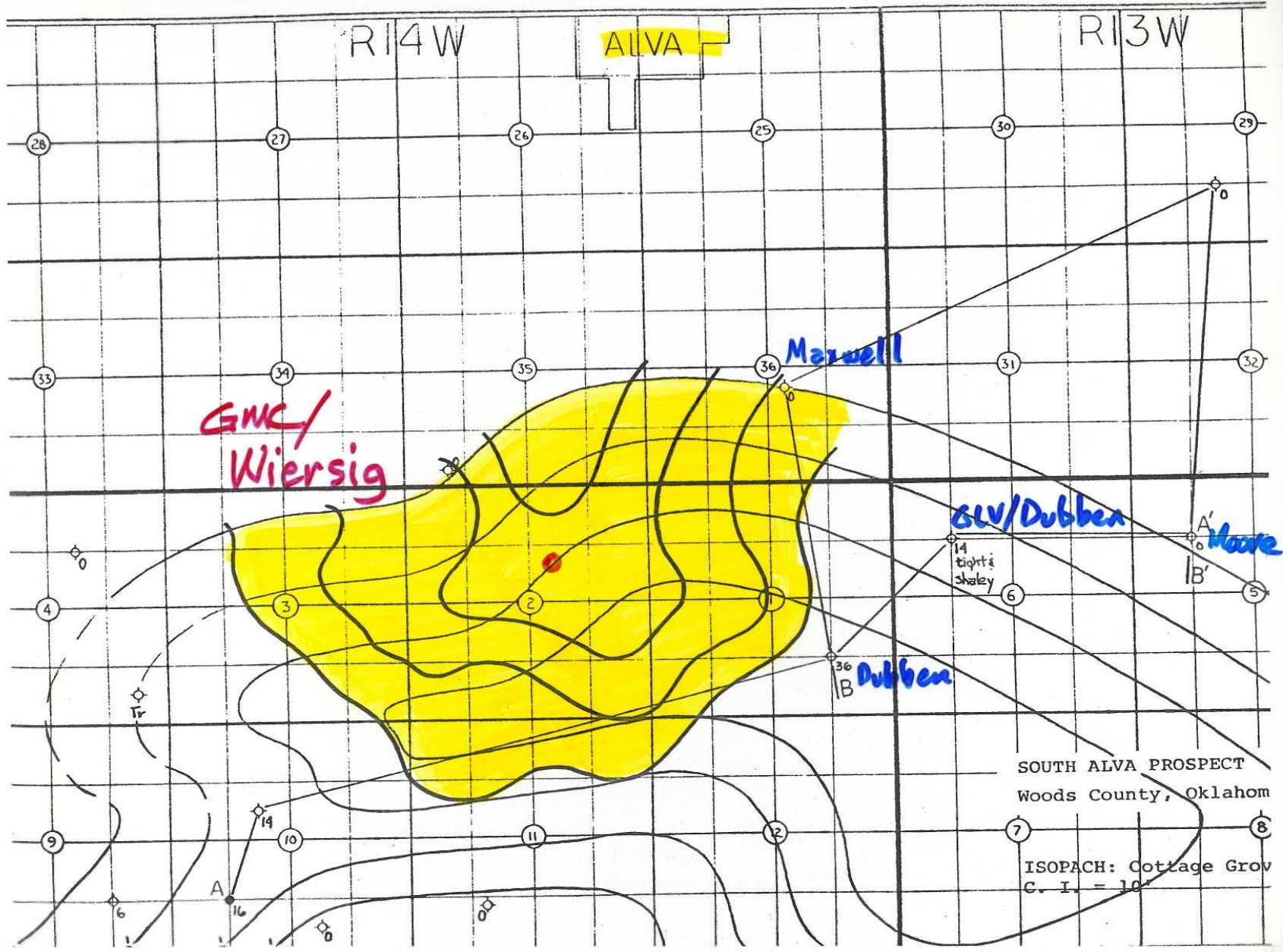
R13W

Scale Change!

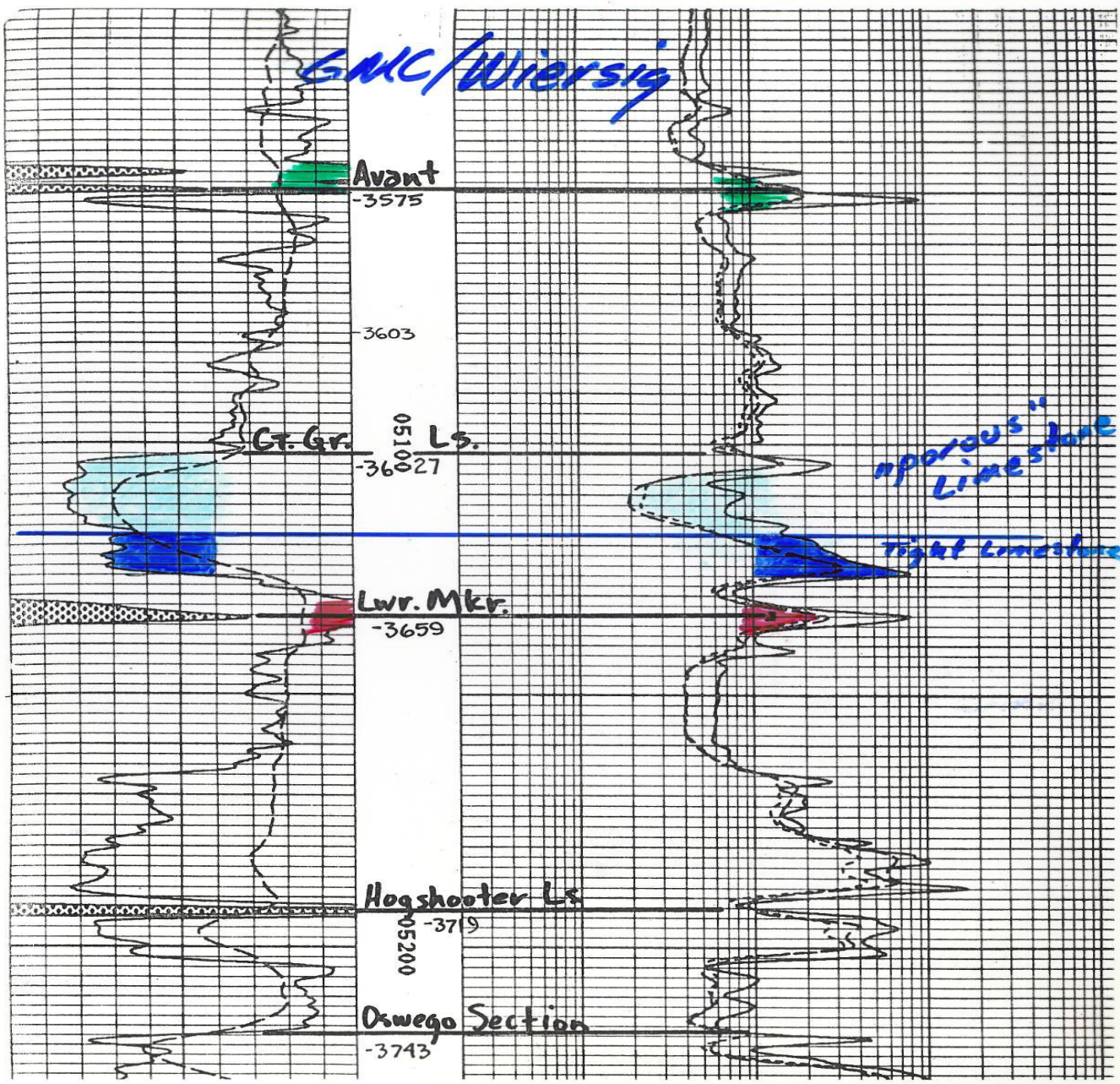


SOUTH ALVA PROSPE
Woods County, Okl

STRUCTURE: Cottag
C. I. = 10'

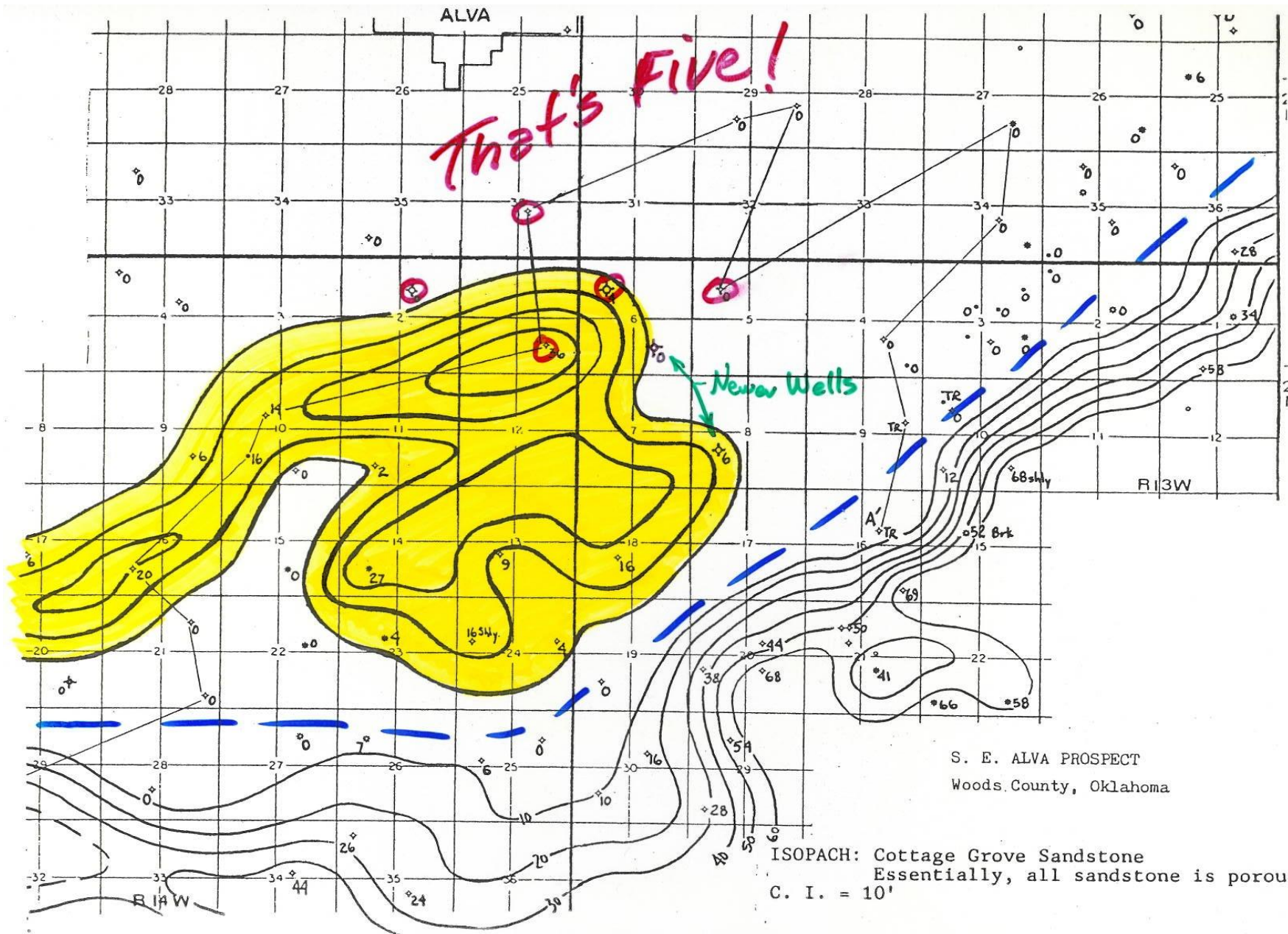


GMC/Wiersig



ALVA

That's Five!



S. E. ALVA PROSPECT
Woods County, Oklahoma

ISOPACH: Cottage Grove Sandstone
Essentially, all sandstone is porous.
C. I. = 10'

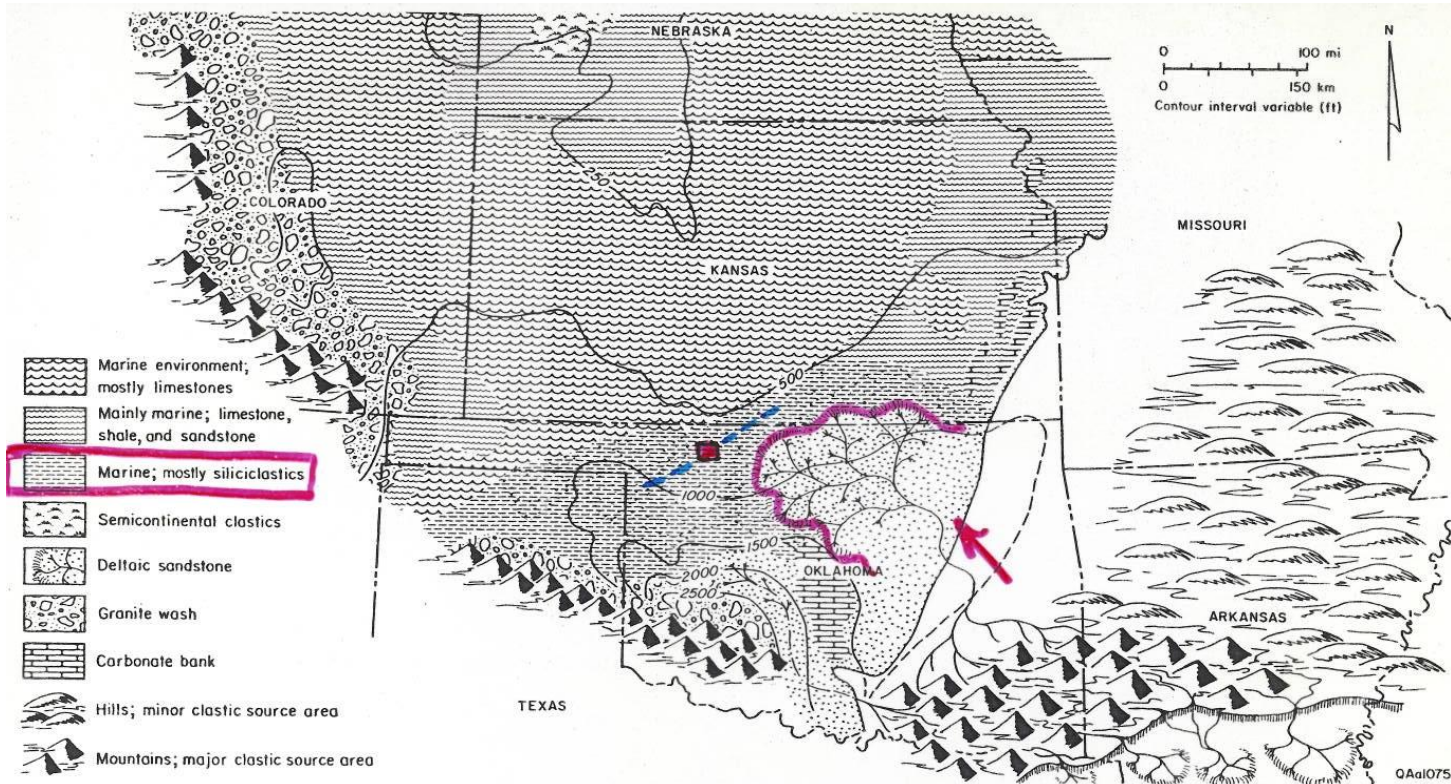
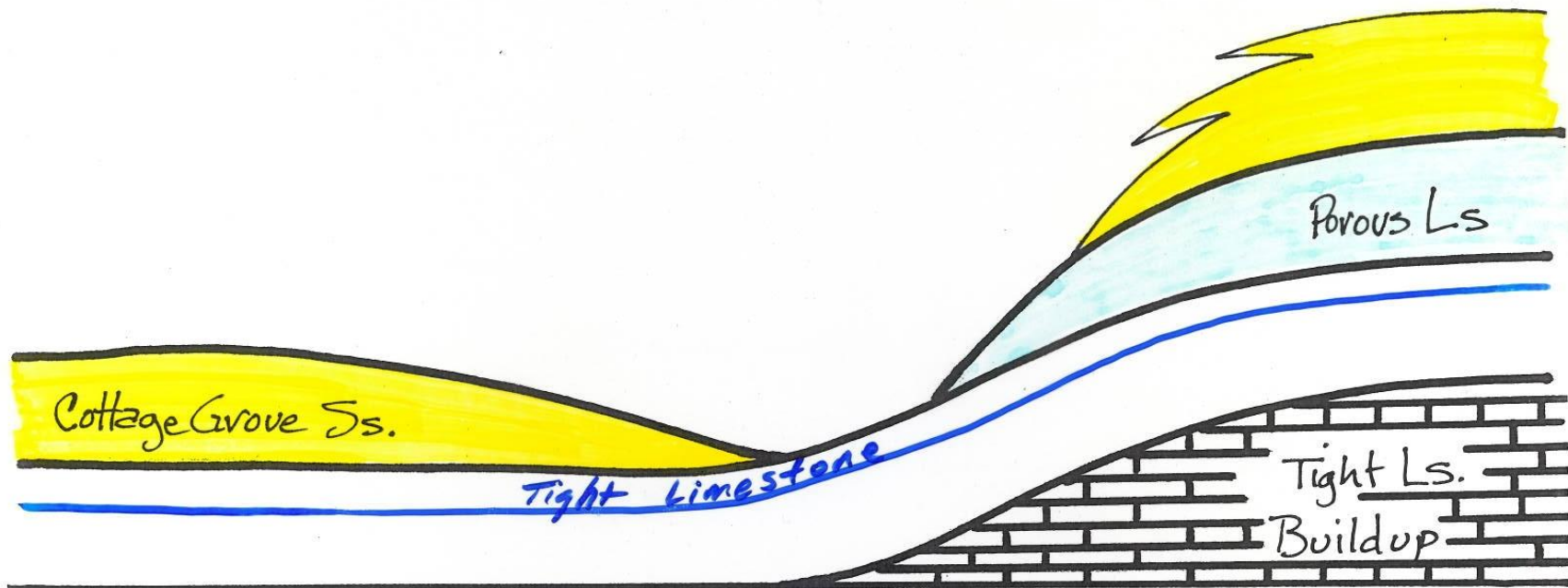


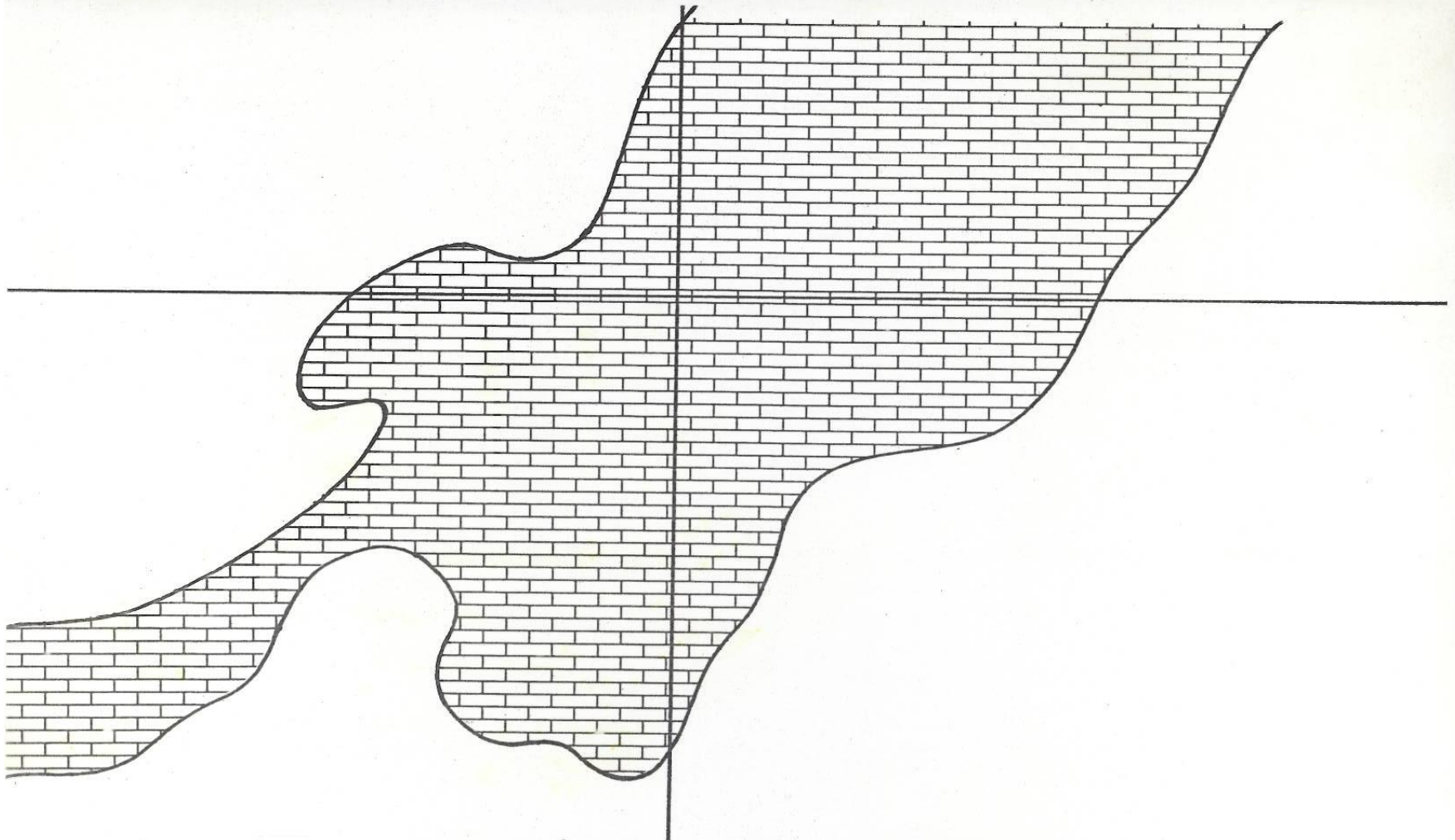
FIGURE 122. Paleogeography of the Midcontinent during the Missourian Epoch and isopach of Missourian strata. From Rascoe and Adler (1983).

- The Cottage Grove *Sandstone ridges* were deposited in a (*shoreface-detached*) *shelf environment*
- Inferred *depositional processes* include
 - Reworking by tidal surge and ebb
 - Winnowing of ridge crests by wave action during storms
 - Episodic delivery of sediment to the shelf by storm induced currents
- A *fossiliferous packstone-grainstone facies* also occurs as thin sheets in some sandstone ridges as well as interridge areas *This is the tight limestone*

Avant

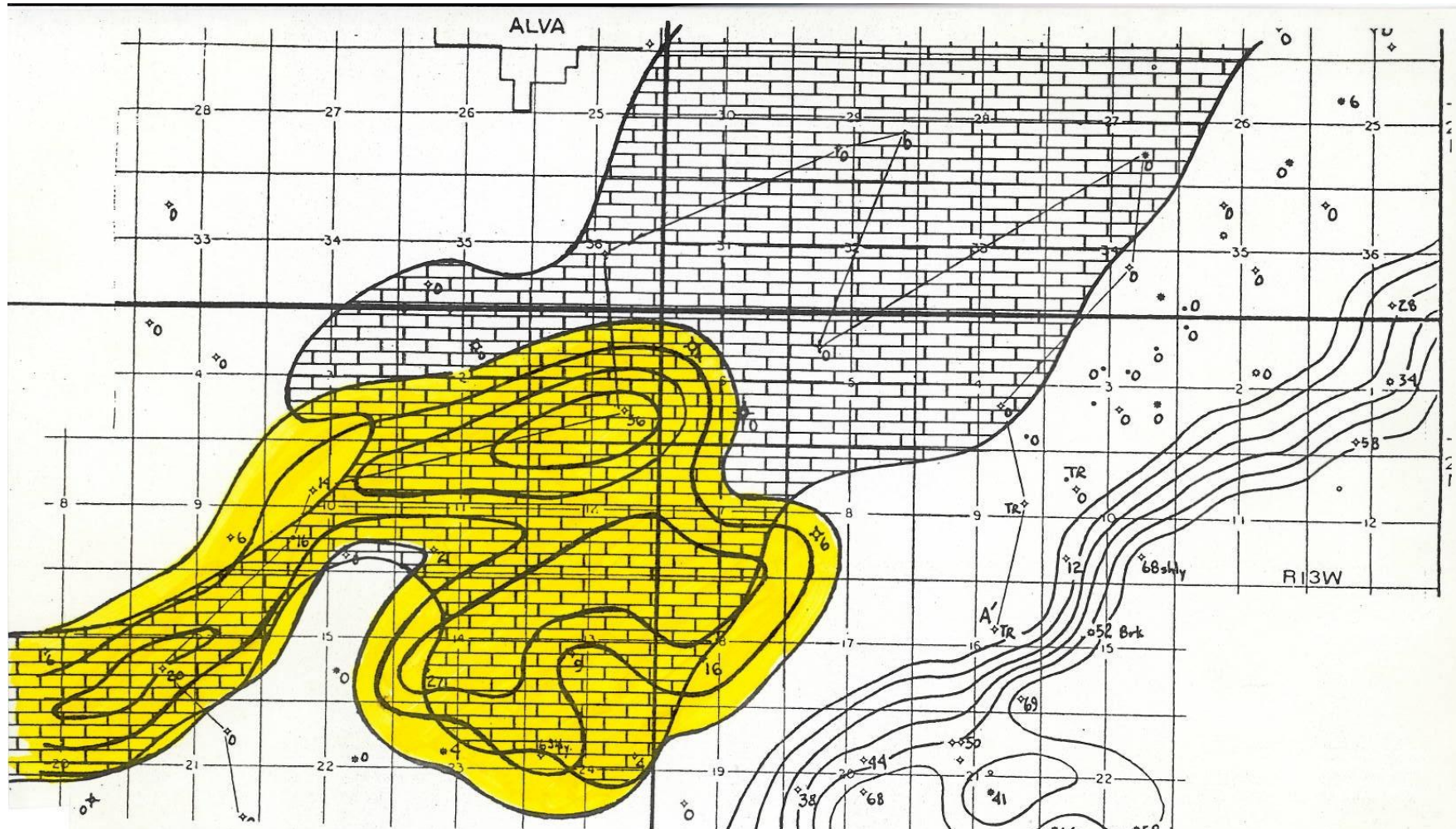


Hogshooter



Chalky, oolitic, porous but impermeable limestone
A **local and anomalous** deposit

This is not the tight limestone



Limestone curiously overlain by the sandstone
? Possible barren reservoir due to no recovery area (encapsulation)?

Very fine grained, shaley, porous but impermeable reservoir
?Prevention of the emplacement of hydrocarbons?

?Leaks to more sandstone updip? or into porous limestone?

S. E. ALVA PROSPECT
 Woods County, Oklahoma

ISOPACH: Cottage Grove Sandstone
 Essentially, all sandstone is porous
 C. I. = 10'

