The Herd Viola Trend, Comanche County, Kansas*

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Abstract

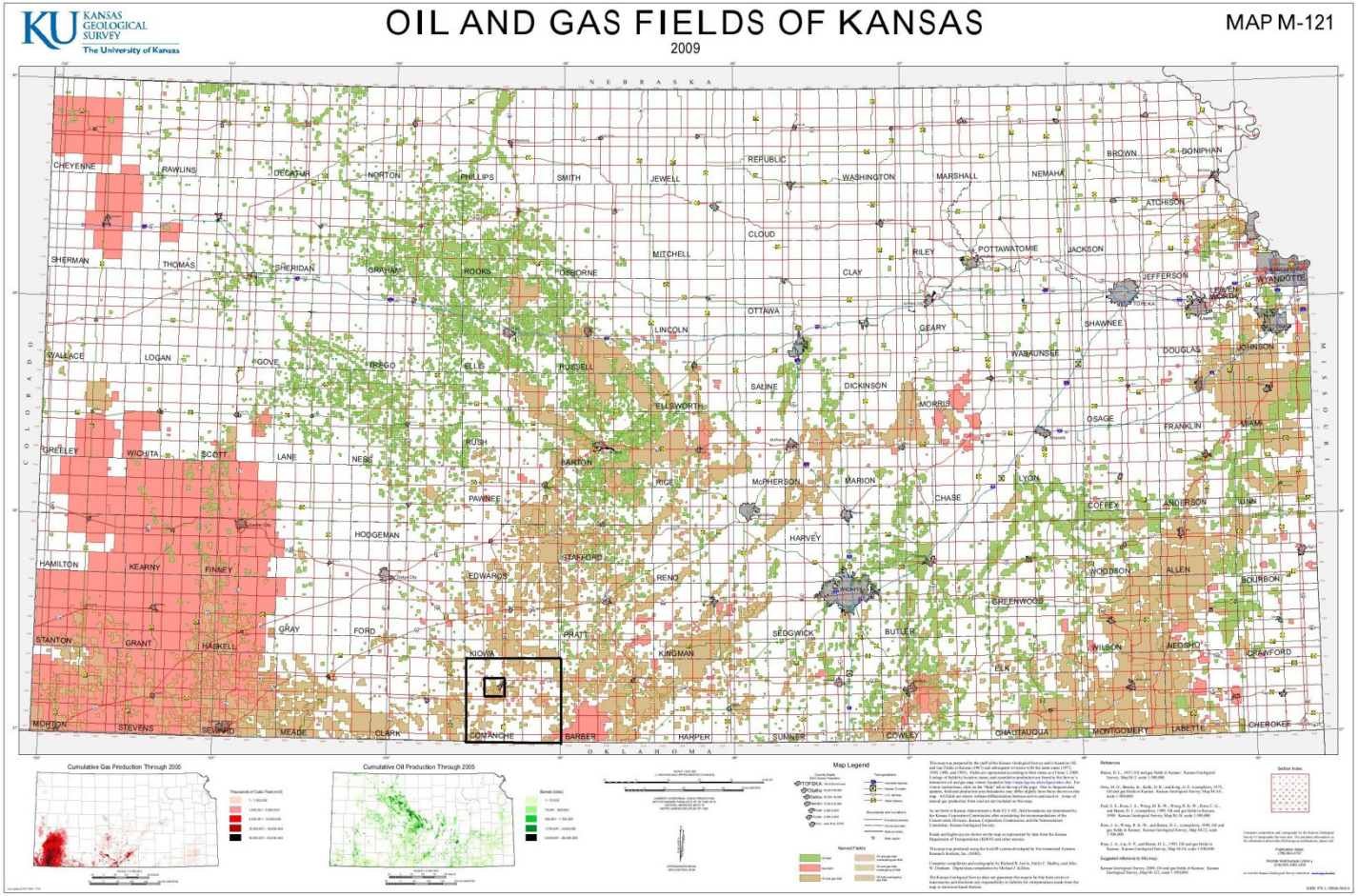
The central portion of Comanche County, Kansas prior to the year 2000 was primarily a Mississippian St. Louis producing area. In April of that year everything changed with the drilling of the Thoroughbred Associates #1 Herd. The #1 Herd was completed in the Viola dolomite flowing 500 BOPD which resulted in an unprecedented leasing and drilling boom in the area and not only expanded the area of Viola production along with the other more traditional producing zones but furnished much valuable information that has aided in the understanding of the geologic conditions that control Viola dolomite oil and gas production.

This study demonstrates that Viola oil production is not necessarily structurally controlled but more importantly by the preservation of that portion of the upper Viola that contains the productive dolomite porosity that lies beneath a difficult to recognize but extremely important erosional unconformity between the Viola and the overlying Maquoketa/Kinderhook section. As a result, the Viola produces from a classic "paleotopographic" trap. The study also shows subsurface mapping techniques that have proven useful in predicting the optimum conditions for porosity preservation. Regional studies also show the relationship between the geologic conditions in the Herd Pool and other Viola pools in Comanche and Clark counties. The Herd Viola trend has produced in excess of 1.1 MMBO along with 208 BCFG from the Viola, Mississippian and Marmaton. The discovery well has produced, by itself, in excess of 560,000 BO along with 330 MMCFG.

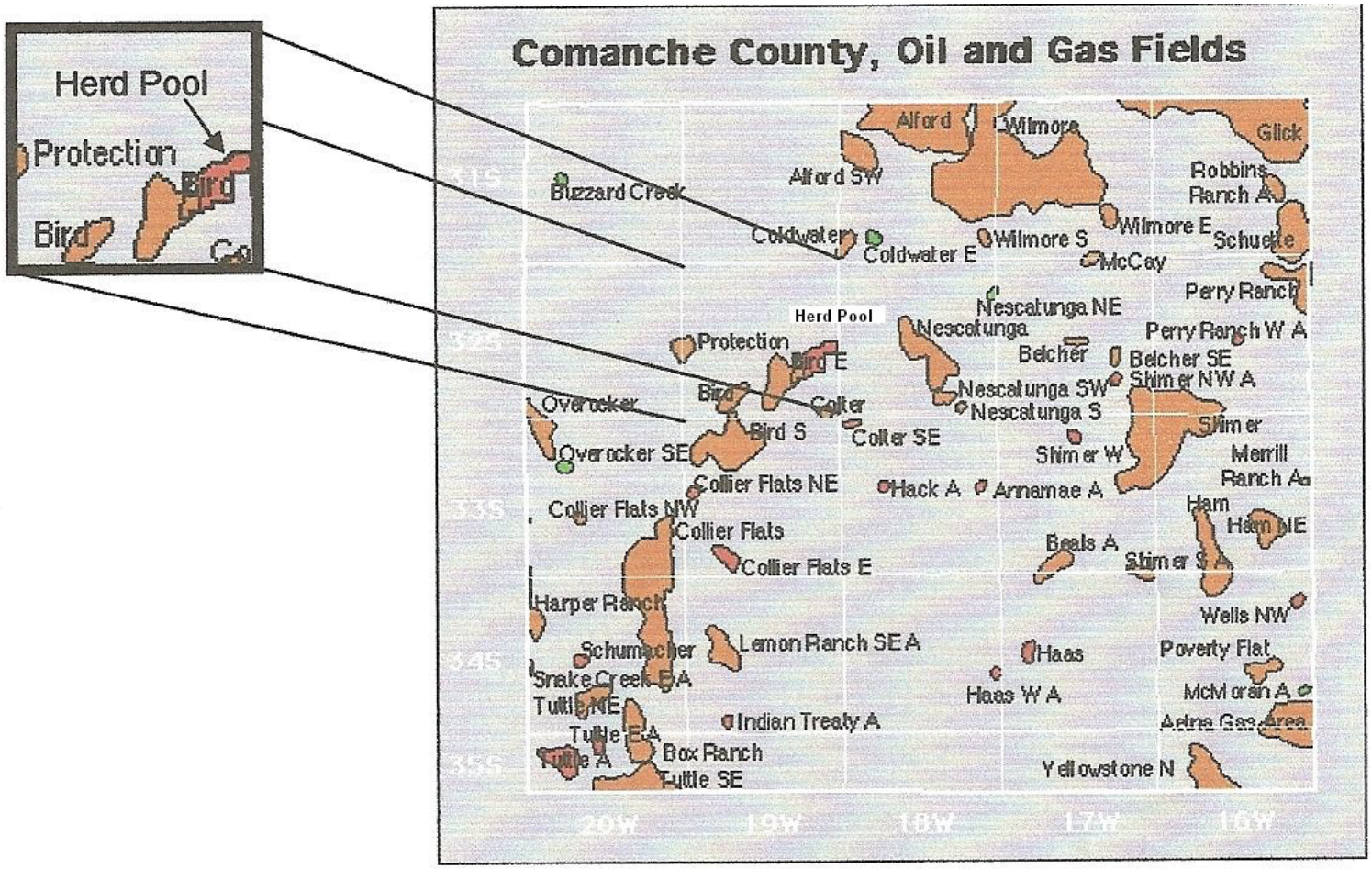
The Herd Viola Trend

Comanche Co., Kansas
Larry J. Richardson
Pickrell Drilling Co., Inc.

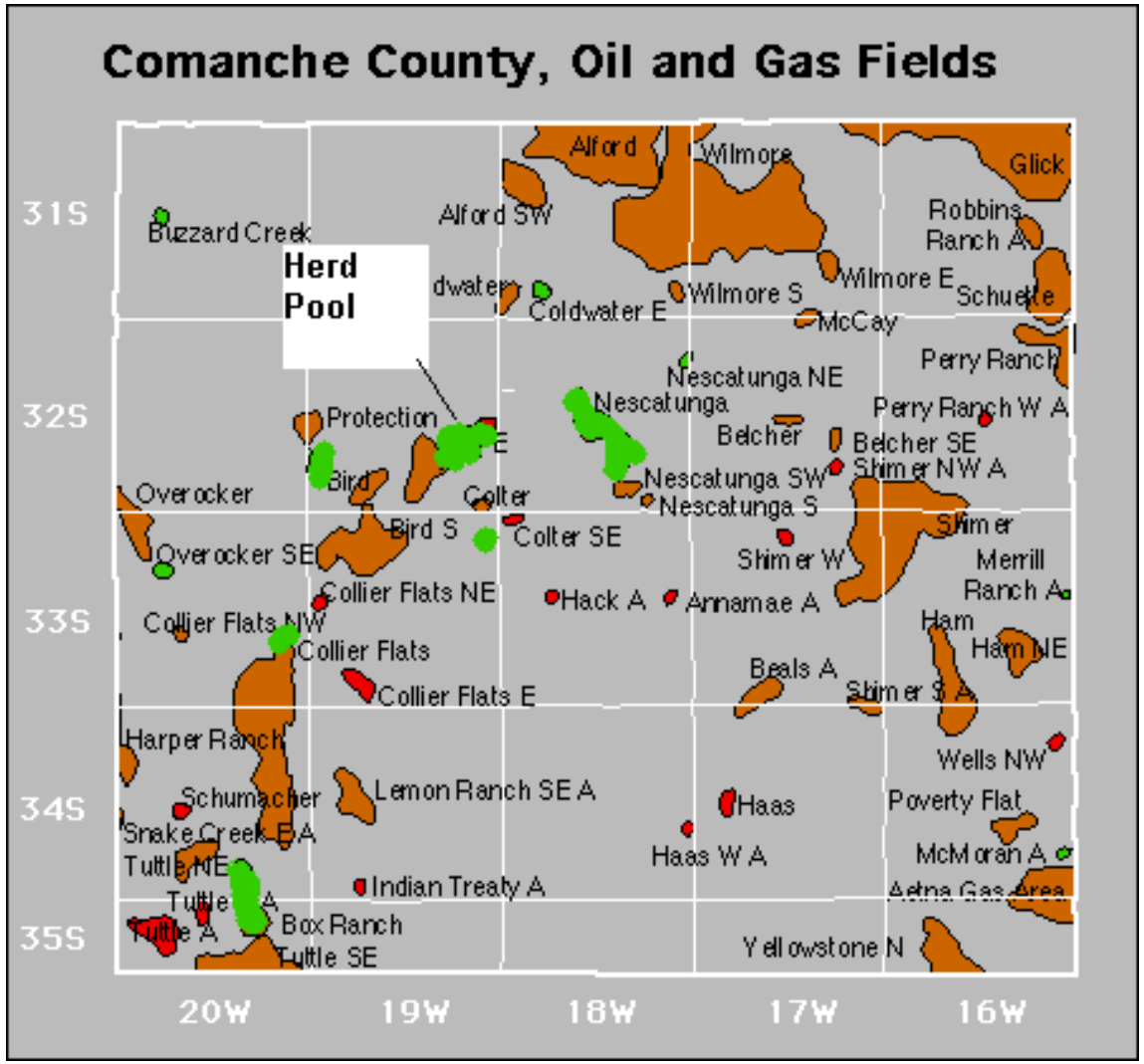
Kansas Oil & Gas Map



Herd Pool Location Map
T32S-R19W



Viola Production in Comanche Co.

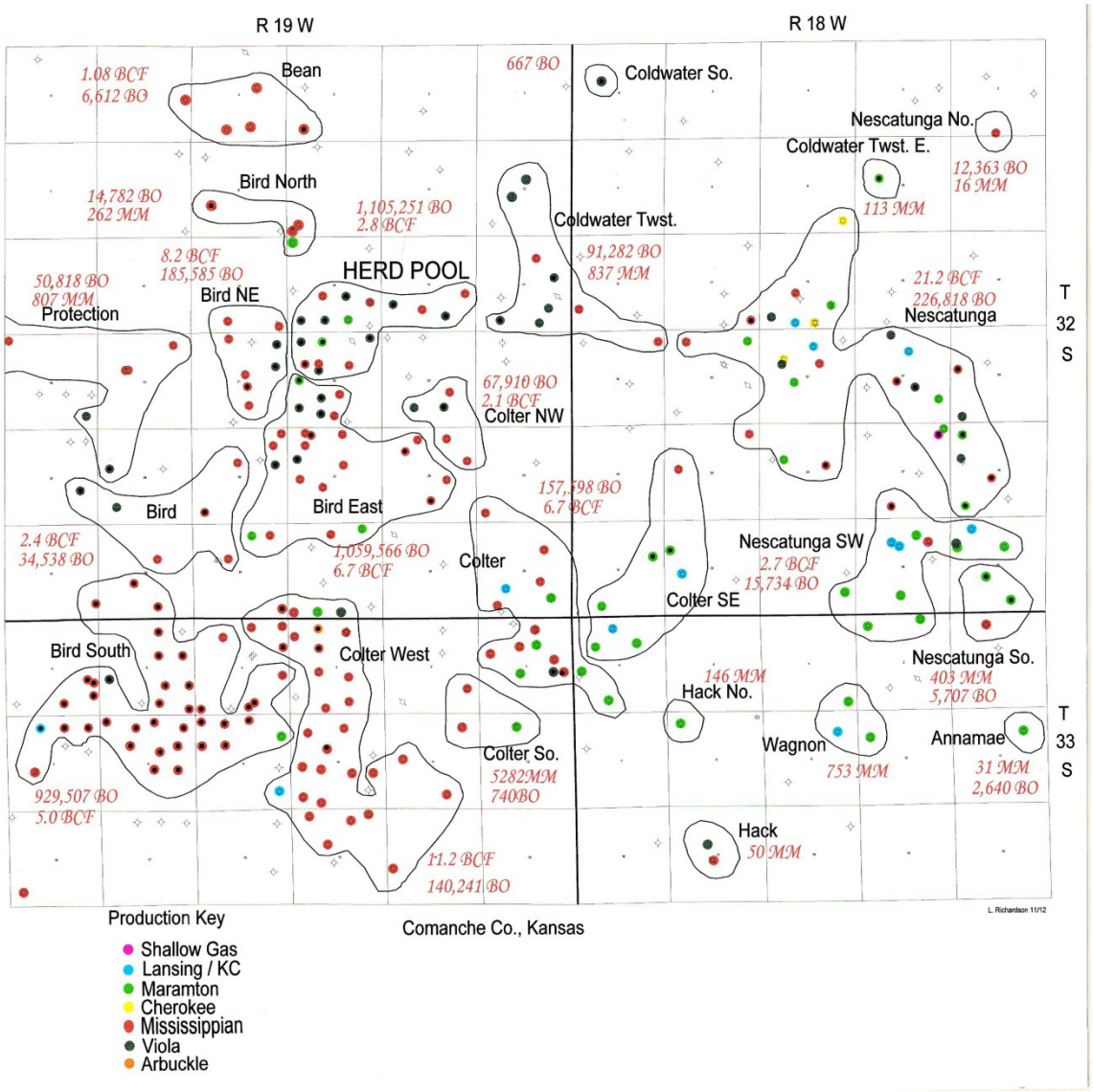


Significant Viola Pools in Area

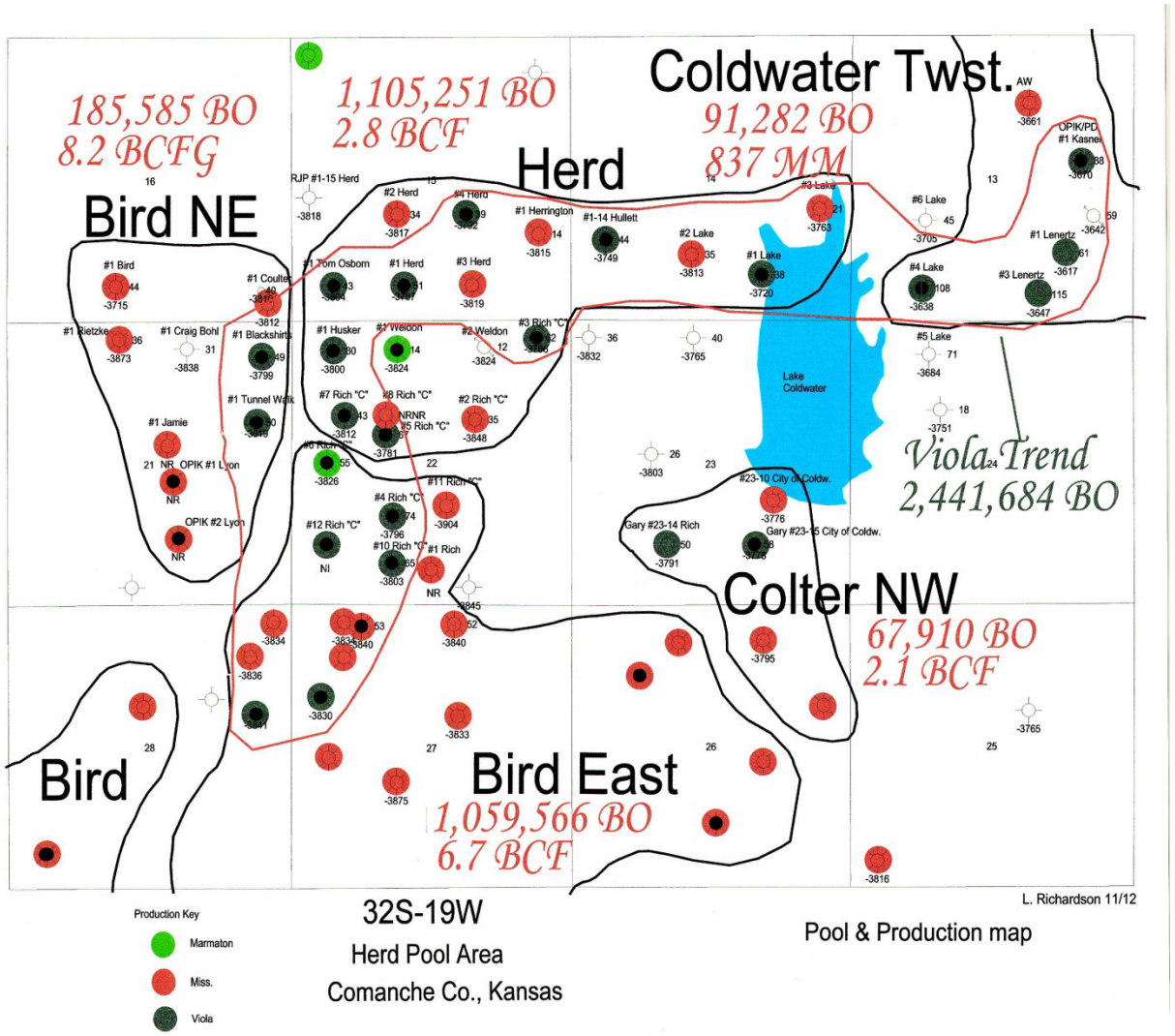
- Nescatunga 231,027 BO & 21.3 BCFG
- Box Ranch 1,229,164 BO & 4.5 BCFG
- Schumacher N. 718,589 BO & 1.6 BCF
- Bird East 1,068,574 BO & 6.8 BCF
- Herd 1,114,499 BO & 2.9 BCF

(note: production is not exclusively from Viola but contains production from Mississippian & Marmaton & other zones)

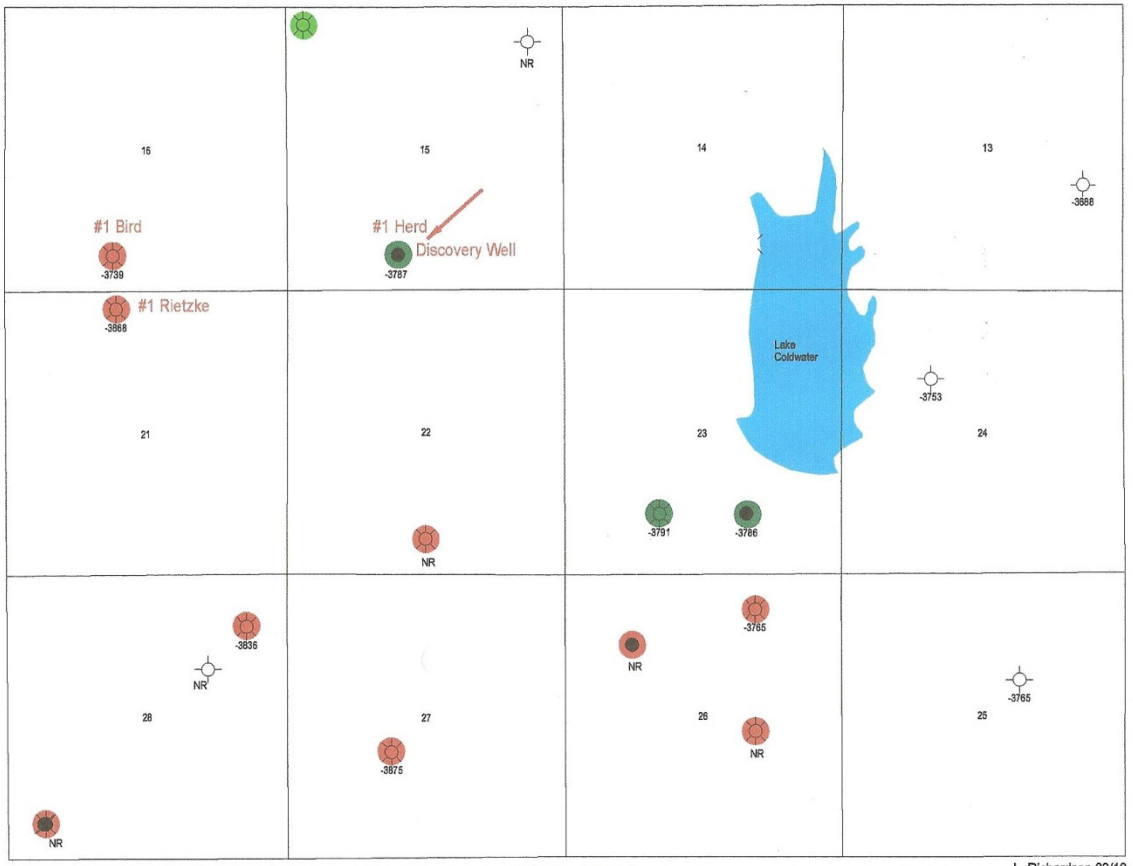
Herd Pool showing surrounding production



Herd Viola Trend



Herd Discovery Well



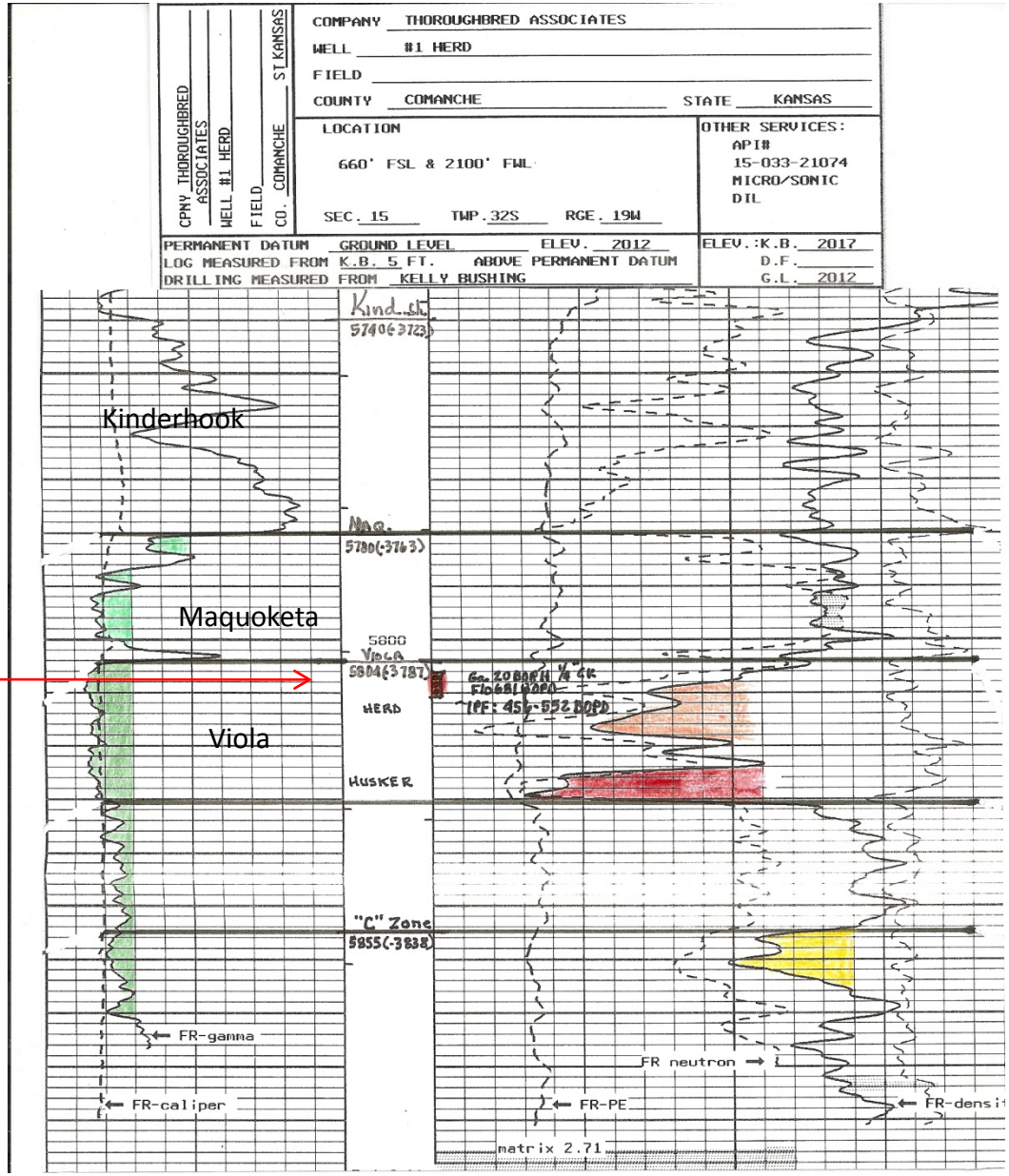
Herd Pool Discovery Well

CUM: 563,347 BO

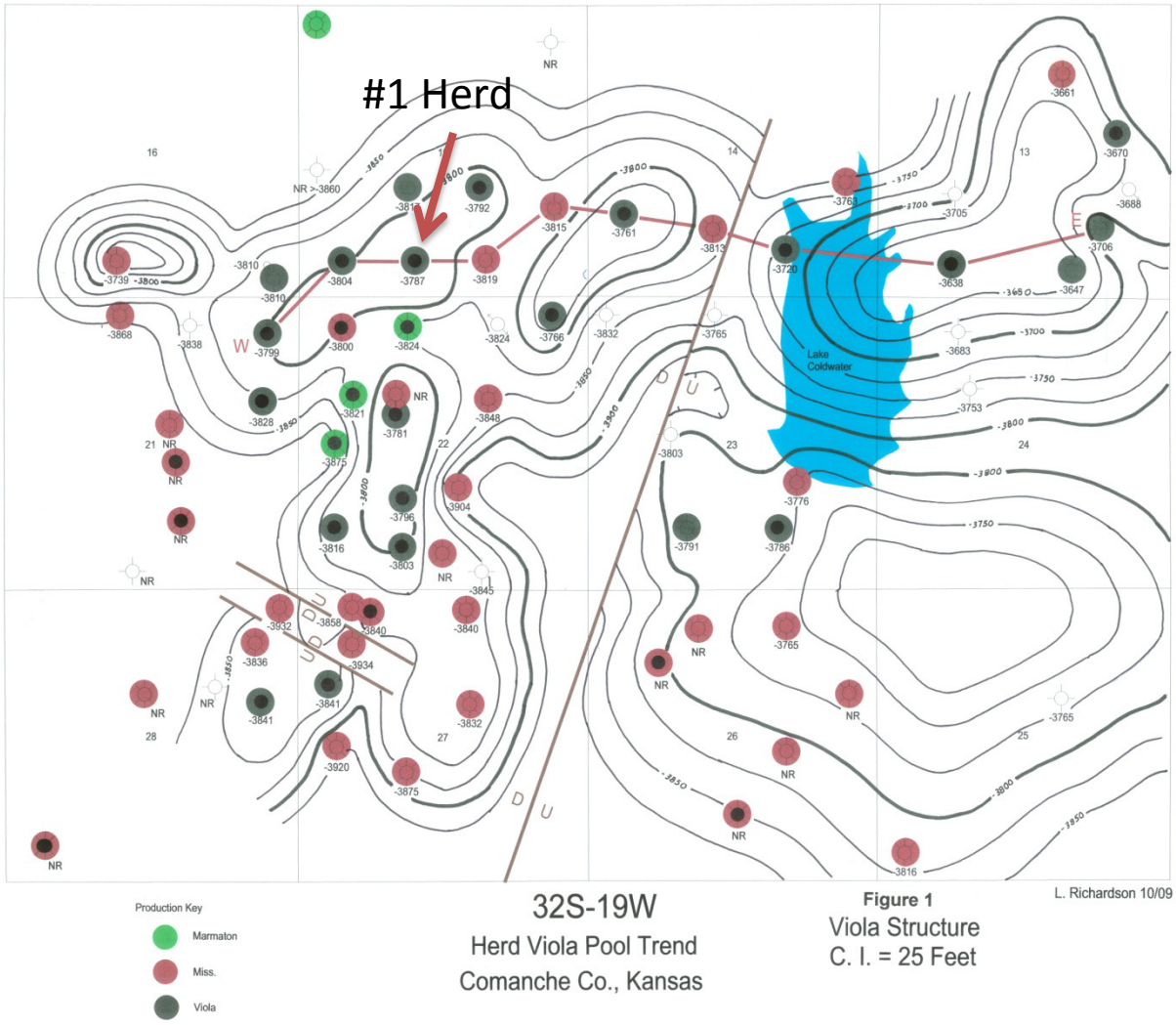
328 MMCFG

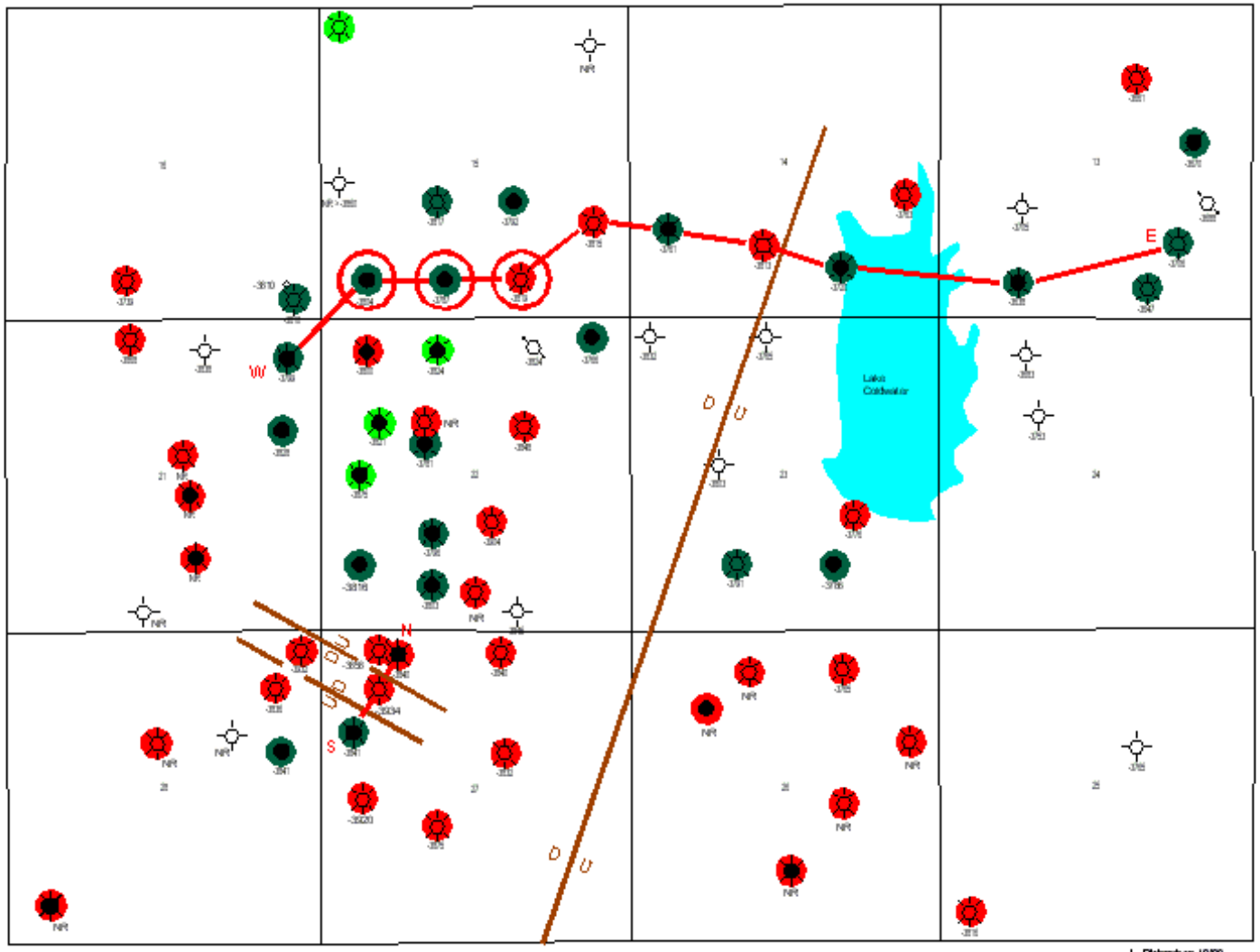
AS OF 2012

IPF 456-552 BOPD



Viola Structure





L. Richardson 10/09

32S-19W

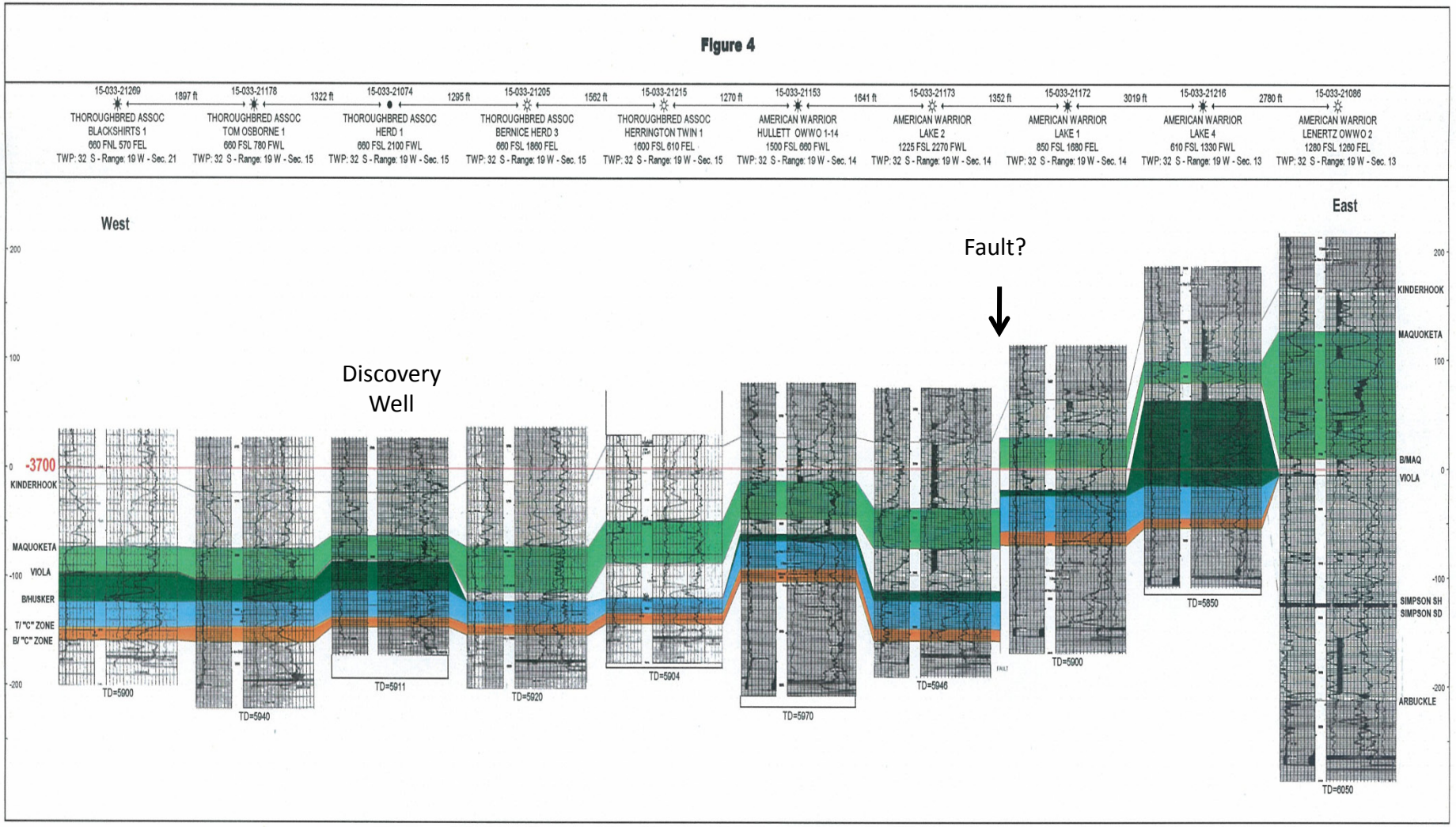
Herd Viola Pool Trend

Comanche Co., Kansas

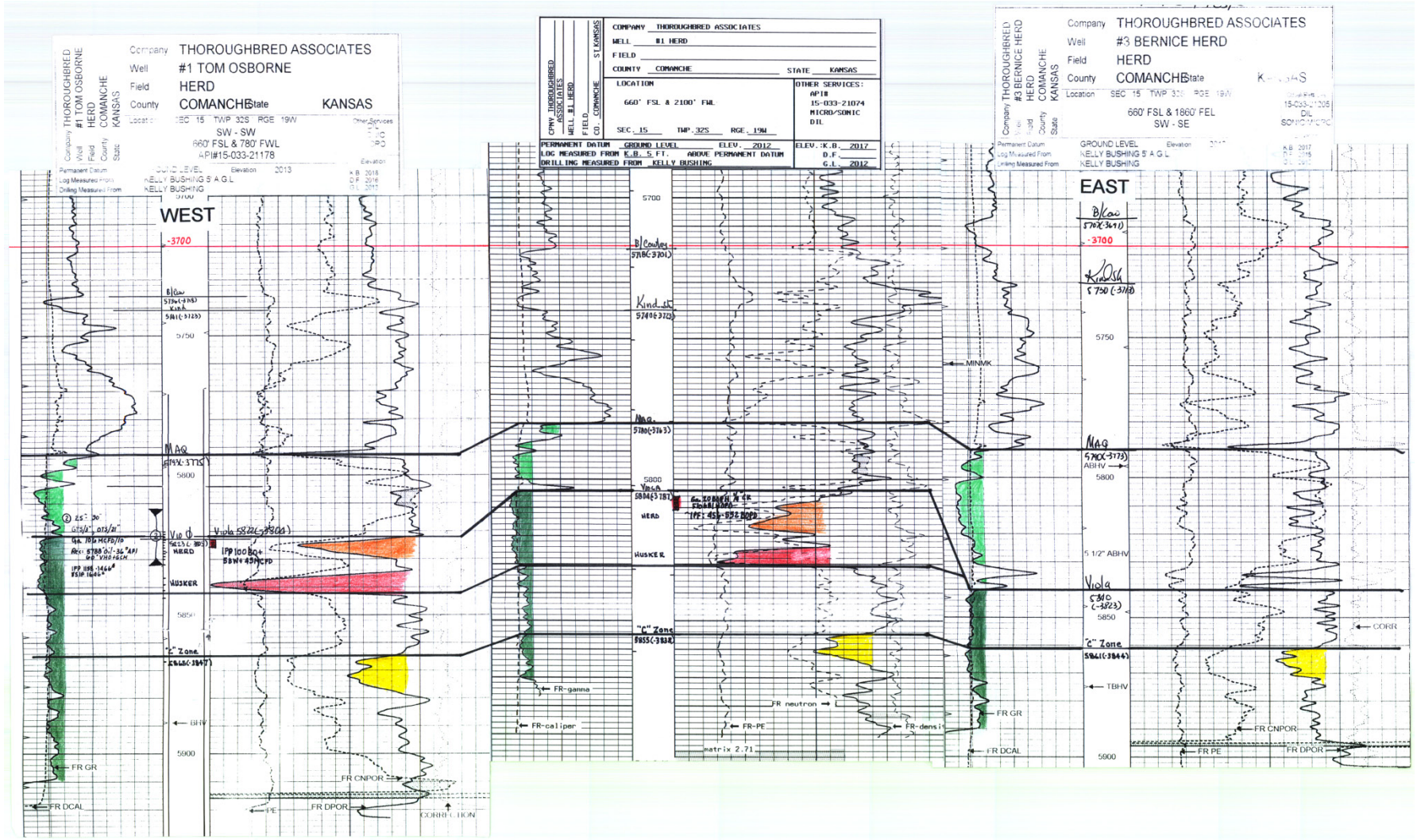
Viola Structure

C. I. = 25 Feet

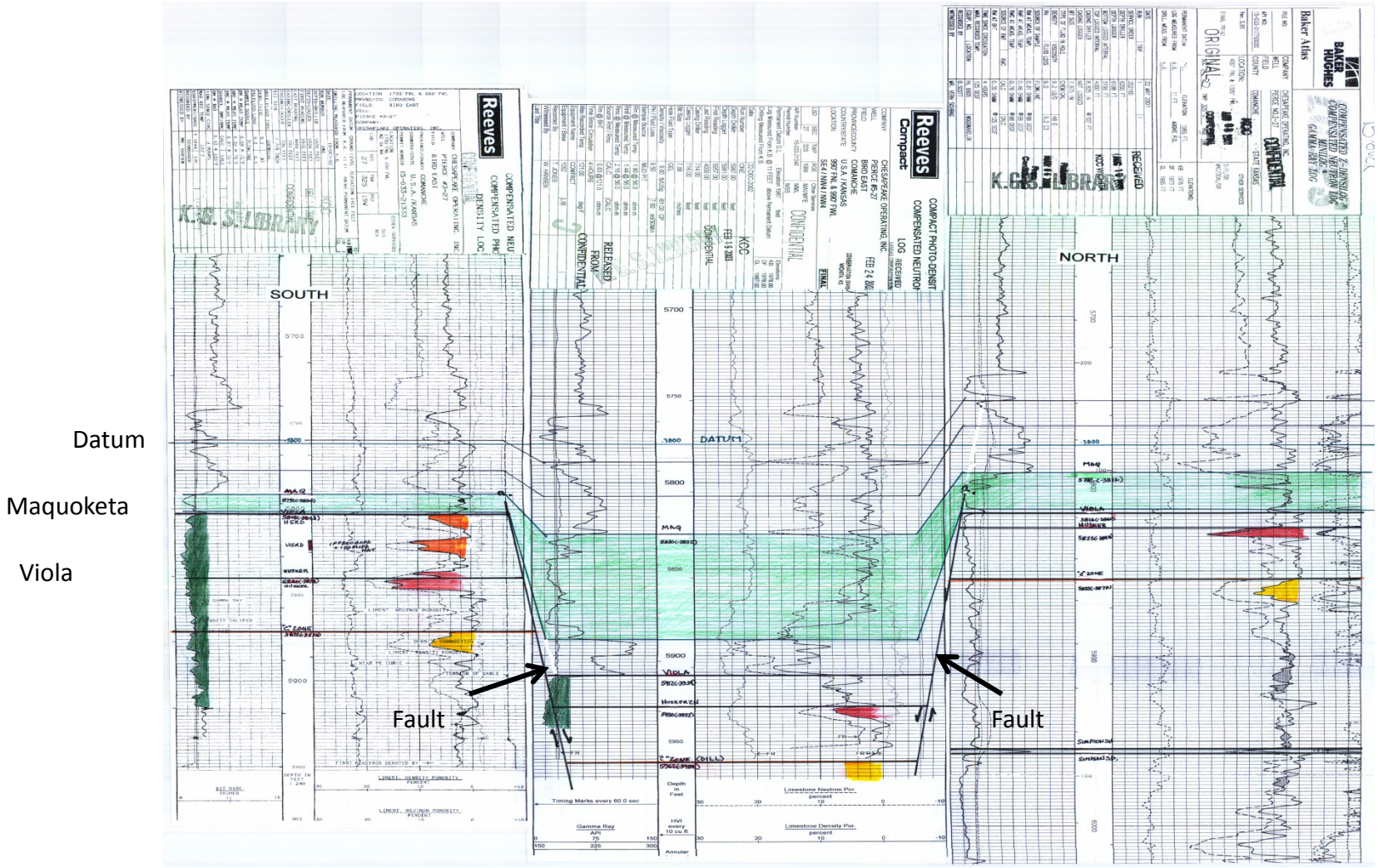
West-East Cross Section



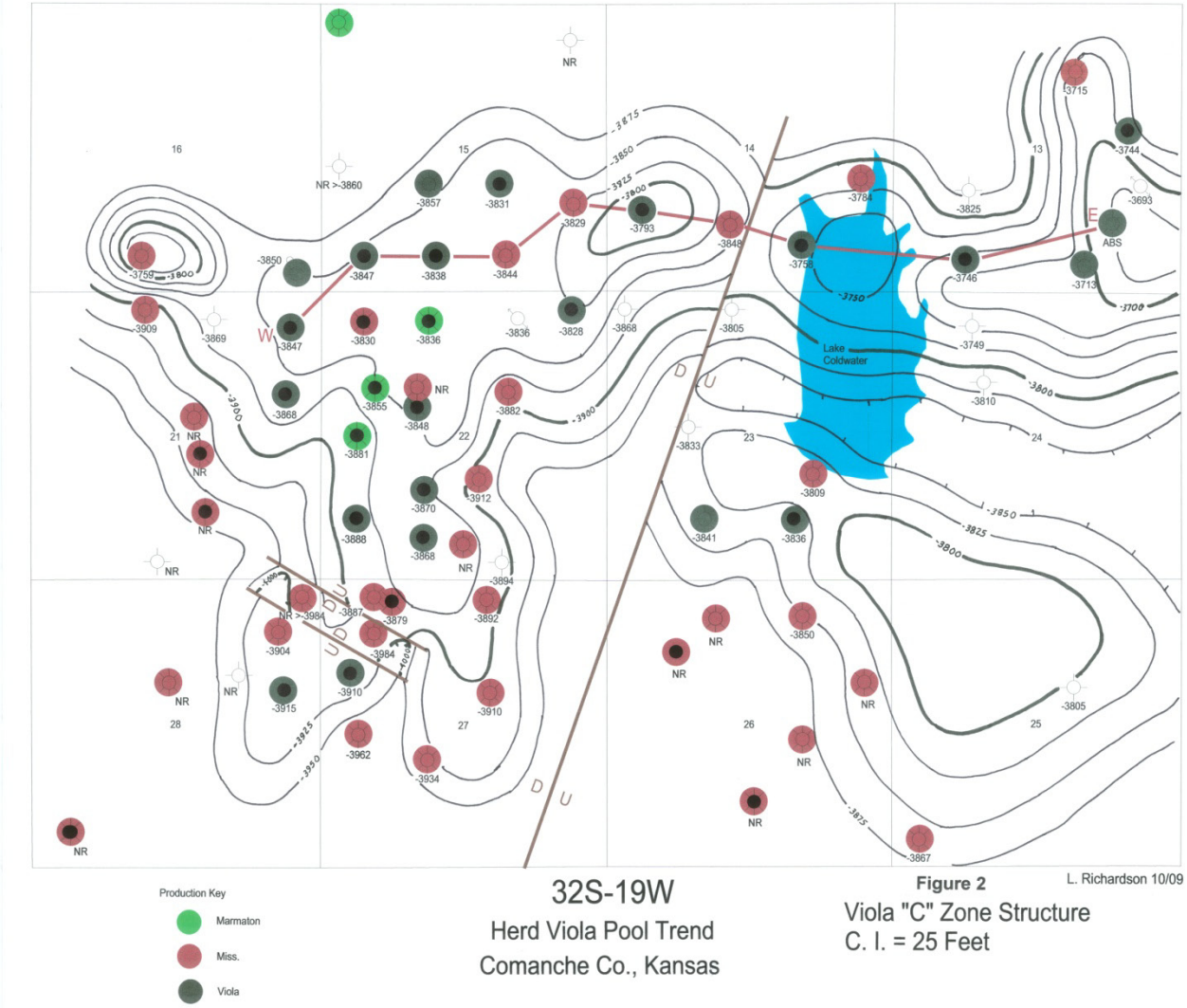
Detailed Cross Section



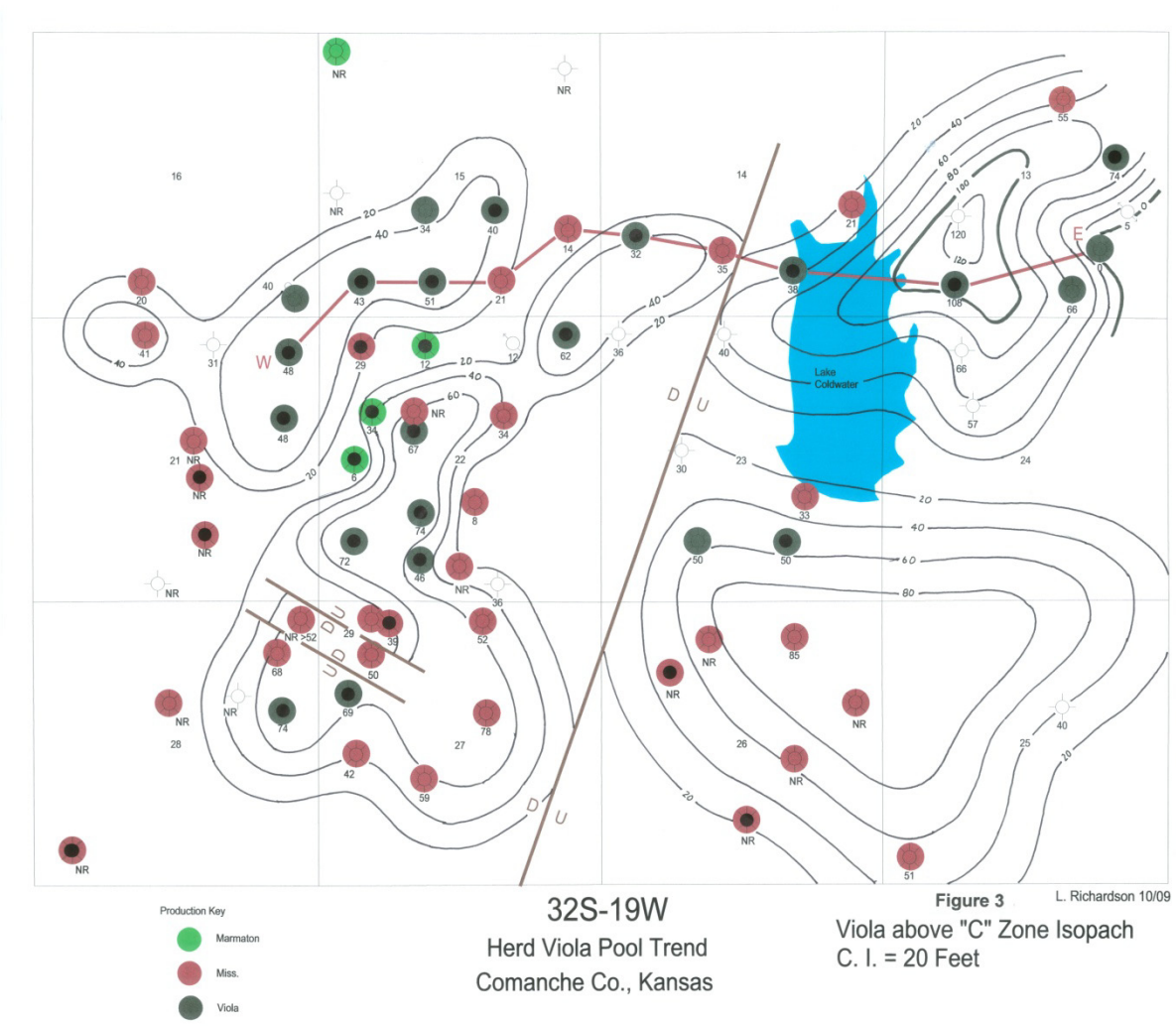
Cross Section showing Graben



Viola “C” Zone Structure



Isopach Map of Viola Above “C”



How does the Viola in the Herd Trend compare to the Viola in other wells in the area?

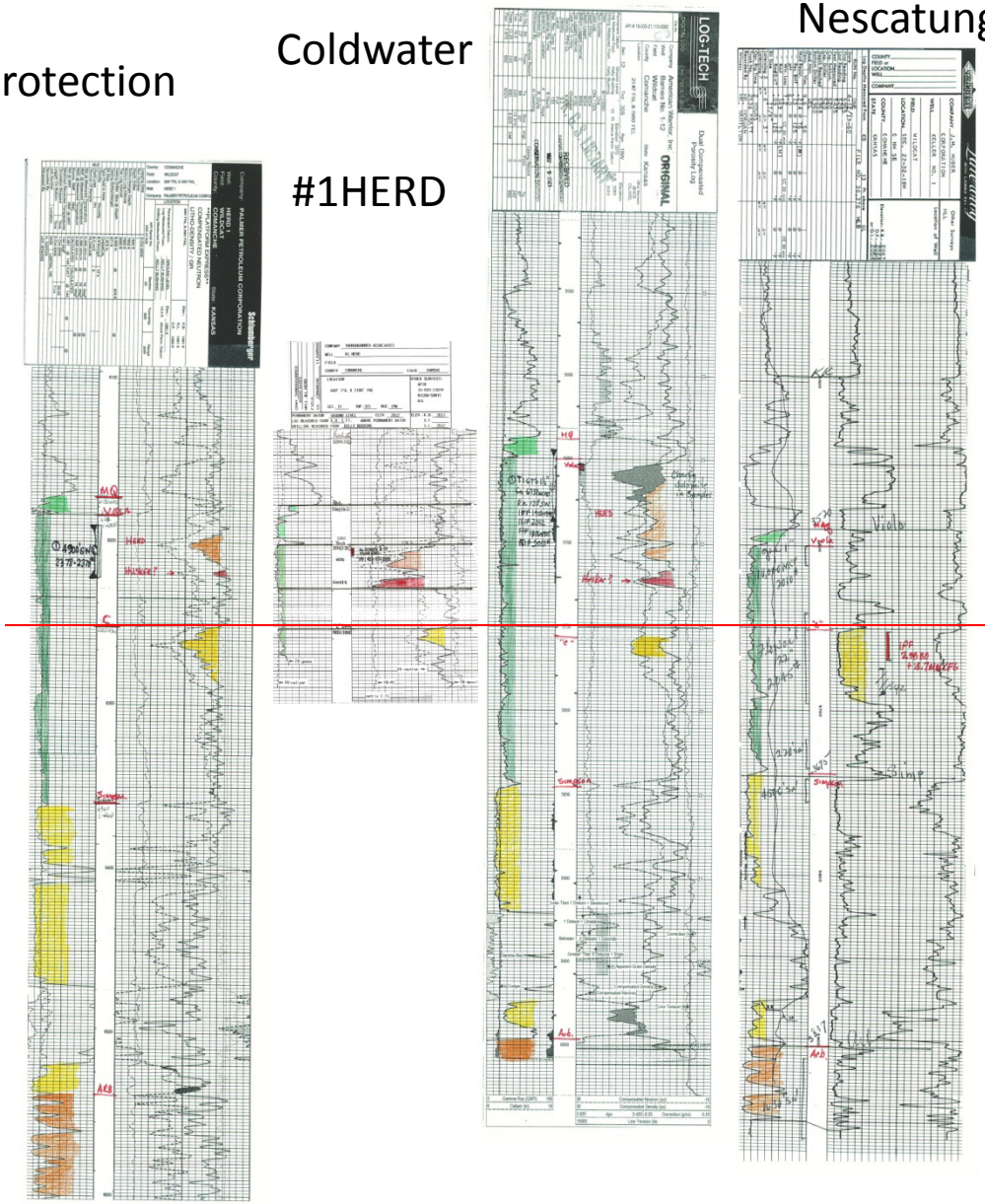
Protection

Coldwater

Nescatunga

#1HERD

"C" Zone



Mississippian Structure

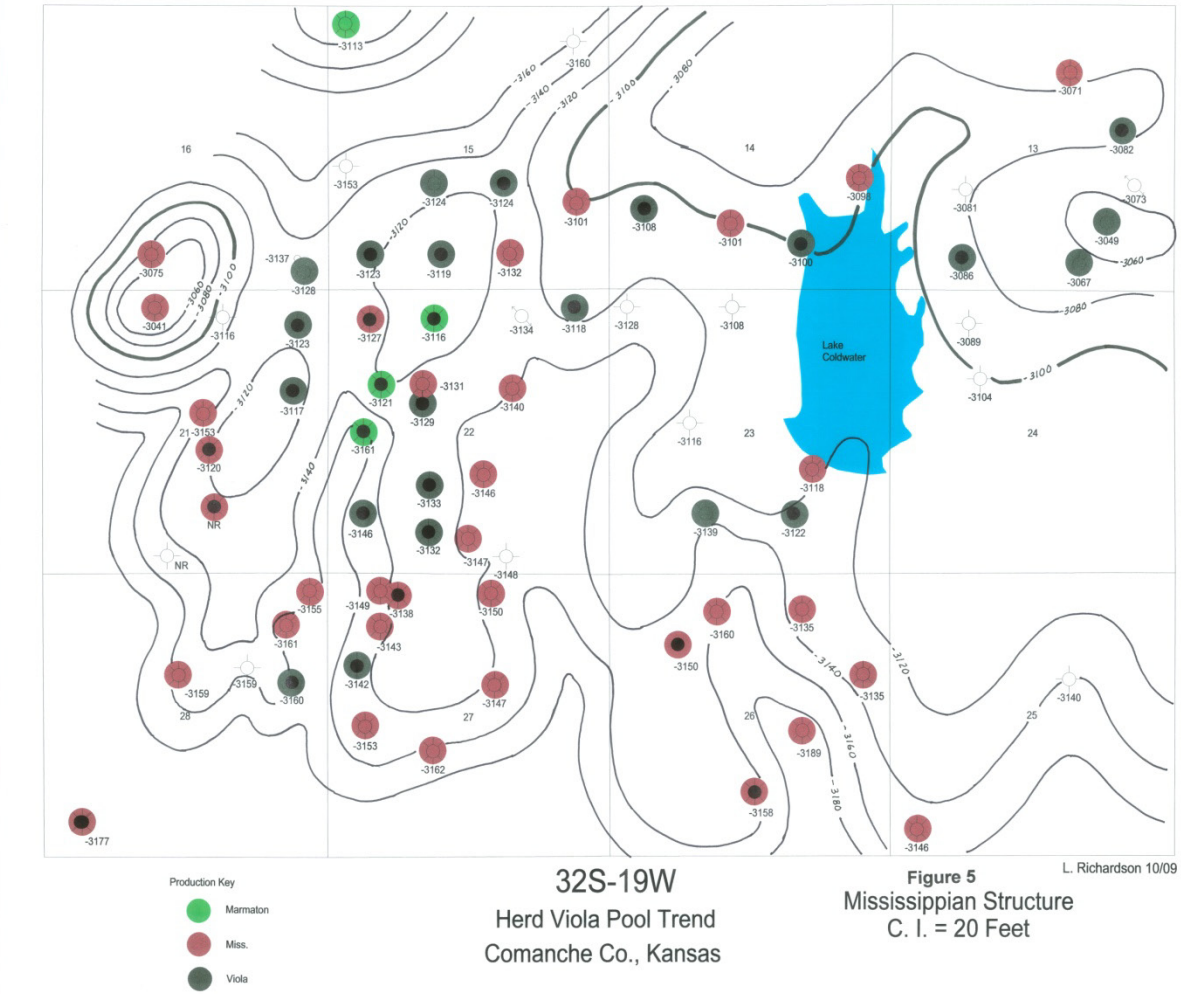
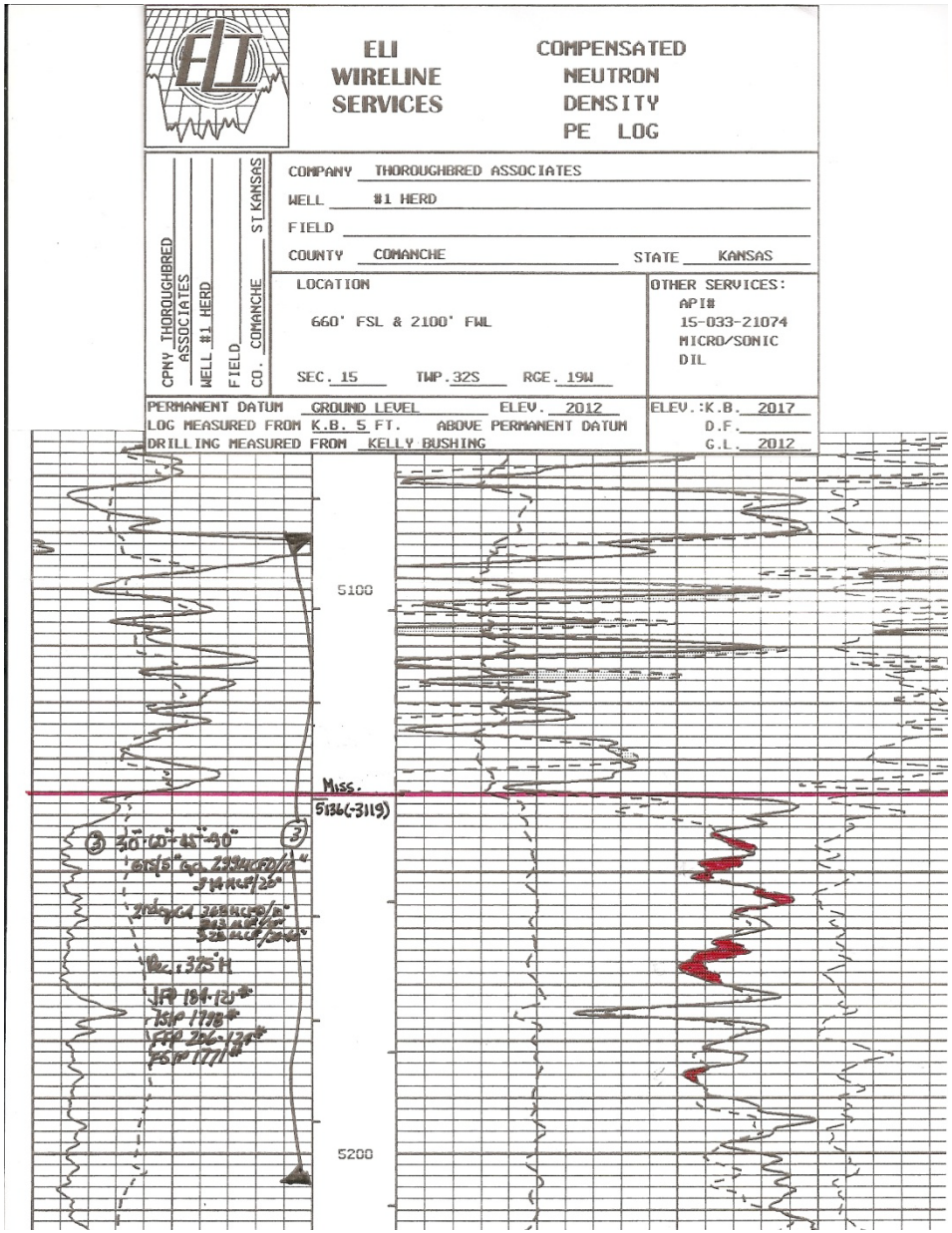
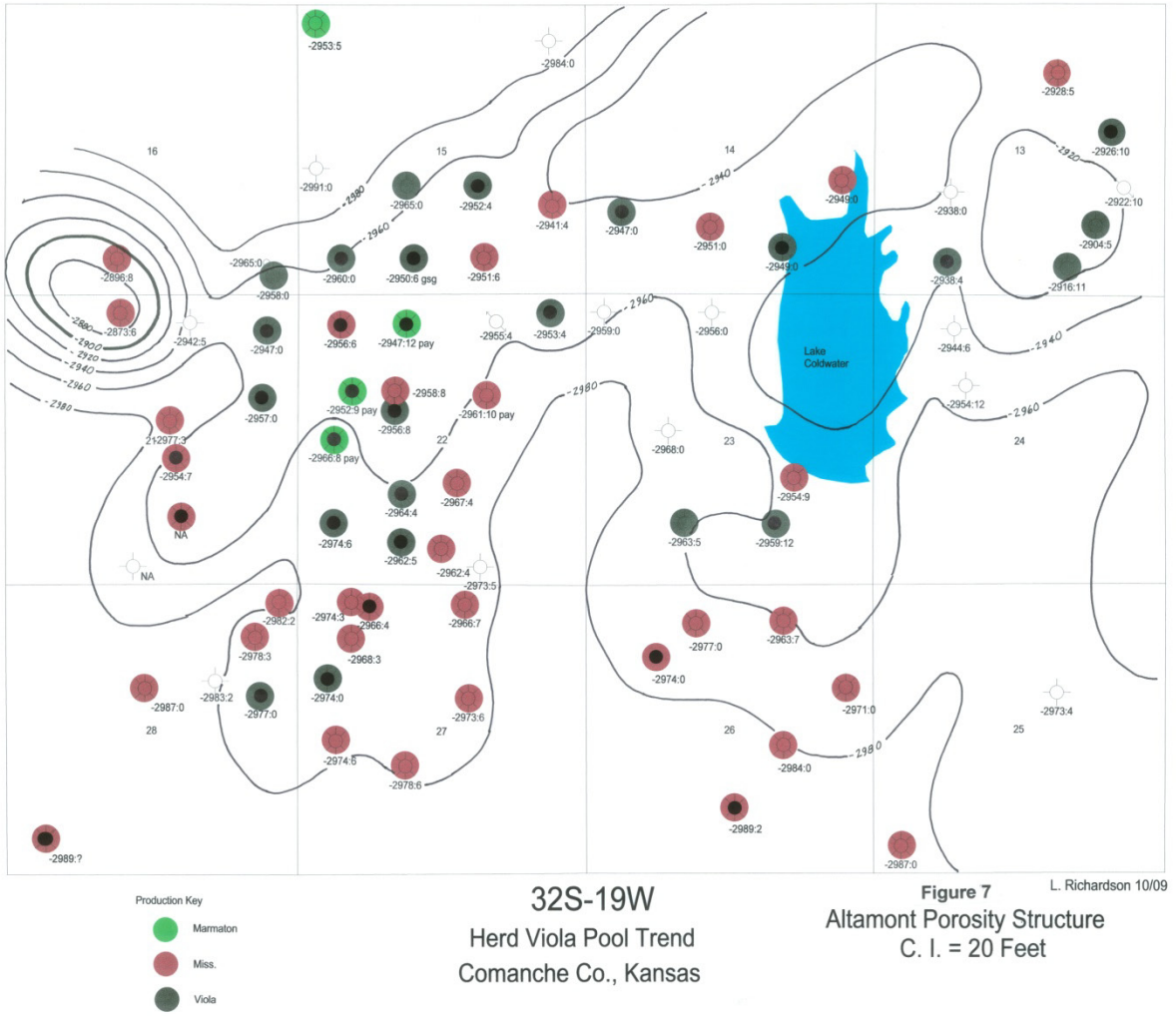


Figure 5
Mississippian Structure
C. I. = 20 Feet

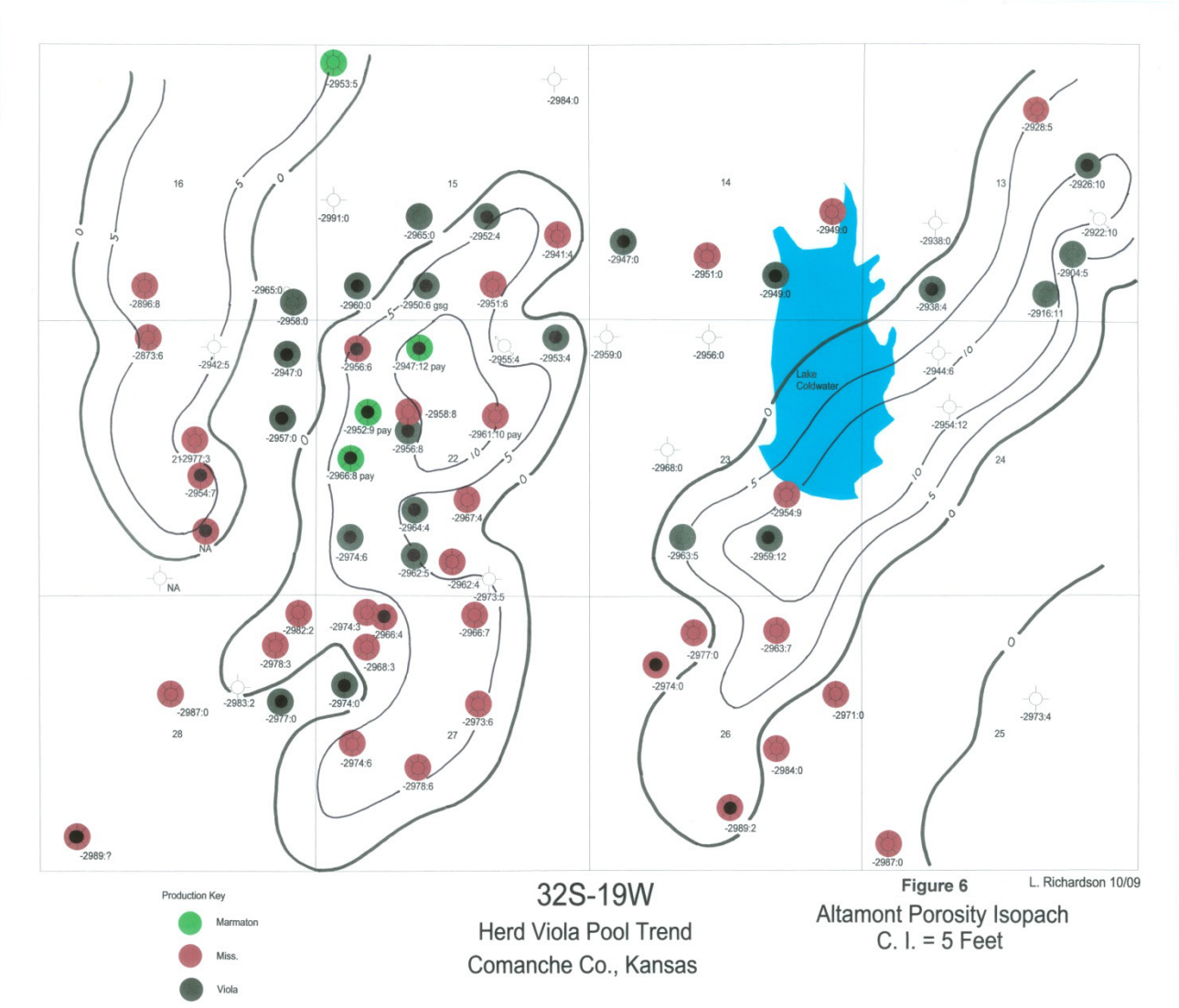
Mississippian Section



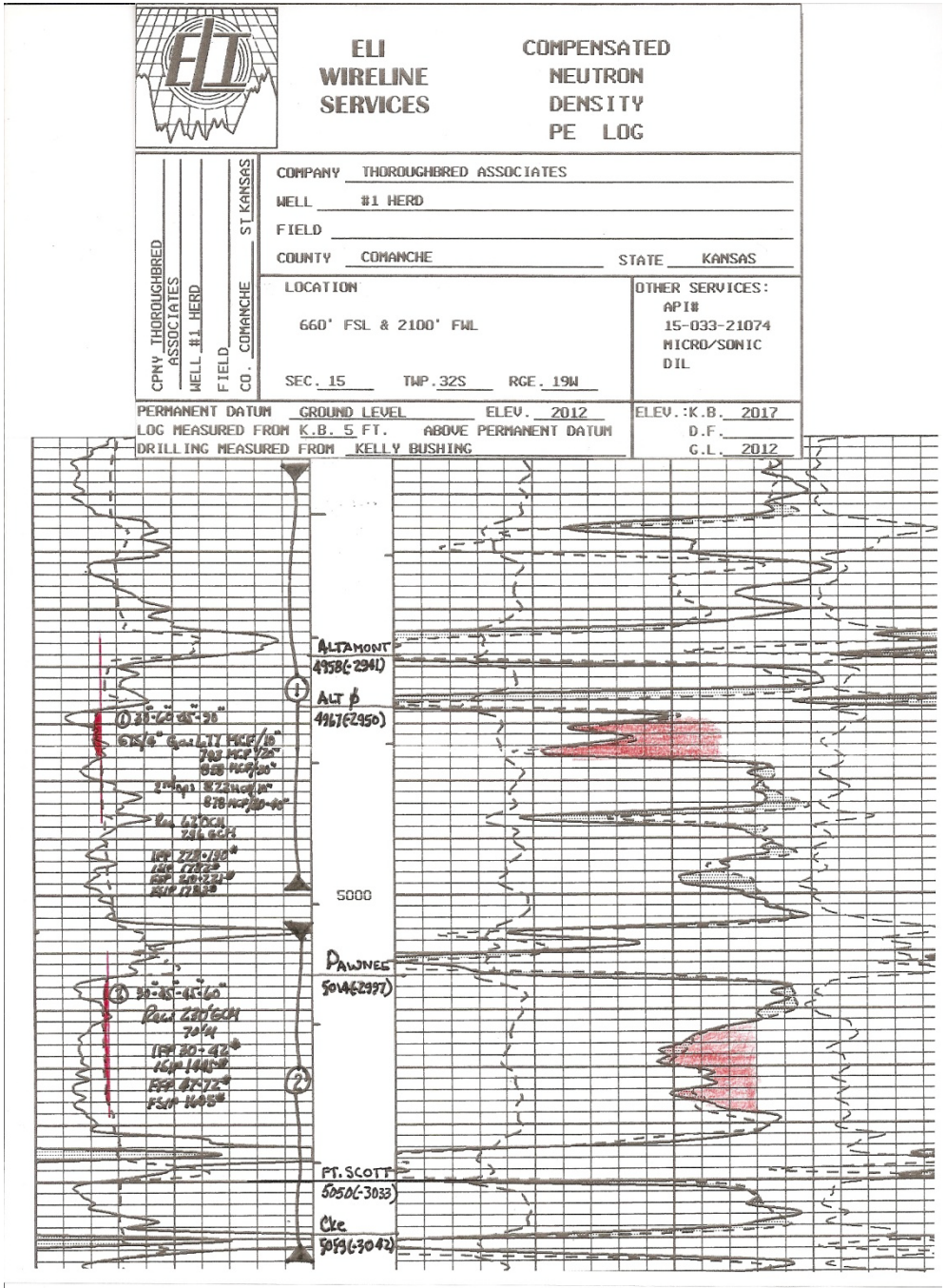
Altamont Porosity Zone Structure



Altamont Porosity Isopach



Altamont / Pawnee Section



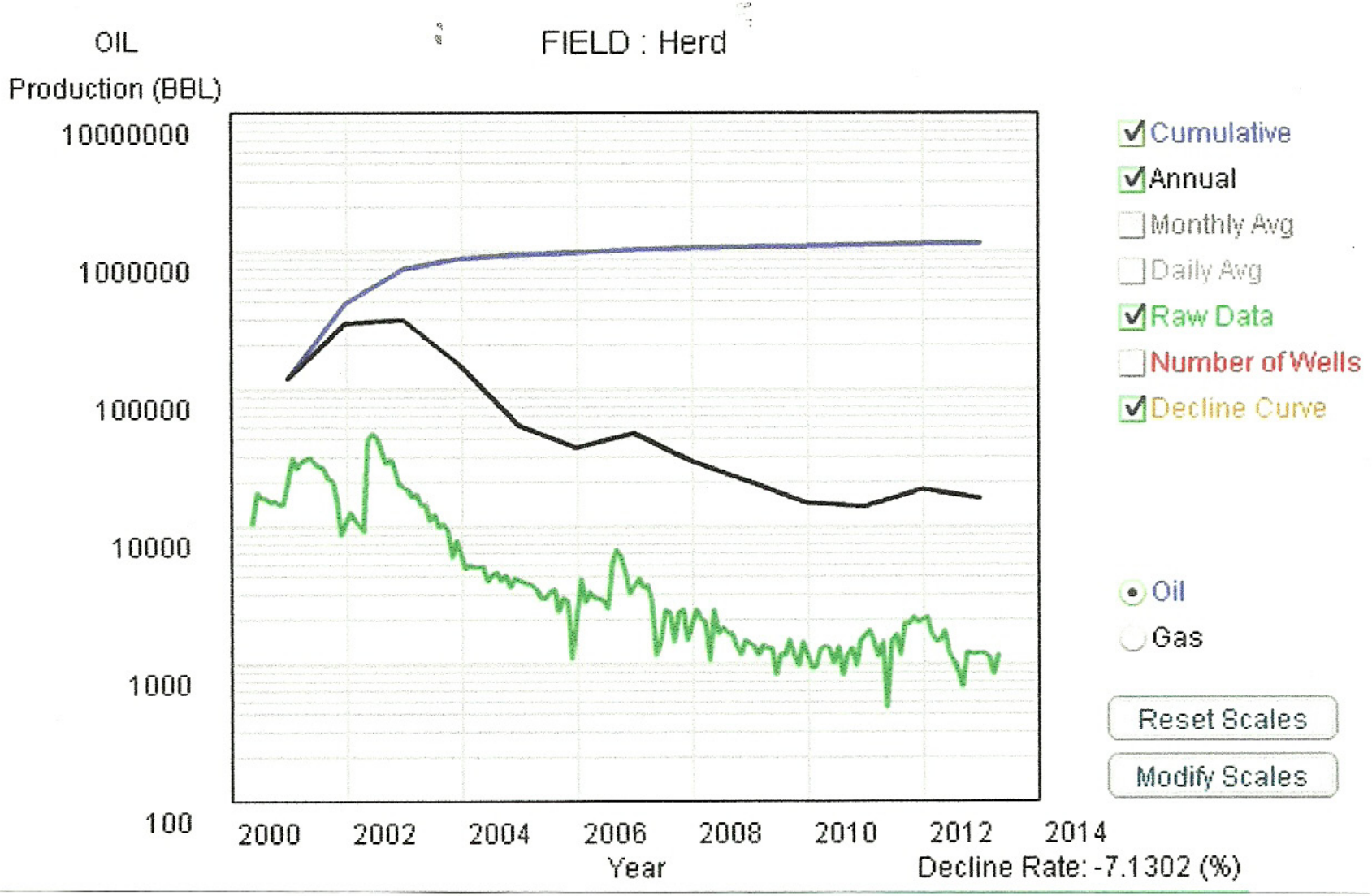
Herd Pool Production History

Year	Oil			Gas		
	Production (bbls)	Wells	Cumulative (bbls)	Production (mcf)	Wells	Cumulative (mcf)
2000	-	2	116,159	-	-	0
2001	292,457	5	408,616	72,273	4	72,273
2002	310,889	7	719,505	542,095	10	614,368
2003	143,621	4	863,126	431,884	12	1,046,252
2004	53,269	4	916,395	342,769	11	1,389,021
2005	36,308	3	952,703	288,138	11	1,677,159
2006	46,470	3	999,173	236,520	11	1,913,679
2007	28,866	2	1,028,039	194,638	11	2,108,317
2008	20,532	3	1,048,571	164,933	11	2,273,250
2009	14,373	3	1,062,944	169,514	11	2,442,764
2010	13,576	4	1,076,520	170,044	11	2,612,808
2011	18,173	4	1,094,693	137,367	11	2,750,175
2012	15,581	4	1,110,274	129,825	11	2,880,000
2013	4,225	4	1,114,499	34,472	11	2,914,472

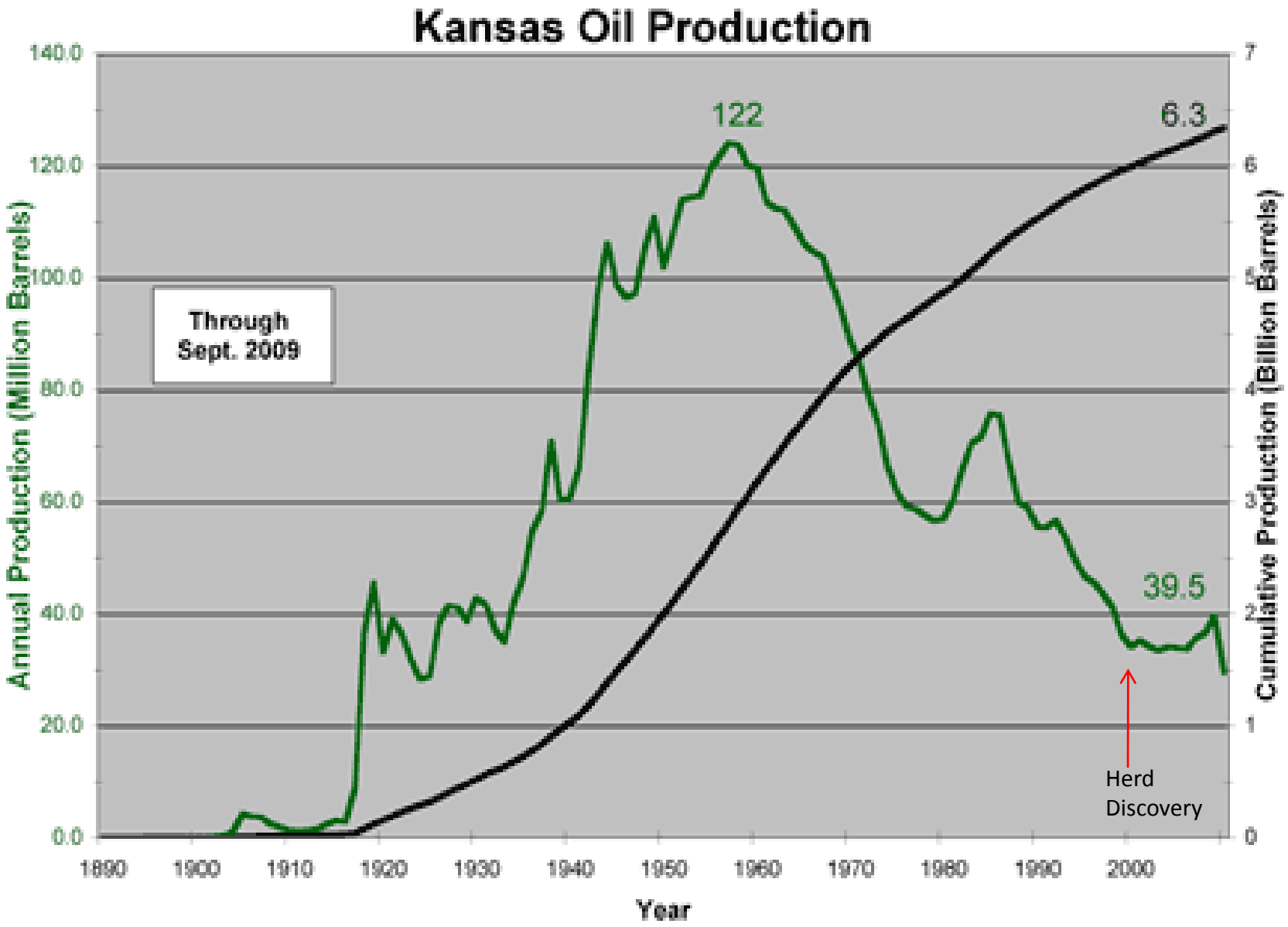
Updated through 4-2013.
Note: bbls is barrels; mcf is 1000 cubic feet.

Source: Kansas Geological Survey website

Herd Pool Decline Curve

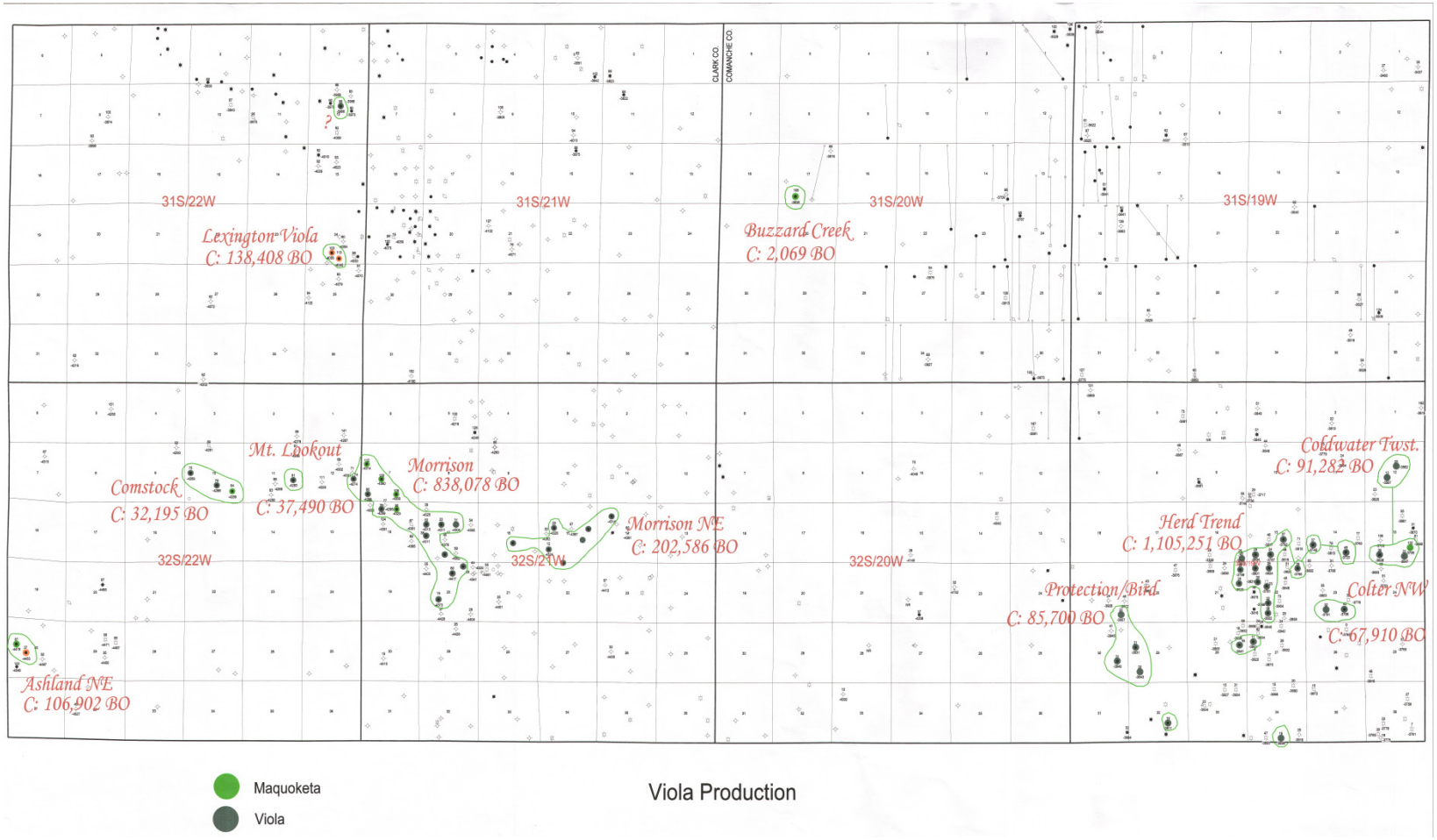


Source: Kansas Geological Survey website

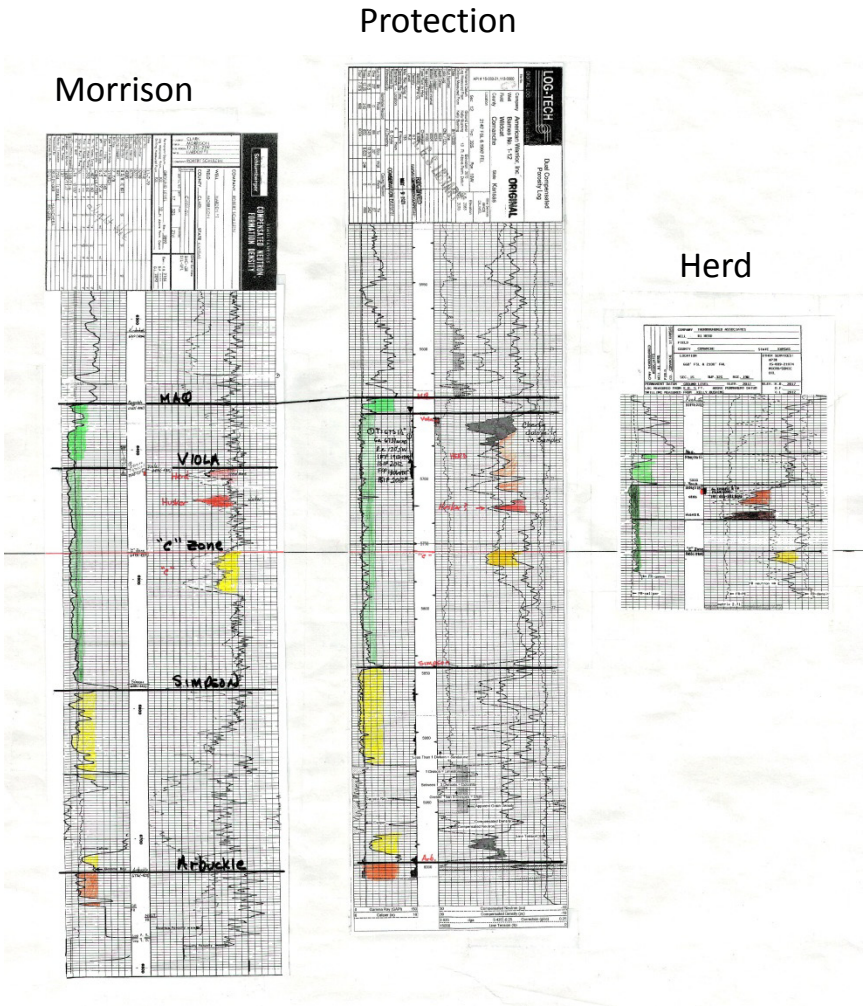


Source: Kansas Geological Survey website

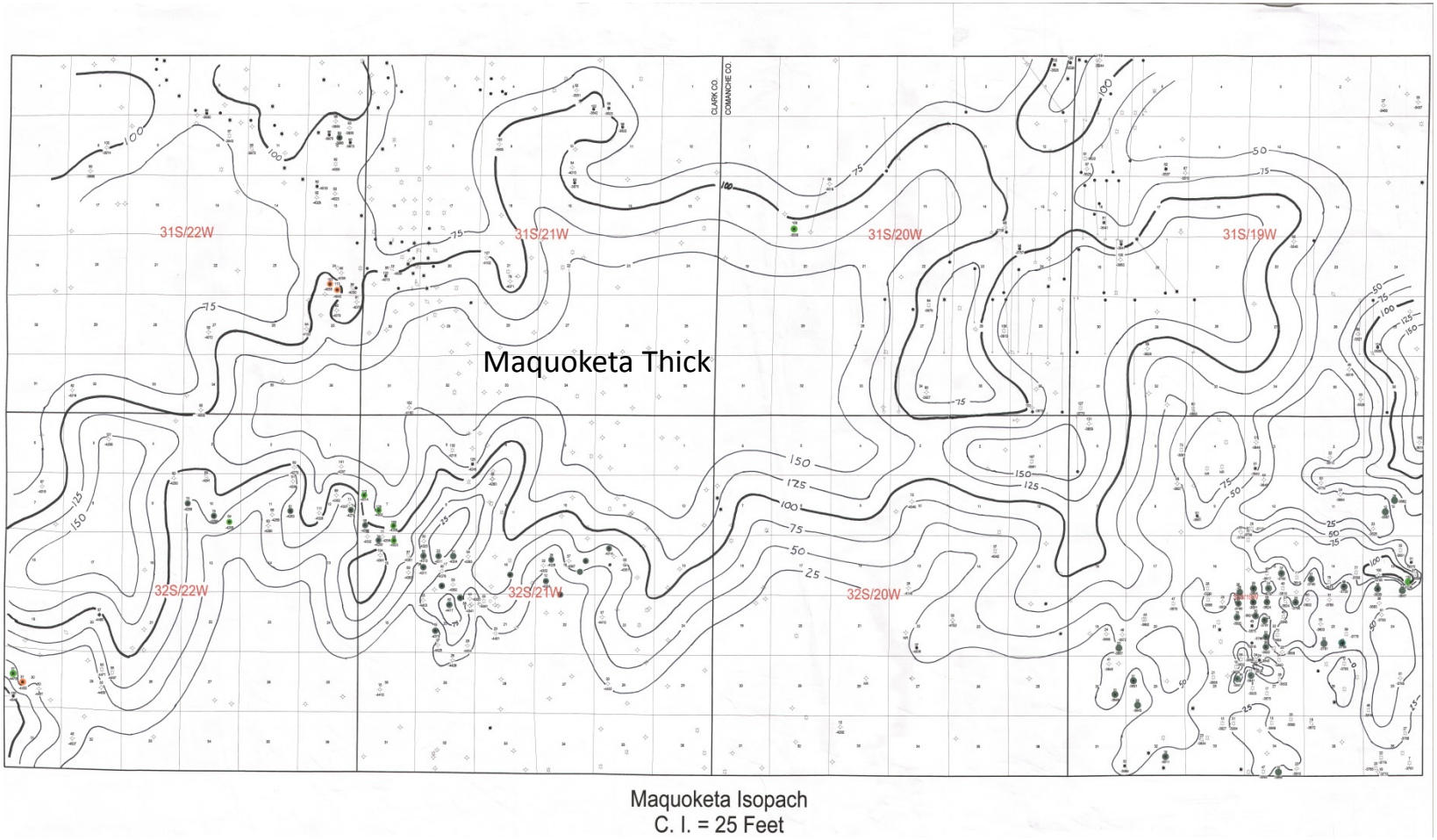
Comanche / Clark Co. Viola Trends



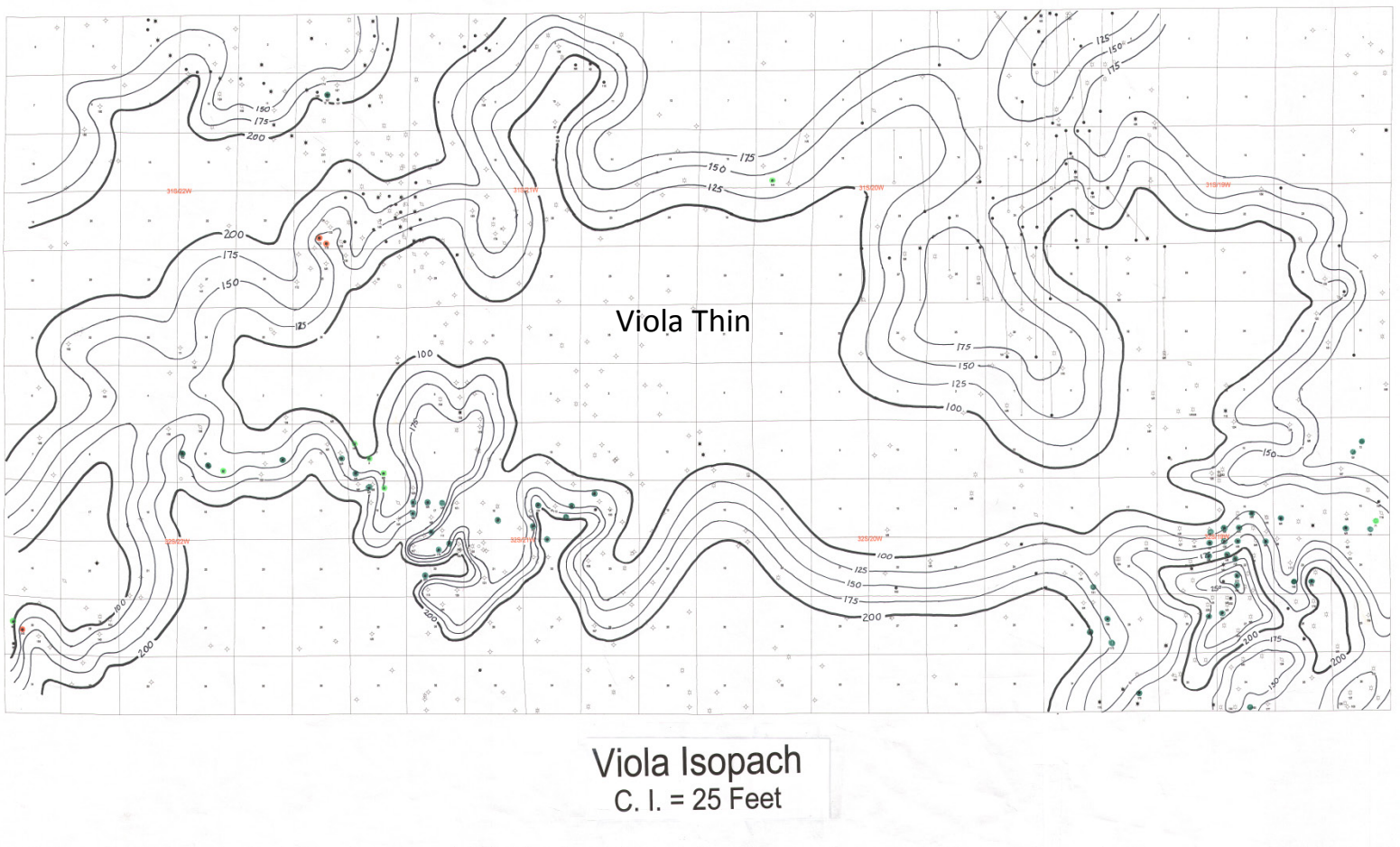
Viola Stratigraphic Relationships



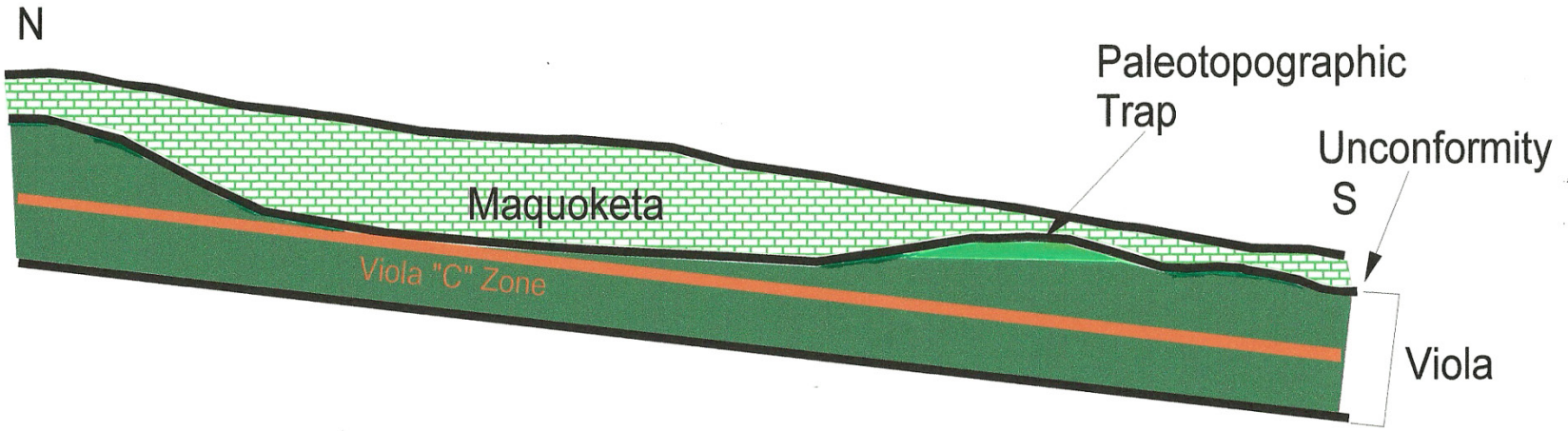
Maquoketa Thickness Relative to Production



Viola Thickness Relative to Maquoketa



Idealized N - S Cross Section



Kansas Exploration - (The Engineer's View)