

^{AV}“Wolfberry”—Wolfcamp/Spraberry: How It Started*

Jim Henry¹

Search and Discovery Article #110164 (2012)**

Posted June 11, 2012

*Adapted from oral presentation at Forum: Discovery Thinking, at AAPG Annual Convention and Exhibition, Long Beach, California, USA, April 22-25, 2012

**AAPG©2012 Serial rights given by author. For all other rights contact author directly.

¹Henry Resources LLC, Midland, Texas (dbarker@henryresources.com)

Making an Uneconomic Play Economic

- Improved Drilling Technology - PDC bits and 2 string csg. design decreased 30-day wells to 12 days, saving significant capital expenditure.
- Multistage high rate frac technology allowed us to contact more reservoir than traditional acid jobs or fracs.
- Ability to comingle previously uneconomic producing zones into a combined flowstream.
- Sustained higher oil price makes play economic. We need about \$70/bbl.

Henry Results

Leases Acquired

Economic	110,000 acres
Uneconomic	<u>220,000 acres</u>
Total	330,000 acres

Reserves Found

Henry proved up a total of 400 million barrels of oil equivalent – about 13% of the total reserves.

Wolfberry

The Wolfberry trend will ultimately recover about 3 billion barrels of oil -- making it the largest discovery in the Permian Basin in the last 50 years.

References

Handford, C.R., 1981, Sedimentology and genetic stratigraphy of Dean and Spraberry formations (Permian), Midland Basin, Texas: AAPG Bulletin, v. 65/9, p. 1602-1616.

Montgomery, S.L., D.S. Schechter, and J.C. Lorenz, 2000, Advanced reservoir characterization to evaluate carbon dioxide flooding, Spraberry trend, Midland basin, Texas: AAPG Bulletin, v. 84/9, p. 1247-1273.



HENRY
RESOURCES LLC

“WOLFBERRY”

WOLFCAMP/SPRABERRY

How It Started

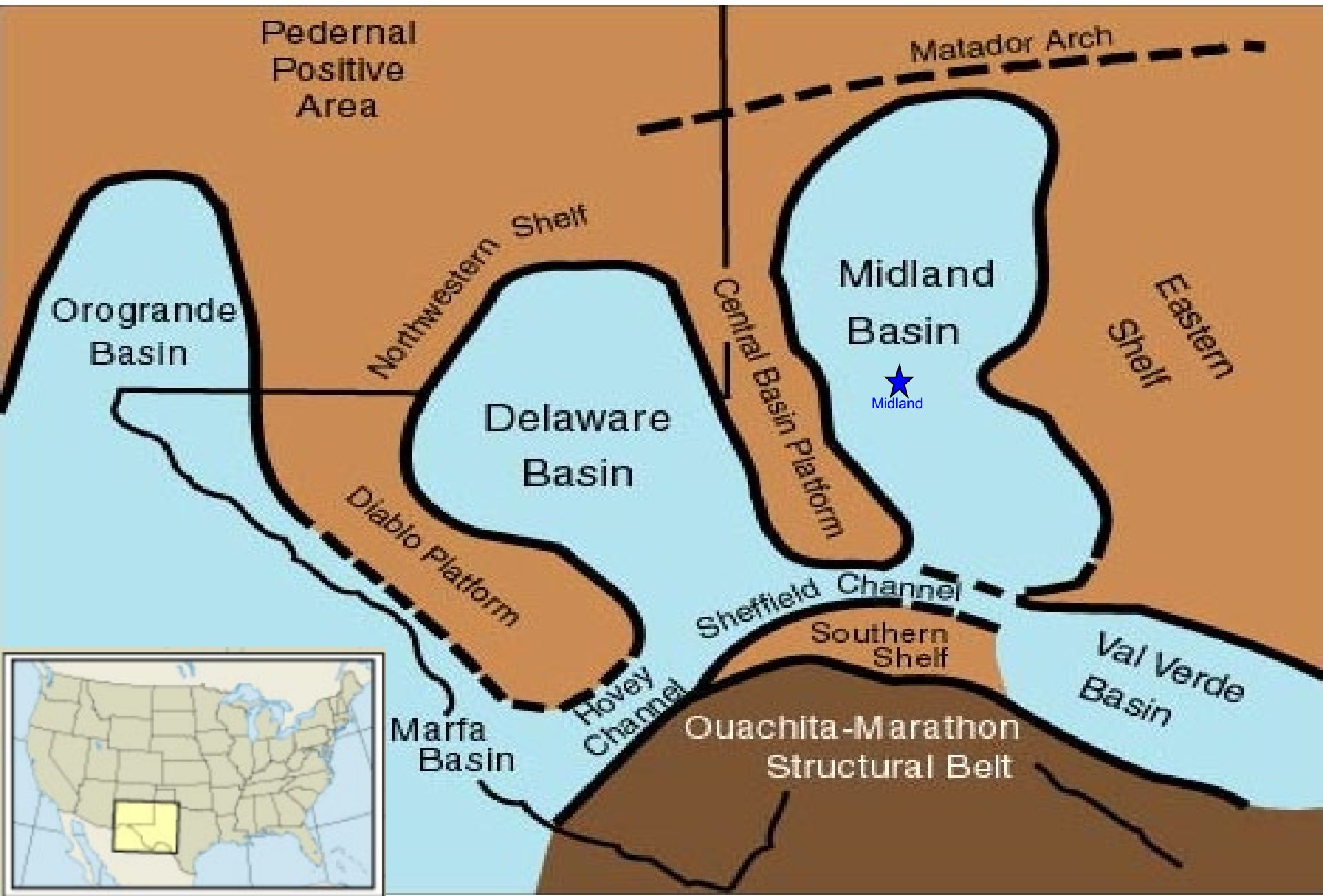
AAPG

4/23/12

Jim Henry

Permian Basin

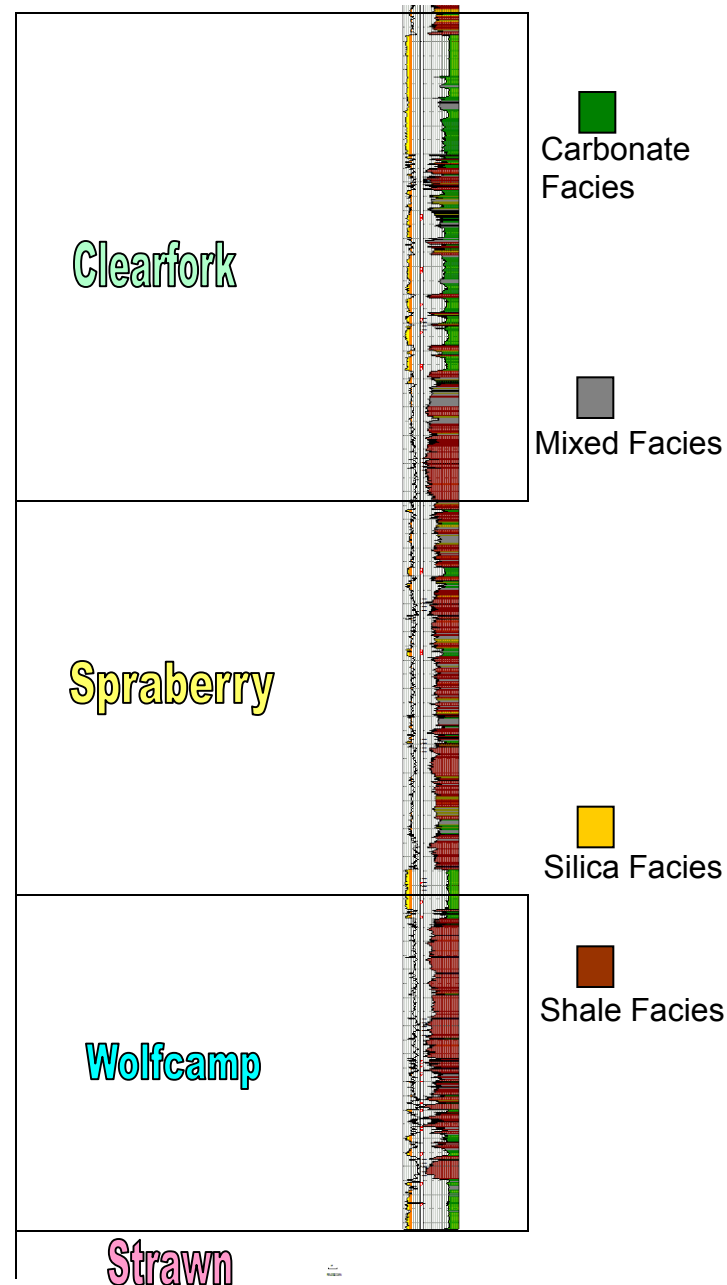
Fig. 1



Wolfberry Stratigraphy

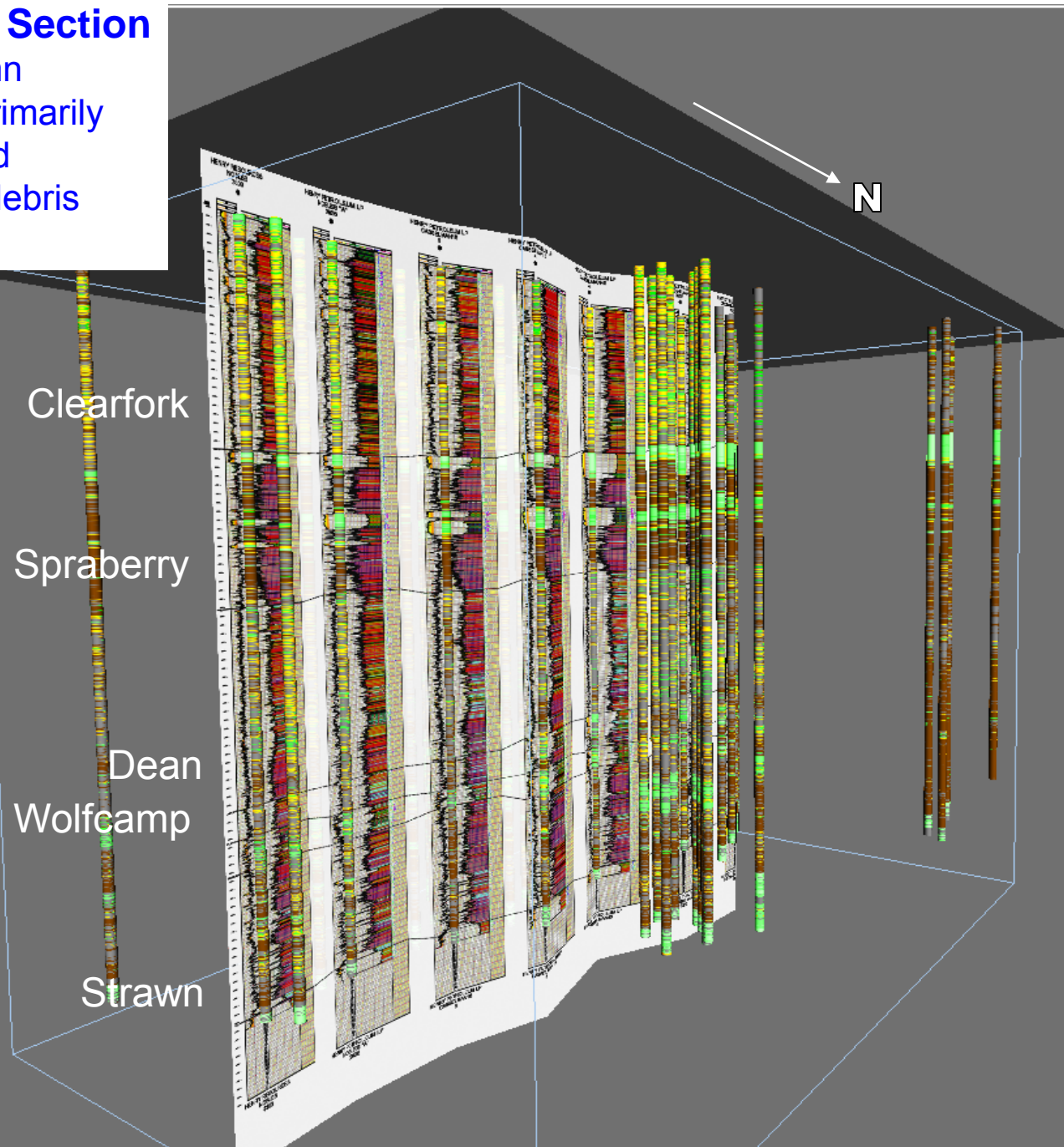
STRATIGRAPHIC COLUMN			
SYSTEM	SERIES	Midland Basin	
PERMIAN	Ochoa	Dewy Lake	
		Rustler	
		Salado	
	Guadalupe	Whitehorse	Tansill
			Yates
			Seven Rivers
			Queen
			Grayburg
		Word	San Andres
	Leonard		Glorieta
		Clearfork	Upper Leonard
		Wichita	U. Spraberry
			L. Spraberry
PENN		Dean	
	Wolfcamp	Wolfcamp	
	Vigil	Cisco	
	Missouri	Canyon	
	Des Moines	Strawn	
MISS	Atoka	Bend/Atoka	
	Chester	U. Miss	
	Meramec Osage	L. Miss	
	Kinderhook	Kinderhook	
DEVONIAN	Upper	Woodford	
	Lower	Devonian	
SILURIAN	U. Niagaran	U. Silurian	
	L. Niagaran	Fusselman	
	Alexandrian		

Target
Interval



N – S Depositional Strike Cross Section

The rock column is comprised primarily of thinly bedded turbidites and debris flows.



Depositional Model – Wolfcamp Carbonates

W

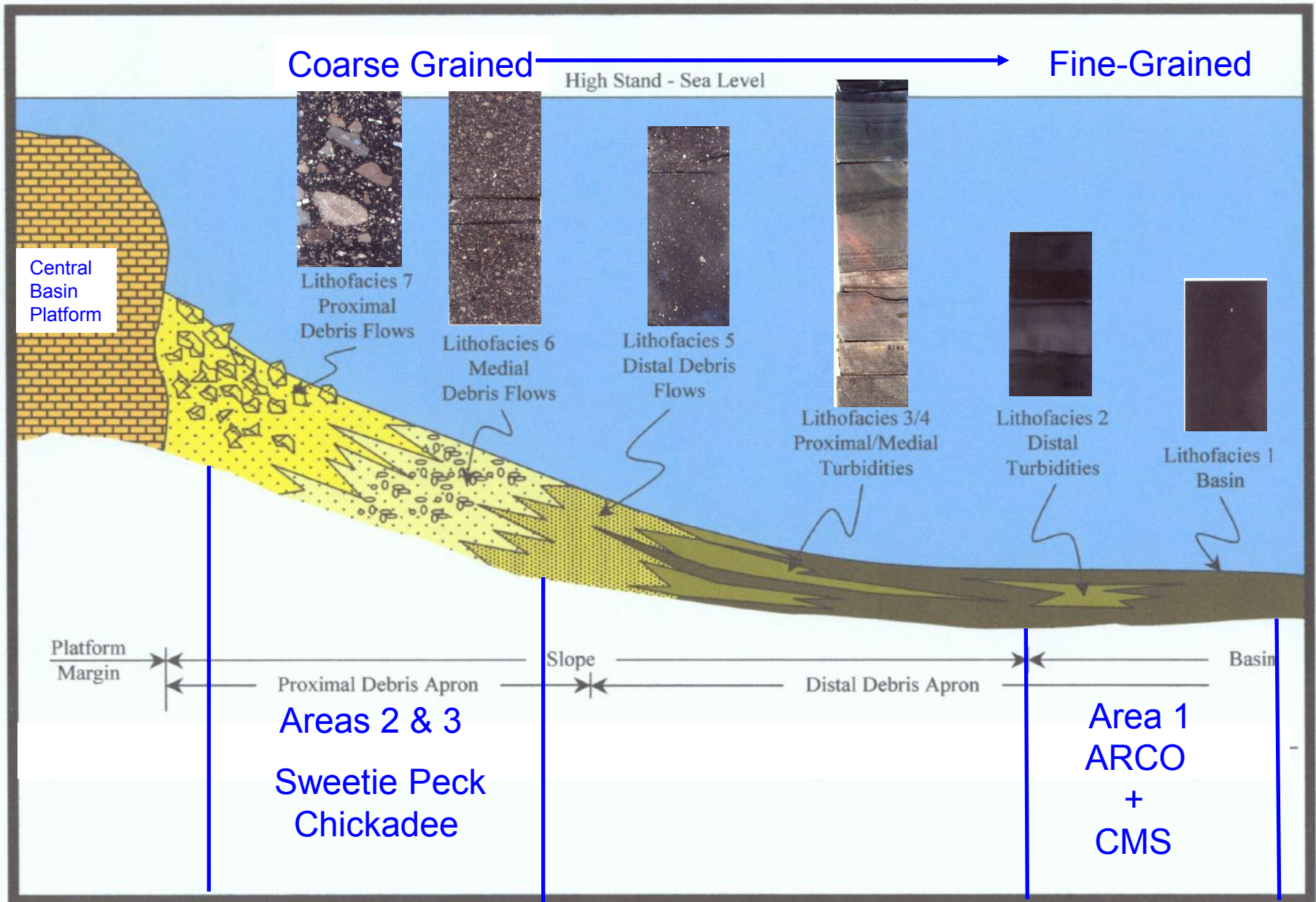
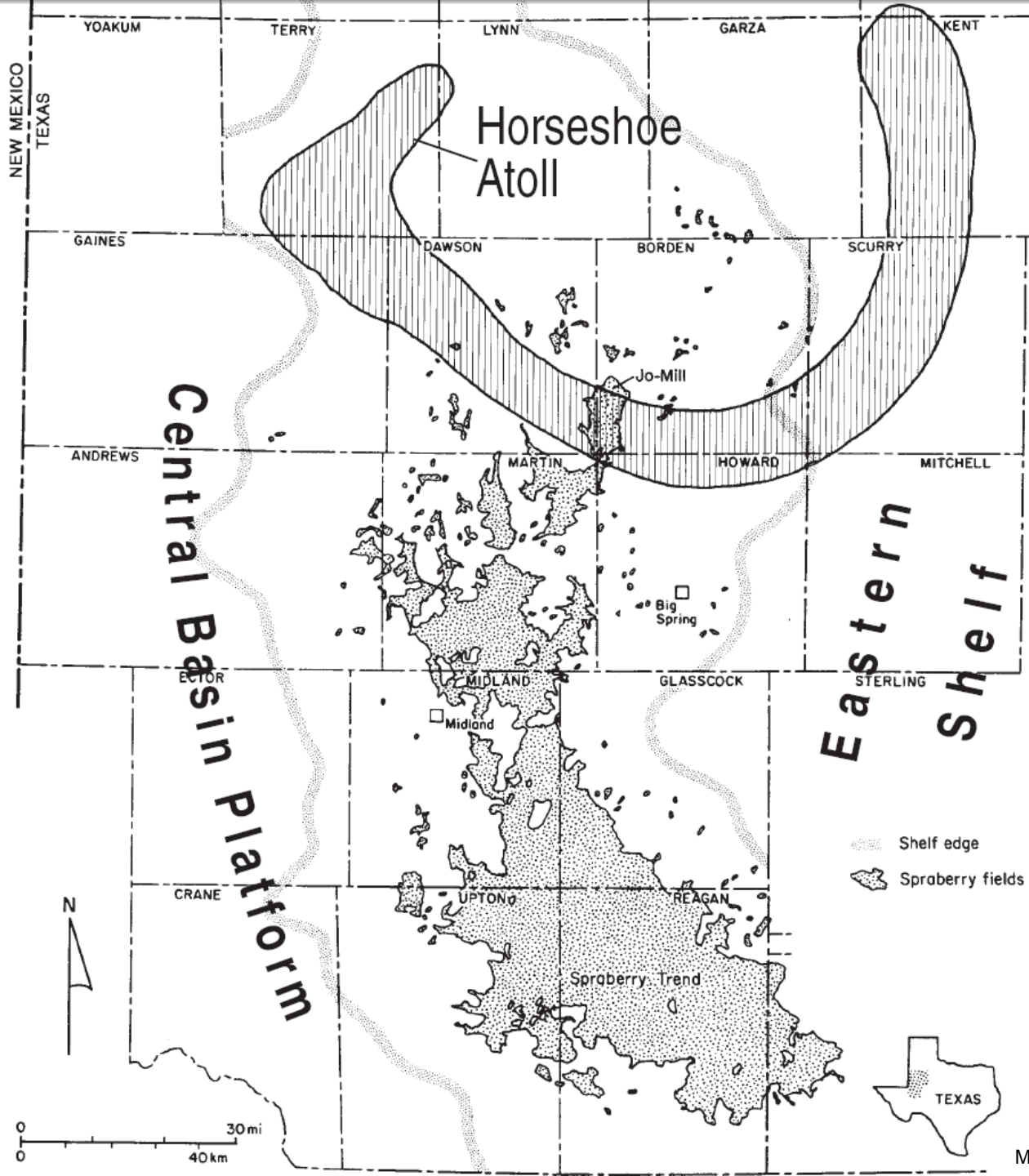


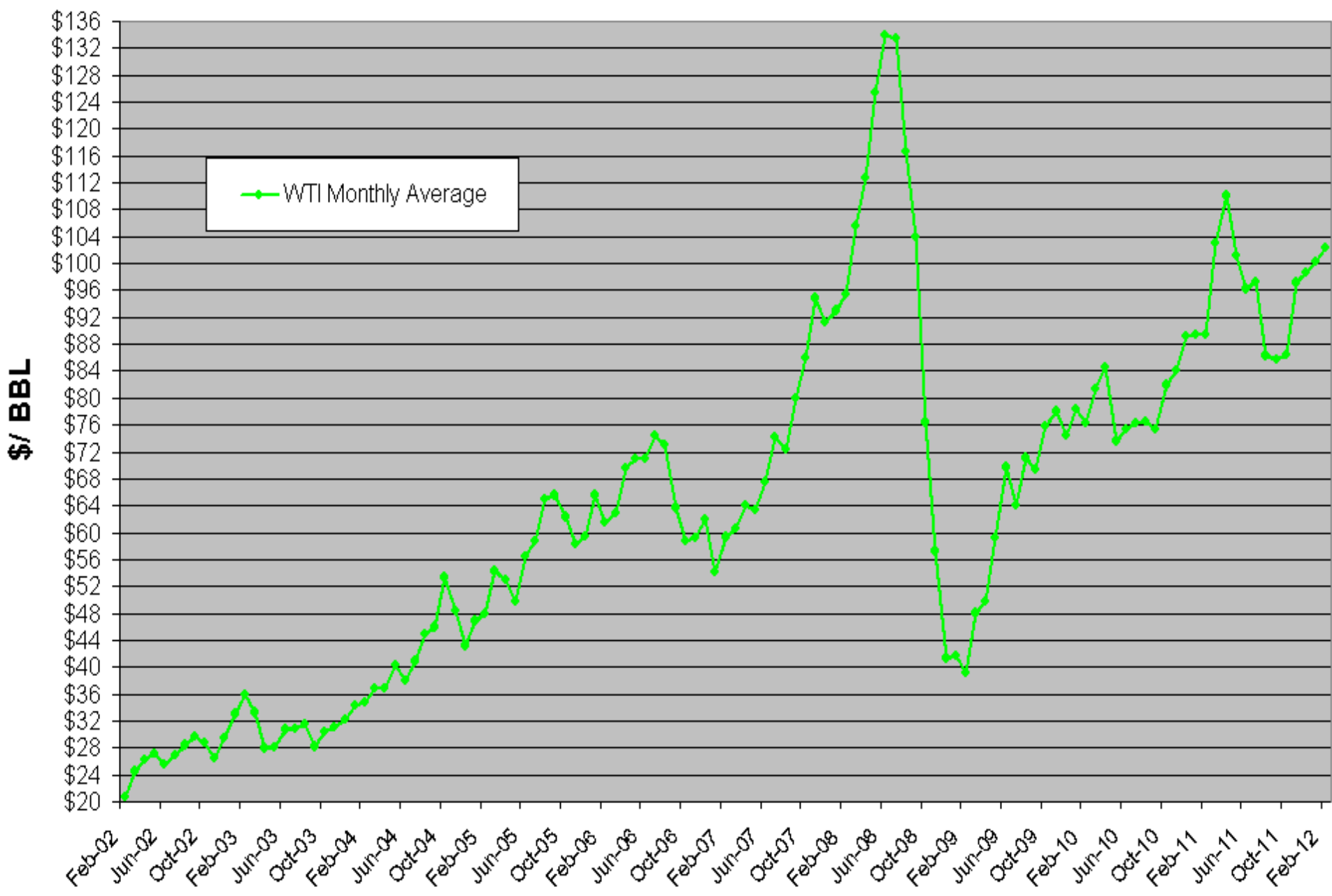
Fig. 5

Spraberry Field

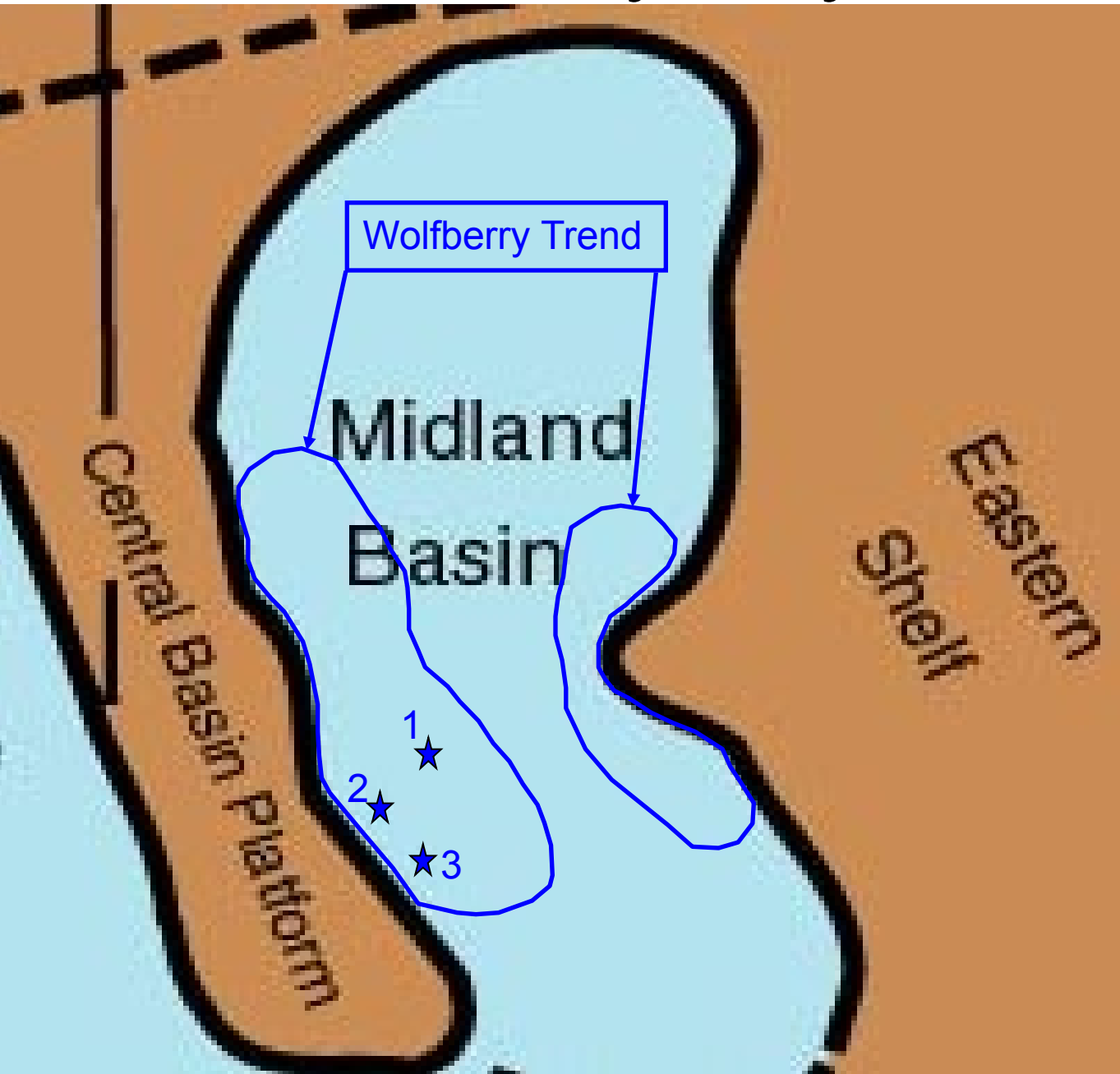


WEST TEXAS INTERMEDIATE OIL PRICE

Fig. 6



Wolfberry Play Area



1 ARCO & CMS

2 Sweetie Peck

3 Chickadee



HENRY
RESOURCES LLC

Wolfberry Chronicle

- Wolfcamp producers drilled before 1997 (316 wells)
- Wolfberry producers drilled 1997-2002 (554 wells)

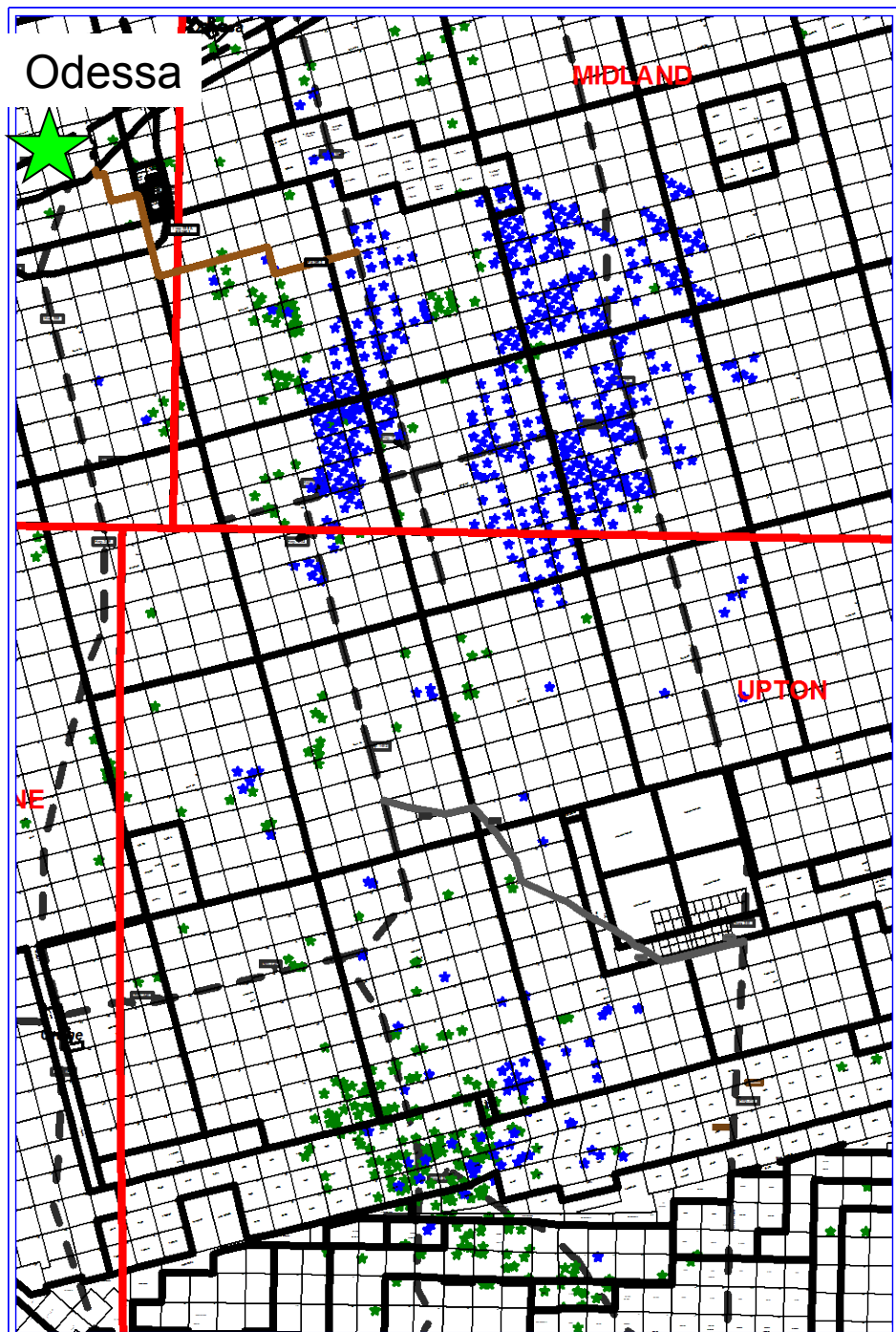


Fig. 8



HENRY
RESOURCES LLC

Wolfberry Chronicle

- Wolfcamp producers
drilled before 1997
(316 wells)
- Wolfberry producers
drilled 1997-2002
(554 wells)
- Wolfberry producers
drilled 2003-2011
(2866 wells)

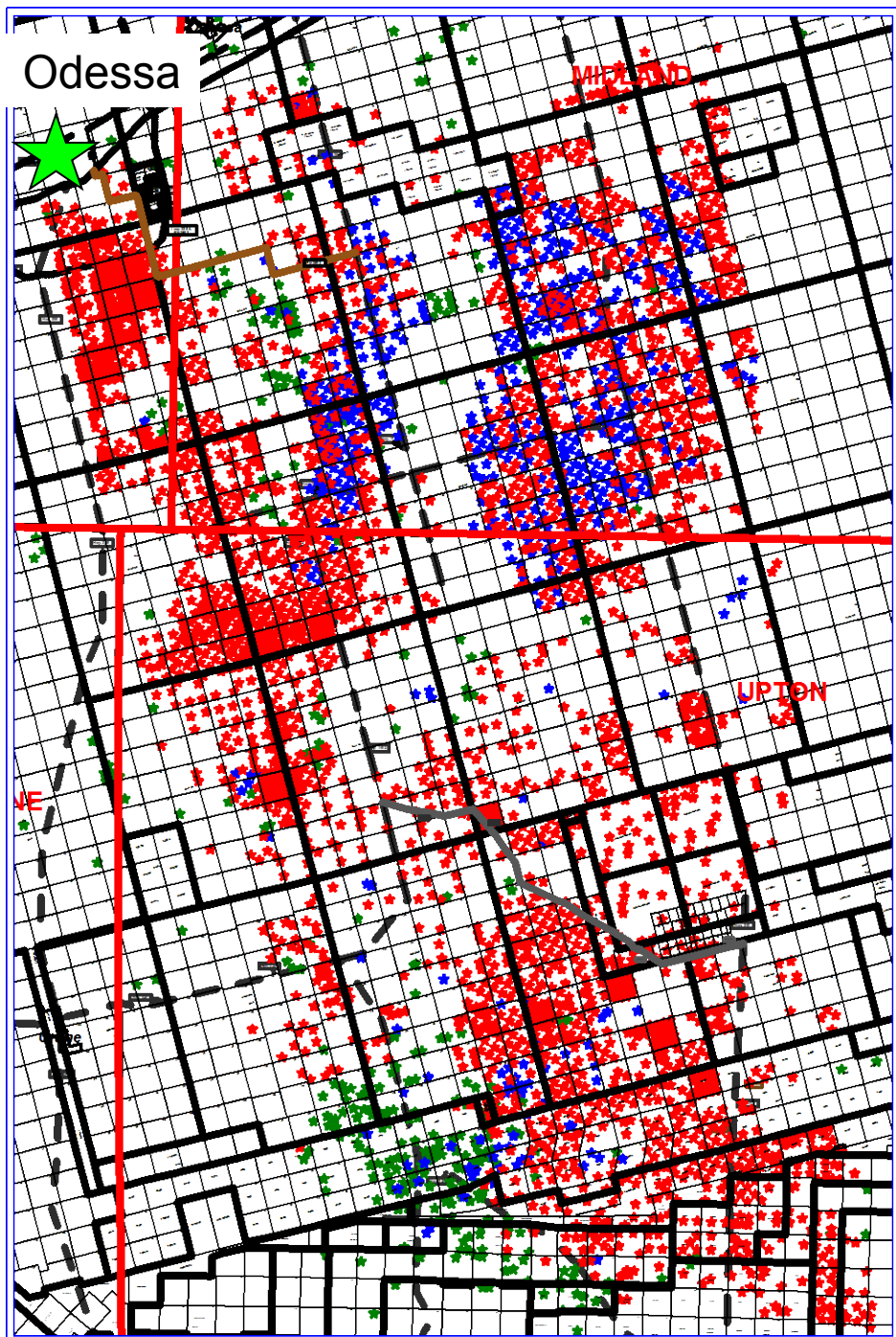
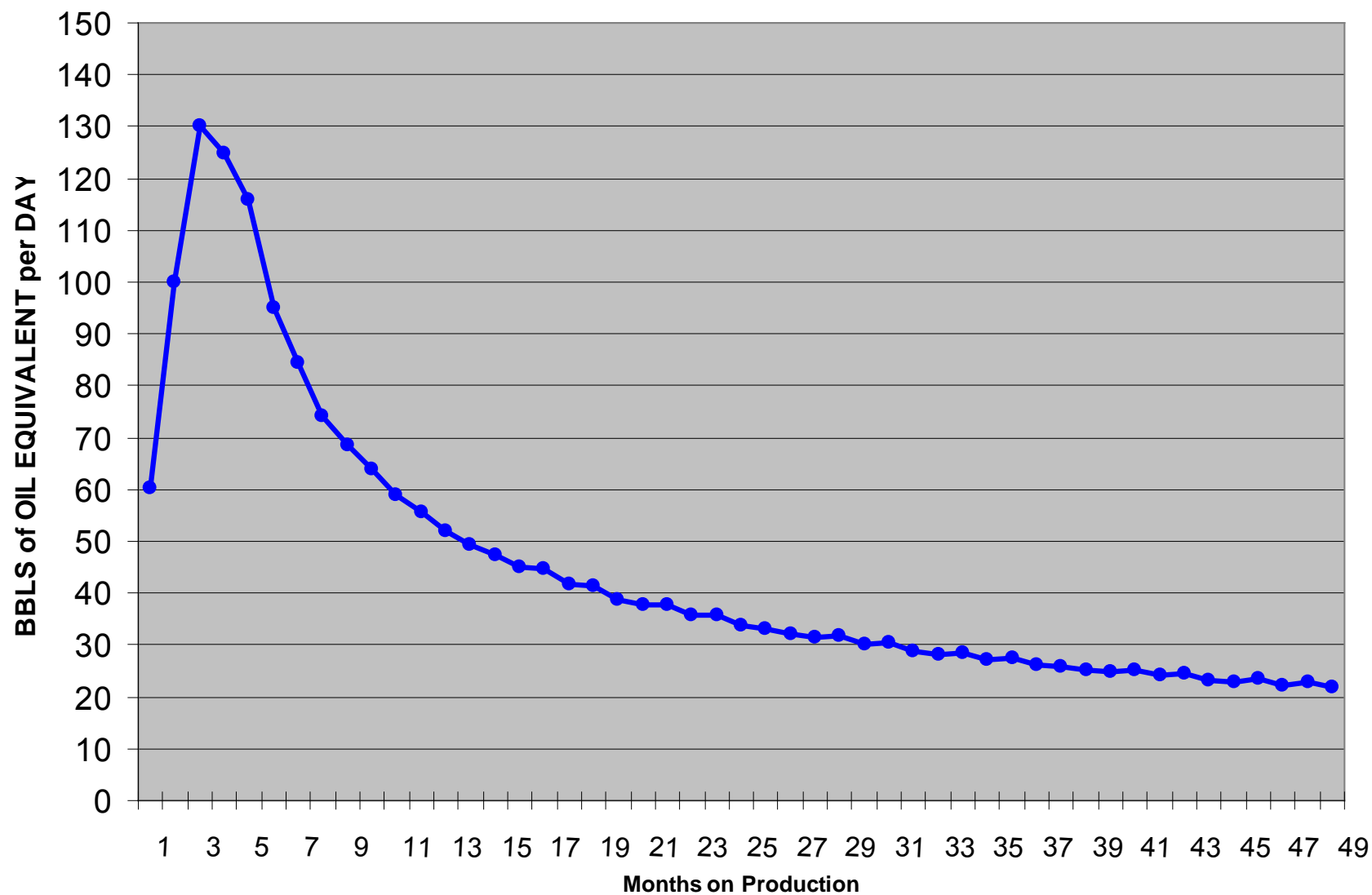


Fig. 9

Typical Decline Curve

WOLFBERRY FAIRWAY PRODUCTION



HENRY RESULTS

- **Leases Acquired**

– Economic	110,000 acres
– Uneconomic	<u>220,000 acres</u>
Total	330,000 acres

- **Reserves Found**

Henry proved up a total of 400 million barrels of oil equivalent – about 13% of the total reserves.

WOLFBERRY

The Wolfberry trend will ultimately recover about 3 billion barrels of oil -- making it the largest discovery in the Permian Basin in the last 50 years.