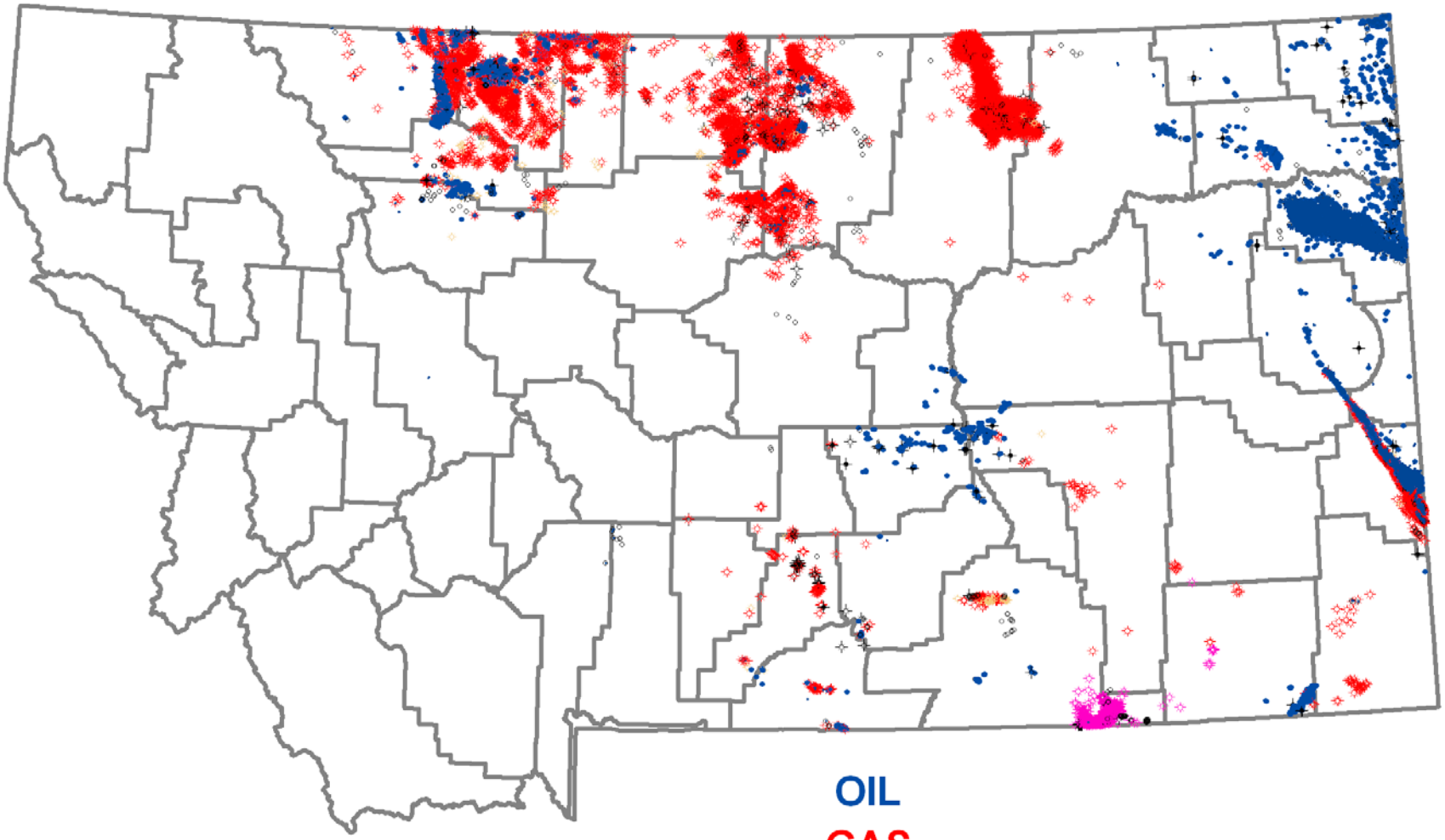
The Sleeping Giant

Bakken Oil in Montana

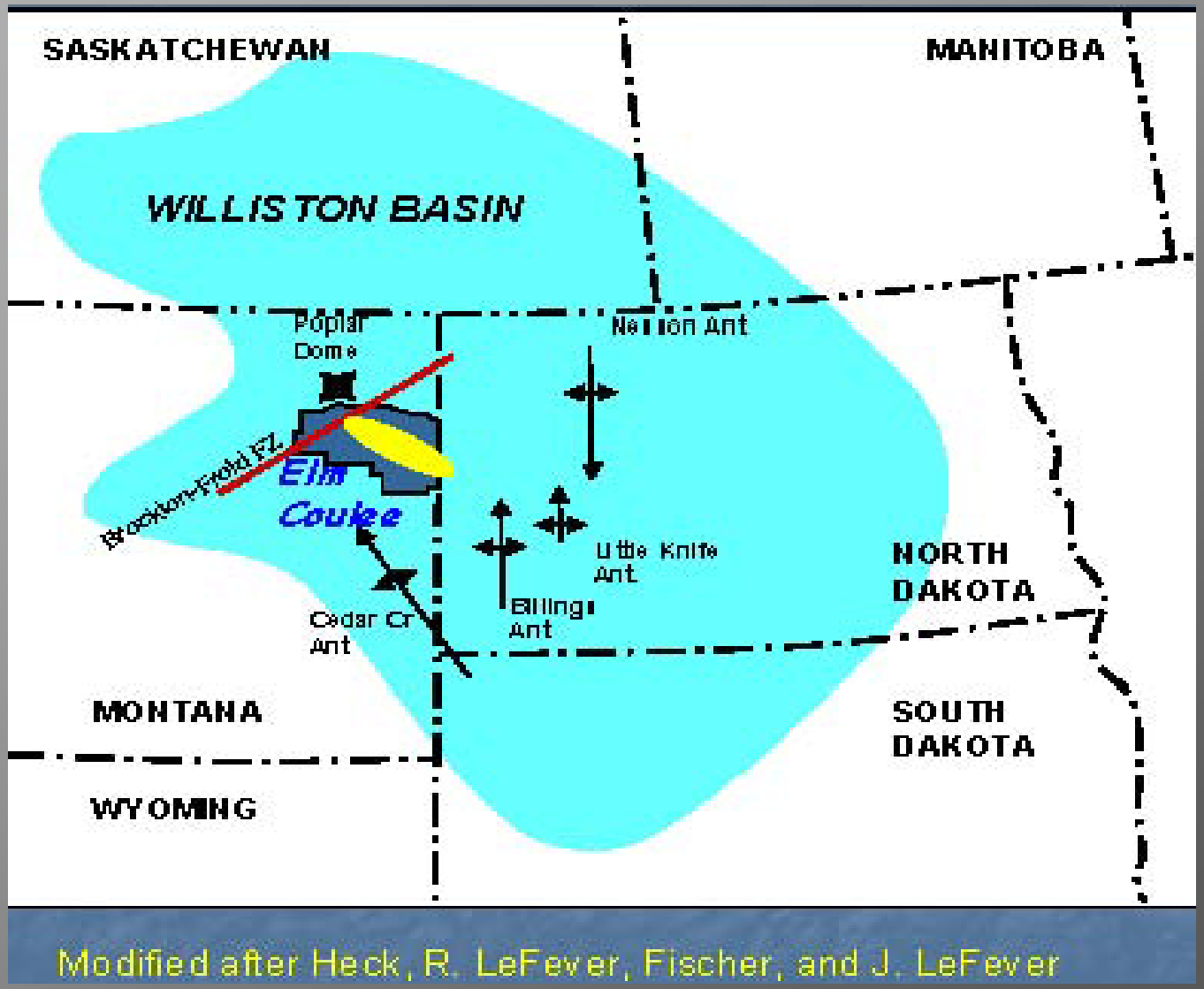
Montana Board of Oil and Gas Conservation



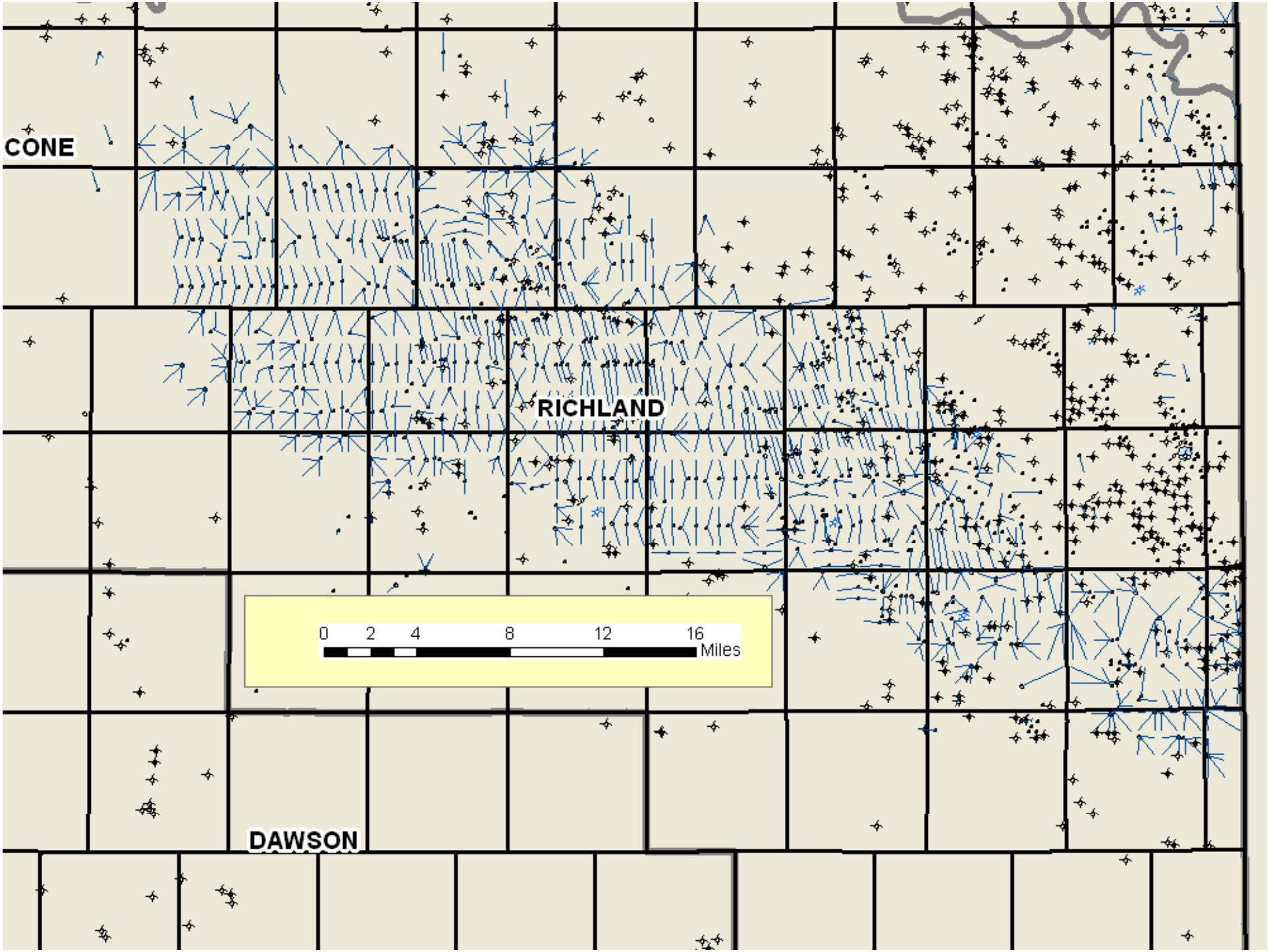
OIL
GAS
COAL BED METHANE

Well Activity Locator Map

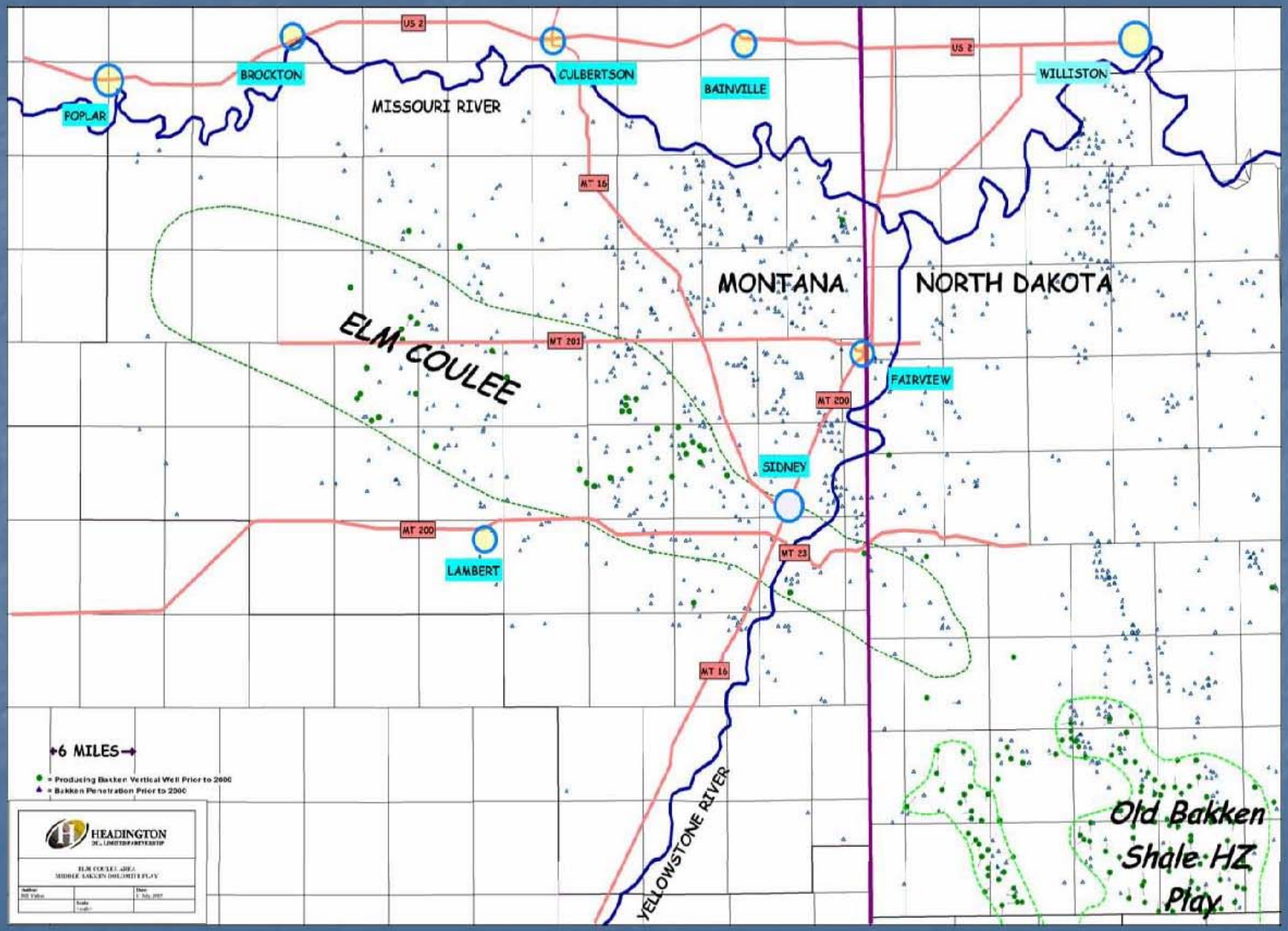
Locator Map Williston Basin



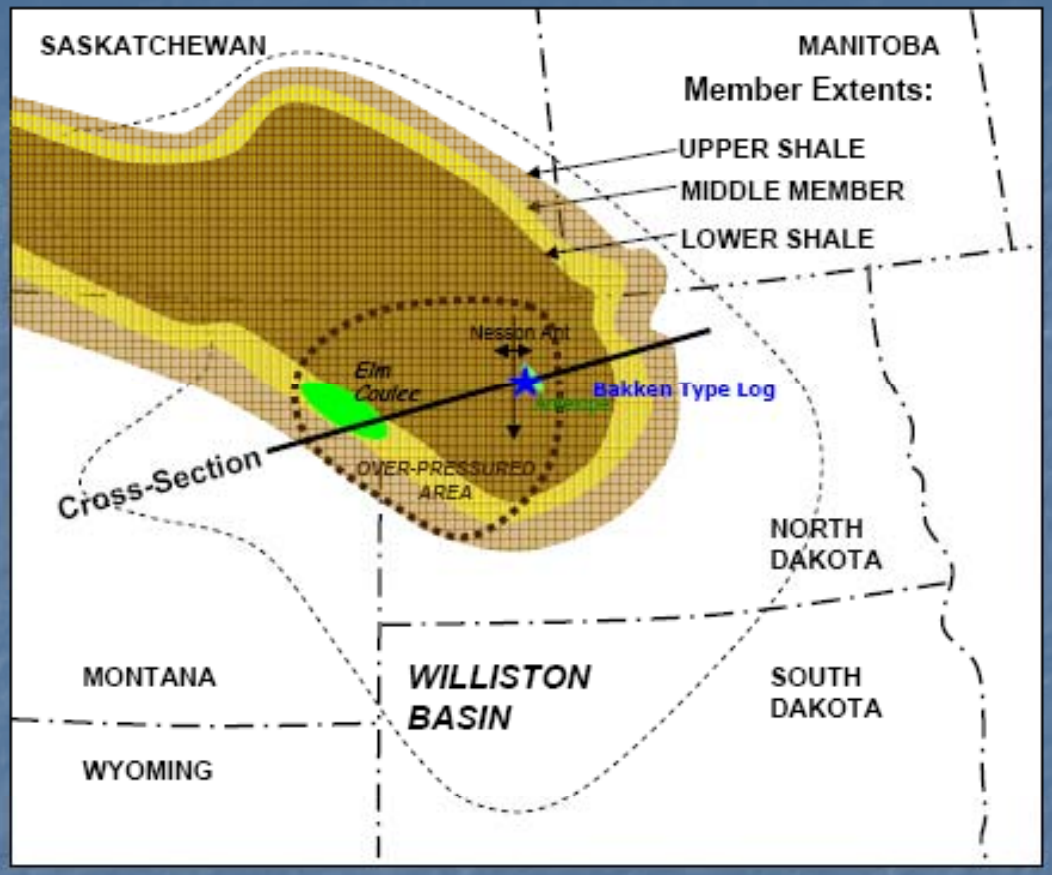
Modified after Heck, R. LeFever, Fischer, and J. LeFever


CONE
RICHLAND
DAWSON
0 2 4 8 12 16
Miles

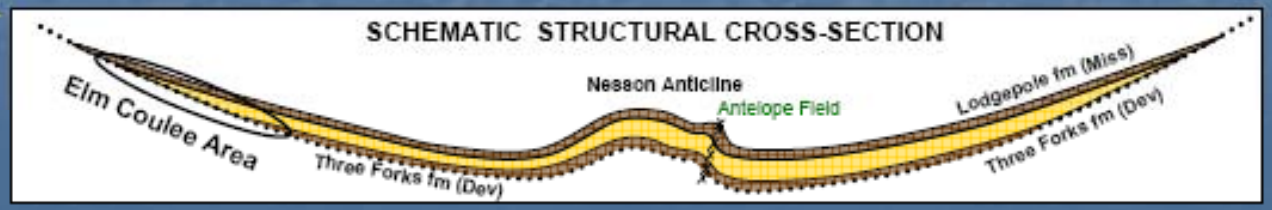
ELM COULEE AREA
PRE-2000 BAKKEN PENETRATIONS



Bakken Formation
Williston Basin



WEST

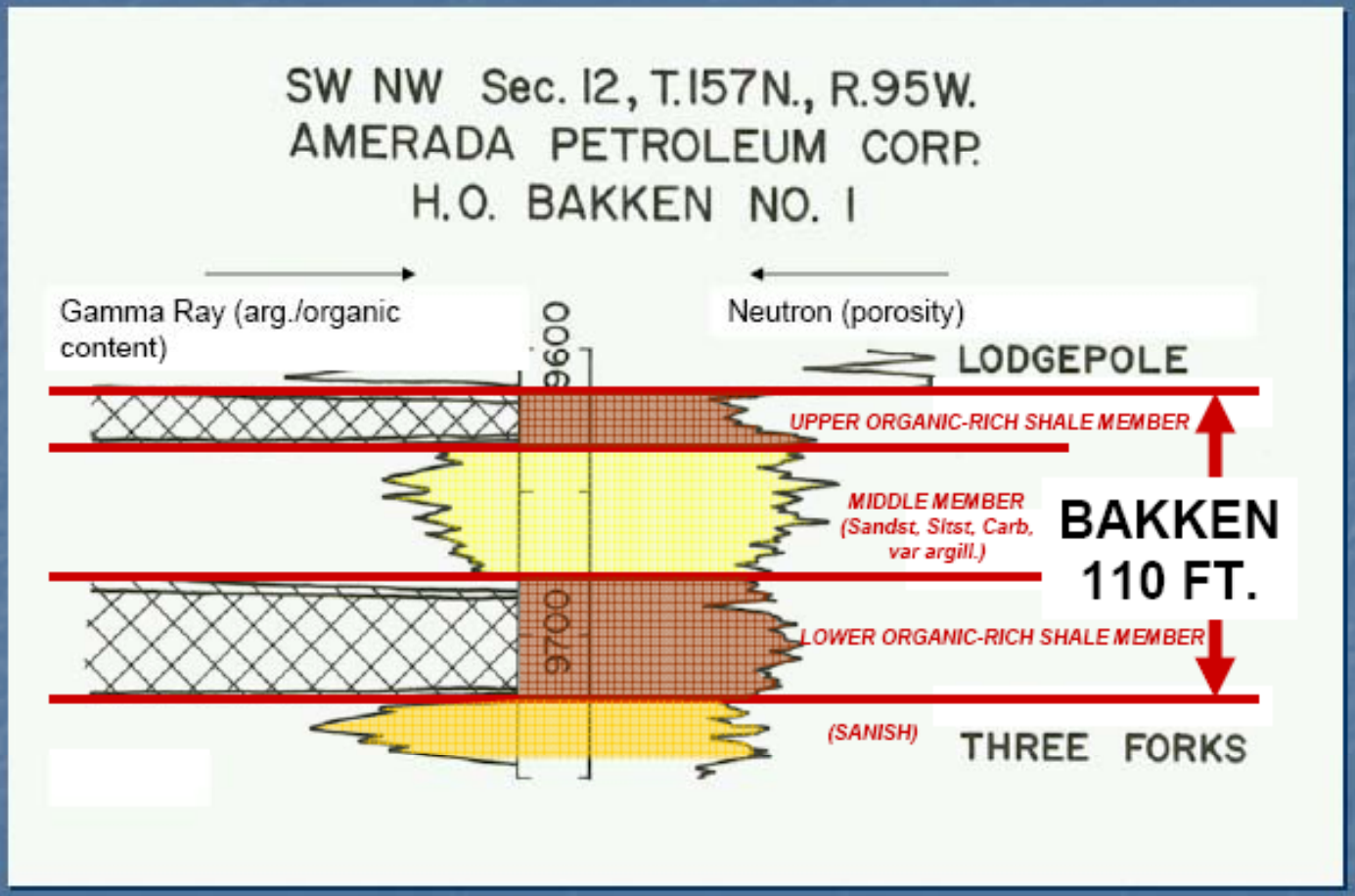


EAST

Modified after Meissner (1978)

WB Cross section

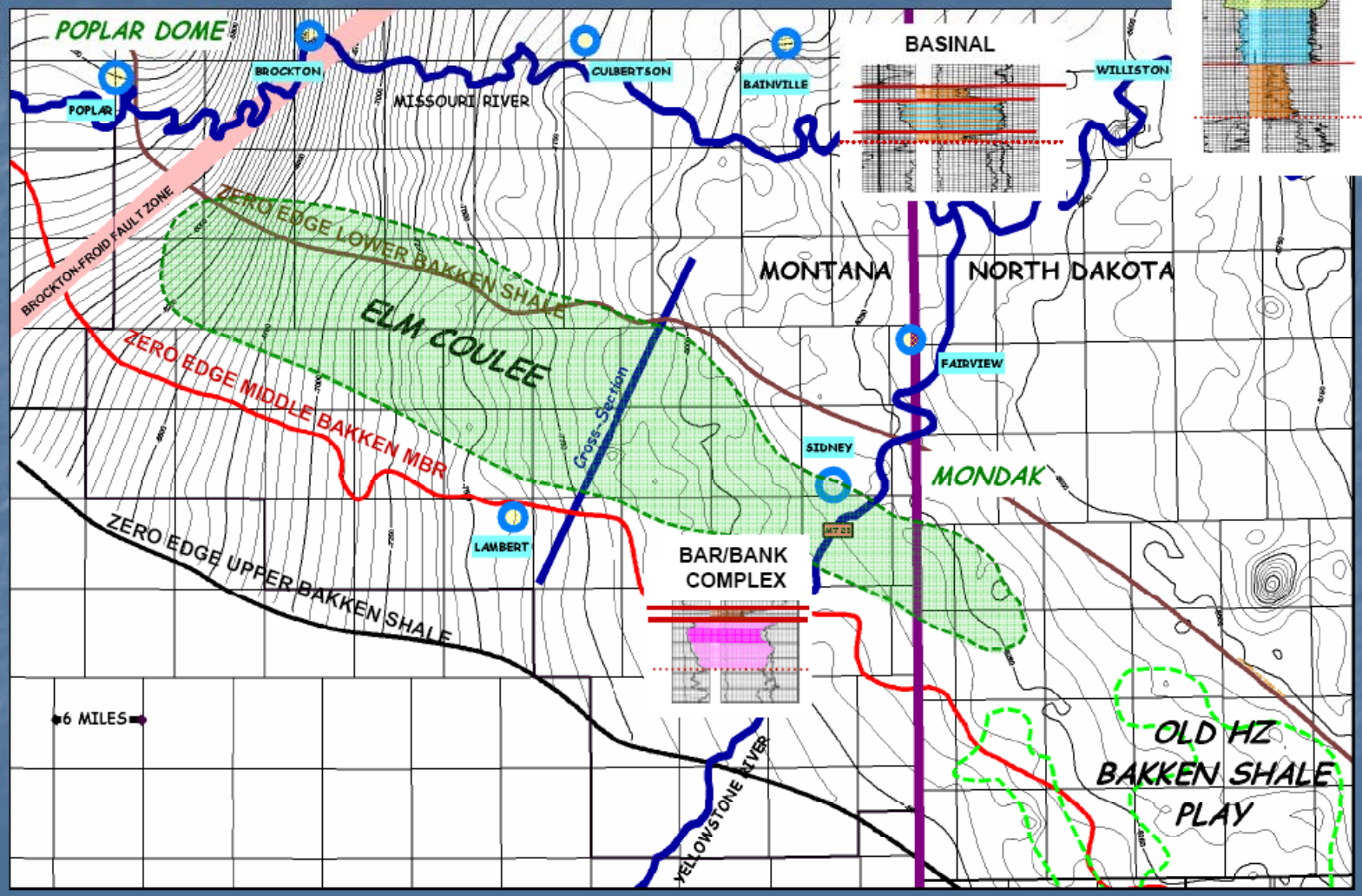
ORIGINAL TYPE LOG – NORTH DAKOTA

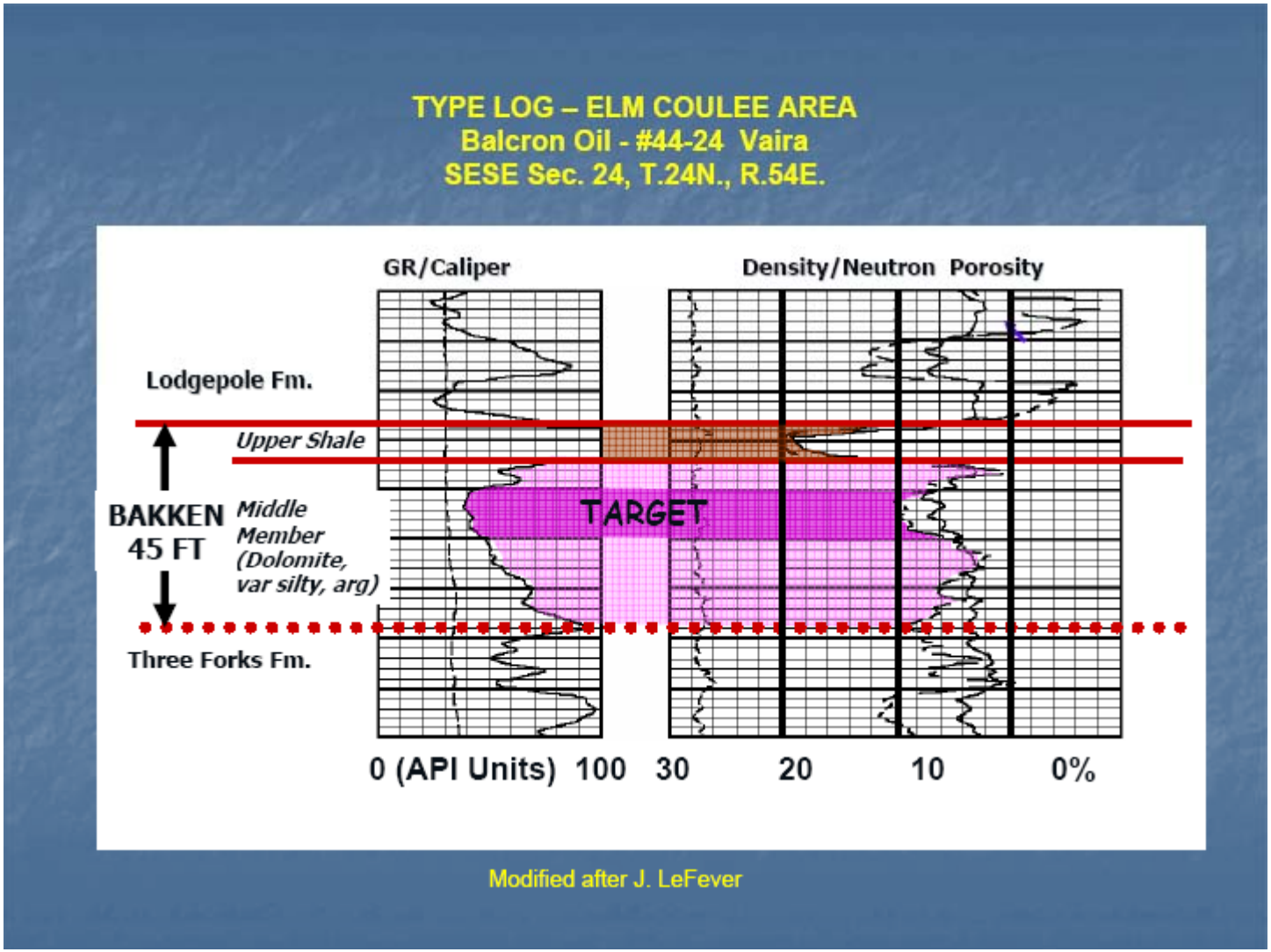


Modified after J. LeFever

WB Type Log

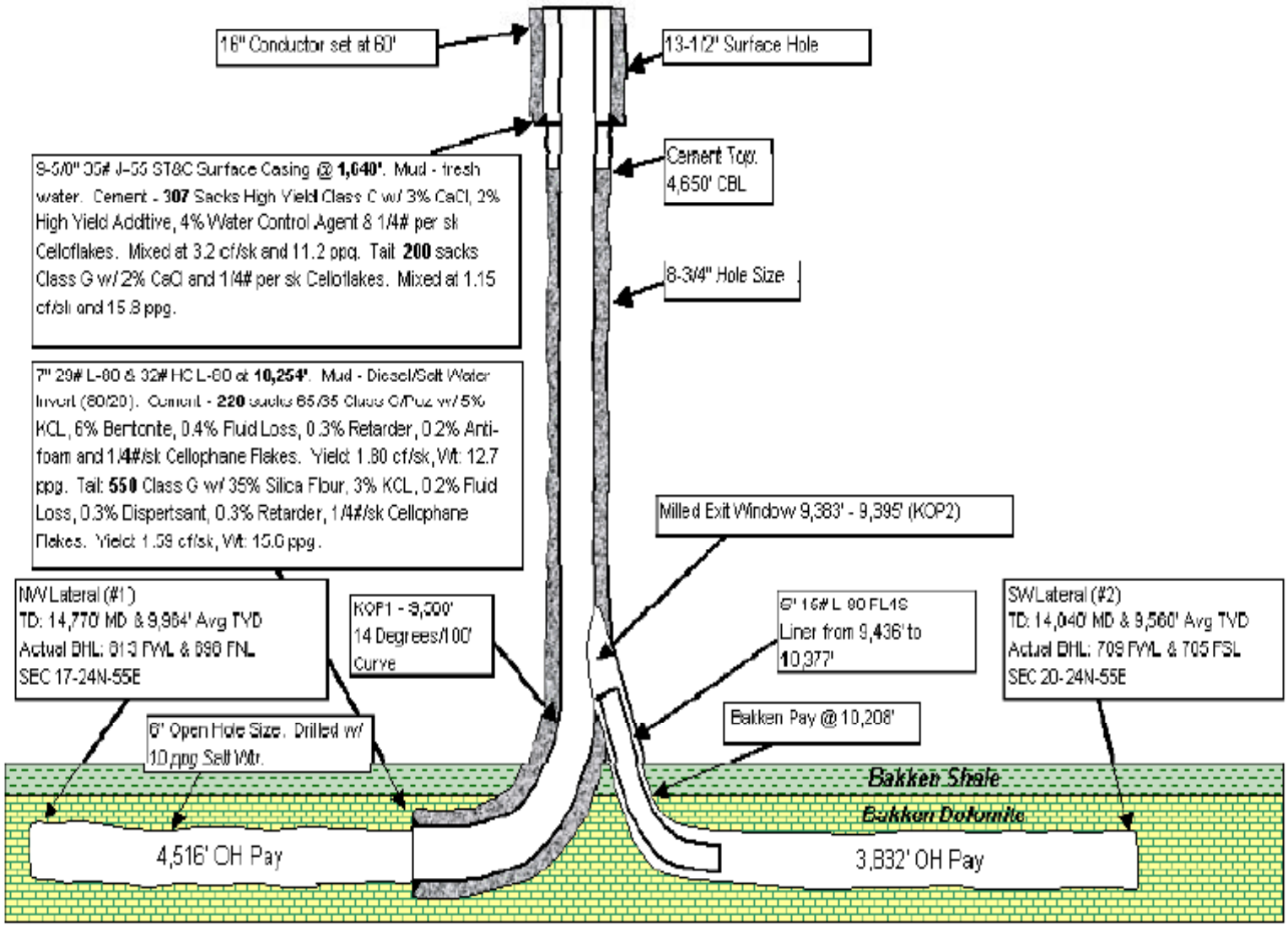
GEOLOGIC SETTING – ELM COULEE FIELD
Bakken Structure, Depositional Limits, Productive Area





Elm Coulee Type Log

VERTICAL CASING EXIT



Horizontal Well Vertical Exit

WELL CONSTRUCTION PLAN
HORIZONTAL CASING EXIT

Headington Oil Co, LP
Dual Lateral Coplanar
Well Construction Diagram

Evoniuk 44X-17
Location: SE SE Sec 17 T142N R99W
Footage: est. 500 FEL & 500 FSL
Elev: est. Graded Pad 2640, KB 2661
Billings County, MT

Directions to Well: 15 miles N of Belfield, ND on Highway 85 to Club 85, then 3 mile W on CR, then 1 mile S, then 1 mile E

16" Conductor set at 60' - 80'. Drill out w/ 13.5" bit.
Set 9-5/8" 36# K-55 surface casing at 2,200
Lead Cement: 504 Sacks SanJel - Control Set C plus 0.25% CFL-3, 1% OGC-60 and 1/4 #/sk Celloflake. Mixed at 18.95 gps wtr, 2.85 cf/sk yield and 11.2 ppg.
Tail Cement: 200 Sacks Class G plus 2% CaCl2 and 1/4 #/sk Celloflake. Mixed at 5.0 gps wtr, 1.15 cf/sk yield and 15.8 ppg. Volume calculated using 55% excess.

8-3/4" hole size. Drilled with invert mud (80% diesel & 20% SW)
7" Casing set at: 12,055
Lead Cement (top at 5,100) - 202 Sacks 65/35 Class G/Poz w/ 5% KCL, 6% Bentonite, 0.4% Fluid Loss, 0.3% Retarder 0.2% Anti-foam and 1/4#/sk Cellophane Flakes. Yield: 1.80 cf/sk, Wt: 12.7 ppg.
Tail Cement (top at 6,700) - 764 Sacks Class G w/ 35% Silica Flour, 3% KCL, 0.2% Fluid Loss, 0.3% Dispertsant, 0.3% Retarder, 1/4#/sk Cellophane Flakes. Yield: 1.59 cf/sk, Wt: 15.6 ppg.
Assume 9" hole plus 30% excess.

Lat #1 Liner: 5" 15# L80 FJ
11,989 to 12,209 Blank
12,209 to 17,570 Pre-Drilled

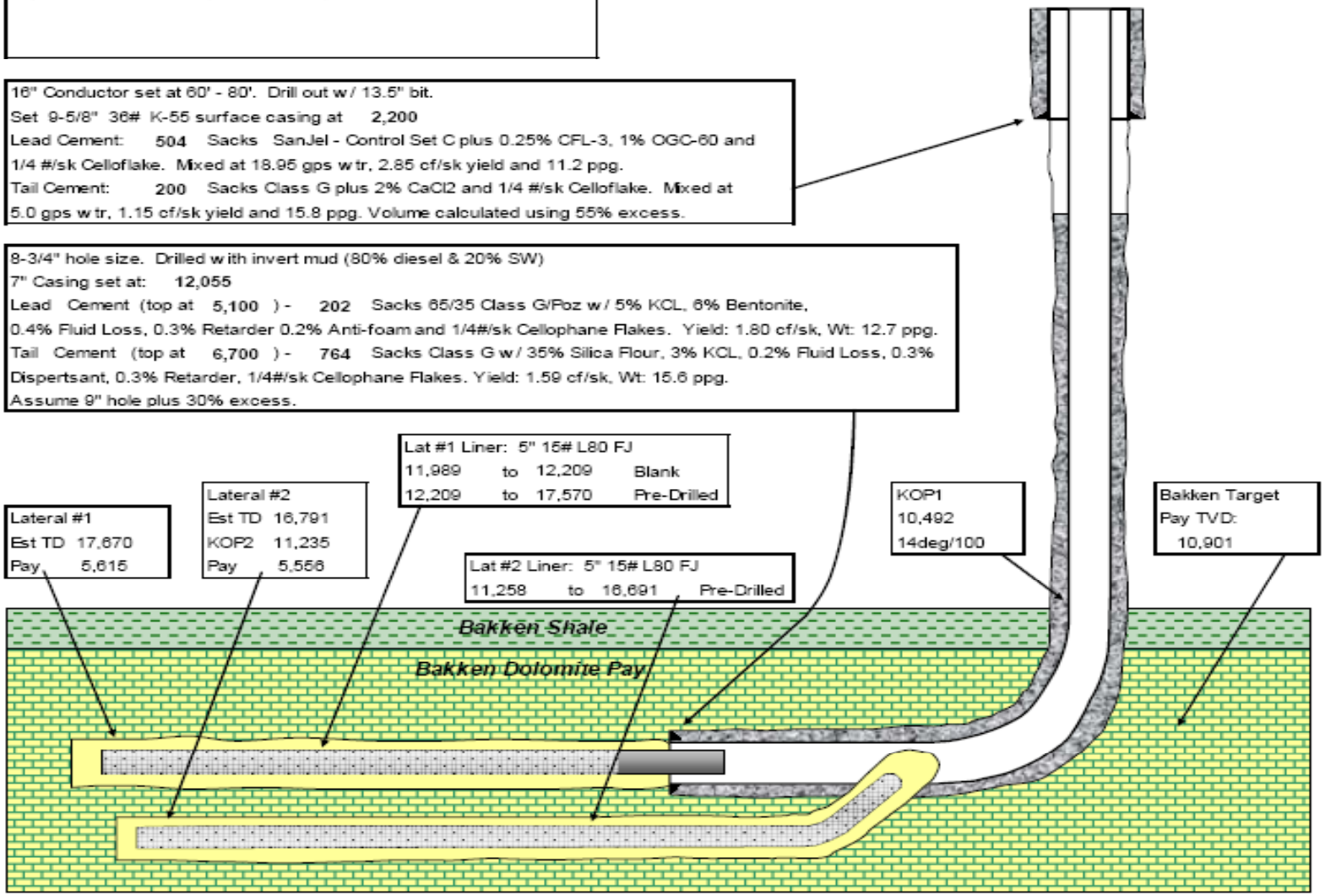
Lateral #1
Est TD 17,670
Pay 5,615

Lateral #2
Est TD 16,791
KOP2 11,235
Pay 5,556

Lat #2 Liner: 5" 15# L80 FJ
11,258 to 16,691 Pre-Drilled

KOP1
10,492
14deg/100

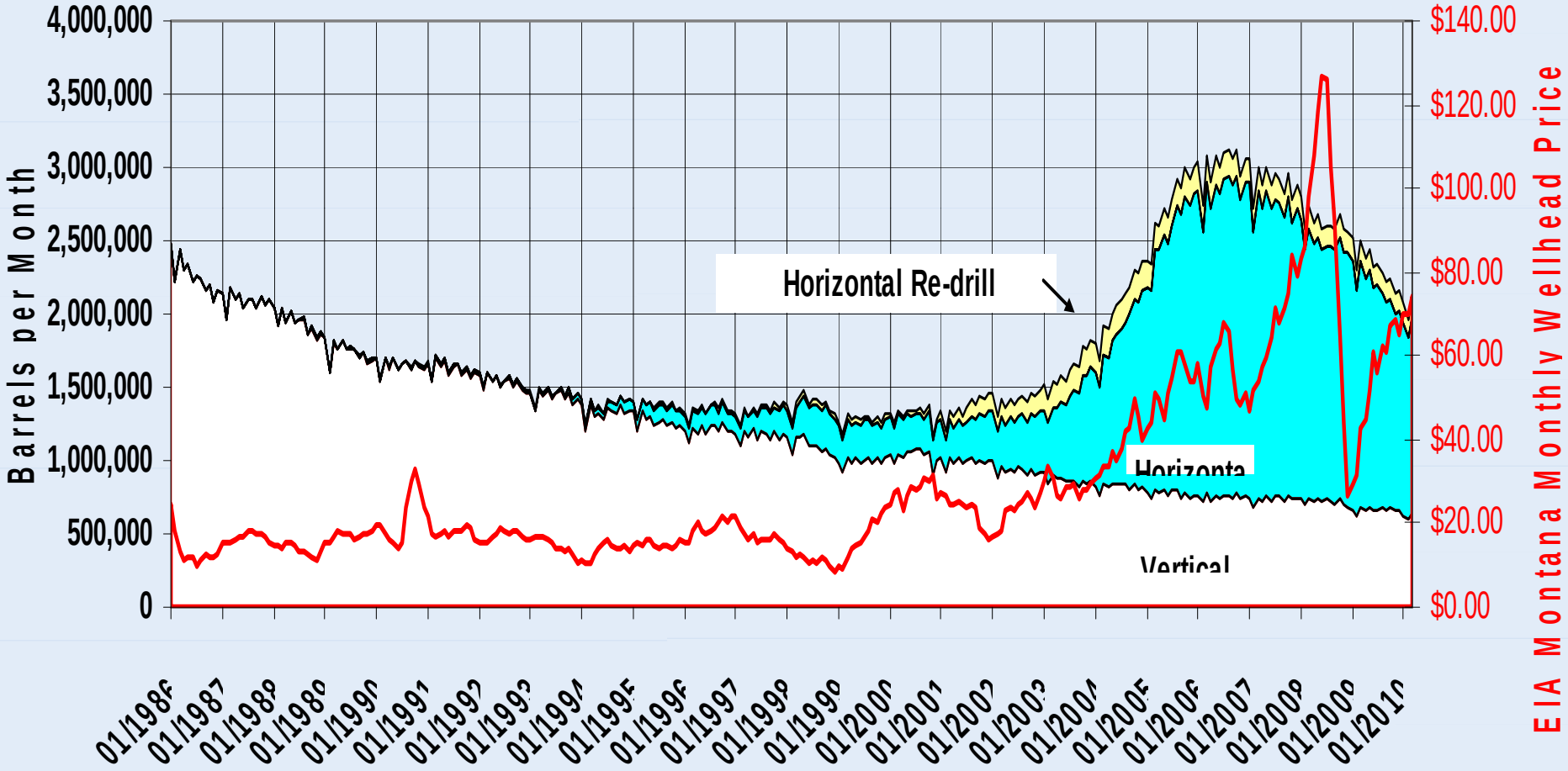
Bakken Target
Pay TVD:
10,901



Fracture Treatment Equipment

Schlumberger

Montana Monthly Oil Production, Vertical vs. Horizontal Wells
January 1986 through March 2010



Elm Coulee Field

• Thin productive zone (<10 feet) and low porosity could only be developed with horizontal drilling.

• First horizontal well in current target zone was completed during 2000.

• Elm Coulee Field has produced 98 million barrels of oil and 76 BCF of gas through May 2010.

•659 wells had reported Bakken production during May 2010.

• Analysis of production data, as well as industry-supplied data, indicate a primary well life often in excess of 20 years.

Elm Coulee Summary

- Oil production during 2006 was 36.3 million barrels, up from a recent historical low of 15.3 million barrels during 1999.
- The 2006 production level was the highest annual production since 1970.
- Statewide production has exceeded 2006 levels in only three years that occurred during peak production from the Bell Creek Field.

Questions?

www.bogc.dnrc.mt.gov