

Bakken Formation Middle Member Lithofacies 5



Julie A. LeFever

LITHOFACIES 5

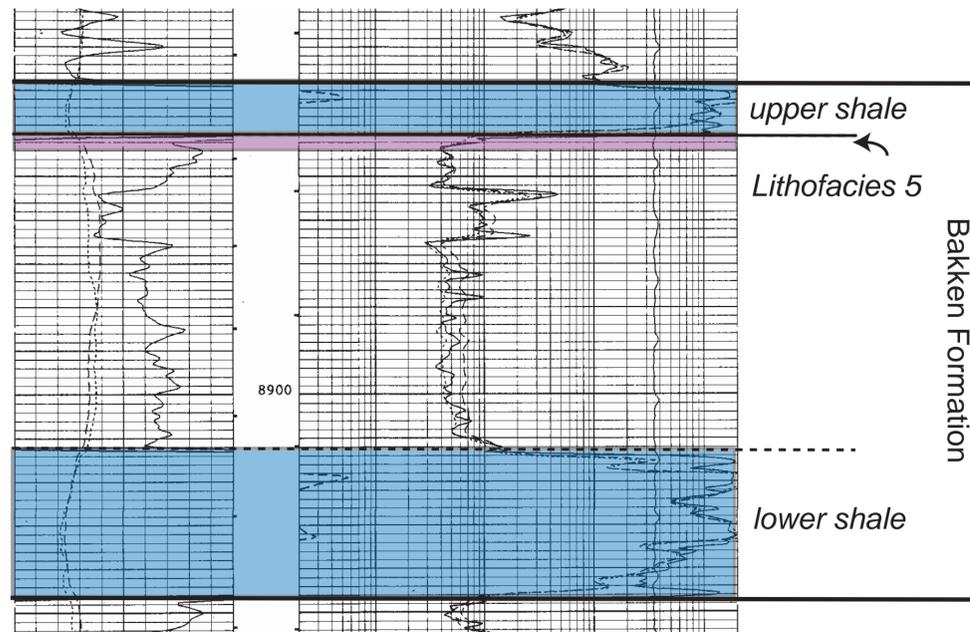
Lithofacies 5 is a transitional facies that underlies the upper Bakken shale and consists of a medium to light grey or greenish-grey, massive to wispy laminated siltstone to a greenish grey massive carbonate.

Thin beds of very fine-grained sandstone occur toward the bottom of the interval. These beds are tan to light grey and commonly have cross-ripple laminations. One fine-grained layer is underlain by an argillaceous layer rich in brachiopods. This brachiopod-rich layer is present in several of the wells. Brachiopods are present throughout the entire interval. In addition to the brachiopods, bryozoan and crinoid fragments are present in wells associated with localized highs, such as the southern Nesson anticline and Burke County areas. In the shoaling areas the cement is commonly dolomite. The change from limestone to dolomite also occurs on the southern Nesson anticline as the localized zero edge is approached. Many of the fossils are completely or partially replaced with pyrite. Pyrite is disseminated throughout the section increasing in concentration towards upper shale contact. The interval is massive immediately below the contact with the shale.

Thickness of the interval ranges from 2 to 6 ft, averaging 4.7 ft. The contact with the overlying Bakken shale may be gradational or abrupt depending on the location of the well in the basin. There is usually a well developed lag deposit of fossil fragments, bitumen grains, and pyrite, immediately overlying the contact where it is erosional. It is represented as a small clean spike on the newer gamma-ray logs (see wireline logs). However, it is commonly overshadowed by the high radioactivity of the overlying shale requiring close core control.

The majority of the lithofacies is middle to lower shoreface reflecting the transgression of the upper Bakken Sea. Areas of shoaling are limited to localized highs. Along the southwestern corner of the map, Lithofacies 5 unconformably overlies the middle member, the lower Bakken shale, and the Devonian Three Forks Formation.

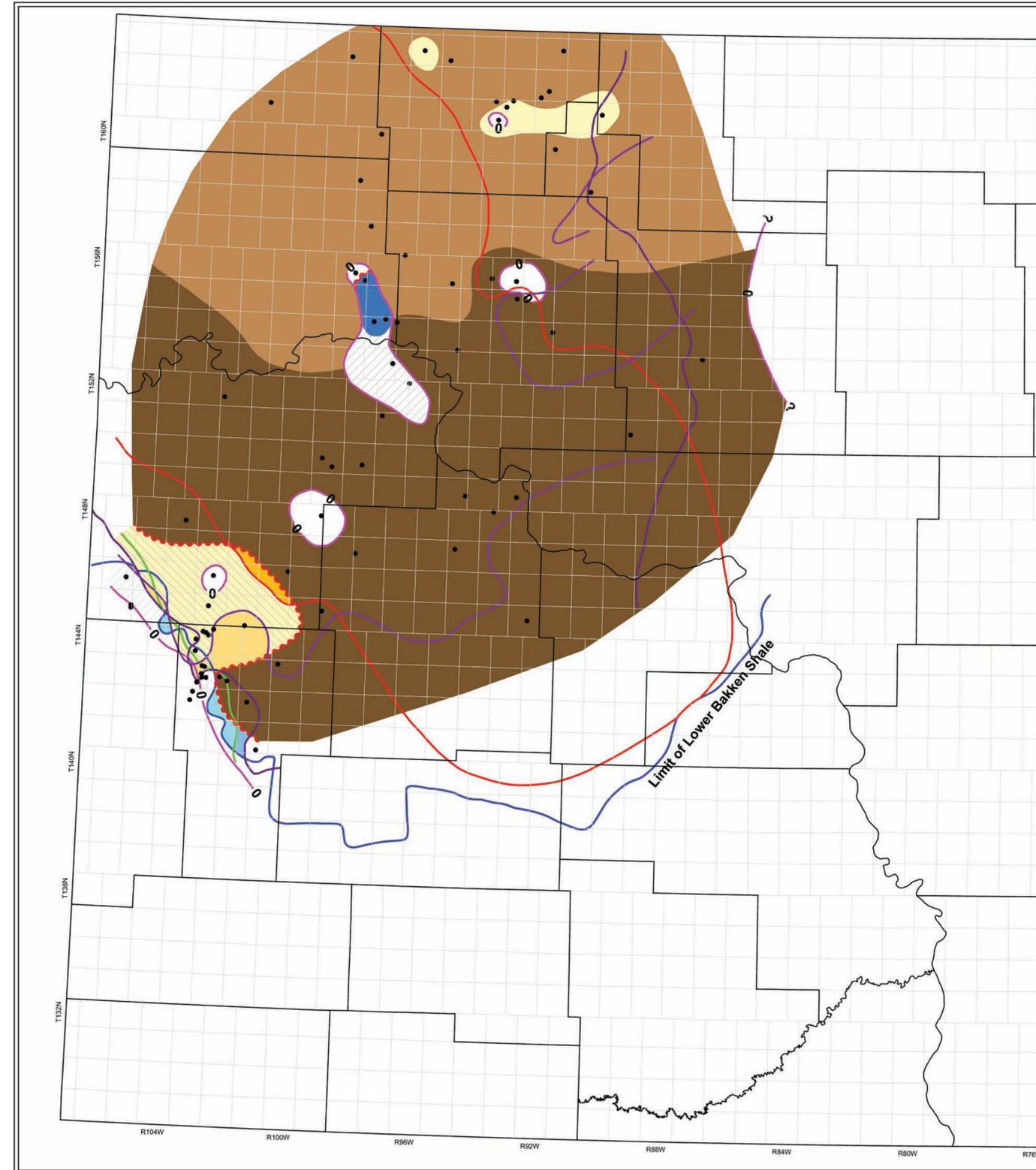
SENW Sec. 11, T.160N., R.95W
 Conoco, Inc.
 #17 Watterud "A"



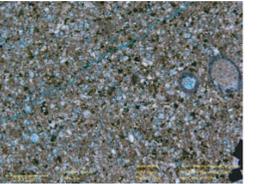
CALS(IN)		LLD(OHMM)		TENS(LBF)	
6.0000	16.0000	20000	20000	10000	0.0
CAL(IIN)		ROX(OHMM)			
6.0000	16.0000	20000	20000	20000	20000
GR(GAPI)		LLS(OHMM)			
0.0	100.00	20000	20000	20000	20000

GR = Gamma Ray
 Cal = Caliper
 DUAL LATEROLOG MICRO-SFL
 LLD = Deep Laterolog
 LLS = Shallow Laterolog
 RXO = Flushed Zone Resistivity

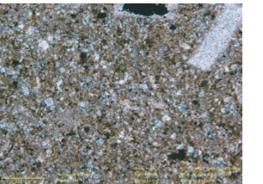
NDIC File No: 13318



NENW Sec. 19, T.147N., R.96W.
 Maxus Exploration Co.
 #21-19 Carus Fee
 KB = 2547



Dolomite with abundant interparticle porosity and some moldic and microfracture porosity.



Dolomitic limestone with pervasive interparticle porosity. Pyrite grains and replacement of fossil fragments by pyrite are common.



Silty dolomitic limestone with brachiopods and brachiopod fragments. Pyrite grains are also abundant through this lithofacies. This interval has abundant interparticle porosity and limited micro-fracture and moldic porosity.

