

/ /

:

.

.

.

Structural and Tectonic Development of Nahr Umr Field, Southern Iraq

Wathiq Ghazy Almutury

University of Basrah/ Science Collage/ Geology Dept.

Abstract

Nahr Umr is one of the important oil fields in southern Iraq. It is oval anticline structure formed by rising of Infra-Cambrian salt that happened by two mechanisms: First, density inversion mechanism represent the difference between density of salt rocks and others surrounding sedimentary rocks. Second, differential loading mechanism represent the difference in distribution of lithostatic pressure above anticline salt structures. These mechanisms worked together with basement uplift from Early Cretaceous to Late Tertiary to form a non-piercement salt

structure that called salt pillow structure at first stage. It called salt pillow and had oval shape in top view. The salt pillow developed to form a piercement salt structure at second stage, and it pierced apart of the Paleozoic overburden successions. The effects of piercement salt structures reached to the Mesozoic and some of Cenozoic overburden successions to form Nahr Umr oil field at last.

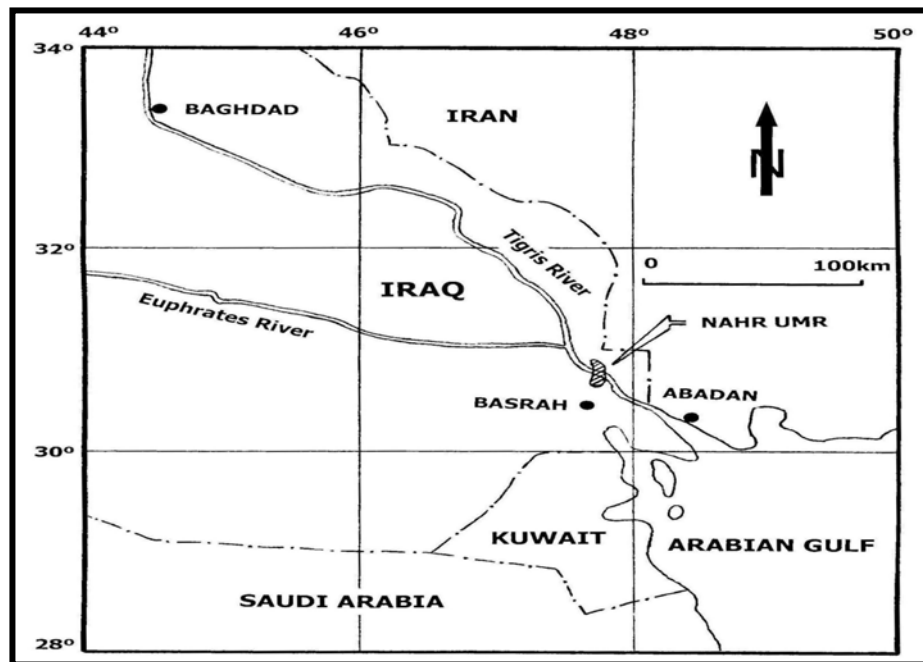
(25)

(47° 45`)

(1940)

.(1) (30° 45`)

.(1996) (Saddle)



.(Abadi, 1972)

:(1)

:
 (Numan, 1997)
 (Sagged basin)
 .(Arabian Plate) (Quasiplatform forland)
 .
 (Infra-Cambrian)
 .(Ibrahim, 1979)
 (Graben structures)
 (Numan, (Rifting)
 .1997)
 (Upper Jurassic)
 .(Numan, 2000)
 (Lagoons) (Middle Miocene)
 (Collision)
 .(Ibrahim, 1979; Numan, 1997) (Eocene)
 (Salt tectonic)
 (Salt pillow)
 .(Alsharhan and Nairn, 1997)
 .
 (Karim, 1989; 1993)
 .
 (Diapirism)
 .(1996) (6-)
 (Ibrahim, 1979)
 .(1996)
 .

(Karim, 1989; 1993)

(The low amplitude gravity maxima)

.

(Salt Plug)

)

.(2002

:

(32)

.(17)

.

(S)

.(1980)

(10^{-3})

(10^{-8})

.(B.P.I.,1981)

(Saddles)

.(1980) (3.5×10^{-3})

(2×10^{-3})

(Vertical relief)

.

.(B.P.I., 1981)

(400)

(Normal faults)

(2)

(65×10^{-3})

(50)

(Throw)

.(B.P.I., 1981)

:

(1695)

(NR-1)

.(3)

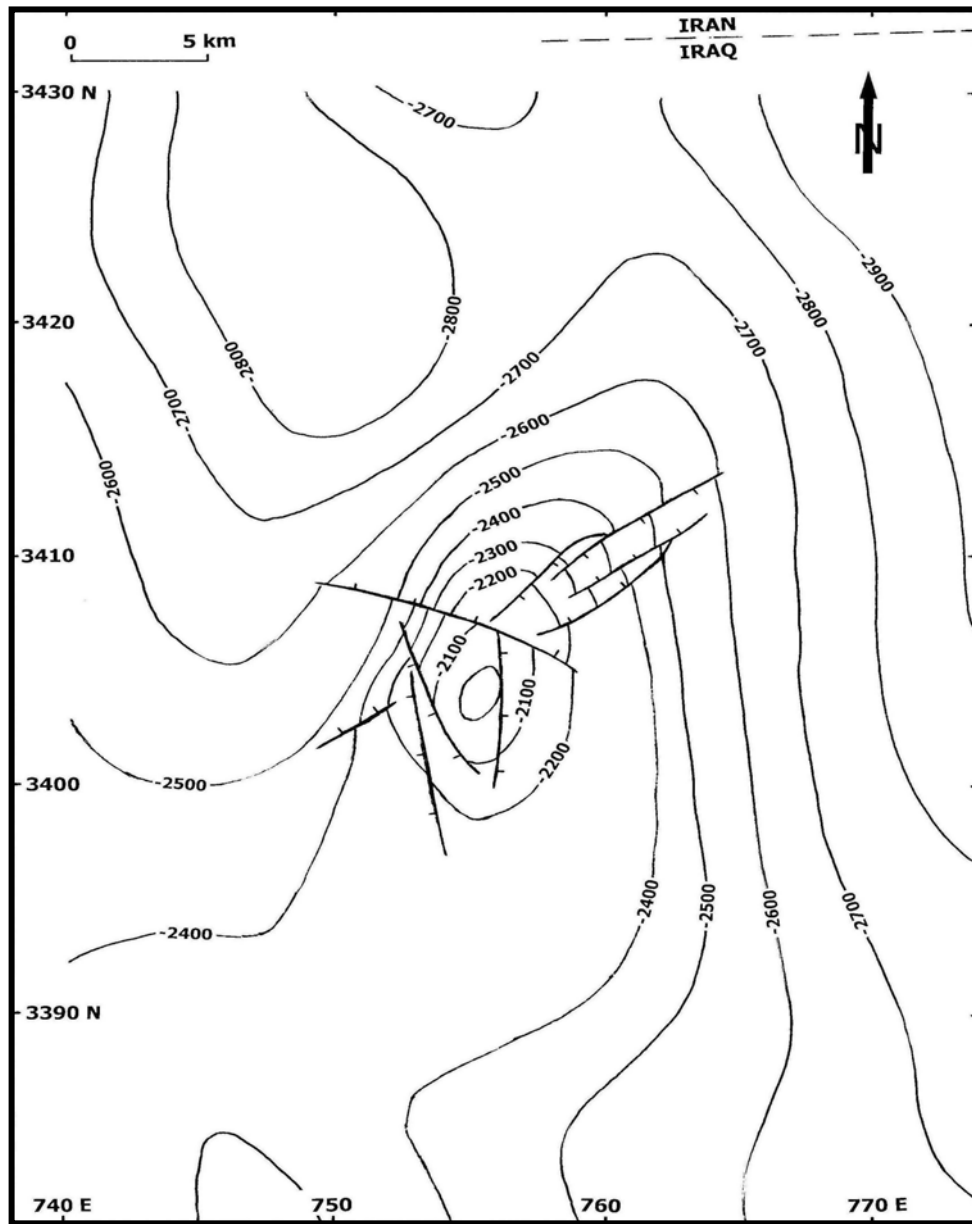
(2104)

(NR-4)

.(Abadi,1972)

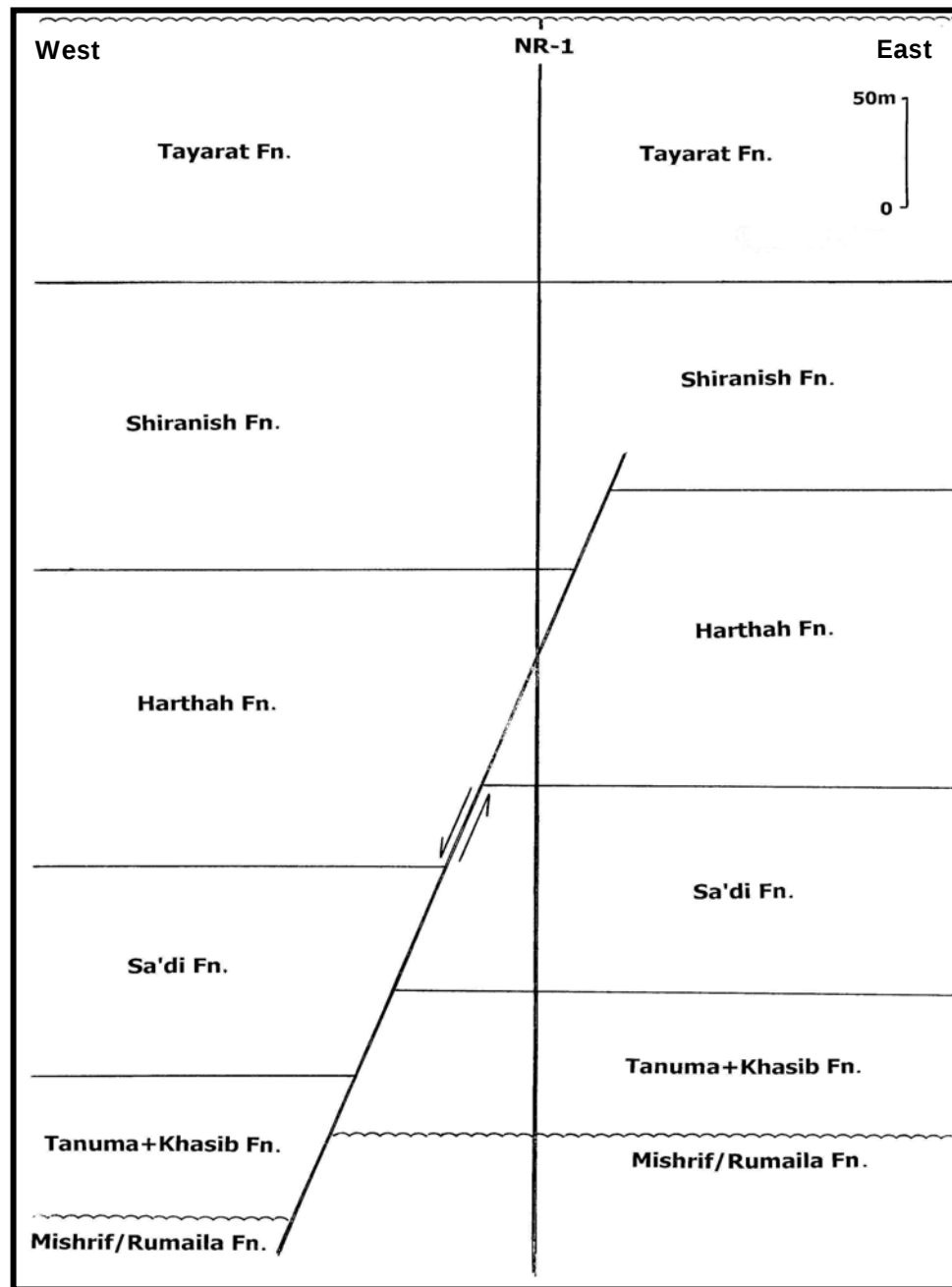
////

(10) (1996).



(2):

(B.P.I., 1981).



(NR1)

:(3)

.(Abadi, 1972) (1695)

:

.

: (4)
: (1)
.(4)
(Density Inversion)

(³ / 2.5)

(Van der (³ / 2.2)

.Pluijm and Marshak, 1997)

(Salt pillow structure)

.

.(Ala, 1972; Kassler, 1973; Kent, 1958; 1986)

.

.(Numan, 1997; 2000)

: (2)
(Differential Loading)

(Van der Pluijm and Marshak,

.1997)

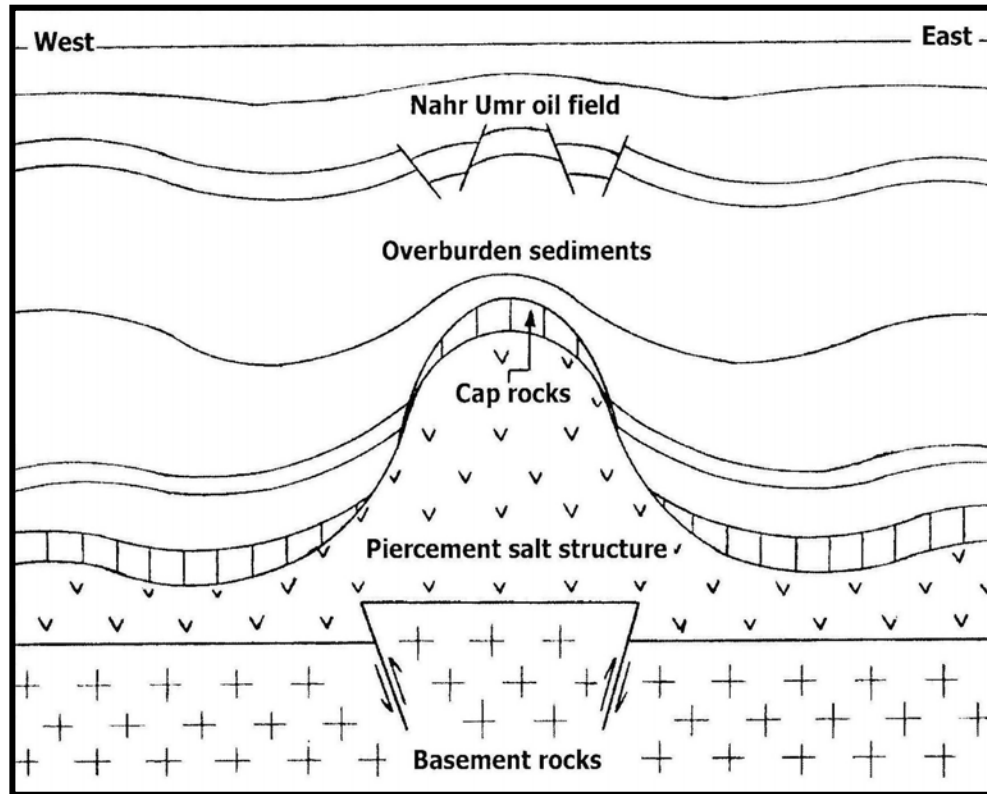
.(Piercement salt structure)

(Cap rocks)

.(Billings, 1972)

: (3)

(Folding)



:(4)

.(Billings, 1972)

////

(9)

(10)

(1996)

.

.

.

.

.

.

.

.

:

:

) :1980

.(

11

) :1996

. 19

.(

.() :1996

. 14

.() :2002

. 110

: :

Ala, M.A., 1974. (Salt Diapirism in Southern Iran). A.A.P.G.Bull., V.58, PP. 1758-1770.

Alsharhan, A.S., and A.E.M. Nairn, 1997: (Sedimentary Basins and Petroleum Geology of the Middle East). Elsevier Science B.V., 843 P.

Abadi, Fadhil, J., 1972: (General Structural Picture of Nahr Umr Field between NR-1 and NR-4). Iraqi National Oil Company, Basrah, 13 P.

B.P.I., 1981: (Reservoir study of Mishrif FM, Geological model, Nahr Umr Field, Iraq). Internal report, Braspetro Petrobras Internacoinal S.A.

Billings, M.P., 1972. (Structural Geology). 3rd. ed., New Delhi Prentice-Hall, Inc., 606 P.

Ibrahim, M.W., 1979. (Shifting Depositional Axes of Iraq: An Outline of Geosynclinal History). Jour. Petrol. Geol., Vol.2, No.2, pp.181-197.

Karim, H.H., 1989. (Qualitative Interpretation of Basrah Aeromagnetic Map, SE Iraq). Jour.Geol.Soc.Iraq, Vol.22, No.2, pp.1-8.

Karim, H.H, 1993. (General Properties and Patterns of the Gravity Field of Basrah Area). Iraqi Geol. Jour., Vol.26, No.1, pp.154-167.

Kassler, P., 1973. (The Structural and Geomorphic Evolution of the Arabian Gulf). In: The Arabian Gulf, Holocene Carbonate Sedimentation and Diagenesis in a Shallow Epicontinental Sea, edited by B.H.Purser, Springer Verlag, New York, heidelberg, berlin, 471 P.

Kent, P.E., 1958. (Recent Studies of South Arabian Salt Plugs). A.A.P.G.Bull., Vol.62, pp.984-1003.

Kent, P.E., 1986. (Island Salt Plugs in the Middle East and their Tectonic Implications). In: Dynamical Geology of Salt and Related Structures, Edited by I.Lerche and J.J.O'Brien, 1987, Academic Press, INC., PP.3-37.

- ////
-
- Numan, N.M.S., 1997. (A Plate Tectonic Scenario for the Phanerozoic Succession in Iraq). Jour.Geol.Soc.Iraq, Vol.30, No.2, pp.85-110.
- Numan, N.M.S., 2000. (Major Cretaceous Tectonic Events in Iraq). Raf.Jour.Sci., Vol.11, No.3, pp.32-52.
- Van der Pluijm, B.A. and S.Marshak, 1997. (Earth Structure An Introduction to Structural Geology and Tectonics). McGraw-Hill, 495 P.