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Associated Gas Potential to Low Resistivity Reservoir in the Northern Ahnet Gedinnian

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Gas potential has been proved for a long time in the North of Ahnet basin, particularly in the lower Devonian reservoirs like the Gedinnian, Siegenian and Emsian. In this area, the Gedinnian reservoir is considered as the main reservoir. Its base display a low resistivity particularity which resulted in shutting certain wells, based on wireline log interpretation. However, these reservoirs could be hydrocarbon bearing as it is known in other Algerian basin like the Berkine.

In the Ahnet basin, low resistivity aspect is not well known. It is noticed on DJBA-1 well, where the lower most Gedinnian is an excellent reservoir with porosities up to 28%, while log indirected water saturation could be over 50%. High gas flow has been produced (9670m³/h) during reservoir testing.

The study consisted of locating similar low resistivities to DJBA-1 ones on the already drilled prospects in the area and considered without petroleum interest. It required the introduction of several approach methods such as:

- A systematic well log re-interpretation
- A sequence stratigraphy well correlation and structural correlation for locating the problematic zones.
- Isobath, isopach and isoporosity map building at the Gedinnian base using different methods (including geostatistics) for study of thickness and porosity evolution through the area, then, trying to locate an interesting zone likely to be prospective.

The result analysis of all these approach methods display a NW-SE oriented trend. The trend contains a low resistivity zone in the 10 to 20 m thickness range with preferential zones around DJBA-1 (17m) and IS-2 (20m). The porosity values reported are good; about 16%, reaching 21% in DJBA-1 and 23% in IS-2.

It is evident that the lowermost Gedinnian seems highly potential and directly related to the low resistivity anomalies. The cause or origin is not well known.

This work will not necessary solve the low resistivity problem in the area, shows that the northern Ahnet basin could have high gas potential in the lower Gedinnian. This increases the estimated gas volumes in place in the area.