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Simpson-Arbuckle Contact Revisited in Northwest Oklahoma County, Oklahoma: Abstract

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ABSTRACT

The Joins Formation, the lowermost formation of the Simpson Group, is traditionally the least studied or understood of the Simpson formations. The Joins, not known to produce hydrocarbons in central Oklahoma, is frequently overlooked by those more interested in the productive Simpson formations above and the Arbuckle carbonates below.

In a study of the lower Simpson to upper Arbuckle interval in northwestern Oklahoma County, Oklahoma, the Joins Formation was found to be present. The formation in this area varies from 65-195 feet in thickness, which is considerably thicker than most published literature for the area; some of which state that the formation is absent.

Lithologically, the Joins Formation in central Oklahoma closely resembles the Arbuckle Mountain type section. The central Oklahoma section consists of interbedded gray, olive gray and green splintery moderately waxy shale, cream to light gray homogeneous microcrystalline dolomite, and microcrystalline to fine crystalline fossiliferous slightly glauconitic limestone. In the lower half of the formation fine to medium grain slightly conglomeratic and glauconitic well cemented sandstones are also noted. The entire Joins Formation is moderately to very fossiliferous; primarily consisting of crinoids, ostracods, brachiopods, and trilobites. The ostracod fauna closely resembles and correlates with the Arbuckle Mountain section, which has been extensively studied over the years by such authors as Taff, Ulrich and Harris. Beneath the Joins in this area is a normal section of Arbuckle dolomites.

Due to the absence of a basal sand in the Joins the separation of the Joins and Arbuckle, utilizing electric logs only, is frequently tenuous. In comparison with the Arbuckle, the Joins tends to have higher gamma ray and S.P. values. Other tools, such as resistivity, bulk density and photoelectric (PE), are frequently inconclusive. The newest of the above tools, the photoelectric that was primarily designed as a lithology identification tool, is particularly ineffective due to the very thin bedded nature of the Joins and the two feet minimum resolution limits of the PE tool during normal logging.

For geologists studying the Simpson-Arbuckle contact in central Oklahoma, the presence or absence of the Joins Formation is best determined through conventional lithologic and paleontologic sample identification techniques. Once this has been done, correlation of electric logs with this type log is possible for the local area. Care must be taken not to extend these correlations to far from the type well, primarily due to the frequent inconclusive nature of electric logs over the Joins interval.

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