

## **The Impact of Astroblems on Earth's History and Its Implications for Hydrocarbon Production**

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To meet the world's growing energy demands, the need to explore for unconventional sources of oil and gas is becoming ever more popular. Each year, smaller new discoveries are made. Exploration within impact structures may prove to increase the number and size of hydrocarbon targets in the future, as they have shown to host many prolific oil and gas fields. Meteorite impacts are known to release a great deal of energy which can result in more than 15 m of vertical ground motion. Sedimentological mechanisms associated with the latter include gravity driven transport (mass transport complexes), ballistic sedimentation and reworking by tsunamigenic forces. In addition, fractured country rock may host significant reservoir potential.

To date, 174 bolides have been reported to blemish the earth's surface. Seventeen confirmed impact structures occur in petroliferous areas of North America, nine of which are being exploited for commercial amounts of hydrocarbons. In the Ames impact feature, Oklahoma, 53 million barrels of oil are estimated to be recovered ultimately from fractured carbonate and granite reservoir rock. The Cantarell field, the largest oil field in Mexico, produces from a thick carbonate breccia that is genetically related to the Chixulub meteorite impact event which occurred in Northern Yucatan. This field produced more than 6.5 billion barrels of oil along with 3 trillion cubic feet of gas.

The Jebel Hadid structure, Libya, is another prospective impact crater which houses a promising source rock, stored in the lower stratigraphic units of the crater. Migration pathways are provided by regional faults as well as impact generated conduits. From these examples, it is evident that the processes associated with bolide impacts favor the generation of all elements necessary for a successful petroleum system.