

New Technical of Seismic Approach to Detection Jatibarang Volcanic Natural Fracture Reservoir, Onshore West Java, Indonesia

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The Jatibarang field is located in West Jawa and approximately 35 km to the west of Cirebon or 180 km east of Jakarta. The field produces oil from Jatibarang Formation with dominant zone production is in naturally fractured volcanic rock. The Jatibarang volcanic formation consists of lava flows (andesite/basalt), tuff and agglomerate/ volcanic breccia. Oil was first discovered in the volcanic reservoir in 1969 and has been developed since 1973 with initial production from 20 wells was approximately 40,000 bbls/day.

This paper was part of a larger multidisciplinary project in which integrating of 3-D seismic survey (was acquired in the end of 2007), core, logs, and engineering data from Volcanic Jatibarang Formation were analyzed, to defining top reservoir characteristics comprehensively, including reservoir architecture and fracture network identification in this reservoir.

It is believed that minor faults drive the geometry of fractures in Jatibarang field. For the geophysical, as an addition to the common geophysical analysis workflow, Ant Tracking™ approach was used in this case to identify the minor faults and maybe fractures. The approach can be divided into several processes starting from seismic conditioning to arrive at validation with well and production data. Migrated seismic data was filtered/smoothed prior to edge detection using Variance which performs best in areas of high amplitude difference. The edge data of Variance cube will then be used for Edge enhancement process using Ant Tracking™ filter. Basically the approach is looking for a trend in a very noisy data. Features in the attribute corresponding to the expectation about the behaviors of the faults will be extracted. The connected pieces of Ant Tracking™ attribute made a significant guidance for fault interpretation as well as minor faults which believed to drive the geometry of fractures. AnT Tracking™ result volume was then converted into depth domain for geostatistical model and validation purpose.