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EXPLORATION AND PRODUCTION APPLICATIONS OF THE BOREHOLE ELECTRICAL IMAGERY

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Borehole electrical imagery provides valuable structural, stratigraphic, and sedimentological information for explorationists, production geologists, and reservoir engineers.

The use of the imagery in extracting, with a high degree of confidence, structural and stratigraphic dip information has been found of great value in evaluating new exploration plays. Also, it illustrates clearly, for the first time, the various distinctive tectonic elements, that intersected by boreholes, and manifests their morphology.

The high resolution images improve our capacity in exploring for and appraising secondary porosity reservoirs. Vuggy and fractured reservoirs are of great significance in different parts of the world. Fractured basement associated with shear zones have become an important exploration target in the Gulf of Suez.

In highly laminated reservoirs and where standard well log evaluation tend to give a pessimistic results, the borehole imagery, and due to its high resolution, is able to reveal thin reservoir beds and attains its gross thickness. Furthermore, it can help in better estimating the percentage of clays in the formation which in turn leads to more realistic computation for hydrocarbon saturation.

Furthermore, the capabilities for the 3-dimentional analysis of sedimentary structures has give the geologists and reservoir engineers the ability in locating successfully development and injector wells. Indicating such features along a vertical sequence make it feasible to interpret as accurate as possible the depositional environment of this sequence together with the orientation of reservoir bodies. On the other hand, it has been evidenced that each type of crossbedding has its preferable permeability orientation.

The interactive analysis on the Sun workstation have further enhanced the contribution of the borehole electrical imagery to the industry.

The basic limitations, however, of the electrical imagery are related to the nature and/or the mud resistivity as well as to the washed over boreholes.