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Fractured Basement Exploration on the Algerian Sahara Platform Applied New Play Concept on the Ramade Horst

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SUMMARY

On the Ramade Horst, the fractured granitic basement at a depth of 1900m has been an active tectonic zone during the Austrian phase. The Silurian is unconformably overlain by the Albian resulting in 2000m of uplift which resulted in the Silurian hot shales being downthrown along the Ramade fault and juxtaposed with the Cambrian and the Basement. The weathered material, the low permeability of the Cambrian/R3 and the Ante-Cambrian shales would be a potential top seal separating the Basement from the Cambrian.

Exploration of this unconventional target in the existing fields is recommended as a mean to increase the production and extend the lifetime of the facilities. Also in the Ramade this play can be bundled with the Cambrian.

The occurrence of naturally fractured basement reservoirs has been known within the hydrocarbon industry for many years. Commercial reserves from this hidden resource have been found largely by accident while exploring conventional reservoirs.

Many examples of producing Basement are well known since 1930 and in the last decade good size fields have been discovered such as Dragon and Tiger, Vietnam (8000bbl/d, OIP 1.59 Billion bbl), Rakk High, Libya (7,627bbl/d), Sumatra-Beruk, Indonesia (1,680bbl/d) and PY-1, India (13MMCF/d).

The Pan-African Basement underwent an intense phase of compressive tectonics and was subsequently uplifted and weathered during significant periods of time.

On the Ramade Horst, the fractured granitic basement at a depth of 1900m has been an active tectonic zone during the Austrian phase. The Silurian is unconformably overlain by the Albian resulting in 2000m of uplift which resulted in the Silurian hot shales being downthrown along the Ramade fault and juxtaposed with the Cambrian and the Basement. The weathered material, the low permeability of the Cambrian/R3 and the Ante-Cambrian shales would be a potential top seal separating the Basement from the Cambrian.

From the Cambrian discovery experience in Hassi-Messaoud, it is highly recommended to explore the basement rocks to a depth of at least 300m especially where overlain by a Cambrian pool. This will reduce the sourcing uncertainties for this presumed unconventional reservoir (e.g. Hassi-Messaoud, Nezla, Gassi-Touil, Baguel etc...). Indeed recent mapping on the Ramade high has revealed large Austrian structures (up to 100km²) strongly modified during the Alpine.

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Key Words: Naturally Fractured Basement Reservoirs, Producing Basement, Fractured Granitic Basement, Ramade Horst, Cambrian and the Basement.