

## **Night Shot-Hole Drilling, a New Approach for Successful Completion of Mega Onshore 3D Seismic Survey**

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### **ABSTRACT**

Wafra Joint Operation (WJO), a joint operation venture between Saudi Arabian Chevron (SAC) in the Kingdom of Saudi Arabia and Kuwait Gulf Oil Company (KGO) of the State of Kuwait successfully completed one of the largest onshore 3D seismic surveys in the world. The project encompassed nearly 4612 sq. km surface area inundated with various topographical and manmade challenges and possibilities. Since the area of operation crossed many different environments, appropriate strategies, geometries and energy sources were adopted. The eastern half of the survey area consisted of Transition zones, wet areas, sabkhas and tidal zones which necessitated to move away from the regular vibroseis operation and adopt explosives as the sources of energy. The increasingly hot temperatures of summer months, reduced working hours, restricted movement and supply in sabkha areas had a detrimental effect on production and it was identified that night operations, which never tried before in the region, would be required to meet the production expectations. To complete the night shot hole drilling process on time without compromising any of the EHS standards, few innovative concepts and best practice approaches were adopted. Five custom built rig units mounted on a rubber crawler, suitable for sabkha type of terrain, were utilized for the task. These drills are suitable to drill both with air and with water and mud. To support the drilling operations specially in sabkha areas 8 Bandvagn 206 (BV 206) vehicles developed by Hagglund, which is tracked, amphibious, articulated all-terrain carrier were deployed. A total of 18,546 shot-holes, equates to 428,175 meter drilled depth needed to support the program. Shot-hole night drilling operation was a historical and extremely challenging activity that was completed in time with all safety norms in place and opens a new chapter in the field of seismic data acquisition that can be referred for future ventures.