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Abstract Title: International Shale Gas Partnership: China Sichuan Shale Gas Project Case Study

Abstract: There is growing international interest in shale gas development, due to the recent advances in technology and operating practices which are unlocking large shale gas resources across North America and changing the energy outlook. China is estimated to have similar resource potential and, given the large and growing energy demand and existing gas infrastructure, several evaluation projects have been initiated.

Shell has been the first international energy company to sign a Production Sharing Contract (PSC) for shale gas exploration and development in China. Shell and PetroChina have been evaluating an area of Joint Cooperation in the Sichuan Basin, since 2010. Since then, two vertical and three horizontal wells have been drilled, demonstrating the continuity of the Lower Silurian Longmaxi Formation shale and gas flow to surface for each of the wells.

The project has achieved the first phase objectives, spudding the first well within a year, achieving 2.5 years Lost Time Injury (LTI) free and demonstrating the technical basis for a shale gas venture. As part of the cooperation, North American best practices and personnel have been deployed and local capability has been developed, leading to successful delivery of the appraisal programme. The programme included basin modeling, seismic interpretation, core and geochemical evaluation, microseismic interpretation and well testing. One vertical well with two frac stages tested at a stable rate of 60 000 m$^3$/d, while a subsequent horizontal well was successfully completed with a 9-stage frac.

In order to predict future well performance and support the field development concept, long term production data from several wells are required. There are also many challenges to overcome. The Sichuan Basin typically consists of densely-populated,
intensively-farmed agricultural land. Land acquisition, permitting processes, water management and community interactions are significant risks for timely and cost-effective project delivery. With good operational practices, however, shale gas operations can bring significant benefits to local communities.

This paper will describe the approach to evaluating the opportunity, critical aspects for successful cooperation and challenges which have application to other international shale gas opportunities.

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