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Oil & Gas Authority
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7 August 2017

**RE: Programme of work for the completion of Brockham X4Z**

Dear Mrs. [redacted]

Following from our earlier conversations please find below our production testing philosophy and plan to complete Brockham X4Z at the Brockham oil field (PL235) into a Kimmeridge producer.

Introduction

As described in the Field Development Plan Addendum the intention is to conduct a trial production period to gather long term production performance information crucial to an understanding of the relationship between the natural fracture system that is likely to control the initial well production performance and the extent to which that fracture system is supported by the matrix both in the limestone intervals and the interbedded shale sections. The initial stages of production are designed to the format of a short-term test to gather transient test data with downhole gauges.

As noted in the FDP Addendum :
*"The well will be initially put into production using underbalanced perforating and with downhole gauges present. There will be an initial "test period" involving an initial flow and build-up to establish initial reservoir pressure followed by one or more short flow and build-up periods to establish kh and skin values and possibly additional near wellbore information. At the end of the initial testing process the gauges will be recovered and a production log will be run across the entire perforated interval to establish the relative contributions from portions of the reservoir section. This will then be used in conjunction with the image logging of the well fracture system to establish the role of the observed natural fracture system in the production performance of different areas of the reservoir. The production log will also check for water production.*

*Subsequently, during the period of sustained natural flow without pumping, at intervals of around 12 months, the production logging will be repeated during that period to build up a picture of the changing performance of the fracture system. The production log will also provide a snapshot of flowing bottom hole pressure. It is envisaged that initially at least production will be constrained to around [redacted] This rate constraint is based on assumptions made about the likely rate at which the fracture system can sustain production."*

Mechanics of Initialising Production

The well will be perforated using tubing conveyed guns to achieve maximum hole size and penetration to facilitate the communication between the natural fracture system and the wellbore.

A simplified sequence of operations would be as follows:-

1. RIH with guns and completion
2. Displace the well to provide an appropriate underbalance
3. Activate guns followed by 5 min flow and build up
4. Set packer (note packer would not withstand shock of guns)
5. Continue with second flow and build up
6. Optional third flow and build up
7. Retrieve gauges drop guns and run PLT
8. Continue to flow

Pressure gauges will be run in a nipple close to the packer. The guns will be pressure activated.

The completion would be very simple as shown in Figure 1 below.

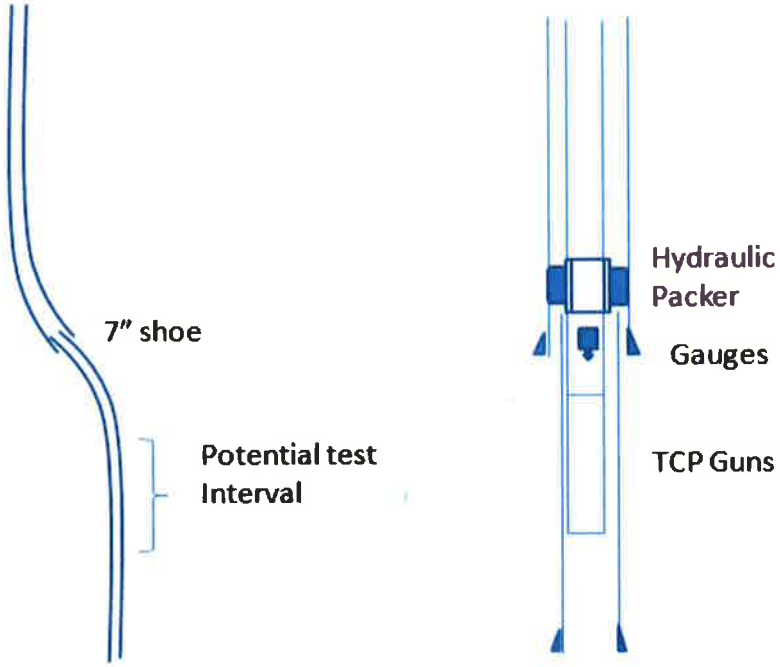


***Figure 1 Schematic of Proposed Completion***

Selection of Perforation Interval

The Kimmeridge section includes a total vertical thickness of approximately 385m. The section consists of an upper shale, upper micritic limestone, a shale section, the middle micritic limestone, a further shale sequence, then the lower micritic limestone and a final shale section to the base of the Kimmeridge. The shale sections above below and between the limestones have numerous thin interbedded limestones.

The logs for the Kimmeridge show together with the mud log and geochemical data that there is a section with elevated total organic content and higher gas readings from above the upper limestone to below the lowest limestone. Evidence from the image logging confirms numerous natural fractures in this section. Lower gas readings in the uppermost shale sections and also in the lowermost shale sections seems to support the concept that oil in these boundary zones has migrated up to the Portland or down to the Corallian. They are therefore of reduced interest. Figure 2 below shows the Kimmeridge section zone of interest.

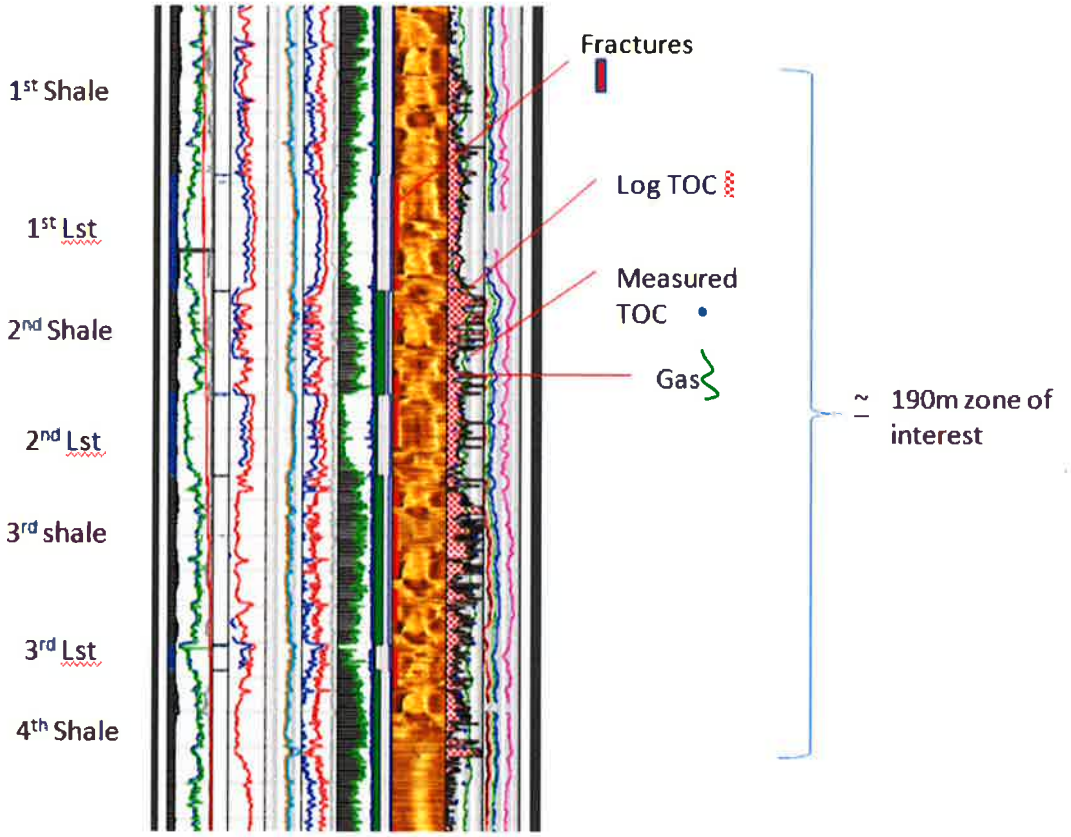


***Figure 2 Central section of the Kimmeridge Clay Formation showing proposed perforated interval and the supporting evidence.***

The 190m interval proposed extends from around 970m MD to 1160m MD (+or- 5m). The precise depths may be adjusted a few metres for operational reasons (spacing out the completion, convenient packer setting depths etc).

A detailed step by step programme will be issued for examination by the HSE with respect to the completion operation.

Subsequent Operations

During the remaining period of long term testing the well will be monitored for flow rate and surface pressures. At intervals a production log will be run until natural flow ceases and a pump is required. The production logging should identify the varying contributions across the section providing additional information on the ability of the matrix in different sections to support the adjacent natural fracture system. The data collected will be presented in a further addendum to the field development plan which will discuss and evaluate the long-term viability of Kimmeridge production from naturally fractured sections such as this.

On behalf of the Board

[redacted]