

Thursday 10th December 2009

Grieve Field EOR Project Final Laboratory Results

HIGHLIGHTS

- Surtek has completed all the laboratory tests for the Grieve chemical flood.
- All of the Alkali Surfactant Polymer (ASP) formulations applied to the radial floods achieved incremental recoveries with the average of the 16 tests achieving 14.4% recovery of the Original Oil in Place (OOIP) for a total oil recovery of 59.6% of OOIP
- The best four chemical formulations achieved an average incremental recovery of 20.6% of OOIP for an overall recovery of 61.0% of OOIP.
- The laboratory testing, and specifically the final radial core flood results, has identified the preferred chemical formulation to be used to achieve optimum crude recovery.
- Surtek's conclusion from all the tests is that *"the Grieve Field is a good application for an alkaline-surfactant-polymer flood"*
- Surtek's recommendation is that *"numerical simulation should be performed to define the most economical injection volumes"*.
- The history match of the numerical simulation, currently being undertaken by Surtek, is expected to be completed this week; this will enable this model forecasting to commence.
- Future production profiles to be generated by the chemical flood simulation model are expected in early January 2010.

BACKGROUND

The Grieve field west of Casper in Wyoming, USA, was the basis for the IPO for Elk Petroleum Limited ("Elk", the "Company"; ASX: ELK) in 2005. Its potential for tertiary recovery was recognized from the outset particularly as there is a carbon dioxide (CO₂) pipeline approximately 3 miles from the lease boundary. However, the Company was unable to contract a reliable and economical supply of CO₂ from the two major sources within Wyoming. In December 2008, Elk engaged Surtek to undertake a detailed study of the chemical flood possibilities for the field. Surtek is the world's leader in chemical flood design and application (www.surtek.com).

The Surtek study began with an initial overview of the Grieve Muddy Sandstone reservoir, production history and its produced fluids. The study then progressed to laboratory testing of collected samples of the Grieve fluids (crude and water) with a view to identifying chemicals which could greatly reduce the interfacial tension between the fluids and the rock. The later laboratory tests have involved Muddy reservoir core material from the Grieve#39A well drilled in July 2009, to examine the effect of surfactants and polymers on the fluid flow through the porous sandstone and finally with the radial core flood tests, to determine the incremental recoveries that can be achieved with different chemical combinations. The radial core floods are small scale replications of actual and forecast production from the Grieve Muddy Sandstone reservoir. The first step of the radial flood ("waterflood" in the following figure) replicates the historical production from Grieve. The second phase of the radial flood forecasts incremental recovery expected to be possible using different chemical combinations and concentrations in a future chemical flood Enhanced Oil Recovery (EOR) development of the field.

RESULTS

From the earlier laboratory work, Surtek was able to identify the chemicals that could achieve significant reductions in the interfacial tension between the Grieve Muddy reservoir fluids (crude and formation water) without resulting in adverse side effects such as the formation of emulsions and

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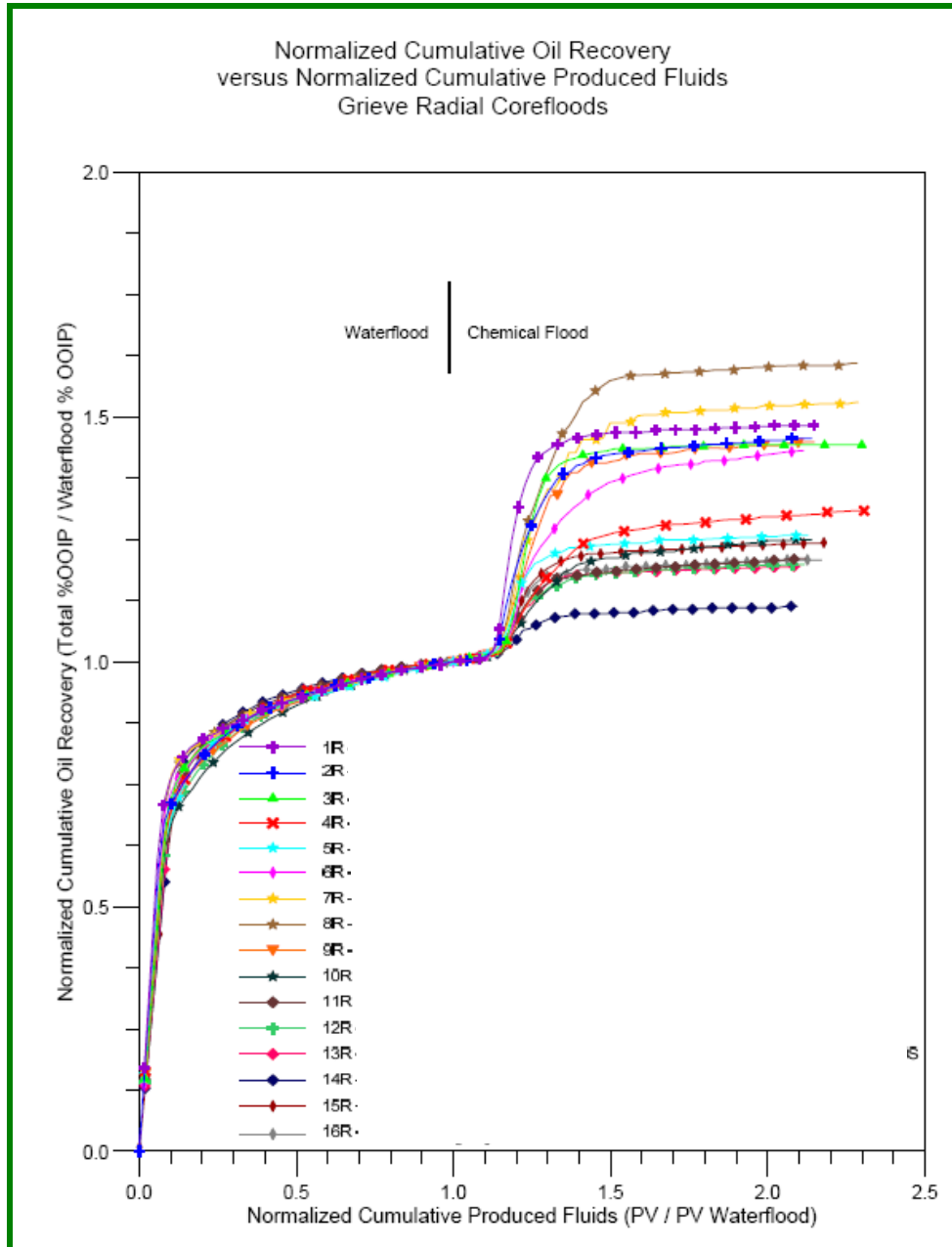
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chemical reactions with the reservoir rock. The most encouraging of these chemical formulations were then applied to fresh core material from the Grieve Muddy Sandstone reservoir to determine expected oil recoveries achievable in each of the different radial core flood tests.

All of the planned sixteen radial core flood tests have now been completed by Surtek. The following plot indicates the two production phases that are being replicated by the radial core flood tests: the first represents the historical phase of Grieve production up to the present time in which the weak water drive in the field has enabled the 30.2 million barrels of oil produced to date.



(Figure courtesy of Surtek Inc)

In the laboratory the average “water flood” recovery from the 16 core flood tests was 45.2% of the initial oil in the core achieved by re-saturation of the cores with Grieve crude (equivalent to the Original Oil In Place, OOIP). Another way to look at this measurement is that it predicts that there is 54.8% of the OOIP left in the reservoir, which is the target for chemical flooding. The second part of the plot represents the incremental recovery possible by flooding the cores with the different chemical formulations aimed at lowering the interfacial tension between the reservoir crude and formation water and thereby liberating a significant volume of the remaining or residual oil.

The sixteen radial core flood tests were used to measure the performance of the selected chemical formulations and then to fine tune concentrations of each of the components of each formulation. Whilst each formulation achieved an improved recovery, using the average recovery of all the outcomes from the sixteen tests of 15.9% does not provide a realistic prediction of the optimum outcome. The average of a suite of similar and the best-performing formulations provides a far better indicator of an optimum outcome. The average of four core flood results using the same alkali base and varying slightly the concentrations of a particular surfactant and a particular polymer achieved the best average incremental chemical flood recovery of 20.6% of the initial oil saturation of the cores (equivalent to the OOIP of the field) which coupled with the average oil recovery from the “waterflood” phase results for the same four tests of 40.4%, achieved an overall recovery of 61.0% of the initial oil saturation of the core (equivalent to the OOIP of the field). Surtek has recommended one of these 4 formulations as the specific formulation to be applied in the chemical flood development of the field. This outcome confirms the decision taken earlier this year by Elk to implement the Phase 1 development of the Enhanced Oil Recovery project of the Grieve Muddy field using chemical flood technology.

The simulation model of Grieve Muddy field has been prepared and various parameters are being modified to achieve a match with historical oil and water production and pressure data (“history match”). This history match is expected to be completed by Surtek this week. Once agreement is achieved, forecasting of the Phase 1 development and the full field development will be undertaken with a final simulation report expected from Surtek early in the New Year.

On behalf of the Board.



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