GeoConvention 2015
GEOSCIENCE
new horizons
Telus Convention Centre • 4-8 May 2015 • Calgary, AB Canada

Nexen's Keg River Water Disposal Wells – N.E. Alberta, Canada.

Michael B. Rogers P.Geol.
Nexen Energy ULC

Summary

Nexen Energy ULC (a CNOOC Limited Company) disposes of significant volumes of water from it's in-situ (SAGD) Oil Sands Operation at Long Lake, Alberta. The majority of that water is disposed into the relatively deep Middle Devonian aged Keg River Formation which lies some 200m below the Lower Cretaceous aged McMurray Formation that contains the oils sands. The Keg River Formation in this area is a dolomitized reef approximately 100m thick.

Successful disposal wells in the Keg River exhibit extensive fracturing to provide excellent near-wellbore permeability. Locating areas of fracturing proved difficult using vertical wells and so Nexen has pioneered the use of horizontal drilling technology which resulted in locating a successful Keg River disposal well for it's new Kinosis Project located approximately 10 kms south of Long Lake.

Extensive planning was required to ensure a safe and environmentally sustainable project. The result is a well that should meet Nexen's disposal requirements for the forseeable future.

Introduction

Location and background information are presented that indicate the importance of sustainable disposal wells for any SAGD operation.

Theory and/or Method

The regional geology of the target Keg River Formation are presented. The relationship of porosity, permeability and the presence of enhanced fracture porosity are discussed. The decision process in opting for a horizontal wellbore is elaborated on.

Examples

The location selection, pre-drill planning and execution are discussed and preliminary results are presented

Conclusions

A case is made for the use of horizontal disposal wells as a new way forward to address the very complex requirements of environmentally sustainable water disposal in the in-situ region of the Athabasca Oil Sands of N.E. Alberta.

Acknowledgements

Acknowledgement is made to Nexen Energy ULC (a CNOOC Limited Company) for permission to present this information.