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Managing Induced Seismicity in Canbriam's Altares Field in the Montney Formation, N.E. British Columbia – an Update.

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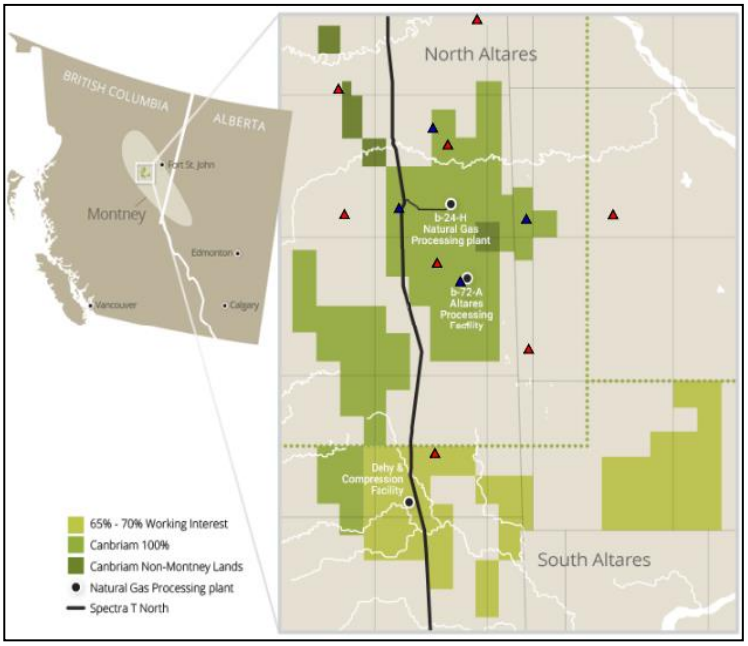
Summary

The Montney formation in British Columbia and Alberta has gained prominence in recent years due to the exploration and production boom which has yielded more than 3.5 billion bcf/d in production output and in excess of 440 TCF of reserves. It is one of the largest unconventional plays in N. America, covering 130,000km^2 with 5600 wells drilled to date. The figure below, illustrates the Montney reservoir trend and Canbriam's position in Altares in N.E. British Columbia. Canbriam is a private company currently with 40,000Boe/d producing capacity and a deep inventory of over-pressured, liquids-rich locations with stable, low-decline.The map also highlights some of Canbriam's seismometer and accelerometer arrays in North Altares.



The key to understanding Induced Seismicity is a thorough understanding of the subsurface. This presentation describes the multidisciplinary integration at Canbriam which has lead to the creation of an Altares-specific Induced Seismicity traffic light protocol based on ground motion, rather than the seismic event's magnitude. The work integrates the subsurface reservoir characterization, including fault/fracture identification to assist in prediction of Induced Seismic events during well completions. Operationally, Canbriam has RTC or request to complete meetings which include full integration of engineering and operations. Decisions in these meetings are relayed to the field to ensure any potential risks such as inter-well communication potential, casing deformation and Induced Seismicity are well understood.

Introduction

Canbriam has been monitoring for induced seismicity since early 2015 with a backbone array of seismometers. Additional accelerometers have been added to better monitor ground motion. The array is real-time capable with M_c <0.5 and <500m hypocentre accuracy.

Examples

Three North Altares Montney completion case studies are discussed. These illustrate the application of the integrated subsurface work combined with seismic events from the monitoring array to make operational decisions while completing.

Altares-specific “Shake-maps” have been produced over the area and will be shown in the presentation.

Conclusions

The backbone seismometer and accelerometer array has allowed us to produce a robust ‘shake map’ based upon ground motion.

This in turn has enabled us to define an Altares-specific Traffice light protocol which is implemented during completions.

The importance of good subsurface reservoir characterization cannot be under-stated.

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