

PS Geological Review and Bitumen Resource Appraisal of the Grosmont Formation within the Athabasca Oil Sands Area*

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Abstract

The Energy Resource Conservation Board (ERCB) regulates oil and gas activity in Alberta. Its mission is to ensure that the discovery, development and delivery of Alberta's energy resources take place in a manner that is fair, responsible and in the public interest. Over the last six years, the ERCB has updated the bitumen resource assessment for the Wabiskaw-McMurray, Bluesky-Gething and Clearwater Deposits in the Athabasca, Peace River and Cold Lake Oil Sands Areas respectively. Recently the ERCB has completed an assessment of the Athabasca Grosmont Oil Sands Deposit for its bitumen potential.

The late Devonian aged Grosmont Formation is a shallow marine to peritidal platform carbonate with four distinct units: the Grosmont A, B, C & D. These reservoir units are highly varied some being highly karsted, brecciated and/or dolomitized. Due to the complex lithology and the diverse suite of porosity types special petrophysical evaluation techniques were used in the ERCB's recent assessment.

The Grosmont Oil Sands Deposit is a huge untapped bitumen resource. The ERCB's previous resource estimate in 1990 estimated an initial bitumen in place volume for the Grosmont Deposit (including all the sub units) of $50,500 \times 10^6 \text{ m}^3$ (50.5 billion m^3) of initial bitumen in place. The new assessment was conducted using higher saturation and porosity cutoffs and found a somewhat larger extent to the Grosmont deposit than previously determined. Recent land sales, drilling activities and applications to the ERCB have publicized the oil industry's re-kindled interest in this elusive carbonate giant. However, development of the Grosmont bitumen is in its infancy with many technical issues still needing to be addressed.

The poster shows the results of the recent review, including cross-sections, isopach maps, and volumetrics.

Websites

Energy Resources Conservation Board (ERCB), 2010, Frequently Asked Questions on the development of Alberta's Energy Resources ERCB-Oil Sands: Website accessed 10 January 2011, <http://www.ercb.ca/docs/public/EnerFAQs/PDF/EnerFAQs12-OilSands.pdf>

Geology of the Upper Devonian Grosmont Carbonate Bitumen Deposit, N. AB. Buschkueleand Grobes: Website accessed 7 January 2011, http://www.ags.gov.ab.ca/conferences/grosmont_part1.pdf

Geological Review and Bitumen Resource Appraisal of the Grosmont Formation within the Athabasca Oil Sands Area

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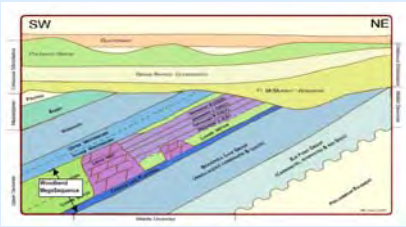
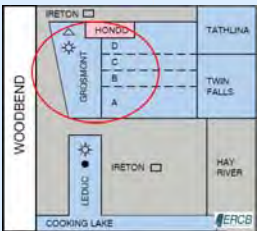
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The Grosmont Fm (Devonian) is part of the Woodbend megasequence.

Schematic showing the Grosmont in relation to the stratigraphy in the OSA



Source: ERCB ST-98, 2010

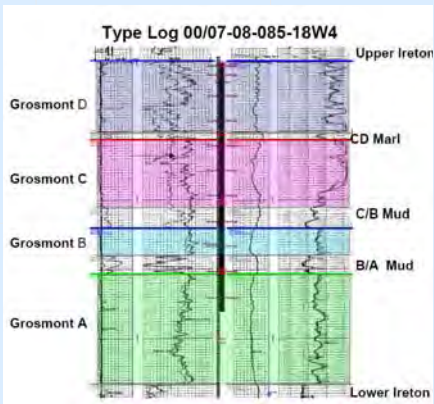
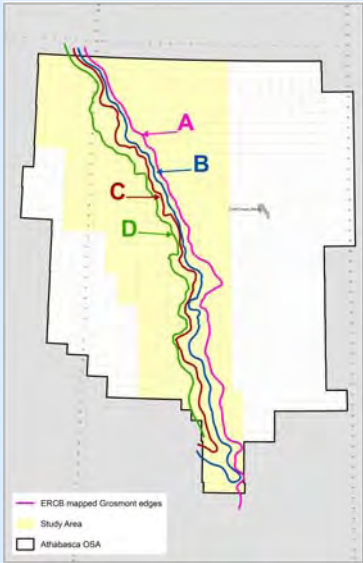


Source: Geology of the Upper Devonian Grosmont Carbonate Bitumen Deposits, N. AB. Buschkuhle and Grobes

This study focuses on the Grosmont Fm in the Athabasca Oil Sands Area (OSA).

Erosional edges of the Grosmont units

Type log example showing the different Grosmont units



The platform extends over 265 townships in the AOS area.
1329 wells were used in determining the stratigraphy.
340 wells & 10 cores were used in the petrophysical study to determine the resources.

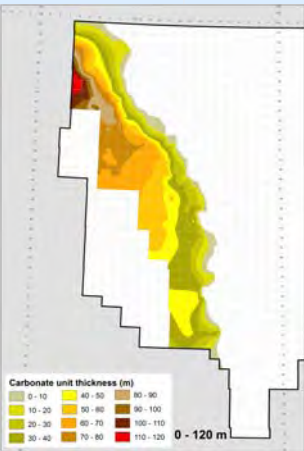
Geological Review

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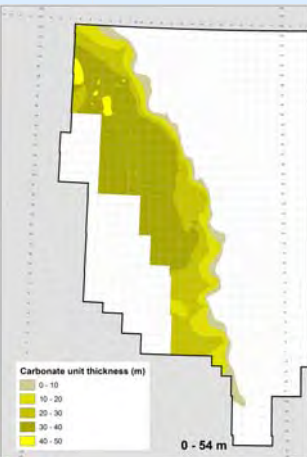


Isopach maps of the carbonate sections

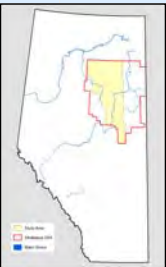
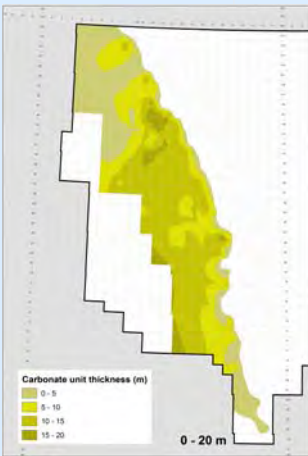
Grosmont D



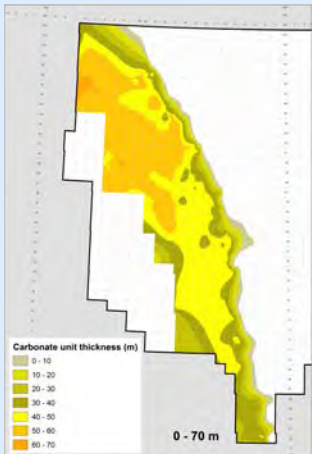
Grosmont C



Grosmont B

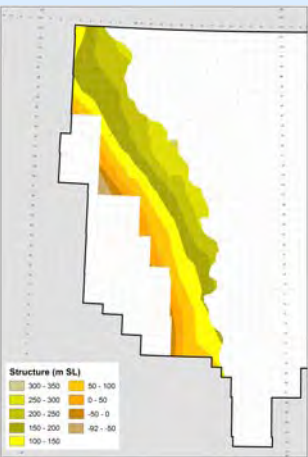


Grosmont A

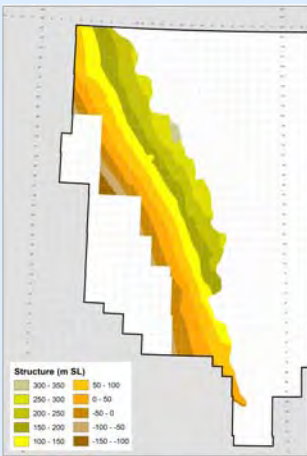


Structure maps of the top of each unit

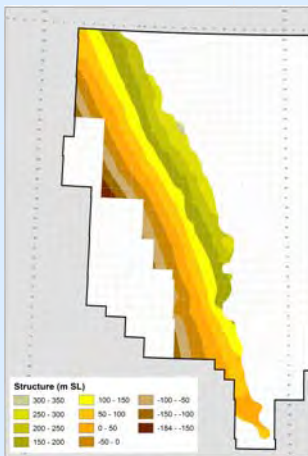
Grosmont D



Grosmont C



Grosmont B



Grosmont A

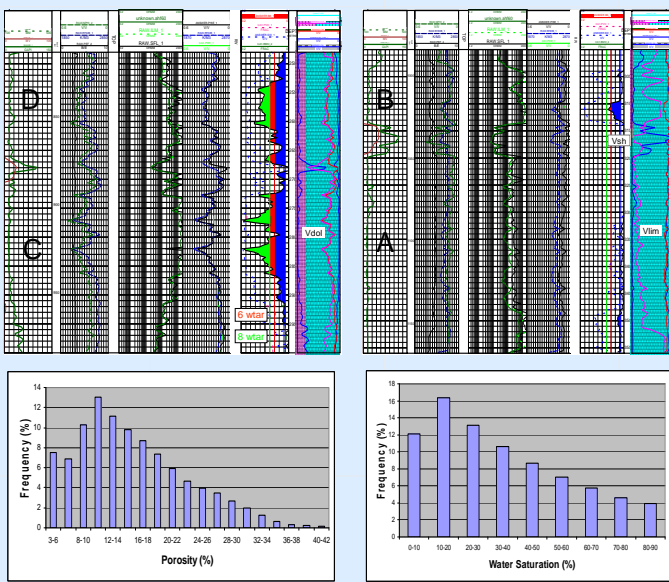
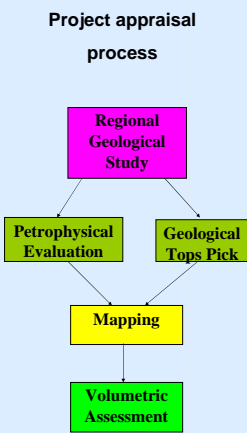


Resource Assessment

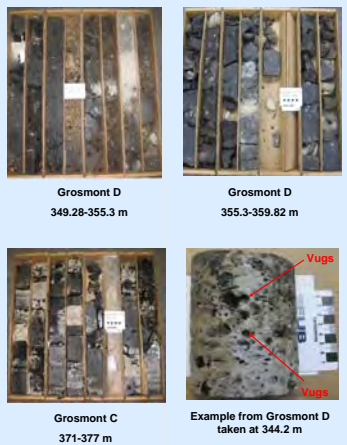
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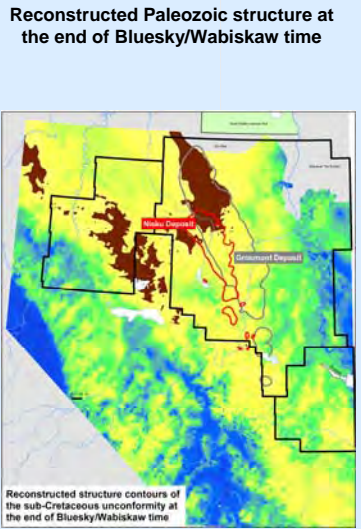
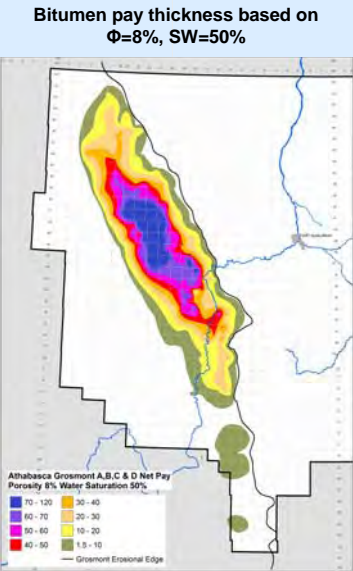
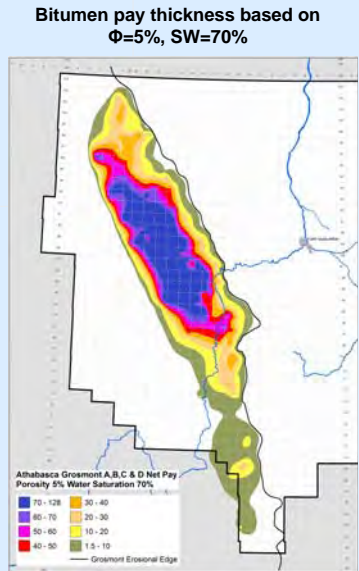
Petrophysical evaluation example for AA/06-04-088-19W4



Core photos for the AA/07-26-85-19W4



Conclusion: Increased Initial Bitumen Volume in Place by 27.7%, from 50.5 to 64.5 Billion m³.



Paleo highs correspond to areas with the best bitumen resource. Areas were subjected to a longer period of subareal exposure and karsting from meteoric waters resulting in the creation of mega porosity. ($\Phi > 40\%$)