The Montney Shale Gas Basin is found primarily in NE British Columbia (B.C.). Horizontal development began in 2005 and, with the advent of multi-stage fracture technology, the true potential of the Montney was realized.

Early development focused on the Upper Montney which was only a portion of the full interval (which is often more than 300 m [~1,000 ft] thick and completely gas charged).

A successful development has since proven deliverability from the Upper, Middle and Lower Montney.

Continued exploration has pushed the play boundaries to the north and west – we focused on a fairway that is approximately 190 by 80 miles or more than 15,000 square miles.

When looking at a blended type curve the Montney is among the top six shale gas plays in North America from an economic perspective delivering a 10% IRR at $2.94 US/GJ – only out performed by the Marcellus, Fayetteville and Granite Wash.

Within the Montney Shale Basin each geographical area of development distinguishes itself with subtle changes in characteristics which impact initial deliverability, decline, liquid content and ultimately economics. There are places within the Montney Shale Gas Fairway where the strip price for a 10% IRR will be even lower than the $2.94.

The unique positioning of the Montney Basin allows for egress to the west coast where LNG terminals are in various stages of development and has created demand for Montney assets as LNG feedstock.
The major shale basins in North America include the Montney of western Canada. The lithofacies map shows the entire Montney stratigraphic sequence stretching from west central Alberta to north eastern B.C., with the tight gas fairway being located on the western side. Here, the Montney is a thick, often 300 m+ (~1,000ft), interval of fine-grained dolomitic siltstones and rich organic shales. Overall thickness of the Montney will decrease toward the erosional edge on the east side. The Montney tight gas resource covers an area of approximately 190 by 80 miles with current gas-in-place estimates as high as 700 Tcf, or more than twice that of the Horn River Shale play. In 2005 and 2006 the land rush began with many operators vying to establish a strong position in the initial portions of the fairway which included strike areas such as Swan and Dawson.
The Upper, Middle and Lower Montney zones are each prospective, and with the thickness of 300 m+ could easily support three stacked horizontals.

Many of the areas developed to date have proved deliverability out of all three zones; Upper, Middle and Lower with drill density expected to be 12 wells per drill spacing unit (~1 section) or four wells per zone.

OGIP calculations vary, based mostly on the changing overall gross thickness (h) and porosity cutoffs but in general are reported by area operators to be 200-350 Bcf per section. The larger OGIP numbers are typically seen on the west side of the fairway where overall gross thickness is 300 m+.

Using more well-developed US shale basins as an analog, recovery factors should be 25-30%.

The regional cross section shows type wells from Swan, Groundbirch, Altares, Lily and Kahta. Density porosity has been coloured from a 0% sandstone cut-off, which equates to a 3% limestone cut-off when considering the high dolomite content of the siltstone. Coloured are the Upper, Middle and Lower Montney sequences.
Montney Play Development within Tight Gas Fairway

- Rights held in the Montney are coloured on the map, where very little open land is observed across the tight gas fairway (between dashed lines)

- Play development history can be tracked by the land sale colours on the map. The origins of the Montney tight gas play are at Swan and Dawson, where vertical development began as early as 2002 targeting a conventional Montney play. Sale of large leases commenced in 2007 close to Swan and Dawson. Further west the land sales at Parkland, Sunset, Groundbirch and Septimus were active during 2008 and 2009. Much of the 2009 and 2010 activity is further west at Monias and Altares, and 2011 sales have pushed the play northward to Kobes, Town and beyond.

- The histograms to the right show increased land sale prices and the large acquisition of land as the play gains momentum. Much of the land has been purchased under brokers’ names so true land positions cannot be accurately determined without company disclosure.

Source: GeoScout, BMO Capital Markets
British Columbia Montney Shale Gas - Currently Producing 1.6 Bcf/d

- In the chart to the right, the stacked rate time production plot indicates the contribution from each of the strike areas. Encana’s Swan area is currently the largest single contributing area.

- Production from horizontal Montney wells began in 2004 with current production almost 1.6 Bcf/d from over 1,100 wells. Approximately 80% of that production is from 400+ horizontal wells. Cumulative production from the Montney is more than 2.0 Tcf.

- The top Montney players in terms of current production are indicated on the chart at the lower right. Included in this group are Encana, Murphy, ARC and Shell. Typically these companies have focused their activity in the early development areas of Swan, Dawson, Tupper, Groundbirch and Parkland.

- Both Talisman and Progress have been very successful in the North Montney area proving this portion of the fairway to have the best Montney wells drilled to date.

- A number of other players have had success in the Montney and include; Huron, UGR, Painted Pony, Crew, Canbriam Yoho and Storm.

- The map above outlines the development areas to date in the Montney. Much of the initial conventional development targeted the submarine fan Montney play which has a much different deliverability profile than the unconventional shale play which is developed using horizontal multi-stage fracture wells.

![Montney Development Map](image)

![Montney Wells - on Production Plot](image)

Top 20 Montney Operators by Current Rate

<table>
<thead>
<tr>
<th>Operator</th>
<th>Wells Producing</th>
<th>Drilled not producing</th>
<th>Licenced not drilled</th>
<th>HZ Wells</th>
<th>Total Wells</th>
<th>May Gas Rate (MMcf)</th>
<th>CTD Gas (Mcf/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnCana Corp</td>
<td>376</td>
<td>48</td>
<td>167</td>
<td>429</td>
<td>591</td>
<td>448,018</td>
<td>454,459</td>
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<tr>
<td>Murphy Oil Corp Ltd</td>
<td>115</td>
<td>41</td>
<td>67</td>
<td>211</td>
<td>223</td>
<td>248,742</td>
<td>74,610</td>
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<td>ARC Resources Ltd</td>
<td>100</td>
<td>36</td>
<td>39</td>
<td>139</td>
<td>175</td>
<td>245,240</td>
<td>100,689</td>
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<td>Shell Canada Ltd</td>
<td>121</td>
<td>50</td>
<td>57</td>
<td>201</td>
<td>228</td>
<td>219,496</td>
<td>80,288</td>
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<td>Cdn Nat Resources Ltd</td>
<td>101</td>
<td>22</td>
<td>15</td>
<td>51</td>
<td>138</td>
<td>97,395</td>
<td>186,683</td>
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<td>Talisman Inc</td>
<td>33</td>
<td>41</td>
<td>83</td>
<td>155</td>
<td>157</td>
<td>83,047</td>
<td>24,221</td>
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<td>Tourmaline Oil Corp</td>
<td>19</td>
<td>3</td>
<td>8</td>
<td>31</td>
<td>30</td>
<td>55,590</td>
<td>4,696</td>
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<td>Birchcliff Energy Inc</td>
<td>42</td>
<td>7</td>
<td>4</td>
<td>36</td>
<td>53</td>
<td>52,548</td>
<td>23,792</td>
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<td>Crew Energy Inc</td>
<td>21</td>
<td>11</td>
<td>22</td>
<td>54</td>
<td>54</td>
<td>33,129</td>
<td>13,229</td>
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<td>Advantage O&amp;G Inc</td>
<td>23</td>
<td>5</td>
<td>3</td>
<td>30</td>
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<td>28,897</td>
<td>10,926</td>
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<td>Huron Energy Inc</td>
<td>14</td>
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<td>11</td>
<td>26</td>
<td>26</td>
<td>22,859</td>
<td>13,638</td>
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<td>Progress Energy Inc</td>
<td>40</td>
<td>11</td>
<td>39</td>
<td>69</td>
<td>90</td>
<td>20,550</td>
<td>18,280</td>
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<td>Painted Pony Petrol Ltd</td>
<td>8</td>
<td>2</td>
<td>8</td>
<td>15</td>
<td>18</td>
<td>19,983</td>
<td>2,315</td>
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<tr>
<td>Pengrowth Corp</td>
<td>11</td>
<td>1</td>
<td>9</td>
<td>21</td>
<td>21</td>
<td>18,644</td>
<td>2,546</td>
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<td>2</td>
<td>43</td>
<td>14,384</td>
<td>92,551</td>
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<td>Canbraam Energy Inc</td>
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<td>6</td>
<td>6</td>
<td>17</td>
<td>17</td>
<td>12,359</td>
<td>2,110</td>
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<td>Devon Canada Ltd</td>
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<td>1</td>
<td>5</td>
<td>13</td>
<td>7,287</td>
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<td>Tapa North Ltd</td>
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<td>2</td>
<td>4</td>
<td>18</td>
<td>6,538</td>
<td>21,956</td>
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<td>Penn West Petrol Ltd</td>
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<td>0</td>
<td>3</td>
<td>6</td>
<td>6,410</td>
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<td>Insenga Energy Inc</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>3,987</td>
<td>3,239</td>
</tr>
<tr>
<td>Others</td>
<td>52</td>
<td>35</td>
<td>23</td>
<td>47</td>
<td>110</td>
<td>22,190</td>
<td>45,301</td>
</tr>
</tbody>
</table>

Source: GeoScout
British Columbia Montney Shale Gas - Robust Economics

Montney Type Wells by Area

North Montney Economic Sensitivity

<table>
<thead>
<tr>
<th>Area</th>
<th>Initial 30 Day</th>
<th>Total Sales</th>
<th>Theoretical</th>
<th>Economics (BTax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Gas Rate</td>
<td>Gas (MMcf/d)</td>
<td>Liquids (Mbbl)</td>
<td>Liquid Yield (bbl / MMcf)</td>
<td>ROR (%)</td>
</tr>
<tr>
<td>Dawson</td>
<td>6.4</td>
<td>5,634</td>
<td>100</td>
<td>16</td>
</tr>
<tr>
<td>Parkland</td>
<td>6.0</td>
<td>4,403</td>
<td>250</td>
<td>48</td>
</tr>
<tr>
<td>North Montney</td>
<td>5.2</td>
<td>4,260</td>
<td>204</td>
<td>42</td>
</tr>
<tr>
<td>Septimus</td>
<td>5.1</td>
<td>5,077</td>
<td>217</td>
<td>39</td>
</tr>
<tr>
<td>Groundbirch</td>
<td>4.7</td>
<td>5,760</td>
<td>62</td>
<td>10</td>
</tr>
<tr>
<td>Glacier</td>
<td>3.2</td>
<td>3,617</td>
<td>102</td>
<td>26</td>
</tr>
<tr>
<td>Swan</td>
<td>4.7</td>
<td>4,200</td>
<td>61</td>
<td>12</td>
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<tr>
<td>Average</td>
<td>5.0</td>
<td>4,707</td>
<td>143</td>
<td>28</td>
</tr>
</tbody>
</table>

Economic Sensitivity:
- Gas Price: +$0.80/GJ
- Capital: +20%
- Liquid Content: 33 bbl/MMcf, 50 bbl/MMcf
- Opex: +20%

Note: Recent results reported in the Kobes/Cameron area have seen test rates as high as 24.5 MMcf/d, suggesting this area may be a sweet spot in the fairway.
A theoretical development scenario was created using the North Montney type well (IP 5.2 MMcf/d and EUR of 4.2 Bcf) and a 50,000 acre (~78 drill spacing units or DSU) land position.

Four wells were drilled per DSU in each of the Upper, Lower and Middle Montney for a total of 12 wells per DSU.

12 wells per month well were drilled until production of 630 MMcf/d is reached. The production was then held constant at 630 MMcf/d for over six years by drilling six wells per month. The full development will see 936 wells drilled.

The 50,000 acre development produces over 5 Tcfe of production and generates a net present value, at a 10% discount, of $3.0B.

This scale of development is similar to what most major Montney producers are planning along the B.C. Montney Fairway.
British Columbia Montney Shale Gas - Feedstock for Future LNG Facilities

Kitimat LNG Partners (KLG - Apache 40%, EOG 30%, Encana 30%)
- NEB approval is expected in Q4-2011. Site prep work has started with an estimated capex of $3.0B
- Initial plant operating capacity 0.7 Bcf/d (train 1) expected to be operational by 2015, with a second train of equal size planned for 2017
- KLG owns the proposed PTP-KSL pipeline with a capacity of 1 Bcf/d

BC LNG Partners (LNG Partners LLC 50%, Haisla Nation 50%)
- Has applied for NEB approval to build an export terminal near Kitimat
- Douglas Channel Energy Partnership (DCEP) has been established to build and operate a barge-based liquefaction facility
- Capacity is 125 MMcf/d with initial operation expected by Q4-2013 at a cost of $0.4B
- Firm contract agreement for 80 MMcf/d through existing PNG Mainline

Note: In order to submit an LNG export application to the NEB, the applicant must demonstrate that there is a 20 year supply of natural gas – for example a 700 MMcf/d project will require 5.1 Tcf of reserves

Pipeline Infrastructure - Current and Proposed

Spectra Energy Main Line
- The main lines through B.C. normally operate near maximum capacity
- Gas flow from the T-North line merges with gas from McMahon for a maximum capacity of ~2.2 Bcf/d through T-South. The majority of this (1.7 Bcf/d) is exported to the United States
- Spectra Energy is actively updating existing facilities and adding capacity to T-North. They will continue to increase capacity as customers demand

Pacific Northern Gas Mainline
- The existing PNG Mainline has a capacity of 115 MMcf/d with 80 MMcf/d contracted to BC LNG Partners

Pacific Trails Pipeline Kitimat-Summit Lake Line
- Kitimat LNG Partners own the proposed PTP KSL line which will be operated by PNG and will deliver 1 Bcf/d to Kitimat

Alliance Fort St. John Loop
- Currently, all gas produced east of McMahon flows into Alberta
- This is the first line to allow gas production to flow from Alberta to B.C.
- Estimated capacity is 0.4 to 0.6 Bcf/d
Case Study: Progress Montney Joint Venture with PETRONAS - $1.1B

Transaction Overview
- Progress to create strategic JV with Malaysian national oil company, PETRONAS, to develop 149,910 acres of Montney shale gas in northeast BC foothills with Progress as operator
- JV lands hold an estimated contingent resource of more than 15 Tcf according to PETRONAS and include five wells with minimum amount of current production
- Progress to sell 50% WI in its Altares, Lily and Kahta properties for C$1.07 billion
  - C$267.5 million paid in cash at closing
  - Capital carry of 75% of Progress’ costs over next five years up to C$802.5 million
- Transaction value of ~$14,275/acre or $0.14/mcf of contingent resource
- Additionally, PETRONAS and Progress to establish an LNG Export JV to be owned 80% and 20% respectively
  - Will undertake a feasibility study of the development of a west coast B.C. LNG facility which PETRONAS would operate
  - PETRONAS to provide $600 million standby financing commitment for Progress’ capital requirements under which Progress can draw when final investment decision in the LNG facility is made
- 50% of JV lands being sold represent approximately 10% of Progress’ North Montney land holdings
- Transaction provides Progress with capital required to accelerate development of its shale gas assets unlocking value underlying its vast Montney land holdings
- JV and equity interest in LNG facility allows Progress to participate in the entire natural gas value chain from producing well to burner tip in Asian markets
- This investment is PETRONAS’ first in North America

PETRONAS
- Malaysia’s national oil and gas company, Petroleam Nasional Berhad (PETRONAS) is one of the world’s largest integrated oil and gas companies
  - Holds exclusive rights to all Malaysian oil and gas reserves
  - 27.1 billion boe 2P reserves and 1.8 million boe/d production FY2010 globally
  - Has been involved in LNG operations for over 30 years; operates one of the world’s largest LNG facilities and owns the largest fleet of LNG carriers via a majority held public subsidiary

Progress
- Progress Energy Resources Corp (TSX: PRQ) is a Calgary-based energy company focused on exploration, development and production of large, unconventional natural gas resources in northeast B.C. and northwest Alberta
  - Current 2P reserves of 252.9 MMboe
  - Q1 production of 44,356 boe/d (88% gas) from B.C. and central Alberta
  - Undeveloped acreage of ~1.2 million, including pro forma holdings of ~825,000 acres in the Montney

BMO acted as exclusive financial advisor to Progress
Case Study: Two Talisman / Sasol Joint Ventures $2.0B

**Transaction Overview**

**Talisman/Sasol Cypress JV**
- On March 8, 2011, Talisman Energy Inc. and Sasol Limited entered into a joint venture agreement to develop the Cypress A assets in Talisman’s Montney shale play in northeastern B.C.
- Talisman will sell a 50% working interest in its Cypress A assets to Sasol for a total consideration of C$1,050 million ($260MM upfront cash payment and a $760MM carry)
- Contingent resources were estimated to be 11.2 Tcfe on 57,000 acres of land with start up expected in 2015

**Talisman/Sasol Farrell Creek JV**
- On December 19, 2010, Talisman Energy Inc. and Sasol Limited entered into a joint venture agreement to develop the Farrell Creek assets in Talisman’s Montney shale play in northeastern B.C.
- Talisman will sell a 50% working interest in its Farrell Creek assets to Sasol for a total consideration of C$1,050 million ($260MM upfront cash payment and a $760MM carry)
- Contingent resources were estimated to be 9.4 Tcfe on 52,000 acres of land with start up expected in 2011
- Talisman reports a 2011 capital program of ~$800MM for the two areas combined

**Asset Overview**
- Together Talisman and Sasol will undertake a feasibility study to build GTL facility in Western Canada
- Sasol’s Cypress A funding commitment maybe applied to Farrell Creek development

Source: Corporate Presentations
**Case Study: Encana / PetroChina Joint Venture $5.4B - Not Going Ahead**

### Transaction Overview

- PetroChina would invest C$5.4 billion to earn 635,000 net acres of land and included the majority of Encana’s Montney, Cadomin and other natural gas assets on a portion of the company’s B.C. and Alberta lands.
- PetroChina would also have a 50% working interest and a daily production of 255 MMcf/d.
- **June 21, 2011** – Encana and PetroChina break off joint venture talks, citing that “the parties were unable to achieve substantial alignment with respect to key elements of the proposed transaction, including the joint operating agreement.”
- At the same time Encana announced its intent to offer multiple smaller joint ventures in the Cutbank area.

“As such, we have determined that the best way for us to advance our plans to unlock value from our Cutbank Ridge business assets is to offer up a variety of joint venture opportunities for portions of the undeveloped resources, and, separately, to examine a transaction with respect to our midstream pipeline and processing assets in the area.”

### Asset Overview

Source: Corporate Presentations

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Source: Corporate Presentations

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Source: Corporate Presentations
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