Duvernay Oil Prospect

Rimbey-Leduc Oil Fairway

Duvernay Hz

Tmax Map by:

GLJ PETROLEUM CONSULTANTS
Recent Activity - Rimbey-Leduc Trend

**Kiwetinohk/Journey 5 Wells**
HZ 102/15-31-042-03W5 (3,413m hz length)
820 Boe/d

**Baytex 7 Wells**
Top Well: HZ 14-31-044-02 W5 rate of 1,360 boe/d (30-day IP)

**Crescent Point 3 Wells**
HZ 16-27-048-02 W5
224 Boe/d (42 API Oil)
Over Pressured: 14.9 kPa/m

**Paramount 2 Wells**
HZ 100/05-29-039-04W5/02
660 Boe/d

**Kiwetinohk/Journey 5 Wells**
HZ 102/16-15-042-03W5 (3,590m hz length)
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**Kiwetinohk/Journey 5 Wells**
HZ 102/16-15-042-03W5 (3,413m hz length)
638 Boe/d
HZ 100/13-02-042-04W5/00
622 bbls/d

**Paramount 2 Wells**
HZ 100/05-29-039-04W5/02
660 Boe/d
HZ 103/16-13-039-05W5/02
510 Boe/d
Why the opportunity exists today

Historically, depth was used as the best proxy for thermal maturity. Recently, core and cuttings Tmax data more accurately depicted the Oil Fairway. Today, economic production data shows the Rimbey-Leduc trend to be top tier!

THERMAL MATURITY IS NOT 1:1 WITH DEPTH

- *Expected hydrocarbon type follows depth somewhat, but there are other controls which impact thermal maturity*
Effect of Snowbird Tectonic Basement Feature

The heating effect of the Snowbird Tectonic basement feature and the cooling (heat absorption) effect of the Rimbey – Leduc reef has created a 10-15 mile wide oil fairway stretching from Willesden Green to Golden Spike.

This is confirmed by oil API’s and Rock Eval work done on core and cuttings.

Mature oil is found at much shallower, and more cost effective, drilling depths.
Factors Affecting Thermal Maturity

THERMAL MATURITY

• GLJ Relies on a number of data sources outside of production data to guide maturity contours in the Duvernay.

• Mapping incorporates:
  – True vertical depth
  – Source rock analysis
  – Geothermal Gradient
  – Magnetic Surveys
  – Other geologic controls
  – Condensate yields from producing wells

• Maturity mapping is a key factor in economic viability based on commodities.

Geological Data + Production Data = Thermal Maturity Mapping
Duvernay – 2 Different Play Types

Pure Source Rock Play Type (Kaybob)

Hybrid Shale Carbonate (East Shale Basin)

Tmax Map by: GLJ Petroleum Consultants
Duvernay Oil Prospect (Golden Spike Area)

Duvernay Summary:

- 16,640 Acres (26 Sections)
- 100% Working Interest
- No Encumbrances
- 4 year term (2024)
- Crown Royalty Holiday
- Tmax of 444
- TOC wt% 9.86
- Located in the oil window
- 40m to 50m thick
- Top and bottom Seals
- Anticipated to be over pressured
- Hybrid Shale/Carbonate Reservoir
- Drill depth of 2,000m allows for drilling costs savings and improved economics
Tmax – Core data and cuttings data

Key Well: 10-4-51-27 W4
Core Tmax values recorded from this well are the most reliable, placing it in the Oil Window

446 = Tmax values from cuttings
Oil Generation at Golden Spike

- Peak oil generation occurs at and ~ Tmax of 435°C
- Strictly generating oil may not be sufficient, maturity may need to be far enough into the oil generation to expel sufficient water to attain commercial thresholds
  - The location of this threshold can fluctuate with technology, capital and prices
Oil Crossover Effect – Dan Jarvie

Key to Geochemical Identification of Producible Oil (conventional or unconventional)

Oil Crossover Effect

S1/TOC > 1
or when
Oil Saturation Index (S1/TOC x 100) > 100 mg oil/g TOC

“Oil Effect”: Oil Crossover

- a simple measure derived from basic geochemical analyses of cuttings (well site or laboratory) whereby high oil saturation can be predicted
- result is 100% effective at locating oil reservoirs:
  - Low resistivity sands
  - By passed pay
  - Shale oil
The Cross Section, on the next slide, reveals a thick Duvernay isopach (40-50m) across the entire land block.

Similar rock characteristics to the East Shale Basin with a thick continuous shale with carbonate stringers.

East Shale Basin companies have identified both the shales and interbedded carbonates as having effective storage and deliverability.
Golden Spike Duvernay Cross Section
Well Costs

$1.5\text{MM to }$2\text{MM Drill Cost}

$2\text{MM to }$2.5\text{MM Fracture Stimulation}

+ $500\text{K Equip and Tie-in}

$4\text{MM to }$5\text{MM Total Well Cost}

Additional Upside

• Thickness may allow for 8+ Wells per section (200+ total wells)
• Heartland of Alberta Oil and Gas
• Pipeline Infrastructure and Oil Facilities nearby
• Year-round surface access
• Shallower prospective zones in the Wabamun, Ellerslie and Viking
Unique opportunity to enter a world class oil play

Golden Spike offers a large contiguous block of land that would entice a large major but at a price point that is affordable to most junior oil and gas companies.

Shallower drilling depths within the oil window offer improved economics on trend with industry pace-setting wells.

Four year term on the entire block allows for the ability to develop at your own pace.

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Appendix
Baytex Update

East Duvernay Shale Light Oil: Emerging Resource Play

Pembina Region
- 268 sections of 100% WI lands
- First 2019 well (14-31) on-stream June 27 - 30-day IP rate of 1,360 boe/d (76% liquids); second well (3-19) on-stream July 26
- D&C costs of ~ $7.0 million represent an ~ 20% reduction from previous wells
- Two most recent completions utilize fracture diversion technology
- First 5 wells on production generated 30-day IP rates of ~ 575 boe/d (88% liquids)
- Delineated a minimum of 100-125 sections
Kiwetinohk/Journey Update

Accelerating Industry Activity offsetting JV Land

- Dramatic increase in activity since Q2 2018
  - Increase from 3 to 17 wells on production delineating the Oil Trend
  - 18 more wells licensed or drilled, plus expectations of 5 strat wells in Oil trend

- Appraisal Programs underway in Fairway
  - Journey/KRC JV: 4 wells tested; 3 on production, 1 awaiting tie-in; 1 drilled awaiting completion, 2 additional wells licensed
  - Repsol: 5 wells drilled, 4 on production, 1 licensed
  - Paramount: 4 wells on production, 1 licensed
  - Baytex: 7 wells on production, 8 licensed/drilled
  - Crescent Point: 2 wells on production, 3 well program ongoing in this fairway.
  - To the SE, Vesta has exceeded 100 wells drilled (mostly pad drilling now)
Kiwetinohk/Journey Update

Joint Venture Lands & Journey Infrastructure
JOY 43.3% ownership in Gilby 1-4 Gas Plant
JOY 50-100% ownership in Gas Gathering System

Initial Results\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>Commitment Well 102/16-15-042-03W5</th>
<th>Commitment Well 102/15-31-042-03W5</th>
<th>Option Well 100/13-02-042-04W5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Test Period</td>
<td>April 13-15 (48 hours)</td>
<td>April 13-15 (48 hours)</td>
<td>July 8-10 (48 hours)</td>
</tr>
<tr>
<td>Oil (bbls/d)</td>
<td>968</td>
<td>1,017</td>
<td>622</td>
</tr>
<tr>
<td>Natural Gas (mscf/d)</td>
<td>1,507</td>
<td>2,270</td>
<td>1,360</td>
</tr>
<tr>
<td>GOR (scf/bbl)</td>
<td>1,556</td>
<td>2,232</td>
<td>2,186</td>
</tr>
<tr>
<td>Average Water Cut (%)</td>
<td>55%</td>
<td>53%</td>
<td>52%</td>
</tr>
<tr>
<td>APT Gravity (°)</td>
<td>46-48°</td>
<td>45-48°</td>
<td>47-48°</td>
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<tr>
<td>Choke Size (mm)</td>
<td>11.11</td>
<td>11.11</td>
<td>8.73</td>
</tr>
<tr>
<td>Flowing Pressure (kPag)</td>
<td>8,443</td>
<td>10,766</td>
<td>9,700</td>
</tr>
<tr>
<td>On Stream Rates</td>
<td>May 8 - July 8</td>
<td>May 8 - July 8</td>
<td>To be tied in</td>
</tr>
<tr>
<td>Oil (bbls/d)</td>
<td>636</td>
<td>460</td>
<td></td>
</tr>
<tr>
<td>Natural Gas (mscf/d)</td>
<td>773</td>
<td>742</td>
<td></td>
</tr>
<tr>
<td>Natural Gas Liquids (bbl/d)</td>
<td>56</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Boe/d (boe/d)</td>
<td>820</td>
<td>638</td>
<td></td>
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<tr>
<td>Average Water Cut (%)</td>
<td>43%</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>Flowing Pressure (kPag)</td>
<td>4,000 (July 7)</td>
<td>10,000 (July 7)</td>
<td></td>
</tr>
</tbody>
</table>

Additional Wells
Option Well: 102/11-09-044-3W5
Extension, Frac & Flow-back complete; on production
Option Well: 100/16-12-044-4W5
Dilled and cased
Option Well: 102/06-04-043-03W5
Drilled to horizontal landing
Option Well: 100/12-07-042-3W5
Licensed – anticipate spud H2 2019

\(^1\) Refer to April 15, 2019 and July 16, 2019 Press Release
Kiwetinohk/Journey Update

Duvernay – World Class Partner Kiwetinohk Resources Corp.

Initial 2 yr. Development Phase
- JV WI: KRC 62.5% / JOY 37.5%
- Joint Wells: 10 wells/yr. max.
- Per well option to participate at 37.5% WI or take 5% GORR on 100% of production
- Attractive single digit initial Lessor Royalties

Five Well Option Phase
- KRC pays 100% of capital to drill, complete, equip and tie-in
- JOY converts to 29.17% WI after payout of 33.33% of capital
- Five well option phase; 2 wells on production

Two Well Commitment Phase
- KRC pays 100% of capital to drill, complete, equip and tie-in
- JOY has 3.75% GORR convertible to 29.17% WI after payout of 58.33% of capital
- Well #2: 15-31-42-3W5 – On production May 8, 2019
Paramount Update

Type Well Economics - Core Areas

Paramount’s 2019 activities are predominantly directed to its highest risk-adjusted rate of return opportunities.

<table>
<thead>
<tr>
<th>Type Well Economics (1)</th>
<th>Montney Grande Prairie</th>
<th>Montney Oil</th>
<th>Kaybob South</th>
<th>Smoky</th>
<th>Central Willesden Green</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Karr</td>
<td>Wapiti</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return (%)</td>
<td>46%</td>
<td>45%</td>
<td>98%</td>
<td>13%</td>
<td>25%</td>
</tr>
<tr>
<td>Payout (Months)</td>
<td>21</td>
<td>15</td>
<td>7</td>
<td>52</td>
<td>33</td>
</tr>
<tr>
<td>IP 365 (Boe/d)</td>
<td>961</td>
<td>1,395</td>
<td>391</td>
<td>673</td>
<td>462</td>
</tr>
<tr>
<td>IP 365 CGR (2) (Bbl/MMcfd)</td>
<td>209</td>
<td>111</td>
<td>79%</td>
<td>161</td>
<td>283</td>
</tr>
<tr>
<td>Sales Volume (MBoe)</td>
<td>1,481</td>
<td>1,594</td>
<td>269</td>
<td>1,108</td>
<td>718</td>
</tr>
<tr>
<td>Avg. CGR (2) (Mbbl/MMcf)</td>
<td>173</td>
<td>80</td>
<td>74%</td>
<td>97</td>
<td>205</td>
</tr>
<tr>
<td>DCET ($MM)</td>
<td>$12.7</td>
<td>$12.3</td>
<td>$4.6</td>
<td>$12.3</td>
<td>$11.8</td>
</tr>
<tr>
<td>Capital Efficiency ($/Boe)</td>
<td>$13,217</td>
<td>$8,816</td>
<td>$11,797</td>
<td>$18,230</td>
<td>$25,584</td>
</tr>
<tr>
<td>F&amp;D ($/Boe)</td>
<td>$8.58</td>
<td>$7.72</td>
<td>$17.15</td>
<td>$11.34</td>
<td>$16.88</td>
</tr>
<tr>
<td>Lateral Length (m)</td>
<td>3,000</td>
<td>3,000</td>
<td>2,400</td>
<td>2,400</td>
<td>2,200</td>
</tr>
<tr>
<td>Tonnage (um)</td>
<td>2.5</td>
<td>2.5</td>
<td>0.4</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Reliability (%)</td>
<td>93%</td>
<td>96%</td>
<td>95%</td>
<td>90%</td>
<td>90%</td>
</tr>
</tbody>
</table>

Paramount employed a consistent, methodical approach in developing its 2019 type curves

- Type well economics specifically relate to the 2019 operations Paramount is conducting with the exception of Smoky and Willesden Green Duvernay which currently are not planned to be drilled in 2019
- Type curves were developed considering variables of reservoir/fluid quality, completion design/lateral length, and pad development, and includes consistent approach to assess the early flowback, peak rate/initial decline, and late well life performance

1) Based on Management’s estimates and price deck. See the Advisory Appendix - Type Well Information. 2) Percent oil (%) for Montney Oil asset.
Early-Stage Play: East Shale Duvernay

- Strategically targeted oil window based on thicker pay, higher pressure, depth and maturity
- Drilled several wells (operated and non-operated) to date with encouraging results
- Completion optimization targeting increased recoveries and efficiencies
- Disciplined capital allocation; continue to monitor well results

Key Statistics

<table>
<thead>
<tr>
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<th>Value</th>
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</thead>
<tbody>
<tr>
<td>OOIP per Section (mmbb)</td>
<td>15 - 30</td>
</tr>
<tr>
<td>Net Acres</td>
<td>355,000</td>
</tr>
<tr>
<td>% of Corporate Production</td>
<td>1%</td>
</tr>
<tr>
<td>% of Corporate Budget</td>
<td>3%</td>
</tr>
<tr>
<td>Risked Inventory (net)*</td>
<td>300</td>
</tr>
<tr>
<td>Pricing Stream</td>
<td>MSW</td>
</tr>
</tbody>
</table>

OOIP, competitor land map and risked inventory as at YE 2018
2019 Duvernay budget includes a mix stratigraphic and Hz wells
Risked inventory is composed of all 2-mile Hz wells identified to date through initial delineation program with potential to increase as this early-stage play is further developed.
All figures are approximates unless otherwise specified.
Crescent Point DFIT 16-15-48-02 W5
WILLESDEEN GREEN OIL WINDOW

- Paramount has pacesetting wells in 39-04W5
- The recent Northern wells have inferred a large oil fairway.

Oil Rate vs Time

The North Wells may have lower IP, but since they shallower, drill costs are cheaper.
WILLESDEN GREEN OIL WINDOW – CROSS SECTION

- Quartz and TOC rich reservoir.
- Interbedded carbonate stringers.
Contact Information

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