CASE STUDY

Montney (Triassic A) Oil
Kaybob South, Fox Creek, Alberta, Canada
CS004-2017

Introduction:
The XX-XX-062-20W5M vertical Montney pumping oil well was successfully treated utilizing StimStixx Technologies’ proprietary wireline conveyed acid stimulation tools on September 6, 2017. The well has a long production history which includes several conventional acid treatments during the life of the well which assisted in maintaining oil production at approximately 3 M3/D since 1998. Between the last acid treatment in 2010 and StimStixx acid treatment in 2017, production declined from 6.2 M3/D to 0.3 M3/D. The operator’s objective to increase fluid inflow was met by the StimStixx treatment.

Production Summary:

<table>
<thead>
<tr>
<th></th>
<th>Total Fluid (M3/D)</th>
<th>Oil (M3/D)</th>
<th>WOR (M3/M3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Treatment - Oct 2016</td>
<td>36.8</td>
<td>2.7</td>
<td>12.6</td>
</tr>
<tr>
<td>Post-Treatment - Nov 2018 (14 Months)</td>
<td>80.3</td>
<td>7.4</td>
<td>9.9</td>
</tr>
<tr>
<td>Change</td>
<td>2.2X</td>
<td>2.7X</td>
<td></td>
</tr>
</tbody>
</table>

Treatment Description:
Treatment consisted of two (2) runs across a single 7.3 meter perforated interval using the MatrixStixx HCL tool to stimulate the near wellbore and remove scale and other debris. Treatment with the ImplosionStixx tool was then run to re-vaporize acid previously placed and remove debris from the near wellbore. TVD = 2,150m, BHT = 84°C, BHP = 19.1 MPa.

Results Discussion:
The treatment using both the MatrixStixx HCL and ImplosionStixx tools successfully removed near wellbore damage and allowed a dramatic 2.7X increase in oil production. This increase has been maintained for 14 full months after the treatment and the water cut has been reduced from 92% to 90%. The total treatment took 5 hours of rig time and did not require swabbing to remove active acid from the wellbore prior to running pumping equipment. Typical post treatment swabbing on traditional acid jobs required up to 2 additional days of rig time. Thus, the StimStixx treatment resulted in significant cost savings and extra production revenue compared to previous traditional acid jobs for the operator. **Less down time, less cost ... better results.**

Attachments:
- Production History & Logs (provided by operator)
- Production Analysis – Conventional Acid vs. StimStixx
- Post Treatment Well Tests
- Recent Production Data
Production History
(graph supplied by operator)

Logs
(Montney formation)
Production Analysis – Conventional Acid vs. StimStixx

Imperial graphs pulled from public data (up to November 2018)

Acidizing Summary:
Feb 97 : No response
Oct 01 : 18 to 27 bbl/d
Jun 06 : No response
May 10 : 2 to 35 bbl/d
Sep 17 : 2 to 47 bbl/d
### Post-Treatment Well Tests

<table>
<thead>
<tr>
<th>Prod. Date</th>
<th>Test Hours</th>
<th>Fluid</th>
<th>@SW %</th>
<th>Oil Vol.</th>
<th>Oil Rate</th>
<th>Water Vol.</th>
<th>Water Rate</th>
<th>Sand Cut Vol.</th>
<th>Sand Cut Rate</th>
<th>Gas Vol.</th>
<th>Gas Rate</th>
<th>Chlorides Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-Sep-30</td>
<td>24.0</td>
<td>71.85</td>
<td>96.36</td>
<td>2.60</td>
<td>0.103</td>
<td>69.26</td>
<td>2.3850</td>
<td>0.00</td>
<td>0.00</td>
<td>2.76</td>
<td>0.1150</td>
<td>0.0</td>
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<td>2017-Oct-02</td>
<td>24.0</td>
<td>0.00</td>
<td>0.00</td>
<td>2.27</td>
<td>0.0946</td>
<td>66.39</td>
<td>2.3496</td>
<td>0.00</td>
<td>0.00</td>
<td>2.74</td>
<td>0.1142</td>
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<td>2017-Oct-07</td>
<td>24.0</td>
<td>0.00</td>
<td>0.00</td>
<td>6.90</td>
<td>0.2875</td>
<td>25.36</td>
<td>1.0567</td>
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<td>0.00</td>
<td>0.85</td>
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<td>2017-Nov-13</td>
<td>24.0</td>
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<td>0.00</td>
<td>13.22</td>
<td>0.5538</td>
<td>51.53</td>
<td>2.1471</td>
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<td>0.00</td>
<td>2.43</td>
<td>0.1013</td>
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