Connacher Performance Presentation - 2016

Great Divide SAGD Facilities - 10587
This Presentation contains forward looking information including, expectations for future production and total bitumen recovery, estimates of reserves, future development of the SAGD+® process commercial project at Algar and mini-steam expansion at Pod One and the anticipated impact thereof, growth potential associated with certain additional capital investment options and development projects to be undertaken at Algar, sustainability of production, well and plant performance, the steam to oil ratio (“SOR”), and plant reliability.

Forward looking information is based on management’s expectations regarding the Company's future growth and financial position; results of operations and production, future commodity prices and foreign exchange rates; future capital and other expenditures (including the amount, nature, and sources of funding thereof), plans for and results of drilling activity; environmental matters; business prospects and opportunities; and future economic conditions. Forward looking information involves significant known and unknown risks and uncertainties, which could cause actual results to differ materially from those anticipated. These risks include, but are not limited to: the risks associated with the oil and gas industry (e.g., operational risks in development, exploration and production; delays or changes in plans with respect to exploration or development projects or capital expenditures; the uncertainty of reserve and resource estimates; the uncertainty of geological interpretations; the uncertainty of estimates and projections relating to production, costs and expenses; and health, safety and environmental risks), risk of commodity price and foreign exchange rate fluctuations, risks associated with the impact of general economic conditions, risks and uncertainties associated with maintaining the necessary regulatory approvals and securing the financing to proceed with the operation and continued expansion of the Great Divide oil sands project.

This presentation includes information pertaining to the reserves as at December 31, 2015, as evaluated by GLJ Petroleum Consultants Ltd., in their report for the year ended December 31, 2015 (the “GLJ Report”). Statements relating to reserves are deemed to be forward looking statements, as they involve the implied assessment, based on certain estimates and assumptions, that the reserves described exist in the quantities predicted or estimated, and can be profitably produced in the future. Certain information and assumptions relating to the reserves reported herein are set out in the Corporation's Annual Information Form for the year ended December 31, 2015, which is available on the System for Electronic Document Analysis and Retrieval (SEDAR) at www.sedar.com. There is no assurance that the forecast price and cost assumptions contained in the GLJ Report will be attained and variances could be material. The reserves estimates of Connacher’s properties described herein are estimates only. The actual reserves on Connacher’s properties may be greater or less than those calculated.

Design capacity is not necessarily indicative of the stabilized production levels or steam generation capacity that may ultimately be achieved at Connacher’s SAGD project sites. Reported average production levels may not be reflective of sustainable production rates and future production rates may differ materially from the production rates reflected in this presentation due to, among other factors, difficulties or interruptions encountered during the production of bitumen.

Although Connacher believes that the expectations in such forward looking information are reasonable, there can be no assurance that such expectations shall prove to be correct. The forward looking information included in this presentation is expressly qualified in its entirety by this cautionary statement. The forward looking information included herein is made as of the date of this presentation and Connacher assumes no obligation to update or revise any forward looking information to reflect new events or circumstances, except as required by law.
## Agenda

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### Surface Presentations

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<th>Presenter</th>
</tr>
</thead>
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<td>Hollis Sylvester</td>
</tr>
<tr>
<td>Future Plans</td>
<td>Hollis Sylvester</td>
</tr>
</tbody>
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Subsurface - Background
Assets

- Connacher is a focused developer, producer, and bitumen marketer from its in-situ oil sands projects in Alberta’s Athabasca oil sands.

- Primary driver of value is the continued development of its bitumen production at its Great Divide oil sands operations using in-situ recovery methods.

- Oil sands reserves and resources include 435,748 Mbbl of 2P reserves (as of 31 December 2015 per GLJ Petroleum Consultants) (1)

(1) See Slide AppendixB for Reserve Definitions
Great Divide Assets

Pod One

- First Steam September 2007
- First Bitumen October 2007

Algar

- First Steam May 2010
- First Bitumen July 2010
No Changes to Net Pay and other Geology Maps

January 2016 Pod One Production Ramp Down

Mini Expansion at Pod One Approved

January 2016 Algar Production Ramp Down

SAGD+® Process Commercial Project Approved at Algar

Pad 104
- 10 Well Pairs Approved
- 4 Wells Drilled and Producing

Other
- Pump Performance Update
- Water Recycle Update
- Facilities and MARP updates
- HSE Updates
Great Divide (Approval 10587) Development

Pod One Current Development

- 23 Well Pairs and 13 Infills
  - Pad 101N - 5 Well Pairs
  - Pad 101S - 6 Well Pairs, 6 Infills
  - Pad 102W - 5 Well Pairs, 5 Infills
  - Pad 102S - 3 Well Pairs, 2 Infills
  - Pad 104 - 4 Well Pairs 80m interwell spacing

Pod One Development History

- Original 15 Well Pairs Drilled in 2007
  - all well pair interwell spacing 100m except Pad 104
- 2 Well Pairs Drilled in 2009 (101S and 102S)
- 2 Well Pairs Drilled in 2010 (102S)
- 4 Infills Drilled in 2013 (102W)
- 4 Well Pairs Drilled in 2013 (104)
Great Divide (Approval 10587) Development

Algar Current Development

- 18 Well Pairs Producing
  - Pad 201S - 5 Well Pairs 100m interwell spacing
  - Pad 202S - 6 Well Pairs (1 re-drill) 100m interwell spacing
  - Pad 203S - 7 Well Pairs 100m interwell spacing

Algar Development History

- Original 17 Well Pairs Drilled in 2009
- Replacement Well Pair (202-01) drilled in 2013
- Approved for 5 Infills on Pad 203 in 2014
<table>
<thead>
<tr>
<th></th>
<th>Pod One @ Sept 30, 2016</th>
<th>Algar @ Sept 30, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Steam</td>
<td>September 2007</td>
<td>May 2010</td>
</tr>
<tr>
<td>First Sales Oil</td>
<td>October 2007</td>
<td>June 2010</td>
</tr>
<tr>
<td>Cumulative Bitumen Produced $\text{e}^3\text{m}^3$</td>
<td>3,280</td>
<td>2,125</td>
</tr>
<tr>
<td>Cumulative Steam Injected $\text{e}^3\text{m}^3$</td>
<td>12,534</td>
<td>9,850</td>
</tr>
<tr>
<td>Cumulative SOR</td>
<td>3.82</td>
<td>4.64</td>
</tr>
<tr>
<td>Number of Producing Well Pairs</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Number of Circulating Well Pairs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Infill Wells Producing</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Wells Using Gas Lift</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Wells Using Downhole Pumps</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Operating Pressure Gas Lift</td>
<td>NA</td>
<td>3850 - 3900 kPa</td>
</tr>
<tr>
<td>Operating Pressure Pump</td>
<td>1300 - 2980 kPa</td>
<td>3000 - 3800 kPa</td>
</tr>
<tr>
<td>Directive 51 Operating MOP</td>
<td>6205 kPa Maximum Operating Pressure</td>
<td>6205 kPa Maximum Operating Pressure</td>
</tr>
</tbody>
</table>
Subsurface - Geology
Great Divide Area Core & Log Data

• Log vs Core Comparison
• Analytical interpretation of geophysical logs to determine bitumen saturations (wt%) gives good correlation with core derived bitumen saturations (wt%). Examples shown below.

Typical Composite Log with Interpretation and core data comparison.

![Typical Composite Log](image)

<table>
<thead>
<tr>
<th>Well</th>
<th>Log NetPay</th>
<th>Core Net Pay</th>
<th>Log Bitumen Wt %</th>
<th>Core Bitumen Wt %</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/08-17-082-12W400</td>
<td>21.3</td>
<td>23.3</td>
<td>13.6%</td>
<td>14.0%</td>
</tr>
<tr>
<td>1AA/03-17-082-12W400</td>
<td>13.2</td>
<td>12.0</td>
<td>11.6%</td>
<td>12.7%</td>
</tr>
<tr>
<td>1AA/03-21-082-12W400</td>
<td>14.9</td>
<td>13.3</td>
<td>10.2%</td>
<td>10.4%</td>
</tr>
<tr>
<td>1AA/07-16-082-12W400</td>
<td>25.9</td>
<td>27.7</td>
<td>11.5%</td>
<td>12.7%</td>
</tr>
<tr>
<td>1AA/10-21-082-12W400</td>
<td>20.8</td>
<td>17.2</td>
<td>13.2%</td>
<td>14.8%</td>
</tr>
</tbody>
</table>
### Great Divide Reservoir Parameters

<table>
<thead>
<tr>
<th></th>
<th>Pod One</th>
<th>Algar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir Thickness (m)</strong></td>
<td>Range</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>10 - 30</td>
<td>22</td>
</tr>
<tr>
<td><strong>Depth to Top of Reservoir (m)</strong></td>
<td>450 - 490</td>
<td>475</td>
</tr>
<tr>
<td><strong>Reservoir Net Pay (m)</strong></td>
<td>10 - 25</td>
<td>21</td>
</tr>
<tr>
<td><strong>Oil Saturation (%)</strong></td>
<td>75 - 85</td>
<td>80</td>
</tr>
<tr>
<td><strong>Bitumen Density (kg/m³)</strong></td>
<td></td>
<td>1018</td>
</tr>
<tr>
<td><strong>Bitumen Viscosity (cPs)</strong></td>
<td>&gt; 1 million</td>
<td>&gt; 1 million</td>
</tr>
<tr>
<td><strong>Porosity (%)</strong></td>
<td>32 - 34</td>
<td>33</td>
</tr>
<tr>
<td><strong>Vertical Permeability (mD)</strong></td>
<td>1500 - 4000</td>
<td>-</td>
</tr>
<tr>
<td><strong>Horizontal Permeability (mD)</strong></td>
<td>2000 - 5000</td>
<td>-</td>
</tr>
<tr>
<td><strong>Initial Reservoir Temperature (°C)</strong></td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td><strong>Initial Reservoir Pressure (kPa)</strong></td>
<td>3500</td>
<td>4500</td>
</tr>
<tr>
<td><strong>Initial Bottom Water Pressure (kPa)</strong></td>
<td></td>
<td>2500</td>
</tr>
</tbody>
</table>
3D Seismic has been successfully used by Connacher to define edges, sand thickness and paleo structure, and ultimately reduces the drilling costs.

No new Seismic was shot during the 2015-16 exploratory season.
Great Divide Area Oil Sands Facies and Pay

**Zones**
Defined by Vshale

**Connacher Cut-Offs**
- **Z1** (Sand): 0-10% fines
- **Z2** (Sandy IHS): 10-20% fines
- **Z3** (IHS): 20-50% fines
- **Z4** (Muddy IHS): 50-80% fines
- **Z5** (Mud): 80-100% fines
- **Z6** (Breccia): >10% clasts

**Pay Base Criteria**
- Minimum bitumen grade: 7wt%
- Minimum Net/Gross ratio: 80%
- Maximum included shale interval: 2m
- Minimum zone thickness: 10 m

Core displayed is from a number of separate wells

Facies Z1, Z2, and Z3 are included in net pay
Net Pay Map Great Divide Area

Minimum Criteria:

- Continuous Net Pay >10m
- Saturation 7% Bitumen by Weight
- Porosity >25%

Net Pay (m)
- 10-15m
- 15-20m
- 20-25m
- 25-30m
- >30m

Great Divide Project Approval Area

Great Divide Approved Development Area
Combined Gas Cap & Lean Zone & Bottom Water Map

Original pressure of the gas cap was 2027 kPa in 1988. Subsequent to depletion, the lowest pressure recorded was 746 kPa in 2003.

Estimated original BW pressure of 2500 kPa (based on lowest (520m Kb) gage in Algar obs well 100/15-13-082-12W4 prior to steam injection May 2010.
Base of Oil Sands

Base of Oil Sands Elevation (m)
Paleo Structure Elevation
Pad 101N is characterized by a higher abundance of IHS in the upper part of the reservoir. As seen in well 05 - 21, the sand body gradually thins to the west. In contrast, the reservoir to the south is dominated by clean Z1 sand facies but develops a gas cap with a lean zone above the bitumen pay column.
Typical Section - Algar

The Algar reservoir has a some IHS along with a breccia deposit to the north seen in well 100/04-19. Despite poor gamma ray, well 1AB/09-13 confirms high quality reservoir to the east which can be seen on the resistivity curve and verified by core. The poor gamma ray is caused by inaccurate log calibration.
The cap-rock in the Great Divide Area consists of a mixture of muddy inclined heterolithic strata (IHS) and a mudstone that average over 10 meters in thickness. The muddy IHS consists of 80% volume of shale that is bio-turbated with mud-lined and sand-filled burrows. Muddy IHS is interpreted to be deposited in a muddy point bar. The light grey mudstone is thinly bedded with the top containing siderite nodules and rootlets. It is interpreted to be deposited in a mud flat to swamp environment. Above are core photos of the cap rock from well 1AA/06-21-82-12W4.

This regionally extensive McMurray caprock is considered the caprock for the project. The McMurray caprock is overlain by the Wabiskaw and Clearwater shales described on the following slide.
A Mini Frac test was conducted in well 1AB/14-27-082-12W4 in February 2010. Certain concerns were raised about one test being representative for the whole project area and also the closure pressure determined for the Wabiskaw which could have been influenced by local changes in rock mechanical properties.

Consequently a second test was conducted at 1AC/09-22-082-12W4 in April 2013, and this is reported in the table below.

Results for the second test are similar to the first. Although the Wabiskaw measured the highest stress gradient it was reduced from the first test.
Cap Rock Integrity - Pod One Monthly Average BH Injection Pressure

Directive 51 Maximum Operating Pressure = 6,205 kPag
Cap Rock Integrity - Algar Monthly Average BH Injection Pressure

**Directive 51 Maximum Operating Pressure = 6,205 kPag**

![Graph showing average bottom hole pressure from 2010 to 2016, with lines for different years (201, 202, 203) and months from May 2010 to November 2016.](image)
Subsurface - Recovery Process
Great Divide SAGD Recovery Process

Basic Process

Additional Process

Pod One
- Pressure Balancing under a gas cap and lean zone
- Infill Wells
- Gas Cap Repressurization
- Natural Gas Co-injection (intermittent pressure maintenance)

Algar
- Pressure Balancing over a water zone
- Infill Wells
- SAGD+® Commercial Project
- Natural Gas Co-injection (intermittent pressure maintenance)
<table>
<thead>
<tr>
<th>Description</th>
<th>Stage</th>
<th>Reason</th>
<th>Approvals</th>
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</thead>
</table>
| Pressure Balancing Under a Top Gas & Lean Zone & Bottom Water             | Developed              | • Eliminate steam losses into a gas and lean zone, lower SORs and improve productivity.  
• Required the parallel development of reliability on high temperature downhole pumps. | Operating within existing approvals                                                          |
| Gas Co-injection                                                          | Implemented            | • Natural gas can replace steam to maintain pressure                                         | Approved for full field at Pod One  
Approved for full field at Algar                                                          |
| Gas Cap Repressurization                                                  | Implemented            | • Reduces steam losses into gas cap and lean zone                                           | Approved                                                                                  |
| **SAGD+® Process Trial / Commercial**                                     | • Trial Finished in 2 wells | • Reduces bitumen viscosity lower than steam alone to improve production rates, SOR, and recovery. | Commercial SAGD+®  
Commercial Project approved at Algar                                                        |
| Infill Wells                                                              | 2 Infills on production at Pod One October 1, 2016 | • Additional production and reserves at low capital and SORs                                  | Approved for 5 Infill Wells at Algar Pad 203                                                 |
Pressure Balancing (Top Gas & Lean Zone)

- Temporary production impact during pressure balance
- Improved SOR with low pressure operation
- Pad 104 is being operated in a similar manner except that the re-pressurization is expected to reduce the quantity of steam losses when the steam reaches the lean zone and pumps are being installed earlier

Note: Detailed description of the process provided in the attached technical paper presented by Connacher at the 2011 WHOC.
Pressure Balancing (Bottom Water)

Installed ESP to balance Inj Pressure with BW Pressure

Installed Steam Diverter

Production: Well 201-03 - Rod Pump

- Gas Lift
- ESP
- Gas Lift
- Rod Pump

Production (m3/d)
- Fluids

SOR, BHP / 1000
- Allocated Steam (m3)
- Allocated Oil (m3)
- Injector BHP / 1000 (kPa)
Re-Pressure Pod One Gas Cap

The purpose of gas cap re-pressuring is to increase the pressure in the gas cap and lean zone immediately above Pad 104 and institute a more effective pressure balancing process. Simulations had shown long term benefits to production and SOR by re-pressuring to just below the SAGD operating pressures (~2300 kPa in pump mode). Details of this are discussed in detail in the Pressure Balancing paper at Pod One which is attached to this presentation.

• The re-pressuring process was underway prior to the start up of Pad 104 in 2013. Methane was injected into the 9-17 well at the injection rates shown in the graph below.

• The gas cap pressure at the 7-17 observation well was approximately 1600 kPa prior to gas injection, and the average pressure for September 2016 was 2424 kPa in the gas cap and 2608 kPa in the lean zone.

• Currently the well is injecting just enough gas to maintain the pressure.

• The response to gas injection at the 7-17 observation well is shown in the following slide.
The chart shows the response at various pressure transducers in observation well 7-17 (approximately 600m south of the gas injection at 9-17). The transducers are set at the KB elevations shown on the adjacent log. Connacher is able to pressure the lean zone and gas cap to the target pressure of 2,400 kPa from the 9-17 gas injector.
SAGD+® Commercial Project

Phase 1

- In January 2011, ERCB granted approval for a trial of light hydrocarbon - steam co-injection in the seven well pairs of Pad 203.
- Connacher selected two well pairs 203-2 and 203-3 for an initial test (Phase 1) of the process.
- In Phase 1, a commercially available solvent was co-injected with the steam starting in July 2011 at initial rates of approximately 10% by volume and increased to 15% by volume in October 2011. Compared to an April 2011 baseline, daily average per well bitumen production volumes during the months of August 2011 through October 2011 increased approximately 28% percent with a SOR decrease of 16%. The SOR decrease was limited by the necessity to increase steam injection rates to maintain normal operating pressure.
- Phase 1 injection ended November 2011. Solvent was recovered from the Phase 1 wells until April 2012 just prior to the start of Phase 1.5, 89% of the solvent had been recovered to surface.

Phase 1.5

- Phase 1.5 commenced in May 2012 with solvent injection of approximately 10% until August when injection rates were reduced to approximately 6%, and further reduced in March 2013 to approximately 4%. In 2014 solvent injection rates averaged 5.9%.
- In the 12 months May 2012 through April 2013 bitumen rates increased by approximately 30% compared to the four months prior to the test. The SOR decreased 32% over the same period.
- In July 2013 an ESP was installed in 203-01. Following operational issues the pump was removed in December 2013. The bank of solvent built up during the ESP issues resulted in improved results following the return to gas-lift.
- The SOR for Well 203-01 during the life of the test is 3.0 significantly lower than other wells in the project.
- Solvent injection was stopped in Well 203-1 on April 21, 2015.

Note: details of the measurement of solvent injection and recovery are discussed in the attached Steam Solvent SAGD Paper and the Algar MARP
Pad 101N

- Current strategy for Pad 101N is to continue to produce 101-04 and 101-05 using rod pumps. Currently only 101-04 and 101-05 are running. A small amount of water disposal is anticipated with the Pod One production ramp up in 2017.

- Pad 101N was approved for produced water disposal on February 8th, 2016. Approval No.10587S
NCG Co-injection intended for pressure maintenance and ability to replace steam with NCG during times of steam shortage.

Commercial Scheme Approval issued for Full Field NCG Co-injection at all wells at Pod One and Algar:

• maximum of $10 \times 10^3$ m$^3$ per day
• limited to a maximum of 4 mole per cent with steam (monthly basis)
• limited to a maximum 20 per cent NCG replacement with steam (6 month average basis)
Infill Wells at Pod One - Pad 102W

- Infills were drilled shorter than the adjacent well pairs to avoid penetrating the thin channel edge.
- Temperature logs prior to the steam injection indicated wide variations in temperatures along horizontal sections of the infill wells.
- In order to increase temperature in the wells steam cycles were initiated as shown in the graph to the right.
- Infill well 02 received the smallest volume of steam and responded the fastest and also had the highest temperature measured in the pre-steam survey.

Bottom Hole temperature surveys were carried out prior to steaming the infill wells.
New Infill Wells at Pod One - Pad 101/102

<table>
<thead>
<tr>
<th>Pad</th>
<th>Infill Well</th>
<th>UWI</th>
<th>Production Start Date</th>
<th>Cum Oil Sept.30 2016(m3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>101S</td>
<td>101-INF07</td>
<td>109/16-17-082-12W4/0</td>
<td>Sept 18, 2015</td>
<td>4,131.1</td>
</tr>
<tr>
<td>101S</td>
<td>101-INF08</td>
<td>108/16-17-082-12 W4/0</td>
<td>Sept 13, 2014</td>
<td>36,590.6</td>
</tr>
<tr>
<td>101S</td>
<td>101-INF09</td>
<td>105/09-17-082-12 W4/0</td>
<td>July 17, 2014</td>
<td>38,256.3</td>
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<tr>
<td>101S</td>
<td>101-INF10</td>
<td>112/12-16-082-12 W4/0</td>
<td>July 24, 2014</td>
<td>31,771.2</td>
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<tr>
<td>101S</td>
<td>101-INF11</td>
<td>114/12-16-082-12 W4/0</td>
<td>Aug 18, 2014</td>
<td>34,664.0</td>
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<tr>
<td>101S</td>
<td>101-INF12</td>
<td>113/12-16-082-12 W4/0</td>
<td>Oct 4, 2014</td>
<td>44,506.9</td>
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<td>102W</td>
<td>102-INF06</td>
<td>112/08-20-082-12W4/00</td>
<td>May 3, 2015</td>
<td>24,401.0</td>
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<td>102W</td>
<td>102-INF13</td>
<td>115/12-16-082-12W4/00</td>
<td>Oct 19, 2015</td>
<td>4,129.4</td>
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<td>102W</td>
<td>102-INF14</td>
<td>116/12-16-082-12W4/00</td>
<td>N/A</td>
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</tbody>
</table>
Subsurface - Completions
Typical bottom hole pressure and temperature measurement

**Injector well BHP measurement:**

- Blanket gas on annular side of the wellhead which is isolated from steam injection points for short and long strings

**Producer well BHP measurement:**

- Algar (gas lift), read by the short string lift gas pressure at surface. This is landed at the heel of the well. The annulus of the well, function as a bubble tube.
- Pod One, read by instrumentation coils which function as a bubble tube. This is landed at the toe of the well. The coil has a check valve at the end to prevent fluid from backing up inside.

**Injector well BHT measurement**

- Connacher does not measure injector well BHT. This is intrepeted from injector reservoir pressure using saturated steam temperature tables.

**Producer well BHT Measurement**

- Connacher uses instrumentation coil strings with fiber or thermocouples to measure producer well BHT at both Algar and Pod One.
**Typical Injector Completion**

- **Injection port**
  - Allows for an increased volume of steam injection through the long string (hydraulic limitations)
  - Promotes more uniform steam distribution throughout the slotted liner

**Short String**
- 88.9 mm tubing to ?? mKB
- 73.0 mm tubing ?? to ?? mKB

**Long String**
- 88.9 mm tubing to ?? mKB
- 73.3 mm tubing ?? to ?? mKB
- 88.9 mm tubing ?? to ?? mKB
Production port
- Allows for an increased volume of fluid to move to surface from the toe (due to pressure drop)
- Promotes more uniform steam chamber development (production optimization) due to production of fluid draining in central region of the well bore
Typical Producer Mechanical Lift

**Electronic Submersible Pump**
Metal on metal Progressive cavity pump
Tubing pump (hydraulic pump jack)

**ESP development**
- Connacher was the first company to run the high temperature limit ESP
  - Previous temperature limit 218°C
  - Current temperature limit 250°C

**Production tail pipe**
- Allows for an increased volume of fluid to move to surface from the toe
  - Reduces preferential production from the heel (more uniform chamber)
  - Allows for more cooling prior to reaching pump (less steam at pump)
Improved Well Bore Design (Algar)

Injector
- Short inj string
- 7" slotted liner
- Inj port
- Long inj string

Producer
- Instrument string
- Short prd string
- Gas lift coil
- 7" slotted liner
- Prd port
- Long prd string
Typical Infill Well Completion

Surface Casing

Production casing

Guide String

Tubing

Corod

Instrument String

Tailpipe tubing

Pump

Production Port

Liner

Slotted Liner Hanger

Production Port

Great Divide SAGD Facilities - 10587
Subsurface - Artificial Lift
**Artificial Lift Performance - Pod One**

<table>
<thead>
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<th>Pad</th>
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**Pads 101S, 102W, 102S & 104**

These Pads produce from good quality oil sands reservoir and are a good application of ESP’s. The pump history is shown here as an example.

The higher rate wells can accommodate ESP’s whereas lower rate wells and infills operate more efficiently with rod pumps.

Pads 101S, 102W and 102S are similar and a detailed history of all the pumps at Great Divide is provide in the additional files accompanying this presentation.
## Artificial Lift Performance - Algar

<table>
<thead>
<tr>
<th>Pad</th>
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<tr>
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### Algar

Artificial lift at Algar was based on gas lift for the early stages of production with a later move to lower pressure operation with pumps being considered.

The selection of pumps is based on well productivity and Connacher’s experience.

ESPs have been used in three wells in Pad 201. These three wells are in, or close to, a limited bottom water zone and the pumps are required to balance pressure and avoid high steam losses.

Recently, and as part of the SAGD+ test, ESPs were installed in three wells in Pad 203. Results show that SOR was reduced by using ESPs for artificial lift. But, due to reservoir characteristics and economics, these wells were converted back to gas lift.

<table>
<thead>
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• SCVF tests were conducted on all injectors and producers at Pod One and Algar in September, 2016. Results will be reported to the AER through DDS.

• A summary table of all historical SCVF results is provided as an additional file to this report.

• Connacher is currently compliant with all SCVF requirements at the Great Divide Project.
Subsurface - Monitoring
100/11-21-82-12W4, Operational April 2011
- Monitor North Pad Performance (47m from Well Pair 101-04)
- Five temperature and five pressure measurements all operational
- Temperature readings suspect - all at original reservoir temperature ~14 °C
- Pressure gauges operational
- Continue collecting data

100/06-21-082-12W4, Operational Dec 2007
- Purpose was to measure rise of steam and to determine if steam moved into any overlying gas caps (39 m from Well Pair 101-05)
- Operational but readings suspect
- Maximum temperature 20 °C.
- Pressure gauges not operational
- Continue collecting data

111/12-16-82-12W4, Operational Mar 2010
- Provided observations on effects of low pressure operations (40 m from Well Pair 101S-P10)
- Five temperature measurements all operational. 2 of 5 Pressure gauges not operational
- Continue collecting data

111/05-21-82-12W4, Operational Mar 2012
- Drilled to acquire information on temperature between well pairs for future infill wells (40m from Well Pair 102-03)
- Five temperature measurements operational. Lower pressure gauge not operational
- Continue collecting data

100/07-17-82-12W4, Operational Mar 2012
- Drilled to acquire information on gas cap repressurizing (33m from Well Pair 104-P03)
- Five temperature and five pressure measurements operational
- Continue collecting data
Pod One - Typical Observations Well

Prepared by Petrospec Engineering Ltd.

Blue line = Piezometer Cables
Red line = MI Thermocouple Cable

Location of Piezometers for Pres 1 and Pres 2

Pres 3 & Temp 5:
430.07mKB

Temp 4: 431.36mKB
Temp 3: 434.05mKB

Pres 2:
456.36mKB

Temp 2:
459.05mKB

Pres 1 & Temp 1:
468.05mKB

Surface Casing

Note: As the 3 piezometers are landed within 3m of each other above the heated zone, it is expected that they should read the same temperature to within their range of accuracy.

Open Hole

Hot Zone Top

De-Centralizing Clamps for Piezometer Windows

Hot Zone Bottom
Chamber appears to be fully developed. Steam is suspected to be leaking to gas cap and lean zone. Temperature readings provide support for gas cap repressurization. No valid pressure readings for 2 of 5 gauges after January 1, 2013.
Temperature response observed by April 2016. Pressure response to steam injection observed. Note that steam injection to Pad 104 commenced in September 1, 2013.
No valid pressure readings at the lowest gauge after January 1, 2013. The piezometer at 445.5 m has failed and is no longer reporting accurate reservoir pressure.
Temperature readings confirm that steam distribution in Pad 101N was a challenge. Note that Pad 101N is on blowdown. Temperature and pressure readings portray a relatively fast response to blowdown.
Pressure and Temperature readings are suspect.
Algar Observations Wells

- 100/04-19-082-11W4M Operational February 2011
  - 6m from Well Pair 203-04
  - Monitors Pad 202 performance
  - Five temperature measurements operational
  - Five pressure gauges are suspect

- 100/01-24-082-12W4M Operational February 2011
  - 20m from Well Pair 203-06
  - Five thermocouples operational
  - Four pressure gauges operational

- 100/15-13-082-12W4M Operational February 2011
  - 8m from Well Pair 201-04
  - Five thermocouples operational
  - One pressure gauge operational

- 100/09-13-082-12W4M Operational February 2011
  - 37m from Well Pair 202-04
  - Five thermocouples operational

- 111/16-13-82-12W4W4 Operational March 2012
  - 48m from Well Pair 203-05
  - Five thermocouples operational
  - Five pressure gauges operational
Temperature readings at 490 m depth suggest that steam is moving to higher IHS zones. This suggests that the IHS zone are discontinuous at this location.
Temperature readings show temperature development in intense IHS zones. Pressure readings at this location are suspect.
Algar Obs Well - 100/09-13-82-12 W4

Temperature readings supports the development of infill wells at this location. No pressure readings available.

37 m from 202-04
Temperature readings show temperature response in IHS zone.
Temperature readings show temperature development in the IHS zone. It is expected that there will be more temperature response at lower depths in the future. Pressure response is observed in the entire column.
Pod One

12-16-082-12W4 - Thermocouples at all measurement depths are operating properly. Piezometers at depths of 471 m and 478 m are not operating due to gauge failure. There are no plans to replace the equipment.

5-21-082-12W4 - Thermocouples at all depths are operating properly. Piezometer located at 445.5 m and 454 m are not operating due to gauge failure. There are no plans to replace the equipment.

6-21-082-12W4 - Thermocouples at all depths are operating properly. All piezometers in this well are not operational. There are no plans to replace the equipment.

Algar

9-13-082-12W4 - Thermocouples at all depths are operating properly. All piezometers in this well are not operational. There are no plans to replace the equipment.

15-13-082-12W4 - Thermocouples at all depths are operating properly. Piezometer at 516 m is the only pressure gauge operating properly. There are no plans to replace the equipment.
In 2016, 13.3 km of ‘old’ Highway 63 (now S/B lanes) was resurveyed. This data could not be compared to 2015 data due to resurface work done in 2016. A survey was conducted on the ‘new’ N/B lanes of Highway 63, -12 cm compared to 2015 due to normal post construction settlement. Within Pod One and Algar 38 monitoring points (5 control points, 16 Algar and 17 Pod One) were resurveyed in 2016. The maximum vertical deformation was 6.6cm (at WSW 03-17), average movement of all points was 0.3cm. All lanes of Highway 63, 38 monitoring points, and 5 control points will be resurveyed in 2017.
Pod One 4D Seismic

Geological cross section across seismic data

PP(Primary) conventional seismic is the difference btw the 2005 and 2010 seismic volumes

PS data shows changes in the shear component - Which is an indicator of steam in the rock since 2010

NRMS(Normalized Root Mean Square of the differences btw the 2005 and 2010 surveys) which highlights and confirms change in the reservoir since 2005
Pod One 4D Seismic (2)

The NRMS represents the percent change in the reservoir since steaming operations commenced in 2007. This roughly corresponds to produced bitumen and should represent the various steam chambers. The shear data is not affected by steam, gas or bitumen heated above 80°C, as this acts like a liquid. The resulting map should show the current extent of the steam chambers. The two maps should be similar and are not, therefore the results of the 4D seismic are inconclusive. Possible reasons for this include plant and highway noise, and errors resulting from using different geophones at different locations in the two surveys.
Subsurface - Scheme Performance
Great Divide Well Layout

Pod One
- 23 Well Pairs (101N, 101S, 102S, 102W and 104)
- 13 Infills
- SAGD well pairs in 101N, 101S, 102S and 102W were drilled at 100m spacing
- SAGD well pairs in 104 were drilled at 80m spacing
- All infills (except 102INF06 @35m) were drilled at 50m spacing between the SAGD producers

Algar
- 18 Well Pairs (201, 202 and 203)
- All SAGD well pairs except 202-01R were drilled at 100m spacing
- 202-01R was drilled 35m from 201-01 and 65m from 202-02 well pair

Note: In order to accommodate similar production and injection start times well pair 11S (shown) was included with Pad 102S for performance plots and resource calculations.
Algar Performance

Great Divide SAGD Facilities - 10587
Pod One - Pad 101N Production

Average of Allocated Oil (m3) - 101N
Average of Allocated Water (m3) - 101N
Average of Allocated Steam (m3) - 101N
Pod One Pad 101S Production

Average of Allocated Oil (m3) - 101S
Average of Allocated Water (m3) - 101S
Average of Allocated Steam (m3) - 101S
Pod One Pad 102S Production

Average of Allocated Oil (m3) - 102S
Average of Allocated Water (m3) - 102S
Average of Allocated Steam (m3) - 102S
Pod One Pad 102W Production

Average of Allocated Oil (m3) - 102W
Average of Allocated Water (m3) - 102W
Average of Allocated Steam (m3) - 102W
Algar - Pad 201 Production

Average of Allocated Oil (m3) - 201
Average of Allocated Water (m3) - 201
Average of Allocated Steam (m3) - 201
Algar Pad 202 Production

![Graph showing Algar Pad 202 Production]

- **Average of Allocated Oil (m3) - 202**
- **Average of Allocated Water (m3) - 202**
- **Average of Allocated Steam (m3) - 202**
Algar Pad 203 Production

Average of Allocated Oil (m3) - 203
Average of Allocated Water (m3) - 203
Average of Allocated Steam (m3) - 203
Pod One Performance - Steam/Water Ratio by Pad

Great Divide SAGD Facilities - 10587
Algar Performance - Steam/Water Ratio by Pad
## Pod One Performance - Well Summary

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Pod One Performance Well Summary (2)

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<th>Months On</th>
<th>Cum Oil m³</th>
<th>Cum Steam m³</th>
<th>Oil Rate (m³/day)</th>
<th>CSOR</th>
<th>Lift</th>
<th>Comments</th>
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## Algar Performance - Well Summary

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<th>Well Pad</th>
<th>Well Pair</th>
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<th>Months On</th>
<th>Cum Oil m³</th>
<th>Cum Steam m³</th>
<th>Oil Rate (m³/day)</th>
<th>CSOR</th>
<th>Lift</th>
<th>Comments</th>
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<td>Average Well, Near Edge</td>
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Pod One - Water Balance
Cumulative Steam In / Water Produced

Steam/Water Ratio

Data points for years from 2007 to 2016 are shown, indicating the cumulative steam input compared to water production over time.
Algar - Water Balance
Cumulative Steam In / Water Produced

Steam / Water Ratio

2016-01 to 2016-11
### Pod One - Recoverable Bitumen By Pad

<table>
<thead>
<tr>
<th>Pads</th>
<th>Area (ha)</th>
<th>Avg Porosity (%)</th>
<th>Avg Oil Sat (%)</th>
<th>Avg Net Pay (m)</th>
<th>Pad OBIP (e³m³)</th>
<th>Est Pad Rec (%)</th>
<th>Est Pad Rec (e³m³)</th>
<th>To date Pad Rec (e³m³)</th>
<th>Recovery to Sept 2016 (%)</th>
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<td>33</td>
<td>74</td>
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**Notes:**

1. Pad 101N only 101-04 and 101-05 are producing
2. Additional of estimated infill recoveries of approximately 8% for Pads 101S, 102W, 102S, and 104
3. Estimated Pad Recovery is based on the basic SAGD process
4. Pad 101N injectors were plugged back approximately 1/3 back from well toes
5. Initial Pad recoveries are proving to be on the conservative side
## Algar - Recoverable Bitumen by Pad

<table>
<thead>
<tr>
<th>Pads</th>
<th>Area (ha)</th>
<th>Avg Porosity (%)</th>
<th>Avg Oil Sat (%)</th>
<th>Avg Net Pay (m)</th>
<th>Pad OBIP (e³m³)</th>
<th>Est Pad Rec (%)</th>
<th>Est Pad Rec (e³m³)</th>
<th>To date Pad Rec (e³m³)</th>
<th>Recovery to Sept 2016 (%)</th>
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**Notes:**

1. Pad 203 has completed SAGD+ on a trial basis. Reserves will be adjusted when the commercial project begins. An additional recovery between 5 to 8% of the OBIP is estimated.

2. Estimated Pad Recovery is based on the basic SAGD process.
Subsurface - Future Plans
Algar - Pad 203 Infills

- Commercial Scheme Approval 10587Q
- 5 Infills Approved at Pad 203
Pod One - Pad 104 Well Pairs

- 10 Well Pair Approved for Pad 104 (Approval 10587H)
- Currently there are 4 existing Well Pairs at Pad 104
Great Divide SAGD Expansion Project

- EIA Deemed Complete
- Commercial Scheme Approval Received September, 2012
- EPEA Approval Amendment Received December, 2013
- Approved for expansion to 44,000 bbl/day
Surface - Facilities
Pod One Facilities

**Key Points**

Design *Capacity* ~ 1,600 m$^3$/day bitumen

*Steam Generation*: Drum boilers
  - Operating pressure 6,300 kPa
  - Deliver 4,300 m$^3$/day steam @ 98% + Quality

*Treating*: Diluent addition

*Water Recycle*: IGF, WS Filter, Two vertical tube falling film evaporator towers

*Waste Water*: Waste water shipped to Algar 2$^\text{nd}$ Stage Evaporators

*Source water*: 3 operating source water wells in the Lower Grand Rapids formation, 1 other source water well approved
**Key Points**

*Design Capacity* ~ 1,600 m$^3$/day bitumen

*Steam Generation*: Drum boilers
- Operating pressure 6,700 kPa
- Deliver 4,800 m$^3$/day steam @ 98% + Quality

*Treating*: Diluent addition

*Water Recycle*: IGF, WS Filter, Two vertical tube falling film evaporator towers

*Waste Water*: All water shipped from facility to approved disposal sites

*Source water*: 3 operating source water wells in the Lower Grand Rapids formation, 1 other source water well approved
Great Divide Plant Modifications

Pod One
- Re-rated temperature and pressure of inlet exchangers
- Started injecting oxygen scavenger into source water piping
- Recycling off-spec oil to front end via P-503 and P-557
- Installed a bulk phosphate tank
- Upgraded corroded steel piping to stainless steel at the inlet of V-104 fuel gas separator

Algar
- Installed a bulk phosphate tank
- Decommissioned peroxide skid
Pod One Process Schematic

Great Divide SAGD Facilities - 10587
Pod One and Algar Integration

Dilbit

Diluent

Evap Waste
Surface - Facility Performance
The reliability considers the two steam Boilers at the plant.

For the period October 1, 2015 to September 30, 2016 the steam plant has averaged 65.69% of the original design basis (4,320 m³/day) and 54.02% of the designed total fluid capacity (5,920 m³/day).

This performance compares to the previous 12 months. Which had a steam generation of 98.8% and a total fluid throughput of 94.04% of plant design capacity.

Reliability has been maintained in all areas of the operation.

Downtime Hours is the reported downtime for the Well Pairs.
The reliability considers the two steam Boilers at the plant. The Cogen steam is not included.

For the 12 months from October 1 2015, to the of September 30, 2016 the steam plant output has averaged 79.46% of the original design basis (4800 m³/day) and 76.85% of the designed total fluid handling capacity (6400 m³/day).

This performance compares to the previous 12 months which had a steam generation of 82.43% and total fluid throughput of 82.73% of plant design capacity.

Downtime Hours is the reported downtime for the Well Pairs.
Pod One Energy Balance

Greenhouse Gas Emissions Reported for December, 2015 = 228,000 t CO₂ equivalent
Greenhouse Gas Emissions Reported for December, 2015 = 279,372 t CO$_2$ equivalent
Algar Co-Generation Facility

- Designed to produce 13.1 MW electricity from GT and 588 m$^3$/d of steam from the HRSG
- Horse River sub-station on line June 2011
- Running near capacity with power distributed to both Algar and Pod One
- Steam being used at Algar
Surface - Measurement and Reporting
Changes to MARP

1. Minor changes and corrections on the 2016 MARP, manual and schematics to implement comments from AER review
Pod One uses manual oil cuts however procedures implemented 2012 are clearly showing improved results.

An Agar oil cut meter is installed at Algar and work is progressing on the calibration however oil cuts are still reported from manual cuts.

The profac at Algar is calculated from the interconnect pipeline volumes whereas the Pod One profac is calculated from truck receipts less the Algar pipeline volumes and is subject to typical truck measurement differences.
Surface - Water Recycle
Source Water Wells - Pod One

<table>
<thead>
<tr>
<th>Year</th>
<th>Pod One Water Withdrawals (m³/year)</th>
<th>Licenced Maximum Annual Diversion (m³/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>132,670</td>
<td>292,000</td>
</tr>
<tr>
<td>2013</td>
<td>92,462</td>
<td>292,000</td>
</tr>
<tr>
<td>2014</td>
<td>122,720</td>
<td>292,000</td>
</tr>
<tr>
<td>2015</td>
<td>114,208</td>
<td>292,000</td>
</tr>
<tr>
<td>2016</td>
<td>106,745</td>
<td>292,000</td>
</tr>
</tbody>
</table>

Water Act Licence 00240458-01-00

<table>
<thead>
<tr>
<th>Well Location</th>
<th>Production Interval (meters below grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-17-082-12 W4M</td>
<td>300 - 350</td>
</tr>
<tr>
<td>09-17-082-12 W4M</td>
<td>300 - 350</td>
</tr>
<tr>
<td>08-17-082-12 W4M</td>
<td>300 - 350</td>
</tr>
<tr>
<td>02-17-082-12 W4M</td>
<td>324 - 330 (standby)</td>
</tr>
</tbody>
</table>

All wells use the Grand Rapids Formation for source water.
Source Water Wells - Algar

<table>
<thead>
<tr>
<th>Year</th>
<th>Algar Water Withdrawals (m³/year)</th>
<th>Licenced Maximum Annual Diversion (m³/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>96,164</td>
<td>330,000</td>
</tr>
<tr>
<td>2013</td>
<td>78,917</td>
<td>330,000</td>
</tr>
<tr>
<td>2014</td>
<td>45,632</td>
<td>330,000</td>
</tr>
<tr>
<td>2015</td>
<td>45,142</td>
<td>330,000</td>
</tr>
<tr>
<td>2016</td>
<td>57,247</td>
<td>330,000</td>
</tr>
</tbody>
</table>

All wells use the Grand Rapids Formation for source water.

Water Act Licence 00240527-00-02

<table>
<thead>
<tr>
<th>Well Location</th>
<th>Production Interval (meters below grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-19-082-11 W4M</td>
<td>356 - 382</td>
</tr>
<tr>
<td>03-19-082-11 W4M</td>
<td>349 - 382</td>
</tr>
<tr>
<td>04-19-082-11 W4M</td>
<td>350 - 382</td>
</tr>
<tr>
<td>06-19-082-11 W4M</td>
<td>347 - 382</td>
</tr>
</tbody>
</table>
Evaporator Waste Integration

Pod 1

Evap waste

T-728

Truck-Transfer

T-726

Truck-Out

T-728

Algar

Source Water Wells

FT 51704, 52604, 53204

FT 90304

Utility Water

55805

T-40

Process Make-up Recycled to Process

Algar Evap. System

FT 72608

Truck-Out
• Evaporators produce high quality boiler feed water efficiently while generating a highly concentrated brine for disposal.

• At Algar a second stage evaporator further concentrates both the Algar brine and a portion of the Pod One brine to improve water reuse and minimize disposal.

• Disposal concentrations are close to crystallizer performance.

• Chemical optimization has significantly improved evaporator reliability.
The series evaporator operation at Algar provides high recycle rates and improved reliability.

The Algar operation accommodates waste from the parallel evaporators at Pod One and brine is shipped from Pod One to Algar.

By treating part of the Pod One blow-down at Algar the average yearly water recycle ratio for both plants is approximately 97%. 

![Pod1 & Algar Water Recycle Rates](chart)

<table>
<thead>
<tr>
<th>Month</th>
<th>Pod1 Monthly WRR%</th>
<th>Pod1 YTD WRR%</th>
<th>Algar Monthly WRR%</th>
<th>Algar YTD WRR%</th>
<th>Combined Monthly WRR%</th>
<th>Combined YTD WRR%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-15</td>
<td>93.5</td>
<td>93.7</td>
<td>103.5</td>
<td>103.2</td>
<td>98.5</td>
<td>98.5</td>
</tr>
<tr>
<td>Nov-15</td>
<td>96.5</td>
<td>94.0</td>
<td>100.1</td>
<td>102.8</td>
<td>98.3</td>
<td>98.4</td>
</tr>
<tr>
<td>Dec-15</td>
<td>96.6</td>
<td>94.2</td>
<td>98.6</td>
<td>102.3</td>
<td>97.6</td>
<td>98.2</td>
</tr>
<tr>
<td>Jan-16</td>
<td>89.7</td>
<td>90.6</td>
<td>115.1</td>
<td>98.5</td>
<td>102.4</td>
<td>95.0</td>
</tr>
<tr>
<td>Feb-16</td>
<td>90.5</td>
<td>90.3</td>
<td>102.7</td>
<td>99.0</td>
<td>96.6</td>
<td>94.7</td>
</tr>
<tr>
<td>Mar-16</td>
<td>85.2</td>
<td>89.5</td>
<td>105.1</td>
<td>99.6</td>
<td>95.2</td>
<td>94.6</td>
</tr>
<tr>
<td>Apr-16</td>
<td>92.8</td>
<td>90.9</td>
<td>103.5</td>
<td>100.3</td>
<td>98.1</td>
<td>95.6</td>
</tr>
<tr>
<td>May-16</td>
<td>92.4</td>
<td>91.0</td>
<td>104.7</td>
<td>101.2</td>
<td>98.6</td>
<td>96.1</td>
</tr>
<tr>
<td>Jun-16</td>
<td>103.6</td>
<td>93.6</td>
<td>99.8</td>
<td>100.9</td>
<td>101.7</td>
<td>97.2</td>
</tr>
<tr>
<td>Jul-16</td>
<td>105.4</td>
<td>96.1</td>
<td>99.1</td>
<td>100.5</td>
<td>102.2</td>
<td>98.3</td>
</tr>
<tr>
<td>Aug-16</td>
<td>99.5</td>
<td>96.6</td>
<td>102.4</td>
<td>100.7</td>
<td>100.9</td>
<td>98.7</td>
</tr>
<tr>
<td>Sep-16</td>
<td>101.3</td>
<td>97.3</td>
<td>101.2</td>
<td>100.7</td>
<td>101.3</td>
<td>99.0</td>
</tr>
</tbody>
</table>

Average: 97.0
Surface - Future Plans
Pod One - Mini Steam Expansion

- Commercial Scheme Approval 10587P.
- 500 t/d of steam.
- Allows for 2 Well Pair at Pad 104.
- Steam Generator (17.26 MW).
- 2 Evaporator Units.
- SIR 1 Submitted for EPEA Amendment.
- No additional water allocation required.
• Commercial Scheme Approval 10587K.

• Light hydrocarbon (solvent) and steam co-injection at all well pairs at Algar.

• Solvent to be recovered at facility for re-injection.

• EPEA 67(3) No objection received May, 2014.

• Construction began August, 2014 but not yet completed.
SAGD+® Process Commercial (pipelines)

- Commercial Scheme Approval 10587K.
- 3 inch light hydrocarbon pipeline to all well pads.
- Installed on existing pipe rack.
- Construction completed but not yet commissioned.
Near Future Development to include:

- Pad 232 (Phase 1A)
- Borrow Pit
- Utility Corridor
Surface - Sulphur Production
Pod One Sulphur Emissions

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Average Sulphur Dioxide Emissions (t/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4 - 2015</td>
<td>0.41</td>
</tr>
<tr>
<td>Q1 - 2016</td>
<td>0.41</td>
</tr>
<tr>
<td>Q2 - 2016</td>
<td>0.09</td>
</tr>
<tr>
<td>Q3 - 2016</td>
<td>0.21</td>
</tr>
</tbody>
</table>

- Pod One EPEA SO₂ emission limit is 1.98 t/day
- Peak SO₂ emissions were 0.41 t/day on Jan 5 to 7, 2016

- Plant Total SO₂ = Flared SO₂ + Steam Generators SO₂
- There has been no material change in sulphur production observed over the past year of production at Pod One
- Connacher will continue to monitor produced gas H₂S concentrations, sulphur emissions and evaluate plans for sulphury recovery installations
- SO₂ production is well below emission limits
## Algar Sulphur Emissions

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Average Sulphur Dioxide Emissions (t/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4 - 2015</td>
<td>0.73</td>
</tr>
<tr>
<td>Q1 - 2016</td>
<td>0.61</td>
</tr>
<tr>
<td>Q2 - 2016</td>
<td>0.71</td>
</tr>
<tr>
<td>Q3 - 2016</td>
<td>0.73</td>
</tr>
</tbody>
</table>

- Algar EPEA SO$_2$ emission limit is 1.98 t/day
- Peak SO$_2$ emissions were 0.83 t/day on Oct 27, 2016

- Plant Total SO$_2$ = Flared SO$_2$ + Steam Generators SO$_2$
- There has been no material change in sulphur production observed over the past year of production at Algar
- Connacher will continue to monitor produced gas H$_2$S concentrations, sulphur emissions and evaluate plans for sulphury recovery installations
- SO$_2$ production is well below emission limits
There are a total of 8 passive air monitoring stations at Pod One and Algar. These sites monitor for SO$_2$ and H$_2$S. For the reporting period there were no exceedances of the AAAQO.

Connacher is required to complete continuous ambient air monitoring station for SO$_2$, H$_2$S and NO$_2$, as well as wind speed and wind direction. This monitoring is required 6 months per year. For the reporting period all measured concentrations were within the AAAQO’s.
Surface - Environment
### Great Divide Applications / Authorizations

<table>
<thead>
<tr>
<th>Approval Date</th>
<th>Authorization No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 4, 2013</td>
<td>10587M</td>
<td>Pod One Full Field NCG Co-injection Scheme Approval</td>
</tr>
<tr>
<td>December 12, 2013</td>
<td>10587N</td>
<td>Pod One - Pad 101 and Pad 102 Infills (9) Scheme Approval</td>
</tr>
<tr>
<td>January 8, 2014</td>
<td>10587O</td>
<td>SAGD+® Trail Pad 104 Scheme Approval</td>
</tr>
<tr>
<td>March 21, 2014</td>
<td>10587P</td>
<td>Mini-Expansion at Pod One Scheme Approval</td>
</tr>
<tr>
<td>Pending</td>
<td>Pending</td>
<td>EPEA Approval Amendment for Mini-Expansion at Pod One</td>
</tr>
<tr>
<td>June 10, 2014</td>
<td>F36853</td>
<td>Pod One Facility Licence Amendment</td>
</tr>
<tr>
<td>August 1, 2014</td>
<td>F40209</td>
<td>SAGD+® Commercial Project Facility Licence Amendment</td>
</tr>
<tr>
<td>August 13, 2014</td>
<td>56423</td>
<td>SAGD+® Commercial Project Solvent Pipeline Licence</td>
</tr>
<tr>
<td>September 10, 2014</td>
<td>10587Q</td>
<td>Algar - Pad 203 Infills (5) Scheme Approval</td>
</tr>
<tr>
<td>October 1, 2014</td>
<td>10587R</td>
<td>Algar Full Field NCG Co-injection Scheme Approval</td>
</tr>
<tr>
<td>Pending</td>
<td>Pending</td>
<td>Algar Water Act Licence 240527-00-00 Renewal</td>
</tr>
<tr>
<td>Pending</td>
<td>Pending</td>
<td>Pod One Water Act Licence 240458-01-00 Renewal</td>
</tr>
<tr>
<td>February 8, 2016</td>
<td>10587S</td>
<td>Produced Water Disposal Operations at Pad 101N Approval</td>
</tr>
</tbody>
</table>
## Great Divide Inspections, Audits and VSDs

### Inspection Date

<table>
<thead>
<tr>
<th>Inspection Date</th>
<th>Licence Number</th>
<th>Location</th>
<th>Inspection Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 8, 2014</td>
<td>51876</td>
<td>01-24-082-12 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>October 8, 2014</td>
<td>54978</td>
<td>01-24-082-12 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>October 8, 2014</td>
<td>51620</td>
<td>14-18-082-11 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>October 8, 2014</td>
<td>48792</td>
<td>13-16-082-12 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>October 8, 2014</td>
<td>40209</td>
<td>15-18-082-11 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>January 1, 2015</td>
<td>36853</td>
<td>15-18-082-11 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>July 1, 2015</td>
<td>240008-00-04 (EPEA)</td>
<td>13-16-082-12 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>March 1, 2016</td>
<td>n/a</td>
<td>15-18-082-11 W4M</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>July 1, 2016</td>
<td>n/a</td>
<td>13-16-082-12 W4M</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

### Audit Date

<table>
<thead>
<tr>
<th>Audit Date</th>
<th>Licence Number</th>
<th>Location</th>
<th>Issue and Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2014</td>
<td>10587</td>
<td>Great Divide SAGD</td>
<td>Injection Pressure audit. Technical data submitted. Closed</td>
</tr>
<tr>
<td>January 2015</td>
<td>W0450332</td>
<td>Pad 202 PO1-1</td>
<td>Unsatisfactory; failure to submit drilling waste records within 24 months of rig release. Closed</td>
</tr>
<tr>
<td>March 2015</td>
<td>W0455341</td>
<td>AC/09-22-082-12W4M</td>
<td>Unsatisfactory; failure to submit drilling waste records within 24 months of rig release. Closed</td>
</tr>
<tr>
<td>April 2015</td>
<td>W0445265</td>
<td>07/02-17-082-12W4M</td>
<td>Unsatisfactory; failure to submit drilling waste records within 24 months of rig release. Closed</td>
</tr>
</tbody>
</table>
## Voluntary Self Disclosures

<table>
<thead>
<tr>
<th>VSD</th>
<th>Licence Number</th>
<th>Location</th>
<th>Issue and Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2014</td>
<td>W0374122</td>
<td>Pad 101N-I03</td>
<td>CLC failed to complete casing inspection log &amp; install casing corrosion coupon in well by July 30th, 2015. Closed Nov 21/2015</td>
</tr>
<tr>
<td>September 2014</td>
<td>multiple</td>
<td>various at Great Divide</td>
<td>CLC acquired several inactive pipelines within the Great Divide area that were not properly suspended or abandoned. Ongoing; AER granted an extension to complete pipeline discontinuation activities to March 31, 2016</td>
</tr>
<tr>
<td>January 2015</td>
<td>W0450336</td>
<td>105/01-13-082-12W4M</td>
<td>Low risk NC, failure to submit drilling waste records within 24 months identified by an internal audit. Closed</td>
</tr>
</tbody>
</table>


Great Divide Monitoring Programs

Connacher currently implements the following monitoring programs at the Great Divide Project:

- Groundwater monitoring program;
- Wildlife monitoring program (approved in late 2014);
- Ambient air monitoring program;
- Industrial wastewater and Industrial runoff monitoring program; and,
- Soil monitoring program.

No changes or developments to EPEA compliance monitoring programs
Appendix A - List of Additional Material Submitted
Additional Material Attached to Submission:

Pressure & temperature data form observation wells for Pod One & Algar in prescribed AER Format

Energy Usage & Balance for Algar & Great Divide

Electrical Use at Pod One & Algar

SCVF GM Testing Results

Connacher Heave monitoring Data

Pump Histories
Appendix B - Bitumen Reserves and Resources
1) Proved reserves are those reserves that can be estimated with a high degree of certainty to be recoverable. It is likely that the actual remaining quantities recovered will exceed the estimated proved reserves.

2) Probable reserves are those additional reserves that are less certain to be recovered than proved reserves. It is equally likely that the actual remaining quantities recovered will be greater or less than the sum of the estimated proved plus probable reserves.
Appendix C - Individual Well Performance
Pod One Pad 101N - 101-02

Average of Allocated Oil (m3) - 101-02
Average of Allocated Water (m3) - 101-02
Average of Allocated Steam (m3) - 101-02
Pod One Pad 101N - 101-03

Average of Allocated Oil (m³) - 101-03
Average of Allocated Water (m³) - 101-03
Average of Allocated Steam (m³) - 101-03
Pod One Pad 101N - 101-04

Average of Allocated Oil (m3) - 101-04
Average of Allocated Water (m3) - 101-04
Average of Allocated Steam (m3) - 101-04
Pod One Pad 101N - 101-05

Average of Allocated Oil (m³) - 101-05
Average of Allocated Water (m³) - 101-05
Average of Allocated Steam (m³) - 101-05
Pod One Pad 101S - 101-06

![Graph showing allocated oil, water, and steam volumes from 2008 to 2016. The graph includes three lines: blue for average allocated oil, red for average allocated water, and green for average allocated steam.]
Pod One Pad 101S - 101-08

- **Average of Allocated Oil (m3) - 101-08**
- **Average of Allocated Water (m3) - 101-08**
- **Average of Allocated Steam (m3) - 101-08**
Pod One Pad 101S - 101-09

![Graph showing the average of Allocated Oil, Water, and Steam over time from 2008 to 2016. The graph uses different colors for each resource: blue for Allocated Oil, red for Allocated Water, and green for Allocated Steam. The data is presented in a line graph with months on the x-axis and the quantity in m3 on the y-axis.]
Pod One Pad 101S - 101-10

Average of Allocated Oil (m3) - 101-10
Average of Allocated Water (m3) - 101-10
Average of Allocated Steam (m3) - 101-10
Pod One Pad 101S - 101-F07

Average of Allocated Oil (m3) - 101-inf07
Average of Allocated Water (m3) - 101-inf07
Average of Allocated Steam (m3) - 101-inf07
Pod One Pad 101S - 101-F08

- Average of Allocated Oil (m3) - 101-inf08
- Average of Allocated Water (m3) - 101-inf08
- Average of Allocated Steam (m3) - 101-inf08
Pod One Pad 101S - 101-F09

Average of Allocated Oil (m3) - 101-inf09
Average of Allocated Water (m3) - 101-inf09
Average of Allocated Steam (m3) - 101-inf09
Pod One Pad 102S - 101-11

Average of Allocated Oil (m3) - 101-11
Average of Allocated Water (m3) - 101-11
Average of Allocated Steam (m3) - 101-11
Pod One Pad 102S - 101-F10

Average of Allocated Oil (m3) - 101-inf10
Average of Allocated Water (m3) - 101-inf10
Average of Allocated Steam (m3) - 101-inf10
Pod One 102S - 101-F11

Average of Allocated Oil (m3) - 101-inf11
Average of Allocated Water (m3) - 101-inf11
Average of Allocated Steam (m3) - 101-inf11
Pod One Pad 102S - 101-F12

Average of Allocated Oil (m³) - 101-inf12
Average of Allocated Water (m³) - 101-inf12
Average of Allocated Steam (m³) - 101-inf12
Pod One Pad 102S - 102-13

Average of Allocated Oil (m3) - 102-13
Average of Allocated Water (m3) - 102-13
Average of Allocated Steam (m3) - 102-13
Pod One Pad 102S - 101-14

Average of Allocated Oil (m³) - 102-14
Average of Allocated Water (m³) - 102-14
Average of Allocated Steam (m³) - 102-14
Pod One Pad 102S - 102-F13

Average of Allocated Oil (m$^3$) - 102-inf13

Average of Allocated Water (m$^3$) - 102-inf13

Average of Allocated Steam (m$^3$) - 102-inf13
Pod One Pad 102W - 102-01

Average of Allocated Oil (m3) - 102-01
Average of Allocated Water (m3) - 102-01
Average of Allocated Steam (m3) - 102-01
Pod One Pad 102W - 102-03

Average of Allocated Oil (m3) - 102-03
Average of Allocated Water (m3) - 102-03
Average of Allocated Steam (m3) - 102-03
Pod One Pad 102W - 102-04

Average of Allocated Oil (m3) - 102-04
Average of Allocated Water (m3) - 102-04
Average of Allocated Steam (m3) - 102-04
Pod One Pad 102W - 102-05

Average of Allocated Oil (m3) - 102-05
Average of Allocated Water (m3) - 102-05
Average of Allocated Steam (m3) - 102-05
Pod One Pad 102W - 102-F02

Average of Allocated Oil (m3) - 102-inf02
Average of Allocated Water (m3) - 102-inf02
Average of Allocated Steam (m3) - 102-inf02
Pod One Pad 102W - 102-F05

Average of Allocated Oil (m³) - 102-inf05
Average of Allocated Water (m³) - 102-inf05
Average of Allocated Steam (m³) - 102-inf05
Pod One Pad 104 - 104-03

Average of Allocated Oil (m3) - 104-03
Average of Allocated Water (m3) - 104-03
Average of Allocated Steam (m3) - 104-03
Pod One Pad 104 - 104-04
Pod One Pad 104 - 104-05

- Average of Allocated Oil (m³) - 104-05
- Average of Allocated Water (m³) - 104-05
- Average of Allocated Steam (m³) - 104-05
Pod One Pad 104 - 104-06

Average of Allocated Oil (m3) - 104-06
Average of Allocated Water (m3) - 104-06
Average of Allocated Steam (m3) - 104-06
Algar Pad 201S - 201-01

201-01

Average of Allocated Oil (m3) - 201-01
Average of Allocated Steam (m3) - 201-01
Average of Allocated Water (m3) - 201-01
Algar Pad 201S - 201-02

201-02

Average of Allocated Oil (m3) - 201-02
Average of Allocated Steam (m3) - 201-02
Average of Allocated Water (m3) - 201-02
201-03

Average of Allocated Oil (m3) - 201-03
Average of Allocated Steam (m3) - 201-03
Average of Allocated Water (m3) - 201-03
Algar Pad 201S - 201-04

201-04

Average of Allocated Oil (m3) - 201-04
Average of Allocated Steam (m3) - 201-04
Average of Allocated Water (m3) - 201-04
Algar Pad 2015 - 201-05

Average of Allocated Oil (m3) - 201-05
Average of Allocated Steam (m3) - 201-05
Average of Allocated Water (m3) - 201-05
Algar Pad 202S - 202-01

Average of Allocated Oil (m³) - 202-01
Average of Allocated Steam (m³) - 202-01
Average of Allocated Water (m³) - 202-01
Algar Pad 202S - 202-01-1

Average of Allocated Oil (m3) - 202-R01
Average of Allocated Steam (m3) - 202-R01
Average of Allocated Water (m3) - 202-R01
Algar Pad 202S - 202-03

Average of Allocated Oil (m3) - 202-03
Average of Allocated Steam (m3) - 202-03
Average of Allocated Water (m3) - 202-03
Algar Pad 202S - 202-04

Average of Allocated Oil (m³) - 202-04
Average of Allocated Steam (m³) - 202-04
Average of Allocated Water (m³) - 202-04
Algar Pad 202S - 202-05

202-05

Average of Allocated Oil (m³) - 202-05
Average of Allocated Steam (m³) - 202-05
Average of Allocated Water (m³) - 202-05
Algar Pad 203 - 203-02

Average of Allocated Oil (m3) - 203-02
Average of Allocated Steam (m3) - 203-02
Average of Allocated Water (m3) - 203-02
Algar Pad 203 - 203-04

Average of Allocated Oil (m3) - 203-04
Average of Allocated Steam (m3) - 203-04
Average of Allocated Water (m3) - 203-04
Algar Pad 203 - 203-05

Average of Allocated Oil (m³) - 203-05
Average of Allocated Steam (m³) - 203-05
Average of Allocated Water (m³) - 203-05
203-06

Average of Allocated Oil (m3) - 203-06
Average of Allocated Steam (m3) - 203-06
Average of Allocated Water (m3) - 203-06
Algar Pad 203 - 203-07

Average of Allocated Oil (m3) - 203-07
Average of Allocated Steam (m3) - 203-07
Average of Allocated Water (m3) - 203-07