Cenovus Foster Creek in-situ oil sands scheme (8623) update for 2015
Advisory

This presentation contains information in compliance with:

AER Directive 054 - Performance Presentations, Auditing, and Surveillance of In Situ Oil Sands Schemes

Section 3.1.1 Subsurface Issues Related to Resource Evaluation and Recovery

This document contains forward-looking information prepared and submitted pursuant to Alberta regulatory requirements and is not intended to be relied upon for the purpose of making investment decisions, including without limitation, to purchase, hold or sell any securities of Cenovus Energy Inc. The resources estimates contained herein are not reported in accordance with National Instrument 51-101 and are provided solely for the purpose of complying with Alberta regulatory requirements.

Additional information regarding Cenovus Energy Inc., including information regarding contingent resources, is available in our Annual Information Form for the year ended December 31, 2015 and in our Statement of Contingent and Prospective Resources for the year ended December 31, 2015 at cenovus.com.
Current project status
Subsection 3.1.1-1
About Cenovus

**TSX, NYSE | CVE**

<table>
<thead>
<tr>
<th>Enterprise value</th>
<th>C$18 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shares outstanding</td>
<td>833 million</td>
</tr>
<tr>
<td>2016F production</td>
<td></td>
</tr>
<tr>
<td>Oil sands</td>
<td>151 Mbbils/d</td>
</tr>
<tr>
<td>Conventional</td>
<td>54 Mbbils/d</td>
</tr>
<tr>
<td>Total liquids</td>
<td>205 Mbbils/d</td>
</tr>
<tr>
<td>Natural gas</td>
<td>385 MMcf/d</td>
</tr>
<tr>
<td><strong>Total production</strong></td>
<td><strong>269 MBOE/d</strong></td>
</tr>
<tr>
<td>2015 proved &amp; probable reserves</td>
<td>3.8 BBOE</td>
</tr>
<tr>
<td>Bitumen</td>
<td></td>
</tr>
<tr>
<td>Economic contingent resources*</td>
<td>9.3 Bbbls</td>
</tr>
<tr>
<td>Lease rights**</td>
<td>2.0 MM net acres</td>
</tr>
<tr>
<td>P&amp;NG rights</td>
<td>4.1 MM net acres</td>
</tr>
<tr>
<td>Refining capacity</td>
<td>230 Mbbils/d net</td>
</tr>
</tbody>
</table>

Values are approximate. Forecast production based on February 11, 2016 guidance.

*See advisory. **Includes an additional 0.5 million net acres of exclusive lease rights to lease on our behalf and our assignee’s behalf.
Foster Creek – current project status

- Phase A - 20k bbls/d on October 2001 (3,180 m3/d)
- 80 MW Cogen on Q1 2003
- Phase B - 30k bbls/d (4,770 m3/d) complete 2004
- Phase C - 60k bbls/d complete 2006 (9,534 m3/d)
- Phases D & E - 120k bbls/d complete 2009 (19,078 m3/d)
- Water treating debottleneck and cooling loop complete 2010
- Phase F - 150k bbls/d complete 2014
- Q1 2016 oil production 121,763 bbls/d (19,358 m3/d)
- Record oil production day 155,302 bbl (24,730 m3)
- Approved for Phases A – J

Note that production volumes refer to total cumulative production capacity.
Project status – phase D and E update

Main Plant:
- 120,000 bbls/d (19,078 m³/d) oil treating design capacity commissioned in 2009
- Debottleneck on water treating capacity complete in 2010
  - 2014 annualized average was 118,344 bbls/d (18,806 m³/d)
  - 2014 exit rate, Dec 2014, was 140,066 bbls/d (22,258 m³/d)

Phases A - E well update:
- E16 Wedge Well™ technology pad on production in June 2014
- E20 Wedge Well™ technology pad on production in August 2014
- E02 Wedge Well™ technology pad on production in September 2014
- E03 Wedge Well™ technology pad on production in November 2014
- E19 Wedge Well™ technology pad on production in December 2014
Project status – phase F, G and H expansion

Expansions have the following design capacities:

• Phase F – 30k bbls/d oil, online September 2014
• Phase G – 30k bbls/d oil, first production target 2016
  • Phase G Steam online February 2016
• Phase H – 30k bbls/d oil, deferred

Phase F well update:

• W07 Pad on production late February 2016
Current Project Status – SAGD Resource

- 3211 MMBbls OBIP (510 MMm³)
- 4468 MMBbls OBIP (710 MMm³)

Development Boundary
Project Boundary

Clearwater Development Area

*OBIP calculation methodology available in subsequent slides
# Reservoir characteristics

<table>
<thead>
<tr>
<th>Reservoir Characteristic</th>
<th>West Area</th>
<th>Central Area</th>
<th>East Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (m subsea)</td>
<td>180 – 225</td>
<td>180 – 225</td>
<td>180 – 225</td>
</tr>
<tr>
<td>Thickness (m)</td>
<td>Up to 30+</td>
<td>Up to 30+</td>
<td>Up to 30+</td>
</tr>
<tr>
<td>Porosity (%)</td>
<td>34%</td>
<td>34%</td>
<td>32%</td>
</tr>
<tr>
<td>Horizontal Permeability (D)</td>
<td>Up to 10 D</td>
<td>Up to 10 D</td>
<td>Up to 8 D</td>
</tr>
<tr>
<td>Vertical Permeability (D)</td>
<td>Up to 8 D</td>
<td>Up to 8 D</td>
<td>Up to 6 D</td>
</tr>
<tr>
<td>Oil Saturation</td>
<td>~0.85 (0.50 in transition)</td>
<td>~0.85 (0.50 in transition)</td>
<td>~0.85 (0.50 in transition)</td>
</tr>
<tr>
<td>Water Saturation</td>
<td>~0.15 (0.50 in transition)</td>
<td>~0.15 (0.50 in transition)</td>
<td>~0.15 (0.50 in transition)</td>
</tr>
<tr>
<td>Original Pressure (kPa)</td>
<td>~2700</td>
<td>~2700</td>
<td>~2700</td>
</tr>
<tr>
<td>Original Temperature (ºC)</td>
<td>12 ºC</td>
<td>12 ºC</td>
<td>12 ºC</td>
</tr>
</tbody>
</table>
Composite type log: central wells

- Basal mud defines base of pay
- Basal mud is discontinuous and ranges from 0-4 metres in thickness
- Provides a good marker during SAGD operations

Location: 11-19-70-4W4

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Subsection 3.1.1 – 2e)
May 31, 2016
Composite type log: east wells

- Basal mud defines base of pay
- Basal mud is discontinuous and ranges from 0-4 metres in thickness
- Provides a good marker during SAGD operations

Location: 2-21-70-3W4
Composite type log: west wells

- Basal mud defines base of pay
- Basal mud is discontinuous and ranges from 0-4 metres in thickness
- Provides a good marker during SAGD operations

Location: 16-12-70-6W4
Maps and core
Subsection 3.1.1 – 2, c, d and f)
2015 SAGD Pay Isopach (2016 Strats)

Clearwater Development Area

102 Strat Wells

3211 MMBbls OBIP (510 MMm³)

4468 MMBbls OBIP (710 MMm³)

Development Boundary

Project Boundary

*OBIP calculation methodology available in subsequent slides

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McMurray to Paleozoic Isopach
# Post-steam core locations

<table>
<thead>
<tr>
<th>Post-steam Core</th>
<th>Year Cored</th>
<th>Associated Well Pair</th>
<th>Distance from Well Pair</th>
<th>% So Clean Sand (from Dean Stark)</th>
<th>% So IHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(in steam chamber)</td>
<td></td>
</tr>
<tr>
<td>3A5-22-70-4</td>
<td>2005</td>
<td>A3</td>
<td>10</td>
<td>92</td>
<td>11-26%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Lats</td>
</tr>
<tr>
<td>2D2-22-70-4</td>
<td>2010</td>
<td>D21</td>
<td>27</td>
<td>90</td>
<td>1-21%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65-83%</td>
</tr>
<tr>
<td>5-22-70-4</td>
<td>2011</td>
<td>A3</td>
<td>17</td>
<td>88</td>
<td>3-20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Lats</td>
</tr>
<tr>
<td>2B9-15-70-4</td>
<td>2012</td>
<td>FP4</td>
<td>32</td>
<td>90</td>
<td>2-34%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Lats</td>
</tr>
<tr>
<td>D14-18-70-3</td>
<td>2013</td>
<td>E0306</td>
<td>21</td>
<td>N/A</td>
<td>2-26%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
Cross-sections
Subsection 3.1.1 – 2, i)
Representative structural cross-section over central area

A

A'

Paleozoic

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Subsection 3.1.1 – 2, i)
May 31, 2016
Representative structural cross-section over East area
Representative structural cross-section over North area

A

A'
Representative structural cross-section over West area
Geo-mechanical data
Subsection 3.1.1 – 2, j)
Geomechanical Data

Sample from Well 1AA/08-08-070-6W4

<table>
<thead>
<tr>
<th>Formation Interval</th>
<th>Depth (m)</th>
<th>Bulk Modulus, K (MPa)</th>
<th>Young's Modulus, E* (MPa)</th>
<th>c' peak (MPa)</th>
<th>φ' peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>T21(CEUDX2)</td>
<td>459.7</td>
<td>213</td>
<td>256</td>
<td>0</td>
<td>30°</td>
</tr>
<tr>
<td>T21(CEUDX1)</td>
<td>459.8</td>
<td>178</td>
<td>214</td>
<td>0</td>
<td>17°</td>
</tr>
<tr>
<td>T21(CEUDX3 &amp; 4)</td>
<td>460.2</td>
<td>482</td>
<td>578</td>
<td>1.5</td>
<td>25°</td>
</tr>
</tbody>
</table>

* Assumes ν = 0.3, K = E/(3(1-2ν))

<table>
<thead>
<tr>
<th>Formation Interval</th>
<th>Depth (m)</th>
<th>Bulk Modulus, K (MPa)</th>
<th>Young's Modulus, E* (MPa)</th>
<th>c' peak (MPa)</th>
<th>φ' peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>T11 (CEUDX5, 6 &amp; 7)</td>
<td>466.6</td>
<td>482</td>
<td>578</td>
<td>0.4</td>
<td>32°</td>
</tr>
</tbody>
</table>

* Assumes ν = 0.3, K = E/(3(1-2ν))

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Subsection 3.1.1 – 2, j)
May 31, 2016
Surface monitoring
Subsection 3.1.1 – 2, k)
2015 Ground Heave Monitoring

Map:
A) Active CRs: 159
B) CTM Points: ~22,000
C) Deformation Maps: 1 per year
Minimum in-situ stress profile
Caprock minimum in-situ stress

Minimum in-situ stress values in the caprock vary across the project. Smallest minimum in-situ stress values in each sub-area are shown in the above map.
Criteria for determining caprock integrity

Cenovus determines the minimum in-situ stress of the caprock over the project area through mini frac testing and seismic mapping

Minimum in-situ stresses have shown variability across our development area

Current project contains four regions with different approved MOP values

- North – 6.6 MPag
- Central – 6.7 MPag
- West – 6.9 MPag
- East – 6.9 MPag

Operating pressures in the project vary through the various well stages

- steam stimulation/circulation: (5.5 – 6.6 MPa)*
- ramp-up: (3.5 – 5.5 MPa)
- normal operating conditions: (2.0 – 3.5 MPa)

* - Note that this upper limit is specific to the MOP of each region
Caprock Monitoring Plans

Cenovus monitors caprock integrity through:

1. SAGD injection pressure monitoring

2. Piezometer monitoring in the T31 caprock
   • Previously 3 locations
   • Added an additional 3 locations in 2015

3. Heave monitoring

4. 4D seismic monitoring
Drilling and completions
Subsection 3.1.1 – 3)
2015-2016 New SAGD Well Pairs Drilling

East Pads:
- E22

West Pads:
- W19, W23

2015 Drilling
2016 Production
Inter Well Spacing

Central Pads
A, B/L, C, D, E/K, F, H, J, M, N– 100m (Pads with Wedge Well™ technology ~50m)
G – 85-100m(with Wedge Well™ technology ~50m)

East Pads
E02, E03, E04, E07, E08, E10, E11, E12, E14, E15, E16, E19, E20, E21, E24, E25 - 100m (Pads with Wedge Well™ technology ~50m)
E42 - 70-85m

West Pads
W01, W02, W05, W06, W08, W15 - 100m
W03 - 80-110m
W07, W10 - 80-90m
W18 - 65-100m
Re-drills and re-entries

List of re-drill and re-entry wells in Foster Creek since January 1, 2015

*Liner failures caused by steam jetting.*

<table>
<thead>
<tr>
<th>Well Name</th>
<th>Type</th>
<th>Drill Start</th>
<th>Drill Complete</th>
<th>Reason for Remediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>E12P08-1</td>
<td>Step-out</td>
<td>19-Jan-15</td>
<td>28-Jan-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E24P06-3</td>
<td>Step-out</td>
<td>02-Feb-15</td>
<td>11-Feb-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E20P06-1</td>
<td>Step-out</td>
<td>07-May-15</td>
<td>16-May-15</td>
<td>Intermediate casing failure</td>
</tr>
<tr>
<td>E10P01</td>
<td>Re-entry</td>
<td>03-Jul-15</td>
<td>08-Jul-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E03I04-1</td>
<td>Step-out</td>
<td>10-Jul-15</td>
<td>17-Jul-15</td>
<td>Re-development to access new reserves</td>
</tr>
<tr>
<td>E07P03-1</td>
<td>Step-out</td>
<td>08-Sep-15</td>
<td>15-Sep-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E08P07</td>
<td>Re-entry</td>
<td>02-Sep-15</td>
<td>05-Sep-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E07P02-1</td>
<td>Step-out</td>
<td>17-Sep-15</td>
<td>23-Sep-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E07I02-1</td>
<td>Step-out</td>
<td>24-Sep-15</td>
<td>30-Sep-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E02P01</td>
<td>Re-entry</td>
<td>28-Oct-15</td>
<td>06-Nov-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>E02P01</td>
<td>Re-entry</td>
<td>23-Oct-15</td>
<td>26-Oct-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>W03P04</td>
<td>Re-entry</td>
<td>07-Nov-15</td>
<td>11-Nov-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>W08P01</td>
<td>Re-entry</td>
<td>12-Nov-15</td>
<td>15-Nov-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>W06P06</td>
<td>Re-entry</td>
<td>17-Nov-15</td>
<td>20-Nov-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>I05</td>
<td>Re-entry</td>
<td>20-Nov-15</td>
<td>25-Nov-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>I05</td>
<td>Re-entry</td>
<td>25-Nov-15</td>
<td>02-Dec-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>W06P03</td>
<td>Re-entry</td>
<td>01-Dec-15</td>
<td>07-Dec-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
<tr>
<td>I05</td>
<td>Step-out</td>
<td>08-Dec-15</td>
<td>15-Dec-15</td>
<td>Primary Liner failure in the Hz slotted section of the well</td>
</tr>
</tbody>
</table>
Standard injector completion

- Majority of well pairs at Foster Creek have been started up with single splitter injector designs
- Multiple splitters have demonstrated increased operational flexibility with steam placement
- New pads with multiple splitter designs on production: W07
Standard producer ESP completion

339.7 mm 81.105 kg/m J-55 ST&C Surface Casing

244.5 mm 59.53 kg/m L80 QB2 Production casing

1/2” Capline for bubble tube and thermocouple

Production Tubing: 88.9mm tubing w/ ESP landed ~5m above primary liner hanger

31.75 mm DTS coiled tubing

Liner: 177.8 mm, 34.23/38.69 kg/m L-80 QB-2
Standard Wedge Well™ technology completion

339.7 mm 71.40 kg/m
H40 ST&C Surface Casing

244.5 mm 59.53 kg/m
L80 QB2 Production casing

1/2” Capline for bubble tube and thermocouple

Production Tubing:
88.9 mm tubing w/ ESP landed ~5 m
above primary liner hanger

31.75 mm DTS coiled tubing

Slotted Liner: 177.8 mm, 38.69 kg/m L-80 QB2
Artificial lift
Subsection 3.1.1 – 4)
Artificial lift

**Electric submersible pumps (ESPs)**
- all operating SAGD pairs (~243 producers) are currently equipped with ESPs.

**Rod pumps**
- 33/97 operating wells utilizing Wedge Well™ technology are equipped with rod pumps
- rod pumps at Foster Creek can range from about 0 – 350 m³/d

<table>
<thead>
<tr>
<th></th>
<th>ESPs</th>
<th>Rod pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn down (m³/d)</td>
<td>120</td>
<td>0</td>
</tr>
<tr>
<td>Max. rate (m³/d)</td>
<td>1200</td>
<td>350</td>
</tr>
<tr>
<td>Max. operating temp (°C)</td>
<td>255</td>
<td>200+</td>
</tr>
<tr>
<td>Number of pumps</td>
<td>243</td>
<td>33</td>
</tr>
<tr>
<td>Average run life (months)</td>
<td>11.2</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Artificial lift – new technology

**ESPs**
- Working with vendors to increase runtime.

**Rod pumps**
- previously utilizing Wedge Well™ technology
- higher maintenance pump than ESPs, have had problems with sand bridging and can result in slower ramp up to peak production
- All new Wedge Well™ pads to be produced via ESP
Instrumentation in wells
Subsection 3.1.1 – 5)
Foster Creek 2016 piezometer locations
Piezometer details

Three installation types:

Cemented tubing – vibrating wire piezometers mounted on tubulars and cemented in place (14 wells)

Hanging wire – pressure / temperature gauges hung from the wellhead to about 10-15m above perforations (9 wells)

Cemented casing – High temperature Optical pressure sensors strapped and cemented to the production casing (33 wells)

Four new McMurray piezometers installed
Foster Creek temperature and RST data

- Wells selected for RST logging (33)
- Wells selected for Temperature logging (27)
Instrumentation in SAGD wells

**SAGD steam injector**
- blanket gas for pressure measurement

**SAGD producer**
- ½” capline strapped to tubing for bubble tubes and single point thermocouple
- Distributed temperature sensing (DTS) strings installed in all new wells

**SAGD using our patented Wedge Well™ technology**
- no downhole instrumentation with rod pumps
- new wells with ESPs to be equipped with ½” capline strapped to production tubing string to measure pressure and temperature

* Schematics can be seen in subsection 3.1.1 – 3 c)
Subsection 3.1.1 – 5 c) and d) – instrumentation data

Requirements under Subsection 3.1.1 5c) and d) are located in the Appendix
Well Integrity Update
Well Integrity

Intermediate Casing Failures

- Confirmed by pressure tests
- Impairments concentrated within the Joli Fou
- Noted elsewhere in the Colorado Shale Group (200-300m SS)

2015 Intermediate Casing Failures

- E20P06 – Failed pressure test

2016 Q1 Intermediate Casing Failures

- No failures confirmed by pressure testing
# 2015/Q1 2016 MFC Logging

## 2015

<table>
<thead>
<tr>
<th>Well</th>
<th>Pressure Test</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>E07P04</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E11I04</td>
<td>Pass</td>
<td>-</td>
</tr>
<tr>
<td>EI26</td>
<td>Pass</td>
<td>Suspended</td>
</tr>
<tr>
<td>W06P05</td>
<td>Pass</td>
<td>-</td>
</tr>
<tr>
<td>E11I05</td>
<td>Pass</td>
<td>Recompletion</td>
</tr>
<tr>
<td>E21I04</td>
<td>Pass</td>
<td>Abandonment</td>
</tr>
<tr>
<td>JP06</td>
<td>Pass</td>
<td>Abandonment</td>
</tr>
<tr>
<td>W01P03</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E20P06</td>
<td>Failed</td>
<td>Abandonment</td>
</tr>
</tbody>
</table>

## Q1 2016

<table>
<thead>
<tr>
<th>Well</th>
<th>Pressure Test</th>
<th>Action</th>
</tr>
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<tbody>
<tr>
<td>E25P08</td>
<td>Pass</td>
<td>Abandonment</td>
</tr>
<tr>
<td>E19P12</td>
<td>Pass</td>
<td>Abandonment</td>
</tr>
<tr>
<td>E04P06</td>
<td>Pass</td>
<td>Abandonment</td>
</tr>
<tr>
<td>E24P08</td>
<td>Pass</td>
<td>Abandonment</td>
</tr>
</tbody>
</table>
## Well Integrity

### Surface Casing Vent Flows (no steam)

<table>
<thead>
<tr>
<th>Well</th>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>E24P06-1</td>
<td>Repair</td>
<td>Monitoring</td>
</tr>
<tr>
<td>BI6</td>
<td>Repair</td>
<td>Monitoring</td>
</tr>
<tr>
<td>E04I06</td>
<td>Current investigation</td>
<td>Monitoring</td>
</tr>
</tbody>
</table>

- **SWS investigation on-going**
# Well Integrity

## Casing Corrosion

<table>
<thead>
<tr>
<th>Corrosion Location</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Casing Exterior</td>
<td>Mitigation on-going</td>
</tr>
<tr>
<td>Surface Casing Interior / Intermediate Casing Exterior</td>
<td>Investigation on-going</td>
</tr>
<tr>
<td>Pack-Off</td>
<td>Investigation on-going</td>
</tr>
</tbody>
</table>
2015 Well Integrity

Routine Monitoring
• Integrated review of open and cased hole logs, well and pad history (drilling information, workover history, pressure testing)

Strain monitoring wells installed
• Baseline data in non-thermally affected zones in laterals
  • 1AB/03-23-070-05W4/00 (FC W20 Pad)
  • 1AD/05-23-070-05W4/00 (FC W20 Pad)
  • 100/05-28-070-03W4/00 (FC E26 Pad)
  • 1AC/07-10-076-06W4/00 (CL H03 Off-pad)
• Proposed installations on pads for vertical builds
• Field measurements scheduled relative to milestone dates

Geomechanical lab testing
• Pending sensitivities determined by geomechanical simulations
2015 Well Integrity

Joint Industry Projects

• Thermal Well Casing Connection Evaluation Protocol (TWČCEP)
• Synergistic Impacts of Thermal-Mechanical Loading & Environmental Corrosion Cracking on Tubular Materials for Thermal Wells
• NSERC/Foundation CMG Industrial Research Chair in Reservoir Geomechanics for Unconventional Resources
• Well Xplore (CalTran) User Group
• Testing of Alternate Cements for Thermal Well Applications
4D seismic
Subsection 3.1.1 – 6)
3D Seismic Within Project Area
4D Seismic Within Project Area
2015 East 4D Seismic

Interpreted top of steam elevation
Scheme performance
Subsection 3.1.1 – 7 a)
Scheme performance prediction

Predict well pair performance based on modified Butler’s equation

Predict well pair CSOR using published CSOR correlations (Edmunds & Chhina 2002)

Generate overall scheme production performance by adding individual well forecasts over time to honour predicted steam capacity and water treating availability
Central - cumulative % recovery SOIP

*Note – A35, AINF-6 & AINF-7 volumes included in E Pad
*Note that SOIP calculation methodology is available in subsequent slides
East - cumulative % recovery SOIP

*Note that SOIP calculation methodology is available in subsequent slides*
West - cumulative % recovery SOIP

*Note that SOIP calculation methodology is available in subsequent slides*
Cumulative steam oil ratio – central pads

B / L and EXP / M Pad SORs high due to shut-in periods of wells on pad that were affected by the Colorado Shale issue

D, C, A, F and G pads have superior SORs as a result of wells drilled utilizing our patented Wedge Well™ technology

D, C and A pad also have started methane co-injection

*Note – A35, AINF-6 & AINF-7 volumes included in E Pad
Cumulative steam oil ratio – East pads

E02 & E03 pads - geology in this area is more heterogeneous than in most areas at Foster Creek and start-up was difficult, requiring several steam stimulations, resulting in a higher CSOR.

E24, E16, E19, E20 and E12 pads – all very good geology and well performance, thus, low SORs.

E10 & E11 pads have seen some water influx in a couple of wells.
Cumulative steam oil ratio – West pads

Foster Creek - West Pads
Cumulative Steam Oil Ratio

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Subsection 3.1.1 – 7a, ii)
May 31, 2016
Actual production vs. approval capacity

Foster Creek has met the target rate in Phase A, Phase B, Phase C and Phase D&E applications

- Phase D&E (Pads J, E04, E08, E11, E15, E16, E19, E20, E21, E25, W01, W02, H) – 120,000 bbl/d (19,080 m³/d)
- Phase F (Pads E07, E14, E42, W06, W03, W08) – 30,000 bbl/d (4767 m³/d)
- Target daily production between 120,000- 150,000bbl/d throughout the remainder of the year

*wells drilled utilizing Wedge Well™ technology have been drilled and are on production

Note that production volumes refer to cumulative production capacity on a total production basis
Steam chamber development
Subsection 3.1.1 – 7 b)
Methods for monitoring chamber development

Cenovus uses the following methods for monitoring chamber development:

• Observation wells
• Specialized logging and coring
• Seismic
• Volumetrics
Foster Creek temperature and RST data

- Wells selected for RST logging (33)
- Wells selected for Temperature logging (27)
Foster Creek temperature wells

- 23m offset E11-04 well pair

TSAT ~216°C

250°C
Foster Creek temperature wells

- 8m offset E24-02 well pair
Foster Creek temperature wells

- 32m offset E25-04 well pair
2015 East 4D Seismic

Interpreted top of steam elevation
Time-lapse seismic: E25 Pair 06
Time-lapse seismic: E20 Pair 02

- **Facies:**
  - Amplitude
  - SEG standard convention: peak (red) = increase in impedance
Time-lapse seismic: E15 Pair 05

SEG standard convention: peak (red) = increase in impedance
Oil in place: SAGDable OIP (SOIP) vs. Productive OIP (POIP)

Two types of Oil in Place (OIP) are provided:

- SAGDable OIP and Productive OIP

**SAGDable OIP defined as:**

- \((\text{Planned Length}) \times (\text{Spacing}) \times (\text{Net SAGD Pay: Base to Top SAGD}) \times (S_o) \times (\Theta)\)
- used drilled length for existing well pairs but will use planned length for all future pairs
- a “before-drilling” OOIP, used during planning phase
- doesn't change after well pair plans finalized
- used to plan additional wells (Wedge Well™ technology, bypassed pay producers, re-drills, new pairs)
- this is essentially a “planned” OOIP, as we would aim to drill the full planned length (typically 800m), and drill the producer well as low as possible in relation to Base SAGD

**Productive OIP defined as:**

- \((\text{Effective Length}) \times (\text{Spacing}) \times (\text{Effective Pay: Producer to Top SAGD}) \times (S_o) \times (\Theta)\)
- an “after-drilling” OOIP, based on well pair potential
- changes with time and interpretation (obs. wells, 4D seismic, MWD error, etc.)
- used to plan blowdown strategy
- this reflects actual well pair performance
  - incorporates actual overlapping slotted liner lengths initially (including blank sections <100m)
  - incorporates actual location of the producing well

**Productive OIP almost always < SAGDable OIP**

Internally updated reserves definitions and methodology in 2010 and review annually. Change in various pads SOIP and POIP values from year to year to better reflect well lengths, placement, recovery factors and production performance.
SOIP and POIP intervals

Wabiskaw Marker
McMurray Top
SAGD Pay Top
Transition
SAGD Pay Base
Paleozoic

Cutoffs:
Gamma: <60 API
Porosity: >27% D
Rt: >20 ohm-m
(equates to 50% So)
Facies: sand, sand-mud clasts, & sand-mud drapes.
<1m mud interval
OIP – location of areas

East: 17 pads  
Central: 10 pads  
West: 5 pads
OIP & percent recovery – central

Ultimate recoveries in the central area are now forecasted higher than originally expected due to:

- Wells drilled utilizing our patented Wedge Well™ technology have been successful
- Indications of lower residual oil than originally expected

C, D & G Pads – currently re-evaluating SOIP, POIP and ultimate recoveries, expectation is that these volumes will increase

<table>
<thead>
<tr>
<th>PAD</th>
<th>SOIP Mm³</th>
<th>POIP Mm³</th>
<th>Cum Oil Mm³ (to Mar 31, 2016)</th>
<th>Recovery % SOIP</th>
<th>Recovery % POIP</th>
<th>Expected Ultimate Recovery Mm³</th>
<th>Ultimate Recovery as % of SOIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>A PAD**</td>
<td>3,228</td>
<td>2,952</td>
<td>2,762</td>
<td>86</td>
<td>94</td>
<td>2,900</td>
<td>90%</td>
</tr>
<tr>
<td>B_LPAD</td>
<td>4,330</td>
<td>3,274</td>
<td>2,407</td>
<td>56</td>
<td>74</td>
<td>2,947</td>
<td>68%</td>
</tr>
<tr>
<td>C PAD**</td>
<td>4,592</td>
<td>3,957</td>
<td>3,724</td>
<td>81</td>
<td>94</td>
<td>3,900</td>
<td>85%</td>
</tr>
<tr>
<td>D PAD**</td>
<td>4,695</td>
<td>4,198</td>
<td>4,500</td>
<td>96</td>
<td>107</td>
<td>4,600</td>
<td>98%</td>
</tr>
<tr>
<td>E_KPAD</td>
<td>4,625</td>
<td>3,820</td>
<td>3,484</td>
<td>75</td>
<td>91</td>
<td>3,700</td>
<td>80%</td>
</tr>
<tr>
<td>EXP_MPAD</td>
<td>4,156</td>
<td>3,110</td>
<td>2,158</td>
<td>52</td>
<td>69</td>
<td>2,593</td>
<td>62%</td>
</tr>
<tr>
<td>F PAD**</td>
<td>4,211</td>
<td>3,541</td>
<td>3,294</td>
<td>78</td>
<td>93</td>
<td>3,500</td>
<td>83%</td>
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<tr>
<td>G PAD**</td>
<td>3,265</td>
<td>2,274</td>
<td>2,683</td>
<td>82</td>
<td>118</td>
<td>2,700</td>
<td>83%</td>
</tr>
<tr>
<td>H PAD</td>
<td>721</td>
<td>504</td>
<td>127</td>
<td>18</td>
<td>25</td>
<td>420</td>
<td>58%</td>
</tr>
<tr>
<td>J PAD</td>
<td>4,170</td>
<td>3,118</td>
<td>1,361</td>
<td>33</td>
<td>44</td>
<td>2,227</td>
<td>53%</td>
</tr>
<tr>
<td>Total Central</td>
<td>37,994</td>
<td>30,748</td>
<td>26,502</td>
<td>70</td>
<td>86</td>
<td>29,487</td>
<td>78%</td>
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<tr>
<td>Total FC</td>
<td>122,994</td>
<td>99,775</td>
<td>59,855</td>
<td>49</td>
<td>60</td>
<td>85,007</td>
<td>69%</td>
</tr>
</tbody>
</table>

*Note - A35, AINF-6 & AINF-7 excluded from A pad volume and recovery and included in E_K pad.
**Note – includes wells drilled utilizing Wedge Well™ technology

Pad, area, and Foster Creek totals based on sum of wells

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Subsection 3.1.1 – 7c, i, ii)
May 31, 2016
OIP and percent recovery - east

Ultimate recovery includes only existing wells.
Cenovus anticipates infill drilling on most pads that will significantly increase the ultimate recovery, but has not quantified these increases at this time.

<table>
<thead>
<tr>
<th>PAD</th>
<th>SOIP Mm³</th>
<th>POIP Mm³</th>
<th>Cum Oil Mm³ (to Mar 31, 2016)</th>
<th>Recovery % SOIP</th>
<th>Recovery % POIP</th>
<th>Expected Ultimate Recovery Mm³</th>
<th>Ultimate Recovery as % of SOIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>E02 PAD</td>
<td>2,993</td>
<td>2,051</td>
<td>1245</td>
<td>42</td>
<td>61</td>
<td>1,749</td>
<td>58%</td>
</tr>
<tr>
<td>E03 PAD</td>
<td>3,042</td>
<td>2,079</td>
<td>1225</td>
<td>40</td>
<td>59</td>
<td>1,985</td>
<td>65%</td>
</tr>
<tr>
<td>E04 PAD</td>
<td>3,568</td>
<td>2,407</td>
<td>762</td>
<td>21</td>
<td>32</td>
<td>1,925</td>
<td>54%</td>
</tr>
<tr>
<td>E07 PAD</td>
<td>2,606</td>
<td>1,849</td>
<td>85</td>
<td>3</td>
<td>5</td>
<td>1,479</td>
<td>57%</td>
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<tr>
<td>E08 PAD</td>
<td>4,676</td>
<td>4,049</td>
<td>533</td>
<td>11</td>
<td>13</td>
<td>3,239</td>
<td>69%</td>
</tr>
<tr>
<td>E10 PAD</td>
<td>2,061</td>
<td>1,492</td>
<td>577</td>
<td>28</td>
<td>39</td>
<td>1,194</td>
<td>58%</td>
</tr>
<tr>
<td>E11 PAD</td>
<td>3,912</td>
<td>3,409</td>
<td>2311</td>
<td>59</td>
<td>68</td>
<td>2,727</td>
<td>70%</td>
</tr>
<tr>
<td>E12 PAD</td>
<td>7,023</td>
<td>4,831</td>
<td>4198</td>
<td>60</td>
<td>87</td>
<td>4,598</td>
<td>65%</td>
</tr>
<tr>
<td>E14 PAD</td>
<td>2,148</td>
<td>1,810</td>
<td>371</td>
<td>17</td>
<td>21</td>
<td>1,289</td>
<td>60%</td>
</tr>
<tr>
<td>E15 PAD</td>
<td>7,397</td>
<td>5,646</td>
<td>2973</td>
<td>40</td>
<td>53</td>
<td>4,517</td>
<td>61%</td>
</tr>
<tr>
<td>E16 PAD</td>
<td>3,486</td>
<td>3,119</td>
<td>2146</td>
<td>62</td>
<td>69</td>
<td>2,512</td>
<td>72%</td>
</tr>
<tr>
<td>E19 PAD</td>
<td>6,307</td>
<td>5,850</td>
<td>3876</td>
<td>61</td>
<td>66</td>
<td>4,680</td>
<td>74%</td>
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<tr>
<td>E20 PAD</td>
<td>5,882</td>
<td>4,909</td>
<td>3332</td>
<td>57</td>
<td>68</td>
<td>4,022</td>
<td>68%</td>
</tr>
<tr>
<td>E21 PAD</td>
<td>3,930</td>
<td>2,863</td>
<td>1413</td>
<td>36</td>
<td>49</td>
<td>2,291</td>
<td>58%</td>
</tr>
<tr>
<td>E24 PAD</td>
<td>5,256</td>
<td>4,931</td>
<td>3454</td>
<td>66</td>
<td>70</td>
<td>4,008</td>
<td>76%</td>
</tr>
<tr>
<td>E42 PAD</td>
<td>1,618</td>
<td>1,283</td>
<td>275</td>
<td>17</td>
<td>21</td>
<td>971</td>
<td>60%</td>
</tr>
<tr>
<td>E25 PAD</td>
<td>4,137</td>
<td>3,390</td>
<td>1809</td>
<td>44</td>
<td>53</td>
<td>2,712</td>
<td>66%</td>
</tr>
<tr>
<td>Total East</td>
<td>70,042</td>
<td>55,968</td>
<td>30,585</td>
<td>44</td>
<td>55</td>
<td>45,898</td>
<td>66%</td>
</tr>
<tr>
<td>Total FC</td>
<td>122,994</td>
<td>99,775</td>
<td>59,855</td>
<td>49</td>
<td>60</td>
<td>85,007</td>
<td>69%</td>
</tr>
</tbody>
</table>

*Note – does not include future Wedge Well™ technology recoverables

**Note – includes wells drilled utilizing Wedge Well™ technology

Pad, area, and Foster Creek totals based on sum of wells

To March 31, 2016

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Subsection 3.1.1 – 7c, i, ii)
May 31, 2016

88
OIP and percent recovery – west

W01 & W02 pads came online in late 2011
W03 & W06 pads came online in late 2014
W08 pads came online in early 2015

<table>
<thead>
<tr>
<th>PAD</th>
<th>SOIP Mm3</th>
<th>POIP Mm3</th>
<th>Cum Oil Mm3 (to Mar 31, 2016)</th>
<th>Recovery % SOIP</th>
<th>Recovery % POIP</th>
<th>Expected Ultimate Recovery Mm3</th>
<th>Ultimate Recovery as % of SOIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>W01</td>
<td>3,697</td>
<td>3,224</td>
<td>1,606</td>
<td>43</td>
<td>50</td>
<td>2,402</td>
<td>65%</td>
</tr>
<tr>
<td>W02</td>
<td>1,753</td>
<td>1,503</td>
<td>446</td>
<td>25</td>
<td>30</td>
<td>1,226</td>
<td>70%</td>
</tr>
<tr>
<td>W03</td>
<td>2,532</td>
<td>1,998</td>
<td>91</td>
<td>4</td>
<td>5</td>
<td>1,568</td>
<td>62%</td>
</tr>
<tr>
<td>W06</td>
<td>4,566</td>
<td>3,735</td>
<td>247</td>
<td>5</td>
<td>7</td>
<td>2,861</td>
<td>63%</td>
</tr>
<tr>
<td>W08</td>
<td>2,409</td>
<td>2,599</td>
<td>379</td>
<td>16</td>
<td>15</td>
<td>1,566</td>
<td>65%</td>
</tr>
<tr>
<td>Total West</td>
<td>14,958</td>
<td>13,058</td>
<td>2,769</td>
<td>19</td>
<td>21</td>
<td>9,623</td>
<td>64%</td>
</tr>
<tr>
<td>Total FC</td>
<td>122,994</td>
<td>99,775</td>
<td>59,855</td>
<td>49</td>
<td>60</td>
<td>85,007</td>
<td>69%</td>
</tr>
</tbody>
</table>

*Note – does not include future Wedge Well™ technology recoverable
Pad, area, and Foster Creek totals based on sum of wells

To March 31, 2016
Recovery examples

W02 pad low ultimate recovery example with focus on W02-04 well pair

E16 pad medium ultimate recovery example with focus on E16-01 well pair

G pad high ultimate recovery example with focus on GP01 well pair
Recovery examples
cumulative percent recovery SOIP

Foster Creek - W02, E16 & G Pads
Cumulative % Recovery SOIP
Normalized

Normalized Months on Production

Cumulative % Recovery

W02 Pad
E16 Pad
G Pad
Current percent recovery of SOIP: pad totals
OBIP – low example
W02 pad
Subsection 3.1.1 – 7 c, iii)
W02 pad overview

- W02 pad began production in September 2011 (five pairs)
- Generally good quality geology on the edge of the valley, some small variations in SAGD base between well pairs
- Pad started up using ESPs, steam stimulations were successful on every well
- Initial operating pressures ~3 Mpa until pad started communicating with rest of central pad at which point pressures were reduced to ~2100 kPa. This resulted in shorter period of operation at higher pressure and the pad to underperform.
- Remedial work on P02, P03, and P05 in 2013 - Q1 2014
- Currently at ~25% recovery of SOIP, slightly behind its recovery curve in relation to the age of the pad.
- CSOR is currently 3.20, expected to drop as pad is in early life
W02 Pad SAGD Pay

Production Date: September 2011
Standoff: 0 – 3 m
# pairs: 5 drilled
Pay trend: moderate to thin, with clast zones
2014 W01W02J 4D Seismic

Interpreted top of steam elevation
### W02 pad - extent of chamber development

<table>
<thead>
<tr>
<th>PAD</th>
<th>PAIR</th>
<th>SOIP Mm³</th>
<th>POIP Mm³</th>
<th>Cum Oil Mm³</th>
<th>% Recovery SOIP</th>
<th>% Recovery POIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>W02 PAD</td>
<td>W02-01</td>
<td>443</td>
<td>355</td>
<td>76</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>W02 PAD</td>
<td>W02-02</td>
<td>348</td>
<td>301</td>
<td>62</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>W02 PAD</td>
<td>W02-03</td>
<td>450</td>
<td>395</td>
<td>132</td>
<td>29</td>
<td>33</td>
</tr>
<tr>
<td>W02 PAD</td>
<td>W02-04</td>
<td>389</td>
<td>360</td>
<td>102</td>
<td>26</td>
<td>28</td>
</tr>
<tr>
<td>W02 PAD</td>
<td>W02-05</td>
<td>124</td>
<td>92</td>
<td>73</td>
<td>59</td>
<td>80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>W02 PAD</td>
<td>1,753</td>
<td>1,503</td>
<td>446</td>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>

Expected ultimate recovery (70% of SOIP) = 1,227 Mm³  
To March 31, 2016
W02 Pad Temperatures

A15-17
27m offset W02-05 well pair

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W02 pad performance

FOSTER CREEK
W02 Pad Performance

W02 pad has had 3 failed wells. Well failures due to horizontal liner failure from steam jet.

CSOR: 3.20
W02-04 Geological Profile
Time-lapse seismic: W02 Pair 4

SEG standard convention: peak (red) = increase in impedance.

- **SAGD Top**
- **SAGD Rich**
- **Base SAGD**

**W02I04**

**W02P04**

- **102/13-16** 120m projection
- **100/16-17** 64m projection
- **103/15-17** 0m projection
W02-04 well pair performance

W02-04 Well Pair Performance

- Total Oil Rate (m³/d)
- Total Water Rate (m³/d)
- Total Steam Inj Rate (m³/d)
- Cum SOR
- Inst SOR

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W02 pad conclusions

- Pad recovery expected to be ~70% of SOIP
- Pad is merged with central pod
- Optimization of pad underway after remedial work
- Currently at 25% recovery of SOIP
OBIP – medium example E16 pad
Subsection 3.1.1 – 7 c, iii)
E16 pad overview

• E16 pad began production in August 2008 (six pairs)
• Steam stimulation start-up method was successful for all pairs
• Geology consists of thick to moderately thick channel sands that are fairly consistent throughout, pay trend and thickness slopes down dip to the east
• Expected ultimate recovery of this pad is 72% of SOIP
• Overall performance is very good to date, with a CSOR of 2.42
• Wells utilizing our patented Wedge Well™ technology were drilled in Q4 of 2013
E16 Pad SAGD Pay

Production Date: October 2008
Standoff: 0 – 5 m
# pairs: 6 drilled
Pay trend: thick to variable
E16 4D seismic (2015)
E16 pad - extent of chamber development

<table>
<thead>
<tr>
<th>PAD</th>
<th>PAIR</th>
<th>SOIP Mm3</th>
<th>POIP Mm3</th>
<th>Cum Oil Mm3</th>
<th>% Recovery SOIP</th>
<th>% Recovery POIP</th>
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</thead>
<tbody>
<tr>
<td>E16 PAD</td>
<td>E16-01</td>
<td>515</td>
<td>490</td>
<td>409</td>
<td>79</td>
<td>83</td>
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<tr>
<td>E16 WEDGE</td>
<td>E16W01</td>
<td></td>
<td></td>
<td>32</td>
<td></td>
<td></td>
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<tr>
<td>E16 PAD</td>
<td>E16-02</td>
<td>689</td>
<td>659</td>
<td>474</td>
<td>69</td>
<td>72</td>
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<td>E16W02</td>
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<td></td>
<td>44</td>
<td></td>
<td></td>
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<td>E16 PAD</td>
<td>E16-03</td>
<td>696</td>
<td>575</td>
<td>388</td>
<td>56</td>
<td>67</td>
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<td>E16 WEDGE</td>
<td>E16W03</td>
<td></td>
<td></td>
<td>32</td>
<td></td>
<td></td>
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<tr>
<td>E16 PAD</td>
<td>E16-04</td>
<td>586</td>
<td>527</td>
<td>263</td>
<td>45</td>
<td>50</td>
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<td>442</td>
<td>244</td>
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<td>55</td>
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<td>E16W05</td>
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<td>E16 PAD</td>
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<td>426</td>
<td>227</td>
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<td>53</td>
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<td>E16 WEDGE</td>
<td>E16W06</td>
<td></td>
<td></td>
<td>13</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>E16 PAD</td>
<td>3,486</td>
<td>3,119</td>
<td>2,147</td>
<td>62</td>
<td>69</td>
</tr>
</tbody>
</table>

Expected ultimate recovery (72% of SOIP) = 2,510 Mm3

To March 31, 2016
E16 Pad Temperatures

12m away from E16-02 well pair

**D12-15**

- Temperature: 240°C

37m away from E16-03 well pair

**A12-15**

- Temperature: 22°C
E16 pad performance

FOSTER CREEK
E16 Pad & E16 Wedge Wells Performance

Wedges on production

CSOR: 2.42
E16-01 Geological Profile
Time-lapse seismic: E16 Pair 1

Top steam/methane (2015 4D)

Paleo
E16-01 well pair performance
E16 pad conclusions

• Ultimate recovery is based on 72% of SOIP
• Differences between POIP and SOIP are primarily due to standoff from SAGD base
• Ramp up took approximately 20 months to hit peak rates
• 4D seismic was shot in 2012, showing good chamber growth along pairs 1 – 4; remedial work was performed on pairs 5/6 which were redrilled to improve conformance and chamber growth
• Wells utilizing our patented Wedge Well™ technology on production June 2014
• Will continue to use observation wells to help determine changes to steam chamber growth in the future
OBIP – high example
G pad
Subsection 3.1.1. – 7c, iii
G pad overview

• G pad began production in October 2005 (six pairs)
• Thick and high quality geology with slight variation in the depth of the SAGD base and a relatively lower SAGD top at the heel of all the wells
• All wedges were started in Q4 of 2009 and Q1 of 2010
• Steam decline in mid 2010 to operate pad at central pod pressure, pad production performance as expected
• Currently total recovery is 82% of SOIP
### G pad - extent of chamber development

<table>
<thead>
<tr>
<th>PAD</th>
<th>PAIR</th>
<th>SOIP Mm³</th>
<th>POIP Mm³</th>
<th>Cum Oil Mm³</th>
<th>% Recovery SOIP</th>
<th>% Recovery POIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>G PAD</td>
<td>GW01</td>
<td>0</td>
<td>0</td>
<td>70</td>
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<tr>
<td>G PAD</td>
<td>G1</td>
<td>580</td>
<td>422</td>
<td>346</td>
<td>72</td>
<td>100</td>
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<tr>
<td>G PAD</td>
<td>GW02</td>
<td>0</td>
<td>0</td>
<td>79</td>
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<td>G PAD</td>
<td>G2</td>
<td>644</td>
<td>413</td>
<td>306</td>
<td>64</td>
<td>99</td>
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<tr>
<td>G PAD</td>
<td>GW03</td>
<td>0</td>
<td>0</td>
<td>127</td>
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<tr>
<td>G PAD</td>
<td>G3</td>
<td>687</td>
<td>471</td>
<td>374</td>
<td>72</td>
<td>105</td>
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<tr>
<td>G PAD</td>
<td>GW04</td>
<td>0</td>
<td>0</td>
<td>114</td>
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<tr>
<td>G PAD</td>
<td>G4</td>
<td>647</td>
<td>470</td>
<td>308</td>
<td>69</td>
<td>95</td>
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<tr>
<td>G PAD</td>
<td>GW05</td>
<td>0</td>
<td>0</td>
<td>166</td>
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<tr>
<td>G PAD</td>
<td>G5</td>
<td>396</td>
<td>261</td>
<td>288</td>
<td>109</td>
<td>166</td>
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<tr>
<td>G PAD</td>
<td>GW06</td>
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<td>0</td>
<td>125</td>
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<td>G PAD</td>
<td>G6</td>
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<td>237</td>
<td>224</td>
<td>94</td>
<td>124</td>
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<td>G PAD</td>
<td>GW07</td>
<td>0</td>
<td>0</td>
<td>141</td>
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<tr>
<td>G PAD</td>
<td>G7</td>
<td></td>
<td></td>
<td>16</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>G PAD</td>
<td>3,265</td>
<td>2,274</td>
<td>2,683</td>
<td>82</td>
<td>118</td>
</tr>
</tbody>
</table>

- only ½ of the cum production from GW01 is shown, the other ½ is allocated to F Pad

To March 31, 2016
G Pad SAGD Pay

Production Date: October 2005
Standoff: 2 – 6 m
# pairs: 6 drilled
# utilizing Wedge Well™ technology wells: 7
Pay trend: thick to variable
G Pad 4D Seismic (2009 vs 2014)

Poor quality seismic data, acquisition related, existing steam chamber still present
G Pad Temperatures

17m away from G-01 well pair

B10-15

46m away from G-01/02 well pair

D10-15

TSAT ~ 216°C

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May 31, 2016
G pad performance

Foster Creek
G Pad & G Wedge Wells™ Performance

Wedges on production

CSOR: 2.72
G-01 Geological Profile
Time-lapse seismic: G-01 (2009 VS 2014)

2009

2014

2014 seismic quality was affected by the surface constraint. It is hard to interpret steam top.
G-01 well pair performance
G pad conclusions

- Higher than anticipated recovery a result of:
  - wells drilled utilizing our patented Wedge Well™ technology have been successful
  - lower than anticipated residual oil saturations (15% vs. less than 10%)
- G pad expansion, drilled new wells in 2014 at 80 m spacing to the west of G pad
Pad abandonments
Subsection 3.1.1 – 7c, iv)
Pad abandonments

No pad abandonments are currently planned at Foster Creek in the next 5 years
Steam quality
Subsection 3.1.1 – 7d)
Steam quality

- Steam quality will be impacted by pipeline size and distance
- Currently at Foster Creek the steam qualities under normal operation conditions are as follows:
  - central ~ 95%
  - east ~ 94%
  - west - Designed to be ~ 95% as development continues
- Steam is delivered to pads at approximately 7000 – 9000 kPa
- Steam quality is not expected to impact well performance at this time
Injected fluids
Subsection 3.1.1 – 7e)
Injected fluids

Non-condensable gas
• methane injection started for A Pad in Q1 2012, C Pad in Q4 2011, D Pad in Q3 2010, F Pad in Q2 2014, and G Pad in Q2 2014

Acid treatments
• wells occasionally treated with HCl to minimize skin

Solvent
• have used solvent in start-up work-overs and have approval to use this as a potential start-up process

CO₂
• injected in E03I05 and E03I06
• pilot concluded in Q4 2013
2015 key learnings
Subsection 3.1.1 – 7f)
Pressure Sink Project Update

- Construction and commissioning completed beginning of 2016
- McMurray Producer WD-2 brought online January 26, 2016.
  - Baseline McMurray sample taken after cleanout had occurred. Gravimetric TDS was 12,000 mg/L. Quarterly samples will be taken going forward
- As of March 1, 2016 15,820 m³ of water has been produced out of the McMurray formation and injected into the Lower Grand Rapids formation
- Monitoring pressure response created by the sink well which will be used to optimize chamber pressure from nearby pads connected to McMurray bottom water
Pressure Sink

- 100/06-08-070-03W4 piezometer immediately responded to pressure sink well production. This piezometer is located approximately 300m away from the source well WD-2
- 100/15-12-070-04W4 which is approximately 3km away has not shown a definitive response to the start-up of source well WD-2
- Over the next year, SAGD pressures in East Pod and regional bottom water pressure will be continually monitored and source rates adjusted accordingly to optimize steam usage while preventing bottom-water influx
W08 Pad Ramp-up

- Fastest Rampup at FC to date
- Ramp up at high pressure of 4500-5000 kPa
- Started with Steam Circulation
W08 Pad Seismic (2016)

- First year seismic shot indicates chamber coalescence
- Colder zones near toes of P01 and P02 due to bad geology
Pressure Monitoring

- No Communication with bottom water
- Piezo P2 and P3 in SAGD zone
- Optical Piezo P3 provides nice reservoir pressure verification

- No Communication with bottom water
- Optical Piezo P3 provides nice reservoir pressure verification

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May 31, 2016
## Current Rampdown/Blowdown

<table>
<thead>
<tr>
<th>Pad Name</th>
<th>Methane Inj Start Date</th>
<th>Blowdown Start Date</th>
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</thead>
<tbody>
<tr>
<td>Pad A</td>
<td>Mar 2012</td>
<td>May 2015</td>
</tr>
<tr>
<td>Pad C</td>
<td>Nov 2011</td>
<td>Mar 2013</td>
</tr>
<tr>
<td>Pad D</td>
<td>Aug 2010</td>
<td>Mar 2015*</td>
</tr>
<tr>
<td>Pad F</td>
<td>May 2014</td>
<td>TBD</td>
</tr>
<tr>
<td>Pad G</td>
<td>May 2014</td>
<td>TBD</td>
</tr>
</tbody>
</table>

*Excludes D17, full pad blowdown was May 2015 including D17
Pad A – production & injection
Pad C – production & injection
Pad D – production & injection
Pad F – production & injection
Pad G – production & injection
Ongoing work

• **Methods of injection**
  • Reduced number of injectors on a pad
  • Top down blowdown – converting existing or redrill high horizontal wells across multiple pads
  • Centralized injection (utilizing central pad for injection to support multiple pads)
Pad performance plots
Subsection 3.1.1 – 7h)
Subsection 3.1.1 – 7 h) – pad performance plots

Requirements under Subsection 3.1.1 7 h) are located in the Appendix
Future plans 2015
initiatives
Subsection 3.1.1 - 8
Steam Rampdown

C Pad on blowdown Q1, 2013
D pad on blowdown Feb, 2015
A pad on last phase of rampdown
F & G pads started coinjection May 2014
B/L, E/K, M_Exp, E02, E03, E04 planned Co-injection to start 2016
2016 initiatives

- Alternate liner trials continue on various pads
- Liner and tubing deployed FCDs
- Lower Grand Rapids disposal evaluation
- Co-injection
  - surfactant
  - solvent
- Insulated tubing
  - Evaluating vendors and technology
- Npad Trials
  - Thin pay pilot
  - Propane SAP pilot
Flow Control Devices

- Currently testing 8 flow control devices
  - 4 liner deployed ICDs
  - 3 tubing deployed ICDs
  - 1 liner deployed OCDs
- Improvements in temperature conformance have been observed at most installations to date
- Evaluation still ongoing

<table>
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<tr>
<th>Well Name</th>
<th>Well Type</th>
<th>Date Run</th>
<th>Deployment</th>
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<td>W05P05</td>
<td>Producer</td>
<td>11/29/2013</td>
<td>Liner Deployed</td>
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<tr>
<td>W08P01</td>
<td>Producer</td>
<td>12/5/2013</td>
<td>Liner Deployed</td>
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<td>GP5-1</td>
<td>Producer</td>
<td>1/14/2014</td>
<td>Liner Deployed</td>
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<tr>
<td>E15P11-1</td>
<td>Producer</td>
<td>7/22/2014</td>
<td>Liner Deployed</td>
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<tr>
<td>E16P06</td>
<td>Producer</td>
<td>11/29/2014</td>
<td>Tubing Deployed</td>
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<tr>
<td>FP2-1</td>
<td>Producer</td>
<td>3/19/2015</td>
<td>Tubing Deployed</td>
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<td>DF1 Fisher</td>
<td>Producer</td>
<td>1/9/2014</td>
<td>Tubing Deployed</td>
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<td>E15I10</td>
<td>Injector</td>
<td>5/1/2014</td>
<td>Liner Deployed</td>
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</tbody>
</table>
2016 New SAGD Well Pairs Drilling Plans

East Pads:
- E26

West Pads:
- W20

2016 Drilling
2015-2016 steam strategy plans

- Cenovus allocates steam to maintain targeted steam chamber operating pressures from pad to pad
- As steam rampdown progresses, steam demand for the project will be reduced, allowing the startup of new pads
- In February of 2016 Cenovus increased steam generating capacity through the addition of Phase G
- The addition on phase G came several months ahead of schedule which generated a short term steam surplus.
  - Pressures were allowed to increase across the field, and a number of new pad start-ups were accelerated to bring the field back into balance
- New steam has been allocated to Phase G pads and existing well pads
FC N-Pad Pilot Update
N Pad Overview

- NP01/NP02 are thin pay pilot wells
- NP04→NP06 are Propane SAP pilot wells
- NP03 was not drilled to maintain isolation between the two pilots
- Startup in Q2 2016
Thin Pay Pilot Overview

**NP01 and NP02 drilled 6 & 7m from the SAGD TOP**
- Some pay will be sacrificed for now but may recovered later with a farmer/wedge well

**NI01 and NI02: drilled 4m high and 3m laterally from producer**
- Vertical ranging from observation wells was used to verify drilling depths and correct MWD uncertainties to ensure accurate thin pay for pilot wells (N01-N02).

**Circulation startup since wells were drilled off SAGD base**
- Wells drilled above the transition zone present in FC Central
SAP Pilot Overview

Propane (C3) SAP pilot is located at NP04-NP06

• 160m development gap between NP02 and NP04
• Delay startup of NP05 to maintain isolation in NP04 and NP06 for SAP trial
• Wells are short to maintain 150m offset to E pad (West)
  • ~500-550m

Wells have rich pay thickness ~12-16m

~1 year SAGD baseline prior to C3 injection
Osprey Pilot (Clearwater Formation)

**Facilities:**
- 2 horizontal wells
- Rod pumps
- 2 BFW tanks & 2 boiler blowdown tanks
- 1 OTSG & steam separator
- Commissioned December 2013
- First steam injection April 30th, 2014
- 4 km south of FC F pad

**Operations:**
- Low pressure CSS pilot
- Emulsion ties into F Pad
- Fuel gas from F Pad
- Water source for steam from blowdown disposal line
- Osprey disposal ties into the Foster Creek disposal line

Location: 11-02-70-4W4M
Overview (As of Dec 31, 2015)

OS1
- No circulation
- Short Recompletion in Nov to increase the injection diameter and reduce the pressure drop allowing for higher quality steam injection
- Completed 14 cycles – 7 before recompletion and 7 post recompletion
- Cum Injection: 2660 m³  Cum Produced Bitumen: 1465 m³

OS2
- Circulation #2 - Sep 9 – Nov 1
- Completed 14 cycles – 3 cycles after Circulation #2
- Cum Injection: 1165 m³  Cum Produced Bitumen: 1166 m³
OS2 2015 Performance Summary

[Graph showing OS2 Circulation #2 with data points for Oil Rate, Water Rate, and Steam Rate over time from 1-Jan-15 to 31-Dec-15.]
Learnings

Increased injectivity with higher quality steam to the formation after November 2015 recompletion on OS1 as evidenced by increased emulsion temperatures at the start of production
## Summary of Reservoir Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td>450 m</td>
</tr>
<tr>
<td>Thickness</td>
<td>10-12 m</td>
</tr>
<tr>
<td>Average porosity</td>
<td>~33%</td>
</tr>
<tr>
<td>Average gas saturation</td>
<td>~10%</td>
</tr>
<tr>
<td>Average water saturation</td>
<td>~30%</td>
</tr>
<tr>
<td>Average bitumen saturation</td>
<td>~60%</td>
</tr>
</tbody>
</table>
Future Plans

Suspending operations in early 2016 due to low price environment
No plans finalized at this time for future usage of facilities and wells
Assess Osprey learnings to guide potential development plans for Clearwater formation
Thank you
Advisory

This presentation contains information in compliance with:

AER Directive 054 - Performance Presentations, Auditing, and Surveillance of In Situ Oil Sands Schemes

Section 3.1.1 Subsurface Issues Related to Resource Evaluation and Recovery

This document contains forward-looking information prepared and submitted pursuant to Alberta regulatory requirements and is not intended to be relied upon for the purpose of making investment decisions, including without limitation, to purchase, hold or sell any securities of Cenovus Energy Inc. The resources estimates contained herein are not reported in accordance with National Instrument 51-101 and are provided solely for the purpose of complying with Alberta regulatory requirements.

Additional information regarding Cenovus Energy Inc., including information regarding contingent resources, is available in our Annual Information Form for the year ended December 31, 2015 and in our Statement of Contingent and Prospective Resources for the year ended December 31, 2015 at cenovus.com.
### About Cenovus

**TSX, NYSE | CVE**

<table>
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<th>Category</th>
<th>Value</th>
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<td>Enterprise value</td>
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<td>Shares outstanding</td>
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<td><strong>2016F production</strong></td>
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<tr>
<td>Oil sands</td>
<td>151 Mbbls/d</td>
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<tr>
<td>Conventional</td>
<td>54 Mbbls/d</td>
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<td><strong>Total liquids</strong></td>
<td>205 Mbbls/d</td>
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<td>Natural gas</td>
<td>385 MMcf/d</td>
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<td><strong>Total production</strong></td>
<td><strong>269 MBOE/d</strong></td>
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<td><strong>2015 proved &amp; probable reserves</strong></td>
<td>3.8 BBOE</td>
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<tr>
<td>Bitumen</td>
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<td>Economic contingent resources*</td>
<td>9.3 Bbbls</td>
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<td>Lease rights**</td>
<td>2.0 MM net acres</td>
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<td>P&amp;NG rights</td>
<td>4.1 MM net acres</td>
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<tr>
<td>Refining capacity</td>
<td>230 Mbbls/d net</td>
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</tbody>
</table>

Values are approximate. Forecast production based on February 11, 2016 guidance.

*See advisory. **Includes an additional 0.5 million net acres of exclusive lease rights to lease on our behalf and our assignee’s behalf.
Foster Creek – current project status

- Phase A - 20k bbls/d on October 2001 (3,180 m³/d)
- 80 MW Cogen on Q1 2003
- Phase B - 30k bbls/d (4,770 m³/d) complete 2004
- Phase C - 60k bbls/d complete 2006 (9,534 m³/d)
- Phases D & E - 120k bbls/d complete 2009 (19,078 m³/d)
- Water treating debottleneck and cooling loop complete 2010
- Phase F - 150k bbls/d complete 2014
- Q1 2016 oil production 121,763 bbls/d (19,358 m³/d)
- Record oil production day 155,302 bbl (24,730 m³)
- Approved for Phases A – J

Note that production volumes refer to total cumulative production capacity
Facilities
Foster Creek A/E plot plan
Simplified process schematic for A/E
Foster Creek FGH plot plan
Phases F, G & H

• Engineering & Procurement completed
  • Phase H 95%

• Construction
  • Phase G 49% complete
    • Major equipment 100%
    • Field piping @ 100%
    • Field E&I @95%
  • Phase H 16% complete (Construction presently on hold)
    • Piling @100%, cutting and capping @ 87%, concrete @ 61%
Phase F & G commissioning

• Phase F started-up successfully last year. Optimization in progress.

• Phase G:
  • Area 02 (Steam generation) - Completed
  • Area 03 (Oil treating) – In progress
  • Area 04 (Tankage & Vapor Recovery) – In progress
  • Area 05 (utilities)- completed
  • Area 07 (De-oiling)- In progress

• Remaining:
  • Area 03 - Flash Treater Package
Facility performance
Plant performance

Foster Creek Performance 2015

- Bitumen (m3)
- PWSR

m3/month

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Emulsion treatment
Area 03: Emulsion treatment

- Two inlet degassers (A/E & FGH)
- Five process trains (A/F), one FWKO + two Treaters per train
- Three Sulphur Removal Units (A/E & FGH) for sweetening produced and recovered gas
- Inlet capacity best achieved rates
  - A~E Phases = 3,235 m3/h
  - F Phase = 800 m3/h
Area 07: Produced water de-oiling

FROM FWKO & TREATERS

RECYCLE FROM SLOP TANKS & OIL RECYCLE TANK

SKIM TANKS

ISFs

ORFs

DEOILED WATER TANKS

WARM LIME SOFTENERS
Area 07: Produced water de-oiling

- Five de-oiling trains (A/F)

- First train
  - one skim tank, one ISF and three ORFs
  - Re-configured this train to series operation Skim Tank > Pump > ISF > ORF.

- Second train
  - one skim tank, one smaller ISF and three ORFs

- Third - fifth trains
  - one skim tank, two ISFs and four ORFs
Area 07: Produced water de-oiling

- Skim tanks
  - Designed for < 4 hours retention time based on nominal capacity
    Actual retention time is much lower
  - Improper oil skimming (XV valve & gravity flow out of tank)
  - There is no solid removal mechanism. Only few nozzles around the perimeter of the tank.

- ISFs
  - Vertical units with about 5-6 minutes of retention time
  - Flocculent injected at inlet
  - Two units are modified with micro-bubbler pumps instead of eductors
Area 07: Produced water de-oiling

- Oil removal filters (ORF) walnut shell media
- De-oiled produced water oil treatment performance
  (January 2015 to Dec 2015)

  - Skim tanks inlet average avg. ~118 ppm
  - ISFs inlet average avg. ~125 ppm
  - ORFs inlet average avg. ~25 ppm
  - ORFs outlet average avg. ~10 ppm
Area 08: Water treatment
Area 08: Produced water treatment

- Three Eimco units tested to 1200/1200/650 m³/h
- One Densadeg tested to 500 m³/h
- Lime softener filters (LSF) – walnut shell media
- SAC or WAC followed by WAC ion exchange units
- 2015 Average BFW quality
  - silica <25 ppm
  - TDS <2800 ppm
  - hardness <0.25 ppm
  - iron <0.05 ppm
- Phase G water plant expected to be commissioned in Q4-2016
Directive 081 update

- AER variance issued (May 2015) for modified Dir 081 limits at FC. The variance expires Dec.31, 2017
  - 2016: 131%
  - 2017: 122%
- Parts of the D81 project scope on hold
  - Adding new glycol capacity to remove cooling load off brackish
  - Increased PW capacity to reduce PW to disposal volumes
Area 2/12: Steam Generation

- Two Co-gen units (40 MW each)
- Five 180 MM Btu/hr OTSGs
- Ten 250 MM Btu/hr OTSGs
  - Continuous Emission Monitoring Systems (CEMS) on FC1-B-0206, FC1-B-0210 and FC3-B-0201
  - Operated B-0206 & B-0208 at 87% Steam quality (ongoing)
- Four 275 MM Btu/hr OTSGs
- Four 275 MM Btu/hr Second Stage OTSGs
Area 02: Second stage OTSG – FC3

• Phase-F 2nd Stage OTSGs (6 pass, 275 MMBTU/H, TIWW)
  • Four OTSGs, FC3-B-0201/02/03/04 were commissioned in May-2014
  • Operated at ~70% steam quality
  • BFW+BBD blend to maximize steam production
  • 1,542,000 Sm3 BBD used to produce steam in 2015
  • Currently Phase G is acting as the 2nd stage phase

• Failures:
  • Tube failures were observed in Phase F in all four boilers in Q4-2014 or Q1-2015.
  • 1 Phase G OTSG saw tube failures in Q1 2016
  • All the failures have been repaired and boilers put back in operation.
Power generation

![Chart showing power generation over time with categories and MWh values.]
Gas usage

Gas Consumption: 0.18 e3m3/m3 bitumen
Solution Gas Recovery: 99.1%
Flared gas volume (e³m³/month)

- 2015 total flared gas 1138.5 e³m³, 0.15 m³/m³ oil, compared to 2002 e³m³ in 2014

- 2015 Q2-Q3 high flaring due to various activities and issues related to new Phase-F start up
  - Phase-F NRSU outage
  - Phase-F Boiler trips
Greenhouse gas emissions
Emissions

• GHG emissions including Cogen = 2.662 MtCO$_2$e in 2015 (2.537 MtCO$_2$e in 2014)
  • Total annual emissions less Deemed GHG Emissions from Cogen = 2.247 MtCO$_2$e
  • Reported emissions intensity = 0.3201 tCO$_2$e/m$^3$ bitumen

• Fugitive emissions = 351.30 tCO$_2$e in 2015 (197.1 tCO$_2$e in 2014)
  • Fugitive emissions include unintentional equipment leaks such as loose flanges, PSVs not sealing properly, equipment wear, etc.
  • Does not include equipment vents that are intentionally designed to vent.
  • Target Emissions Services used for LDAR services
Area 04: Vapor Recovery Unit (VRU)

• One screw compressor + eight liquid ring compressors
• Construction in progress for
  • Addition of a new screw compressor K-0422
  • VRU header twinning to resolve hydraulics limitations
  • Expected to be commissioned in Q2/Q3-2016
• Four rotary compressors (sliding vane)
Area 04: Slop handling

- Eight slop tanks each about 870 m$^3$
- Tricanter to treat slop fluid and reduce waste
  - Processing 200 to 350 m$^3$/d of slop fluid
  - Water and oil on spec and returned to facility
  - Investigating what other fluids could be treated with this system

- AE plant Flash Treaters not being used
- Phase-F one Flash Treater to be commissioned
Measurement and reporting
Simplified MARP schematic

- Fresh Source from Wells
- Saline Source from Wells
- P/L Fuel
- Truck
- Salt Cavern(s)
- LACT
- Blow Down & Waste to Disp.
- Gas
- Oil
- Water
- Domestic use
- Steam to Field
- Blow Down to Disp.
- PW & REGEN to Disp.
- IF
- Lease Fuel
- Lease fuel to IF
- BD OR BRKWR to SC
- INV.
- Utility to BT
- PW to IF
- Brackish Produced Gas

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Subsection 3.1.2 – 3)
Foster Creek Facility Scheme Codes

- ABBT0066377  Sub type 344 Production Battery
- ABIF0009473  Sub type 506 Injection Facility
- ABIF0116044  Sub type 506 Salt Cavern 1
- ABIF0116045  Sub type 506 Salt Cavern 2
MARP approvals

- FGH MARP was approved in April 2011
- Salt caverns are separated from the rest of the plant for production reporting
- Cenovus received Approval #8623 for Emulsion Sampling and Primary/Secondary Water Measurement requirements
- MARP documentation submitted to AER in November 2015
Methods for estimating injection and production volumes

• Production well metering/estimates:
• Wellhead meters are quadrant edge orifice plate meters for the first 34 pads, manual BS&W samples
• W08 first new well pad with test separator design, all new pads will incorporate test separators
• W08 test separator has had some maintenance issues with water cut meters and level switches. Using manual samples and orifice plate meters if separator is out of service.
• Other initiatives
  • Trialed Perm Inc. NMR technology for water cut with favorable results. Continue to work with vendor on development
  • Using NMR benchtop unit in central lab to analyze all manual samples
  • AGAR MPFM installed on W06 pad well pairs WP7 and WP8 which may come on this summer
Methods for estimating injection and production volumes

• Production is prorated to plant volumes:
  • Oil: sales – diluent +/- inventories + blending shrinkage
  • Water: water entering battery and transferred to the IF (sum of the ORFS +/- inventories + transfers)

• Steam injection meters:
  • Injection well head meters are nozzle-style and V-cone
  • Steam is measured at each injector
  • Steam leaving the plant is calculated using the sum of the boiler feedwater meters minus the blowdown water meters. The plant steam is then prorated to each well.
Emulsion Meter Acceptance Sampling

AER Approval 8623

• Allows for the use of sampling principles to determine the health of the emulsion orifice plates located on the Foster Creek Production Pads.
• Inspections are based on a sample size that adequately represents the total number of orifice plates.
• Approval requires 3 wells per pad to be inspected on an annual basis.
Emulsion Meter Acceptance Sampling

2015 Results

• The total lot sample size was 99 emulsion orifice plates
• Based on sampling methodology, an acceptable lot sample must contain ≤4 failed inspections
• 2015 results showed no failed inspections due to element damage, however, 2 installations were found to have incorrect calibrations
• Lot sample for 2015 accepted

2016 Execution Plan

• 3 emulsion wells per pad will be inspected during the course of 2016, for a total of 102
• 2016 lot sample will not contain any orifice plates inspected as part of the 2015 program.
Proration factors

- Oil and water estimates are obtained from the wellhead meters and manual samples
- Oil and water production is calculated from meters at the plant
- Proration factors are found by dividing the actual production by the estimated
- Gas allocated to each well is determined by GOR for the battery
Oil Proration
Water Proration

Water Proration Factor

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Subsection 3.1.2 – 3)
Steam Proration

Steam Proration Factor

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Subsection 3.1.2 – 3)
Facility Water Imbalance
Optimization of test durations

- Wellhead flow meters are used to measure the flow rate of existing wells at Foster Creek.
- This variance from standard testing duration was granted by exemption letter because the wells all have individual flow meters so flow is continuously measured.
- Quadrant edge orifice meters have been proven to compare well to coriolis meters.
- New test separators have coriolis meters and watercut analyzer on liquid leg (first units are Phase Dynamics – currently working with vendor on calibrations).
Description of water production, injection and uses
Current brackish source network

Legend
- Drilled Deviated Water Source Well
- Drilled Vertical Water Source Well
- Grand Rapids Source Well
- McMurray Source Well
- Grand Rapids Piezometer
- McMurray Piezometer

Grand Rapids Wells:
- 1F2/08-29-070-03W4
- 1F2/12-28-070-03W4
- 1F1/02-28-070-03W4
- 1F1/05-28-070-03W4
- 1F1/05-27-070-03W4
- 1F2/03-27-070-03W4
- 1F1/15-21-070-03W4
- 1F1/15-09-070-03W4
- 1F1/14-09-070-03W4

McMurray Wells:
- 1F1/08-23-070-03W4
- 1F2/01-23-070-03W4
- 1F1/15-09-070-03W4
- 1F1/13-13-070-03W4

LGR Wells:
- 1F2/08-29-070-03W4
- 1F2/12-28-070-03W4
- 1F1/02-28-070-03W4
- 1F1/05-28-070-03W4
- 1F1/05-27-070-03W4
- 1F2/03-27-070-03W4
- 1F1/15-21-070-03W4
- 1F1/14-21-070-03W4
- 1F1/13-14-070-03W4
- 1F1/12-14-070-03W4
- 1F1/15-09-070-03W4
- 1F1/14-09-070-03W4

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Fresh source wells

PW06 3-22-70-4

PW07 4-22-70-4
2015 monthly saline water use ($m^3$)

- Saline water use during 2015 was 3,797,171 m3 (0.50 m3/m3 oil)
- Saline water used for cooling and makeup
2015 monthly fresh water use (m³)

- Fresh water used during 2015 was 809,629 m³ (0.09 m³/m³ bitumen)
- Phase F start up increased fresh water use for BFW make up purposes.
2015 Produced water

- Produced Water volume in 2015 was 19,403,957 m³
Steam generation

• Steam generated during 2015 was 18,682,024 m³
# Water quality parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>McMurray</th>
<th>Grand Rapids</th>
<th>Produced</th>
<th>Boiler feed water</th>
<th>Boiler blowdown</th>
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<tbody>
<tr>
<td>TDS (mg/L)</td>
<td>9400</td>
<td>5800</td>
<td>2000</td>
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<tr>
<td>SiO2 (mg/L)</td>
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<td>8.5</td>
<td>124</td>
<td>15.4</td>
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<tr>
<td>Cl (mg/L)</td>
<td>5200</td>
<td>3600</td>
<td>861</td>
<td>1330</td>
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<tr>
<td>Na (mg/L)</td>
<td>3500</td>
<td>2100</td>
<td>700</td>
<td>1010</td>
<td>4800</td>
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<td>K (mg/L)</td>
<td>12</td>
<td>7.6</td>
<td>21</td>
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<td>365</td>
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<tr>
<td>Ca (mg/L)</td>
<td>35</td>
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<tr>
<td>Alkalinity (as CaCO₃) (mg/L)</td>
<td>1200</td>
<td>300</td>
<td>355</td>
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<td>1800</td>
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<tr>
<td>pH</td>
<td>8.15</td>
<td>8.25</td>
<td>7.58</td>
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<tr>
<td>Fe (mg/L)</td>
<td>2.6</td>
<td>0.6</td>
<td>0.5</td>
<td>&lt;0.02</td>
<td>3</td>
</tr>
</tbody>
</table>

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Foster Creek McMurray water disposal

- Class 1B (28 wells) approval 11351F, Class II (1 well) Approval 11059C
- Water disposal includes water from operations (produced, regens, blowdown) and brines from cavern washing and displacements
- Regens are performed using softened water (brackish + produced) and combined with produced water for disposal
- Well workovers include coil cleanouts and acid stimulations
- Volumes are measured on each individual well by turbine or magnetic meters and pressure is measured at common headers located at the disposal pads
Foster Creek McMurray water disposal wells

<table>
<thead>
<tr>
<th>UWI</th>
<th>Approval No.</th>
<th>Classification</th>
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<tbody>
<tr>
<td>102/02-02-070-04W4</td>
<td>11351F</td>
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<tr>
<td>100/02-02-070-04W4 (LGR)</td>
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<td>100/06-34-069-04W4</td>
<td>11315F</td>
<td>Class 1B</td>
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## Foster Creek McMurray water disposal wells

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<th>Classification</th>
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<tr>
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<td>102/11-19-069-03W4</td>
<td>11315F</td>
<td>Class 1B</td>
</tr>
</tbody>
</table>
Current disposal well locations

Disposal Wells:
ED1 Pad:
- WDHZ 1 – 100/03-02-070-04W4
- WDHZ 2 – 100/02-02-070-04W4
- WDHZ 3 – 102/02-02-070-04W4
- WDHZ 4 – 100/08-02-070-04W4
- WD6 – 104/11-02-070-03W4
- WD7 – 105/11-02-070-03W4
- WD8 – 104/10-02-070-03W4
- WD9 – 102/10-02-070-03W4
- WD10 – 103/10-02-070-03W4

ED2 Pad:
- WD11 – 102/11-34-069-04W4
- WD12 – 100/12-34-069-04W4
- WD13 – 103/11-34-069-04W4
- WD14 – 102/12-34-069-04W4
- WD15 – 100/06-34-069-04W4
- WD16 – 100/05-34-069-04W4
- WD17 – 102/06-34-069-04W4
- WD18 – 102/05-34-069-04W4
- WD19 – 102/03-34-069-04W4
- WD20 – 100/04-34-069-04W4

ED3 Pad:
- WD21 – 100/02-30-069-03W4
- WD22 – 100/03-30-069-03W4
- WD23 – 100/16-19-069-03W4
- WD24 – 100/14-19-069-03W4
- WD25 – 100/16-19-069-03W4
- WD26 – 102/14-19-069-03W4
- WD27 – 100/09-19-069-03W4
- WD28 – 100/11-19-069-03W4
- WD29 – 100/10-19-069-03W4
- WD30 – 102/11-19-069-03W4

Abandoned Disposal well:
WD5 – 103/11-02-070-03W4
Class 1B approval

No. 11351F MWHIP 6,250 kPag  Avg. Operating Temp 55-60°C
Class II approval

No. 11059C MWHIP 6,255 kPa

Avg. Operating Temp
40-50°C
## Waste disposal

<table>
<thead>
<tr>
<th>Waste Streams</th>
<th>2015 Volume (m³)</th>
<th>Location</th>
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<tbody>
<tr>
<td>Slop oil/Desand Fluid</td>
<td>10,577</td>
<td>NewAlta Elk Point/Tervita Coronation/Tervita Lindbergh Cavern</td>
</tr>
<tr>
<td>Drilling waste</td>
<td>21,041</td>
<td>Newalta Elk Point/Tervita Lindbergh Cavern/Tervita Bonnyville Landfill</td>
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<tr>
<td>Lime sludge</td>
<td>31,476</td>
<td>Newalta Elk Point/Tervita Lindbergh Cavern/Tervita Bonnyville Landfill</td>
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<tr>
<td>Contaminated soils</td>
<td>1,446</td>
<td>Newalta Elk Point/Tervita Lindbergh Cavern/Tervita Bonnyville Landfill/RBW Edmonton</td>
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<tr>
<td>Sweetening liquids/sludge</td>
<td>13,401</td>
<td>Absolute Environmental Class Ia Disposal Well/ Cancen New Sarepta/Tervita Unity Cavern</td>
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<tr>
<td>Acid Workover Program</td>
<td>825</td>
<td>Tervita Lindbergh Cavern</td>
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<tr>
<td>Process Solids (TriCanter)</td>
<td>5,565</td>
<td>Newalta Elk Point</td>
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</tbody>
</table>
Sulphur production
Sulphur recovery overview

• Central facility non-regenerative sweetening unit (NRSU) has been used since April 2007 to meet sulphur recovery requirements

• Second unit added in 2010 at Phase A-E – can be used in parallel or for backup

• Third unit was commissioned in Sept 2014 at Phase F

• High operating costs for chemical and disposal

• Balance recoveries on a daily/monthly basis

• Sulphur recovery – Q1 2015: 83.1%, Q2 2015: 77.1%, Q3 2015: 90.1%, Q4 2014: 82.7%, Q1 2016: 80.8%
Sulphur recovery comments

• Sulphur recovery system being reviewed to ensure it has sufficient capacity
• Re-designed and installed new inlet gas sparger (distributor) in all three NRSUs to improve flow rate and reliability. This new sparger significantly reduces fouling and plugging.
• Planning to perform capacity test with the new sparger and FC3 NRSU in Q3 - 2016
• C-Pad compressor reliability has been improved to handle casing gas flows.
• Continued use of non-regenerative sweetening unit (NRSU) technology
• Developed casing gas gathering pipeline model to ensure appropriate capacity at lower pressure drop.
Environmental issues summary
Environmental non-compliance 2015

• AER Events:
  • Zero NOx exceedances
  • Two CEMS availability contraventions
  • Twenty-eight environmental spills were reported and remedial action taken
  • Three 7-day letters submitted
    • Elevated salinity within plant boundary, CPF storm water collection pond sampling process not followed, TDL exceedance

• AESRD Events:
  • TDL Audit completed (was initiated in Dec 2014); satisfactory
  • One 7-day letter submitted
    • Non-Compliance to License approval conditions
  • Camps, two 7-day letters submitted
    • Well depth sampling contravention (Bear’s Den)
    • PDL exceedance (Fox Den)

• Federal Events:
  • No non-compliance events
# AER scheme applications – filed in 2015, approval received

<table>
<thead>
<tr>
<th>Application</th>
<th>Filing Date</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Pad (WP17 blowdown)</td>
<td>March 13, 2015</td>
<td>May 21, 2015</td>
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<tr>
<td>RD/BD Coinjection Pads (Clauses 23,24,33)</td>
<td>June 17, 2015</td>
<td>August 14, 2015</td>
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AER scheme applications – filed in 2015, approval received continued

<table>
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<tr>
<th>Application</th>
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<th>Approval</th>
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<tbody>
<tr>
<td>Osprey Dilation</td>
<td>October 30, 2015</td>
<td>December 17, 2015</td>
</tr>
</tbody>
</table>
Approval amendments – AESRD EPEA

None in 2015
Annual reporting - 2015

The following reports were submitted as per EPEA Approval 00068492-01-03:

- Annual Groundwater Reports
- Annual C&R Plan
- Annual Air Monitoring Report
- Annual Industrial Runoff Report
- Comprehensive Wildlife Report
Cenovus is required to implement the following monitoring programs as part of EPEA Approval 00068492-01-03:

<table>
<thead>
<tr>
<th>EPEA Requirement</th>
<th>Report Name</th>
<th>Due Date</th>
<th>Status</th>
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<tbody>
<tr>
<td>Schedule VI, Condition 12</td>
<td>Updated Groundwater Monitoring Program Proposal</td>
<td>June 30, 2015</td>
<td>Submitted &amp; Approved</td>
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<tr>
<td>Schedule VIII, Condition 4</td>
<td>Wildlife Mitigation Program</td>
<td>October 31, 2012</td>
<td>Implemented</td>
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<td>Schedule VIII, Condition 19</td>
<td>Updated Wildlife Mitigation Program</td>
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<td>Schedule VIII, Condition 21</td>
<td>Updated Wildlife Monitoring Program</td>
<td>June 30, 2015</td>
<td>Submitted</td>
</tr>
<tr>
<td>Schedule VIII, Condition 9</td>
<td>Woodland Caribou Mitigation and Monitoring Plan</td>
<td>January 31, 2013</td>
<td>Implemented</td>
</tr>
<tr>
<td>Schedule VIII, Condition 20</td>
<td>Updated Woodland Caribou Mitigation and Monitoring Plan</td>
<td>May 15, 2015</td>
<td>Submitted</td>
</tr>
<tr>
<td>Schedule IX, Condition 41</td>
<td>Updated Wetland Reclamation Trial Program</td>
<td>June 30, 2015</td>
<td>Submitted &amp; Approved</td>
</tr>
<tr>
<td>Schedule IX, Condition 47</td>
<td>Reclamation Monitoring Program</td>
<td>July 31, 2013</td>
<td>Implemented</td>
</tr>
<tr>
<td>Schedule XI, Condition 2</td>
<td>Updated Wetland Monitoring Program</td>
<td>June 30, 2015</td>
<td>Submitted &amp; Approved</td>
</tr>
<tr>
<td>Schedule VII, Condition 1</td>
<td>Soil Monitoring and Management Program Proposal</td>
<td>February 1, 2014</td>
<td>Submitted &amp; Approved</td>
</tr>
<tr>
<td>Schedule IX, Condition 28</td>
<td>Project-Level Conservation, Reclamation and Closure Plan</td>
<td>October 31, 2017</td>
<td>Not due yet</td>
</tr>
<tr>
<td>Schedule IX, Condition 17</td>
<td>Decommissioning Plan and Land Reclamation Plan</td>
<td>Within six months of the plant ceasing operation</td>
<td>Not due yet</td>
</tr>
</tbody>
</table>
Goals of monitoring programs

Wildlife and Caribou Mitigation and Monitoring:

• The monitoring programs propose mitigation measures, metrics, targets, and monitoring objectives
• Monitoring and mitigation uses an outcomes based approach to facilitate continuous improvement
• First Comprehensive Wildlife Report was submitted May 15th, 2015

Mitigation measures are designed in relation to project-related issues that have the potential to affect:

• Wildlife habitat availability and use, including noise and other sensory disturbance
• Wildlife mortality
• Obstruction of movement
Goals of monitoring continued

Wetland monitoring:

- Objective is to assess and quantify potential impacts of project infrastructure on surrounding wetlands using selected metrics and targets.
- Effects of roads, well pads, borrow pits and CPFs will be monitored throughout the life of the project by assessing key parameters including water quality, water levels, vegetation species composition, cover and vigour.
Collaborative initiatives

Cenovus participates in various collaborative efforts to address industry issues:

- Regional environmental monitoring
- Environmental research
- Stakeholder consultation
- Innovation and continuous improvement
Collaborative initiatives - Examples

- Canada’s Oil Sands Innovation Alliance (COSIA)
- Contributed to over thirty projects including: Wildwatch, LiDEA, Fladry, Geodesign, Functional Quality Land Metric, etc.
- Support for three chairs at the University of Alberta
- Contributor to the Joint Canada-Alberta Oil Sands Monitoring (JOSM)
- Lakeland Industry and Community Association (LICA)
  - Airshed Monitoring
  - Beaver River Watershed Alliance
Collaborative initiatives continued

- Regional Industry Caribou Collaboration project
- Alberta Chamber of Resources (ARC)
- Chair of the Caribou Committee
- Ecological Monitoring Committee for the Lower Athabasca (EMCLA)
- CAPP Environment Committee
Reclamation

- The Reclamation Monitoring Program was approved in August of 2014.
- Final reclamation initiated and/or complete on small portions of the commercial footprint (remote from the CPF) that are no longer required.
- Interim reclamation is in progress on approximately 25% of the commercial footprint of Foster Creek.
- There is currently no facility abandonment scheduled, consequently no well pad reclamation has commenced.
Reclamation continued

Restoration of legacy 2D seismic initiated in 2012 and continued through 2016:

• TWP 70-1, 70-2, 71-1, 71-2, 72-1, 72-2, 73-1, 73-2 (West of 4th)
• Objective is successional advancement, increasing the growth and abundance of conifers and reducing trafficability to large mammals
• Treatments used on linear features include mounding, stand modification and tree planting
• Treatment progress to-date has covered 237 km
Statement of Compliance
Compliance statement

Cenovus maintains and tracks compliance through the CenTrac conditions/commitment database, Incident Management System (IMS), routine inspections, and dedicated regulatory and environmental staff.

Cenovus believes its operations are in compliance with AER approvals and regulatory requirements.
Non-compliance
# AER Non-compliance events

<table>
<thead>
<tr>
<th>Non-compliance</th>
<th>Unsatisfactory Low Risk Drilling Operation Inspection @ 1-22-70-5W4 W0471917 January 27, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Events that led to non-compliance</strong></td>
<td>The 25m Flare line was not properly secured with stakes or weights.</td>
</tr>
<tr>
<td><strong>CVE action plan</strong></td>
<td>The non-compliance was immediately rectified by the rig crew as weights were taken out of the manifold shack and applied to the line.</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Compliance achieved on January 28, 2015</td>
</tr>
</tbody>
</table>
### AER Non-compliance events

<table>
<thead>
<tr>
<th>Notice</th>
<th>Notice of Noncompliance - Outstanding Non-Abandoned Oil Sands Evaluation (OSE) Wells July 15, 2015 (68 wells ~ FC 8 wells)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Events that led to non-compliance</strong></td>
<td>- Failure to Complete surface abandonment within specified timeframe; and/or</td>
</tr>
<tr>
<td></td>
<td>- Failure to report surface abandonments through the DDS system within 30 days of completing the operation</td>
</tr>
<tr>
<td><strong>CVE action plan</strong></td>
<td>Wells were abandoned and entered all pertinent data into the DDS system</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Compliance achieved September 14, 2015</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notice</th>
<th>Notice of Noncompliance - Outstanding Serious Surface Casing Vent Flow/Gas Migration (SCVF/GM) @ 2-21-70-4W4 W0239789 August 5, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Events that led to non-compliance</strong></td>
<td>AER records indicate that the well has not been repaired within the required 90 days and remain outstanding.</td>
</tr>
<tr>
<td><strong>CVE action plan</strong></td>
<td>Informed AER that the location BI7 WL0239789 has had no vent flow since being shut in April 2012. Well has been removed from DDS serious SCVF list as of August 11, 2015.</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Compliance achieved August 11, 2015</td>
</tr>
</tbody>
</table>
AER Non-compliance events

<table>
<thead>
<tr>
<th>Notice</th>
<th>Notice of Noncompliance - Outstanding Casing Failure repair @ 2-21-70-4W4 W0239792 November 10, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events that led to non-compliance</td>
<td>AER records indicate that the well has not been repaired within the required 90 days and remain outstanding</td>
</tr>
<tr>
<td>CVE action plan</td>
<td>Repaired the SCVF/GM and submitted the resolution information on the DDS system</td>
</tr>
<tr>
<td>Status</td>
<td>Compliance achieved November 23, 2015</td>
</tr>
</tbody>
</table>
### Cenovus Voluntary Self-Disclosures

<table>
<thead>
<tr>
<th>Non-compliance</th>
<th>Voluntary Self Disclosure - Microbial Start-Up Test Scheme Approval 8623 October 27, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Events that led to non-compliance</strong></td>
<td>Non-compliance event related to clause 28 of Approval 8623UU. Cenovus missed the window during Pad E14 and E42 start-up as the microbial test application was approved on August 19, 2014 and both Pads had their first steam (circulation phase) in May 2014.</td>
</tr>
<tr>
<td><strong>CVE action plan</strong></td>
<td>Cenovus is revisiting and updating its internal processes to eliminate similar future occurrences. A Category 2 amendment to Scheme Approval 8623 as per Directive 078 was submitted October 28, 2015 to include Pad W10 for microbial start-up test as per clause 28 and remove the previously approved Pads E14 and E42.</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Cat.2 amendment application submitted October 28, 2015. Approval 8623HHH received November 25, 2015.</td>
</tr>
</tbody>
</table>
Future plans
Future projects

Current capacity is 150,000 bbls/d, target for Phases F, G & H to peak at 210,000 bbls/d. Evaluating opportunities to increase capacity.

Currently scoping plant optimization opportunities for Phases A-E

Phases F, G & H update

• New steam generation and production treating facilities being constructed next to the existing plant
• Phase F: 30,000 bbls/d, Phase G: 30,000 bbls/d, Phase H: 30,000 bbls/d, for total new capacity of 90,000 bbls/d (4,770 m³/d + 4,770 m³/d + 4,770 m³/d = 14,310 m³/d)
• Potential for another 35,000 bbls/d of optimization work
• The majority of new expansion is planned to be drilled west of the plant

Note that production volumes refer to production capacity on an incremental basis
Future projects continued

Current success in SOR & WOR, and increased efficiencies in plant operations at Foster Creek indicates that Phases A – H may be capable of production greater than 240,000 bbls/d

Upcoming regulatory applications

• Currently evaluating opportunities to increase project capacity to 310,000 bbl/d (49,286 m3/d)
• Additional wells to recover un-swept reserves including injector-producer well pairs and single well producers
• Continued exit strategies for mature pads
• Future phase & sustaining development well pads

Currently drilling, completing and performing facilities work for sustaining and Phase F and G wells in 2014 through 2016

Note that production volumes refer to production capacity on an incremental basis
Osprey Process Schematic
Suspension

Q1 2016
Decision was made to suspend the Osprey pilot due to low price environment
Facility and well’s have been placed in a state of preservation for potential future usage
End