Cosmopolitan Development Project
Cook Inlet, Alaska
February, 2017
Business Overview

- Small privately-held oil and gas development company
  - Headquarters in Fort Worth, TX
  - Operation office in Anchorage, AK

- Alaska experienced directors and management team

- Project located about six miles north of Anchor Point
  - 100% lease ownership in Cosmopolitan Unit

- Over $350 million invested in Cosmo Unit to date

- Emphasis on personnel safety and environmental stewardship
Asset Details

- Field located 3 miles offshore
- Extended reach wells drilled from shore
- Dual-lateral wells
- Hydraulic fracture stimulation
- Spud first well on Nov. 29, 2016
- 12K BLPD onshore processing facility
- Tyonek and Hemlock Formations; 24-27 API

Project Overview
Hansen Production Facility
38 Acre Pad
The Cosmopolitan Field History:

- **1967**: Pennzoil drilled the first exploration well that barely penetrated the outer limit of one oil zone. The well tested 75 bopd and was plugged and abandoned.
- **1994**: ConocoPhillips directionally drilled the Hansen 1 well from an onshore location 3 miles away. The well proved up an additional oil zone and tested at 500 bopd. The Cosmopolitan Unit was formed for testing and development of the field.
- **2001**: ConocoPhillips drilled the Hansen 1A well to further penetrate the deepest oil zone. The well tested at 1000 bopd.
- **2003**: Pioneer conducted a 3D seismic survey of the entire field area. The survey confirmed a large clear anticline structure with a gas cloud at the top of the dome.
- **2005**: Pioneer finalized its development plan for oil wells drilled from the onshore location. Prior to implementation of the development, Pioneer's board decided to shift capital investments to their Permian Basin leases instead of developing the Cosmopolitan Unit.
- **2007**: Pioneer disbanded the former Cosmopolitan Unit but retained the two main productive leases. BlueCrest and Buccaneer Energy began negotiating with Pioneer for their two main productive leases. Apache acquired the remaining minor productive leases.
- **2010**: BlueCrest acquired Buccaneer's interest in all the Cosmopolitan leases, thus owning 100% of all the properties, and began actions to develop the field.

**Key Events:**
- ARCO took a new look at the old Pennzoil well data and concluded that the first well may have just missed a larger field.
- Pioneer drilled the Hansen 1A1 well in the highest-known oil zone at the time. The well, that partially penetrated the zone, tested at 300 bopd, and produced over 35,000 bbls of oil. Pioneer could not permanently produce the well due to the lack of a gas pipeline, but Pioneer began planning for a full field development of the two oil zones confirmed at the time.
- BlueCrest acquired Apache’s leases. BlueCrest drilled the Cosmopolitan State #1 vertical well from offshore, proving up six new productive gas zones and four new productive oil zones all above the two oil zones previously identified by ConocoPhillips and Pioneer.
Geologic Summary

- Northeast-southwest-trending anticlinal structure
- Supported by local 3-D seismic and 6 wellbores
- Target Eocene-Oligocene Hemlock Formation and Lower Tyonek Formation
- Seal is the shale-rich member of the Tyonek Formation.
- Braided fluvial depositional setting with conglomeratic sandstone

Top of structure at 6400’ TVDSS
Reservoir Model

- History matched to well test data
- Used for field development planning and profile generation
- Reserves analysis
- Geocellular model with 549 layers with 1ft average thickness
- Upscaled to 42 layers (280K active cells)
- 7 subzones identified in the Starichkof and 14 within Hemlock
- Porosity 12-17%, permeability 3-14 md, Water saturation 40%
Facility Summary

- Processing Facility Capability:
  - 12,000 BLPD
  - 12.5 MMSCFD
- 5000 Barrel Oil Storage Tanks, 2 Sales Oil Loading racks
- Sales Gas Pipeline
- Control room monitoring
- 50 man camp
- First oil sold April 2016
Plan of Development

Oil Development

Phase 1: 12K BLPD facility, 10 producer wells

Phase 2: Additional infill drilling, waterflood

Expansion projects

- Train 2 additional processing capacity
- Lower Tyonek oil development
- Offshore gas development
  - Offshore prod platform
  - Tyonek gas sands
  - On hold pending tax credit continuation or reasonable alternative
Drilling Challenges
Rig Specifications

Main Specs

- 3000 HP Drawworks
- 1.5 million pound mast hook load (derrick rating)
- Dual skidding modules
- 750ton/1350hp AC top drive
- 5 - Cat 3512 gensets
- 32’ high drill floor with 800K setback
- Mud system 2000 bbls active
- 3 – PZ-11 Mud Pumps (7500psi)
- 13 5/8 Cameron 10000# BOP stack
- Pipe handling system with elevator lift
- Full winterization
Section Review

H16-P02 (P3b)  
"As Planned"

- Bit: 17.5" Insert  
  RSS: PDX6  
  MWD: PowerPulse  
  LWD: arcVISION (GR/RES)

- Bit: 12.25" PDC  
  RSS: Xceed900  
  MWD: TeleScope  
  LWD: arcVISION (GR/RES)

- Bit: 8.5" PDC  
  RSS: Xceed675  
  MWD: TeleScope  
  LWD: GeoSphere  
  adnVISION

- Bit: 4-1/2" 15.2# P110 H563  
  4-1/2" x 8-3/4" Swell Packer  
  HES Frac Sleeve  
  HES Perfed Pup

- 4-1/2" x 9-5/8" Baker Hanger/Packer  
  9-5/8" 47# P110 H563  
  4-1/2" x 8-3/4" Swell Packer  
  HES Frac Sleeve  
  HES Perfed Pup

- 9-5/8" 53.5# P110 H563 (1,500')  
  12.0 Lead  
  637 bbls  
  50% XS  
  Top of Tail – 3,459' MD  
  15.8 Class "G" Tail  
  198 bbls  
  50% XS

- WBM 9.8 ppg Spud Mud  
  Inc. 67.33°  
  Azi. 298.09°

- TOC @ 12,900’ MD  
  15.8 ppg Class "G"  
  160 bbls  
  50% XS

- OBM 10.5 ppg VersaPro  
  Inc. 90.00°  
  Azi. 300.00°

- OBM 9.5 ppg VersaPro  
  Inc. 90.00°  
  Azi. 302.40°
Dual-lateral Well Schematic

**Hansen 5 - 9-5/8” Producer**
**Dual-Lateral Completion with**
7” x 9-5/8” S-3 HOOK

**Complete Sequence:**
1. Run Main Bore Liner
2. Run Whipstock
3. Retrieve Whipstock
4. Run Upper Lateral Liner
5. Run Main Bore Re-Entry Diverter
6. Run 4” Seals; Frac; Pull seals and diverter together
7. Run Lateral Re-Entry Diverter
8. Run 4” Seals; Frac; Pull seals and diverter together
9. Run 4.5” production string

**Upper Lateral**

**Equipment Specifications**

<table>
<thead>
<tr>
<th>7” x 9-5/8” HOOK Hanger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainbore Drift, with diverter: 6.00’</td>
</tr>
<tr>
<td>Lateral Drift, w/ diverter: 6.00’</td>
</tr>
<tr>
<td>Lateral/ Mainbore Diverter OD: 6.69’</td>
</tr>
<tr>
<td>Frac seabore ID: 4.00’</td>
</tr>
<tr>
<td>Frac seabore ID: 2.867’</td>
</tr>
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Stimulation Program Engineering Details

### General Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>No. of stages per well</td>
<td>17</td>
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<tr>
<td>Fluid volume per frac stage</td>
<td>2000 bbls</td>
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<tr>
<td>Estimated frac pressure</td>
<td>4500-5000 psi</td>
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<tr>
<td>Max surf treatment pressure</td>
<td>8500 psi</td>
</tr>
<tr>
<td>Design height of fracture</td>
<td>200 ft</td>
</tr>
<tr>
<td>Design Fracture Half length</td>
<td>200 ft</td>
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<tr>
<td>Type of proppant</td>
<td>16/20 Carbolite ceramic</td>
</tr>
<tr>
<td>Volume of proppant per stage (avg)</td>
<td>220K lbs</td>
</tr>
</tbody>
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Community Outreach

• Community input has influenced development plans
  • Water wells won’t be drilled to avoid impacts to private wells
  • 14-foot berm around entire pad for light and noise mitigation
  • Emergency Evacuation Notice System to Neighbors
  • Directional LED Lighting

• We encourage feedback and local engagement

• Local hire preference as project develops

• Multiple community meetings
  • Ninilchik, Homer, Anchor Pt.
Entire offshore gas development is now on hold, pending confirmation of future tax credit program.
Questions?
Back Up
Reservoir Mapping

GeoSphere

- Deep Directional Resistivity Measurements
- 100’ Depth of Investigation
- Post processing azimuthal shifting
Three Well Drilling & Frac Schedule

Cosmopolitan Project Schedule

- Hansen 2: Drill & Complete
- Hansen 2: WO Swell Packers
- Hansen 2: Frac
- Hansen 2: Upper Completion WO
- Hansen 3: Drill Surf and Inter
- Hansen 3: Drill Dual Lat
- Hansen 3: Frac Lower Lateral
- Hansen 3L: CO Frac Diverter
- Hansen 3L: Frac Upper Lateral
- Hansen 3/3L: Upper Completion WO
- Hansen 4: Drill Surf and Inter
- Hansen 4: Drill Lower lateral
- Hansen 4L: Drill Upper lateral
- Hansen 4L: Frac Lower Lateral
- Hansen 4L: CO Frac Diverter
- Hansen 4L: Frac Upper Lateral
- Hansen 4L: Upper Completion WO

Drill & Complete, WO Swell Packers, Rig Workover, Frac
Tracer technology

- Tracers are installed at each frac sleeve
- Concentration is recorded through sampling at surface
- Analysis is performed after each sampling period
- Used widely on North Slope – COP, BP, ENI, Caelus

Tracer carrier design