Austin Chalk & LAMS Stack Play

PLANO Luncheon
*Mandeville, Louisiana*

May, 2019
Louisiana-Mississippi Stack Play (LAMS)

9 billion barrel recoverable resource
BACKGROUND
Kirk Barrell – Career Summary

- 34 years of petroleum industry experience
- 29 years of interpretation and transactions in the Tuscaloosa Trend
- B.S. Geology: Louisiana State University
- M.S. Geology: Texas A&M University

- Amoco Production Company (1988-95)
- Barrell Energy Inc.: Founder & President (1997-Present)
- Amelia Resources LLC: Founder & President (2003-Present)
Amelia Resources, LLC

- Founded 2003
- Generate drilling prospects in the onshore Gulf Coast
- Offices across the LA Austin Chalk Trend

New Orleans – St. Francisville - Natchez – Marksville

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Amelia Joint Venture Model

AMELIA
GEOLOGY
GEOPHYSICS

AMELIA
LAND

AMELIA
RELATIONSHIPS

PARTNER
CAPITAL

PARTNER
OPERATIONS

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AUSTIN CHALK
HISTORY
Austin Chalk Trend

GIDDINGS FIELD
1.4 BBOE

FREDERICKSBURG SHELF EDGE

LAMS STACK PLAY

Austin Chalk Fields (green)
Austin Chalk Trend
Austin Chalk Activity Cycles

1.0

1937-1990

1990-2016

Vertical Wellbore
Natural Fractures

Horizontal Wellbore
Frac Matrix Porosity

Horizontal Wellbore
Natural Fractures

2016-?

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Austin Chalk: Barrell/Wave/Amelia

1990
AMOCO 1993 Port Hudson

2000
Joint Venture – Avoyelles Parish 2010-11
3D Acquisition - 22,000 Acres
Drilled 3 wells

2010
Regional Study Mexico to MS
Midstates Joint Venture

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Austin Chalk Geographic Regions

Austin Chalk Fields (green) Production Fairways (A,B,C,D)
AUSTIN CHALK 3.0
Austin Chalk Play Concepts

AUSTIN CHALK 1.0 – “Feast or Famine”
Drill vertical wells near naturally occurring fractures.

AUSTIN CHALK 2.0 – “Focus where you find them”
Drill horizontal wells across naturally occurring fractures.

AUSTIN CHALK 3.0 – “Thick Saturated Porosity”
Utilize very high proppant hydraulic fracturing methods where higher matrix porosity and hydrocarbon saturation exists.
Amelia Dataset: Digital Well Logs

- Conducted regional Austin Chalk log analysis evaluation from Mexico to Mississippi (878 wells)

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Source Rock – South Texas

280’ OF EAGLE FORD SOURCE ROCK
The Austin Chalk in the Tuscaloosa Trend of Louisiana is a high TOC source rock

*Amoco Production Research, 1992*

Log analysis in the eastern portion of the Louisiana Austin Chalk requires a different approach.
The Hydrocarbon Kitchen

THE HYDROCARBON KITCHEN FOR AUSTIN CHALK, TMS, TUSCALOOSA, LOWER CRETACEOUS, AND SMACKOVER

ANCESTRAL MISSISSIPPI RIVER BASIN EMBAYMENT

FREDERICKSBURG SHELF EDGE

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Austin Chalk Trend

*EOG Project Areas*

- GIDDINGS FIELD 1.44 BBOE
- EOG Eagles Ranch 14H-1 -16200’ TVD
- EOG Ironwood 37H-1 -12550’ TVD
- EOG Karnes Trough -10200’ TVD
- EOG Tonkawa Unit #1 -15040’ TVD

**THE REGIONAL LOG ANALYSIS EVALUATION REVEALED WHAT EOG PREFERS IN ROCK PROPERTIES**
Passey Method: TX/LA

VALUES
DLogR: Feet > 1.0
DlogR: Mean

FAYETTE

174
1.1

AVOYELLES

180
1.26

Near the EOG Tonkawa Unit #1

Near the EOG Eagles Ranch 14H-1

Austin Chalk
Giddings Field – Current Focus Area

AUSTIN CHALK PRODUCERS

CURRENT ACTIVITY IS NOT IN HISTORICALLY ACTIVE AREAS WHERE FRACTURES WERE PURSUED

EOG TONKAWA #1
1.6 BCF in 4.5 months
## Louisiana Region Parameters

<table>
<thead>
<tr>
<th></th>
<th>LA-WEST UPDIP</th>
<th>LA-WEST DOWNDIP</th>
<th>LA-EAST UPDIP</th>
<th>LA-EAST DOWNDIP</th>
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<tr>
<td>Depths</td>
<td>2000'-14800'</td>
<td>13,000-22,200</td>
<td>5000'-17200'</td>
<td>10,000-23,000</td>
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<td>Geologic Structure</td>
<td>MONOCULAR DIP; MINIMAL FAULTS</td>
<td>COMPLEX GEOLOGY; LARGE FAULTS; 3-WAY AND 4-WAY CLOSURES; SALT TECTONICS</td>
<td>MONOCULAR DIP; MINIMAL FAULTS</td>
<td>COMPLEX GEOLOGY; LARGE FAULTS; 3-WAY AND 4-WAY CLOSURES; SALT TECTONICS</td>
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<td>Lithology</td>
<td>CHALK/SOME MARL</td>
<td>CHALK/SOME MARL</td>
<td>CHALK/MARL</td>
<td>CHALK/MARL</td>
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<tr>
<td>Pressure</td>
<td>NORMAL TO SLIGHTLY OVERPRESSURED</td>
<td>OVERPRESSURED</td>
<td>NORMAL TO SLIGHTLY OVERPRESSURED</td>
<td>OVERPRESSURED</td>
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<tr>
<td>Natural Fractures</td>
<td>SOME</td>
<td>ABUNDANT</td>
<td>SOME</td>
<td>ABUNDANT</td>
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<td>Potential Lateral Lengths</td>
<td>UNRESTRICTED BY GEOLOGY</td>
<td>POTENTIALLY RESTRICTED BY FAULT SPACING</td>
<td>UNRESTRICTED BY GEOLOGY</td>
<td>POTENTIALLY RESTRICTED BY FAULT SPACING</td>
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<td>Geosteering/Stay in Zone</td>
<td>SIMPLE</td>
<td>CHALLENGING</td>
<td>SIMPLE</td>
<td>CHALLENGING</td>
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<td>Vertical Well Penetrations</td>
<td>323</td>
<td>326</td>
<td>711</td>
<td>407</td>
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<td>Production</td>
<td>MOSTLY OIL</td>
<td>GAS AND OIL</td>
<td>MOSTLY OIL</td>
<td>GAS AND OIL</td>
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<td>Oil Gravity - Range</td>
<td>38-55</td>
<td>43-54</td>
<td>Unknown</td>
<td>36-47</td>
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<td>Gas Oil Ratio - Range</td>
<td>1,669-16,849</td>
<td>2,389-12,739</td>
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<td>248-11,052</td>
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<tr>
<td>Gas Oil Ratio - Average</td>
<td>5111</td>
<td>4796</td>
<td>Unknown</td>
<td>1157</td>
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<tr>
<td>Yield (bbl/mmf) - Range</td>
<td>157-599</td>
<td>148-395</td>
<td>12-4,033</td>
<td>865</td>
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<td>Yield (bbl/mmf) - Average</td>
<td>196</td>
<td>208</td>
<td>Unknown</td>
<td>1.29</td>
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<tr>
<td>Water/Boe Ratio</td>
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<td>1.29</td>
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<td>Drilling</td>
<td>LOWER RISK</td>
<td>CHALLENGING DUE TO DEPTH, PRESSURE, FRACTURES, AND FAULTING</td>
<td>LOWER RISK</td>
<td>CHALLENGING DUE TO DEPTH, PRESSURE, FRACTURES, AND FAULTING</td>
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<td>Log Analysis</td>
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<td></td>
<td></td>
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<tr>
<td>Phi-H (Sonic Calculated Porosity)</td>
<td>20-37</td>
<td>37-44</td>
<td>22-56</td>
<td>19-42</td>
</tr>
</tbody>
</table>

It's very likely that the Louisiana Austin Chalk play will have varying results across the four regions.
LEASING
Net Acres Leased

- EOG Resources: ~350,000
- ConocoPhillips: ~245,000
- Marathon Oil: ~220,000
- Cimarex: ~130,000
- Less than 100,000 acres: Devon, BlackBrush, Petroquest, State Line Exploration, Torrent, Prime Rock, and Panther Energy.

- Amelia Resources:
  - 565,000 secured
  - 127,000 sold
  - 438,000 being marketed
Leases – Large Operators

[Map showing leasing areas with operators such as MRO, EQNR, COP, EOG, ATS, DVN, XEC, and LA-West and LA-East regions marked as Updip and Downdip.]
EOG – TMS & Austin Chalk Leasing

EOG is now balanced between updip and downdip
Amelia Resources Leasing Strategy

- Target geologically superior locations based on petrophysics, structure, and stratigraphy
- Leverage reputation, track record, and relationships to secure premium acreage (TMS Part II)
- Focus on large tracts first (15k, 33k, 10k)
- Leasing across 10 parishes/counties
- LA-East, LA-West
- Updip and downdip
- Preference towards the “stack”
- $2.6 million invested to date (37 landmen)
Kickstarter Model

**TMS**
- Amelia Resources “kickstarted” Encana who ultimately became the largest leaseholder.
- Technical transfer
- 1st 60,000 acres

**AUSTIN CHALK**
- Amelia Resources “kickstarted” ConocoPhillips who is one of the largest leaseholders in the play.
- Technical transfer
- 1st 85,000 acres
“If you don’t have the leases, then you don’t have a prospect!”
Wise Geologist
DRILLING
EOG Eagles Ranch 14H-1

Cum Oil: 135,945
Cum Gas: 130,239
(18 months)

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### Giddings Field 3.0

<table>
<thead>
<tr>
<th>Date</th>
<th>Oil (MBo)</th>
<th>Gas (MMcf)</th>
<th>BOE (MMcfe)</th>
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<tbody>
<tr>
<td>29</td>
<td>73,776</td>
<td>325,400</td>
<td>126,176</td>
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<td>3</td>
<td>81,999</td>
<td>156,462</td>
<td>108,076</td>
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<tr>
<td>1</td>
<td>52,801</td>
<td>314,315</td>
<td>105,187</td>
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<tr>
<td>21</td>
<td>70,972</td>
<td>204,583</td>
<td>105,086</td>
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<td>17</td>
<td>57,789</td>
<td>260,270</td>
<td>101,167</td>
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<tr>
<td>16</td>
<td>63,303</td>
<td>180,747</td>
<td>93,427</td>
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<tr>
<td>20</td>
<td>55,449</td>
<td>184,837</td>
<td>86,255</td>
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<tr>
<td>4</td>
<td>35,480</td>
<td>282,910</td>
<td>82,632</td>
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<tr>
<td>2</td>
<td>67,598</td>
<td>20,493</td>
<td>71,014</td>
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<td>8</td>
<td>61,599</td>
<td>19,349</td>
<td>60,824</td>
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<td>11</td>
<td>36,992</td>
<td>121,160</td>
<td>57,285</td>
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<td>6</td>
<td>44,379</td>
<td>13,792</td>
<td>46,678</td>
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<td>12</td>
<td>17,518</td>
<td>12,774</td>
<td>19,647</td>
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<tr>
<td>13</td>
<td>3,599</td>
<td>15,422</td>
<td>6,169</td>
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<td>26</td>
<td>8</td>
<td>10,637</td>
<td>1,781</td>
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<td>28</td>
<td>145</td>
<td>4,526</td>
<td>499</td>
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<tr>
<td>15</td>
<td>14</td>
<td>3,858</td>
<td>657</td>
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<tr>
<td>27</td>
<td>1,889</td>
<td>315</td>
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<tr>
<td>10</td>
<td>1,184</td>
<td>197</td>
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Monthly Production

Date

- Oil
- Gas
- Water

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Current Drilling

- CROWELL #1, P&A
- EAGLES RANCH 14-1, Producing 135 MBO
- MCKOWEN #1, Producing
- IRWIN #1, Post-Frac
- JONES #1, Permitted
- SOTERRA #1, Permitted
- EOG Ironwood 37H-1, Permitted
- CURRENT FOCUS IN LAMS STACK

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Austin Chalk - Drilling Times

Obtaining conventional core

Well
- COP Erwin #1
- COP Hebert #1
- COP McKowen #1
- EOG Eagles Ranch 14-1

Irwin
McKowen
Hebert

www.ameliaresources.com tuscaloosatrend.blogspot.com
EOG Ironwood 37H-1 Offset Well

Passey Log Display

AUSTIN CHALK

TUSCALOOSA MARINE SHALE

252’ of high TOC source rock

130’ of high TOC source rock

800’
TUSCALOOSA MARINE SHALE
Wells Drilled (Thru 2018)

84 COMPLETIONS
Cumulative Production

<table>
<thead>
<tr>
<th>Operator Company Name (Beta)</th>
<th>Well/Lease Name</th>
<th>Cum BOE</th>
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</thead>
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<tr>
<td>AUSTRALIS TMS INC.</td>
<td>LONGLEAF 29H 2</td>
<td>494219</td>
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<tr>
<td>AUSTRALIS TMS INC.</td>
<td>LAWSON 25-13H 1</td>
<td>428187</td>
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<tr>
<td>AUSTRALIS TMS INC.</td>
<td>ASH 13H 1</td>
<td>390670</td>
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<tr>
<td>GOODRICH PETROLEUM</td>
<td>CMR/FOSTER CREEK 31-22H 1</td>
<td>351408</td>
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<tr>
<td>AUSTRALIS TMS INC.</td>
<td>PINTARD 28H 2</td>
<td>344331</td>
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<td>AUSTRALIS TMS INC.</td>
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<td>GOODRICH PETROLEUM</td>
<td>CMR FOSTER CREEK 24-13H 1</td>
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<tr>
<td>GOODRICH PETROLEUM</td>
<td>CMR FOSTER CREEK 26-13H 1</td>
<td>239468</td>
</tr>
</tbody>
</table>

**BEST WELLS WERE THE LAST COMPLETED IN 2014 BEFORE THE PRICE CRASH**
THE HIGHER GOR & PRESSURE WINDOW IN LOUISIANA IS BARELY EXPLORED
Encana/Australis Longleaf 29H-2

EUR: 945 MBO
Encana/Australis Lawson 25H-13

EUR: 885 MBO

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## Australis TMS Results

### Initial Drilling Program – Status & Costs

All drilling and completion operations have been executed without any reportable safety or environmental incidents.

#### Drilling Operations Summary

<table>
<thead>
<tr>
<th>Well</th>
<th>Well Status &amp; Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stewart 30H-1</strong></td>
<td>Lateral length drilled 6,900ft, completed 20 stages. 86,503 bbls produced after 91 days – 35% above the TMS Type Curve.</td>
</tr>
<tr>
<td><strong>Bergold 29H-2</strong></td>
<td>Lateral length drilled 2,000ft, completed 5 stages. Operational decision to shorten well to preserve capital.</td>
</tr>
<tr>
<td><strong>Taylor 27H-1</strong></td>
<td>Lateral length drilled 6,798ft, completed 20 stages. Commenced flowback in early April and after 19 days following clean up has produced at an average rate of 1,105 bbl/d and a reported IP24 of 1,282 bbl/d (1,386 boe/d).</td>
</tr>
<tr>
<td><strong>Williams 26H-2</strong></td>
<td>Lateral length drilled 2,878ft, completed 9 stages. Drilling issue resolution identified and successfully implemented on Quin 41-30 3H. Commenced flowback in early April and after 20 days following clean up has produced at an average rate of 386 bbl/d and a reported IP24 of 507 bbl/d (527 boe/d). On a normalised basis the 20 day average rate equates to 1,083 bbl/d.</td>
</tr>
<tr>
<td><strong>Saxby 03-10 2H</strong></td>
<td>Vertical surface hole drilled to 3,210 ft awaiting rig release from Quin well.</td>
</tr>
<tr>
<td><strong>Quin 41-30 3H</strong></td>
<td>Drilling horizontal lateral, operations ongoing.</td>
</tr>
</tbody>
</table>

Source: www.australisoil.com

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Recent TMS Results

LAMS Stack boundary

LK Shelf Edge

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TMS Producers

MUCH MORE TO BE EXPLORED

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Conclusions

• The Austin Chalk 3.0 play in Louisiana is in the very early stages of exploration (2 wells drilled)
• The potential to stack the TMS provides very attractive upside
• The industry has abundant capital to fund new plays
• Oil needs to stay above $60 per barrel
• The play has a stellar group of operators leading the exploratory effort
• Stay tuned
What To Look For In 2019

- Oil prices
- Additional leasing
- New drilling units
- Drilling by ConocoPhillips, EOG, and Marathon
- Amelia Resources transaction(s)
- More TMS wells?
Communicating to The Market

Regions - Geological Comparison and Contrast

In my November 5, 2018 post, I presented detailed maps illustrating geographic regions across the Austin Chalk Trend. This allows for comparison and contrast across this vast trend.

The table below provides a comparison and contrast of the geographic regions of the Austin Chalk in Louisiana and Mississippi. Due to the fact that I've not evaluated the Texas Austin Chalk trend to the same extensive detail that I have in Louisiana, I'm only presenting the table for LA and MS.
QUESTIONS?